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

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A.1 Introduction

The following analysis evaluates the changes to the following Final Phase III ERP/PEIS early restoration project: Enhancement of Franklin County Parks and Boat Ramps—Eastpoint Fishing Pier Improvements (Eastpoint Fishing Pier Improvements component) selected in the Record of Decision (ROD) for the Final Phase III ERP/PEIS. Section 9.2 of the ROD for the Final Phase III ERP/PEIS describes criteria the Trustees will consider to evaluate for material changes to any selected Phase III early restoration project to determine whether additional restoration planning and environmental review, including opportunity for public comment, is necessary. First, the Trustees will determine whether any change to the project is consistent with the environmental review in the Final Phase III ERP/PEIS or if there are substantial changes that are relevant to environmental concerns. Second, the Trustees will assess whether or not there are significant new circumstances or information relevant to environmental concerns not addressed in the impact analysis of the Final Phase III ERP/PEIS (40 C.F.R. § 1502.9 (c)). Third, the Trustees will evaluate whether changes to the project result in changes to the project description in the Final Phase III ERP/PEIS that affects their selection under Oil Pollution Act of 1990 (OPA). After considering these criteria in relation to the identified change, the Trustees have determined that the change to the Eastpoint Fishing Pier Improvements component does not impact the overall “Enhancement of Franklin County Parks and Boat Ramps” project objective (which is to enhance and/or increase recreational fishing and boating opportunities by improving two existing fishing piers, an existing boat launch facility, and an existing waterfront park), that the environmental consequences of the change to the Eastpoint Fishing Pier Improvements component will not be substantial, and that the change does not present significant new circumstances or information pursuant to the first two criteria. Consequently, the Trustees find the project change does not affect the Trustees’ selection of the project under OPA or the environmental analysis under NEPA in the Final Phase III ERP/PEIS.

A.2 Description of Project Change

The Final Phase III ERP/PEIS states that the work to be Eastpoint Fishing Pier in Franklin County includes constructing a restroom facility at the base of the public fishing pier, which will utilize a holding tank that would need to be pumped out regularly. In addition to the restroom facility, a kiosk describing fishing ethics, litter control, and the important resources surrounding the pier (primarily commercial oyster bars) would also be added.

The Trustees are modifying this project by designing the restroom facility with a holding tank (approximately 50 gallon) and grinder pump system, which will be connected to the existing sewer infrastructure approximately 2/3 of a mile away, instead of only utilizing a holding tank that would need to be pumped out regularly. The Trustees will dig a trench along and across a previously disturbed right-of-way alongside Highway 300 and Patton drive to construct the 2-3 inch sewer line, which will connect the restroom to the sewer infrastructure. The Trustees will work with Franklin County in obtaining all necessary permits that the project change requires before project implementation begins. The restroom will still be built at the base of the public fishing pier and the kiosk describing fishing ethics, litter control, and important resources surrounding the pier will still be constructed as well.
The project change to the Eastpoint Fishing Pier Improvements component does not impact the overall “Enhancement of Franklin County Parks and Boat Ramps” project objective, which is to enhance and/or increase recreational fishing and boating opportunities by improving two existing fishing piers, an existing boat launch facility, and an existing waterfront park.

A.3 Evaluation Criteria, Performance Criteria, Monitoring and Maintenance, Offsets, and Costs Update

The project change does not change the result of the analysis of the OPA evaluation criteria in the Final Phase III ERP/PEIS for the Eastpoint Fishing Pier Improvements component of the “Enhancement of Franklin County Parks and Boat Ramps” project. In particular the project change still meets the evaluation criteria established for OPA and the Framework Agreement. As a result of the Deepwater Horizon oil spill and related response actions, the public’s access to and enjoyment of the natural resources along Florida’s Panhandle was denied or severely restricted. The project change still intends to enhance and/or increase recreational fishing opportunities by improving the fishing pier. The project change will enhance and/or increase opportunities for the public’s use and enjoyment of the natural resources, helping to offset adverse impacts to such uses caused by the Spill. Thus, the nexus to resources injured by the Spill is clear. See 15 C.F.R. § 990.54(a)(2); and Section 6a-6c of the Framework Agreement.

The project change is technically feasible and uses proven techniques with established methods and documented results. Further, the project change can be implemented with minimal delay. Agencies have successfully completed projects of similar scope throughout Florida over many years, including in earlier phases of the Deepwater Horizon Early Restoration. For these reasons, the project change has a high likelihood of success. See 15 C.F.R. § 990.54(a)(3); and Section 6e of the Framework Agreement. The project change does not result in any material net change to the project’s estimated costs as identified in the Final Phase III ERP/PEIS and so the project will still be conducted at a reasonable cost. See 15 C.F.R. § 990.54(a)(1); and Section 6e of the Framework Agreement.

A thorough environmental review, including review under applicable environmental laws and regulations, as described in section 12.66 of the Final Phase III ERP/PEIS, indicates that adverse impacts from the project will largely be minor, localized, and often of short duration. In addition, best management practices (BMPS) and measures to avoid or minimize adverse impacts described in section 12.66 of the Final Phase III ERP/PEIS will be implemented. As a result collateral injury will be avoided and minimized during project implementation (construction and installation and operations and maintenance). See 15 C.F.R. § 990.54(a)(4). The project change would not affect the determination of the project’s effects in the Final Phase III ERP/PEIS and, further, is not anticipated to negatively affect regional ecological restoration and is therefore not inconsistent with the long-term restoration needs of the State of Florida. See Section 6d of the Framework Agreement.

Furthermore, the project change does not require or result in any change to the project’s performance criteria, monitoring and maintenance, offsets or costs as currently provided in the Final Phase III
ERP/PEIS for the Eastpoint Fishing Pier Improvements component of the “Enhancement of Franklin County Parks and Boat Ramps” project.

A.4 Analysis of the Project Change to the Eastpoint Fishing Pier Improvements Component

This analysis covers the project change to the Eastpoint Fishing Pier Improvements component. The impacts of the project change are identified and analyzed. The broader environmental analyses of the “Enhancement of Franklin County Parks and Boat Ramps” project and these types of actions as a whole are discussed in the Final Phase III ERP/PEIS.

A.4.1 Project Location

The restroom facility location for the Eastpoint Fishing Pier Improvements component is the same as identified in the Final Phase III ERP/PEIS. See Figure A-1 which updates the scope of the project location to include the construction of a sewer pipe. All work for this project component will take place in developed upland areas. No in-water work will be required.

A.4.2 Construction and Installation

The Eastpoint Fishing Pier Improvements component is one of four components encompassed within the “Enhancement of Franklin County Parks and Boat Ramps” project. This analysis is only applicable to construction activities related to the Eastpoint Fishing Pier Improvements component. Currently, the Final Phase III ERP/PEIS states that the improvements include construction of a public restroom sewage holding tank that will be pumped out regularly. This analysis reflects the project change which will connect the public restrooms directly with the Franklin County sewer system. The Trustees will now build the project with a holding tank (approximately 50 gallon) and grinder pump system and will install approximately 2/3-mile length of 2 to 3 inch PVC or polyethylene pipe, which will connect the public restrooms with the existing Franklin County sewer infrastructure. The Trustees will dig a trench along and across a previously disturbed right-of-way alongside Highway 300 and Patton drive to construct and install the sewer line. The total estimated costs are the same.

A.4.3 Operations and Maintenance

As described in Final Phase III ERP/PEIS, Franklin County will be responsible for operation and maintenance of the new amenities and enhancements at the Eastpoint Fishing Pier. This analysis also identifies Franklin County as responsible for operations and maintenance of the connecting sewer line. The Trustees will work with Franklin County in obtaining all necessary permits that the project change requires before project implementation begins.

A.4.4 Affected Environment and Environmental Consequences

Under the National Environmental Policy Act, federal agencies must consider environmental impacts of their actions that include, among others, impacts on social, cultural, and economic resources, as well as
natural resources. The following sections describe the affected environment and environmental consequences impacted by the project change to the Eastpoint Fishing Pier Improvements component.

A.4.4.1 Affected Environment

The affected environments for each of the following subsections are the same as described in Enhancement of Franklin County Parks and Boat Ramps: Environmental Review, which is part of the Final Phase III ERP/PEIS.

A.4.4.1.1 Physical Environment

Geology and Substrates

Environmental Consequences

The project change will involve minor alterations to soils due to the placement of the sewer pipe. The ground disturbance will range between approximately 18-36 inches deep and 4-6 inches across in a previously disturbed right-of-way alongside Highway 300 and Patton drive. The excavation for the sewer pipe is temporary and all sewer pipes will be buried post-construction. Given that there will be no substantial change in uses at the project sites following implementation of the enhancement activities, it is anticipated there will be no long-term negative impacts to soils. The implementation of the project change will therefore result in short-term minor negative and long-term beneficial impacts on soils.
Figure A-1. Location of the Eastpoint Fishing Pier Improvements component and sewer connection pipe
Air Quality and Greenhouse Gas Emissions

Environmental Consequences

The project change will require the use of a small excavator to lay the sewer pipe which will temporarily affect air quality in the project vicinity due to construction vehicle emissions. The excavator will be in use for no more than one week during project construction. BMPs will be employed to prevent, mitigate, and control potential air pollutants during project implementation. Any air quality impacts that will occur will be localized and short in duration. Therefore, any adverse impacts to air quality will be short-term and minor.

Engine exhaust from bulldozers, excavators, trucks, backhoes and other vehicles will contribute to an increase in greenhouse gases (GHG). Table A-1 describes the likely GHG emission scenario for the implementation of the entirety of the “Enhancement of Franklin County Parks and Boat Ramps” project.

Based on the assumptions described in Table A-1 below, and the small scale and short duration of the construction portion of the project, predicted GHG emissions will be short-term and minor and would not exceed 25,000 metric tons per year. Available BMPs will be employed to reduce the release of GHGs during implementation. Based on the small scale and short duration of the project, GHG emissions in the “Enhancement of Franklin County Parks and Boat Ramps” project staging and deployment areas will be minimal. Therefore, any increase in GHG emissions will be short-term and minor.

The project change will not impact overall GHG estimates for the “Enhancement of Franklin County Parks and Boat Ramps” project.

Noise

Environmental Consequences

The project change may expose sensitive park visitors and wildlife to noise sources during project construction due to the use of a small excavator. The project change will generate noise during the sewer pipe construction in the right-of-way along Highway 300 and Patton Drive. Construction equipment noise is known to disturb nesting shorebirds. Construction noise can also be a nuisance to residents living on the shorelines adjacent to project construction activities or to park visitors.

Mitigation measures that serve to limit noise during construction include: limiting activity at project sites to daytime hours; limiting truck traffic ingress/egress to the site to daytime hours; promoting awareness that producing prominent discrete tones and periodic noises (e.g., excessive dump truck gate banging) should be avoided as much as possible; and requiring that work crews seek pre-approval for any weekend activities, or activities outside of daytime hours. Because construction noise is temporary, any negative impacts to the human environment during construction activities will be short-term and minor.
Table A-1. Greenhouse gas emissions estimates

<table>
<thead>
<tr>
<th>PROJECT ACTIVITY</th>
<th>CONSTRUCTION EQUIPMENT</th>
<th>NO. OF HOURS OPERATED</th>
<th>NO. FOR PROJECT</th>
<th>TOTAL CO2E EMISSION RATE (METRIC TONS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courtesy Docks, Boat Ramp, and Bulkhead Repair</td>
<td>Small barge w/ crane (pile driving)</td>
<td>8 hours/day, 5 days/week, 1 month</td>
<td>4</td>
<td>23.2 (used crane .29 equipment for calculating total)</td>
</tr>
<tr>
<td></td>
<td>tractor trailer (material delivery)</td>
<td>3 trips</td>
<td>4</td>
<td>4.1 (used dump truck .34)</td>
</tr>
<tr>
<td></td>
<td>small power tools (nail guns, saws, drills)</td>
<td>8 hr/day, 5 day/week, 4 month</td>
<td>4</td>
<td>51.2 (used pickup truck .16)</td>
</tr>
<tr>
<td></td>
<td>generator (small tools)</td>
<td>8 hr/day, 5 day/week, 4 month</td>
<td>4</td>
<td>64 (used .8 as conversion)</td>
</tr>
<tr>
<td>Parking Improvements &amp; Restrooms</td>
<td>Small tools (nail guns, saws, drills)</td>
<td>8 hr/day, 5 day/week, 6 months</td>
<td>3</td>
<td>14.4</td>
</tr>
<tr>
<td></td>
<td>Tractor trailer (material delivery)</td>
<td>1 trip/week, 6 months</td>
<td>3</td>
<td>24.5</td>
</tr>
<tr>
<td></td>
<td>generator (small tools)</td>
<td>8 hr/day, 5 day/week, 6 months</td>
<td>3</td>
<td>96</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>277.4</td>
</tr>
</tbody>
</table>

Note: 1. Includes CO2, CH4, and NOx

A.5 Analysis of Criteria for Changes to Phase III Early Restoration Projects

Pursuant to Section 9.2 of the ROD for the Final Phase III ERP/PEIS, the Trustees will review material project changes against three criteria. The first criterion is whether the project change is consistent with the environmental review in the Final Phase III ERP/PEIS. As discussed above in greater detail, while the installation of the sewer line will result in short-term minor negative impacts to geology and substrate, air quality and greenhouse gas emissions, and noise, these impacts are consistent with the detailed environmental review in the Final Phase III ERP/PEIS and will not change the overall impacts of the project. This ties into the second criteria of whether or not there are significant new circumstances or information relevant to environmental concerns not addressed in the impact analysis of the Final Phase III ERP/PEIS and will not change the overall impacts of the project. Therefore, the Trustees have determined that the environmental consequences of the project change to the Eastpoint Fishing Pier Improvement component will not be substantial and do not present significant new circumstances or information pursuant to the first two criteria.

The third criteria evaluates whether changes to the project result in changes to the project description in the Final Phase III ERP/PEIS that affects its selection under OPA. As discussed above in greater detail,
the nexus to resources injured by the Spill is addressed, since the project change will enhance and/or increase opportunities for the public’s use and enjoyment of the natural resources, helping to offset adverse impacts to such uses caused by the Spill. Furthermore, the project change has a high likelihood of success since the installation of the sewer line is technically feasible and uses proven techniques with established methods and documented results. Additionally, the project change will be conducted at a reasonable cost since the installation of the sewer line instead of large holding tank doesn’t increase the cost of the project. Moreover, collateral injury will be avoided and minimized since the project change doesn’t change the adverse impacts of the project and BMPs will still be implemented. Finally, this project change is not inconsistent with the long-term restoration needs of the State of Florida, since the project change is not anticipated to negatively affect regional ecological restoration. Therefore, the Trustees have determined that the project change does not impact the overall “Enhancement of Franklin County Parks and Boat Ramps” project objective (which is to enhance and/or increase recreational fishing and boating opportunities by improving two existing fishing piers, an existing boat launch facility, and an existing waterfront park).

Based on this analysis, the Trustees find that the project change does not affects the Trustees’ selection of the project under OPA or environmental analysis under NEPA in the Final Phase III ERP/PEIS.

A.6 Summary

The project change for the Enhancement of Franklin County Parks and Boat Ramps – Eastpoint Fishing Pier Improvements is consistent with the selected alternative in the Final Phase III ERP/PEIS (Alternative 4), under which the Trustees propose to implement project emphasizing the restoration of habitat and living coastal marine resources as well as projects emphasizing the restoration of recreational opportunities.

This analysis of the environmental consequences suggests that while minor adverse impacts may occur to some resources categories, no moderate to major adverse impacts are anticipated to result. The project change to the Eastpoint Fishing Pier Improvements component will still enhance and/or increase recreational fishing opportunities by improving the existing Eastpoint Fishing Pier.
Appendix B: Phase IV Early Restoration Project Monitoring Plans

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B.1 Introduction

Monitoring plans for each of the proposed Phase IV projects are provided in this Appendix B. These plans were designed to evaluate the effectiveness of each of the proposed restoration actions in meeting the restoration objectives and to assist, where feasible, in determining the need for corrective actions. As applicable, these plans contain information on restoration objectives, performance criteria, specific monitoring parameters and methods to be used to collect data, and expected monitoring timelines. While the Trustees intend to strive for consistency in performance monitoring parameters, frequency, and duration for similar project types, flexibility in monitoring design is necessary to account for inherent differences between restoration projects and locations. Monitoring plans for most projects will be refined as project siting and design are finalized. In addition, for those projects that will include biological and structural sampling in the natural environment, the specifics regarding sampling methods, timing, frequency, and locations could be modified to evaluate the established performance criteria.

Monitoring of Early Restoration projects may also include evaluation of project compliance with other laws (e.g., to address Endangered Species Act monitoring needs) or to assist future restoration planning related to the Spill.
B.2 Texas Rookery Islands

B.2.1 Introduction

The Trustees developed this monitoring plan (Plan) for the Texas Rookery Islands Project. This project is included as a Phase IV Deepwater Horizon early restoration project that is intended to contribute to making the environment and public whole for injuries to birds. The purpose of this plan is to describe monitoring activities that will be conducted to evaluate and document restoration effectiveness, including performance criteria for determining the success of restoration or need for interim corrective action (15 CFR §990.55(b)(1)(vii)). This monitoring plan is intended to be specific to this Early Restoration Project and should not be generalized beyond this project. Other monitoring plans and designs may be appropriate in other contexts or sites. The monitoring plan outlined here will be used for each island site: Smith Point Island, Dickinson Bay Island II, Rollover Island, and Dressing Point Island. Since each island will target specific bird species and is located in a different environment, the islands will be independently designed and constructed and may be managed by different Trustees or project partners. Information collected for each site will be maintained and evaluated separately on an annual basis. At the conclusion of the project, the Implementing Trustees will develop a final project summary which will detail the overall accomplishments of the entire project. This Plan will be implemented by Texas Trustees\(^1\), DOI and project partners and may be modified over time based on the management needs for the Projects.

B.2.1.1 Project Overview

The Texas Rookery Islands Project would restore and protect three rookery islands in the Galveston Bay System and one rookery island in East Matagorda Bay. The Galveston Bay System islands include Dickinson Bay Island II, located within Dickinson Bay; Rollover Bay Island, located in East (Galveston) Bay; and Smith Point Island, located west of the Smith Point peninsula in Galveston Bay (Figure B-1).

The purpose of the project is to improve the numbers of nesting birds and protect rookery islands in the Galveston Bay System and East Matagorda Bay. Restoration and protection of the rookery islands is needed to protect the islands from land loss associated with erosion and relative sea level rise. The project involves the restoration of former island habitat area and construction of protective features at each rookery island. The habitat improvements aim to increase nesting of colonial waterbirds by increasing the amount of available nesting habitat, enhancing the quality of habitat, and by increasing protection of the habitat from natural environmental processes (e.g., wave action).

\(^1\) The Texas Trustees include the Texas Commission on Environmental Quality, Texas General Land Office, and Texas Parks and Wildlife Department (TPWD).
B.2.1.2 Restoration Objectives and Performance Criteria

The specific restoration objectives relevant for this monitoring plan are to: (1) Restore and protect colonial waterbird nesting islands; (2) Establish native vegetation for platform nesting birds; and (3) Increase the numbers of nesting colonial waterbirds.

Performance criteria that will be used to determine restoration success, the need for corrective action (15 CFR 990.55(b)(1)(vii)), or adaptive management are described below:

- The project is constructed according to design specifications. At the end of the 5-year monitoring period, the infrastructure is stable and is performing as expected.
- Approximately 60% survival of planted vegetation at the end of the 5-year monitoring period.
- Increased numbers of nesting pairs of target species over the Performance Monitoring Period (5 years).
B.2.1.3 Roles and Responsibilities
The Texas Trustees and DOI are the Implementing Trustees for the Bird Rookery Islands Project. Each island site will have a project team that includes representatives of the relevant Implementing Trustees and organizational or NGO project partners for that site.

The Implementing Trustees will work with the partners participating in management of project activities and where appropriate to identify corrective actions needed to help achieve success. Corrective actions will be part of an adaptive management process in which the Implementing Trustees and Component partners will evaluate information obtained as part of this project and other projects or datasets to inform planning of future actions. This allows for flexibility to optimize performance of the efforts under changing conditions to achieve success.

B.2.2 Project Monitoring
The monitoring for this project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, sample size, sites, and performance criteria. Once construction of each site is completed, the project team for each island will begin Performance Monitoring.

The Implementing Trustees will evaluate the outcome of each year’s activities to determine if any changes in monitoring protocols are needed. If changes are needed, the Trustees will update the Plan to describe any modifications. Any changes to procedures must be compliant with all active agreements. The Implementing Trustees will evaluate the submitted reports to determine if any changes in monitoring procedures are needed. If changes are needed, the Trustees will update the Project Monitoring Plan to describe any modifications. The activities involved with monitoring each objective are detailed below:

Objective #1: Restore and protect colonial waterbird nesting islands

- Did the project achieve its design criteria?
- Are the constructed structures (e.g., breakwater, levee, etc.) working as intended?
- What is the change in island size?

Activities associated with this objective are aimed at monitoring an island’s physical dimensions and effectiveness of restoring the island’s mass and protecting it from physical processes.

Parameter #1: Physical infrastructure that supports suitable island nesting habitat (as-built) at each of the rookery island sites.

a) Method:
   a. The Implementing Trustees will work with the project partners to review construction documents and will verify final construction. A final inspection and post construction as-built survey by a professional Engineer (PE) will be performed to document completion.
b. Visual inspections of specific physical features or issues such as breakwaters or erosion to the site will be conducted. Field and aerial photography will be taken to document features and conditions. The photographs will focus on infrastructures and features created on the island. The first aerial image will coincide with the end of construction to establish an aerial image baseline. The image will be high resolution and digitally rectified.

b) Timing and Frequency:
   a. Design criteria will be evaluated once at the completion of construction of physical infrastructure.
   b. After completion of the as-built survey, visual inspections, which include field photography, will be conducted at least once every year during the 5-year monitoring period. Each site will be visually inspected by members of the project team. Aerial photography will be obtained at least once a year for a total of 6 images.

c) Sample Size: Construction area.

d) Sites: Construction activities will occur at each rookery island site.

e) Performance Criteria: The project is constructed according to design specifications. At the end of the 5-year monitoring period, the infrastructure is stable and is performing as expected.

f) Data Products:
   a. As-built designs for the project, pre and post construction inspection reports, field and aerial photographs documenting features and conditions of the islands.
   b. Annual inspection reports and photographs
   c. A copy of the final construction report submitted by the professional engineer (PE), including a post construction as-built survey

Objective #2: Establish native vegetation for platform nesting birds

- Is target vegetation becoming established?

Parameter #1: Planting survival
   a) Method: Field surveys which would result in an estimation of dominant species by area and an estimation of survival rate.
   b) Timing and Frequency: First year of planting: 6 survey events; Remaining monitoring period: 2 survey events per year.
   c) Sample Size: Survey entire restored or constructed area.
   d) Sites: All rookery island sites.
   e) Performance Criteria: Approximately 60% survival of planted vegetation at the end of the 5-year monitoring period.
   f) Data Products: Monitoring reports, including photographs, and replanting documentation if replanting is required

Parameter #2: Vegetation distribution and/or planting survival.
   a) Method:
a. The Project Team will develop a Vegetation Plan for each island that will be approved by the Implementing Trustees. The Vegetation Plan will contain specific requirements that would be met by a planting contractor including but not limited to items such as identifying the vegetation to be planted, the quantity of vegetation, by species to be planted, locations to be planted, survival criteria. This plan will utilize information provided in NRCS Guidance TX-612 (NRCS 2013) and will incorporate site specific modifications to account for coastal island conditions and scrub-shrub species. The Vegetation Plan will provide the contractor with specific targets in order to complete their contract. Once the vegetation contractor is finished, the project team will continue to use the plan throughout the remainder of the monitoring period.

b. Project team members will conduct field surveys to ensure the contractor is meeting their obligations, document plant survival and health, and to obtain information needed to initiate timely corrective actions. Field surveys will document plant survival for each species planted, collect on-site photographs, and assess corrective actions if they may be deemed necessary. Soil salinities may also be measured to determine when soil salinity is appropriate for planting and/or if it is a factor in plant survival. The field surveys will include documentation of natural colonization of the island by dominant plant species not actively planted by a contractor. Information collected will include species, distribution, and estimates of coverage or density.

c. Aerial imagery will be obtained and rectified for each island site. The imagery will be reviewed for the status of the vegetation planted and for the natural colonizers. The imagery will be ground-truthed during the vegetation surveys. Estimates of coverage would be used to document the rate of vegetation establishment and provide location information that can be checked against field observations.

d. Field photography will focus on the vegetation present.

b) Timing and Frequency:

a. The Vegetation Plan will be developed prior to planting activities.

b. Field surveys will be conducted 6 times in the first year after planting. This is considered the most vulnerable period for survival. This increased survey effort would help identify needed corrective actions/adaptive management. For the remainder of the monitoring period, 2 surveys will be conducted each year to assess island vegetation.

c. Aerial imagery will be obtained and evaluated once annually for 5 years (for a total of 6 aerial images).

d. Field Photography will be conducted during the habitat monitoring activities (approximately 14 survey events).

c) Sample Size: Survey entire restored or constructed area.

d) Sites: All rookery island sites.

e) Performance Criteria: TBA. Each island will have its own Vegetation Planting Plan which will specify performance criteria for the project. The current expectation for survival is
approximately 60% for the planted scrub-shrub plants at the end of the 5-year monitoring period. The Vegetation Plan for each island will be developed prior to any planting activities.

f) Data Products:
   a. The Vegetation Plan for each island.
   b. Field survey data which would include metrics outlined in the Vegetation Plan such as qualitative information on plant health, estimates of plant survival, measures of soil salinities (if needed), natural colonization by dominant plant species, estimates of areal distribution, and photographs taken during each survey.
   c. Aerial images of the islands would be provided once annually to support information collected in the field.

Objective #3: Increase the numbers of nesting colonial nesting waterbirds

- Are the target birds, in expected numbers, nesting on the restored habitat?

Parameter #1: Number of nesting pairs
   a) Method:
      a. Survey methodology will be consistent with that used by the Texas Colonial Waterbird Society surveys (Damude 2000). A guidance document for surveys will be formalized prior to completion of infrastructure construction has been completed. In general, surveys will be implemented as follows:
         i. Surveys will be performed in early morning or late afternoon hours to avoid excessive temperature stress on eggs or young of potentially disturbed birds.
         ii. Surveys will be performed from vessels adjacent to shoreline at static locations or by drifting. If conditions preclude these options, surveys will be conducted from fixed locations on the island edge. Observers will not intrude into any nesting area to perform counts.
         iii. No less than a two member team representing the Implementing Trustees will perform each survey. Additional observers approved by the Implementing Trustees may accompany survey teams.
         iv. The survey team will assess safety, environmental, and island conditions and discuss specific approaches to implement the task prior to counting. For each static or drifting survey, each survey team member will count the estimated number of nesting pairs for all nesting species using similar estimating approaches and agree on a single value for each species.
         v. For each species counted, notes will be taken to document factors influencing estimate or how estimate was determined; e.g. black-crowned night heron – nesting site obscured, nest-building, number of adults/2 or tri-colored heron, single adult, nesting site fidelity, head count method.
      b. All species of nesting birds present will be recorded. Surveys will estimate the number of breeding pairs for each species using the island. General associations with particular locations and/or vegetation will be noted. Permanent geo-referenced visual markers
will be placed on the islands to aid observers by partitioning sections of the island into virtual polygons and used to assist in determining associations between nesting location and vegetation.

c. Each site may have fixed photographic stations that remotely record images during the nesting season. These would be installed prior to the onset of nesting activity and removed at the end of the most active part of the nesting season. Images collected would be used to better inform interactions between individuals and species at each site and document predation and or disturbance issues at each site. This activity will help guide adaptive management/corrective actions.

d. Aerial imagery will be obtained and rectified for each island site. The imagery will be evaluated for information related to bird nesting at each site and used to support information collected during field surveys.

e. Field photographs will be collected associated with each survey event at sufficient resolution to aid in refining estimates. It will also document any noteworthy activities related to nesting activities.

b) Timing and Frequency:

a. Nesting bird surveys will begin after vegetation planting has occurred. This monitoring will occur biannually in April and May for 5 years. Where existing, historical information on nesting birds will be obtained and summarized as part of pre-project monitoring activities.

b. Fixed photography would capture images at appropriate intervals based on technology chosen.

c. Aerial imagery will be obtained and evaluated once annually for 5 years (for a total of 6 aerial images).

d. Field Photography will be conducted during each survey event (approximately 10 survey events).

e. Sample Size: Observations on all nesting habitat.

f. Sites: All rookery island sites.

g. Performance Criteria: Increased numbers of nesting pairs of target species over the Performance Monitoring Period (5 years).

h. Corrective Action: Implementing Trustees will evaluate survey methods and bird survey data results as well as other data included in the annual report and employ adaptive management techniques to address survey method improvements or actions that promote nesting as appropriate. For example, if birds fail to use the site prior to the advent of nesting season, Trustees may employ decoys and playbacks as attractants prior to the next nesting season.

c) Data Products: Datasheets, field notes, field and aerial photographs, and GPS information.

B.2.3 Monitoring Frequency and Schedule

The schedule for the project monitoring is shown in Table B-1, separated by monitoring activity. The frequency of the sampling events per year is presented within each cell. Post-construction monitoring will occur as the various construction components (defined in the work contracts) are finalized. After
construction completion, a professional Engineer (PE) will perform a final inspection and submit a final construction report, including a post construction as-built survey to document final completion. Performance monitoring will begin after receipt of the construction completion report and after vegetation planting. Performance monitoring will occur annually following project construction (Years 1–5) after vegetation planting has been completed. The occurrence of a significant storm event may initiate additional ad-hoc surveys. Any adaptive measures will be documented and coordinated with the Implementing Trustees.

Table B-1. Anticipated monitoring frequency and schedule

<table>
<thead>
<tr>
<th>Monitoring Activity</th>
<th>Post-Construction Monitoring</th>
<th>Performance Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>As-built survey of island area and features</td>
<td>1X</td>
</tr>
<tr>
<td></td>
<td>Post-construction field inspection of the physical infrastructure</td>
<td>1X</td>
</tr>
<tr>
<td></td>
<td>Vegetation Plan</td>
<td>1X</td>
</tr>
<tr>
<td></td>
<td>Vegetation surveys</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Nesting bird surveys</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Fixed photography</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Aerial imagery</td>
<td>1X</td>
</tr>
<tr>
<td></td>
<td>Field photography</td>
<td>1X</td>
</tr>
</tbody>
</table>

B.2.4 Reporting and Data Requirements

This section describes the process that will be used to document, validate and report field data collected for the purposes of performance monitoring. The reporting and data requirements described herein are intended to:

- Maximize the quality, utility, and integrity of monitoring data;
- Organize, track, locate, and access monitoring data over the long-term; and
- Share finalized monitoring data with the public in a consistent and comprehensible format.

B.2.4.1 Reporting

Annual reports will summarize the activities described above including results, expenses, and document the degree to which the project is progressing. For the purposes of the annual reporting, a reporting year will cover from January 1st to December 31st. The first annual report will cover the year following the receipt of funding. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. Each island will be evaluated in a separate chapter within the report. Information related to any corrective actions taken will be included in the report.
The reports should provide a summary of the previous annual report (including timelines documenting monitoring procedures) as well as summary information for the most recent monitoring year. Reported data and all data that is available to the public will be aggregated in accordance with existing requirements and laws, including the protection of personal identifiable information. The Implementing Trustees will develop a final project summary report at the conclusion of the project which will detail the overall accomplishments of the project.

**B.2.4.2 Data Documentation**

The majority of data collected during the monitoring portion of this project will be field observations of infrastructure, photography, observations of birds using and nesting in the project area, and the distribution of dominant vegetation and survival of planted vegetation. To the extent possible, all environmental and biological data generated during monitoring activities will be documented using field datasheets which have been approved by the Implementing Trustees. The bird monitoring datasheets will be modified from the standard datasheets used for the Texas Colonial Waterbird Society Survey Data Collection (Appendix A). Other additional datasheets may be developed for this project. All project-specific datasheets will be drafted prior to conducting monitoring activities and will be attached to an updated version of this Monitoring Plan.

All data available to the public will be aggregated in accordance with existing requirements and laws, including the protection of personal identifiable information. Field data will be reviewed by the Implementing Trustees for completeness and accuracy before being finalized. Original hardcopy datasheets and photographs will be retained by the Implementing Trustee in a secure location in accordance with litigation-hold and other agency and Trustee requirements. All validated datasets and aggregated data will be retained by the Implementing Trustees.

**B.2.4.3 Data Transcription, Verification, Validation, and Analysis**

Where and when applicable field datasheets and notes will be scanned to PDF files and will be archived along with the original hardcopies. Electronic data files should be named with the date on which the file was created. Where possible, a ReadMe file should be included that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved. Relevant project data will be transcribed (entered) into Excel spreadsheets (or similar agreed upon digital format) for required data analysis and reporting.

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic database, spreadsheet, or other agreed upon electronic format against the hardcopy datasheets, and will make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. After identified errors are addressed, data are considered to be validated.

When the data transcription process is complete, electronic datasets can be used for data analysis and reporting. Analyses will be conducted by the Implementing Trustees to derive Project monitoring performance criteria metrics. All data will be (1) entered or converted into agreed upon/commonly used digital format and (2) stored and managed in a secure location in such a way that the Implementing
Trustee is guaranteed to have access to all versions of the data at least as long as Trustee retention requires and during the entire period of litigation hold.

B.2.5 References


TEXAS ROOKERY ISLANDS APPENDIX A:
EXAMPLE BIRD SURVEY FIELD DATA FORM

DOCUMENT WILL BE MODIFIED AND UPDATED PRIOR TO INITIATION OF FIELD SURVEYS
**Texas Waterbird Colony Census Form**

**Colony Name:**

**Colony Code:**

**Survey Date:**

Mo Day Year

**Latitude:**

**Longitude:**

- New Colony
- Surveyed, Inactive
- Surveyed, Active
- Prev. Known Colony
- Prev. Known Colony (Count Only)

**Observer(S):**

**Time:**

Start _______ End _______

**Survey Vantage:**

- Aerial
- On-Site Visit
- View from Adjacent Area by Vehicle/Boat/On Foot

<table>
<thead>
<tr>
<th>Predominant Reprod. Stage (enter 1 code)</th>
<th>Survey Type (enter code)</th>
<th>No. Active Nests</th>
<th>No. Adults</th>
<th>Est. Breed. Pairs</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Pelican</td>
<td>Nests Adults</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown Pelican</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dalmatian Cormorant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neotropical Cormorant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anhinga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Egret</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snaggle Bill</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little Blue Heron</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reddish Egret</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red morph</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White morph</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cattle Egret</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>El.-cr. Night Heron</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y.-cr. Night Heron</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White Ibis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White-faced Ibis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roseate Spoonbill</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laughing Gull</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gulf-banded Tern</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caspian Tern</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Royal Tern</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandwich Tern</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forster's Tern</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least Tern</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sooty Tern</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Skimmer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Prenesting = 1
Eggs in Nests = 3
Nestlings = 7

- Total Count = 1
- Sampling Process = 6
- Visual Estimate = 8
- Other = 0 specify in comments

**Comments:**

---

13
COLONY SITE DESCRIPTION

COLONY CODE: __________________ COLONY NAME: __________________ DATE: ________________

County: _______________ Size: ___ acres/hectares
Latitude: ___________ Longitude: ___________ Owner: ______________

Nearest city/town: ______________ Distance: ___ km. Direction to colony: __________

Distance to nearest routinely occupied dwelling within 1 km from colony: ___ m
Distance to nearest highway, canal, airport, park, railroad, etc. Within 1 km from colony: ___ m

Height of lowest nests above normal water level ___ m

Would some nests be flooded by extreme high water levels expected at the colony? Yes ___ no ___

Is colony specifically managed or protected for waterbirds? yes ___ no ___

General habitat: (Provide a general description of the habitat. ex. barrier island, upland wooded, riparian, saltwater non-barrier island, spoil island etc.)

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Specific habitat: (List any specific habitat characteristics. ex. dune, mixed trees, mixed forbs/shrubs/grass, man-made structures, fresh or salt marsh, etc.)

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Important vegetation: (Describe the vegetation composition of the island. Provide of the island if possible.)

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Ground Surface: (Describe the surface of the colony. ex. Sand, shell, salt/mud flat, dead herbaceous/wrack/drift, etc.)

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Other comments:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
B.3 Restoring Living Shorelines and Reefs in Mississippi Estuaries

B.3.1 Introduction

The proposed Restoring Living Shorelines and Reefs in Mississippi Estuaries includes the restoration of secondary productivity through the placement of intertidal and subtidal reefs and the use of living shoreline techniques including breakwaters. Projects are proposed in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay in Jackson, Harrison, and Hancock Counties, Mississippi. The project builds on recent collaborative projects implemented by Mississippi Department of Marine Resources (MDMR), National Oceanic and Atmospheric Administration (NOAA), and The Nature Conservancy. When completed at all locations, the project would provide for construction of over four (4) miles of breakwaters, five (5) acres of intertidal reef habitat and 267 acres of subtidal reef habitat at four (4) locations across the Mississippi Gulf Coast (Figure B-2). For the Grand Bay and Graveline Bay project locations, intertidal and subtidal reefs would be created in a number of sites. Over time, the breakwaters, intertidal and subtidal restoration areas would develop into living reefs that support benthic secondary productivity, including, but not limited to oysters/bivalve mollusks, annelid worms, shrimp, and crabs. Breakwaters would reduce shoreline erosion as well as marsh loss. This monitoring plan provides [project monitoring] guidelines including parameters and performance criteria by restoration objective, based on the project’s current conceptual design.
The monitoring plan will be refined as the project siting and design is finalized. In addition, due to the nature of biological and structural sampling in the natural environment, sampling techniques, timing, frequency, and locations could be modified in order to evaluate the established performance criteria.

This monitoring plan is specific to this Early Restoration Project and should not be generalized beyond this project. Other monitoring plans and designs may be appropriate in other contexts or projects.

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2 Project areas encompass the project components, the direct restoration measures and potential areas for construction or indirect impacts. Conceptual design features (breakwaters, intertidal reef habitat, subtidal reef habitat, and temporary flotation channels) are subject to refinement and could be sited within respective project areas.
**B.3.1.1 Project Overview**

The project components are grouped into four project locations. The project components are located in Grand Bay, Graveline Bay, Back Bay of Biloxi, and St. Louis Bay. For this project, the living shoreline approach includes constructing breakwaters made of suitable manufactured and/or natural materials that reduce shoreline erosion by dampening wave energy while encouraging reestablishment of habitat that was once present in the region. Breakwaters would develop into reefs that support secondary productivity (living reefs). Subtidal and intertidal reefs would be built using suitable cultch material (e.g. limestone, crushed concrete, oyster shell or a combination thereof). Some sites would be built to complement existing restoration sites constructed by MDMR, NOAA, and The Nature Conservancy projects funded through the NOAA Community-based Restoration Program. The following proposed early restoration project components are listed in Table B-2, shown in Figures B-2 to B-9, and are described below.

**Table B-2. Restoring Living Shorelines and Reefs in Mississippi Estuaries—Project Components**

<table>
<thead>
<tr>
<th>Project Components</th>
<th>Breakwater Structure Length (feet)</th>
<th>Subtidal Reef Habitat (acres)</th>
<th>Intertidal Reef Habitat (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand Bay and Graveline Bayou (Jackson County)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grand Bay Intertidal and Subtidal Reefs</td>
<td></td>
<td>77</td>
<td>3</td>
</tr>
<tr>
<td>Graveline Bay Intertidal and Subtidal Reefs</td>
<td></td>
<td>70</td>
<td>2</td>
</tr>
<tr>
<td>Back Bay of Biloxi and Vicinity (Jackson and Harrison County)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel Island Living Shoreline and Subtidal Reefs</td>
<td>2,385</td>
<td>70</td>
<td>-</td>
</tr>
<tr>
<td>Big Island Living Shoreline</td>
<td>5,011</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Little Island Living Shoreline</td>
<td>2,316</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Deer Island Subtidal Reef</td>
<td>-</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>St. Louis Bay (Harrison and Hancock County)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wolf River Living Shoreline and Subtidal Reef</td>
<td>1,388</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>St. Louis Bay Living Shoreline</td>
<td>10,812</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>TOTAL</td>
<td>21,912 feet</td>
<td>267 acres</td>
<td>5 acres</td>
</tr>
</tbody>
</table>

3 For the purpose of the Restoring Living Shorelines and Reefs in Mississippi Estuaries Phase IV project components are located in eight locations across the Mississippi Gulf Coast and include some combination of the following restoration measures; intertidal reef habitat restoration; subtidal reef habitat restoration and breakwater construction. Grand Bay and Graveline Bay are each considered a project location with numerous intertidal and subtidal reefs sites.
Grand Bay Project Component (Jackson County)

Grand Bay Intertidal and Subtidal Reefs (Figure B-3): The Grand Bay Intertidal and Subtidal Reefs project component would restore approximately three (3) acres of intertidal reefs in the intertidal waterways of Grand Bay. Approximately 77 acres of subtidal reef habitat would be restored in the nearshore environment of Grand Bay. Conceptual site locations for the intertidal and subtidal reefs are depicted in Figure B-3 and are subject to refinement.

Figure B-3. Grand Bay Intertidal and Subtidal Reefs Project Area

Graveline Bay Project Component (Jackson County)

Graveline Bay Intertidal and Subtidal Reefs (Figure B-4): The Graveline Bay Intertidal and Subtidal Reefs project component would restore approximately two (2) acres of intertidal reefs along the intertidal waterways of Graveline Bay. Approximately 70 acres of subtidal reef habitat would be restored in the nearshore environment of Graveline Bay. Conceptual site locations for the intertidal and subtidal reefs are depicted in Figure B-4 and are subject to refinement.
Back Bay of Biloxi and Vicinity Project Components (Jackson and Harrison County)

Back Bay of Biloxi and vicinity would have four (4) project components located along islands within Back Bay of Biloxi, which currently experience erosion, and along Deer Island to the south of Back Bay of Biloxi. Using living shoreline techniques, such as breakwater or intertidal shoreline stabilization, erosion rates would be reduced along approximately 1.8 miles of marsh island shoreline in Back Bay of Biloxi. Approximately 90 acres of subtidal reef habitat would be restored at locations in Back Bay of Biloxi and in the vicinity on the north side of Deer Island, adjacent to current reef projects.

Channel Island Living Shoreline and Subtidal Reef (Figure B- 5): Would include construction of approximately 2,385 ft. of breakwater along the shoreline. Approximately 70 acres of subtidal reef habitat would be created and would connect the breakwater structure to an existing subtidal reef on the north and south sides of the island. The conceptual site location for the breakwater, subtidal reefs and temporary flotation channels are depicted in Figure B- 5 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.
Big Island Living Shoreline (Figure B-6): Would include construction of approximately 5,011 ft. of breakwater along the southern facing shoreline directly adjacent to the navigation channel. The conceptual site location for the breakwater and temporary flotation channels are depicted in Figure B-6 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.
Figure B-6. Big Island Living Shoreline Project Area

Restoring Living Shorelines and Reefs in Mississippi Estuaries

Back Bay of Biloxi and Vicinity

- Project Area
- Navigation Channel
- Proposed Flotation Channel
- Proposed Phase IV Breakwater

Conceptual project design features represent generalized areas and are subject to refinement.
**Little Island Living Shoreline (Figure B-7):** Would include construction of approximately 2,316 linear ft. of breakwater along the southern facing shoreline directly adjacent to the navigation channel. The conceptual site location for the breakwater and temporary flotation channels are depicted in Figure B-7 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.

*Figure B-7. Little Island Living Shoreline Project Area*

**Deer Island Subtidal Reef (Figure B-8):** Would expand an existing reef project at Deer Island to create approximately 20 acres of subtidal reef habitat. The conceptual site location for the subtidal reef is depicted in Figure B-8 and is subject to refinement.
St. Louis Bay Project Components (Harrison and Hancock County)

St. Louis Bay would have two project components including approximately 2.3 miles of breakwater and approximately 30 acres of subtidal reef habitat restoration at two locations.

Wolf River Living Shoreline and Subtidal Reef (Figure B-9): Would include construction of approximately 1,388 ft. of breakwater along the island at the mouth of the Wolf River in St. Louis Bay. This would also include construction of approximately 30 acres of subtidal reef habitat in St. Louis Bay, adjacent to current reef projects at mouth of Wolf River. Conceptual site locations for the breakwater, subtidal reefs and temporary flotation channels are depicted in Figure B-9 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.
St. Louis Bay Living Shoreline (Figure B-10): Would include the construction of approximately 10,812 ft. of breakwater in St. Louis Bay. Conceptual site locations for the breakwater and temporary flotation channels are depicted in Figure B-10 and are subject to refinement. Temporary flotation channel conceptual locations and footprints have been included for the purpose of estimating the maximum impact, but may be avoided depending on project design and/or construction timing.
B.3.1.2 Restoration Objectives and Performance Criteria

There are two overall goals of this restoration project: 1) Construct breakwater structures to protect shoreline from erosion, to facilitate reef development, and to support secondary production, and 2) Restore subtidal and intertidal reefs to support secondary production. The specific restoration objectives for each goal are outline below.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). Since full recovery of restoration projects may occur over a long time frame, performance criteria typically represent interim milestones that will help project managers determine if the project is improving along an acceptable trajectory. The specific performance criteria for this project are identified below and shown in Table B-3.

Goal 1: Construct breakwater structures to protect shoreline from erosion, to facilitate reef development, and to support secondary production
Objectives

1) Build breakwaters that are sustained for the expected lifespan of the project.
   a. Performance Criteria: Over five (5) or seven (7) years elevation and area meet the engineering design specifications.

2) Support habitat utilization of the breakwaters by invertebrate infauna and epifauna.
   a. Performance Criteria: Over five (5) or seven (7) years, the average non-bivalve infauna and epifauna invertebrate biomass is at least 84 g wet weight/ m²

3) Reduce shoreline erosion.
   a. Performance Criteria: Over five (5) or seven (7) years there is reduction or no change in shoreline slope compared to pre-construction condition.
   b. Performance Criteria: Over five (5) or seven (7) years, the average shoreline erosion loss is less than the calculated average loss/year at specific site.

Goal 2: Restore subtidal and intertidal reefs to support secondary production

Objectives

4) Create or restore subtidal and intertidal reefs that are sustained for the expected lifespan of the project.
   a. Performance Criteria: Over five (5) or seven (7) years the total subtidal reef area is equal to or greater than 267 acres and the elevation meets engineering design specifications.
   b. Performance Criteria: Over five (5) or seven (7) years the total intertidal reef habitat is equal to or greater than 5 acres.

5) Support habitat utilization of subtidal reefs and intertidal reefs by invertebrate infauna and epifauna.
   a. Performance Criteria: Over five (5) or seven (7) years, the average non-bivalve infauna and epifauna invertebrate biomass is at least 84 g wet weight/m²

Table B-3. Performance Criteria for Restoring Living Shorelines and Reefs in MS Estuaries Project

<table>
<thead>
<tr>
<th>Performance criteria</th>
<th>Construction (as-built survey)</th>
<th>Year 3</th>
<th>Year 5 or 7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BREAKWATER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breakwater elevation</td>
<td>Meets design specifications</td>
<td></td>
<td>Meets design specifications</td>
</tr>
<tr>
<td>Breakwater area</td>
<td>Meets design specifications</td>
<td></td>
<td>Meets design specifications</td>
</tr>
<tr>
<td>Non-bivalve invertebrate infauna and epifauna</td>
<td>At least 84gww/m²</td>
<td></td>
<td>At least 84gww/m²</td>
</tr>
<tr>
<td>Shoreline profile/slope</td>
<td></td>
<td></td>
<td>Reduction or no change in slope</td>
</tr>
<tr>
<td>Marsh edge position</td>
<td></td>
<td></td>
<td>Loss is &lt;average historic loss/year at site</td>
</tr>
</tbody>
</table>
### B.3.1.3 Conceptual Model and Monitoring Questions

Table B-4, below, outlines the conceptual model that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

#### Table B-4. Conceptual Model for the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project

<table>
<thead>
<tr>
<th>Activity</th>
<th>Output</th>
<th>Short-term outcome</th>
<th>Long-term outcome</th>
</tr>
</thead>
</table>
| • Construct breakwater structures parallel to shoreline | • 4.1 miles of shore-parallel reef structures are built | • Wave energy is dissipated  
• Shoreline erosion rate is reduced  
• Invertebrate infauna and epifauna colonize | • Breakwaters are sustained for the expected lifespan of the project  
• Wave energy is dissipated  
• Shoreline erosion rate is reduced  
• Breakwaters support a diverse benthic community |
| • Construct /restore subtidal and intertidal reef habitat | • 267 acres of subtidal reefs are built  
• 5 acres of intertidal reefs are built | • Invertebrate infauna and epifauna colonize | • Reefs are sustained for the expected lifespan of the project  
• Reefs support a diverse benthic community |

This monitoring plan has been designed around the project’s objectives and desired outcomes, and is intended to address the following monitoring questions for each objective:

**Objective #1: Build breakwaters that are sustained for the expected lifespan of the project**

- Did the project achieve its design criteria?
- Is the projected structure of the breakwaters being maintained?
Objective #2: Support habitat utilization of the breakwaters by invertebrate infauna and epifauna

- Are invertebrate infauna and epifauna colonizing the breakwater structures?
- What is the secondary productivity of non-bivalve invertebrate infauna and epifauna associated with the breakwater structures?

Objective #3: Reduce shoreline erosion

- Is shoreline erosion rate being reduced?

Objective #4: Create or restore subtidal and intertidal reefs that are sustained for the expected lifespan of the project

- Did the project achieve its design criteria?
- Is the projected structure of the reef being maintained?

Objective #5: Support habitat utilization of subtidal reefs and intertidal reefs by invertebrate infauna and epifauna

- Are invertebrate infauna and epifauna colonizing the reef structures?
- What is the secondary productivity of non-bivalve invertebrate infauna and epifauna associated with the subtidal and intertidal reefs?

B.3.2 Project Monitoring

The proposed monitoring for this restoration project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the potential monitoring methods, timing and frequency, sample size, and sites. In addition, performance criteria for each parameter are identified (if applicable), including corrective actions that may be taken if the performance criteria are not met. The timing and frequency as well as sample size provided here are the minimum suggested values. More frequent events or more samples will be performed or collected if budget allows.

GOAL 1, Objective #1: Build breakwaters that are sustained for the expected lifespan of the project

- Did the project achieve its design criteria?
- Is the projected structure of the breakwaters being maintained?

Parameter #1: Structural integrity of breakwater structure
a) Method: Conduct visual observations and take pictures of the project site from a boat or shoreline, or during an aerial survey.

b) Timing and Frequency: Post-construction (Opportunely, Years 0-5 or 7)\(^4\).

c) Sample Size: Observations along entire length of reef structure.

d) Performance Criteria: None, this is a contract performance criterion.

Parameter #2-3: Breakwater height/elevation and area

a) Methods [list of potential options]: Several options for assessing breakwater height/elevation and area are proposed. Any or all of these methods could be used to determine whether the parameter is met depending on available budget. In addition, other methodologies, not included here, could be identified as project design is finalized.
1. Method #1: Visual and field measurements;
2. Method #2: Acquisition of bathymetric and topographic (topobathy) data if budget allows
3. Method #3: Conduct bathymetric/topographic survey using advanced surveying instrumentation (e.g., RTK GPS, Total Station) with cross-sections extending from the reef structures to low elevation marsh habitat. Potential method described by Baggett et al. (2013).

b) Timing and Frequency: Post-construction (Years 0 and 5 or 7).

c) Sample Size: TBD with final engineering and design

d) Performance Criteria: Over five (5) or seven (7) years elevation and area meet the engineering design specifications.

e) Corrective Action [as budget allows]: Add structural material to existing breakwater structure.

GOAL 1, Objective #2: Support habitat utilization of the breakwaters by invertebrate infauna and epifauna

- Are invertebrate infauna and epifauna colonizing the breakwater structures?
- What is the secondary productivity of non-bivalve invertebrate infauna and epifauna associated with the breakwater structures?

Parameter #1: Infauna and epifauna species composition, density (individuals/m\(^2\)), and biomass (g wet weight/m\(^2\))

a) Method: Deploy substrate trays at random locations along the breakwater structure (Eggleston et al., 1998; Gregalis et al., 2009; Baggett et al., 2013). Trays should remain in

\(^4\) Additional surveys may be warranted if the project site is directly impacted by a major storm.
place for at least one month before collection (Baggett et al., 2013). Following collection, identify, count, and weigh (wet weight) all species within the baskets/trays. Report density, biomass, and secondary productivity on a square meter basis.

b) Timing and Frequency: Post-construction (Year 3 and 5 or 7)
c) Sample Size: TBD with final engineering and design
d) Performance Criteria: Over five (5) or seven (7) years, the average non-bivalve infauna and epifauna invertebrate biomass is at least 84 g wet weight/m²
e) Corrective action [as budget allow]: Add structural material to existing breakwater structure

GOAL 1, Objective #3: Reduce shoreline erosion

- Is shoreline erosion rate being reduced?

Parameter #1: Shoreline profile/elevation

a) Method [list of potential options]:
   1. Method #1: Shoreline vectors would be derived from the acquired topographic (topobathy) data [Lidar – as budget allows] and would be referenced to vertical and horizontal datums so that accurate vertical measurements can be made using spatial software. Shoreline elevation profiles would be created using 3D components of the software.

b) Timing and Frequency: Pre-construction (once); Post-construction (Years 5 or 7); or if project site impacted by a major storm.
c) Sample Size: TBD with final engineering and design
d) Performance Criterion: Over five (5) or seven (7) years there is reduction or no change in shoreline slope compared to pre-construction condition.
e) Corrective Action [as budget allows]: Add structural material to breakwater structures.

Parameter #2: Marsh edge position

a) Method [list of potential options]: Several options for assessing marsh edge position are proposed. Any or all of these methods could be used to determine whether the parameter

---

5 Performance criteria based on data from scientific literature.
is met depending on available budget. In addition, other methodologies, not included here, could be identified as project design is finalized.

1. Method #1: Shoreline vectors would be derived from the acquired topographic (topobathy) data [Lidar – as budget allows] and would be referenced to vertical and horizontal datums so that accurate vertical measurements can be made using spatial software. Shoreline data between years will be analyzed by calculating linear distance between derived position data.

2. Method #2: Walk the marsh edge and take continuous readings with a differential GPS. Marsh edge is defined as the lower/seaward extent of the emergent marsh vegetation. Import and analyze data using spatial analysis software. Determine shoreline loss/gain in meters per year. Potential method describe by Steyer et al. (1995 revised 2000) and Baggett et al. (2013).

3. Method #3: Establish permanent base locations along the length of the shoreline at least 10 m landward of the marsh edge. Measure the linear distance from the base location to the marsh edge along an established compass direction. Marsh edge is defined as the lower/seaward extent of the emergent marsh vegetation. Import and analyze data using spatial analysis software. Determine shoreline loss/gain in meters per year. Potential method describe by Steyer et al. (1995 revised 2000), Meyer et al. (1997), Piazza et al. (2005), and Baggett et al. (2013).

b) Timing and Frequency: Pre-construction (once); Post-construction (Years 5 or 7); or if project site impacted by a major storm.

c) Sample Size: TBD with final engineering and design

d) Performance Criterion: Over five (5) or seven (7) years, the average shoreline erosion loss is less than the average historic feet lost per year at the specific site.

e) Corrective Action [as budget allows]: Add structural material to breakwater structures.

GOAL 2, Objective #4: Create or restore subtidal and intertidal reefs that are sustained for the expected lifespan of the project

- Did the project achieve its design criteria?
- Is the projected structure of the reef being maintained?

Parameter #1: Structural integrity observations of reef structure

a) Method: Conduct visual observations during low tides or through manually poling site for substrate

b) Timing and Frequency: Post-construction (Opportunely, Years 0-5 or 7)\(^6\).

\(^6\) Additional surveys may be warranted if the project site is directly impacted by a major storm.
c) Sample Size: Qualitative observations along entire length of reef structure.

Parameter #2-3: Reef height/elevation and area

a) Method: Conduct bathymetric survey using side-scan sonar, depth finder fitted with a differential GPS (e.g., Ceeducer), or another acoustic technique, of the reef area with transects over the entire project footprint. Import and analyze data using spatial analysis software. Reef area is the actual area (summed) of patches of living and non-living oyster shell (or reef substrate with and without live oysters) within the project footprint (Baggett et al., 2013).

b) Timing and Frequency: Post-construction (Years 0 and 5 or 7).

c) Sample Size: TBD with final engineering and design

d) Performance Criteria:
   a. Performance Criterion: Over five (5) or seven (7) years the total subtidal reef area is equal to or greater than 267 acres and the elevation meets engineering design specifications.
   b. Performance Criterion: Over five (5) or seven (7) years the total intertidal reef habitat is equal to or greater than five (5) acres.
   e) Corrective Action [as budget allows]: 1) Add structural material to existing reef structure or 2) construct new reef structures.

GOAL 2, Objective #5: Support habitat utilization of subtidal reefs and intertidal reefs by invertebrate infauna and epifauna

- Are invertebrate infauna and epifauna colonizing the reef structures?
- What is the secondary productivity of non-bivalve invertebrate infauna and epifauna associated with the subtidal and intertidal reefs?

Parameter #1: Infauna and epifauna species composition, density (individuals/m²), and biomass (g wet weight/m²)

a) Method: Deploy substrate trays along the reef structure (Eggleston et al., 1998; Gregalis et al., 2009; Baggett et al., 2013). Trays should remain in place for at least one month before collection (Baggett et al., 2013). Following collection, identify, count, and weigh (wet weight) all species within the baskets/trays. Report density and biomass on a square meter basis.

b) Timing and Frequency: Post-construction (Year 3 and 5 or 7).

c) Sample Size: TBD with final engineering and design

---

7 These performance criteria are based on engineering and design specifications
d) Performance Criterion\(^8\): Over five (5) or seven (7) years, the average non-bivalve infauna and epifauna invertebrate biomass is at least 84 g wet weight/m\(^2\).

e) Corrective Action [as budget allows]: 1) add structural material to existing reef structure, 2) construct new reef structures in a more suitable location(s).

Additional Monitoring

Water temperature, salinity, and dissolved oxygen

a) Method: Determine water temperature, salinity, and dissolved oxygen using appropriate instrumentation (e.g., YSI water quality sonde).

b) Timing and Frequency: During biological sampling events.

c) Sample Size: [TBD].

B.3.3 Monitoring Schedule

The tentative schedule for the project monitoring is shown in Table B-5, separated by monitoring activity. Pre-construction monitoring will occur before project implementation. Construction monitoring occurs when project has been fully executed as planned (Year 0). Post construction monitoring will occur in the years following initial project construction (Years 1-5 or 7). This table represents the minimum number of monitoring events expected for this project. Depending on the implementation costs for monitoring, more monitoring events, higher sample size, and two more years of monitoring may be added to strengthen project tracking over time.

<table>
<thead>
<tr>
<th>Performance Criteria</th>
<th>Pre-Construction Monitoring</th>
<th>Construction monitoring (initial)</th>
<th>Post-Construction Monitoring (ongoing)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>As-built (Year 0)</td>
<td>Year 1</td>
</tr>
<tr>
<td>BREAKWATER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structural integrity observations</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Breakwater height/elevation and area</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological monitoring</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Marsh edge position and shoreline profile/elevation</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^{8}\) Performance criteria based on data from scientific literature.

\(^{9}\) Year 6 and 7 monitoring events are optional and may be implemented depending on available budget.
### Performance Criteria

<table>
<thead>
<tr>
<th>Performance Criteria</th>
<th>Pre-Construction Monitoring</th>
<th>Construction monitoring (initial)</th>
<th>Post-Construction Monitoring (ongoing)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>As-built (Year 0)</td>
<td>Year 1 Year 2 Year 3 Year 4 Year 5 Year 6 Year 7</td>
</tr>
<tr>
<td>Water quality monitoring</td>
<td>X</td>
<td>X</td>
<td>X X X X X</td>
</tr>
</tbody>
</table>

#### SUBTIDAL AND INTERTIDAL REEFS

<table>
<thead>
<tr>
<th>Performance Criteria</th>
<th>Pre-Construction Monitoring</th>
<th>Construction monitoring (initial)</th>
<th>Post-Construction Monitoring (ongoing)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>As-built (Year 0)</td>
<td>Year 1 Year 2 Year 3 Year 4 Year 5 Year 6 Year 7</td>
</tr>
<tr>
<td>Structural integrity observations</td>
<td>X</td>
<td>X</td>
<td>X X X X X X X</td>
</tr>
<tr>
<td>Reef height/elevation and area</td>
<td>X</td>
<td></td>
<td>X X</td>
</tr>
<tr>
<td>Biological monitoring</td>
<td>X</td>
<td></td>
<td>X X</td>
</tr>
<tr>
<td>Water quality monitoring</td>
<td>X</td>
<td></td>
<td>X X</td>
</tr>
</tbody>
</table>

### B.3.4 Reporting and Data Requirements

#### B.3.4.1 Reporting

Annual reports will summarize the annual monitoring events and document the degree to which the project is attaining success. For the purposes of the annual reporting, a reporting year will cover from January 1st to December 31st. The first annual report will cover the calendar year immediately following the calendar year in which the implementing Trustee has completed construction of the Early Restoration Project. The reports should provide a summary of the previous annual report (including timelines documenting monitoring procedures), a list or table of performance standards that compares annual monitoring results to each performance criteria, and a summary of any problems encountered and solutions to each or whether corrective actions were necessary.

#### B.3.4.2 Quality Assurance / Quality Control Procedures

The Trustees have developed QA/QC guidance for the Early Restoration Projects which dictates the minimum requirements QA/QC clearance and release. This is described in the Trustees’ approved document, “Data QA/QC, Clearance, and Release Steps”.

The Goals of the document are to:

- Ensure the quality, utility, and integrity of information disseminated by trustees
- Develop procedures that are efficient, easy to use, and result in easily accessible data

Given the large amount of monitoring data that will be generated over the next few years, following agreed upon data QA/QC, clearance, and release procedures will help the Trustees:

- Ensure the quality, utility, and integrity of monitoring data
- Organize, track, locate, and access monitoring data over the long-term
- Share validated monitoring data with the public in a consistent and comprehensible format
- Meet stipulation requirements and respond to data requests by BP in a uniform and efficient manner
Furthermore, all Early Restoration Projects in Mississippi are subject to the formal Quality Management Program developed by Mississippi Department of Environmental Quality (MDEQ 2014). This program dictates that all data collection and monitoring efforts be performed under a project specific Quality Assurance Project Plan (QAPP). To meet this requirement, Mississippi DEQ has developed a Comprehensive Quality Assurance Plan (CompQAP) for all of its early restoration Projects (MDEQ 2015). Quality Assurance procedures for this monitoring plan, all field methods and associated data collection, recording and storage efforts are included in the CompQAP.

B.3.5 References


Mississippi Department of Environmental Quality. 2015. Comprehensive Quality Assurance Plan. In prep


B.4 Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore

B.4.1 Introduction

B.4.1.1 Project Overview

This project involves implementing roadway improvements to the 2.17-mile length of Park Road in the Davis Bayou unit of Gulf Islands National Seashore (GUIS). The project will enhance the use of Park Road by bicyclists and pedestrians.

B.4.1.2 Restoration Objectives and Performance Criteria

The overall goal of this restoration project is to restore a portion of the lost recreation-use injuries sustained on lands managed by DOI in the five Gulf States. The specific restoration objectives relevant for this monitoring plan are: (1) to construct and complete the project as scoped; and (2) to have bicyclists and pedestrians regularly using the improvements to Park Road.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). The specific performance criteria for this project are identified below.

- **Performance Criterion #1**: project is constructed and completed as designed and specified in the contract
- **Performance Criterion #2**: bicyclists and pedestrians are regularly using the improved areas along Park Road after project completion

B.4.1.3 Conceptual Model and Monitoring Questions

Table B-6, below, outlines the conceptual model for this restoration project that forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Output</th>
<th>Short-term outcome</th>
<th>Long-term outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct/ implement enhancements to Park Road for bicyclists and pedestrians</td>
<td>Enhancements are complete and public are using Park Road to bike and hike</td>
<td>• New infrastructure and/or traffic controls • Function as designed</td>
<td>• Bicyclists and pedestrians are using the improved areas along Park Road after project completion</td>
</tr>
</tbody>
</table>
This monitoring plan has been designed around the objectives and desired outcomes for this restoration project, and is intended to address the following monitoring questions for each objective:

**Objective #1: construct and complete the project as scoped**
- Was the project constructed and completed as designed and contracted?

**Objective #2: bicyclists and pedestrians are regularly using the improvements to Park Road**
- Are bicyclists and pedestrians regularly using the improvements along Park Road to bike and walk?

### B.4.1.4 Roles and Responsibilities

NPS employees (from park, region, Washington Office, or some combination thereof) acting as the Contracting Officer (CO) and Contracting Officer’s Representative (COR) will be responsible for ensuring that the project is constructed and completed as scoped and contracted and that all deliverables are acceptable and have been received.

GUIs employees would document the regular use of the Park Road improved areas by bicyclists and pedestrians.

### B.4.2 Project Monitoring

The monitoring for this restoration project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, sample size, and sites. In addition, performance criteria for each parameter are identified (if applicable), including example corrective actions that could be taken if the performance criteria are not met. The parameters listed below may or may not be tied to performance criteria and/or corrective actions.

**Objective #1: construct and complete the project as scoped**
- Was the project constructed and completed as designed and contracted?

  **Parameter #1: level of completion of project**
  a) **Method:** CO/COR review contractor reports, conduct on-site inspections, and compare to as-built designs
  b) **Timing and Frequency:** approximately monthly and at end of project, unless otherwise provided by contract
  c) **Sample Size:** approximately 10 sampling periods (approx. once per month for approx. 10 months), unless otherwise provided by contract
  d) **Sites:** restoration project site
  e) **Performance Criterion:** project is constructed and completed as designed and specified in the contract
  f) **Corrective Action:** resolution with contractor such that the terms of the contract are met
Objective #2: bicyclists and pedestrians are regularly using the improvements to Park Road

- Are bicyclists and pedestrians regularly using the improved areas along Park Road?

  Parameter #1: regular presence of bicyclists and pedestrians in the improved areas
  a) Method: visual observation of bicyclists and pedestrian in the improved areas by park staff
  b) Timing and Frequency: twice monthly on same days each month for one year after project completion
  c) Sample Size: 24 observation periods
  d) Sites: along Park Road (near same locations as pre-construction)
  e) Performance Criterion: bicyclists and pedestrians are regularly using the improved areas along Park Road after project completion
  f) Corrective action: none

B.4.3 Monitoring Schedule

The schedule for the project monitoring is shown in Table B-7, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned (Year 0). Performance monitoring will occur in the year following initial project execution (Year 1).

<table>
<thead>
<tr>
<th>Monitoring Parameters</th>
<th>Monitoring Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Execution Monitoring</td>
</tr>
<tr>
<td></td>
<td>As-built (Year 0)</td>
</tr>
<tr>
<td>Level of completion of project</td>
<td>X</td>
</tr>
<tr>
<td>Observations of regular presence of bicyclists and pedestrians in improved areas</td>
<td>X</td>
</tr>
</tbody>
</table>

B.4.4 Reporting and Data Requirements

Reporting will occur once at the end of Year 0 and once at the end of Year 1. There are no known data requirements. Reports will be in the form of brief narratives.
B.5  Bon Secour National Wildlife Refuge Trail Enhancement Project, Alabama

B.5.1  Introduction

B.5.1.1  Project Overview

This proposed project involves repairing and improving an existing trail (Jeff Friend Trail) located on the Bon Secour National Wildlife Refuge (NWR). This aged boardwalk and gravel trail would be repaired and improved to ensure safe public access and to improve the quality of visitor experience. An observation platform would also be constructed along the trail, and two handicapped parking spaces would be widened to better accommodate visitors. Improvements will meet the standards provided by the Americans with Disabilities Act. The project is expected to extend the availability of a safe and enhanced experience for visitors to the refuge.

B.5.1.2  Restoration Objectives and Performance Criteria

The overall goal of this restoration project is to restore a portion of the lost recreational use injuries sustained on lands managed by DOI in the five Gulf States. The specific restoration objectives relevant for this monitoring plan are: (1) to construct and complete the project as scoped; and (2) to provide all visitors access to the Jeff Friend Trail an enhanced visitor experience.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). The specific performance criteria for this project are identified below.

- **Performance Criterion #1**: project is constructed and completed as designed and specified in the contract for construction of improvements;
- **Performance Criterion #2**: public with all different abilities are able to use the enhanced trail after project completion;

B.5.1.3  Conceptual Model and Monitoring Questions

Table B-8 below, outlines the conceptual model for this restoration, which forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.
This monitoring plan has been designed around the objectives and desired outcomes for this restoration project, and is intended to address the following monitoring questions for each objective:

**Objective #1: construct and complete the project as scoped**

- Was the project constructed and completed as designed and contracted?

**Objective #2: improve access and use by the public for the Jeff Friend Trail at Bon Secour National Wildlife Refuge**

- Are the public using the improved and enhanced trail?

### B.5.1.4 Roles and Responsibilities

FWS employees (could be from Bon Secour NWR, the Fairhope DWH Field Office, the FWS Region 4 Office, or some combination thereof) acting as the Contracting Officer (CO) and Contracting Officer’s Representative (COR) will be responsible for ensuring that the project is constructed and completed as designed.

FWS employees would document the use of the trail and parking area enhancements by the public.

### B.5.2 Project Monitoring

The monitoring for this restoration project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, sample size, and sites. In addition, performance criteria for each parameter are identified (if applicable), including example corrective actions that could be taken if the performance criteria are not met. The parameters listed below may or may not be tied to performance criteria and/or corrective actions.
Objective #1: Construct and complete the project as designed

- Was the project constructed and completed as designed and contracted?
  
  Parameter #1: Level of construction to terms of contract
  
  g) Method: CO/COR review contractor reports, conduct on-site inspections, and compare to construction drawings
  
  h) Timing and Frequency: approximately monthly and at end of project, unless otherwise provided by contract
  
  i) Sample Size: approximately 10 (approx. once per month for approx. 10 months), unless otherwise provided by contract
  
  j) Sites: project site
  
  k) Performance Criteria: project is constructed and completed as designed and specified in the contract
  
  l) Corrective Action: resolution with contractor such that the terms of the contract are met

Objective #2: Improve access and enhance public use of the Jeff Friend Trail at Bon Secour National Wildlife Refuge

- Are the public of different abilities using the enhanced trail?

Parameter #1: Level of public use

  a) Method: visual observation or automated counter
  
  b) Timing and Frequency: Prior to construction of the enhancements to the Jeff Friend Trail visual observations or automated counters will be conducted twice monthly at randomly selected intervals until the project is initiated. Post construction, visual observations or automated counters will be conducted 3 hours per quarter for one year.
  
  c) Sample Size: dependent upon project initiation. Pre-construction sampling expected to be about 10-20 observations.
  
  d) Sites: Jeff Friend Trail and the parking area
  
  e) Performance Criteria: the public are using the enhanced trail after project completion

Additional Monitoring: The use and performance of the project will continue to be measured throughout the life of the trail, however less frequently and methodically than the first year of NRDA Early Restoration monitoring. The continued monitoring will occur in the course of regular Refuge management activities and all costs associated with monitoring, maintenance, and/or corrective actions after construction is accepted, will be the responsibility of Bon Secour NWR and are, therefore, outside the scope of this monitoring plan.

B.5.3 Monitoring Schedule

The schedule for the project monitoring is shown in Table B-9, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has
been fully executed as planned (Year 0). Performance monitoring will occur in the year following initial project execution.

**Table B- 9. Monitoring Schedule**

<table>
<thead>
<tr>
<th>Monitoring Parameters</th>
<th>Pre-Execution Monitoring</th>
<th>Execution Monitoring (initial)</th>
<th>Post-Execution Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review contractor invoices and deliverables, including the completed project</td>
<td>X</td>
<td>X</td>
<td>Year 1</td>
</tr>
<tr>
<td>Observations or counts of visitors(TBD)</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**B.5.4 Reporting and Data Requirements**

Reporting will occur once at Year 0 and once at Year 1. There are no known data requirements. Reports will be in the form of brief narratives.
B.6 Osprey Restoration in Coastal Alabama

B.6.1 Introduction

This document presents a monitoring plan designed to monitor and evaluate the performance of the Osprey Restoration in Coastal Alabama project. This project seeks to compensate the losses to natural resources resulting from the Spill by establishing 5 osprey nesting platforms in Mobile and Baldwin Counties in coastal Alabama.

B.6.1.1 Project Overview

The proposed restoration project would improve Osprey nesting success by establishing five (5) Osprey nesting platforms in multiple locations in coastal Alabama in Mobile and Baldwin Counties, including Gulf State Park. The specific locations and design of these nesting platforms would be developed to maximize project success and meet regulatory requirements. Five general areas have been identified for the location of these platforms (from west to east): the vicinity of Portersville Bay, the vicinity of Dauphin Island, the vicinity of Fort Morgan, the vicinity of the Little Lagoon area in Gulf Shores, and in Gulf State Park (Figures B 13- B17).

Figure B-11 and Figure B-12 illustrate typical osprey nesting platforms. A typical design for such structures is an approximately 1 meter by 1 meter nesting platform atop a pole approximately 3 to 6 meters high. Poles are typically placed 1 to 2 meters deep in the ground. Sheet metal can be attached to the pole approximately 1 to 2 meters above the ground to protect eggs and fledglings from predators.
Figure B-11. Potential Osprey Restoration Locations in the Vicinity of Portersville Bay
Figure B-12. Potential Osprey Restoration Locations in the Vicinity of Dauphin Island
Figure B-13. Potential Osprey Restoration Locations in the Vicinity of Fort Morgan
Figure B- 14. Potential Osprey Restoration Locations in the Vicinity of Little Lagoon, Gulf Shores
Figure B-15. Potential Osprey Restoration Locations in Gulf State Park
Figure B- 16. View of Typical Osprey Nesting Platform
Figure B-17. Dimensions of Typical Osprey Nesting Platform

NOTE:
Make all platforms about 3' x 3'
**B.6.1.2 Restoration Objectives and Performance Criteria**

The overall goal of this restoration project is to provide additional osprey habitat for osprey restoration in coastal Alabama. The specific restoration objective relevant for this monitoring plan is to (1) construct osprey nesting platforms that meet project design criteria and (2) increase osprey nesting success in the project area.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). Since full recovery of restoration projects may occur over a long time frame, performance criteria typically represent interim milestones that will help project managers determine if the project is improving along an acceptable trajectory. The specific performance criteria for this project are identified below and shown in Table B-10.

We will monitor the platforms for utilization as described in the sections of this document that follow.

**B.6.1.3 Conceptual Model and Monitoring Questions**

Table B-10, below, outlines the conceptual model that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Output</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction of Osprey Nesting Platforms</td>
<td>Platform use by breeding pairs.</td>
<td>Fledglings</td>
</tr>
</tbody>
</table>

This monitoring plan has been designed around the project’s objectives and desired outcomes, and is intended to address the following monitoring questions for each objective:

**Objective 1:** construction of osprey nesting platforms that meet project design criteria.

- Were the nesting platforms constructed as designed?

**Objective #2:** increase osprey nesting success in project area.

- Are the platforms being utilized by osprey?
- Are fledglings present in nests?

**B.6.2 Project Monitoring**

The monitoring for this restoration project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, sample size, and sites. In
addition, performance criteria for each parameter are identified (if applicable), including corrective actions that may be taken if the performance criteria are not met.

**Objective #1: Construction of osprey nesting platforms meet project design criteria**
- Were the nesting platforms constructed as designed?
  Parameter #1: Inspection of nesting platforms prior to, during and after construction.
    a) [Potential] Method:
       1. Meet with contractor to insure design specifications are understood.
       2. On-site inspection of construction of all platforms to insure proper placement.
       3. Post-construction inspection of platforms.
    b) Timing and Frequency:
       1. Pre-construction (once)
       2. During Construction (once)
       3. Post-construction (1-3 times a year for Years 1-5)
    c) Sites: All platform sites (5)
    d) Performance Criterion: Successful construction of 5 Osprey nesting platforms.

**Objective #2: Increase Osprey Nesting Success in the Project Area.**
- Are the platforms being utilized by osprey?
- Are fledglings present in nests?

Parameter #1: Utilization by a breeding pair.
  a) Method: Observe platform and document presence of nesting materials and/or presence of osprey
  b) Timing and Frequency: Post-construction (1-3 times a year for Years 1-5)
  c) Sites: All platform sites
  d) Performance Criterion: Presence of nesting osprey

Parameter #2: Presence of fledglings
  e) Method: Observe platform and document presence of fledglings
  f) Timing and Frequency: Post-construction (1-3 times a year for Years 1-5)
  g) Sites: All platform sites
  h) Performance criterion: presence of osprey fledglings.

**B.6.3 Monitoring Schedule**

The schedule for the project monitoring is shown in Table B-11, separated by monitoring activity. Pre-construction monitoring will occur before project implementation. Implementation monitoring will occur immediately following project implementation (Year 0). Performance monitoring will occur in the years following project implementation (Years 1-5).
Table B-11. Monitoring schedule for the Osprey Restoration in Coastal Alabama Project

<table>
<thead>
<tr>
<th></th>
<th>Pre-construction</th>
<th>As-built</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspection of nesting platforms</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presence of Breeding Pairs</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Presence of Fledglings</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

B.6.4 Reporting and Data Requirements

B.6.4.1 Reporting

Annual reports will summarize the annual monitoring events and document the degree to which the project is attaining success. For the purposes of the annual reporting, a reporting year will cover from January 1st to December 31st. The first annual report will cover the calendar year immediately following the calendar year in which the implementing Trustee has completed construction of the Early Restoration Project. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. The reports should provide a summary of the previous annual report (including timelines documenting monitoring procedures), a list or table of performance standards in that compares annual monitoring results to each performance criteria, and a summary of any problems encountered and solutions to each or whether corrective actions were necessary.

B.6.4.2 Quality Assurance / Quality Control Procedures

Monitoring data sheets will be reviewed by ADCNR staff and/or its contractor for accuracy of dates, times and observational information recorded. Discrepancies and/or questions concerning data or observations will be reviewed and rectified in consultation with the ADCNR staff and/or contractor performing monitoring.
B.7  Point aux Pins Living Shorelines

B.7.1  Introduction

This document presents a monitoring plan designed to monitor and evaluate the performance of the Point aux Pines (PaP) Living Shorelines project in Mississippi Sound, Alabama. This monitoring plan is intended to be specific to this Early Restoration Project and should not be generalized beyond this project. Other monitoring plans and designs may be appropriate in other contexts or sites.

B.7.1.1  Project Overview

The proposed PaP early restoration project is located along the northeastern portion of Point aux Pins, along the northern shoreline Mississippi Sound in southern Mobile County, Alabama (see Figure B- 18). Shoreline erosion rates for the project area vary from approximately 3-12 feet between 1992 and 2010 (based upon aerial photography interpretation). The goal of the project is to reduce the rate of erosion through reduction of wave height and energy while enhancing the benthic ecosystem function of the area. The preliminary layout of the living shoreline is shown in Figure B- 19.

Figure B- 18. Site Location
B.7.1.2 Restoration Objectives and Performance Criteria

The overall goal of this restoration project is to reduce the rate of erosion through reduction of wave height and energy while enhancing the ecosystem function of the area. The specific restoration objectives relevant for this monitoring plan are: 1) construction of breakwaters that meet project design criteria and that are sustained for the expected lifespan of the project to support benthic secondary productivity and reduce shoreline erosion, 2) support habitat utilization of the breakwater segments by bivalves and other invertebrate infauna and epifauna to increase secondary benthic productivity at the project site, and 3) reduction of shoreline erosion rate to protect existing salt marsh habitat.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). Since full recovery of restoration projects may occur over a long time frame, performance criteria typically represent interim milestones that will help project managers determine if the project is improving along an acceptable trajectory. The specific performance criteria for this project are identified below and shown in Table B-12.

1) Build living shorelines that are sustained for the expected lifespan of the project.
   a. Performance Criterion: At year 0, breakwater segments meet the design specifications.
   b. Performance Criterion: At years 1-5, breakwater segments are present.
2) Support habitat utilization of breakwater segments by bivalves and other invertebrate infauna and epifauna.
   a. Performance Criterion: At year 5, 90% of breakwater units have invertebrate infauna and epifauna present.
3) Reduce shoreline erosion.
   a. Performance Criterion: Over 5 years, the cumulative shoreline slope is unchanged and shoreline loss is less than pre-project average loss/year.

Table B-12. Performance criteria for the Point aux Pins Living Shoreline Project. (Finalize After Design is Complete)

<table>
<thead>
<tr>
<th>Performance criteria</th>
<th>Implementation</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakwater Segment Construction</td>
<td>Meets design specifications</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>Invertebrate infauna and epifauna density</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marsh Edge Position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance criteria</th>
<th>Implementation</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakwater Segment Construction</td>
<td>Meets design specifications</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>Invertebrate infauna and epifauna density</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marsh Edge Position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B.7.1.3 Conceptual Model and Monitoring Questions

Table B-13, below, outlines the conceptual model that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

Table B-13. Conceptual Model for the Point aux Pins Living Shorelines Project

<table>
<thead>
<tr>
<th>Activity</th>
<th>Output</th>
<th>Short-term outcome</th>
<th>Long-term outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct breakwater segments parallel to shoreline</td>
<td>2,400 linear feet of breakwater segments are built</td>
<td>Wave energy is dissipated, Shoreline erosion is reduced, Invertebrate infauna and epifauna settle and grow on the breakwater segments</td>
<td>Breakwater segments are sustained for the expected lifespan of the project, Wave energy is dissipated, Shoreline erosion rate is reduced, Breakwaters support a diverse benthic community</td>
</tr>
</tbody>
</table>
This monitoring plan has been designed around the project’s objectives and desired outcomes, and is intended to address the following monitoring questions for each objective:

**Objective #1: Construction of breakwater segments that meet project design criteria.**

- Were the breakwater segments constructed in accordance with design criteria?
- Are the breakwater segments present during years 1-5?

**Objective #2: Support habitat utilization of the breakwater segments invertebrate infauna and epifauna to increase secondary benthic productivity at the project site**

- Are invertebrate infauna and epifauna colonizing the breakwater structures?
- What is the density of invertebrate infauna and epifauna associated with the breakwater structures?

**Objective #3: Reduction of shoreline erosion to protect existing salt marsh habitat**

- Is shoreline erosion rate being reduced?

### B.7.2 Project Monitoring

The monitoring for this restoration project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, sample size, and sites. In addition, performance criteria for each parameter are identified (if applicable).

**Objective #1: Construction of breakwater segments that meet project design criteria.**

- Did the project achieve its design criteria?

**Parameter #1: Breakwater Segments Constructed in Accordance with Design Criteria**

  - **Method:** Conduct visual inspections and take pictures of the project site from the boat or shoreline.
  - **Timing and Frequency:** During Construction and Immediately Post-construction (Years 0) then annually for years 1-5. (Annually from Years 1-5 for observational purposes only. Additional visual inspections are recommended to be conducted after major storm events).
  - **Sample Size:** Observations of all breakwater segments, counts of WAU’s placed.
  - **Performance Criterion:** Breakwater segments meet project design criteria.

**Objective #2: Support habitat utilization of the breakwater structures by invertebrate infauna and epifauna to increase secondary benthic productivity at the project site**

- Are invertebrate infauna and epifauna colonizing the breakwater structures?
- What is the density of invertebrate infauna and epifauna on the breakwater structures?

**Parameter #1: Invertebrate infaunal and epifaunal species composition, and abundance.**
a) Method: Identify and count invertebrate infaunal and epifaunal organisms within a defined area on WAUs. Utilize methods that report density on a square meter basis (e.g., quadrat sampling). Infaunal and epifaunal species composition and density (individuals m$^{-2}$) will be measured annually.

b) Timing and Frequency: Post-construction Year 1-5 (1 times per year - late summer).

c) Sample Size: 0.25 m$^2$ quadrats on five (5) randomly selected breakwater units within each breakwater segment for a total of 55 - 0.25 m$^2$ quadrats sampled.

d) Performance Criterion: At year 5, 90% of breakwater units have invertebrate infauna and epifauna present.

**Objective #3: Reduction of shoreline erosion rate to protect existing salt marsh habitat**

- Is shoreline erosion being reduced?
  
  Parameter #1: Shoreline elevation/profile
  
  a) Method: Conduct bathymetric/topographic survey of cross-shore profiles using RTK GPS with cross-sections at the center of each breakwater segment. Cross sections should begin 100 feet seaward and extend to fixed marked location 100’ landward of the marsh edge at Year 0. This landward fixed point shall be marked with a PVC pipe. Note the location and elevation of the marsh edge.
  
  b) Timing and Frequency: Pre-construction (once) and Post-construction (Years 0-5, 1 time per year during late summer. Other surveys may be conducted following major storm events.)
  
  c) Sample Size: 11 transects, 1 each at the center of each breakwater segment.
    
    a. Performance Criterion: Over years 1-5, the average shoreline erosion loss is less than the calculated average loss per year at project site.

**B.7.3 Monitoring Schedule**

The schedule for the project monitoring is shown in Table B-14, separated by monitoring activity.

**Table B-14. Monitoring schedule for the Point aux Pins Living Shorelines Project**

<table>
<thead>
<tr>
<th>Implementation Monitoring</th>
<th>Performance Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakwater Segment</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Year 0</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Bathymetric/topographic survey/Marsh Edge</td>
<td>X</td>
</tr>
<tr>
<td>Biological monitoring</td>
<td>X</td>
</tr>
</tbody>
</table>
B.7.4 Reporting and Data Requirements

B.7.4.1 Reporting

Annual reports will summarize the annual monitoring events and document the degree to which the project is attaining success. For the purposes of the annual reporting, a reporting year will cover from January 1st to December 31st. The first annual report will cover the calendar year immediately following the calendar year in which the implementing Trustee has completed construction of the Early Restoration Project. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. The reports should provide a summary of the previous annual report (including timelines documenting monitoring procedures), a list or table of performance standards in that compares annual monitoring results to each performance criteria, and a summary of any problems encountered and solutions to each or whether corrective actions were necessary.

B.7.4.2 Quality Assurance / Quality Control Procedures

Monitoring data sheets will be reviewed by ADCNR staff and/or its contractor for accuracy of dates, times and observational information recorded. Discrepancies and/or questions concerning data or observations will be reviewed and rectified in consultation with the ADCNR staff and/or contractor performing monitoring.

B.7.5 References


B.8  Shell Belt and Coden Belt Roads Living Shoreline

B.8.1  Introduction

This document presents a monitoring plan designed to monitor and evaluate the performance of the Shell Belt and Coden Belt Roads Living Shorelines project (Project) in south Mobile County, Alabama. This monitoring plan is intended to be specific to this Early Restoration Project and should not be generalized beyond this project. Other monitoring plans and designs may be appropriate in other contexts or sites.

B.8.1.1  Project Overview

The proposed Project is located along the northern shoreline of Portersville Bay in the eastern portion of Mississippi Sound in southern Mobile County, Alabama (see Figure B-20). The site is located along two bulkheaded roads, Shell Belt Road and Coden Belt Road. The primary goal of the project is to enhance the benthic ecosystem function of the area. The secondary goal is to promote the restoration of salt marsh between the living shoreline breakwater and the existing bulkhead. The preliminary layout of the living shoreline is shown in Figure B-21 and Figure B-22.
Figure B-20. Project Location
Figure B- 21. Shell Belt Road Site Location & Proposed Project Layout
Figure B-22. Coden Belt Road Site Location & Proposed Project Layout
**B.8.1.2 Restoration Objectives and Performance Criteria**

The primary goal of the project is to enhance the benthic ecosystem function of the area. The secondary goal is to reduce wave height and energy to promote the restoration of salt marsh between the living shoreline breakwater and the existing bulkhead. The specific restoration objectives relevant for this monitoring plan are: 1) construction of living shorelines breakwater segments that meet project design criteria and that are sustained for the expected lifespan of the project to support benthic secondary productivity and reduce wave energies, 2) support habitat utilization of the reefs by bivalves and other invertebrate infauna and epifauna to increase secondary benthic productivity at the project site, and 3) restoration of salt marsh habitat through the planting of *Spartina alterniflora* or similar native marsh vegetation.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). Since full recovery of restoration projects may occur over a long time frame, performance criteria typically represent interim milestones that will help project managers determine if the project is improving along an acceptable trajectory. The specific performance criteria for this project are identified below and shown in Table B-15.

4) Build living shorelines that are sustained for the expected lifespan of the project.
   a. Performance Criterion: At year 0, breakwater segments meet the design specifications. At years 1-5 breakwater segments are present.

5) Support habitat utilization of reefs by bivalves and other invertebrate infauna and epifauna.
   a. Performance Criterion: At year 5, 90% of breakwater units have coverage of invertebrate infauna and epifauna.

6) Establish Marsh Vegetation.
   a. Performance Criterion: At Year 1, 75% of transplanted marsh plugs have survived.

**Table B-15. Performance criteria for the Shell Belt and Coden Belt Roads Living Shorelines Project**

<table>
<thead>
<tr>
<th>Performance criteria</th>
<th>Implementation Year 0</th>
<th>Post-Implementation</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakwater Segment</td>
<td>Meets design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>specifications</td>
<td></td>
<td>present</td>
<td>present</td>
<td>present</td>
<td>present</td>
<td>present</td>
</tr>
<tr>
<td>Invertebrate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>infaunal and epifaunal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Invertebrate</td>
</tr>
<tr>
<td></td>
<td>densities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>epifauna present on</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>90% of Breakwater</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Units</td>
</tr>
<tr>
<td>Marsh Plantings</td>
<td>Number of Required</td>
<td>75% Survival</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survival</td>
<td>Plugs Planted</td>
<td>of Plantings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**B.8.1.3 Conceptual Model and Monitoring Questions**

Table B-16, below, outlines the conceptual model that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.

**Table B-16. Conceptual model for the Shell Belt and Coden Belt Roads Living Shorelines Project**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Output</th>
<th>Short-term outcome</th>
<th>Long-term outcome</th>
</tr>
</thead>
</table>
| • Construct breakwater segments parallel to shoreline. | • 10,800 linear feet of breakwater segments are built. | • Invertebrate infauna and epifauna settle and grow  
• Salt marsh vegetation is planted. | • Breakwaters are sustained for the expected lifespan of the project.  
• Wave energy is dissipated.  
• Reefs support a diverse benthic community.  
• Salt Marsh is established between breakwater and existing bulkhead. |

This monitoring plan has been designed around the project’s objectives and desired outcomes, and is intended to address the following monitoring questions for each objective:

**Objective #1: Construction of breakwater segments that meet project design criteria and that are sustained for the expected lifespan of the project.**

• Did the project achieve its design criteria?

**Objective #2: Support habitat utilization of the breakwater segments by invertebrate infauna and epifauna.**

• Are invertebrate infauna and epifauna colonizing and being maintained on the breakwater structures?  
• What is the density of invertebrate infauna and epifauna associated with the breakwater structures?

**Objective #3: Restoration of salt marsh habitat through the planting of Spartina alterniflora.**

• Are marsh plantings surviving?

**B.8.2 Project Monitoring**

The monitoring for this restoration project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, sample size, and sites. In addition, performance criteria for each parameter are identified (if applicable), including corrective actions that may be taken if the performance criteria are not met.
Objective #1: Construction of breakwaters that meet project design criteria and that are sustained for the expected lifespan of the project to support benthic secondary productivity.

- Did the project achieve its design criteria?
  
  Parameter #1: Structural integrity of breakwater structure
  
  i) Method: Conduct visual inspections and take pictures of the project site from the boat or shoreline.
  
  j) Timing and Frequency: Post-construction (Annually from Years 1-5 for observational purposes only. Additional visual inspections are recommended to be conducted after major storm events).
  
  k) Sample Size: Observations along entire length of breakwater structure
  
  l) Performance Criteria:
     a. Year 0: Did the contractor construction breakwater segments as specified?
     b. Years 1-5: Are the breakwater segments present?

Objective #2: Support habitat utilization of the breakwater segments invertebrate infauna and epifauna to increase secondary benthic productivity at the project site

- Are invertebrate infauna and epifauna colonizing and being maintained on the breakwater structures?
- What is the density of invertebrate infauna and epifauna on the breakwater structures?

  Parameter #1: Invertebrate infauna and epifauna species composition and abundance.
  
  a) Method: Identify and count invertebrate infaunal and epifaunal organisms within a defined area on WAUs. Utilize methods that report density on a square meter basis (e.g., quadrat sampling).
  
  b) Timing and Frequency: Post-construction Year 1-5 (1 times per year- late summer).
  
  c) Sample Size: 0.25 m² quadrats on five (5) randomly selected breakwater units within each breakwater segment for a total of 55 - 0.25m² quadrats sampled.
  
  e) Performance Criterion: At year 5, 90% of breakwater units have infaunal and epifaunal organisms present.

Objective #3: Restoration of salt marsh habitat through the planting of Spartina alterniflora.

- Is the planted marsh surviving?

  Parameter #1: Marsh Planting Survival
  
  a. Method: Visual counts of presence or absence of live plantings behind each breakwater segment.
  
  b. Timing and Frequency: Post-construction (Year 1). The timing of the post-implementation surveys may be adjusted based on the actual date of the completion of plantings. Typically end of growing season in late summer/early fall. Additional surveys may be conducted after major storms.
  
  c. Sample Size: Presence/absence of all plantings
  
  d. Performance Criterion: At year 1: 75% survival of marsh plantings.
  
  e. Corrective Action: Contractual requirement to replace plugs to reach 75% survival.
Parameter #2: Marsh Vegetation Cover

a. Method: Conduct cover estimates in 1 meter square plots located randomly behind each breakwater (number of plots TBD).

b. Timing and Frequency: Post-construction (Years 1-5). The timing of the post-implementation surveys may be adjusted based on the actual date of the completion of plantings. Years 1-5, once per year. Additional surveys may be conducted after major storms.

c. Sample Size: 1 meter square plots (number of plots TBD).

d. Performance Criterion: None. This is a supporting monitoring parameter.

B.8.3 Monitoring Schedule

The schedule for the project monitoring is shown in Table B-17, separated by monitoring activity. Baseline monitoring will occur before project implementation. Implementation monitoring will occur immediately following project implementation (Year 0). Performance monitoring will occur in the years following project implementation (Years 1–5).

Table B-17. Monitoring schedule for the Shell Belt and Coden Belt Roads Living Shoreline Project

<table>
<thead>
<tr>
<th>Breakwater Segment Construction Observations</th>
<th>Implementation Monitoring</th>
<th>Year 0</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological monitoring</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Marsh Plantings Survival</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marsh Cover</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B.8.4 Reporting and Data Requirements

B.8.4.1 Reporting

Annual reports will summarize the annual monitoring events and document the degree to which the project is attaining success. For the purposes of the annual reporting, a reporting year will cover from January 1st to December 31st. The first annual report will cover the calendar year immediately following the calendar year in which the implementing Trustee has completed construction of the Early Restoration Project. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. The reports should provide a summary of the previous annual report (including timelines documenting monitoring procedures), a list or table of performance standards in that...
compares annual monitoring results to each performance criteria, and a summary of any problems encountered and solutions to each or whether corrective actions were necessary.

### B.8.4.2 Quality Assurance / Quality Control Procedures

Monitoring data sheets will be reviewed by ADCNR staff and/or its contractor for accuracy of dates, times and observational information recorded. Discrepancies and/or questions concerning data or observations will be reviewed and rectified in consultation with the ADCNR staff and/or contractor performing monitoring.

### B.8.5 References


B.9  Seagrass Recovery Project at Gulf Islands National Seashore, Florida District

B.9.1  Introduction

The proposed Seagrass Recovery project at Gulf Islands National Seashore’s Florida District (hereafter, GUIS) will address damage to shallow seagrass beds on DOI-managed lands in the five Gulf States by restoring injury to turtle grass (*Thalassia testudinum*) in seagrass beds located on the south side of the GUIS’s Naval Live Oaks Preserve in Santa Rosa Sound, in Santa Rosa County.

Although a general area for seagrass restoration has been selected, specific sites will not be determined until the completion of a site assessment. The site assessment will determine the severity and current conditions of injuries to seagrass beds. The assessment will then evaluate which injuries may recover independently and which ones need intervention to promote re-growth of seagrass. Sites to be restored will be selected based on a restoration priority determined from the site assessment and available funding. This monitoring plan would be applied to the sites restored based on these priorities.

B.9.1.1  Project Overview

Restoration activities include transplanting seagrass and installing bird stakes and signage. Monitoring would be conducted to assess whether a site is recovering.

B.9.1.2  Restoration Objectives and Performance Criteria

The overall goal of this restoration project is to restore seagrass habitat on DOI-managed lands in the five Gulf States by restoring injured turtle grass (*Thalassia testudinum*) habitats located in GUIS. The specific restoration objectives relevant for this monitoring plan are: (1) Stabilize substrates and (2) Promote re-growth of turtle grass.

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). The specific performance criteria for this project are identified below.

- **Performance Criteria #1**: At Year 1, transplants have survived in restored areas;
- **Performance Criteria #2**: At Year 0 and 1, bird stakes and/or signs are installed as designed and maintained.

B.9.1.3  Conceptual Model and Monitoring Questions

Table B-18, below, outlines the conceptual model for this restoration type that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.
### Table B-18. Conceptual Model for Restoration

<table>
<thead>
<tr>
<th>Activity</th>
<th>Output</th>
<th>Short-term outcome</th>
<th>Long-term outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Install bird stakes</td>
<td>• 0.02 acres of seagrass beds restored</td>
<td>• Bird stakes are utilized as intended</td>
<td>• Area of damaged seagrass beds is restored</td>
</tr>
<tr>
<td>• Install signage</td>
<td></td>
<td>• Signs are installed</td>
<td>• Halted further degradation</td>
</tr>
<tr>
<td>• Transplant seagrass</td>
<td></td>
<td>• Promoted new seagrass growth</td>
<td></td>
</tr>
</tbody>
</table>

This monitoring plan is intended to address the following monitoring questions for each objective:

**Objective #1: Stabilize, protect, and enhance seagrass beds through transplanting seagrass, installing bird stakes and signage.**

- Was the project implemented as designed?
- Are seagrass planting units surviving?
- Are bird stakes and signage being maintained?

**Objective #2: Promote re-growth of native seagrass beds**

- Is the areal coverage of seagrass in damaged area increasing?

### B.9.2 Project Monitoring

Once all site restoration has been completed and as-planted conditions are documented, the site will be monitored after one year. The overall goal for this project is to restore seagrass. Given this goal, restoration success for this project will be based on establishment of seagrass transplants in the restored area. Restoration success will be monitored and evaluated using two parameters: structural integrity of stakes and signs and areal coverage of seagrass. The methods are described below:

**Objective #1: Stabilize, protect, and enhance seagrass beds through transplanting seagrass, installing bird stakes and signage.**

- Was the project implemented as designed?
- Are seagrass planting units surviving?
- Are bird stakes and signage being maintained?

**Parameter #1: Structural Integrity**

a.) Method: Visual observation of bird stakes and signs to ensure they are still in place and performing as designed.
b.) Timing and Frequency: Bird stakes and signage will be inspected during the follow up monitoring event approximately one year after construction.
c.) Sample Size: monitor all stakes and signs.

d.) Performance Criteria: At Year 0 and 1, bird stakes and/or signs are installed as designed and maintained.

e.) Corrective Action: Repair or replace signs and stakes.

Objective #2: Promote re-growth of native seagrasses

- Is the transplanted seagrass surviving?

Parameter #1: Percent Cover:

a.) Method: At least ten percent of the restored area will be monitored through random placement of square 0.25m² quadrats. Benthic cover of seagrasses will be estimated in the quadrats using a modified Braun-Blanquet scale.

b.) Timing and Frequency: Initially after the transplants are installed and again one year later.

c.) Sample Size: At least ten percent of the restored area will be monitored through random placement of square 0.25m² quadrats.

d.) Performance Criteria: At Year 1, transplanted seagrass is surviving in restored areas.

e.) Corrective Action: If transplanted seagrass has not survived based on the monitoring conducted, contractor should replant if project funding is available.

B.9.3 Monitoring Schedule

Once all site restoration has been completed, the site will be monitored immediately after planting and again one year later, providing the restored area time to begin recovery.

B.9.4 Reporting and Data Requirements

A report will be prepared after completion of site restoration and a final report will be completed after the data are collected one year after site restoration.
B.10 Sea Turtle Early Restoration Project Component A: Kemp’s Ridley Sea Turtle Nest Detection and Enhancement

B.10.1 Introduction

The Trustees developed this monitoring plan (Plan) as part of the Sea Turtle Early Restoration Project for the Kemp’s Ridley Sea Turtle Nest Detection and Enhancement Project Component. This Project and its components are included as a Phase IV Deepwater Horizon early restoration project and are intended to at least partially compensate the public for injury to sea turtles. The purpose of this plan is to describe monitoring activities that will be conducted to evaluate and document restoration effectiveness, including performance criteria for determining the success of restoration or need for interim corrective action (15 CFR §990.55(b)(1)(vii)).

This Plan will be implemented by the Texas Trustees and the Department of the Interior and may be modified over time based on the management needs for the Project.

B.10.1.1 Project Overview

This project will help protect Kemp’s ridley nests from predation and other environmental and anthropogenic disturbances. This project will provide support for additional staff, training, equipment, supplies and vehicles over a ten year period in Texas and Mexico. The project will also provide for the addition of two base camps (cabins) and nesting corrals on the southern end of the Padre Island National Seashore (PAIS) on North Padre Island, Texas.

B.10.1.2 Restoration Objectives and Performance Criteria

The overall goal of this restoration project component is to increase Kemp’s ridley nest survival in Texas and Mexico. The specific restoration objectives relevant for this monitoring plan are to: (1) Construct two base camps (cabins and corrals) at the southern end of North Padre Island (Figure B-23); (2) Enhance Texas nesting and hatchling protection (Figure B-23); and (3) Enhance Mexico nesting and hatchling protection (Figure B-24).

Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)) or adaptive management are described below.

Performance Criteria:

- Successful construction of the PAIS cabins and corrals.
- Reduce sea turtle hatchling mortalities through continued support for nest detection and protection activities in Texas as part of the ongoing Kemp’s ridley recovery efforts.
- Reduce sea turtle hatchling mortalities through continued support for nest detection and protection activities in Mexico as part of the ongoing Kemp’s ridley recovery efforts.

The Implementing Trustees will work with the various partners participating in the project component and sub-components to identify corrective actions needed to help achieve success. Corrective actions
will be part of an adaptive management process in which the implementing Trustees and project partners may evaluate information obtained as part of this project and other projects or datasets to inform future actions. This allows for flexibility to maximize performance for this project under changing conditions.

Figure B-23.
Figure B-24.
B.10.1.3 Roles and Responsibilities

The Texas Trustees through Texas Parks and Wildlife Department and the Department of the Interior ("DOI") through the U.S. Fish and Wildlife Service and the National Park Service ("NPS") are the implementing Trustees for the Kemp’s Ridley Sea Turtle Nest Detection and Enhancement Project Component. The implementing Trustees will be responsible for overseeing the implementation of the project components, establishing agreements with the various State, Federal, NGO and Academic partners participating in the Texas nest detection and protection program to implement project activities and provide data, interim reports, quarterly reports and annual reports as necessary.

B.10.2 Project Monitoring

The proposed monitoring for this restoration project type, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the identified monitoring parameters, information is provided on the monitoring methods, timing and frequency, and sites. In addition, example performance criteria for each parameter are identified (if applicable), including example corrective actions that could be taken if the performance criteria are not met. The parameters listed below may or may not be tied to performance criteria and/or corrective actions. The implementing Trustees will also evaluate the outcome of year’s activities to determine if any changes in monitoring protocols are needed. If changes are needed, the Trustees will update the Project Monitoring Plan to describe any modifications.

Objective #1: Construct two base camps (cabins and corrals) at the southern end of North Padre Island

- Did the project achieve its design criteria?
- Is the projected structure being maintained?

Parameter #1: Structural integrity of cabins and corrals on PAIS

f) Method: The Implementing Trustees will work with NPS to review construction documents and verify final construction and that the facilities are functioning as intended.

g) Timing and Frequency:

i. During cabin and corral construction: Quarterly

ii. After completion of construction: annual reports

h) Sites: Cabins and corrals will be located near the PAIS 30 and 50-mile marks.

i) Performance Criterion: Successful construction of cabins and corrals to engineering and design specifications

j) Data Product(s):

i. As-built construction drawings, final construction inspection report, and photographs will be used to document the construction activities.

ii. Annual inspections and maintenance report will document if structures are functioning as intended.
Objective #2: Enhance Texas nesting and hatchling protection

- Is program support for nest detection and protection activities in Texas reducing sea turtle hatchling mortalities?

Parameter Set #1: Level of effort for nest detection: Number and frequency of nests detected, Miles of beach patrolled

  a) Method: This project component will utilize nest detection and protection program data as well as supplemental labor and funding information.
  b) Timing and Frequency: Annual report summarizing of level of effort data for nest detection
  c) Sites: Texas nesting beaches
  d) Performance Criterion: Maintain or increase level of effort for nest detection
  e) Data Product(s):
     - Number of miles patrolled
     - Hours spent patrolling
     - Number of personnel patrolling
     - Nest Reporting Forms

Parameter Set #2: Level of effort for nest protection: Number of nests protected, Number of eggs protected and/or relocated

  a) Method: This project component will utilize nest detection and protection program data as well as supplemental labor and funding information.
  b) Timing and Frequency: Annual data during and after project implementation
     i. Preliminary (i.e., unvalidated) data
        1) Daily nesting reports once nesting beings and concluding with the end of nesting.
        2) Nest Reporting forms provided annually with annual report
     ii. Validated data: annually data summary report for nest protection period.
  c) Sites: Texas nesting beaches
  d) Performance Criterion: Maintain or increase level of effort for nest protection
  e) Data Product(s):
     - Date of first and last nesting in a calendar year
     - Texas clutch number
     - Location (non-GPS)
     - Date detected
     - Time detected
     - Total number of eggs at nest excavation
     - Number of broken eggs
     - Eggs incubated (incubation facility, corral)
Parameter #3: Hatchlings in incubations facilities and corrals

a) **Method:** Hatching and emergence success are quantified using equations from the standard techniques manual titled Research and Management Techniques for the Conservation of Sea Turtles (Miller, 1999).

b) **Timing and Frequency:** annual data during and after project implementation

   i. Preliminary (unvalidated) Data:
      1) Clutch Reporting forms provided annually with annual report
   ii. Validated data:
      1) Annually data summary report for nest incubation period

c) **Sites:** At incubation facilities and corrals on Texas nesting beaches

d) **Performance Criterion:** Avoid hatchling mortalities through nest detection and protection

e) **Data Product(s):**
   - Clutch number
   - Lay date
   - Eggs broken pre-incubation
   - Number of eggs in clutch (initial)
   - Number of eggs in clutch (final)
   - Number of eggs hatched
   - Percent hatched
   - Percent emergence
   - Number of unhatched eggs
   - Number of dead hatchlings
   - Number of live hatchlings released

Parameter Set #4: Influential events effecting this objective, including date, location, and description of environmental conditions relevant to nesting activities

**Method:** This project component will report on influential events for the nesting season

a) **Timing and Frequency:** annual data during and after project implementation

b) **Sites:** Texas nesting beaches

c) **Data Products:**

   Summary report documenting extreme weather or other events that could affect nesting success or the documentation thereof. This could include hurricanes and tropical storms, the number of estimated nests lost due to events, lost patrol days.

Objective #3: Enhance Mexico nesting and hatchling protection

- Is program support for nest detection and protection activities in Mexico reducing sea turtle hatchling mortalities?
Parameter Set #1: Level of effort for nest detection: Number and frequency of nests detected, miles of beach patrolled

a) **Method:** This project component will utilize nest detection and protection program data as well as supplemental labor and funding information.

b) **Timing and Frequency:** Annual report summarizing of level of effort data for nest detection period

c) **Sites:** Mexican nesting beaches

d) **Performance Criterion:** Maintain or increase level of effort for nest detection

e) **Data Product(s):**
   - Number of miles patrolled
   - Hours of patrolling
   - Number of personnel patrolling
   - Nest reporting forms

Parameter Set #2: Level of effort for nest protection: Number of nests protected in situ, and/or relocated

a) **Method:** This project component will utilize nest detection and protection program data as well as supplemental labor and funding information.

b) **Timing and Frequency:** annual data during and after project implementation
   
i) Preliminary (unvalidated) Data
      1) Daily nesting reports would be completed for the entire nesting period
      2) Nest reporting forms provided annually with annual report
   
ii) Validated data: annually data summary report for nest protection period

c) **Sites:** Mexico nesting beaches

d) **Performance Criterion:** Maintain or increase level of effort for nest protection

e) **Data Product(s):**
   - Date of first and last nesting
   - Mexico clutch number
   - Location (non-GPS)
   - Date detected
   - Time detected
   - Total number of eggs at nest excavation
   - Number of broken eggs
   - Eggs Incubated (corral, in-situ)

Parameter #3: Total hatchlings in corrals

a) **Method:** Hatching and emergence success are quantified using equations from the standard techniques manual titled Research and Management Techniques for the Conservation of Sea Turtles (Miller, 1999).
b) **Timing and Frequency:** annual data during and after project implementation  
   i. Preliminary (unvalidated) data  
      1. Clutch reporting forms provided annually with annual report  
   ii. Validated data:  
      i. Annually data summary report for nest incubation period  

c) **Sites:** At corrals on Mexican nesting beaches  

d) **Performance Criterion:** Avoid hatchling mortalities related through nest detection and protection  

e) **Data Product(s):**  
   - Clutch number  
   - Lay date  
   - Eggs broken pre-incubation  
   - Number of eggs in clutch (initial)  
   - Number of eggs in clutch (final)  
   - Number of eggs hatched  
   - Percent hatched  
   - Percent emergence  
   - Number of unhatched eggs  
   - Number of dead hatchlings  
   - Number of live hatchlings released  

**Parameter Set #4: Influential events effecting this objective, including date, location, and description of environmental conditions relevant to nesting activities**  

- **Method:** report on influential events for the nesting season  
- **Timing and Frequency:** annual data during and after project implementation  
- **Sites:** Mexican nesting beaches  
- **Data Products:** Summary report documenting extreme weather or other events that could affect nesting success or the documentation thereof. This could include hurricanes and tropical storms, the number of estimated nests lost due to events, number of nests predated, and number of eggs lost due to predation.  

**B.10.3 Monitoring Schedule**  

The schedule for the project monitoring is shown in Table B-19, separated by monitoring activity. Pre-Project Monitoring refers to obtaining existing historical information. Project Start-Up Monitoring is the planning and initial activities that will occur prior to the implementation of the field efforts. Performance monitoring will begin once agreements are in place between the implementing Trustees and the project partners.
### Table B-19. Monitoring Schedule

<table>
<thead>
<tr>
<th>Monitoring Activity</th>
<th>Pre-Project Monitoring</th>
<th>Project Start-up Monitoring</th>
<th>Performance Monitoring Year 1-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct two base camps (cabins and corrals) at the southern end of North Padre Island</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Construction certification</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Maintenance reports- annually</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Enhance Texas nesting and hatchling protection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of effort for nest detection</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Level of effort for nest protection</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Hatchlings in incubation facilities and corrals</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Influential events</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Enhance Mexico nesting and hatchling protection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of effort for nest detection</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Level of effort for nest protection</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Hatchlings in corrals</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Influential events</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

### Reporting and Data Requirements

This section describes the process the implementing Trustees and project partners will follow to document, validate and report field data collected for the purposes of performance monitoring. The reporting and data requirements described herein are intended to:

- Maximize the quality, utility, and integrity of monitoring data;
- Organize, track, locate, and access monitoring data over the long-term; and
- Share finalized monitoring data with the public in a consistent and comprehensible format

#### B.10.3.1 Data Reporting

The Implementing Trustees shall provide annual status reports describing the status of and any changes to the Early Restoration Project Component and/or project Component expenditures during each calendar year. The Implementing Trustees shall provide annual status reports until the applicable performance criteria, monitoring, and maintenance period has expired or by the agreed upon stipulations for the sea turtle early restoration project, whichever comes first.

Annual reporting will cover from January 1st to December 31st of each restoration year. The first annual report will cover the calendar year following the year in which this stipulation is filed. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. Some data may not be available within this time-period, and will be provided within 6 months after the conclusion of the annual reporting year. Reported data and all data that is available to the public will be aggregated in accordance with existing requirements and laws, including the protection of personal identifiable information. Data for this component will be analyzed, in part, by evaluating trends related to Kemp’s
ridley nesting activities that occur during the monitoring period of this component. Data collected during component implementation will not be compared to historical data due to inconsistencies in historical data collection and methodologies.

The implementing Trustees will develop a final project summary at the conclusion of the 10-year project period which will detail the overall accomplishments of the project.

**B.10.3.2 Data Documentation**

The majority of data collected for this project component will be reports of sea turtle nesting and hatchling releases conducted by the Texas and Mexico sea turtle nest detection and protection programs. To the extent possible, all environmental and biological data generated during monitoring activities will be documented using existing standardized report forms and established field protocols.

Where and when applicable, all tangible forms of data may be reviewed by the Implementing Trustees for completeness and accuracy before being finalized. Original hardcopy report forms and other relevant data including photographs will be maintained by the programs in a secure location in accordance with agency and litigation-hold requirements. While the Trustees will be relying on data from existing programs, only aggregated summary data will be incorporated in annual reports.

**B.10.3.3 Data Transcription, Verification, Validation and Analysis**

Data collected by currently existing programs are subject to the existing verification procedures of the programs from which the data originate.

Data generated by this project component will be reviewed by the appropriate implementing Trustee (DOI and Texas) for completeness and accuracy before being finalized. Originals or copies (to be decided by the implementing Trustee) of the data collected, which may include but is not limited to datasheets, notebooks, and photographs (which may be in the form of photo micro SD cards) will be retained by the federal or state programs that collected the data and stored in a secure location in accordance with agency and applicable litigation-hold requirements. Any data that is transferred to the implementing Trustees by non-state and non-federal project participants will be retained by the implementing Trustee and stored in a secure location in accordance with agency and applicable litigation-hold requirements. Prior to data collection efforts, the implementing Trustees will decide where the original documents and copies of those documents will be stored.

When the data transcription and verification/validation processes are complete, electronic datasets can be used for data analysis. Analyses will be conducted by the implementing Trustees to derive Project monitoring performance criteria metrics.

**B.10.4 References**

# Texas Data Sheet for Sea Turtle Tracks and Nests

<table>
<thead>
<tr>
<th>General Information</th>
<th>Track Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date detected:</td>
<td>Flippers impressions: alternate, opposite.</td>
</tr>
<tr>
<td>Time detected:</td>
<td>Width of Tracks: cm</td>
</tr>
<tr>
<td>Found by:</td>
<td>Estimated age of tracks (if no female present): cm</td>
</tr>
<tr>
<td>(turtle patrol, beach worker or visitor)</td>
<td>Topographical feature at end of tracks or at nest site (circle)</td>
</tr>
<tr>
<td>First investigated by:</td>
<td>3-beach, 2-back, 3-embryonic, 8-base of forelimb.</td>
</tr>
<tr>
<td>Specific location:</td>
<td>3-slope of first forelimb, 4-top of first forelimb, 5-shoulder of first forelimb, 6-forelimb depression, 7-shoulder of second forelimb.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nest Information</th>
<th>Turtle Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was a nest found?</td>
<td>Action when first encountered turtle (circle):</td>
</tr>
<tr>
<td>☐ Yes ☐ No</td>
<td>emerging, digging, laying, covering, returning to sea.</td>
</tr>
<tr>
<td>Nest GPS (ddddd°):</td>
<td>Orientation of turtle when laying eggs: (12 o'clock facing inland, 6 o'clock facing towards sea).</td>
</tr>
<tr>
<td>N W</td>
<td>Scanned for PIT Tag? ☐ Yes ☐ No</td>
</tr>
<tr>
<td>Date and time eggs excavated:</td>
<td>* APPLY ALL TAGS TO LEFT FLIPPERS IN TEXAS</td>
</tr>
<tr>
<td>Eggs excavated by:</td>
<td>Left Front: Present or Applied (circle)</td>
</tr>
<tr>
<td>Eggs transported by:</td>
<td>Right Front: Present or Applied (circle)</td>
</tr>
<tr>
<td>Total number of eggs at nest excavation:</td>
<td>Left Rear: Present or Applied (circle)</td>
</tr>
<tr>
<td># of tiny eggs</td>
<td>Right Rear: Present or Applied (circle)</td>
</tr>
<tr>
<td># of &quot;normal size&quot; eggs:</td>
<td>Metal Tag Scars (list location, describe):</td>
</tr>
<tr>
<td># of broken eggs:</td>
<td>Carapace measurements using metal calipers (SLCL):</td>
</tr>
<tr>
<td>Describe any conjoined or otherwise abnormal eggs:</td>
<td>Straight length (notch-tip): cm</td>
</tr>
<tr>
<td>Eggs Incubated (check one):</td>
<td>Minimum length (notch-notch): cm</td>
</tr>
<tr>
<td>Incubation Facility</td>
<td>Straight width (widest point): cm</td>
</tr>
<tr>
<td>Corral</td>
<td>Carapace measurements using non-metal measuring tape:</td>
</tr>
<tr>
<td>In-situ</td>
<td>Curved length (notch-tip): cm</td>
</tr>
<tr>
<td>Date &amp; time eggs placed in incubation facility/corral:</td>
<td>Minimum length (notch-notch): cm</td>
</tr>
<tr>
<td>Placed in incubation facility/corral by:</td>
<td>Curved width (widest point): cm</td>
</tr>
<tr>
<td>Temperature datalogger placed in nest? ☐ Yes ☐ No</td>
<td>Scanned for Coded Wire (Magnetic) Tag? ☐ Yes ☐ No</td>
</tr>
<tr>
<td>Datalogger ID #:</td>
<td>If magnetic tag, which flipper: left front right front</td>
</tr>
<tr>
<td>Temperature probe placed in nest? ☐ Yes ☐ No</td>
<td>Checked for Living Tag? ☐ Yes ☐ No</td>
</tr>
<tr>
<td>Additional remarks, comments, data, or sketches on tracks, turtle, nest site or back of form? ☐ Yes ☐ No</td>
<td>Was carapace scrubbed? ☐ Yes ☐ No</td>
</tr>
<tr>
<td>If no nest is found, record GPS of highest point of tracks and describe/draw below.</td>
<td>Carapace measurements (mark, describe, photograph): LC = left costal, V = vertebral, RC = right costal.</td>
</tr>
</tbody>
</table>

- Transmitter ID #
- Present or Applied (circle)
- Samples: Biopsy-tissue? ☐ Yes ☐ No

---

Notify immediately, fax, and mail originals to:

Dr. Dona Shaver, Padre Island National Seashore
P.O. Box 181300, Corpus Christi, TX 78440-1300
Office (361) 949-8173 ext. 226; fax (361) 949-9134
CLUTCH INFORMATION DATA SHEET

Clutch # __________
Lay Date: __________________________
Hatch Date & Time (All or Part Δ): __________________________
Δ: Incubation Duration (# Days): __________________________
Hatch Date & Time (Part Δ): __________________________
Hatch Date & Time (Part B): __________________________
B: Incubation Duration (# Days): __________________________
C: Incubation Duration (# Days): __________________________

# Eggs broken pre-incubation: __________
# Eggs in Clutch (initial): __________
# Eggs in Clutch (final): __________
# Eggs Hatched: __________
% Hatched: __________ = # hatchlings / # eggs
% Emergence: __________ = # live hatchlings / # eggs
# Unhatched eggs: __________
# Dead Hatchlings*: __________
# Live Hatchlings Released: __________
# Live Hatchlings Held Long Term: __________
* Hatchlings are individuals that have left their egg shells

Transfer Information:

<table>
<thead>
<tr>
<th>Number</th>
<th>Date</th>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

Release Information:

<table>
<thead>
<tr>
<th>Number</th>
<th>Date</th>
<th>Time</th>
<th># Retrieved</th>
<th>Fate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Comments:
PLAYA = BEACH
ESTACA = KILOMETER MARKER
ZONA = ZONE
FECHA = DATE
ESPECIE = SPECIES
ACCION = ACTION

What the turtle was doing when first spotted – the actions are at the bottom of the data card:

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>mating</td>
</tr>
<tr>
<td>1</td>
<td>arriving to the beach</td>
</tr>
<tr>
<td>2</td>
<td>making the nest</td>
</tr>
<tr>
<td>3</td>
<td>laying eggs</td>
</tr>
<tr>
<td>4</td>
<td>covering the nest</td>
</tr>
<tr>
<td>5</td>
<td>leaving the beach</td>
</tr>
<tr>
<td>6</td>
<td>false crawl (did not lay eggs)</td>
</tr>
<tr>
<td>7</td>
<td>swimming back</td>
</tr>
<tr>
<td>8</td>
<td>nest only (no turtle)</td>
</tr>
</tbody>
</table>

HORA A = TIME A

Time when the turtle (or nest) was first spotted
B.11 Sea Turtle Early Restoration Project Component B: Enhancement of the Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program

B.11.1 Introduction

This document presents the monitoring plan for the Enhancement of the Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program Project Component (Plan), which is a component of the Sea Turtle Early Restoration Project. This project component is included as a Phase IV Deepwater Horizon early restoration project that is intended to contribute to making the environment and public whole for injuries to sea turtles. This Plan describes the monitoring activities that will be conducted to evaluate and document the effectiveness at meeting restoration objectives, including the performance criteria that will apply to determining the success of restoration or need for interim corrective action (15 CFR §990.55(b)(1)(vii)).

This Plan is specific to the Enhancement of the Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program component and should not be generalized beyond this. Other monitoring plans and designs may be appropriate in other contexts. The compilation of data under this Plan will not occur until funding under a filed restoration funding agreement for the Sea Turtle Early Restoration Project (Stipulation) has been received. This Plan will be implemented by the Texas Trustees\(^\text{10}\), the Department of Interior (DOI), and National Oceanic and Atmospheric Administration (NOAA) and may be modified over time based on the management needs for the project.

B.11.1.1 Project Overview

Enhancement of the Sea Turtle Stranding and Salvage Network and Development of a Sea Turtle Emergency Response Program component (Component) will maintain and enhance the Sea Turtle Stranding and Salvage Network (STSSN) beyond current capacities for 10 years and develop a formal Sea Turtle Emergency Response Program within the Gulf of Mexico (Figure B-25). The goal of this Component is to improve response capabilities to quickly recover dead and injured sea turtles and improve data quality and accessibility.

Enhancement of the Sea Turtle Stranding and Salvage Network Sub-Component

This sub-component includes two separate sets of activities: (1) Enhancement of the Gulf-Wide Sea Turtle Stranding and Salvage Network and (2) Enhancement of the Sea Turtle Stranding and Salvage Network and Rehabilitation Efforts in Texas, as described below.

\(^{10}\) The Texas Trustees include the Texas Commission on Environmental Quality, Texas General Land Office, and Texas Parks and Wildlife Department (TPWD).
Enhancement of the Gulf-Wide Sea Turtle Stranding and Salvage Network
This sub-component would enhance the infrastructure of the Gulf of Mexico STSSN across the five Gulf states to improve the capacity for response, coordination, data handling and reporting, and data dissemination related to strandings for use in sea turtle conservation management programs. The goal of this sub-component is to provide for more rapid response to stranding events, so that mortality sources may be identified and addressed more rapidly and solutions implemented where possible. This sub-component will be implemented by NOAA, with partners including the STSSN state coordinators for each of the five Gulf states.

Enhancement of the Sea Turtle Stranding and Salvage Network and Rehabilitation Efforts in Texas
This sub-component would enhance the STSSN within Texas by expanding the capacity of the network in Texas through funding to the STSSN partner organizations and rehabilitation providers. The goal of this sub-component is to replace lost funding and expand the STSSN’s capacity to respond to strandings on Texas beaches, in order for more turtles to be found, rehabilitated, and released. This sub-component will be implemented by DOI and the Texas Trustees, with partners including the participating organizations in the TX STSSN.

Development of a Sea Turtle Emergency Response Program Sub-Component
This sub-component is to develop and implement a comprehensive Sea Turtle Emergency Response Program in the Gulf of Mexico. The primary implementation actions are to create a formal response plan and to provide the necessary infrastructure (i.e. supplies and equipment). The goal of this sub-component is to increase the STSSN’s capacity to respond to cold stun and other emergency events that may kill or injure large numbers of sea turtles to increase the survival of live stranded sea turtles. The program design will be focused on increasing response capacity and increasing the extent of search areas during emergency events. This sub-component will be implemented by NOAA.
B.11.1.2 Restoration Objectives and Performance Criteria

The specific restoration objectives for this Component that are relevant to this monitoring plan and the performance criteria to be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)) or adaptive management are described below.

Enhancement of the Sea Turtle Stranding and Salvage Network – Gulf-wide STSSN Activities Subcomponent (Implemented by NOAA)

Objective 1: Enhance the STSSN to improve response capacity, monitoring, and data collection/ accessibility/timeliness

Performance Criteria:

- At end of Year 1, STSSN positions will be hired or funded, and are operational to support the Gulf-wide STSSN (one in each state STSSN program and 3 within NOAA)
- At end of Year 1, start-up equipment has been purchased for STSSN staff
• Each year necropsies will be completed on dead stranded sea turtles following improved necropy protocols allowing for more consistency in analysis, when and where applicable
• Each year the need for training programs will be evaluated and where needed training will be offered to the STSSN

*Enhancement of the Sea Turtle Stranding and Salvage Network – Texas STSSN Activities Sub-component (Implemented by DOI and Texas Trustees)*

**Objective 2:** Decrease sea turtle mortality by expanding the ability to find and rehabilitate injured sea turtles in Texas

**Performance Criteria:**
• Each year maintain or increase level of survey effort for the number of team survey hours, personnel hours spent patrolling Texas beaches, and the number and frequency of patrols by defined areas
• Each year maintain or increase level of effort recovering and treating injured and stranded sea turtles

*Development of a Sea Turtle Emergency Response Program (Implemented by NOAA)*

**Objective 3:** Implement a program to enhance response to emergency events and reduce mortality of sea turtles affected by these events:

**Performance Criteria:**
• At end of Year 1, new Mobile Aquatic Sea Turtle Holding (MASH) units have been built-out and staged and are ready for use in the Gulf of Mexico
• Each year a report is produced that summarizes cold stun and other emergency unusual stranding events and response efforts completed (i.e. type of event, number of MASH units deployed, waters surveyed)
• Each year a report is produced summarizes cold stun and other emergency unusual stranding events and response efforts completed (i.e. total number of animals collected and status live or dead, number of animals found during surveys, number released alive post-event)

**B.11.1.3 Roles and Responsibilities**
NOAA is the Implementing Trustee for Enhancement of the Gulf-wide STSSN and the Development of a Sea Turtle Emergency Response Program. DOI and the Texas Trustees are the Implementing Trustees for the Texas-only portion of the Enhancement of the STSSN.

Field activities for this Component will be implemented by the STSSN. The National Marine Fisheries Service (NMFS), part of NOAA, is the primary coordinator for the STSSN and is responsible for ensuring that data are collected in a manner sufficient for conservation management, monitoring, and research purposes and to facilitate its use to meet recovery objectives.
The STSSN includes federal, state and private partners, and is coordinated by NMFS. Each state has a STSSN State coordinator responsible for coordinating the stranding network within their state. The agencies that host the state coordinator by state are; National Park Service for the Texas STSSN, Louisiana Department of Wildlife and Fisheries for the Louisiana STSSN, NMFS for the Mississippi STSSN, United States Fish and Wildlife Service for the Alabama STSSN, and Florida Fish and Wildlife Conservation Commission for the Florida STSSN.

The STSSN documents each stranding on a standardized stranding report form, where specific data are recorded for each stranding event (Appendix A). Each stranding is photo documented, unless circumstances preclude acquiring photographs. All photos and stranding forms are submitted to NMFS for data validation and archival. Current STSSN procedures for data transfer and validation will be used for this Component, and data collected will be further used by the Implementing Trustees to monitor the project.

NOAA and the Texas Trustees will evaluate data collected for the Sub-component for which they are the Implementing Trustee, and will develop status reports that are available to the public.

The Implementing Trustees (DOI, NOAA, and Texas Trustees) will work with the partners participating in implementation of Component activities and where appropriate to identify corrective actions needed to help achieve success. Corrective actions will be part of an adaptive management process in which the Implementing Trustees and Component partners will evaluate information obtained as part of this project and other projects or datasets to inform planning of future actions. This allows for flexibility to optimize performance of the STSSN efforts under changing conditions to achieve success.

### B.11.2 Project Monitoring

The monitoring for this Component, outlined below, is organized by objective, with monitoring parameters specified for each objective. For the monitoring parameters listed below, information is provided on the monitoring methods, timing and frequency, and sites. Performance criteria are described for parameters that directly evaluate project objectives. Performance criteria are not identified for additional monitoring parameters where data will only be used to inform adaptive management to help ensure the success of the project.

Implementing Trustee(s) will also evaluate the outcome of annual activities to determine if any changes in monitoring protocols are needed. If changes are needed, the Implementing Trustee(s) will update this Plan to identify and describe modifications. Any changes to procedures must be compliant with all active agreements.

Performance monitoring will be used to evaluate the effectiveness of the project in meeting the established restoration objectives and assist in determining the need for corrective actions. Additional monitoring may be completed to support project management by identifying potential factors influencing project success. To evaluate the success of this Component, data collected over the 10-year duration will be evaluated in comparison to the project objectives.
In some cases, this Component involves the initiation of new activities, and in other cases, this Component is replacing or enhancing existing funding and Programs. Therefore, data collected as part of this Component will not be evaluated against baseline conditions in all cases.

**Enhancement of the Sea Turtle Stranding and Salvage Network – Gulf-wide STSSN Activities**

(Implemented by NOAA)

**Objective #1:** Improve sea turtle stranding and response networks to enhance response capabilities and data collection/accessibility/timeliness

- Has the STSSN been improved?
- Have the response capabilities, monitoring, and data collection, accessibility, and timeliness of the STSSNs been enhanced?

**Parameter #1: Number of STSSN staff hired and operational**

- Method: Track hiring and funding of staff to fill stranding program positions (1 position in each of the 5 Gulf Coast states; 3 positions at the NOAA STSSN coordination level)
- Timing and Frequency: One-time assessment at the end of project Year 1
- Sites: Gulf-wide
- Performance Criteria: At end of Year 1, staff will be hired or funded and are operational to support the Gulf-wide STSSN (one in each state STSSN program and 3 within the NOAA STSSN)
- Data Product(s): Report of STSSN network structure documentation, including staff hired and general work schedule (i.e. part-time, full-time, seasonal).

**Parameter #2: Inventory of start-up equipment purchased**

- Method: Track expenditures of large-scale start-up equipment for stranding staff (i.e. vehicles, computers).
- Timing and Frequency: One-time assessment at the end of project Year 1
- Sites: Gulf-wide
- Performance Criteria: At end of Year 1, start-up equipment has been purchased for STSSN staff
- Data Product(s): Inventory of equipment expenditures

**Parameter #3: Necropsies completed**

- Method: Data will be sourced from the Gulf-wide STSSN. Data will be aggregated in accordance with existing STSSN data management procedures.
- Timing and Frequency: Annually provide data listed below in (e) for the life of the project.
- Sites: Gulf-wide
- Performance Criteria: Each year necropsies will be completed on dead stranded sea turtles following improved necropsy protocols allowing for more consistency in analysis, when and where applicable.
Data Product(s): Compilation of Gulf-wide STSSN necropsy data. Necropsy data will be reported as follows:

- Total necropsies conducted to date
  - By species
    - By condition code
      - Fresh Dead
      - Moderately Decomposed
      - Severely Decomposed
      - Dried Carcass
      - Skeleton
  - Principal Finding at Necropsy
    - By species ( # in each category)
      - Traumatic Injury (e.g., boat strike, entanglement)
      - Cold Stun
      - Findings Consistent with Disease or Debilitation
      - No Anomalies, Good Nutritional Condition
      - Other (e.g., oil fouling, debris ingestion)
      - Basic Dissection Only, Principal Postmortem Finding Categorization Not Possible
      - Necropsy Findings Pending (e.g., lab analyses still underway)

Parameter #4: Training programs provided

- Method: Data will be sourced from the Gulf-wide STSSN and NOAA
- Timing and Frequency: Annually provide data listed below in (e) for the life of the project.
- Sites: Gulf-wide
- Performance Criteria: Each year, the need for training programs will be evaluated, and where needed, training will be offered to the STSSN.
- Data Product(s): Report of training provided to the STSSN by NOAA and/or the State coordinators, including the total number of training programs conducted, location, and type of training.

Enhancement of the Sea Turtle Stranding and Salvage Network – Texas STSSN Activities (Implemented by DOI and Texas Trustees)

Objective #2: Decrease sea turtle mortality by expanding the ability to find and rehabilitate injured sea turtles in Texas.

- Were response efforts able to decrease sea turtle mortalities?

Parameter #1: Level of Survey Effort

- Method: Use STSSN program data as well as labor and funding information. Where applicable, data will be collected according to standard methodologies (NPS 2013).
b) Timing and Frequency: Annually, validated data for each calendar year would be compiled into a report, for the duration of the monitoring period (10 years).

c) Sites: Texas

d) Performance Criteria: Maintain or increase the level of survey effort for the number of team survey hours, personnel hours spent patrolling, and the number and frequency of patrols by defined areas.

e) Data Product(s): Number of team survey hours broken out by geographic survey area, number of personnel hours spent patrolling by survey area, and the number and frequency of patrols by survey area

Parameter #2: Sea Turtle Response will include numbers of injured/stranded sea turtles and numbers of sea turtles admitted for treatment

a) Method: Use STSSN program data as well as supplemental labor and funding information. Where applicable, data will be collected according to standard methodologies (NPS 2013; Miller 1999).

b) Timing and Frequency: Annually, validated data for each calendar year would be compiled into a report, for the duration of the monitoring period (10 years).

c) Sites: Texas

d) Performance Criteria: Maintain or increase the level of effort recovering and treating injured and stranded sea turtles.

e) Data Product(s): numbers of injured/stranded sea turtles, numbers of sea turtles admitted for treatment, summary of injury types (if available). Copy of NPS 2013 methodologies and any changes that occur during the life of the project.

Parameter #3 Influential events effecting this objective, including date, location, and description of environmental conditions relevant to stranding events

a) Method: Use STSSN program data as well as supplemental weather information to document influential events relevant to strandings. Where applicable, data will be collected according to standard methodologies (NPS 2013).

b) Timing and Frequency: Annually, validated data for each calendar year would be compiled into a report for the duration of the monitoring period (10 years).

c) Sites: Texas

d) Performance Criteria: Documentation of influential events is included in the annual reports

e) Data Product(s): Summary report documenting extreme weather or environmental events resulting in strandings and any relevant supporting data (temperature, HABs, etc.) that is collected as part of this project.
Objective #3: Implement a program to enhance response to emergency events and reduce mortality of sea turtles affected by these events
- Has a formal Emergency Response Program been established?
- Has capacity been increased to respond to emergency events?

Parameter #1: MASH Unit build-out and staging
a) Method: Track purchase of the MASH units as well as build-out and staging of new MASH units
b) Timing and Frequency:
   i. Pre-project Monitoring: Review of historical emergency response data to determine most strategic locations for MASH unit placement.
   ii. One-time assessment at the end of project Year 1.
c) Sites: Gulf-wide
d) Performance Criteria:
   i. At end of Year 1, new MASH units have been built-out and staged and are ready for use in the Gulf of Mexico.
   ii. Annually, maintenance, use and location of MASH units sustained.
e) Data Product(s): Inventory of equipment purchased, location where they are staged.

Parameter #2: Response capacity during cold stun or other emergency events
a) Method: The following will be tracked: number and location of cold stun and other emergency unusual stranding events, number of vessels contracted, MASH unit readiness and location where staged, response time, search area.
b) Timing and Frequency: Annually for the life of the project.
c) Sites: Gulf-wide
d) Performance Criteria: Annual report summarizes cold stun and other emergency unusual stranding events and response efforts completed (i.e. type of event, number of MASH units deployed, waters surveyed).
e) Data Product(s): Summary of Gulf-wide STSSN Emergency Response Program, number of times MASH units deployed and locations where they were used. Emergency response data will be summarized as follows:
   • Date, location and duration of emergency event
   • Number of MASH units deployed, where located
   • Number of vessels contracted/used for surveys

Parameter #3: Sea turtle condition following response
a) Method: Number and condition of animals triaged and released during cold stun or other emergency unusual stranding events will be counted. Data will be sourced from the Gulf-
STSSN. Data will be aggregated in accordance with existing STSSN data management procedures.

b) Timing and Frequency: Compilation and analysis of Gulf-wide STSSN data will occur annually for the life of the project.

c) Sites: Gulf-wide

d) Performance Criterion: Annual report summarizes cold stun and other emergency unusual stranding events and response efforts completed (i.e. total number of animals collected and status live or dead, number of animals found during surveys, number released alive post-event)

e) Data Product(s): Summary of Emergency Response Program efforts. For each emergency event, data will be summarized as follows:
   • Total number of animals collected as part of the event
   • Status of animals upon recovery
   • Summary of areas surveyed and number of animals collected during survey efforts
   • Number of turtle triaged in MASH unites (or other permanent facilities)
   • Number of turtles released alive

B.11.3 Monitoring Schedule

The schedule for the project monitoring is shown in Table B-20, separated by monitoring activity. Pre-Project Monitoring refers to obtaining existing historical information. Project Start-Up Monitoring is the planning and initial activities that will occur prior to the implementation of field efforts. Performance Monitoring for each sub-component will begin at the point agreements are in place between the Implementing Trustees and the project partners.

<table>
<thead>
<tr>
<th>Monitoring Activities</th>
<th>Pre-Project Monitoring</th>
<th>Project Start-up Monitoring</th>
<th>Performance Monitoring Years 1 - 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of STSSN staff hired and operational</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inventory of start-up equipment purchased</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Pre-project monitoring may not be identified in all cases. In some cases, the project may be initiating a new program or activity for which no historical information is available. In other cases, insufficient historical data may exist or existing historical data may not be appropriate to compare to project performance monitoring data.
### Monitoring Activities

<table>
<thead>
<tr>
<th>Monitoring Activities</th>
<th>Pre-Project Monitoring</th>
<th>Project Start-up Monitoring</th>
<th>Performance Monitoring Years 1 - 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of necropsies completed</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Number of training programs provided</td>
<td></td>
<td>X</td>
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<tr>
<td>Restoration funding agreement</td>
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<tr>
<td>Level of survey effort</td>
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<td></td>
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<td>Sea turtle response</td>
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<td>X</td>
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<tr>
<td>Influential events</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Documentation of expenditures</td>
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<td></td>
<td>X</td>
</tr>
</tbody>
</table>

- Enhancement of the Sea Turtle Stranding and Salvage Network and Rehabilitation Efforts in Texas

#### Development of a Sea Turtle Emergency Response Program

| Number of MASH units built-out, staged and ready for use | X | X |
| Response capacity during cold stun or other emergency events | X | X |
| Sea turtle condition following response                    |   | X |

---

### B.11.4 Reporting and Data Requirements

This section describes the process the Implementing Trustees and project partners will follow to document, validate and report field data collected for the purposes of performance monitoring. The reporting and data requirements described herein are intended to:

- Maximize the quality, utility, and integrity of monitoring data;
- Organize, track, locate, and access monitoring data over the long-term; and
- Share finalized monitoring data with the public in a consistent and comprehensible format.

#### B.11.4.1 Reporting

The Implementing Trustees shall provide annual status report describing the status of and any changes to this Early Restoration Project Component and/or project Component expenditures during each calendar year. The Implementing Trustees shall provide annual status reports to the public for all performance objectives until the applicable performance criteria, monitoring, and maintenance period has expired or by the agreed upon stipulations for the sea turtle early restoration project, whichever comes first.

Annual reporting will cover from January 1st to December 31st of each restoration year. The first annual report will cover the calendar year following the year in which the project stipulation is filed. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. Data that is not available within this time-period will be provided within 6 months after the conclusion of the subject annual reporting year. Reported data and all data that is available to the public will be aggregated in accordance applicable laws and regulations. While the Trustees will be relying on data from the existing programs, only aggregated summary data will be incorporated in annual reports.

Data for this Component will be analyzed, in part, by evaluating trends related to sea turtle strandings and rehabilitation that occur during the monitoring period for this Component. Data will not be
compared to historical data in all cases because some data collected as part of this Component is not directly comparable to the existing historical data.

The Implementing Trustees will develop a final project summary at the conclusion of the 10-year project period which will detail the overall accomplishments of the project.

**B.11.4.2 Data Documentation**
The majority of data collected for this Component will be reports of sea turtle strandings and surveys conducted by the STSSN. The Trustees will be relying on data from the existing programs and only aggregated summary data will be incorporated in annual reports. To the extent possible, all environmental and biological data collected during monitoring activities will be documented using existing standardized report forms and established field protocols.

Where and when applicable, all tangible forms of data generated by the Implementing Trustees or project partners, will be reviewed by the Implementing Trustees for completeness and accuracy before being finalized. Original hardcopy report forms and other relevant data including photographs will be retained and maintained by the STSSN in a secure location in accordance with agency, program and Deepwater Horizon litigation-hold requirements.

**B.11.4.3 Data Transcription, Verification, and Analysis**
Data collected by existing programs is subject to the existing verification procedures of the programs from which the data originate. Data generated by this Component will be reviewed by the appropriate Implementing Trustee (NOAA, DOI and/or Texas Trustees) for completeness and accuracy before being finalized. Originals or copies (to be decided by the Implementing Trustee) of the data collected, which may include but is not limited to datasheets, notebooks, and photographs (which may be in the form of photo micro SD cards) will be retained by the federal or state programs (including project partners) that collected the data and will be stored in a secure location in accordance with agency and applicable litigation hold requirements. Any data that is transferred to the Implementing Trustee(s) by non-state and non-federal project participants will be retained by the Implementing Trustee(s) and stored in a secure location in accordance with agency and applicable litigation-hold requirements. Prior to data collection efforts, the Implementing Trustees will decide where the original documents and copies of those documents will be stored.

When the data transcription and verification/validation processes are complete, electronic datasets can be used for data analysis. Analyses will be conducted by the Implementing Trustees to derive Project monitoring performance criteria metrics.

**B.11.5 References**
SEA TURTLE EARLY RESTORATION PROJECT COMPONENT B
APPENDIX A: EXAMPLE STSSN REPORTING FORM

EXISTING REPORTING FORM MAY BE MODIFIED OR SUPPLEMENTED AS NECESSARY
SEA TURTLE STRANDING AND SALVAGE NETWORK – STRANDING REPORT

OBSERVER'S NAME / ADDRESS / PHONE:
First  M.I.  Last
Affiliation
Address
Area code/Phone number

STRANDING DATE:
Year 20  Month  Day
Turtle number by day

Coordinator must be notified within 24 hrs; this was done by:
Phone  email  fax

STRANDING LOCATION:
☐ Offshore (Atlantic or Gulf beach)  ☐ Inshore (bay, river, sound, inlet, etc)
State  County/Parish
Descriptive location (be specific)
Latitude  Longitude

CONDITION: (check one)
☐ 0 = Alive
☐ 1 = Fresh dead
☐ 2 = Moderately decomposed
☐ 3 = Severely decomposed
☐ 4 = Dried carcass
☐ 5 = Skeleton, bones only

FINA L DISPOSITION: (check)
☐ 1 = Left on beach where found; painted? ☐ Yes* ☐ No
☐ 2 = Buried; ☐ on beach / ☐ off beach; carcass painted before buried? ☐ Yes* ☐ No
☐ 3 = Salvaged; ☐ all ☐ part(s); what/why?
☐ 4 = Pulled up on beach/dune; painted? ☐ Yes* ☐ No
☐ 5 = Alive, released
☐ 7 = Alive, taken to rehab. facility, where?
☐ 8 = Left floating, not recovered; painted? ☐ Yes* ☐ No
☐ 9 = Disposition unknown, explain

TAGS: Contact coordinator before disposing of any tagged animal!
Checked for flipper tags? ☐ Yes ☐ No
Check all 4 flippers. If found, record tag number(s) / tag location / return address

CARAPACE MEASUREMENTS: (see drawing)

Using callipers
Circle unit
Straight length (NOTCH-TIP) cm / in
Minimum length (NOTCH-NOTCH) cm / in
Straight width (Widest Point) cm / in

Using non-metal measuring tape
Circle unit
Curved length (NOTCH-TIP) cm / in
Minimum length (NOTCH-NOTCH) cm / in
Curved width (Widest Point) cm / in

Weight ☐ actual / ☐ est. kg / lb

Mark wounds / abnormalities on diagrams at left and describe below (note tar or oil, gos or debris entanglement, propeller damage, epibiota, papilomas, emaciation, etc.). Please note if no wounds / abnormalities are found.
Please use an envelope and mail original form to:

APPROPRIATE STATE STSSN COORDINATOR

A list of these state coordinators can be found at

http://www.sefsc.noaa.gov/seaturtleSTSSN.jsp
B.12 Sea Turtle Early Restoration Project Component C: Gulf of Mexico Shrimp Trawl Bycatch Reduction

B.12.1 Introduction

This document presents the monitoring plan for the Gulf of Mexico Shrimp Trawl Bycatch Reduction project component of the Sea Turtle Early Restoration Project. This project component is included as a Phase IV Deepwater Horizon early restoration project that is intended to contribute to making the environment and public whole for injuries to sea turtles. This Plan describes the monitoring activities that will be conducted to evaluate and document the effectiveness at meeting restoration objectives, including the performance criteria that will apply to determining the success of restoration or need for interim corrective action (15 CFR §990.55(b)(1)(vii)).

This Plan is specific to the Gulf of Mexico Shrimp Trawl Bycatch Reduction project component and should not be generalized beyond this. Other monitoring plans and designs may be appropriate in other contexts. The compilation of data under this Plan will not occur until funding under a filed restoration funding agreement for the Sea Turtle Early Restoration Project (Stipulation) has been received. This Plan will be implemented by NOAA and may be modified over time based on the management needs for the project.

B.12.1.1 Project Overview

Enhancement of the Gulf of Mexico Shrimp Trawl Bycatch Reduction project component (Component) would enhance two existing NOAA programs, 1) the Gulf of Mexico Gear Monitoring Team, and 2) the Southeast Shrimp Trawl Fisheries Observer Program. This project Component would be implemented for a 10-year period. The goal of this Component is to increase compliance with TED regulations through training, education and outreach programs, and capacity building. Increased compliance with TED regulations contributes to reducing sea turtle mortalities in the Gulf of Mexico.

Enhancement of the Gulf of Mexico Gear Monitoring Team (GMT)

The enhanced GMT would provide a greater capacity for education and outreach to the shrimp fishing community to improve compliance with federal TED regulations. The enhanced GMT would provide direct benefits to individual sea turtles by decreasing the likelihood of capture mortality through greater use of properly built, installed, and maintained TEDs.

Enhancement of the Southeast Shrimp Trawl Fisheries Observer Program (Observer Program)

The enhanced Observer Program would improve capacity to collect data on bycatch of sea turtles in the shrimp trawl fishery in the Gulf of Mexico. The funding for this project Component would add 300 observer days annually for a 10-year period. This additional coverage would focus on specific times and areas identified as priorities for monitoring sea turtle bycatch. Information on sea turtle interactions with fishing activities would help target activities of the GMT, thereby contributing to increased compliance and decreased bycatch mortality of sea turtles in the Gulf of Mexico.
B.12.1.2 Restoration Objectives and Performance Criteria

The specific restoration objectives relevant for this monitoring plan and the performance criteria used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)) or adaptive management are described below.

Gulf of Mexico Gear Monitoring Team (GMT) Enhancement

Objective 1: Increase training, outreach, and education to build capacity in the shrimp fishery to properly build, install, use, and maintain required TEDs

Performance Criteria:

- At the end of project Year 1, two new teams (four GMT program staff positions) will be hired and operational
- At the end of project Year 1, all start-up equipment will be purchased for the two new GMTs
- Training, education and outreach efforts and capacity building (i.e., number of net shops/TED manufacturers visited, training programs provided, and courtesy inspections
completed) will increase over the pre-project implementation activities, and will be shown in annual report

Objective 2: Improve compliance with TED regulations, including TED maintenance and proper installation

Performance Criteria:
- Compliance rates with existing TED regulations within the Gulf of Mexico state and federal shrimp trawl fisheries are increased

Southeast Shrimp Trawl Fisheries Observer Program Enhancement

Objective 3: Improve NOAA’s capability to detect and monitor the bycatch of sea turtles in shrimp trawls

Performance Criteria:
- By the end of project Year 1, an additional 300 observer days per year, targeted for sea turtle information needs, will have been allocated and implemented by the NOAA Gulf of Mexico Shrimp Trawl Fishery Observer Program
- 300 observer days will be allocated annually for the project lifespan of 10 years

B.12.1.3 Roles and Responsibilities
NOAA is the implementing Trustee for the Gulf of Mexico Shrimp Trawl Bycatch Reduction project component. The Component field activities will be completed by NOAA’s National Marine Fisheries Service (NMFS), Southeast Fisheries Science Center. The Observer Program is operated out of the NOAA NMFS Galveston Lab. The GMT program operates out of the NOAA NMFS Pascagoula Lab. The existing NOAA programs will collect and evaluate data based on the existing procedures for data transfer and validation, and data collected will be further used by NOAA to monitor the project. All data will be aggregated in accordance with existing requirements and laws, including the protection of personal identifiable information.

NOAA will work with the partners participating in implementation of Component activities and where appropriate to identify corrective actions needed to help achieve success. Corrective actions will be part of an adaptive management process in NOAA will evaluate information obtained as part of this project and other projects or datasets to inform planning of future actions. This allows for flexibility to optimize performance of the bycatch reduction efforts under changing conditions to achieve success.

B.12.2 Project Monitoring

The monitoring for this Component, outlined below, is organized by project objective, with one or more monitoring questions to be addressed by each objective. For the monitoring parameters listed below, information is provided on the monitoring methods, timing and frequency, and sites. Performance criteria are described for parameters that directly evaluate project objectives. Performance criteria are not identified for additional monitoring parameters where data will only be used to inform adaptive management to ensure the success of the project.
NOAA will also evaluate the outcome of annual activities to determine if any changes in monitoring protocols are needed. If changes are needed, NOAA will update this Plan to identify and describe modifications. Any changes to procedures must be compliant with all active agreements.

Performance monitoring will be used to evaluate the effectiveness of the project in meeting the established restoration objectives and assist in determining the need for corrective actions. Additional monitoring may be completed to support project management by identifying potential factors influencing project success. To evaluate the success of this Component, data collected over the 10-year duration will be evaluated in comparison to the project objectives.

**Gulf of Mexico Gear Monitoring Team (GMT) Enhancement**

**Objective 1:** Increase training, outreach and educational capacity to build capacity in the shrimp industry about how to properly build, install, use, and maintain required TEDs

- Has TED training, outreach and educational capacity been increased?

**Parameter #1: Number of teams hired and operational**

p) Method: Track hiring of staff to create two new GMTs focused on TED compliance education and outreach for the shrimp trawl fishery in the Gulf of Mexico

q) Timing and Frequency: One-time assessment at the end of project Year 1 (included in the Year 1 annual report)

r) Sites: Gulf-wide

s) Performance Criterion: At the end of project Year 1, two new teams will be hired and operational

 t) Data Product(s): Report of staff hired and general work schedule (i.e. full-time, part-time, seasonal)

**Parameter #2: Inventory of start-up equipment purchased**

k) Method: Track all expenditures for start-up equipment for newly hired GMT staff

l) Timing and Frequency: One-time assessment at the end of project Year 1 (included in the Year 1 annual report)

m) Sites: Gulf-wide

n) Performance Criterion:
   I. At the end of project Year 1, all start-up equipment will be purchased for the two new GMTs
   II. Equipment maintained, and replacement equipment purchased, for the project lifespan of 10 years

 o) Data Product(s): Inventory of start-up equipment expenditures, and maintenance schedule
Parameter #3: Training, education and outreach activities

a) Method: Use data sourced from the NOAA GMT program. Data will be aggregated in accordance with existing requirements and laws, including the protection of personal identifiable information.

b) Timing and Frequency: Annually for the life of the project (included in annual report).

c) Sites: Gulf-wide.

d) Performance Criterion: Education and outreach efforts (i.e., number of net shops/TED manufacturers visited, training programs provided, and courtesy inspections completed) will increase over the baseline activities, and will be shown in annual report.

e) Data Product(s): Annual summary of education and outreach events. Will be summarized as follows:
   - Total number of outreach events by state
   - Total number of workshops/trainings offered by state
   - Summary of interactions with net shops and TED manufactures, including the outcomes of those interactions.

Objective 2: Improve compliance with TED regulations, including TED maintenance and proper installation.

- Has compliance with TED regulations increased?

Parameter #1: Compliance with existing TED regulations, including maintenance and installation, within Gulf of Mexico state and federal shrimp trawl fisheries

a) Method: Use data sourced from the NOAA GMT program and state and federal enforcement offices, as appropriate. Data are compiled by NOAA’s Southeast Regional Office to determine the number of vessels that are non-compliant and the overall compliance rate for the fishery, which is based in part on the severity of violation. Data will be aggregated in accordance with existing requirements and laws, including the protection of personal identifiable information.

b) Timing and Frequency: Annually for the life of the project (included in annual report).

c) Sites: Gulf-wide.

d) Performance Criterion: Compliance rates with existing TED regulations within the shrimp trawl fishery are increased.

e) Data Product(s): Data will be summarized as follows:
   - GMT TED inspections will be aggregated into summary form, including the total number of boardings in each state and by month.
   - Compliance rates will be provided monthly in a table, as follows:
     1. Number of vessels inspected for TED Compliance
     2. Number of inspected vessels in violation of TED Regulations
     3. Number of inspected vessels that were fully compliant with TED regulations
     4. Percentage of vessels that were fully compliant
     5. Percentage of vessels that were non-compliant.
6. Estimated capture rate for juvenile and adult Kemp’s ridley sea turtle, and juvenile loggerhead and juvenile green sea turtles.

**Southeast Shrimp Trawl Fisheries Observer Program Enhancement**

**Objective 1:** Improve NOAA’s capability to detect and monitor the bycatch of sea turtles in shrimp trawls

- Has NOAA’s capability to detect and monitor sea turtle bycatch in the Gulf of Mexico shrimp trawl fishery increased?

**Parameter #1: Number of observer days achieved**

a) Method: Use data sourced from NOAA’s Gulf of Mexico Shrimp Trawl Fishery Observer Program.

b) Timing and Frequency:
   - Once at start of project: Review of historical data to direct the initial placement of the observer days within the Gulf of Mexico
   - Annually for the life of the project

c) Sites: Gulf-wide

d) Performance Criteria:
   i. By the end of project Year 1, an additional 300 observer days, targeted for sea turtle information needs, will have been allocated and implemented by the NOAA Gulf of Mexico Shrimp Trawl Fishery Observer Program
   ii. 300 observer days will be allocated annually for the project lifespan of 10 years

e) Data Product(s): Aggregated NOAA Gulf of Mexico Shrimp Trawl Fishery Observer Program data will be provided annually for the life of the project. Data will be summarized as follows:
   - Number of trips observed and observer sea days each month by shrimp statistical zone

**Parameter #2: Number of bycaught turtles observed**

a) Method: Use data sourced from NOAA’s Gulf of Mexico Shrimp Trawl Fishery Observer Program

b) Timing and Frequency: Annually for the life of the project

c) Sites: Gulf-wide

d) Performance Criteria: N/A

e) Data Product(s): Aggregated NOAA Gulf of Mexico Shrimp Trawl Fishery Observer Program data will be provided annually for the life of the project. Data will be summarized as follows.
   - Total number of sea turtle interactions observed each month by species and by shrimp statistical zone.
B.12.3 Monitoring Schedule

The schedule for the project monitoring is shown in Table B-21, separated by monitoring activity. Pre-Project Monitoring refers to obtaining existing historical information. Project Start-up Monitoring refers to all planning and initial activities (i.e. hiring staff, purchasing equipment) that will occur prior to the implementation of field efforts.

### Table B-21. Monitoring Schedule

<table>
<thead>
<tr>
<th>Monitoring Activity</th>
<th>Pre-Project Monitoring</th>
<th>Project Start-up Monitoring</th>
<th>Performance Monitoring Years 1 - 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOAA’s GMT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of teams hired and operational</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Amount of start-up equipment purchased</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Number of education and outreach activities (i.e., number of net shops/TED manufacturers visited, training programs provided, and courtesy inspections completed)</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Compliance rates with existing TED regulations, including maintenance and installation, within Gulf of Mexico state and federal shrimp trawl fisheries</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Observer Program</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of observer days achieved, including temporal and spatial coverage (i.e., observer days by shrimp statistical zone)</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Number of incidental takes observed during increased observer coverage</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

B.12.4 Reporting and Data Requirements

This section describes the process the NOAA will follow to document, validate and report field data collected for the purposes of performance monitoring. The reporting and data requirements described herein are intended to:

- Maximize the quality, utility, and integrity of monitoring data;
- Organize, track, locate, and access monitoring data over the long-term; and
- Share finalized monitoring data with the public in a consistent and comprehensible format.

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12 Pre-project monitoring may not be identified in all cases. In some cases, the project may be initiating a new program or activity for which no historical information is available. In other cases, insufficient historical data may exist or existing historical data may not be appropriate to compare to project performance monitoring data.
B.12.4.1 Reporting
NOAA shall provide annual status reports describing the status of and any changes to this Component’s expenditures during each calendar year. NOAA shall provide annual status reports to the public for all performance objectives until the applicable performance criteria, monitoring, and maintenance period has expired or by the agreed upon stipulations for the sea turtle early restoration project, whichever comes first.

Annual reporting will cover from January 1st to December 31st of each restoration year. The first annual report will cover the calendar year following the year in which the project stipulation is filed. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year. Data that is not available within this time-period will be provided within 6 months after the conclusion of the subject annual reporting year. Reported data and all data that is available to the public will be aggregated in accordance applicable laws and regulations. Data for this Component will be analyzed, in part, by evaluating trends related to STSSN data, Observer Program data and GMT data during the monitoring period for this Component. Data will not be compared to historical data in all cases because some data collected as part of this Component is not directly comparable to the existing historical data.

While NOAA will be relying on data from the existing programs, due to restrictions on the release of data under the Magnuson-Stevens Fishery Conservation and Management Act, only aggregated summary data will be incorporated in annual reports. In addition to annual reports, NOAA will develop a final project summary at the conclusion of the 10-year project period which will detail the overall accomplishments of the project.

B.12.4.2 Data Documentation
The majority of data collected for this Component will be inspection reports and observer data collected by NOAA’s GMT and Observer Programs. To the extent possible, all data generated during monitoring activities will be documented using an existing report form and established protocols (NMFS 2010).

Where and when applicable, all tangible forms of data generated by existing programs, will be reviewed by NOAA for completeness and accuracy before being finalized. Original hardcopy report forms and other relevant data including photographs will be retained and maintained by the existing programs in a secure location in accordance with agency, program and Deepwater Horizon litigation-hold requirements.

B.12.4.3 Data Transcription, Verification, and Analysis
Data collected by existing programs, including NOAA’s GMT and Observer Programs, and data from other outside resources, is subject to the existing verification procedures of the programs from which the data originate.

Data generated by this project component will be reviewed by NOAA for completeness and accuracy before being finalized. Originals or copies (to be decided by the NOAA) of the data collected, which may include but is not limited to datasheets, notebooks, and photographs (which may be in the form of photo micro SD cards) will be retained by the federal or state programs that collected the data and stored in a secure location in accordance with agency and applicable litigation-hold requirements.
data that are transferred to the implementing Trustees by non-state and non-federal project participants will be retained NOAA and stored in a secure location in accordance with agency and applicable litigation-hold requirements. Prior to data collection efforts, NOAA will decide where the original documents and copies of those documents will be stored.

When the data transcription and verification/validation processes are complete, electronic datasets can be used for data analysis. Analyses will be conducted NOAA to derive Project monitoring performance criteria metrics.

B.12.5 References

B.13  Sea Turtle Early Restoration Project Component D: Texas Enhanced Fisheries Bycatch Enforcement

B.13.1 Introduction

This document presents the monitoring plan (Plan) for the Texas Enhanced Fisheries Bycatch Enforcement, which is a component of the Sea Turtle Early Restoration Project. This project component is included as part of a Phase IV Deepwater Horizon early restoration project and is intended to contribute to making the environment and public whole for injuries to sea turtles. This plan describes the activities that will be conducted to evaluate and document its effectiveness at meeting its restoration objectives, including the performance criteria that will apply to determining the success of restoration or need for interim corrective action (15 CFR §990.55(b)(1)(vii)).

This Plan is specific to the Texas Enhanced Fisheries Bycatch Enforcement Component (Component) and should not be generalized beyond this component. Other monitoring plans and designs may be appropriate in other contexts or sites. This Plan will be implemented by the Texas Trustees13, in cooperation with the project partner, Texas Parks and Wildlife Department (TPWD) Law Enforcement Division. This Plan may be modified over time based on the management needs for this project component.

B.13.1.1 Project Overview

The Texas Enhanced Fisheries Bycatch Enforcement Component would enhance TPWD enforcement activities for fisheries that incidentally catch sea turtles while they operate primarily in Texas State waters (approximately 367 miles of coast line out to 9 nautical miles) within the Gulf of Mexico for a 10-year period (Figure B-27). These increased enforcement operations would focus on compliance with Turtle Excluder Device (TED) regulations during the Gulf shrimp fishery season (primarily February through mid-May) right before the Gulf closes to shrimping in May. Patrols would be targeted during this timeframe because it is an active time not only for the industry, but for sea turtle interactions due to the beginning of the spring nesting season. Previous efforts to increase enforcement activities during this time period have had an impact on compliance rates, reducing the number of observed strandings during this time period. The goal of this project component is to reduce sea turtle mortalities through increased compliance with TED regulations as a result of increased enforcement actions.

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13 The Texas Trustees include the Texas Commission on Environmental Quality, Texas General Land Office, and Texas Parks and Wildlife Department (TPWD).
Figure B-27. Texas Enhanced Fisheries Bycatch Enforcement geographic scope
B.13.1.2 Restoration Objectives and Performance Criteria

The specific restoration objectives for the Texas Enhanced Fisheries Bycatch Enforcement Component that are relevant for this monitoring plan and the performance criteria used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)) or adaptive management are:

Objective #1: Increase enforcement activities related to the proper use of TEDs.

Performance Criteria:

- Each year there will be an increase in TED-related enforcement vessel patrol hours as compared to the currently funded vessel patrol hours.
- By the end of the monitoring period, there will be a decrease in the number of enforcement actions as compared to the number of boat inspections.

Objective #2: Increase compliance with TED regulations.

Performance Criteria:

- By the end of the monitoring period, there will be a decrease in number of violations or severity of violations as compared to historic data.

B.13.1.3 Roles and Responsibilities

This Plan will be implemented by the Texas Trustees via the project partner, TPWD law enforcement division. TPWD will conduct all enforcement-related activities and provide the Texas Trustees information that documents their actions.

The Texas Trustees will work with the TPWD Law Enforcement Division to identify corrective actions needed to help achieve success, measured as a decrease in the number or severity of violations. Corrective actions will be part of an adaptive management process in which the Texas Trustees and TPWD law enforcement may evaluate information obtained as part of this project and other projects or datasets to inform future actions. This allows for flexibility to maximize performance for this project component under changing conditions.

B.13.2 Project Monitoring

The proposed monitoring for this project component, outlined below, is organized by objective, with one or more monitoring parameters. For each of the identified monitoring parameters, where appropriate, information is provided on the monitoring methods, timing and frequency, and sites. The activities involved with monitoring each objective are detailed below:

Objective #1: Increase enforcement patrols for the proper use of TEDs.

- Have the number of hours spent on TED-related enforcement patrols increased?

Parameter #1: Level of effort for enforcement will include vessel patrol hours, personnel hours used for TED-related enforcement activities, boat hours and number of vessels inspected.
a) Method: Historical and new data will be collected from TPWD law enforcement. Data collection will be provided to the Texas Trustees. Texas Trustees will analyze the data provided by TPWD law enforcement.
b) Timing and Frequency:
   i) One time, in the first annual report, historical data will be compiled as part of pre-project implementation monitoring (once)
   ii) On an annual basis for the duration of the project, the data products collected from this project that are related to this parameter will be reported.
c) Sites: Gulf of Mexico, primarily Texas state waters.
d) Performance Criteria:
   i) Each year there will be an increase in TED-related enforcement vessel patrol hours as compared to the currently funded vessel patrol hours.
   ii) By the end of the monitoring period, there will be a decrease in the number of enforcement actions as compared to the number of boat inspections.
e) Data Product(s): vessel patrol hours, personnel hours used for TED-related enforcement activities, boat hours and number of vessels inspected. Geographical data associated with inspections (waterbody and county).

Objective #2: Increase compliance with TED regulations.

- Has compliance with TED regulations increased?

Parameter #1: Compliance with TED regulations which will include the number and severity of citations.

a) Method: Historical information on the number and severity of citations related to non-compliance with TED regulations will be obtained from TPWD for at least the 5 years prior to project implementation. TPWD will monitor compliance with TED regulations following regular enforcement duties and procedures and provide information relating to citations including number and severity of citation during the period of funding. Data regarding the number of citations an individual receives will be aggregated, as required by law.
b) Timing and Frequency:
   i) One time, in the first annual report, historical data will be compiled.
   ii) On an annual basis for the duration of the project, the data products collected from this project that are related to this parameter will be reported Sites: Gulf of Mexico, primarily Texas state waters.
c) Performance Criteria: By the end of the monitoring period, there will be a decrease in number of violations or severity of violations as compared to historic data.
d) Data Product (s): Number and severity of citation broken out by geographical region (waterbody and county).
B.13.3 Monitoring Schedule

The schedule for this project component monitoring is shown in Table B-22, separated by monitoring activity. The compilation of historical data identified in this plan will be reported in the first annual report (Pre-Project Monitoring). Performance Monitoring will begin at the point agreements are in place between the Texas Trustees and TPWD law enforcement.

Table B-22. Monitoring Schedule

<table>
<thead>
<tr>
<th>Monitoring Activity</th>
<th>Pre-Project Monitoring</th>
<th>Project Start-up Monitoring</th>
<th>Performance Monitoring Years 1-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of enforcement effort</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Compliance with TED regulations</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

B.13.4 Reporting and Data Requirements

This section describes the process the Texas Trustees and TPWD will follow to document, validate and report field data collected for the purposes of Performance Monitoring. The reporting and data requirements described herein are intended to:

- Maximize the quality, utility, and integrity of monitoring data;
- Organize, track, locate, and access monitoring data over the long-term; and
- Share finalized monitoring data with the public in a consistent and comprehensible format.

B.13.4.1 Reporting

The Texas Trustees shall provide annual status reports describing the status of and any changes to this Early Restoration Project Component and/or project Component expenditures during each calendar year. The Texas Trustees shall provide annual status reports to the public until the applicable performance criteria, monitoring, and maintenance period has expired or the annual reporting requirement has been met in any active agreement, whichever comes first.

Annual reporting will cover from January 1st to December 31st of each restoration year. The first annual report will cover the calendar year following the year in which the Stipulation is filed. Annual status reports will be due within sixty (60) days after the conclusion of that annual reporting year.

Data that is not available within this time-period will be provided within 6 months after the conclusion of the subject annual reporting year. Reported data and all data that is available to the public will be aggregated in accordance with applicable laws and regulations. While the Trustees will be relying on data from the existing programs, only aggregated summary data will be incorporated in annual reports. The Implementing Trustees will develop a final project summary at the conclusion of the 10-year project period which will detail the overall accomplishments of the project. Data collected as part of this project...
will be compared to historical data. Additionally, there will be an evaluation of any changes in the citations (number or severity) over time.

**B.13.4.2 Data Documentation**
Data collected for this Component will include citation forms, expenses, and level of effort. To the extent possible, data generated during monitoring activities will be documented in accordance with methods and procedures used by the TPWD Law Enforcement Division. Data will be entered into a law enforcement managed database and appropriate fields will be reported out.

**B.13.4.3 Data Transcription, Validation, and Analysis**
Data collected by TPWD law enforcement is subject to existing verification procedures of its Law Enforcement Division. Data generated by this project component will be reviewed by the Texas Trustees for completeness and accuracy before being finalized. Monitoring data that is transferred to the Texas Trustees will be retained by the Texas Trustees and stored in accordance with TPWD, Trustee, and applicable litigation-hold requirements.

When the data transcription and verification/validation processes are complete, electronic datasets can be used for data analysis. Analyses will be used to derive Project monitoring performance criteria metrics.
B.14 Pelagic Longline Bycatch Reduction Project

B.14.1 Introduction

This document presents a monitoring plan designed to monitor and evaluate the performance of the proposed Pelagic Longline Bycatch Reduction Project (hereafter proposed PLL Project). The PLL Project is proposed in phase IV of early restoration under the Deepwater Horizon Oil Spill Early Restoration Framework Agreement\textsuperscript{14} to offset injuries to pelagic finfish, marine mammals, and leatherback turtles. This monitoring plan is specific to this early restoration project and should not be generalized beyond this project. Other monitoring plans and designs may be appropriate in other contexts or projects.

\textit{B.14.1.1 Project Overview}

The proposed PLL Project for Early Restoration targets the pelagic longline fishery in the waters of the US EEZ of the Gulf of Mexico (hereafter GOM PLL fishery) (Figure B- 28), and is open to pelagic longline vessels with sufficient available Individual Bluefin Quota for the GOM PLL fishery.

\begin{footnotesize}
\footnotesize\textsuperscript{14} http://www.restorethegulf.gov/sites/default/files/documents/pdf/framework-for-early-restoration-04212011.pdf
\end{footnotesize}
The project is intended to restore biomass of offshore fishes by reducing discards in the GOM PLL fishery, while minimizing economic effects from reductions of catches of target species through the distribution of and training in use of alternative gears. A map of Highly Migratory Species (HMS) PLL fishing ports in the US Gulf of Mexico, the proposed PLL Project’s target ports are shown in Figure B-29.
The following project elements are important to effectiveness:

- Vessel participation for the duration of the project (i.e. time to reach 60 vessel-year participation in repose)
- Conversion to alternative gears, including installation and training

**B.14.1.2 Restoration Objectives and Performance Criteria**

The goal of the proposed PLL Project is to restore biomass of offshore fishes through a reduction in bycatch mortality in the GOM PLL fishery and to minimize economic effects from potential reductions of catches of target species. Restoration objectives to be evaluated through monitoring are: 1) Reduce discards in the GOM PLL fishery 2) Minimize economic effects from potential reductions of catches of target species through the use of alternative gears in the Gulf of Mexico. Performance criteria will be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)).
Performance criteria will represent interim milestones that help project managers determine if the project is performing at an acceptable level given the current stage of the project. The performance criteria for this proposed project are identified by objective below and shown over several phases\textsuperscript{15} in Table B-23. These may be set or adjusted to reflect, or for consistency with, the project’s final design, implementation details or requirements.

1) Reduce discards in the GOM PLL fishery
   a. Performance Criteria:
      i. Annual target number of executed agreements for participation in repose is reached (number to be set before the first repose period begins)
      ii. Annual target participation\textsuperscript{16} in repose is reached
      iii. 60-vessel year participation in repose is achieved
      iv. Participants are in compliance with terms of active agreements
      v. Average biomass of dead discards avoided averages 11,600 dkg per vessel year

6) Minimize economic effects from potential reductions of catches of target species through the use of alternative gears in the Gulf of Mexico
   a. Performance Criteria:
      i. Annual target number of executed agreements\textsuperscript{14} for participation in gear conversion is reached (number to be set before the first repose period begins)
      ii. Annual target level of participation\textsuperscript{14} in gear conversion is reached
      iii. Vessels participating in the gear conversion have installed and are using their alternative gears as defined in their agreement
      iv. Net profit\textsuperscript{14} of alternative gears (catch per unit effort, CPUE) will improve annually

\textsuperscript{15} For a full description of monitoring phases, see section 3 Monitoring Schedule
\textsuperscript{16} Target participation and net profit (CPUE) will be updated prior to implementation of the first repose period
### Table B-23. Performance criteria by restoration objective for the Proposed PLL Project

<table>
<thead>
<tr>
<th>Performance Criteria</th>
<th>Project Execution</th>
<th>Post-Execution</th>
<th>Project End</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OBJECTIVE 1 – Reduce Discards in the GOM PLL fishery</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation in annual repose periods</td>
<td>• Annual target number of executed agreements(^{14}) for participation in repose is reached</td>
<td>• Annual target participation(^{14}) in repose is achieved</td>
<td>• 60-vessel year participation in repose is achieved</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Participants are in compliance with terms of active agreements</td>
<td></td>
</tr>
<tr>
<td>Quantity and disposition of bycatch and discards by species</td>
<td>• Average biomass of dead discards avoided averages 11,600 dkg per vessel year</td>
<td></td>
<td>• Average biomass of dead discards avoided averages 11,600 dkg per vessel year</td>
</tr>
<tr>
<td><strong>OBJECTIVE 2 – Minimize Economic Effects through Use of Alternative Gears</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation in Alternative gear installation and use</td>
<td>• Annual target number of executed agreements(^{14}) for participation in gear conversion is reached</td>
<td>• Annual target level of participation(^{14}) in gear conversion is reached</td>
<td>• Target level of participation(^{14}) in gear conversion is reached</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Vessels participating in the gear conversion have installed and are using their alternative gears as defined in their agreement</td>
<td></td>
</tr>
<tr>
<td>Net profit of alternative gears (catch per unit effort)</td>
<td>• Net profit(^{14}) of alternative gears (catch per unit effort) will improve annually</td>
<td></td>
<td>• Net profit(^{14}) of alternative gears (catch per unit effort) will improve annually has improved</td>
</tr>
</tbody>
</table>

### B.14.1.3 Conceptual Model and Monitoring Questions

Table B-24 below outlines the conceptual model that forms the basis of the monitoring plan, including a summary of the project activities, the expected product or output of those activities, and the desired project outcomes.
Table B- 24. Conceptual model for the Pelagic Longline Bycatch Reduction Project

<table>
<thead>
<tr>
<th>Activity</th>
<th>Output</th>
<th>Short-term outcome</th>
<th>Long-term outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fishing repose</td>
<td>• Agreements signed that cover a 60 vessel-year participation in repose</td>
<td>• Target participation is reached</td>
<td>• Target participation is sustained</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reduced bycatch</td>
<td>• Reduced bycatch</td>
</tr>
<tr>
<td>• Conversion of PLL gear to alternative gears</td>
<td>• Provisioning of alternative gears to participants</td>
<td>• Target participation is reached</td>
<td>• Target participation is sustained</td>
</tr>
<tr>
<td></td>
<td>• Education and training on alternate gears</td>
<td>• Improved net profit of alternative gears (catch per unit effort)</td>
<td>• Improved net profit of alternative gears (catch per unit effort)</td>
</tr>
<tr>
<td></td>
<td>• Utilization of alternative gears</td>
<td></td>
<td>• Effective alternative gear technology is transferred to new areas</td>
</tr>
<tr>
<td></td>
<td>• Evaluation of alternative gears</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Technical extension to gear users to improve efficiency</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This monitoring plan has been designed to address the following monitoring questions for each component objective and desired outcome:

**Objective #1: Reduce discards in the GOM PLL fishery**

- Are vessel owners fulfilling their agreement to abstain from PLL fishing during the agreement period(s)?
- What is the quantity and disposition of bycatch species in the Gulf of Mexico?
- What gear configurations, set parameters, and environmental parameters result in reduced bycatch using alternative gears?
- What is the dead discard rate when using alternative gears or PLL gear in the Gulf of Mexico?
- What is the dead:live discard ratio, when using alternative gears or PLL gear in the Gulf of Mexico?
- Does post-release survival of bycatch species increase when caught with alternative gears, compared to being caught with PLL gear?

**Objective #2: Minimize economic effects from potential reductions of catches of target species through the use of alternative gears in the Gulf of Mexico**

- Are vessel owners using alternative gears to the level prescribed in their agreement?
- What are the annual income, annual expenses, and net profit per vessel using alternative gears?
• What gear configurations, set parameters, environmental parameters, could result in increased economic efficiency of alternative gears (e.g. higher catch rates, higher product quality, reduced costs)?
• Is effective alternative gear technology being transferred to new areas?
• Are market conditions changing that influence net profit (catch per unit effort)?

B.14.2 Project Monitoring

Performance monitoring is required by OPA to evaluate the effectiveness of the project in meeting its established restoration objectives and to assist in determining the need for corrective actions. Additional monitoring may be done to support project management by informing corrective actions and identifying potential factors influencing project success.

The monitoring for this restoration project, outlined below, includes both performance and potential additional monitoring and is organized by restoration objective, with one or more monitoring parameters for each objective. For each of the monitoring parameters, information is provided on the monitoring methods, timing and frequency, and sample size. In addition, performance criteria for each parameter are identified (if applicable).

Performance Monitoring: to evaluate project effectiveness and inform the need for corrective actions

Objective #1: Reduce discards in the GOM PLL fishery

• Are vessel owners fulfilling their agreement to abstain from PLL fishing during the agreement period?
• What is the quantity and disposition of bycatch species in the Gulf of Mexico?
• What gear configurations, set parameters, and environmental parameters result in reduced bycatch using alternative gears?

Parameter #1: Number of agreements fully executed, including number of participating vessels in repose
a) Method: Relate agreements with participating vessels to track the number of vessels signed up to participate in the repose
b) Timing and Frequency: Report data annually from PLL Project implementation through the duration of the project
c) Sample Size: Track all agreements
d) Performance Criteria:
   i. Annual target number of executed agreements 14 for participation in repose is reached (target number to be set before the first repose period begins)
   ii. Annual target participation 14 in repose is reached during project implementation
   iii. 60-vessel year participation in repose is achieved at the end of the project

Parameter #2: Counts of non-compliance with agreements by all vessels participating in the repose
a) Method: Reference agreements with participants to identify and count any vessels not complying with their agreements
b) Timing and Frequency: Collate data annually from PLL Project implementation through the duration of the project
c) Sample Size: Track agreements of all vessels participating in the Project
d) Performance Criterion: Participants are in compliance with terms of active agreements

Parameter Set #3: Quantity (count by size) and disposition of bycatch and discards by species caught by project participant vessels with alternative gear and vessels in the PLL fishery
a) Method: Data are sourced from Atlantic HMS Logbooks, the PLL Project vessel observers, the existing Pelagic Observer Program (POP), set forms, dealer report forms, weighout slips, payment receipts, and trip tickets. Data will be reported in aggregate to protect privacy and in adherence with law
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all or a subset of project participant vessels using alternative gear; track all vessels in the GOM PLL fishery for which POP data are collected
d) Performance Criterion: Average biomass of dead discards avoided averages 11,600 dkg per vessel year

Parameter Set #4: Gear configuration parameters (e.g. gear type used, gear condition, specific gear parameters (e.g. number/depth of hooks, floats, light sticks, radio beacons, etc.), for project participant vessels with alternative gear and vessels in the GOM PLL fishery.

a) Method: Data are sourced from PLL Project vessel observers, and the existing Pelagic Observer Program, Atlantic HMS Logbooks, and trip tickets
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all or a subset of participating vessels using alternative gear; track all vessels in the GOM PLL fishery

Parameter Set #5: Set parameters (e.g. set location, target species, date, time of day, speed, days at sea, etc.) for vessels in the GOM PLL fishery

a) Method: Data are sourced from Atlantic HMS Logbooks, PLL Project vessel observers, the existing Pelagic Observer Program, set forms and trip tickets
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all vessels in the GOM PLL fishery
Objective #2: Minimize economic effects from potential reductions of catches of target species through the use of alternative gears in the Gulf of Mexico

- Are vessel owners using alternative gears to the level prescribed in their agreement?
- What are the annual income, annual expenses, and net profit (catch per unit effort) using alternative gears?
- What gear configurations, set parameters, environmental parameters, could result in increased economic efficiency of alternative gears (e.g. higher catch rates, higher product quality, reduced costs)?

Parameter #1: Number of repose agreements that include participation in the alternative gear use project component

a) Method: Reference agreements with participants to track the number of vessels signed up to participate in the repose and conversion to alternative gears
b) Timing and Frequency: Report data annually from PLL Project implementation through the duration of the project
c) Sample Size: Track all agreements
d) Performance Criteria:
   i. Annual target number of executed agreements\(^{14}\) for participation in gear conversion is reached (number to be set before the first repose period begins)
   ii. Annual target level of participation\(^{14}\) in gear conversion is reached

Parameter #2: Current status of installation, use, and training on use of alternative gears on project participant vessels

a) Method: Reference agreements with participants, interim and annual reports from contractors and consultants regarding gear installation and training on use of gear. Track the number of vessels receiving alternative gears, the type of gear and the status (installation and use) of alternative gears
b) Timing and Frequency: Report data annually from PLL Project implementation through the duration of the project
c) Sample Size: Track status of alternative gear for all vessels participating in gear conversion
d) Performance Criterion: Vessels participating in the gear conversion have installed and are using their alternative gears as defined in their agreement

Parameter Set #3: Quantity (count by weight, size, and product grade), and price of landings of fishery target species landed by project participant vessels with alternative gears and vessels in the GOM PLL fishery
a) Method: Data are sourced from Atlantic HMS Logbooks\(^{17}\) (part of the NOAA Fisheries Logbook System\(^{18}\)), the PLL Project vessel observers, the existing Pelagic Observer Program\(^{19}\), set forms, dealer report forms, weighout slips, payment receipts, trip tickets, trip expense summaries and annual expense reports. Data will be reported in aggregate to protect privacy and in adherence with law.

b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project.

c) Sample Size: Track all project participant vessels using alternative gears; track all vessels in the GOM PLL fishery for which these parameters are collected.

d) Performance Criterion (for parameter sets 3 and 4, in combination): Net profit\(^{14}\) of alternative gears (catch per unit effort) will improve annually.

Parameter Set #4: Annual expenses per vessel; (e.g. equipment purchases and/or maintenance, staff and salaries, revenue sharing, fuel and trip costs), for project participant vessels with alternative gears and vessels in the GOM PLL fishery.

a) Method: Data are sourced from Atlantic HMS Logbooks, the PLL Project vessel observers, the existing Pelagic Observer Program, set forms, dealer report forms, weighout slips, payment receipts, trip tickets, trip expense summaries and annual expense reports. Data will be reported in aggregate to protect privacy and in adherence with law.

b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project.

c) Sample Size: Track all project participant vessels using alternative gears; track all vessels in the GOM PLL fishery for which these parameters are collected.

d) Performance Criterion (for parameter sets 3 and 4, in combination): Net profit\(^{14}\) of alternative gears (catch per unit effort) will improve annually.

Parameters Sets # 5 and 6: Gear configuration and set parameters for project participant vessels with alternative gear and vessels in the GOM PLL fishery.

a) Method, Timing and Frequency, and Sample Size match those of Parameter Sets 4 (gear configuration) and 5 (set parameters) found under Objective #1.

\(^{17}\) Atlantic HMS Logbooks: [http://www.sefsc.noaa.gov/fisheries/reporting.htm](http://www.sefsc.noaa.gov/fisheries/reporting.htm)

\(^{18}\) NOAA Fisheries Logbook System: [http://www.sefsc.noaa.gov/fisheries/logbook.htm](http://www.sefsc.noaa.gov/fisheries/logbook.htm)

\(^{19}\) Pelagic Observer Program: [http://www.sefsc.noaa.gov/fisheries/observers/pelagic.htm](http://www.sefsc.noaa.gov/fisheries/observers/pelagic.htm)
Parameter Set #7: Environmental conditions (e.g. wind speed and direction, weather, wave height, water and air temperature) encountered by project participant vessels with alternative gears

a) Method: Data are sourced from Atlantic HMS Logbooks, PLL Project vessel observers. Gather satellite-derived, weather buoy-derived and observer-recorded air and sea surface temperature (SST), weather conditions, and wind speed and direction, wave height

b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project

c) Sample Size: Track all participating vessels using alternative gears

Additional Monitoring: to support project management

Objective #1: Reduce discards in the GOM PLL fishery

- What is the dead discard rate when using alternative gears or PLL gear in the Gulf of Mexico?
- What is the dead:live discard ratio, when using alternative gears or PLL gear in the Gulf of Mexico?
- Does post-release survival of bycatch species increase when caught with alternative gears, compared to being caught with PLL gear?

Parameter #1: Dead discard rate by species, caught by project participant vessels with alternative gears and vessels in the GOM PLL fishery

a) Method: Data are sourced from Atlantic HMS Logbooks, the PLL Project vessel observers, the existing Pelagic Observer Program, set forms, dealer report forms, weighout slips, payment receipts, and trip tickets. Data will be reported in aggregate to protect privacy and in adherence with law

b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project

c) Sample Size: Track all or a subset of project participant vessels using alternative gears; track all vessels in the GOM PLL fishery for which POP data are collected

Parameter #2: Dead discard ratio by species, caught by project participant vessels with alternative gears and vessels in the PLL fishery

a) Method: Data are sourced from Atlantic HMS Logbooks, the PLL Project vessel observers, the existing Pelagic Observer Program, set forms, dealer report forms, weighout slips, payment receipts, and trip tickets. Data will be reported in aggregate to protect privacy and in adherence with law

b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project

c) Sample Size: Track all or a subset of project participant vessels using alternative gears; track all vessels in the GOM PLL fishery for which POP data are collected
Parameter #3 (as needed and equipment are available): Post-release survival of satellite-tagged individuals caught with alternative and PLL gear

a) Method: Reference satellite tagging information from the NMFS Billfish Project
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Tag a subset of individual fish caught using alternative gears, as satellite tags are available. Track all satellite tagging data that are available for vessels in the GOM PLL fishery

Objective #2: Minimize economic effects from potential reductions of catches of target species through the use of alternative gears in the Gulf of Mexico

- Is the effective alternative gear technology being transferred to new areas?
- Are market conditions changing that influence net profit (catch per unit effort)?

Parameter #1: Technology transfer and cooperative extension of alternative gear technology and application of new information: number of demonstrations, workshops, or 1-on-1 informational or troubleshoot sessions, and number of participants

a) Method: Reference agreements with participants and interim and annual reports from contractors and consultants regarding technology transfer and extension tracking data
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all project participant vessels using alternative gears

Parameter Set #2: Qualitative features of the market influencing the revenue for both project participant vessels with alternative gears and vessels in the PLL fishery

a) Method: Collect data on market conditions from dealer report forms, weighout slips and receipts, and prices for fish markets (whole sale prices), and other sources
b) Timing and Frequency: Data will be accessed regularly and analyzed annually starting with PLL Project implementation and continuing for the duration of the project
c) Sample Size: Track all participating vessels using alternative gears; track all vessels in the GOM PLL fishery

B.14.3 Monitoring Schedule

Monitoring will occur in several phases throughout this project, including pre-project monitoring, project execution monitoring, and post-execution monitoring. Pre-project monitoring consists of data collection from vessels in the GOM PLL fishery that occurred before the proposed PLL Project would be implemented. Project execution monitoring will occur after a vessel owner executes a contract, and will consist largely of tracking execution of agreements and provisioning of alternative gears. Post-execution monitoring will occur annually for the lifespan of the Project (i.e. the time to reach 60 vessel-years of
participation in repose, anticipated at 5-10 years). For the proposed PLL Project, post-execution monitoring consists of the majority of monitoring activities, including performance monitoring that will evaluate the project against its performance criteria and additional monitoring that may be done to support project management.

B.14.4 Reporting and Data Requirements

B.14.4.1 Monitoring Reports

Monitoring reports will summarize the annual monitoring events and document the degree to which the project is attaining success. For the purposes of the monitoring reports, a reporting year will cover from January 1st to December 31st. The first monitoring report will cover the calendar year in which the first repose period has commenced as part of the proposed PLL Project. Monitoring reports will be due within nine months after the conclusion of that monitoring year. Monitoring reports for the PLL Project will rely heavily on existing data collection programs to evaluate project performance relative to baseline conditions. Further, project-specific data collection will be implemented through existing monitoring programs in many cases. The anticipated delivery schedule of monitoring reports is a result of the length of time needed to gather and collate data from various sources, aggregation of data to meet regulatory requirements, and completion of complex analyses on a large volume of data. Table B-25 provides examples of existing data collection programs that will be utilized by the PLL Project as well as project-specific monitoring efforts, collected by the project. The reports should provide a summary of the previous monitoring report (including timelines documenting monitoring procedures), a list or table of performance standards that compares annual monitoring results to each performance criterion, and a summary of any problems encountered and solutions to each or whether corrective actions were necessary.

Table B-25. Data on which monitoring of this project will rely, listed by their source. Data from existing programs are listed on the left, and data collected by the project are listed on the right

<table>
<thead>
<tr>
<th>Existing data collection programs (also provide baseline data)</th>
<th>Project-Specific Monitoring Efforts (Project data)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Atlantic HMS Logbooks</td>
<td>• Agreements with participating vessels</td>
</tr>
<tr>
<td>• Pelagic Observer Program</td>
<td>• Proposed PLL Project vessel observers</td>
</tr>
<tr>
<td>• Set Forms</td>
<td>• Observer-derived environmental data</td>
</tr>
<tr>
<td>• Dealer Report Forms</td>
<td>(e.g. air and sea-surface temperatures,</td>
</tr>
<tr>
<td>• Weighout Slips</td>
<td>wind speed and direction, and wave height)</td>
</tr>
<tr>
<td>• Payment Receipts</td>
<td>• Interim and annual reports on gear fate</td>
</tr>
<tr>
<td>• Trip Tickets</td>
<td>from contractors and consultants</td>
</tr>
<tr>
<td>• Observer, Satellite-derived and weather buoy-derived</td>
<td></td>
</tr>
<tr>
<td>• Trip Expense Summaries</td>
<td></td>
</tr>
<tr>
<td>• Observer, Satellite-derived and weather buoy-derived</td>
<td></td>
</tr>
<tr>
<td>• Annual Expense Reports</td>
<td></td>
</tr>
<tr>
<td>• NMFS Billfish Project</td>
<td></td>
</tr>
<tr>
<td>• Wholesale Prices</td>
<td></td>
</tr>
</tbody>
</table>
B.14.4.2 Quality Assurance / Quality Control Procedures

Data Collected by Existing Programs

Data this project will rely on that is collected by currently existing programs, including Atlantic HMS Logbooks, Pelagic Observer Program, and all other outside resources, is subject to the QA/QC requirements of the programs from which the data originate (for a comparison of data source, including data from existing programs and project specific monitoring efforts collected by this project, see Table B-5).

Data Collected by the Trustees

Data collected by the trustees includes counts of participant vessels referenced from cooperative agreements, status of alternative gears from interim and annual reports from contractors and consultants, and all data from project participant vessel observers, including gear, set, environmental and other parameters.

This section describes the process the National Oceanic and Atmospheric Administration will follow to document, validate and report data collected by the trustees for the purposes of monitoring the project. The reporting and data requirements described herein are intended to:

- Maximize the quality, utility, and integrity of monitoring data
- Organize, track, locate, and access monitoring data over the long-term
- Share finalized monitoring data with the public in a consistent and comprehensible format

B.14.4.3 Data Documentation

The majority of data collected during this Project will be field observations of environmental conditions and enumeration and size assessment of biological organisms. To the extent possible, all environmental and biological data generated during monitoring activities will be documented using standardized datasheets. If standardized datasheets are unavailable or not readily amendable to record Project-specific data, then Project-specific datasheets will be drafted prior to conducting any Project monitoring activities.

All tangible forms of data will be reviewed by NOAA for completeness and accuracy before being finalized.

B.14.4.4 Data Transcription, Validation, and Analysis

All datasheets and notebook entries will be scanned to PDF files and will be archived along with the hardcopy datasheets.

Relevant Project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into a digital format for required data analysis by NOAA staff or contractors hired by NOAA.

Procedures for data collection (e.g. standardized data sheets, metrics, etc.) and quality control / quality assurance for data collected by the PLL Project vessel observers will match procedures of the existing
Pelagic Observer Project (POP) to the extent practicable. Additionally, QA/QC standards set by the Trustees’ Program Implementation Group will define procedures for all project-specific data.

When the data transcription and QA/QC processes are complete, electronic datasets can be used for data analysis. Analyses will be conducted by NOAA and/or contractors hired by NOAA to derive Project monitoring performance criteria metrics.
This Appendix consists of a glossary of terms utilized for Offsets, applicable solely to the following proposed Phase IV early restoration projects:

- Restoring Living Shorelines and Reefs in Mississippi Estuaries;
- Shell Belt and Coden Belt Roads Living Shoreline Project; and
- Point aux Pins Living Shoreline Project

These definitions are not considered to be a comprehensive list for all Early Restoration Projects under the Framework for Early Restoration Addressing Injuries Resulting from the Deepwater Horizon Oil Spill executed April 20, 2011. Future projects may require other definitions, including but not limited to, other definitions for habitats included in this list.

C.1 Glossary of Terms

**Continental Shelf** shall mean the contiguous shallow platforms or terraces that surround most of the continents and are terminated seaward by a relatively sharp break in slope, called the shelf edge or shelf break. In the Gulf of Mexico, this generally follows the 200-meter isobaths.

**Discounted Kilogram Years** is expressed in present value 2010 kilogram years.

**Discounted Service Acre Years** is expressed in present value 2010 service acre years.

**Estuarine Dependent Aquatic Biomass:** Is defined as the biomass of aquatic species that depend on the habitat found within estuaries for at least one stage of their life cycle.

**Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat**- is defined as the biomass of those fishes and crustaceans that depend on the habitat found within oyster reefs and other estuarine hard bottom/structural habitat for at least one stage of their life cycle. Applicable to this project only, this definition includes the individual species listed below in Table C-1 which are a subset of species listed in Attachment A. As part of the ongoing NRD Assessment, the species in Table C-1 or Attachment A may be shifted or consolidated within or between the groups, but none of the species listed in Table C-1 will be removed from this definition. Any consolidation or shifting of species between groups, renaming or dividing of groups, or removal of species currently listed in Attachment A, that are determined by the Trustees in the final NRD Assessment, must have a reliable scientific basis.

Groups:

- Crabs and Lobsters
- Drums and Seatrout
- Forage Fish
- Other Demersal Fish
- Other Reef Associated Fish
- Shrimp
- Brown Shrimp
Federal Waters on the Continental Shelf refers to the area of water extending from the outer boundary of Mississippi state waters to the edge of the Continental Shelf, excluding any area within the state waters of Texas, Louisiana, Mississippi, Alabama, or Florida.

Salt Marsh Habitat refers to transitional marsh areas between land and water that occur in coastal areas at salinities at or approaching that of ocean water. Typical vegetation in salt marsh habitat includes species such as Spartina alterniflora, Juncus roemerianus, and Distichlis spicata.

Secondary Productivity: The strict definition of secondary productivity is the rate of production of consumers (heterotrophs) in an ecosystem (Edmondson & Winberg, 1971). For purposes of the Offsets for this living shoreline, subtidal and intertidal reef project, it is more narrowly defined as production of herbivores and detritivores, (the P2 production level in Odum, 1959) and in particular, the net production of mobile and sessile invertebrate infauna and epifauna associated with hard bottom substrates.


Table C- 1. Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom / Structural Habitats and their Assigned Species Groups from Attachment A.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farfantepenaeus aztecus</td>
<td>brown shrimp</td>
<td>Brown Shrimp</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>blue crab</td>
<td>Crabs and Lobsters</td>
</tr>
<tr>
<td>Callinectes similis</td>
<td>lesser blue crab</td>
<td>Crabs and Lobsters</td>
</tr>
<tr>
<td>Dyspanopeus texanus</td>
<td>Gulf grassflat crab</td>
<td>Crabs and Lobsters</td>
</tr>
<tr>
<td>Menippe adina</td>
<td>Gulf stone crab</td>
<td>Crabs and Lobsters</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>sand seatrout</td>
<td>Drums and Seatrout</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>spotted seatrout</td>
<td>Drums and Seatrout</td>
</tr>
<tr>
<td>Cynoscion nothus</td>
<td>silver seatrout</td>
<td>Drums and Seatrout</td>
</tr>
<tr>
<td>Equetus lanceolatus</td>
<td>spotted drum</td>
<td>Drums and Seatrout</td>
</tr>
<tr>
<td>Larimus fasciatus</td>
<td>banded drum</td>
<td>Drums and Seatrout</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>Spot</td>
<td>Drums and Seatrout</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>Atlantic croaker</td>
<td>Drums and Seatrout</td>
</tr>
<tr>
<td>Pareques acuminatus</td>
<td>high-hat drum</td>
<td>Drums and Seatrout</td>
</tr>
<tr>
<td>Pareques iwamotoi</td>
<td>blackbar drum</td>
<td>Drums and Seatrout</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>black drum</td>
<td>Drums and Seatrout</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>red drum</td>
<td>Drums and Seatrout</td>
</tr>
<tr>
<td>Stellifer lanceolatus</td>
<td>American stardrum</td>
<td>Drums and Seatrout</td>
</tr>
<tr>
<td>Alosa alabamae</td>
<td>Alabama shad</td>
<td>Forage Fish</td>
</tr>
<tr>
<td>Alosa chrysochloris</td>
<td>skipjack shad</td>
<td>Forage Fish</td>
</tr>
<tr>
<td>Scientific Name</td>
<td>Common Name</td>
<td>Groups</td>
</tr>
<tr>
<td>----------------------------</td>
<td>---------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Anchoa cubana</td>
<td>Cuban anchovy</td>
<td>Forage Fish</td>
</tr>
<tr>
<td>Anchoa hepsetus</td>
<td>striped anchovy</td>
<td>Forage Fish</td>
</tr>
<tr>
<td>Anchoa lyolepis</td>
<td>shortfinger anchovy</td>
<td>Forage Fish</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>Bay anchovy</td>
<td>Forage Fish</td>
</tr>
<tr>
<td>Anchovia perfasciata</td>
<td>Poey's anchovy</td>
<td>Forage Fish</td>
</tr>
<tr>
<td>Brevoortia gunteri</td>
<td>finescale menhaden</td>
<td>Forage Fish</td>
</tr>
<tr>
<td>Brevoortia patronus</td>
<td>Gulf menhaden</td>
<td>Forage Fish</td>
</tr>
<tr>
<td>Dorosoma petenense</td>
<td>threadfin shad</td>
<td>Forage Fish</td>
</tr>
<tr>
<td>Engraulis eurystole</td>
<td>silver anchovy</td>
<td>Forage Fish</td>
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## Attachment A. List of Species Associated with Each Species Categorization Grouping

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See Appendix C, Glossary of Terms: “Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat”
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1 See Appendix C, Glossary of Terms: “Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat”
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1 See Appendix C, Glossary of Terms: “Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat”
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¹ See Appendix C, Glossary of Terms: “Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat”
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<td><em>Sicyonia penicillata</em></td>
<td>Target Rock Shrimp</td>
<td>Shrimp</td>
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<tr>
<td><em>Sicyonia typica</em></td>
<td>rock shrimp</td>
<td>Shrimp</td>
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<tr>
<td><em>Sicyoniidae postlarvae</em></td>
<td>rock shrimp unspecified</td>
<td>Shrimp</td>
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<tr>
<td><em>Solenocera atlantidis</em></td>
<td>dwarf humpback shrimp</td>
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<tr>
<td><em>Solenocera vioscai</em></td>
<td>humpback shrimp</td>
<td>Shrimp</td>
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<tr>
<td><em>Squilla chydaea</em></td>
<td>offshore mantis shrimp</td>
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<td><em>Squilla deceptrix</em></td>
<td>mantis shrimp</td>
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<td><em>Squilla edentata</em></td>
<td>mantis shrimp</td>
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<td><em>Squilla empusa</em></td>
<td>mantis shrimp</td>
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<tr>
<td><em>Stenopus scutellatus</em></td>
<td>gold coral banded shrimp</td>
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<tr>
<td><em>Xiphopenaeus kroyeri</em></td>
<td>seabob shrimp</td>
<td>Shrimp</td>
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1 See Appendix C, Glossary of Terms: “Estuarine Obligate Fishes and Mobile Crustaceans Dependent on Oyster Reefs and Other Estuarine Hard Bottom/Structural Habitat”
Appendix D. Guidelines for NEPA Impact Determinations from the Final Phase III ERP/PEIS

As discussed in Chapters 5 through 14, agencies must consider the environmental effects of their actions. These effects may include, among others, impacts to social, cultural, and economic resources, as well as natural resources. To identify those resources that could be significantly impacted by the proposed alternatives and actions, appropriate definitions of impacts must first be identified. Table D-1 provides guidelines for resource-specific definitions for determining effects of individual planned actions. These definitions were also included and described in the Final Phase III ERP/PEIS.
<table>
<thead>
<tr>
<th>RESOURCE AREA</th>
<th>IMPACT DURATION</th>
<th>MINOR</th>
<th>MODERATE</th>
<th>MAJOR</th>
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<tbody>
<tr>
<td>Geology and Substrates</td>
<td>Short-term: During construction period.</td>
<td>Disturbance to geologic features or soils could be detectable, but could be small and localized. There could be no changes to local geologic features or soil characteristics. Erosion and/or compaction could occur in localized areas.</td>
<td>Disturbance could occur over local and immediately adjacent areas. Impacts to geology or soils could be readily apparent and result in changes to the soil character or local geologic characteristics. Erosion and compaction impacts could occur over local and immediately adjacent areas.</td>
<td>Disturbance could occur over a wide-spread area. Impacts to geology or soils could be readily apparent and could result in changes to the character of the geology or soils over a wide-spread area. Erosion and compaction could occur over a wide-spread area. Disruptions to substrates or soils may be permanent.</td>
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<td>Long-term: Over the life of the project or longer.</td>
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<tr>
<td>Hydrology and Water Quality</td>
<td>Short-term: During construction period.</td>
<td>Hydrology: The effect on hydrology could be measurable, but it could be small and limited to local and adjacent areas. The effect could permanently alter the area's hydrology, including surface and groundwater flows.</td>
<td>Water Quality: Impacts could result in a detectable change to water quality, but the change could be expected to be small and localized. Impacts could quickly become undetectable. State water quality standards as required by the Clean Water Act could not be exceeded.</td>
<td>Hydrology: The effect on hydrology could be measurable and wide-spread. The effect could permanently alter hydrologic patterns including surface and groundwater flows. Water Quality: Impacts could likely result in a change to water quality that could be readily detectable and wide-spread. Impacts could likely result in exceedance of state water quality standards and/or could impair designated uses of a water body. Floodplains: Impacts could result in a change to natural and beneficial floodplain values that could have substantial consequences over a wide-spread area. Location of operations could increase risk of flood loss including impacts on human safety, health, and welfare.</td>
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<td>Long-term: Over the life of the project or longer.</td>
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<td>Wetlands: The effect on wetlands could be measurable, but small in</td>
<td>Floodplains: Impacts could result in a change to natural and beneficial floodplain values and could be readily detectable, but limited to local and adjacent areas. Location of operations in floodplains could increase risk of flood loss including impacts on human safety, health, and welfare.</td>
<td>Wetlands: The action could cause a permanent loss of wetlands across a wide-spread area. The character of the wetlands could be changed so that the functions typically provided by the wetland could be permanently lost.</td>
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<td>RESOURCE AREA</td>
<td>IMPACT DURATION</td>
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<tr>
<td><strong>IMPACT INTENSITY DEFINITIONS</strong></td>
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<td>terms of area and the nature of the impact. A small impact on the size, integrity, or connectivity could occur; however, wetland function could not be affected and natural restoration could occur if left alone.</td>
<td>Wetlands: The action could cause a measurable effect on wetlands indicators (size, integrity, connectivity) or could result in a permanent loss of wetland acreage across local and adjacent areas. However, wetland functions could only be permanently altered in limited areas.</td>
<td>The impact on air quality could be measurable over a wide-spread area. Emissions are high, such that they could exceed the EPA’s de minimis criteria for a general conformity determination. The contribution to GHGs could exceed 25,000 metric tons of CO₂ or its equivalent annually. The source could be a dominant contributor in terms of GHG in the area.</td>
</tr>
<tr>
<td><strong>Air Quality and Greenhouse Gas Emissions</strong></td>
<td>Short-term: During construction period.</td>
<td>The impact on air quality may be measurable, but could be localized and temporary, such that the emissions do not exceed the Environmental Protection Agency’s (EPA’s) de minimis criteria for a general conformity determination under the Clean Air Act (40 C.F.R. 93.153). The contributions to GHGs may be measurable, but below 25,000 metric ton/year of carbon dioxide (CO₂) or its equivalent. ¹</td>
<td>The impact on air quality could be measurable and limited to local and adjacent areas. Emissions of criteria pollutants could be at the EPA’s de minimis criteria levels for general conformity determination. The contribution to GHG emissions could exceed 25,000 metric tons of CO₂ or its equivalent annually. Although the level of emissions could be similar to a large source (i.e. natural gas and petroleum users, landfills, agriculture, etc.), the levels could not be a dominant contributor to GHGs in the area.</td>
<td>The impact on air quality could be measurable over a wide-spread area. Emissions are high, such that they could exceed the EPA’s de minimis criteria for a general conformity determination. The contribution to GHGs could exceed 25,000 metric tons of CO₂ or its equivalent annually. The source could be a dominant contributor in terms of GHG in the area.</td>
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<td>Long-term: Over the life of the project or longer.</td>
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¹ “The reference point of 25,000 metric tons of direct CO₂-equivalent GHG emissions may provide agencies with a useful indicator – rather than an absolute standard of insignificant effects -- for agencies’ action-specific evaluation of GHG emissions and disclosure of that analysis in their NEPA documents. CEQ does not propose this reference point as an indicator of a level of GHG emissions that may significantly affect the quality of the human environment, as that term is used by NEPA, but notes that it serves as a minimum standard for reporting emissions under the Clean Air Act.” CEQ, “Draft NEPA guidance on consideration of the effects of climate change and GHG emissions.” 2010.
### IMPACT INTENSITY DEFINITIONS

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<tr>
<th>RESOURCE AREA</th>
<th>IMPACT DURATION</th>
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<th>MODERATE</th>
<th>MAJOR</th>
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</table>
| Noise         | Short-term: During construction period.  
               Long-term: Over the life of the project.  | Increased noise could attract attention, but its contribution to the soundscape would be localized and unlikely to affect current user activities.  | Increased noise could attract attention, and contribute to the soundscape including in local areas and those adjacent to the action, but could not dominate. User activities could be affected.  | Increased noise could attract attention, and dominate the soundscape over wide-spread areas. Noise levels could eliminate or discourage user activities.  |
| Habitats      | Short-term: Lasting less than two growing seasons.  
               Long-term: Lasting longer than two growing seasons.  | Impacts on native vegetation may be detectable, but could not alter natural conditions and be limited to localized areas. Infrequent disturbance to individual plants could be expected, but without affecting local or range-wide population stability. Infrequent or insignificant one-time disturbance to locally suitable habitat could occur, but sufficient habitat could remain functional at both the local and regional scales to maintain the viability of the species.  
               Opportunity for increased spread of non-native species could be detectable but temporary and localized and could not displace native species populations and distributions.  | Impacts on native vegetation could be measureable but limited to local and adjacent areas. Occasional disturbance to individual plants could be expected. These disturbances could affect local populations negatively, but could not be expected to affect regional population stability. Some impacts might occur in key habitats, but sufficient local habitat could retain functional to maintain the viability of the species both locally and throughout its range.  
               Opportunity for increased spread of non-native species could be detectable and limited to local and adjacent areas, but could only result in temporary changes to native species population and distributions.  | Impacts on native vegetation could be measurable and wide-spread. Frequent disturbances of individual plants could be expected, with negative impacts to both local and regional population levels. These disturbances could negatively affect range-wide population stability. Some impacts might occur in key habitats, and habitat impacts could negatively affect the viability of the species both locally and throughout its range.  
               Actions could result in the wide-spread increase of non-native species resulting in broad and permanent changes to native species populations and distributions.  |
| Living Coastal and Marine Resources:  
Wildlife Species (including birds) | Short-term: Lasting up to two breeding seasons, depending on length of breeding season.  
Long-term: Lasting more than two breeding seasons.  | Impacts to native species, their habitats, or the natural processes sustaining them could be detectable, but localized and could not measurably alter natural conditions. Infrequent responses to disturbance by some individuals could be expected, but without interference to feeding, reproduction, resting, migrating, or other factors affecting local population levels. Some impacts might occur in  | Impacts on native species, their habitats, or the natural processes sustaining them could be measurable but limited to local and adjacent areas. Occasional responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, resting, migrating, or other factors affecting local population levels. Some impacts might occur in  | Impacts on native species, their habitats, or the natural processes sustaining them could be detectable, and wide-spread. Frequent responses to disturbance by some individuals could be expected, with negative impacts to feeding, reproduction, migrating, or other factors resulting in a decrease in both local and range-wide population levels and habitat type. Impacts could occur during critical periods of reproduction or in key habitats and  |
<table>
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<tr>
<th>RESOURCE AREA</th>
<th>IMPACT DURATION</th>
<th>MINOR</th>
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</table>
| **Living Coastal and Marine Resources:** Marine and Estuarine Fauna, (fish, shellfish benthic organisms) | **Short-term:** Lasting up to two spawning seasons, depending on length of season.  
**Long-term:** Lasting more than two spawning seasons. | Impacts could be detectable and localized but small. Disturbance of individual species could occur; however, there could be no change in the diversity or local populations of marine and estuarine species. Any disturbance could not interfere with key behaviors such feeding and spawning. There could be no restriction of movements daily or seasonally.  
Opportunity for increased spread of non-native species could be detectable but temporary and localized and could not displace native species populations and distributions. | key habitats. However, sufficient population numbers or habitat could retain function to maintain the viability of the species both locally and throughout its range.  
Opportunity for increased spread of non-native species could be detectable and limited to local and adjacent areas, but could only result in temporary changes to native species population and distributions. | could result in direct mortality or loss of habitat that might affect the viability of a species. Local population numbers, population structure, and other demographic factors might experience large changes or declines.  
Actions could result in the wide-spread increase of non-native species resulting in broad and permanent changes to native species populations and distributions. |
| **Living Coastal and Marine Resources:** Protected Species | **Short-term:** Lasting up to one breeding/growing season. | Impacts on protected species, their habitats, or the natural processes sustaining them could be | Impacts on protected species, their habitats, or the natural processes sustaining them could be detectable | Impacts on protected species, their habitats, or the natural processes sustaining them could be detectable, wide-spread, and |
## Impact Intensity Definitions

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Impact Duration</th>
<th>Minor</th>
<th>Moderate</th>
<th>Major</th>
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<tbody>
<tr>
<td><strong>Resource Area</strong></td>
<td><strong>Impact Duration</strong></td>
<td><strong>Minor</strong></td>
<td><strong>Moderate</strong></td>
<td><strong>Major</strong></td>
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<tr>
<td>Long-term: Lasting more than one breeding/growing season.</td>
<td>detectable, but small, localized, and could not measurably alter natural conditions. Impacts could likely result in a “may affect, not likely to adversely affect” determination for at least one listed species.</td>
<td>and some alteration in the numbers of protected species, or occasional responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, resting, migrating, or other factors affecting local and adjacent population levels. Impacts could occur in key habitats, but sufficient population numbers or habitat could remain functional to maintain the viability of the species both locally and throughout its range. Some disturbance to individuals or impacts to potential or designated critical habitat could occur. Impacts could likely result in a “may affect, likely to adversely affect” determination for at least one listed species.</td>
<td>permanent. Substantial impacts to the population numbers of protected species, or interference with their survival, growth, or reproduction could be expected. There could be impacts to key habitat, resulting in substantial reductions in species numbers. Results in an “Is likely to jeopardize proposed or listed species / adversely modify proposed or designated critical habitat (impairment)” determination for at least one listed species.</td>
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<tr>
<td><strong>Socioeconomics and Environmental Justice</strong></td>
<td><strong>Short-term: During construction period.</strong></td>
<td>A few individuals, groups, businesses, properties or institutions could be impacted. Impacts could be small and localized. These impacts are not expected to substantively alter social and/or economic conditions. Actions could not disproportionately affect minority populations and low-income populations.</td>
<td>Many individuals, groups, businesses, properties or institutions could be impacted. Impacts could be readily apparent and detectable in local and adjacent areas and could have a noticeable effect on social and/or economic conditions. Actions could disproportionately affect minority populations and low-income populations. However, the impact could be temporary and localized.</td>
<td>A large number of individuals, groups, businesses, properties or institutions could be impacted. Impacts could be readily detectable and observed, extend over a wide-spread area, and could have a substantial influence on social and/or economic conditions. Actions could disproportionately affect minority populations and low-income populations. However, the impact could be permanent and widespread.</td>
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<td>RESOURCE AREA</td>
<td>IMPACT DURATION</td>
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<tr>
<td>Cultural Resources</td>
<td>Short-term: During construction period. Long-term: Over the life of the project or longer.</td>
<td>Adverse impact: The disturbance of a site(s), building, structure or object could be confined to a small area with little, if any, loss of important cultural information potential.</td>
<td>Adverse impact: Disturbance of a site(s), building, structure or object not expected to result in a substantial loss of important cultural information.</td>
<td>Adverse impact: Disturbance of a site(s), building, structure or object could be substantial and may result in the loss of most or all its potential to yield important cultural information.</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Short-term: During construction period. Long-term: Over the life of the project or longer.</td>
<td>The action could affect public services or utilities but the impact could be localized and within operational capacities. There could be negligible increases in local daily traffic volumes resulting in perceived inconvenience to drivers but no actual disruptions to traffic.</td>
<td>The action could affect public services or utilities in local and adjacent areas and the impact could require the acquisition of additional service providers or capacity. Detectable increase in daily traffic volumes (with slightly reduced speed of travel) resulting in slowing down traffic and delays, but no change in level of service (LOS). Short service interruptions (temporary closure for a few hours) to roadway and rail traffic.</td>
<td>The action could affect public services utilities over a wide-spread area resulting in the loss of certain services or necessary utilities. Extensive increase in daily traffic volumes (with reduced speed of travel) resulting in an adverse change in LOS to worsened conditions. Extensive service disruptions (temporary closure of one day or more) to roadways or railroad traffic.</td>
</tr>
<tr>
<td>Land and Marine Management</td>
<td>Short-term: During construction period. Long-term: Over the life of the project or longer.</td>
<td>The action could require a variance, zoning change or amendment to a land use or area comprehensive or management plan, but could not affect overall use and management beyond the local area.</td>
<td>The action could require a variance, zoning change or amendment to a land use or area comprehensive or management plan, and could affect overall land use and management in local and adjacent areas.</td>
<td>The action could cause permanent changes to and conflict with land uses or management plans over a wide-spread area.</td>
</tr>
<tr>
<td>Tourism and Recreational Use</td>
<td>Short-term: During construction period. Long-term: Over the life of the project or longer.</td>
<td>There could be partial developed recreational site closures to protect public safety. The same site capacity and visitor experience could remain unchanged after construction. The impact could be detectable and/or could only affect some recreationalists. Users could likely be aware of the action but changes</td>
<td>There could be complete site closures to protect public safety. However, the sites could be reopened after activities occur. There could be slightly reduced site capacity. The visitor experience could be slightly changed but could still be available. The impact could be readily apparent and/or could affect many recreationalists locally and in adjacent areas.</td>
<td>All developed site capacity could be eliminated because developed facilities could be closed and removed. Visitors could be displaced to facilities over a wide-spread area and visitor experiences could no longer be available in many locations. The impact could affect the most recreationalists over a wide-spread area. Users could be highly aware of the action. Users could choose to pursue activities in</td>
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<td>RESOURCE AREA</td>
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<td>in use could be slight. There could be partial closures to protect public safety. Impacts could be local.</td>
<td>areas. Users could be aware of the action. There could be complete closures to protect public safety. However, the areas could be reopened after activities occur. Some users could choose to pursue activities in other available local or regional areas.</td>
<td>other available regional areas.</td>
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<td>There could be a change in local recreational opportunities; however it could affect relatively few visitors, or could not affect any related recreational activities.</td>
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<tr>
<td>Fisheries and Aquaculture</td>
<td><strong>Short-term</strong>: During construction period.</td>
<td>A few individuals, groups, businesses, properties or institutions could be impacted. Impacts could be small and localized. These impacts are not expected to substantively alter social and/or economic conditions.</td>
<td>Many individuals, groups, businesses, properties or institutions could be impacted. Impacts could be readily apparent and detectable in local and adjacent areas and could have a noticeable effect on social and/or economic conditions.</td>
<td>A large number of individuals, groups, businesses, properties or institutions could be impacted. Impacts could be readily detectable and observed, extend over a wide-spread area, and could have a substantial influence on social and/or economic conditions.</td>
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<td><strong>Long-term</strong>: Over the life of the project or longer.</td>
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<tr>
<td>Marine Transportation</td>
<td><strong>Short-term</strong>: During construction period.</td>
<td>The action could affect public services or utilities but the impact could be localized and within operational capacities. There could be negligible increases in local daily marine traffic volumes resulting in perceived inconvenience to operators but no actual disruptions to transportation.</td>
<td>The action could affect public services or utilities in local and adjacent areas and the impact could require the acquisition of additional service providers or capacity. Detectable increase in daily marine traffic volumes (with slightly reduced speed of travel) resulting in slowing down traffic and delays. Short service interruptions (temporary delays for a few hours).</td>
<td>The action could affect public services utilities over a wide-spread area resulting in the loss of certain services or necessary utilities. Extensive increase in daily marine traffic volumes (with reduced speed of travel) resulting in an extensive service disruptions (temporary closure of one day or more).</td>
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<td><strong>Long-term</strong>: Over the life of the project or longer.</td>
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<td>Aesthetics and Visual Resources</td>
<td><strong>Short-term</strong>: During construction period.</td>
<td>There could be a change in the view shed that was readily apparent but could not attract attention, dominate the view, or detract from current user activities or experiences.</td>
<td>There could be a change in the view shed that was readily apparent and attract attention. Changes could not dominate the viewscape, though they could detract from the current user activities or experiences.</td>
<td>Changes to the characteristic views could dominate and detract from current user activities or experiences.</td>
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<td><strong>Long-term</strong>: Over the life of the project or longer.</td>
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<td>RESOURCE AREA</td>
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<tr>
<td>Public Health and Safety, Including Flood and Shoreline Protection</td>
<td>Short-term: During construction period. Long-term: Over the life of the project or longer.</td>
<td>Actions could not result in 1) soil, groundwater, and/or surface water contamination, 2) exposure of contaminated media to construction workers or transmission line operations personnel, and/or 3) mobilization and migration of contaminants currently in the soil, groundwater, or surface water at levels that could harm the workers or general public. Increased risk of potential hazards (e.g., increase likelihood of storm surge) to visitors, residents, and workers from decreased shoreline integrity could be temporary and localized.</td>
<td>Project construction and operation could result in 1) exposure, mobilization and/or migration of existing contaminated soil, groundwater or surface water to an extent that requires mitigation and/or 2) could introduce detectable levels of contaminants to soil, groundwater and/or surface water in localized areas within the project boundaries such that mitigation/remediation is required to restore the affected area to the preconstruction conditions. Increased risk of potential hazards to visitors, residents, and workers from decreased shoreline integrity could be sufficient to cause a permanent change in use patterns and area avoidance in local and adjacent areas.</td>
<td>Actions could result in soil, groundwater and/or surface water contamination, at levels exceeding federal, state, or local hazardous waste criteria including those established by 40 C.F.R. Part 261; 2) mobilization of contaminants currently in the soil, groundwater or surface water resulting in exposure of humans or other sensitive receptors such as plants and wildlife to contaminant levels that could result in health effects; and 3) result in the presence of contaminated soil, groundwater or surface water within the project area exposing workers and/or the public to contaminated or hazardous materials at levels exceeding those permitted by Federal Occupational Safety and Health Administration (OSHA) in 29 C.F.R. Part 1910. Increased risk of potential hazards to visitors, residents, and workers from decreased shoreline integrity could be substantial and could cause permanent changes in use patterns and area avoidance over a widespread area.</td>
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Appendix E. Statements of Findings Related to DOI Bike and Pedestrian Use Enhancement Project at Gulf Islands National Seashore
STATEMENT OF FINDINGS
FOR
EXECUTIVE ORDER 11900 (PROTECTION OF WETLANDS)

Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore: Project Description; PMIS 176842

Recommended:

Superintendent, Gulf Island National Seashore

Certification of Technical Adequacy and Service-wide Consistency

Chief, Water Resources Division

Approved:

Director, Southeast Region
Wetlands Statement of Findings

INTRODUCTION

Much of the vegetation between The Gulf of Mexico and the uplands at Gulf Islands National Seashore is considered tidal marsh. According to NPS Director’s Order 77-1, the wetlands procedural manual, the National Park Service adheres to the Cowardin et al. 1979 wetlands classification scheme. In the Mississippi District, wetlands are now found in areas of Davis Bayou that are dammed or blocked by roadways and culverts, resulting in the unnatural ponding and retention of water. The National Park Service adheres to a “no net loss” of wetlands policy, as well as other federal and agency policies. This statement of findings has been prepared in accordance with Executive Order 11990 (Protection of Wetlands) and NPS Director’s Order #77-1.

PROPOSED ACTION

The proposed Bike and Pedestrian Use Enhancements project involves improving the experience of bicyclists and pedestrians on Park Road and Robert McGhee Road in the Davis Bayou Area of Gulf Islands National Seashore (Figure 7-3 of Chapter 7). Park Road and Robert McGhee Road are both two-lane roads with no shoulders. Park Road was constructed over 30 years ago to serve as the primary access to the William M. Colmer Visitor Center. In the past 20 years, approximately 10,000 additional residents have moved into Ocean Springs. As development has increased, neighboring residents have increasingly driven through the Davis Bayou Area as a shortcut to other destinations. Park Road offers an overpass over the railroad line that motorists use to avoid temporary blockages by passing trains. This road also provides a shorter route to many residences.

Robert McGhee Road (Route 016), previously known as Hanley Road, provides access to the Davis Bayou campground and public use boat dock. Robert McGhee Road also connects to a bicycle trail route that extends to Halstead Road, located outside of the park. A portion of the Live Oak Bicycle Trail, a 15.5-mile route within the city of Ocean Springs, also traverses through the Davis Bayou Area along Robert McGhee Road.

Members of the public use these roads as walking, jogging, bicycling, and motor vehicle traffic routes. Motorists are known to drive excessive speeds that place non-motorized visitors at risk. The simultaneous use of the roads by all user groups results in a high probability for accidents, visitor conflicts, and potentially unsafe conditions for pedestrians, bicyclists, and motorists. Pedestrians and bicyclists using the road corridors within the Davis Bayou Area have limited space to maneuver to avoid approaching motorists, as there is little room beyond the edge of the road to traverse. Additionally, wetland areas adjacent to the roadway minimize the extent to which pedestrians and bicyclists can negotiate off-road to avoid collisions with motorists. Motorized traffic also poses risks to park wildlife. High speeds of the motor vehicles increases the number of wildlife collisions on Park Road and Robert McGhee Road.
**Preferred Alternative**

The exact project schedule for the Preferred Alternative (Alternative B in the EA) is currently unknown. Construction is expected to begin in fall of 2016 and continue into spring 2017. Only the 2.17-mile Park Road portion of this project is being funded as this Phase IV early restoration project. The 0.82-mile portion on McGhee Road will be funded – and constructed – separately, but is included here and in the Environmental Assessment as a “connected action.”

The new road configuration would widen the existing roadway from 22 foot (ft) to up to 36-ft paved surface that includes two 11-ft motor vehicle lanes flanked by 2-ft buffers and 5-ft multiple-use lanes (as depicted in the diagram below). There would also be 4-ft non-paved shoulders flanking the multiple use lanes. Beyond the non-paved shoulders, construction would also include fill in areas, plus 5 additional feet of clearing (as depicted in the diagram below). Retaining walls could also be constructed in areas where the road is elevated higher than the surrounding landforms.

The study corridor for this project includes 50 feet from the edge of the paved surface along Park Road and Robert McGhee Road. Therefore, the total width of the study corridor is 122-ft wide.

Under this alternative, project construction activities could include:

- excavating, grading, filling, and overlaying asphalt to widen the existing paved surface from 22-ft up to 36-ft paved surface with additional 4 ft non-paved shoulders, with appropriate striping;
- ground disturbance beyond the existing asphalt and up to 14 additional feet of asphalt proposed, 8 feet of non-paved shoulders, plus 5 feet from the toe of slopes for construction and heavy equipment maneuvering, thus widening the existing road corridors;
- placing and compacting fill adjacent to roadway including wetland areas;
- installing two traffic-calming medians (e.g., 10-ft wide ellipses) within the first mile of Park Road, similar to the entrance median;
- installing retaining walls along the road in areas where the road is elevated higher than the surrounding land forms;
- installing new or extending several existing culverts;
- removing woody vegetation and mature trees;
- planting native grasses on non-paved shoulders and grasses/trees on bare slopes or in new medians;
- constructing replacement boardwalks over portions of Stark Bayou on Robert McGhee Road, using cantilevers and pilings, with clearance for under-boardwalk wildlife crossings, or replacing the boardwalk with fill for the multiple use lane;
• replacing existing culvert bridge on Park Road over East Stark Bayou with a larger bottomless box culvert or small bridge, with restoration of water flow of wetlands on both sides of the road at culvert location, and possibly eliminating the existing cantilevered boardwalk on the west side of the road;
• conducting wetlands mitigation activities, possibly consisting of prescribed burns (NPS 2009);
• avoiding most existing utilities and possible relocating some existing utilities, where needed, (e.g., light poles, cable and phone lines, water hydrants, buried electrical lines and transformers);
• relocating/replacing road signs;
• relocating/replacing guardrails to meet current standards;
• installing park entrance sign at VFW Road;
• relocating park entrance sign at U.S. Route 90;
• Equipment likely to be used includes: track hoes, back hoes, graders, dump trucks, compactors, asphalt pavers, and road striping equipment;
• One lane will likely remain open during the project implementation except for occasional brief closures of both lanes as needed.

Other Alternatives Considered

Under the No-Action Alternative (Alternative A in the EA), the National Park Service would continue to use and maintain the existing configuration (i.e., two 11-foot [ft] one-way lanes with no paved shoulder) of Park Road and Robert McGhee Road within the Davis Bayou Area of the park. There would be no changes to NPS maintenance, enforcement, and operating activities and no anticipated changes to traffic levels or community and visitor use. Alternative A represents a continuation of the existing condition and provides a baseline for evaluating impacts of the action alternatives.

Under Alternative C of the associated Environmental Assessment, the existing configuration of Park Road and Robert McGhee Road would remain at the current width. A gate would be installed at the intersection of Knapp and VFW Roads. During times of high recreational use on Park Road, VFW Road would be closed to motorists. Proposed closure times would be from 4pm-7pm Monday-Friday and 8am-12pm Saturday. This alternative would substantially reduce the number of motor vehicles present on the mile of Park Road between U.S. Route 90 and VFW Road during high recreational usage times. The gate would permit emergency vehicles to pass through at all hours. There would be no change to the access point off of U.S. Route 90. A sign would be posted at the U.S. Route 90 entrance and Government Street / Knapp Road Intersection indicating timed closures of VFW Road.

Neither the No Action Alternative nor Alternative C would solve the safety and visitor experience concerns as effectively as the Preferred Alternative. Under the No Action Alternative, the existing safety concerns along Park Road and Robert McGhee Road would remain. Under Alternative C, the pedestrians, bicyclists, and motorists would still share the same space on Park Road and Robert McGhee Road. The number of intersections between user groups would be reduced under this alternative, but the interactions would still occur. Under the Preferred Alternative, pedestrians and bicyclist would be
separated from the motor vehicle lanes, creating a safer and more visitor-friendly experience in the Davis Bayou Area.

**BRIEF SITE DESCRIPTION**

Gulf Island National Seashore encompasses barrier islands and coastal mainland in Mississippi and Florida and consists of 12 separate units stretching along 160 miles from Cat Island in Mississippi to the eastern end of Santa Rosa Island in Florida. The Davis Bayou Area of Gulf Islands National Seashore is located in Ocean Springs, Jackson County, Mississippi (see Figure 7-1 of the EA).

**WETLANDS DELINEATION AND IMPACTS**

In December 2013, wetlands scientists with the assistance of personnel from the Gulf Islands National Seashore Science and Resources Stewardship Division and the Southeast Regional Office conducted field delineations of wetland features within a 50-ft buffer of the proposed project area (Figure 1). Due to concerns of some NPS wetlands not being included in the original delineation in December 2013, another delineation occurred in March 2015 to complete the delineation. The wetlands delineation was conducted in accordance with the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory 1987), Regional Supplement to the U.S. Corps of Engineers Wetlands Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0), and the National Park Service Procedural Manual #77-1: Wetland Protection (National Park Service, 2012).

Wetland boundaries were determined by evaluating the presence or absence of wetland indicators at two or more “observation points” (OP). The boundary was mapped between an OP evaluated as an upland location and an OP evaluated as a wetland. Delineated wetlands were identified using the Cowardin classification system (Cowardin et al. 1979). Under this classification, the wetlands present in the Davis Bayou Area were placed into estuarine (non-oceanic wetlands influenced by tidal flows) emergent, palustrine (fresh water wetland systems) emergent, palustrine scrub-shrub, and palustrine forested.

The field delineation efforts mapped 8.5 acres of wetlands within the 50-ft of the existing Park Road and Robert McGhee Road (i.e., the 122-ft study corridor). Of these 8.5 acres mapped, 4 acres were delineated as potentially having jurisdiction by the U.S. Army Corps of Engineers (Figure 2). Table 1 depicts the amount of wetlands delineated in the study corridor by Cowardin classification.

<table>
<thead>
<tr>
<th>WETLAND CLASSIFICATION</th>
<th>AREA IN 122-FT STUDY CORRIDOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estuarine Emergent/Tidal Marsh (E2EM1)</td>
<td>1.9 acres</td>
</tr>
<tr>
<td>Palustrine Emergent (PEM1)</td>
<td>0.4 acres</td>
</tr>
<tr>
<td>Palustrine Scrub-Shrub (PSS1)</td>
<td>0.1 acres</td>
</tr>
<tr>
<td>Palustrine Forested (PFO1 &amp; PFO4)</td>
<td>6.1 acres</td>
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</table>
The construction of multiple use lanes would adversely affect wetlands adjacent to the proposed project area in Davis Bayou. Impacts are expected to be minor due to the small size of the project footprint in relation to the amount of surrounding wetlands and the mitigation measures that would be in place. The wetlands identified in this study are not fully contained within the corridor. The boundaries of the wetlands extend outside the 122-ft study corridor. The areas that extend outside the study corridor are similar in biological and physical characteristics as the areas delineated in the study corridor. Therefore, tidal marsh is present beyond the study corridor where estuarine emergent wetlands were identified and wet pine flatwoods are present beyond the study corridor where palustrine forested wetlands were identified. The Davis Bayou Area is estimated to have approximately 144 acres of wetlands and 120 acres of bayou (NPS 2000).

Wetland habitat types delineated include tidal marshes (salt and brackish) located along tidal bayous, bayhead swamps that constitute the upper reaches of small drainage systems, wet pine savannas located within flat, poorly drained sites, and transitional wet forest located on the sloping wet soil areas between tidal marsh and adjacent upland areas. The acreage of each of these types of wetland found in the Davis Bayou Area is presented in Table 2.

### Table 2. Acreage of Wetland Types present in the Davis Bayou Area.

<table>
<thead>
<tr>
<th>WETLAND TYPE</th>
<th>AMOUNT IN DAVIS BAYOU AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tidal Marsh</td>
<td>52 acres</td>
</tr>
<tr>
<td>Bayhead Swamp (PFO1)</td>
<td>20 acres</td>
</tr>
<tr>
<td>Wet Pine Savanna (PFO4)</td>
<td>74 acres</td>
</tr>
<tr>
<td>Transitional Wet Forest (PFO1)</td>
<td>18 acres</td>
</tr>
</tbody>
</table>

*Source: NPS 2000*

**Tidal Salt Marshes**

The salt marsh community (E2EM1) in the Davis Bayou Area is comprised of the three arms of Davis Bayou. Within the study corridor, the tidal salt marshes are East Stark Bayou crossed by Park Road, and Stark Bayou crossed by Robert McGhee Road. These estuarine emergent wetlands are composed of wet and salt tolerant grasses and sedges growing along the fringe of intertidal flats that are exposed to the ebb and flow of the daily fluctuating ocean tides. This community occurs in relatively protected niches and drainage basins and creates a transition from open water to the emerging land. Because this vegetation community must tolerate daily flooding and saline conditions, relatively few species grow in this environment, and the subtypes or zones within this community are often composed of nearly pure stands of a single species (NPS 2014). 52 acres of tidal marsh is present in the Davis Bayou Area (NPS 2000).

**Bayhead Swamp**

Bayhead swamps (PFO1 & PFO4) occur on mucky silt loams within the Davis Bayou Area. These areas are forested wetlands found at or near the heads of smaller tributaries of large drainage basins or as the...
main part of smaller or local drainage systems. These wetlands drain quickly following rains. Commonly occurring trees include sweet bay magnolia, swamp black gum (*Nyssa biflora*), red bay (*Persea palustris*), red maple (*Acer rubrum*), slash pine (*Pinus elliottii*), and sweetgum (*Liquidambar styraciflua*). Common shrubs include wax myrtle, large gallberry (*Ilex coriacea*), and swamp titi. The ground or herb layer commonly consists of cinnamon fern (*Osmunda cinnamomea*), royal fern, netted chain fern (*Woodwardia areolata*), lizard’s tail (*Saururus cernuus*), sphagnum moss (*Sphagnum* spp.), with occasional grasses and sedges. This habitat typically drains almost completely after rain events. Fire has been excluded as a management approach in these areas for approximately 80 years. Fire is not an apparent controlling factor in this habitat type, occurring only in dry conditions. Soils are hydric, composed primarily of sand with varying smaller amounts of silt and clay (NPS 2014).

**Wet Pine Savanna**

Wet pine savannas are open grasslands with scattered pines that occur on poorly drained, flat terraces of the lower coastal plain region of the southeast. This habitat belongs to a broad group of pine-dominated forests referred to as “flatwoods” that include pine flatwoods, southern mixed hardwood forest, and longleaf pine-turkey oak forest. In the study corridor within the Davis Bayou Area, this habitat can be found north of Park Road between VFW Road and Gollott Avenue. As with all flatwood habitat types, longleaf pine is the dominant tree, and a periodic fire (three- to five-year cycle) helps to maintain this and numerous other fire-adapted species. Trees are typically widely spaced or absent in the wettest sites. In absence of fire, slash pine may become more dominant and, along with shrubs, create a dense canopy that limits understory vegetation. Although large individual slash pines can survive “cool” ground fires, this species does not have a fire resistant “grass” stage like the longleaf pine. Under natural conditions of periodic fire, longleaf pine is the only common tree species that thrives. In the absence or suppression of fire, slash pine, red maple, sweet bay magnolia, and red bay may become more common, as well as shrubs like common gallberry (*Ilex glabra*), large gallberry, yaupon, wax myrtle, and swamp titi (NPS 2014).

**Transitional Wet Forest**

Transitional wet forests occupy a zone of transition from one habitat type to another. In the case of Davis Bayou, this community occupies the wet soil slopes between upland ridges and Davis Bayou intertidal areas. In the study corridor these areas are palustrine wetlands found along the perimeter of the estuarine emergent wetlands at the Robert McGhee Road crossing of Davis Bayou. This habitat designation was recognized to account for the wet soil areas delineated up slope of the adjacent tidal marshes that were clearly not affected by the normal tidal action. Groundwater seeping from the upland ridges is the apparent source of water responsible for the wet soil conditions. Although similar to bayhead swamps in general characteristics, this habitat type can also include vegetation found in the adjacent mixed hardwood forest. The effect of fire in this habitat is unknown. Although similar to bayhead swamps in vegetation and soil characteristics, the upland proximity to fire-susceptible southern mixed hardwood forest may expose them to periodic fire. As with bayhead swamps, these habitats may support fire only under dry conditions (NPS 2014).

Direct loss of functionality would occur to those wetlands where fill would be added for construction of the new multiple use lanes. The area of wetlands impacted could be up to 8.5 acres (Table 1). Long-
term, minor, adverse direct impacts are expected to fish and wildlife due to the permanent loss of habitat from removal of vegetation. The ability for these wetlands to retain stormwater and recharge ground water would be reduced. Fishing does occur near the culverts under Park Road at East Stark Bayou and under Robert McGhee Road at Stark Bayou. Short-term minor impacts would occur to this recreational opportunity during construction. The impacts described above to the biological, hydrologic, and recreation values of the wetlands would be minor. Approximately 155 acres of wetlands with similar functionality would still be present at the Davis Bayou Area providing habitat for displace wildlife, providing stormwater storage and ground water recharge, and recreational opportunities.

Implementation of the Preferred Alternative is not expected to have adverse impacts to chemical geomorphological, cultural, or aesthetic characteristics of the wetlands found in the Davis Bayou Area.

For the in-water portion of this project, the proposed discharge of dredged or fill material into waters of the United States, including wetlands, or work affecting navigable waters associated with this project will continue to be coordinated with the USACE pursuant to the Clean Water Act Section 404 and Rivers and Harbors Act (CWA/RHA). The Mobile Corps District was contacted in 2014 for a preliminary discussion of the permitting process. Continued coordination with USACE and final authorization pursuant to CWA/RHA will be completed prior to project implementation once final design is completed.

PRE-JURISDICTIONAL DETERMINATIONS

Clean Water Act (CWA) jurisdiction was applied over all areas within the 122 ft study corridor. Certain wetlands within the study corridor are in accordance with Joint EPA and USACE Guidance: Clean Water Act Jurisdiction Following the U. S. Supreme Court’s Decision in Rapanos v. United States and Carabell v. United States (EPA and USACE 2007). A summary of the joint Environmental Protection Agency and U.S. Army Corps of Engineers guidance is included below:

- CWA jurisdiction is always applied over waters that are (1) traditional navigable waters; (2) wetlands adjacent to traditional navigable waters; (3) non-navigable tributaries of traditional navigable waters that are perennial streams with permanent or seasonal flows; or (4) wetlands that directly abut such tributaries.

- CWA jurisdiction is applied on a case-by-case basis evaluating if a significant nexus exists with a traditional navigable water for waters that are (1) intermittent non-navigable tributaries; (2) intermittently flooded wetlands adjacent to intermittent tributaries; or (3) wetlands adjacent to but do not directly abut a perennial non-navigable tributary.

- CWA jurisdiction is not applicable over the following waters: (1) swales or erosional features, such as small washes characterized by low volume, infrequent, or short duration flow; or (2) ditches, including roadside ditches excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

Hydrological and ecological factors that may establish a significant nexus to navigable waters (thereby establishing CWA jurisdiction) include the following: (1) volume, duration, and frequency of flow; (2) proximity to a traditional navigable water and watershed size; (3) average annual rainfall; (4) potential of tributaries to carry flood waters to navigable waters or to trap and filter pollutants or flood waters; and, (5) maintenance of water quality and aquatic habitat in traditional navigable waters. Approximately
4 acres of the 8.5 acres of the wetlands located in study corridor are likely jurisdictional under Section 404 of the Clean Water Act. These wetlands either have a tidal connection with Davis Bayou or are wetlands abut tributaries described as non-navigable tributaries of traditional navigable waters that are perennial streams with permanent or seasonal flows. This connectivity establishes the wetlands as adjacent to a traditional navigable water—one of the criteria for establishing a wetland as jurisdictional under Section 404 of the Clean Water Act.

Where Robert McGhee Road crosses Davis Bayou and Park Road crosses East Davis Bayou, 1.9 acres of estuarine emergent wetlands have a tidal connection with Davis Bayou. Another, approximate 2.1 acres of potentially jurisdictional wetlands were identified in the study corridor comprising of 0.4 acre of palustrine emergent wetland, 0.1 acre of palustrine scrub-shrub wetland, and 1.7 acres of palustrine forested wetland (Figure 1). Wetlands scientists identified 4.4 acres of palustrine wetland that do not meet the requirements (i.e., hydrological requirement) for being classified as Section 404 jurisdictional wetlands. However, these wetlands are still considered special ecological features that meet the definition of wetlands used by the Department of Interior and the National Park Service (Figure 2).

**FUNCTIONAL ANALYSIS**

The CWA Section 404 program requires that adverse impacts to wetlands (determined to be Waters of the U.S.) be avoided, minimized, or compensated for through mitigation as a condition for issuance of a Section 404 permit. Compensatory mitigation is determined in part by functional impairment of a wetland. According to U.S. Army Corps of Engineers and Environmental Protection Agency, the objective of compensatory mitigation is to provide, at a minimum, full replacement of wetland value (USACE and EPA 1993). Replacement of value requires replacement of underlying wetland functions. In the mitigation section provided below, the replacement of functional values has been discussed to compensate for any loss of wetland functionality. Currently, no design is available to predict an accurate acreage of impacts. Therefore, a worst-case scenario has been assumed resulting in up to 6.6 acres of palustrine wetlands that could be impacted and up to 0.65 acres (0.23 along Park Road and 0.42 along Robert McGhee Road) of estuarine wetlands that could be impacted.1

A modified Wetland Evaluation Technique (WET) method was used to assess functional criteria. Under this method, 11 functions and values are assessed. These criteria include: groundwater re-charge or discharge potential, flood flow alteration, sediment stabilization, sediment/toxicant retention, nutrient removal/transformation, production export, wildlife habitat assessment, plant habitat assessment; aquatic habitat assessment, recreation, and uniqueness/heritage values (Adamus et al. 1987, Adamus et al. 1991, USACE 2001). To evaluate functional value using the WET method, not all criteria need to be used (USACE 2001).

1 Although 1.9 acres of estuarine wetlands occurs in the 122-ft-wide study corridor, the actual acreage of the footprint of newly added fill along both sides of Park and McGhee Roads will be 0.65. This is based on the assumption that each filled area extends 20 ft out from the toe of the existing roads (this includes a 2-ft paved buffer, a 5-ft multi-use path, a 4-ft unpaved buffer, and a generous 9-ft horizontal distance to the toe of the new slope).
In order to more effectively and efficiently assess functional value of the wetlands in the study corridor at Davis Bayou, the wetlands have been separated into four groups based on similarities of hydrological connection to larger systems and function. These four groups are depicted in Figure 3-8. The four groups the wetlands were divided into:

**Group 1** – Estuarine emergent wetlands and the palustrine wetlands that abut these estuarine wetlands. These wetlands would likely be considered Section 404 jurisdictional wetlands and are found adjacent to the road crossings of the bayous.

**Group 2** – Wetlands associated with the 1981 construction of Park Road. The hydrology of these wetlands have been affected by using the soil in this area as borrow pits to construct the bridges on Park Road that cross Pabst Road and Government Street. These wetlands palustrine emergent and palustrine forested wetlands located adjacent to Park Road near the intersection of Highway 90.

**Group 3** – Small palustrine forested wetlands created by the drainages that flow under Park Road and Robert McGhee Road. These wetlands are created, in part, by the depressional areas around culverts that cross under the road and would likely be considered Section 404 jurisdictional wetlands.

**Group 4** – Palustrine forested wetlands are considered special ecological features that meet the definition of wetlands used by the Department of Interior and the National Park Service.

For the purposes of the wetland delineation and assessment performed on wetlands in the Davis Bayou Area of Gulf Islands National Seashore, some of the criteria considered in the WET method were grouped into larger categories to assess functional values. For instance, wildlife habitat assessment, plant habitat assessment, and aquatic habitat assessment criteria were grouped into a “natural communities functional values” category based on the quality of habitat provided. Similarly, groundwater recharge potential, groundwater discharge, sediment stabilization, sediment/toxicant retention potential, and nutrient removal/transformation potential were grouped into a “water quality/hydrological functional values” category. The qualitative functional assessment of the wetlands identified in this report is provided in Table 3 and Table 4.

For the natural communities functional values category, the functions were rated as “high” if the wetland supported diverse habitats with high vegetation diversity and could support foraging or reproductive habitat. A “medium” rating was applied for wetlands with more than one habitat with some vegetation diversity, and a “low” was applied to wetlands with a monotypic vegetation stand and low habitat diversity.

For the water quality/hydrological functional values category, a “high rating” was applied when the wetland appeared to undisturbed hydrological functions and supported features that are associated with maintaining or enhancing water quality and bank stabilization functions. A “medium” rating was applied when the functions appeared to be altered, and a “low” rating was applied when the functions were absent or highly degraded.
JUSTIFICATION FOR THE USE OF WETLANDS

The proposed Bike and Pedestrian Use Enhancements project involves improving the experience of bicyclists and pedestrians on Park Road and Robert McGhee Road in the Davis Bayou Area of Gulf Islands National Seashore. The existing road transects the wetlands mentioned in this document already and cannot be re-routed without extreme expense and would still have a footprint within these wetlands. The preferred alternative utilizes the existing road to improve safety for bicyclists and pedestrians, with the addition of additional space alongside the existing roadway.

The proposed project is needed for the following reasons:

- The use of Park Road and Robert McGhee Road by pedestrians, bicyclists, and motorists results in visitor conflicts and potential unsafe operations for all three user groups;
- The preferred alternative would provide a separate, safer area for pedestrians and bicyclists to use that would reduce the interactions with motor vehicles. This alternative is expected to improve safety and visitor experience of pedestrians, bicyclists, and motorists;
- Traffic on Park Road has increased by approximately 500 cars a day since the 2010 installation of a traffic light at the US Route 90 intersection raising safety concerns;
- The road corridor does not have a shoulder and therefore, there is limited space for pedestrians and bicyclists to maneuver to avoid approaching motorists;
- Adjacent wetlands minimize the extent to which pedestrians and bicyclists are able to negotiate off road attempts to avoid collisions with motorists;
- Future development, including on private properties whose only road access is via Park Road, is expected to increase the traffic on Park Road;
- Wildlife collisions on Park and McGhee Road occur frequently, and the reduction in speed of motor vehicles would reduce these collisions;

MITIGATION

The design of the Preferred Alternative is unknown at the time of production of this statement of finding. However, wetland avoidance has been taken into consideration to extent practicable in the NEPA process. During the alternatives development process, an alternative was proposed to construct a multiple-use trail completely separate from the Park Road and Robert McGhee Roads. Due to the added impacts this alternative would have had to wetlands, it was not considered for detailed analysis in the environmental assessment. By constructing the multiple-use lanes adjacent to the existing roadways, the NPS will be avoiding wetlands by using areas that have been previously filled to the extent possible. Wetland avoidance will also be taken into consideration during the design of the multiple-use lanes.

The U.S. Army Corps of Engineers has verified through email correspondence with the Park, that mitigation would likely be necessary under the preferred alternative. Since the final design has not been completed for the project, the exact extent of mitigation required is unknown. The mitigation plan will follow the “Required Components of a Mitigation Plan” (33 CFR (c)(1)(i)).
There are two types of wetlands that are expected to be impacted and require mitigation:

1) **Wet Pine Savannah**: The extent of impacts to palustrine wetlands is unknown without the design of the proposed action, but is expected to be 6.6 acres or less. It is expected that fill would be added to these wetlands. The mitigation plan being proposed is expected to include prescribed burns of wetland areas outside the study corridor at Davis Bayou to mitigate for loss of function to palustrine wetlands (Figure 9). Areas proposed as mitigation areas have some of the only pitcher plants, including parrot beak and sundew, within the Davis Bayou Area. Many of the wetland areas at Davis Bayou have extremely thick understory of loblolly pine saplings, sweetgum saplings, swamp titi, green briar, wax myrtle, and red maple. This understory limits the regeneration of the longleaf pine, and limits the availability of longleaf pine savannas that were once prevalent in the area. Prescribed burns will help to remove the thick understory, promote ecosystem sustainability, allow for longleaf pine regeneration, allow pitcher plants to thrive, and improve the biological functional value of the existing wetlands.

Mitigation is proposed to occur in the area north of Park Road between Robert McGhee Road and VFW Road. This area consists of 60 acres, of which 29 acres was delineated as wetland in 2000 (NPS 2000) (Figure 9). Therefore, the approximate mitigation ratio based on a worst case scenario would be 2:9. Once the construction schedule is finalized, a burn plan will be designed. It is expected that the prescribed burn would occur during late winter or early spring. The biological habitat in the area would benefit from the prescribed burn immediately due to the removal of understory. Germination of certain plant species (e.g., long-leaf pine) would be expected to occur during the following years as natural succession is restored. No monitoring or maintenance is currently planned. Funding for this mitigation would be provided as part of the costs associated with the proposed action.

2) **Tidal Marsh**: The extent of impacts to estuarine wetlands is unknown without the design of the proposed action, but is expected to be 0.65 acres or less. It is expected that fill would be added to tidal wetlands. The mitigation being proposed for these impacts is to improve the hydrologic regime to East Stark Bayou east of Park Road by replacing the existing 3 ft x 3 ft concrete box culvert under Park Road with a 20’-wide bottomless culvert similar to the one currently in place under Robert McGhee Road at Stark Bayou. The existing culvert restricts flow to East Stark Bayou east of Park road. Increasing the size of the culvert under Park Road would improve the hydrologic regime to 4.95 acres (Figure 9) of estuarine emergent wetland. The worst case scenario for the ratio of impacts to mitigation is approximately 1:8. Improvement of the hydrologic regime of the wetland would be seen immediately after the culvert has been replaced – sometime around spring, 2017. However, improvements to the function of providing biological habitat would be gradual with changes seen over the following 2-5 years.

Maintenance to the culvert would be provided as regular road maintenance. Monitoring parameters have not been determined yet but could include water level elevations along both sides of the road during tidal changes before and after the project and/or flow measurements at the mouths of the current and future culverts during tidal changes before and after the project. Funding for this mitigation would be provided as part of construction costs associated with the proposed action.
Additionally, best management practices will be implemented during construction to help reduce impacts to wetlands during construction. These Best Management Practices include:

- Buffers between areas of soil disturbance and wetlands or waterways would be planned and maintained;
- Soil erosion best management practices such as sediment traps, erosion check screen filters, and hydro mulch to prevent the entry of sediment into wetlands would be used;
- Any hazardous waste that is generated in the project area would be promptly removed and properly disposed of;
- Equipment would be inspected for leaks of oil, fuels, or hydraulic fluids before and during use to prevent soil and water contamination. Contractors would be required to implement a plan to promptly clean up any leaks or spills from equipment, such as hydraulic fluid, oil, fuel, or antifreeze;
- Onsite fueling and maintenance would be minimized. If these activities could not be avoided, fuels and other fluids would be stored in a restricted/designated area, and fueling and maintenance would be performed in designated areas that are bermed and lined to contain spills. Provisions for the containment of spills and the removal and safe disposal of contaminated materials, including soil, would be required;
- Actions would be taken to minimize effects on site hydrology and fluvial processes, including flow, circulation, water level fluctuations, and sediment transport. Take care to avoid any rutting caused by vehicles or equipment;
- Measures would be employed to prevent or control spills of fuels, lubricants, or other contaminants from entering wetland areas. Action would be consistent with state water quality standards and Clean Water Act Section 401 certification requirements;
- Appropriate erosion and siltation controls would be maintained during construction;
- Fill material would be properly maintained to avoid adverse impacts on aquatic environments.

SUMMARY

The NPS finds that the proposed Bike and Pedestrian Use Enhancements project improving the experience of bicyclists and pedestrians on Park Road and Robert McGhee Road in the Davis Bayou Area of Gulf Islands National Seashore are essential for ensuring the safety of park visitors. The NPS also finds that there are no practicable alternatives to constructing the multiple use lanes. While the proposed action would impact wetlands and wetland function in the 122-ft study corridor, appropriate mitigation would be implemented to compensate for the loss of this function. Initiating the proposed action would require work within jurisdictional waters of the U.S.; therefore, a Department of the Army permit would be required from the U.S. Army Corps of Engineers. The type of permit would be determined in coordination with the regulatory staff of the Corps Regulatory Branch. This project is consistent with the policies and procedures of NPS Director’s Order #77-1 (Protection of Wetlands) and Executive Order 11990.
Literature Cited

Adamus, P.R., E.J. Clairain, R.D. Smith, & R.E. Young

1987 Wetland Evaluation Technique (WET), Volume II: Methodology. Department of the Army, Waterways Experiment Station, Vicksburg, MS. NTIS No. ADA 189968.


Cowardin, L. M., V. Carter, F. C. Golet, & E. T. LaRoe


Environmental Laboratory.


National Park Service (NPS)

2000 Wetland Delineation and Hydrologic/Community Survey of the Davis Bayou Area of Golf Islands National Seashore


U.S. Army Corps of Engineers (USACE)


U.S. Army Corps of Engineers (USACE)


U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE)

1993 Memorandum to the field: Appropriate level of analysis required for evaluating compliance with the section 404(b)(1) guidelines alternatives requirements. Washington, DC.
<table>
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<tr>
<th>Delineated Wetlands</th>
<th>Biological</th>
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<tr>
<td>Group 2</td>
<td>High</td>
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<td>Group 3</td>
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<td>Group 4</td>
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</tr>
</tbody>
</table>
Table 4: Detailed Functional Assessment of the Biological and Hydrological Values of Affected Wetlands

<table>
<thead>
<tr>
<th>Delineated Wetlands</th>
<th>Natural Communities Functional Values</th>
<th>Water Quality / Hydrological Functional Values</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1</strong></td>
<td>Estuarine Emergent Wetlands or associated freshwater bayhead swamps. Habitat for tidal aquatic species, American alligator, fishes, and birds. Shallow areas have emergent vegetation. Open water areas present.</td>
<td>Sediment retention, obstruction of storm surge, shoreline stabilization.</td>
<td>Habitat functions rating: “high” Water quality/hydrological functions rating: “high” Overall rating: “high”</td>
</tr>
<tr>
<td><strong>Group 2</strong></td>
<td>Freshwater shallow lentic habitat for aquatic mammals, amphibians, fishes, and reptiles including the American alligator. Shallow areas have emergent vegetation. Open water areas present.</td>
<td>Sediment retention, water storage and delay (subsurface and surface).</td>
<td>Habitat functions rating: “high” Water quality/hydrological functions rating: “medium” Overall rating: “medium”</td>
</tr>
<tr>
<td><strong>Group 3</strong></td>
<td>Habitat for aquatic reptiles and amphibians, and high plant diversity.</td>
<td>Sediment retention, water storage and delay (subsurface and surface).</td>
<td>Habitat functions rating: “medium” Water quality/hydrological functions rating: “medium” Overall rating: “medium”</td>
</tr>
<tr>
<td><strong>Group 4</strong></td>
<td>High plant diversity. Dense understory in many areas provides habitat for small mammals, mesopredators, and birds.</td>
<td>Minimal water storage and delay (subsurface).</td>
<td>Habitat functions rating: “medium” Water quality/hydrological functions rating: “low” Overall rating: “medium”</td>
</tr>
</tbody>
</table>
Figure 1: Wetlands within the 122-ft Study Corridor
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service

Legend:
- Estuarine Emergent
- Saltmarsh Emergent
- Palustrine Forested
- Palustrine Scrub-Shrub
- NW Wetlands

North

0 500 1,000 2,000 Feet
Figure 2: Section 404 Wetlands and NPS Wetlands within the 122-ft Study Corridor
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service
Figure 3: Wetlands by Functional Group within the 122-ft Study Corridor
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U.S. Department of Interior/ National Park Service

Legend
- Group 1 - Estuarine and Associated Wetlands
- Group 2 - Borrow Pits from Road Construction
- Group 3 - Small Palustrine Wetland at Road Crossings
- Group 4 - Palustrine Forested NPS Wetlands
- 122-ft Study Corridor
- Project Area Boundary
Figure 4: Wetlands by Functional Group within the 122-ft Study Corridor
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service

Legend

- Group 1 - Estuarine and Associated Wetlands
- Group 2 - Borrow Pits from Road Construction
- Group 3 - Small Palustrine Wetland at Road Crossings
- Group 4 - Palustrine Forested NPS Wetlands
- 122-ft Study Corridor
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Figure 5: Wetlands by Functional Group within the 122-ft Study Corridor
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service

Legend
- Group 1 - Estuarine and Associated Wetlands
- Group 2 - Borrow Pits from Road Construction
- Group 3 - Small Palustrine Wetland at Road Crossings
- Group 4 - Palustrine Forested NPS Wetlands
- 122-ft Study Corridor
- Project Area Boundary
Figure 8: Wetlands by Functional Group within the 122-ft Study Corridor
Gulf Islands National Seashore
U.S. Department of Interior/ National Park Service

Legend
- Group 1 - Estuarine and Associated Wetlands
- Group 2 - Borrow Pits from Road Construction
- Group 3 - Small Palustrine Wetland at Road Crossings
- Group 4 - Palustrine Forested NPII Wetlands
- 122-ft Study Corridor
- Project Area Boundary
STATEMENT OF FINDINGS
FOR
EXECUTIVE ORDER 11988 (FLOODPLAIN MANAGEMENT)

Bike and Pedestrian Use Enhancements at Davis Bayou, Mississippi District, Gulf Islands National Seashore: Project Description; PMIS 176842

Recommended:

Superintendent, Gulf Islands National Seashore

Certification of Technical Adequacy and Servicewide Consistency

Chief, Water Resources Division

Approved:

Director, Southeast Region
STATEMENT OF FINDINGS FOR EXECUTIVE ORDER 11988 (FLOODPLAIN MANAGEMENT)

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

INTRODUCTION

Situated in a dynamic coastal environment that includes rising sea levels, Gulf Island National Seashore is proposing a bicyclist and pedestrian use enhancements project which involves reducing the speed of automobiles and the number of interactions between pedestrians/bicyclists on Park Road and Robert McGhee Road in the Davis Bayou Area of Gulf Islands National Seashore.

This Statement of Findings has been prepared in accordance with Executive Order 11988 (Floodplain Management), National Park Service (NPS) Director’s Order #77-2, and Floodplain Management and Procedural Manual #77-2. The Statement of Findings summarizes the floodplain development associated with actions to enhance the use of Park and Robert McGhee Roads by bicyclists and pedestrians within the Davis Bayou Area of the Gulf Island National Seashore. Gulf Island National Seashore and the project area locations are shown on Figure 7-1 in Chapter 7. The Statement of Findings also describes the reasons why encroachment into the floodplain is required to implement the project, the site-specific flood risks involved, and the measures that would be taken to mitigate floodplain impacts.

Proposed Action and Preferred Alternative

The purpose of the project is to improve safety for pedestrians, bicyclists, and motorists along Park Road and Robert McGhee Road within the Davis Bayou Area of the park. This project involves improving road safety along Park Road and Robert McGhee Road in the Davis Bayou Area of Gulf Islands National Seashore, managed by the National Park Service (Figure 7-3). Park Road and Robert McGhee Road are both two-lane roads with no shoulders. Park Road was constructed over 30 years ago to serve as the primary access to the William M. Colmer Visitor Center. In the past 20 years, approximately 10,000 additional residents have moved into Ocean Springs. As development has increased, neighboring residents have increasingly driven through the Davis Bayou Area as a shortcut to other destinations. Park Road offers an overpass over the railroad line that motorist use to avoid temporary blockages by passing trains. This road also provides a shorter route to many residences.

Robert McGhee Road (Route 016), previously known as Hanley Road, provides access to the Davis Bayou campground and public use boat dock. Robert McGhee Road also connects to a multiple-use bicycle-pedestrian trail route that extends to Halstead Road, located outside of the park. A portion of the Live Oak Bicycle Trail, a 15.5-mile route within the city of Ocean Springs, also traverses through the Davis Bayou Area along Robert McGhee Road.

Members of the public use these roads as walking, jogging, bicycling, and motor vehicle traffic routes. Motorists are known to drive excessive speeds that place non-motorized visitors at risk. The simultaneous use of the roads by all user groups results in a high probability for accidents, visitor conflicts, and potentially unsafe conditions for pedestrians, bicyclists, and motorists. Pedestrians and bicyclists using the road corridors within the Davis Bayou Area have limited space to maneuver to avoid approaching motorists, as there is little room beyond the edge of the road to traverse. Additionally, wetland areas adjacent to the roadway minimize the extent to which pedestrians and bicyclists can negotiate off-road to avoid collisions with motorists.
Motorized traffic also poses risks to park wildlife. High speeds of the motor vehicles increases the number of wildlife collisions on Park Road and Robert McGhee Road.

The exact project schedule for the Preferred Alternative is currently unknown. Construction is expected to begin in fall of 2016 and continue into spring 2017. Only the 2.17-mile Park Road portion of this project is being funded as this Phase IV early restoration project. The 0.82-mile portion on McGhee Road will be funded – and constructed – separately, but is included here and in the Environmental Assessment as a “connected action.”

Under this alternative, project construction activities could include:

- excavating, grading, filling, and overlaying asphalt to widen the existing paved surface from 22-ft up to 36-ft paved surface with additional 4 ft non-paved shoulders, with appropriate striping;
- ground disturbance beyond the existing asphalt and up to 14 additional feet of asphalt proposed, 8 feet of non-paved shoulders, plus 5 feet from the toe of slopes for construction and heavy equipment maneuvering, thus widening the existing road corridors;
- placing and compacting fill adjacent to roadway including wetland areas;
- installing two traffic-calming medians (e.g., 10-ft wide ellipses) within the first mile of Park Road, similar to the entrance median;
- installing retaining walls along the road in areas where the road is elevated higher than the surrounding land forms;
- installing new or extending several existing culverts;
- removing woody vegetation and mature trees;
- planting native grasses on non-paved shoulders and grasses/trees on bare slopes or in new medians;
- constructing replacement boardwalks over portions of Stark Bayou on Robert McGhee Road, using cantilevers and pilings, with clearance for under-boardwalk wildlife crossings, or replacing the boardwalk with fill for the multiple use lane.
- replacing existing culvert bridge on Park Road over East Stark Bayou with a larger bottomless box culvert or small bridge, with restoration of water flow of wetlands on both sides of the road at culvert location, and possibly eliminating the existing cantilevered boardwalk on the west side of the road;
- conducting wetlands mitigation activities, possibly consisting of prescribed burns (NPS 2009);
- avoiding most existing utilities and possible relocating some existing utilities, where needed, (e.g., light poles, cable and phone lines, water hydrants, buried electrical lines and transformers);
- relocating/replacing road signs;
- relocating/replacing guardrails to meet current standards;
- installing park entrance sign at VFW Road;
- relocating park entrance sign at U.S. Route 90;
- Equipment likely to be used includes: track hoes, back hoes, graders, dump trucks, compactors, asphalt pavers, and road striping equipment;
- One lane will likely remain open during the project implementation except for occasional brief closures of both lanes as needed.
Brief Site Description

Gulf Island National Seashore encompasses barrier islands and coastal mainland in Mississippi and Florida and consists of 12 separate units stretching along 160 miles from Cat Island in Mississippi to the eastern end of Santa Rosa Island in Florida. The Davis Bayou Area of Gulf Islands National Seashore is located in Ocean Springs, Jackson County, Mississippi (see figure 7-1).

JUSTIFICATION FOR THE USE OF THE FLOODPLAIN

Road safety improvements are needed for the following reasons:

- Traffic on Park Road has increased by approximately 500 cars a day since the 2010 installation of a traffic light at the US Route 90 intersection;
- The road corridor does not have a shoulder and therefore, there is limited space for pedestrians and bicyclists to maneuver to avoid approaching motorists;
- Improving safety along the roads will reduce the number of interactions between automobiles and pedestrians/bicyclists and reduce the number of automobile/wildlife collisions in the Davis Bayou Area.

FLOOD RISK

A Statement of Findings is prepared if the action falls within the defined regulatory floodplain:

- Class I includes the location or construction of administrative, residential, warehouse and maintenance buildings, non-excepted parking lots or other man-made features, which by their nature entice or require individuals to occupy the site, are prone to flood damage, or result in impacts to natural floodplain values. Actions in this class are subject to the floodplain policies and procedures if they lie within the 100-year regulatory floodplain (the Base Floodplain);
- Class II includes “critical actions”—those activities for which even a slight chance of flooding would be too great. Examples of critical actions include schools, hospitals, fuel storage facilities, irreplaceable records, museums, and storage of archeological artifacts. Actions in this class are subject to the floodplain policies and procedures if they lie within the 500-year regulatory floodplain;
- Class III includes all Class I or Class II actions that are located in High Hazard Areas, including coastal high hazard areas and areas subject to flash flooding. Actions in this class are subject to the floodplain policies and procedures if they lie within the Extreme Flood regulatory floodplain.

Portions of the project area are within the mapped 100-year and 500-year floodplains, as shown on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) numbers 28059C0292G, 28059C0293G, and 28059C0294G (FEMA 2009). The Federal Emergency Management Agency defines geographic areas as flood zones according to varying levels of flood risk. Each zone reflects the severity or type of flooding in the area, as depicted on Figure 7-5. The first zone, labeled “AE” on the Federal Emergency Management Agency maps, is within the 100-year floodplain and ranges in elevation from 16-18 ft National Geodetic Vertical Datum of 1988 (NAV88). This zone encompasses mostly the southern portion of the Davis
Bayou Area. The major source of flooding in this area would be flooding from overwash in the bayous. This zone would contain Class I floodplains.

The second zone on the Federal Emergency Management Agency mapping is zone “X (Other Flooded Areas),” designated for areas of 0.2% annual chance flood or areas of 1% annual chance flood with average depths of less than 1 ft or less of drainage areas less than 1 square mile. The major source of flooding in this area would be flooding would also be from the bayous from more severe overwash events. The third zone is also zone “X (Other Areas),” areas determined to be outside the 0.2% annual chance floodplain and less likely to flood than the 100-year floodplain or the Other Flooded Areas. Zone “X (Other Areas)” occurs in the northern portion of the study area just south of the Pasbt Road bridge crossing (Figure 7-5). The final zone, VE (Coastal Flood Zone), extends from offshore to the inland limit of a primary frontal dune along an open coast and any other area and is subject to high velocity wave action from storms. No project activities are proposed in zone VE.

Dynamic and challenging weather conditions are typical for the national seashore. Storms continuously reshape the landscape. The Gulf and Atlantic hurricane season begins on June 1 and continues through November 30 each year, and these dates encompass over 97% of tropical activity (NOAA 2012). The peak season runs from August through October, with 78% of the tropical storm days, 87% of the minor hurricane days, and 96% of the major storms. The number of tropical storms (sustained winds between 39 and 73 mph) occurring each season may vary from 4 to 12.

Flooding in the Davis Bayou Area of Gulf Islands National Seashore can range from minor events from high tides to major flooding from hurricanes and other coastal storms. Heavy precipitation can also flood low elevation areas. As demonstrated by Hurricane Katrina, the area is extremely vulnerable to coastal flood events. In Mississippi, the Katrina storm surge was 25 to 28 ft above normal tide and the surge damage reached several miles inland (NOAA 2012). The Davis Bayou Area of Gulf Islands National Seashore supports a number of natural features that reduce the severity of flooding. For example, coastal wetlands and bayous provide various functions, such as storage and sediment retention and dissipation of energy during flooding events. Wetlands and other depressions also function to store water during overwash or heavy precipitation (see section 7.2.6 on wetlands in this environmental assessment and the Wetland Statement of Findings located in the Appendix).

MITIGATION OF RISK TO PEOPLE AND STRUCTURES

Gulf Island National Seashore has a hurricane and flooding plan that would direct emergency actions and evacuations in the event of flooding. At the appropriate times visitors would be removed from the site and the site would be closed until potentially hazardous conditions subsided.

The road safety improvements would incorporate the use of materials to withstand the temporary flooding that comes from a storm surge whenever possible. In other locations, efforts will also be made to remove or tie down any loose materials that could be blown away by storm force winds. These activities would be easily implemented and most likely successful. Therefore, hazard to life and property from flooding would be reduced. NPS acknowledges the ecosystem services provided by wetlands and their benefits to floodplains and will work to minimize the impacts to them and will focus efforts to remove the least amount of wetland are as possible.
The following mitigation measures would be applied when implementing the proposed action:

- Maintenance of generators, cranes, and any other stationary equipment operated within 150 feet of any natural or wetland area as necessary to prevent leaks and spills from entering the water;
- Development and implementation of spill prevention and control plans to minimize the risk of releasing petroleum and oil products to receiving waters;
- Employment of standard BMPs for construction to reduce erosion;
- Employment of temporary erosion controls prior to any land clearing or land disturbance on the project site, which would be monitored during construction to ensure proper function. Turbidity curtains, hay bales, and erosion mats would be used where appropriate.

SUMMARY

The National Park Service finds that the road safety improvements at Gulf Islands National Seashore are essential for public use and safety, despite the fact that the new locations would be located in flood-prone areas. The National Park Service also finds that in designing the improvements, there are no practicable alternatives for relocating portion of them outside of the floodplain since the existing roads are within the floodplain. However, it has been determined that consideration of a number of prospective mitigation actions would serve to reduce long-term impacts of the construction and operation of the facilities on floodplain resources and functions. This project is consistent with the policies and procedures of NPS Director’s Order 77-2 (Floodplain Management) and Executive Order #11988.
Appendix F: Adopted Environmental Assessment

Expansion of Facilities Supporting Sea Turtle Science and Recovery, Construction of Patrol Cabins and Expansion of Incubation Laboratory, 2011
Expansion of Facilities Supporting Sea Turtle Science and Recovery
Construction of Patrol Cabins and Expansion of Incubation Laboratory

Environmental Assessment
February 2011
Final
Sea Turtle Patrol Cabin Construction

Environmental Assessment

Summary

Padre Island National Seashore proposes to construct two new sea turtle backcountry patrol cabins and to expand the Headquarters Sea Turtle Incubation Facility for supporting the Division of Sea Turtle Science and Recovery. Historically, a total of six bio-techs patrolled the backcountry (down-island), looking for nesting sea turtles. With the success of the program, the total number of down-island patrollers has doubled in size and the number of nests collected and incubated in the headquarters incubation facility has increased to a total of 127 in 2009. One backcountry patrol cabin is currently in place, providing overnight accommodations for six bio-techs and the current incubation facility can accommodate approximately 250 nests. The number of nests has been doubling about every three years and the staff in the incubation facility has grown to 35 people from 24 people in 2007. Because of the growth of the program, new or expanded facilities are necessary. The proposal to decommission the current cabin and replace it with two new cabins would also allow for better distribution of sea turtle patrollers along Padre Island National Seashore’s Gulf of Mexico shoreline.

This environmental assessment evaluates two alternatives: a no-action alternative and an action alternative. The no-action alternative describes the current condition if no new cabins are constructed and the incubation facility is not expanded, while the action alternative addresses the decommissioning of the current cabin and construction of two new cabins and the expansion of the current incubation facility.

This environmental assessment has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet objectives of the proposal, 2) evaluates potential issues and impacts to Padre Island National Seashore’s resources and values, and 3) identifies mitigation measures to lessen the degree or extent of these impacts. Resource topics are included in this document because the resultant impacts may be greater-than-minor include: topography, geology, and soils; visitor use and experience; park operations; and floodplains. All other resource topics were dismissed because the project would result in negligible or minor effects to those resources. No major effects are anticipated as a result of this project. Public scoping was conducted to assist with the development of this document and comments were received, mostly in support of the proposed project.

Public Comment (After the comment period expired a FONSI was issued for this EA.)

If you wish to comment on the environmental assessment, you may post comments online at http://parkplanning.nps.gov/pais or mail comments to:

Superintendent
Padre Island National Seashore
P.O. Box 181300
Corpus Christi, TX 78480

This environmental assessment will be on public review for 30 days. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.
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PURPOSE AND NEED

Introduction

Padre Island National Seashore was established by an act of Congress on September 28, 1962, and is managed by the National Park Service (NPS). The 130,434 acres of the Seashore were set aside as part of the National Park System in order to save and preserve, for purposes of public recreation, benefit, and inspiration, a portion of the diminishing seashore of the United States that remains undeveloped. (Public Law 87-712)

The significance of Padre Island National Seashore (National Seashore) lies in the unique, undeveloped nature of a natural, ever changing barrier island. The park is located along the southern coast of Texas, approximately eight miles south of Corpus Christi, and is bordered by the Laguna Madre and the Gulf of Mexico. The park occupies the central 68 miles of the approximately 113-mile long Padre Island (Figure 1). The Seashore’s landscape changes from broad sandy beaches, to ridges of fore-island dunes, to grassy flats separated by smaller dunes, ephemeral ponds, and wetlands. Back-island dunes and wind tidal flats merge with the waters of the Laguna Madre and define the western portion of the Seashore. The park encompasses tens-of-thousands of acres of pristine wetlands that are important habitat for numerous flora and fauna species. The park is also the most significant nesting beach in the United States for the Kemp’s ridley sea turtle and is a Globally Important Bird Area, which includes over 350 species of birds.

This environmental assessment will examine the environmental impacts associated with the proposal to construct two new sea turtle patrol cabins and to expand the Headquarters sea turtle incubation facility at Padre Island National Seashore. The new patrol cabins would be constructed in the backcountry of the park and would replace the existing patrol cabin. The incubation facility expansion would expand the buildings to the north east of the current building into an area that was occupied by the Law Enforcement and Resource Management buildings that burned down in January of 2005.

Figure 1. Park Vicinity Map.
This environmental assessment was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council on Environmental Quality (CEQ) (40 CFR §1508.9), and the National Park Service Director’s Order (DO)-12 (Conservation Planning, Environmental Impact Analysis, and Decision-Making).

Background

Kemp’s ridley (*Lepidochelys kempii*) is the most critically endangered sea turtle species in the world, nesting primarily in Rancho Nuevo, Mexico. As part of the 1992 U.S. Fish and Wildlife Service (USFWS) recovery plan for the Kemp’s ridley sea turtle, there has been a large effort to re-establish a nesting colony of endangered Kemp’s ridley at the National Seashore. For three decades the NPS at Padre Island National Seashore has participated with this international recovery effort. When the project was initiated, Kemp’s ridley had already been declared the world’s most endangered sea turtle species and was feared that it would go extinct within 5-10 years unless immediate actions were undertaken to try to restore the species. Establishment of a secondary population would help mitigate a single event (e.g., hurricane) that could affect the species within a specific geographic area and safeguard against extinction.

From 1978-1988, 22,507 Kemp’s ridley eggs were shipped from Rancho Nuevo to Padre Island National Seashore to re-establish a nesting colony there, where 55% of the Kemp’s ridley nests documented in the U.S. have been found. Overall, 77.1% of the eggs hatched and the resulting hatchlings were transferred to the National Marine Fisheries Service (NMFS) Laboratory in Galveston, Texas for head-starting (rearing in captivity). A total of 13,513 turtles imprinted to the National Seashore were released into U.S. waters, most after 9-11 months in captivity, and most into the Gulf of Mexico approximately 30 km offshore from the National Seashore and nearby locales. From 1989-2000, NMFS continued to head-start between 178 and 2,000 hatchlings per year, but these were obtained directly from Mexico and it was thought that they would return to Mexico to nest. Overall, nearly 10,500 of these Mexico imprinted head-starts were released, most in Gulf of Mexico waters off Galveston or the National Seashore (Shaver 2006).

To perpetuate nesting of Kemp’s ridley and other sea turtles at Padre Island National Seashore, it is vital to locate and protect nests to ensure maximum hatching success and optimum sex ratios. Monitoring patrols, turtle and nest protection, and data collection have been on-going at the National Seashore. A record 195 Kemp’s ridley nests were found in Texas during 2008, including 93 at Padre Island National Seashore (Shaver 2009). The National Seashore is now the most important nesting beach for Kemp’s ridley turtles in the U.S., with 55% of the nests documented in the U.S. from 1989-2004 found at the park (Shaver 2006). Since Kemp’s ridley nesting is increasing and more head-started turtles are maturing, more record years of nesting are expected in the future.

Because of the Endangered Species Act of 1973 and the approved 1992 U.S. Fish and Wildlife Service Kemp’s Ridley Species Recovery Plan, as well as National Park Service’s policy for proper management of special status species, the National Seashore has the responsibility of detecting and protecting nesting sea turtle females, their nests, and for ensuring safe passage of sea turtle hatchlings to the Gulf of Mexico. The USFWS assigned specific monitoring actions to the National Seashore as part of the Kemp’s Ridley Sea Turtle Recovery Plan (USFWS and NMFS, 1992). Specifically, the Kemp’s Ridley Sea Turtle Recovery Plan lists patrolling and managing Padre Island’s nesting beach as task priorities, with the NPS as the responsible agency.

Currently, the National Seashore’s nesting sea turtle monitoring and nest protection efforts (patrols) stage out of either the park’s Headquarters or an existing cabin located within the backcountry of the National Seashore at the park’s 39-mile mark (Fig. 2). This cabin provides overnight accommodations for sea turtle patrollers, and acts as a staging area for the beginning and ending of each day’s patrols. The cabin acts as a shelter, where park employees may flee to during times of strong developing storms, and it also provides a refuge when a dangerous situation arises along the Gulf of Mexico beach. The cabin provides
a staging area for around-the-clock, 24-hour operations, which includes oversight of a sea turtle egg incubation facility.

With the success of the program, the current facilities at the National Seashore are no longer sufficient in size. The program has expanded because of the additional nesting of sea turtles, and in turn, has outgrown the park’s current infrastructure that supports this program. The proposed action of building two sea turtle patrol cabins and expanding the incubation facilities is warranted not only to address the recovery task priority items in the Kemp’s Ridley Recovery Plan, but is also necessary for park staff to proactively manage the park’s number one natural resources management priority, as identified in the approved Padre Island National Seashore 1995 Resource Management Plan.

Purpose and Need

The purpose of the proposal is to provide a safe, functional and efficient working environment for Padre Island National Seashore staff in compliance with the goals and objectives of current plans and policy. The project is needed to accomplish the following objectives:

1. To replace the current backcountry patrol cabin, which is no longer suitable for the growing need of the National Seashore’s sea turtle program, with two new cabins; thereby providing sufficient space for housing seasonal park staff.

2. To provide additional shelter or refuge for backcountry staff during times of inclement weather or a dangerous situation arising along the backcountry beach.

3. To provide better distribution of sea turtle incubation facilities along the Gulf of Mexico beach; thereby minimizing the distance and time for which the excavated eggs are transported to a secure incubation facility. This action would also allow for release of hatchlings closer to their nesting site along the Gulf beach.

4. Provide better distribution of cabins for more efficient daily and 24-hour operations of sea turtle monitoring efforts.

5. To expand the turtle incubation facility in the Headquarters compound to provide expanded hatching capacity in a climate controlled setting.

This project would maintain detection, incubation and protection efforts expanding activities in the park, thereby decreasing response time, increasing incubation capacity and increasing egg and turtle survival. Construction of the cabins would also be used to mitigate employee safety risks per the Operational Risk Review recommendations following a fatal accident in 2007.

The cabins would replace the original two cabins that were lost in 1999 to Hurricane Bret. After Hurricane Bret, limited funding allowed for construction of only one replacement cabin. To compensate, the replacement cabin’s location was centered between the original locations. The centered location has proven less efficient to park staff for sea turtle nesting monitoring efforts. Construction of these two cabins would provide better distribution of park staff to begin and end their patrols each day, allowing for more work hours applied towards monitoring, while also reducing fuel consumption and the park’s carbon footprint for total miles surveyed. During times of inclement weather and emergency situations, the extra cabins would allow for additional places within the park where park staff could find refuge or shelter (Fig. 2).

In addition to the current incubation facility found at the existing cabin at the park’s 39-mile mark, this project would also include sea turtle egg incubation facilities, known as corrals, at each of the proposed cabins. Situating these corrals near the cabins provides overnight oversight and safety for the eggs. Having the corrals located at the National Seashore’s 30, 39, and 50-mile marks would allow for optimum locations for park staff to deposit eggs to one of these incubation repositories shortly after being
excavated from their nest. This action would thereby reduce transport time of eggs in vehicles and the potential for egg embryo injury. Once sea turtles emerge from hatching, the hatchlings would be released at the 30, 39, or 50-mile mark incubation facility, thereby dispersing the hatchlings along the Gulf beach and providing releases closer to where the nests were found (Fig. 2).

As mentioned previously, because of the Endangered Species Act and the approved 1992 U.S. Fish and Wildlife Service Kemp’s Ridley Species Recovery Plan, as well as National Park Service policy, the National Seashore has the responsibility of detecting and protecting nesting females and nests, and ensuring safe passage of hatchlings to the Gulf of Mexico. The USFWS assigned monitoring actions to the National Seashore as part of this recovery plan. Specifically, the Kemp’s Ridley Sea Turtle Recovery Plan lists patrolling and managing Padre Island’s nesting beach as task priorities, with the NPS as the responsible agency.

The proposed action of building two sea turtle patrol cabins and expanding the Headquarters incubation facility is warranted not only to address the recovery task priority items in the Kemp’s Ridley Recovery Plan, but also necessary for park staff to proactively manage the park’s number one natural resource management priority, as identified in the approved Padre Island National Seashore 1995 Resource Management Plan. As a result of the sea turtle backcountry monitoring patrol efforts and the Headquarters incubation efforts, backcountry staff have doubled in size and the number of nests recovered in the park has increased to 118 including one Green Sea turtle nest in 2009. Building two new cabins would provide adequate housing for the patrollers, and provide additional space for future growth and supporting operations. Each cabin would be able to accommodate up to twenty-three overnight campers. Expansion of the headquarters incubation facilities would provide sufficient space to handle the anticipated increase in sea turtle nests and staff to provide the appropriate care.

An appropriate categorical exclusion does not exist that covers construction activities and, therefore, an environmental assessment (EA) must be developed that analyzes the effects of a proposed action. This EA evaluates the environmental impacts of the No Action alternative and the National Seashore’s proposal to construct two new Kemp’s ridley sea turtle patrol cabins in the backcountry of Padre Island National Seashore as well as the expansion of the incubation facilities at the Headquarters compound. The purpose of this analysis is to provide a decision-making framework for the NPS to approve the construction of two new sea turtle patrol cabins, and the expansion of the incubation facilities while protecting and preventing impairment to park resources and values.
Figure 2 – Comparison maps of the existing vs. the proposed (Alternative A vs. Alternative B)
Relationship to Other Plans and Policies

Current plans and policy that pertain to this proposal include the 1983 Padre Island National Seashore General Management Plan (NPS 1983), the 1995 Padre Island National Seashore Resource Management Plan (NPS 1995), and the 2006 Management Policies (NPS 2006). Following is more information on how this proposal meets the goals and objectives of these plans and policies:

- This project is consistent with the 1983 Padre Island National Seashore General Management Plan, which proposes the continued support and development of the successful Division of Sea Turtle Science and Recovery. The general management plan (GMP) identifies the actions, impacts, and mitigating measures necessary to resolve the issues facing the National Seashore. Many of these issues are the direct result of operating and occupying interim facilities that do not meet current health and safety codes. The construction of two new sea turtle patrol cabins and the expansion of the Headquarters incubation facilities is in accordance with the goals and objectives of the Seashore’s existing GMP.

- Construction of two new sea turtle patrol cabins and the expansion of the Headquarters incubation facilities would provide operational facilities for the Division of Sea Turtle Science and Recovery that complies with the 1996 Padre Island National Seashore Resource Management Plan. The resources management plan (RMP) is an implementation plan that provides a systemized course of action that can serve as a bridge between the broad directions provided in the GMP. The Seashore’s RMP was completed and approved in 1996 and identified the protection and monitoring of sea turtles as a high park priority (NPS 1996), as sea turtles are the only federal and state-listed endangered species nesting in the park.

- The proposal is consistent with the goals and objectives of the 2006 National Park Service Management Policies (NPS 2006) that state that major park facilities within park boundaries should be located so as to minimize impacts to park resources. The proposed site of the new administration building was identified to minimize harm to all park resources, particularly significant paleontological resources.

Appropriate Use

Section 1.5 of Management Policies (2006), —Appropriate Use of the Parks,— directs that the National Park Service must ensure that park uses that are allowed would not cause impairment of, or unacceptable impacts on, park resources and values. A new form of park use may be allowed within a park only after a determination has been made in the professional judgment of the park manager that it would not result in unacceptable impacts.

Section 8.1.2 of Management Policies (2006), Process for Determining Appropriate Uses, provides evaluation factors for determining appropriate uses. All proposals for park uses are evaluated for:

- consistency with applicable laws, executive orders, regulations, and policies;
- consistency with existing plans for public use and resource management;
- actual and potential effects on park resources and values;
- total costs to the Service; and
- Whether the public interest will be served.

Park managers must continually monitor all park uses to prevent unanticipated and unacceptable impacts. If unanticipated and unacceptable impacts emerge, the park manager must engage in a thoughtful, deliberate process to further manage or constrain the use, or discontinue it.

From Section 8.2 of Management Policies: —To provide for enjoyment of the parks, the National Park
Service will encourage visitor use activities that

- are appropriate to the purpose for which the park was established, and
- are inspirational, educational, or healthful, and otherwise appropriate to the park environment; and
- will foster an understanding of and appreciation for park resources and values, or will promote enjoyment through a direct association with, interaction with, or relation to park resources; and
- can be sustained without causing unacceptable impacts to park resources and values.

Support buildings are common and vital structures in most park units. Proper consideration for location, sizing, as well as construction materials and methods ensures that unacceptable impacts to park resources and values do not occur. The proposed cabins and the expansion of the Headquarters incubation facilities are consistent with the park’s general management plan and other related park plans. With this in mind, the NPS finds that construction and use of the sea turtle patrol cabins and the expansion of the Headquarters incubation facilities are an acceptable use at Padre Island National Seashore.

The next question is whether such use, and the associated necessary and appropriate impacts, can be sustained without causing unacceptable impacts to park resources and values. That analysis is found in the *Environmental Consequences* chapter.

**Scoping**

Scoping is a process to identify the resources that may be affected by a project proposal, and to explore possible alternative ways of achieving the proposal while minimizing adverse impacts. Padre Island National Seashore conducted internal scoping with appropriate National Park Service staff, as described in more detail in the *Consultation and Coordination* chapter. The National Seashore also conducted external scoping with the public and interested/affected groups.

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposal to construct the new cabins, and to generate input on the preparation of this environmental assessment. The scoping letter dated February 12, 2010 was mailed to over 500 residents of Corpus Christi, TX, greater Texas Coastal Bend area, including landowners adjacent to the National Seashore. In addition, the scoping letter was mailed to various federal and state agencies, local governments, local news organizations, and the affiliated Native American tribe. Scoping information was also posted on the National Seashore’s website.

During the 30-day scoping period, 17 public responses were received from The NPS online site Planning, Environment and Public Comment (PEPC) and three letters were received by the superintendent, including one from TPWD and one from the USACE. Nearly all of the respondents were in favor of constructing the two new cabins, for reasons as identified by the scoping brochure: egg protection, temporary staff housing, and safety. One letter suggested an Environmental Impact Statement was necessary for the Kemp’s ridley recovery plan, and the alternative of moving the program to Matagorda Island—a non-NPS managed land. As this document is for the proposed construction of two cabins and an addition for the turtle incubation facility at headquarters, this comment is out of scope. In addition, Padre Island National Seashore is maintaining compliance with the National Marine and Fisheries Service (NMFS) and the U. S. Fish and Wildlife Service’s (USFWS) Kemp’s ridley recovery plan by this proposed action. Any request for NEPA analysis for the NMFS and USFWS plans should be addressed to their offices. The 17 public responses provided no new substantive alternatives. If an alternative had been proposed which met the objectives the interdisciplinary team would have examined the alternative, weighed its merits and either carried it forward for additional analysis or dismissed it. In addition, the Native American tribe, Tonkawa, did not respond to our request for input for the proposed project. More information regarding external scoping and Native American consultation can be found in *Comments and Coordination*. 
Impact Topics Retained For Further Analysis

In this section and the following section on Impact Topics Dismissed from Further Analysis, the National Park Service takes a “hard look” at potential impacts by considering the direct, indirect, and cumulative effects of the proposed action on the environment, along with connected and cumulative actions. Impacts are described in terms of context and duration. The context or extent of the impact is described as localized or widespread. The duration of impacts is described as short-term, ranging from days to three years in duration, or long-term, extending up to 20 years or longer. The intensity and type of impact is described as negligible, minor, moderate, or major, and as beneficial or adverse. The NPS equates “major” effects as “significant” effects. The identification of “major” effects would trigger the need for an Environmental Impact Statement (EIS). Where the intensity of an impact could be described quantitatively, the numerical data is presented; however, most impact analyses are qualitative and use best professional judgment in making the assessment.

The NPS defines “measurable” impacts as moderate or greater effects. It equates “no measurable effects” as minor or less effects. “No measurable effects” is used by the NPS in determining if a categorical exclusion applies or if impact topics may be dismissed from further evaluation in an EA or EIS. The use of “no measurable effects” in this EA pertains to whether the NPS dismisses an impact topic from further detailed evaluation in the EA. The reason the NPS uses “no measurable effects” to determine whether impact topics are dismissed from further evaluation is to concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail in accordance with Commission on Environmental Quality (CEQ) regulations at 1500.1(b).

In this section of the EA, the NPS provides a limited evaluation and explanation as to why some impact topics are not evaluated in more detail. Impact topics are dismissed from further evaluation in this EA if:

- they do not exist in the analysis area, or
- they would not be affected by the proposal, or the likelihood of impacts are not reasonably expected, or
- through the application of mitigation measures, there would be minor or less effects (i.e., no measurable effects) from the proposal, and there is little controversy on the subject or reasons to otherwise include the topic.

Due to there being no effect or no measurable effects, there would either be no contribution towards cumulative effects or the contribution would be low. For each issue or topic presented below, if the resource is found in the analysis area or the issue is applicable to the proposal, then a limited analysis of direct and indirect, and cumulative effects is presented. There is no impairment analysis included in the limited evaluations for the dismissed topics because the NPS’s threshold for considering whether there could be impairment is based on “major” effects.

Impact topics for this project have been identified on the basis of federal laws, regulations, and orders; 2006 Management Policies; and National Park Service knowledge of resources at Padre Island National Seashore. Impact topics that are carried forward for further analysis in this environmental assessment are listed below along with the reasons why the impact topic is further analyzed. For each of these topics, the following text also describes the existing setting or baseline conditions (i.e., affected environment) within the project area. This information will be used to analyze impacts against the current conditions of the project area in the Environmental Consequences chapter.

Topography, Geology, and Soils

According to the National Park Service’s 2006 Management Policies, the National Park Service will preserve and protect geologic resources and features from adverse effects of human activity, while allowing natural processes to continue (NPS 2006). These policies also state that the National Park
Service will strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources.

The Headquarters Incubation facility expansion would take place within the Headquarters compound, in an area that has previously been used for park buildings. The area is currently covered with leveled caliche fill and has no significant topographic or geologic features.

The proposed construction of the two new sea turtle patrol cabins would be on the Gulf of Mexico beachfront, set within its dune-line. The dunes of the National Seashore are significant topographic/geologic features. Minor modifications of the topography would be required to provide a level surface on which to construct the cabins, which would have a negligible to minor effect to the topography of this area. The construction for the cabins would also require excavation, which would displace and disturb soils, primarily in the footprint of the new cabins. Soils may also be disturbed and compacted on a temporary basis in the locations were the park would stage construction materials.

Given that there are significant topographic or geologic features in the project areas, and that the proposed actions would result in negligible to minor, and temporary and permanent adverse effects to topography, geology, and soils, the topics of topography, geology, and soils have been carried forward for further analysis in this document.

**Special Status Species**

The Endangered Species Act of 1973 requires examination of impacts on all Federally-listed threatened, endangered, and candidate species. Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. In addition, the 2006 Management Policies and Director’s Order-77 Natural Resources Management Guidelines require the National Park Service to examine the impacts on Federal candidate species, as well as State-listed threatened, endangered, candidate, rare, declining, and sensitive species (NPS 2006). For the purposes of this analysis, the U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department were contacted with regards to Federally- and State-listed species to determine those species that could potentially occur on or near the project area.

Known threatened, endangered, or other species of concern occurring in the project areas include: piping plover (*Charadrius melodus*), northern aplomado falcon (*Falco femoralis septentrionalis*), reddish egret (*Egretta rufescens*), eastern brown pelican (*Pelecanus occidentalis*), sooty tern (*Sterna fuscata*), American peregrine falcon (*Falco peregrines anatum*), spot-tailed earless lizard (*Holbrookia lacerate*), Texas horned lizard (*Phrynosoma cornutum*), as well as green sea turtle (*Chelonia mydas*), loggerhead sea turtle (*Caretta caretta*), Atlantic hawksbill sea turtle (*Eretmochelys imbricata*), leatherback sea turtle(*Dermochelys coiacea*), and Kemp’s ridley sea turtle (*Lepidochelys kempii*).

Given that there are special status species within the project areas, and that the proposed actions would occur during the sea turtle nesting season, potentially resulting in adverse effects, the topic of special status species has been carried forward for further analysis in this document.

**Visitor Use and Experience**

According to 2006 Management Policies, the enjoyment of park resources and values by people is part of the fundamental purpose of all park units (NPS 2006). The National Park Service is committed to providing appropriate, high quality opportunities for visitors to enjoy the parks, and will maintain within the parks an atmosphere that is open, inviting, and accessible to every segment of society. Further, the National Park Service will provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks. The National Park
Service 2006 Management Policies also state that scenic views and visual resources are considered highly valued associated characteristics that the National Park Service should strive to protect (NPS 2006).

The primary visitor activity is recreating on the beach, which may include beachcombing, fishing, bird watching, relaxing, and windsurfing; however, due to the extreme difficulty of access, only a few of the National Seashore’s 600,000+ annual visitors travel into the park’s backcountry beach, found along the Gulf of Mexico at the south end of the park.

The proposed patrol cabins would be located respectively at the 30-mile mark and 50-mile mark locations; areas that are frequented by our down-island, backcountry beach visitors. While the turtle patrol cabins will be set back into the dune line and only visible to visitors while passing directly in front the buildings. Because the proposed project would visually reconfigure the area in the two proposed places on the beach, the topic of visitor use and experience has been carried forward for further analysis.

**Park Operations**

Current park operations for the Division of Sea Turtle Science and Recovery include six backcountry patrollers who monitor for nesting sea turtles. The current cabin in place provides the bio-techs with overnight accommodations, and also acts as a staging area for their efforts to assist with sea turtle standings and efforts for the re-establishment of a second nesting population of the Kemp’s ridley sea turtle.

Location of the current cabin was placed between the locations where the original two sea turtle patrol cabins were located, prior to being destroyed by Hurricane Brett in 1999. The two cabins that were destroyed by Hurricane Brett were ideally placed for maximum efficiency of the sea turtle patrol efforts; however, when funding for replacement of the cabins wasn’t enough to build two cabins, only one cabin was constructed in a location situated between the locations for the original cabins.

The proposed project of replacing the two cabins would restore the efficiency of patrols. The backcountry patrols begin and end each day from the sea turtle patrol cabins; therefore, having two patrol cabins would allow the patrols to begin and end closer to the patrollers survey areas, i.e., the patrol cabins would be positioned closer to the patrollers’ survey areas; therefore, less amount of travel time to and from the survey areas is necessary.

Another important reason for this action is the park’s need to establish more areas for nest protection. To prevent loss of sea turtle nests to predators, high tides and passing vehicle traffic, the National Seashore has been excavating sea turtle nests. The collected eggs are then incubated under the care of the NPS. While all of the collected eggs were once incubated within a controlled lab, the park has chosen to expand the outdoor incubation areas and the Headquarters incubation facilities to accommodate the success of Kemp’s ridley sea turtle recovery effort, with the proposed egg corrals at the turtle cabins helping to minimize the time spent in transport from the southern part of the beach to the Headquarters incubation facility area. These outside facilities are referred to as corrals, and basically consist of a designated area on the Gulf beach, protected from predators and human disturbance by the use of chain-link fence. These corrals will be sited as high on the beach as possible to avoid being inundated by normal high tides.

The proposed project would accommodate the regional office’s approved increase in staffing for the Division of Sea Turtle Science and Recovery. Historically, there has been only six bio-techs patrolling the backcountry beaches for nesting sea turtles, but with the success of the program, the National Seashore has hired additional bio-techs to patrol down-island for sea turtles as well as staff for the Headquarters incubation facilities to handle the increasing work load that comes with continued success of the recovery program.

Construction of the new sea turtle patrol cabins in the project areas and expansion of the Headquarters incubation facility would have a measurable effect on the National Seashore’s staff and how/where they
conduct their work. For these reasons, the topic of park operations has been carried forward for further analysis in this document.

**Floodplains**

Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. The National Park Service under 2006 *Management Policies* and Director’s Order 77-2 *Floodplain Management* will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to Director’s Order 77-2 *Floodplain Management*, certain construction within a 100-year floodplain requires preparation of a statement of findings for floodplains.

The Park is entirely within the 100-year floodplain as defined by US Army Corp of Engineers and the Federal Emergency Management Agency; therefore, a statement of findings for floodplains will be prepared. The proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006.

**Impact Topics Dismissed From Further Analysis**

**Historic Structures**

The National Park Service, as steward of many of America's most important cultural resources, is charged to preserve historic properties for the enjoyment of present and future generations. According to the National Park Service’s 2006 *Management Policies and Cultural Resource Management* (Director’s Order-28), management decisions and activities throughout the National Park System must reflect awareness of the irreplaceable nature of these resources (NPS 2006). The National Park Service will protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with these policies and guidelines.

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation an opportunity to comment in the consultation process. The term —historic properties— is defined as any site, district, building, structure, or object eligible or listed in the National Register of Historic Places, which is the nation’s inventory of historic places and the national repository of documentation on property types and their significance. More information about this consultation can be found in the *Consultation and Coordination* chapter.

The term —historic structures— refers to both historic and prehistoric structures, which are defined as constructions that shelter any form of human habitation or activity. The proposed locations for the two new sea turtle patrol cabins were surveyed for cultural resources on April 8, 2010, and no structures were identified in the immediate project area. Further, the National Seashore consulted with the park’s state historical preservation office, Texas Historical Commission, for concurrence with the park’s negative findings for the NPS survey (THC 2010).

The project areas for the two sea turtle patrol cabins and the sea turtle lab expansion contained no historic structures; therefore, the topic of historic structures has been retained for further analysis.

**Paleontological Resources**

According to 2006 *Management Policies*, paleontological resources (fossils), including both organic and mineralized remains in body or trace form, will be protected, preserved, and managed for public education, interpretation, and scientific research (NPS 2006). The proposed sites for the construction of two new sea turtle patrol cabins are within the fore dunes on the surface of the Gulf of Mexico beach.

The proposed locations for the two new sea turtle patrol cabins was surveyed by an NPS geologist on April 8, 2010 and no paleontological items were identified in the immediate project area. While the proposed project areas are not expected to contain any paleontological deposits, appropriate steps would
be taken to protect any paleontological resources that are inadvertently discovered during construction. Because the project would not disturb any known paleontological sites, the affect of the project on paleontological resources is expected to be negligible. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Vegetation

According to the National Park Service’s 2006 Management Policies, the National Park Service strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants (NPS 2006). The project areas are located on the Gulf of Mexico shoreline within the Gulf dunes. These areas are made up of two rows of fore dunes adjacent to the Gulf beach and high dune fields with scattered upland swales. The two rows of fore dunes are typically dominated by silver-leaf croton (Croton punctatus), beach morning-glory (Ipomoea pescaprae), camphorweed (Heterotheca subaxillaris), prairie clover (Dalea sp.), western ragweed (Ambrosia psilostachya), and sea oats (Uniola paniculata). The high dune fields are generally dominated by camphorweed, Prairie clover, sea oats, sea coast bluestem (Schizachyrium scoparium), western ragweed (Ambrosia psilostachya), and some tropic croton (Croton glandulosus var. lindheimeri).

In the areas of construction where the proposed footprints of the new cabins are, vegetation would be displaced, disturbed, and/or compacted. Any disturbance, where appropriate, would involve recontouring and restoring of dunes, which includes replanting of disturbed vegetation. Because the proposed construction would consist of being elevated on stilts, it is thought disturbance to vegetation would be minor or negligible. An addition, a monitor would be onsite to identify any rare, protected species, i.e., Roughseed sea-purslane (Sesuvium trianthemoides). In the area that the incubation facilities would be expanded the area has been built up and leveled with caliche. The area is maintained as a lawn, watered and cut regularly. Sand Burr and native grasses dominant the plant community. After construction is finished disturbed areas will be leveled and seeded with native grasses. This proposed action is thought to have minor or negligible impacts and would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Wildlife

According to the National Park Service’s 2006 Management Policies, the National Park Service strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of animals (NPS 2006). Mammals commonly found in the National Seashore include white-tailed deer, coyote, bobcat, badger, black-tailed jackrabbit, pocket gopher, raccoon, ground squirrel, kangaroo rat, mice, and bats. There are 385 documented species of birds, which includes sandhill crane, snowy plover, American bittern, long-billed curlew, eastern meadowlark, black skimmer, caracara, northern bobwhite, and American white pelican, and loggerhead shrike. Reptiles and amphibian species found at the National Seashore include the keeled earless lizard, whiptail lizard, western diamondback rattlesnake, slender glass lizard, ornate box turtle, northern leopard frog, green tree frog, Hurter's spadefoot toad, and five of the eight sea turtles found in the world. There are also numerous insect species, fish, crustaceans and mollusks.

Protection under the Migratory Bird Treaty Act makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. In addition, this act serves to protect environmental conditions for migratory birds from pollution or other ecosystem degradations. Padre Island National Seashore has 385 birds documented for being within the park. Many of these birds are found at the proposed locations for this project; however, there are no known nesting sites or vital foraging and roosting grounds for the proposed
locations. Construction-related noise and vehicles accessing the sites could potentially disturb migratory bird species, but these adverse impacts would be 1) temporary, lasting only as long as construction, and 2) negligible, because suitable habitat for migratory birds is found throughout the region.

The locations for the proposed sea turtle patrol cabins are in beach areas that are frequently impacted by storm ocean waters, where little fresh water and minimal vegetation is present in the project areas. The project areas are accessible by beach driving; therefore, presence of humans and human-related activities are frequent occurrences.

If this proposed project is carried forward, smaller wildlife such as rodents, reptiles, and amphibians and their habitat would be displaced or eliminated during construction of the new cabins and egg incubation facility expansion. Disturbed areas would be revegetated and restored following construction, which would result in a negligible to minor adverse impact to the wildlife and wildlife habitat in the immediate area of construction.

During construction noise would also increase, which may disturb wildlife in the general area. Construction-related noise would be temporary, and existing sound conditions would resume following construction activities. Therefore, the temporary noise from construction would have a negligible to minor adverse effect on wildlife. The Headquarters compound has nearly constant foot and vehicle traffic and noise from construction would have little effect on wildlife. Further, such minor or negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

In addition, the expansion of the Headquarters incubation facility will have little to no effect on wildlife because construction will be within a highly modified area that is heavily used by park staff and provides no suitable habitat for listed species.

**Water Resources**

National Park Service policies require protection of water quality consistent with the Clean Water Act. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To enact this goal, the U.S. Army Corps of Engineers has been charged with evaluating federal actions that result in potential degradation of waters of the United States and issuing permits for actions consistent with the Clean Water Act. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions, which affect waters of the United States.

The proposed turtle patrol cabin project areas are located along the Gulf of Mexico shoreline; therefore, navigable waters are present. Water quality, water quantity, and drinking water are not expected to be affected by the project. The size of the two new patrol cabins’ footprints (approximately 2,500 square feet each) would increase the amount of impervious surface in the area, which could possibly increase the erosion potential of the areas; however, the building will be elevated on piers and run off from the roofs will be able to infiltrate under the buildings and as these areas occur within the intertidal zone, these effects are thought to be minimal. The caliche fill that the incubation facility expansion will be constructed on is nearly impermeable and does not act as an infiltration zone to the water table. Sheet wash patterns to the surrounding natural infiltration areas would not be significantly altered by the expansion of the incubation facility. To further assist with erosion and water quality, disturbed areas would be revegetated and recontoured following construction. The proposed action would result in negligible effects to water resources. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.
**Wetlands**

For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

Executive Order 11990 *Protection of Wetlands* requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, §404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to prohibit or regulate, through a permitting process, discharge or dredged or fill material or excavation within waters of the United States. National Park Service policies for wetlands as stated in 2006 *Management Policies* and Director’s Order 77-1 *Wetlands Protection* strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77-1 *Wetlands Protection*, proposed actions that have the potential to adversely impact wetlands must be addressed in a statement of findings for wetlands.

While the Gulf of Mexico beach is considered wetland and the proposed project is located within these areas, the construction of these cabins would be elevated; therefore, the amount of impacts to wetlands would be minor in degree. The site of the incubation facility expansion has been elevated above the adjacent undisturbed area with caliche fill and does not qualify as wetlands and does not support wetland vegetative species. Water drains in the form of sheet wash and standing water is only present during significant flood events. Because these effects would not result in any unacceptable impacts to wetlands, this topic is dismissed from further analysis in this document and a wetland statement of findings will not be prepared.

**Archeological Resources**

In addition to the National Historic Preservation Act and the National Park Service 2006 *Management Policies*, the National Park Service’s Director’s Order-28B *Archeology* affirms a long-term commitment to the appropriate investigation, documentation, preservation, interpretation, and protection of archeological resources inside units of the National Park System. As one of the principal stewards of America's heritage, the National Park Service is charged with the preservation of the commemorative, educational, scientific, and traditional cultural values of archeological resources for the benefit and enjoyment of present and future generations. Archeological resources are nonrenewable and irreplaceable, so it is important that all management decisions and activities throughout the National Park System reflect a commitment to the conservation of archeological resources as elements of our national heritage.

The proposed locations for the two new sea turtle patrol cabins were surveyed by a NPS archeologist on April 8, 2010, and no archeological sites were identified in the immediate project area, further, the National Seashore consulted with the park’s state historical preservation office (SHPO), Texas Historical Commission, for concurrence with the park’s negative findings for the NPS archeological survey. (THC 2010). On August 24-25, 2010, the proposed site of the incubation facility expansion was surveyed by a NPS archeologist and no archeological sites were identified in the immediate project area. A letter to the SHPO has been prepared for the incubation lab expansion archeological survey, and the results of the concurrence letter will be included with either the Finding of No Significant Impact (FONSI) or the Notice of Intent (NOI) for Environmental Impact Statement (EIS). While the proposed project areas are not expected to contain archeological deposits, appropriate steps would be taken to protect any archeological resources that are inadvertently discovered during construction. Because the project would not disturb any known archeological sites, the affect of the project on archeological resources is expected to be negligible. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS *Management Policies* 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.
Ethnographic Resources

National Park Service’s Director’s Order-28 Cultural Resource Management defines ethnographic resources as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. According to DO-28 and Executive Order 13007 on sacred sites, the National Park Service should try to preserve and protect ethnographic resources.

In consultation with Native American tribes, ethnographic resources are not known to exist in the proposed project areas. Native American tribes traditionally associated with Padre Island National Seashore were apprised of the proposed project in a letter dated March 18, 2010, and no responses were received from these tribes. Tribal responses to previous park projects confirm their cultural affiliations with the area. The previous contacts with tribal representatives provide no reason to expect impacts to significant ethnographic resources. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Cultural Landscapes

According to the National Park Service’s Director’s Order-28 Cultural Resource Management Guideline, a cultural landscape is a reflection of human adaptation and use of natural resources, and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. Although a cultural landscape inventory has not been conducted for the National Seashore, the features within the general turtle patrol cabin project areas are temporary in nature and not likely to contribute to a significant cultural landscape. The sea turtle patrol cabins and the Headquarters incubation facility expansion will be constructed with design and materials that will blend in well with the current architectural style of structures within the Headquarters compound. Further, since these structures are not likely to contribute to a significant cultural landscape, no unacceptable impacts would occur; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Because no contributing structures are likely present within the project areas, there would be no unacceptable impacts to cultural landscapes; this topic is dismissed from further analysis in this document.

Museum Collections

According to Director’s Order-24 Museum Collections, the National Park Service requires the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material), and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, National Park Service museum collections.

As the National Seashore is located within a 100-year floodplain, no museum specimens are kept inside of the park; therefore, the National Seashore’s museum collection would not result in any unacceptable impacts. The proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Because these effects are minor or less in degree and would not result in any impacts, this topic is dismissed from further analysis in this document.

Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 et seq.) was established to promote the public health and welfare by protecting and enhancing the nation’s air quality. The act establishes specific programs that provide special protection for air resources and air quality related values associated with National Park Service units. Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards. Padre Island National Seashore is designated as a Class II air quality area under the Clean Air Act. A Class II designation by the State of Texas, as authorized by the Prevention of Significant Deterioration provisions of the Clean Air Act (EA Engineering, Science and Technology
indicates the maximum allowable increase in concentrations of pollutants over baseline concentrations of sulfur dioxide and particulate matter as specified in §163 of the Clean Air Act. Further, the Clean Air Act provides that the federal land manager has an affirmative responsibility to protect air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts (EPA 2000). The park’s air quality is protected by allowing limited increases over baseline concentrations of sulfur dioxide, nitrogen oxides, and particulate matter.

Mobile source emissions include highway and non-road vehicles, which affect air quality through the production of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, and volatile organic compounds. Vehicle emissions occur from both NPS operated and visitor vehicles. The National Seashore operates 35 road vehicles annually, but the number of visitor vehicles is estimated. The number of visitor vehicles is correlated to the number of annual visitors to the park. In 2009, the National Seashore visitation was recorded at 642,163 recreational visitors, with an average visitor per vehicle ratio of 2.8 (EA Engineering, Science and Technology 2003), which equates to 229,344 visitor vehicles. Based on vehicle calculations mentioned above the emissions generated by road vehicles at Padre Island National Seashore are provided in Table 2. Particulate emissions include exhaust and road dust.

Table 1. Mobile source emissions at Padre Island National Seashore from road vehicles.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Particulates (lbs/yr)</th>
<th>Sulfur Dioxide (lbs/yr)</th>
<th>Nitrogen Oxides (lbs/yr)</th>
<th>Carbon Monoxide (lbs/yr)</th>
<th>Volatile Organics (lbs/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor Vehicles</td>
<td>6,880</td>
<td>--</td>
<td>9,174</td>
<td>114,672</td>
<td>6,880</td>
</tr>
<tr>
<td>NPS Vehicles</td>
<td>213</td>
<td>--</td>
<td>391</td>
<td>3,937</td>
<td>213</td>
</tr>
<tr>
<td>Totals</td>
<td>7,093</td>
<td>--</td>
<td>9,565</td>
<td>118,609</td>
<td>7,093</td>
</tr>
<tr>
<td>Per Vehicle Total</td>
<td>.03</td>
<td>--</td>
<td>.04</td>
<td>.5</td>
<td>.03</td>
</tr>
</tbody>
</table>

Constructing the new patrol cabins would require vehicles to deliver construction materials, and transport construction personnel to the proposed construction sites. These activities could result in temporary increases in air quality emissions whenever construction vehicles are operated. However, vehicle emissions would dissipate quickly due to prevailing southeast winds from March through September and north-northeasterly winds from October through February (PAIS 2000b). Transport emissions would also be mitigated by providing temporary housing at the construction location, minimizing the number of trips to and from the job sites. Based on the estimated emissions per vehicle from Table 1, the number of vehicles operating in the park yearly, and the dominant daily winds, impacts to air quality would be negligible and within state and federal standards. The Class II air quality designation for Padre Island National Seashore would not be affected by the proposal. Further, because the Class II air quality would not be affected, there would be no unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Because there would be no effects on air quality, and the proposed actions would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

**Soundscape Management**

In accordance with 2006 Management Policies and Director’s Order-47 Sound Preservation and Noise Management, an important component of the National Park Service’s mission is the preservation of
natural soundscapes associated with national park units (NPS 2006). Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among National Park Service units as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

The proposed location for the two new patrol cabins and all construction activity would occur in a zone of the park that is currently accessible by park visitors and their vehicles. The dominate sound source is the crashing of the surf, other sounds in this area are most often generated from vehicular traffic (visitors and employees entering/leaving the National Seashore), people, boats, nonfederal oil and gas exploration and development, grounds-keeping equipment, climate controls equipment on the buildings, some wildlife such as birds, and wind. Sound generated by the long-term operation of the patrol cabins may include people using the building and vehicles coming and going. Because the areas already contain man-made noises, the long-term operation of the cabins and Headquarters incubation facilities is not expected to appreciably increase the noise levels in the general areas.

The existing sounds in the Headquarters area where the incubation facility expansion will be built are most often generated from vehicular traffic, visitors and employees entering/leaving the area, people talking, grounds-keeping equipment, climate control equipment on the buildings, some wildlife such as birds, and the wind.

During construction, human-caused sounds would likely increase due to construction activities, equipment, vehicular traffic, and construction crews. Any sounds generated from construction would be temporary, lasting only as long as the construction activity is generating the sounds, and would have a negligible to minor adverse impact on visitors and employees. Further, such negligible or minor impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

**Lightscape Management**

In accordance with 2006 Management Policies, the National Park Service strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human caused light (NPS 2006). Padre Island National Seashore strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. The National Seashore also strives to ensure that all outdoor lighting is shielded to the maximum extent possible, to keep light on the intended subject and out of the night sky. The visitor center and the existing headquarters facility are the primary sources of light in the National Seashore.

The proposed action may incorporate minimal exterior lighting on the cabins and incubation facility expansion but the lighting would be directed toward the intended subject with appropriate shielding mechanisms and would be placed in only those areas where lighting is needed for safety reasons. This concern has been considered and addressed with other facilities placed along the beach, as the potential of artificial light to negatively affect hatchling sea turtles is well documented. The amount and extent of exterior lighting on the two new proposed sea turtle patrol cabins and headquarters incubation facility expansion would have negligible effects on the existing outside lighting or natural night sky of the area. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.
Socioeconomics

The proposed action would neither change local and regional land use nor appreciably impact local businesses or other agencies. Implementation of the proposed action could provide a negligible beneficial impact to the economies of nearby Corpus Christi, Texas as well Nueces County due to minimal increases in employment opportunities for sea turtle patrollers and revenues for local businesses and governments generated from these additional construction activities and materials obtained. Any increase in workforce and revenue, however, would be temporary and negligible, lasting only as long as construction. Because the impacts to the socioeconomic environment would be negligible, this topic is dismissed.

Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), and is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. According to the NRCS, the project area does not contain prime or unique farmlands (NRCS 2003). Because there would be no effects on prime and unique farmlands, this topic is dismissed from further analysis in this document.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by the Department of Interior agencies be explicitly addressed in environmental documents. The Federal Indian Trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources at Padre Island National Seashore. The lands comprising the National Seashore are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Because there are no Indian trust resources, this topic is dismissed from further analysis in this document.

Environmental Justice

Executive Order 12898 General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Because the new patrol cabins and Headquarters incubation facility expansion would be available for use by all staff of the park’s Division of Sea Turtle Science and Recovery regardless of race or income, and the construction material suppliers would not be purchased based on their race or income, the proposed action would not have disproportionate health or environmental effects on minorities or low-income populations or communities. Because there would be no disproportionate effects, this topic is dismissed from further analysis in this document.

Climate Change and Sustainability

Although climatologists are unsure about the long-term results of global climate change, it is clear that the planet is experiencing a warming trend that affects ocean currents, sea levels, polar sea ice, and global weather patterns. Although these changes are likely to affect winter precipitation patterns and amounts in the parks, it would be speculative to predict localized changes in temperature, precipitation, or other weather changes, in part because there are many variables that are not fully understood and there may be variables not currently defined. Therefore, the analysis in this document is based on past and current weather patterns and the effects of future climate changes are not discussed further.
ALTERNATIVES

During January 2010, an interdisciplinary team of National Park Service employees met for the purpose of developing project alternatives. This meeting resulted in the definition of project objectives as described in the *Purpose and Need*, and a list of alternatives that could potentially meet these objectives. A total of four action alternatives and the no-action alternative were originally identified for this project. Of these, three of the action alternatives were dismissed from further consideration for various reasons, as described later in this chapter. One action alternative and the no-action alternative are carried forward for further evaluation in this environmental assessment. A summary table comparing alternative components is presented at the end of this chapter.

**Alternatives Carried Forward**

**Alternative A – No-Action**

Under this alternative, the two new sea turtle patrol cabins and the headquarters incubation facility expansion would not be constructed. The existing sea turtle patrol cabin at the park’s 39-mile mark would continue to provide biological technicians overnight accommodations and other support functions. The Headquarters incubation facility would continue to provide office space, lab facilities and incubation services. The current cabin with accommodations for six would remain in its present condition, and the Division of Sea Turtle Science and Recovery would not expand their backcountry patrol operations. The operation facilities would not be relocated and the efficiency and safety of the sea turtle recovery program would not be improved. Should the no-action alternative be selected, the National Park Service would respond to future needs and conditions of the sea turtle recovery program as it does now, without major actions or changes than the present course of action. See Figure 2 for a map of existing cabins placement.

**Alternative B – Construct Two New Sea Turtle Patrol Cabins and Expand the Headquarters Incubation Facility**

This alternative consists of constructing two new sea turtle patrol cabins along the Gulf of Mexico shoreline in Kenedy County, Texas, at Padre Island National Seashore’s 30 and 50-mile mark locations, i.e., respectively ten and thirty miles north of the Port Mansfield channel and to expand the current incubation facility at the Headquarters compound. This proposed action would restore the sea turtle program’s original two cabins, which were destroyed by Hurricane Brett in 1999 and meet the needs created by the success of the Turtle protection and restoration program. The following text further describes the components of Alternative B:

- **Cabin Features** – The new sea turtle patrol cabins would be general wood stud (–stick!) construction, elevated on pilings, each approximately 2,500 square feet in size. Rough dimensions for the new cabin design are 50 feet wide by 40 feet long, with a 10 feet deep deck, making the total footprint for the building to be 50 feet by 50 feet. The interior of the building would include sleeping quarters for up to 23 people, two full bathrooms, a kitchen, office and living space, storage area, and basic operational space to support the program. With the remote backcountry location for the cabins, they would be equipped with solar powered photovoltaic cells to provide a small amount of electricity for lighting and communications. Propane gas would power the stove and cool the refrigerator. A fire protection system for the cabins would consist of smoke alarms, with fire exits in the building. The cabins would not be equipped with modern climate control systems, i.e., there would be no heating, ventilation, or air conditioning (HVAC) included. Since the cabins are for a specialized use and are not open to the public, they would not be American Disability Act compliant. See Figure 1 for a layout of the proposed cabin.
• **Headquarters Incubation Facility Expansion**

The expansion of the incubation facility would consist of two buildings built to withstand hurricane force winds of 170 mile per hour. These buildings would be elevated on pilings. One building would be a new incubation room, designed to hold eggs during the last third of incubation, a time when it is critical to regulate temperatures generated by the developing eggs. This building will be cooled with a 2.5 ton HVAC, where a 60,000 BTU propane air handler will supply heat. The second building would provide expanded office space, a storage area and a mechanical room. This second building will be cooled with a 3 ton HVAC and an 80,000 BTU propane air handler will provide heat. Lighting for both buildings will be high efficiency LED fixtures. Both buildings will be ADA compliant. See Figure 2 for the layout of the proposed incubation facility expansion.

• **Use/Operation of the Facility** – The new cabins and Headquarters incubation facility expansion would be solely used by park employees for the function of sea turtle science and recovery; however, in the case of a special event outside of the sea turtle season, special operations could acquire the use of these facilities. The cabins would be geographically placed for better placement along the Gulf of Mexico beach. This would allow for less time traveling to and from the patrollers’ survey areas each day, as well as offer closer shelter or refuge should the event of foul weather or a dangerous situation arise on the backcountry beach. An area near the cabins would be designated to contain or –corrall sea turtle eggs, which would be collected for incubation, hatching, and release. Having the corrals in the proposed areas would reduce the sea turtle eggs that were collected in the southern part of the park time of transport and time in the vehicle; therefore reducing the risk of injury or damage to the viable eggs. This incubation coral would be a fenced-locked area, as similar to pre-existing corrals being used by the program. This corral would be similar to the 20 feet by 45 feet coral as found at the current sea turtle patrol cabin for the 2010 sea turtle nesting season, but the size of the corrals would be enlarged with success of the program. The current sea turtle patrol cabin in place would be converted over to be used by law enforcement for border security and visitor safety related issues. Like the current cabin in place, the National Seashore would not offer visitor services in the new patrol cabins or the incubation facilities; however, the cabins could become made available for other park-specific business such as scientific research. See Figure 3 for maps of the park with only the existing cabin against the park with the proposed cabins.

• **Access** - The National Seashore allows for beach driving; therefore, access to the new sea turtle patrol cabins would be via the Gulf of Mexico shoreline. Access to the Headquarters area via Park Rd 22.

• **Revegetation** – The existing forbs and grasses in the project area would be preserved to the extent possible. All areas disturbed by construction of the new sea turtle patrol cabins would be revegetated and recontoured to the style of the native landscape. Native vegetation, topography, or other natural features would be used, as appropriate. The area disturbed by construction of incubation facility expansion would be leveled and reseeded with native grasses.

• **Temporary Housing** – A temporary housing facility (travel trailer) would be located at the project areas during construction. This would allow for all eight to ten hours of work time to be applied to construction of the cabins, rather than time being spent commuting to the project areas. After completion of the cabins, the travel trailer would be removed from each of the project areas. Currently, the areas where the temporary housing facility would be are sites available to visitors for backcountry camping.

• **Construction Staging** – To implement this alternative, an area near each of the proposed sites for the new sea turtle patrol cabins would be designated for construction staging, material stockpiling, and equipment storage. These areas would likely be sited in areas somewhere along the Gulf of Mexico beach, where disturbances from beach driving and tidal flows already occur. The staging areas would be designated in areas that would neither impede beach vehicle traffic nor pose a collision safety risk to visitors’, contractors’, and park staff’s vehicles.
This alternative is based on preliminary designs and best information available at the time of this writing. Specific distances, areas, and layouts used to describe the alternative are only estimates and could change during final site design. If changes during final site design are inconsistent with the intent and effects of the selected alternative, then additional compliance would be completed, as appropriate.

Figure 3 - Proposed cabin floor plan
Figure 4 - Alternative B, Construct New Sea Turtle Patrol Cabins
Proposed Expansion of Headquarters Incubation Facility

Figure 5 - Floor Plan of the Headquarters Incubation Facility Expansion
Figure 5 - Current Sea Turtle Lab with Proposed Lab Expansion
Mitigation Measures

The following mitigation measures were developed to minimize the degree and or severity of adverse effects and would be implemented during construction of the action alternative, as needed:

- Construction activities would be scheduled to minimize construction-related impacts upon visitors. Areas not under construction would remain accessible to visitors as much as is safely possible.

- The National Seashore’s facility manager would be responsible for ensuring that their crew performs the necessary work in accordance with instructions and standards provided by the NPS.

- The NPS would coordinate with contractors and any volunteers to monitor construction activities per NPS standards. Specifically, the National Seashore would monitor and or direct vehicles transporting materials to their designated locations.

- All crew members, contractors, and volunteers assisting with work efforts would be educated about the importance of avoiding impacts to sensitive resources that have been flagged for avoidance, which may include natural and cultural resources.

- An archaeological survey would be performed prior to any construction; however, should construction unearth previously undiscovered cultural resources, work would be stopped in the area of discovery and the recreation area would consult with the state historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to 36 CFR 800.13, Post Review Discoveries. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.

- To minimize the amount of ground disturbance, staging and stockpiling areas would be in previously disturbed sites, away from visitor use areas to the extent possible. All staging and stockpiling areas would be returned to pre-construction conditions following construction.

- Construction zones would be identified and fenced with construction tape, silt fencing, or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing.

- Revegetation and recontouring of disturbed areas would take place following construction and would be designed to minimize the visual intrusion of the structure. Revegetation efforts would strive to reconstruct the natural spacing, abundance, and diversity of native plant species using native species. All disturbed areas would be restored as nearly as possible to pre-construction conditions shortly after construction activities are completed. Weed control methods would be implemented to minimize the introduction of noxious weeds. Some shrubs and grasses would be removed, but other existing vegetation at the site would not be disturbed to the extent possible. A monitor would be onsite for identification and protection of any rare, protected plant species.

- Because disturbed soils are susceptible to erosion until revegetation takes place, standard erosion control measures such as silt fences and/or sand bags would be used to minimize any potential soil erosion.

- Fugitive dust generated by construction would be controlled by spraying water on the construction site, if necessary.

- Employees and construction crews would be required to park their vehicles on the beach, away from the flow of beach driving traffic to ensure enough capacity and access to the National Seashore for visitors.
• To reduce noise and emissions, construction equipment would not be permitted to idle for long periods of time.

• To minimize possible petrochemical leaks from construction equipment, the contractor would regularly monitor and check construction equipment to identify and repair any leaks.

• Construction workers and supervisors would be informed about special status species. Contract provisions would require the cessation of construction activities if a species were discovered in the project area, until park staff re-evaluates the project. This would allow modification of the contract for any protection measures determined necessary to protect the discovery. A monitor would assist for identification of special status species.

• Should construction unearth previously undiscovered cultural resources, work would be stopped in the area of any discovery and the National Seashore would consult with the state historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, *Post Review Discoveries*. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.

• The National Park Service would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging paleontological materials, archeological sites, or historic properties. Contractors and subcontractors would also be instructed on procedures to follow in case previously unknown paleontological or archeological resources are uncovered during construction.

• To minimize the potential for impacts to nesting sea turtles, a trained escort would accompany and lead vehicles down beach. Construction vehicles traveling to construction sites would coordinate times of work so convoys may be implemented.

• Construction workers and supervisors would be informed about the special sensitivity of the National Seashore’s values, regulations, and appropriate housekeeping.

• According to 2006 *Management Policies*, the National Park Service would strive to construct facilities with sustainable designs and systems to minimize potential environmental impacts. Development would not compete with or dominate monument’s features, or interfere with natural processes, such as the seasonal migration of wildlife or hydrologic activity associated with wetlands. To the extent possible, the design and management of facilities would emphasize environmental sensitivity in construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings. The National Park Service also reduces energy costs, eliminates waste, and conserves energy resources by using energy-efficient and cost-effective technology. Energy efficiency is incorporated into the decision-making process during the design and acquisition of buildings, facilities, and transportation systems that emphasize the use of renewable energy sources.

### Alternatives Considered and Dismissed

The following three alternatives were considered for project implementation, but were ultimately dismissed from further analysis (the last bullet is a combination of the first two alternatives). Reasons for their dismissal are provided in the following alternative descriptions. Each of these alternatives which were considered but dismissed consisted of using the pre-existing sea turtle patrol cabin.

• **Expansion of Current Sea Turtle Patrol Cabin without Expanding the Headquarters Incubation Facility** – This alternative consisted of utilizing the current patrol cabin in place, but expanding it so the park could accommodate the successful sea turtle program and its need for
additional patrollers. This alternative would have consisted of no new construction, and no additional buildings would have been constructed. This alternative would have caused patrollers to commute each morning and evening, at the beginning and end of their patrols, to their designated survey areas as they do currently. The added fuel expense and carbon footprint driving the sea turtle monitor vehicles (UTVs) would be higher than the preferred alternative. Also, this does not allow for expansion of the Headquarters incubation facilities or the sea turtle egg incubation corrals to be placed at supervised locations at the park’s 30 and 50-mile mark locations. The only corral would then be where it is today at the current cabin; therefore, causing longer transport of eggs in vehicles, which could lead to egg injury or loss. The capacity of the Headquarters incubation facility would quickly reach capacity requiring less than optimal spacing of incubation containers within the existing facility. Temperature control would not be optimal and hatching success would be reduced. This alternative of expanding only the current turtle patrol facility was eliminated for feasibility reasons and because the alternative would not meet the project’s objectives.

- **Construction of Only One Sea Turtle Patrol Cabin with Current Cabin** – This alternative consisted of leaving the current sea turtle patrol cabin in its current place, and supplementing it with another patrol cabin in another location. This alternative was seriously considered to keep costs down for construction; however, this alternative was dismissed for reason of the need for specific geographic positioning of the cabins, improving efficiency of the recovery program’s survey efforts, safety, as well as better placement of egg incubation corrals. Additional space in the Headquarters incubation facility would still be needed in the near future. This alternative would have offset the cabins by ten miles from the preferred locations. This alternative also does not address the need for expanding the current lab facilities.

- **Construction of Only One Sea Turtle Patrol Cabin, but also Expanding Current Cabin** – This alternative consisted of combining the two preceding alternatives; however, for reasons of dismissing the two prior, this alternative was not selected.

- **Construction of Only the Headquarters Incubation Facility** – This alternative does not meet the majority of the objectives for this project. It would not accommodate the increase of personnel, and it would not increase the safety of the program for park staff and sea turtle egg embryo.

**Alternative Summaries**

Table 2 summarizes the major components of Alternatives A and B, and compares the ability of these alternatives to meet the project objectives (the objectives for this project are identified in the *Purpose and Need* chapter). As shown in the following table, Alternative B meets each of the objectives identified for this project, while the No Action Alternative does not address all of the objectives.

<table>
<thead>
<tr>
<th>Alternative Elements</th>
<th>Alternative A – No Action</th>
<th>Alternative B – Preferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabins and Living/Operational Space</td>
<td>The existing sea turtle patrol cabin would continue to function as employee accommodations, and the cabin and Headquarters facility would continue to provide operational space for the sea turtle science and recovery program.</td>
<td>Two new cabins would be constructed, measuring roughly 2,500 square feet each. Construction of the cabins would offer overnight accommodations for the additional staff that would be needed by the expanding program. The old sea turtle cabin would be decommissioned by the sea turtle program, and all backcountry patrol staff’s accommodations would be moved to the two new cabins. The old cabin would be gifted to law enforcement, providing support for backcountry...</td>
</tr>
<tr>
<td><strong>Sea Turtle Egg Facilities</strong></td>
<td>The incubation corral located at the current cabin would remain, and no additional backcountry corrals would be constructed. Vehicles would continue to transport eggs to the current corral, causing some clutches to be transported more than 20 miles across extremely difficult driving conditions and rough terrain.</td>
<td>Two new incubation corrals could be constructed in the park’s backcountry, providing egg incubation deposition locations for egg transports at intervals no more than approximately 10 miles apart; therefore, reducing the duration of time the eggs would be handled, and the amount of rough terrain the eggs would need to be transported across. Time of movement after laying may cause a significant decrease in relative hatching success. The Headquarters incubation facility would be expanded which would provide sufficient space for current and future incubation and staff needs.</td>
</tr>
<tr>
<td><strong>Access and Operational Efficiency</strong></td>
<td>The cabin would continue to be the start and end points for backcountry patrol surveys each day, with access to the cabin via the Gulf beach. Commuting to the patrollers’ survey areas would be necessary at the start and end of each day. Access to Headquarters and the current incubation lab would continue via Park Road 22.</td>
<td>Construction of the new cabins would provide closer access for the backcountry patrol survey areas at the start and end of each day. Offering closer access provides for a more efficient program by reduction of demands on utility terrain vehicles (UTVs) and fuel for patrols, as well as offering less time commuting to and from survey areas each day. Staff working in the Headquarters incubation facilities expansion would access the facility from Park Road 22 and would park their vehicles in the existing parking area within the Headquarters complex.</td>
</tr>
<tr>
<td><strong>Employee Safety</strong></td>
<td>Operations and activities would continue as they do in their present form, and safety would continue to be considered highest priority and applied as indentified in current, up-to-date protocols. The existing cabin would remain the only shelter in the backcountry beach to offer refuge during times of need.</td>
<td>The two new cabins would offer two additional locations for backcountry patrollers to take refuge from inclement weather, or could potentially offer solace from a dangerous situation arising within the park. The new cabins would contain first aid and first responder supplies. The existing sea turtle cabin would be decommissioned and gifted to the park’s Division of Visitor Safety and Resource Protection; therefore, increasing opportunities for Protection Rangers’ and emergency medical technicians (EMTs) presence on the Gulf beach. The expanded Headquarters incubation facility would provide sufficient working space for</td>
</tr>
<tr>
<td>Visitor Safety</td>
<td>Safety would continue to be considered highest priority and applied as indentified in current, up-to-date protocols.</td>
<td>The new cabins would contain first aid and first responder supplies, as well as offer a place where visitors may be able to locate park staff and communications during a time of need. The present sea turtle cabin would be decommissioned and gifted to the park’s Division of Visitor Safety and Resource Protection; therefore, increasing opportunities for Protection Rangers’ and emergency medical technicians (EMTs) presence on the Gulf beach.</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Project Objectives</strong></td>
<td><strong>Meets Project Objectives?</strong></td>
<td><strong>Meets Project Objectives?</strong></td>
</tr>
<tr>
<td>Provide facilities that would support the sea turtle program’s demands for increased overnight accommodations and increased area for controlled incubation, along with additional office space.</td>
<td>No. The cabin would not accommodate the extra backcountry patrollers. The Current incubation facilities would not accommodate future need incubation services and office space.</td>
<td>Yes. Two new sea turtle patrol cabins would provide the additional overnight accommodations for the increase in the program’s personnel number. The expanded headquarters incubation facility would provide sufficient space for incubating addional eggs produced by program success and working space for staff needed to take care of the eggs.</td>
</tr>
<tr>
<td>Provide improved employee safety.</td>
<td>No. Operations and activities would continue as they do in their present form, and safety would continue to be considered highest priority and applied as indentified in current, up-to-date protocols. The existing cabin would remain the only shelter in the backcountry beach to offer refuge during times of need. Staff working in the Headquarters incubation facility would still have to share work spaces designed for single employees.</td>
<td>Yes. The two proposed cabins would offer two additional locations for backcountry patrollers to take refuge from inclement weather, or could potentially offer solace from a dangerous situation arising within the park. The new cabins would contain first aid and first responder supplies. The present sea turtle cabin would be decommissioned and gifted to the park’s Division of Visitor Safety and Resource Protection, therefore offering better opportunities for Protection Rangers’ increased presence on the beach. The expanded headquarters incubation facility would provide sufficient space for employees to work in uncrowded, safe areas.</td>
</tr>
<tr>
<td>Provide opportunities for better sea turtle egg incubation facilities within safe transport distances (time) for eggs.</td>
<td>Unknown. With unknown safe distances for sea turtle egg vehicle transport across rough terrain, the best estimates the park has for the current location for the incubation corral is considered —far! while transporting eggs during times of poor beach driving conditions. Time of moving eggs after laying may cause a significant decrease in relative hatching success (Limpus 1979).</td>
<td>Yes. Distances of sea turtle egg transport would be reduced by more than 50% of the distance of current condition. Reducing the eggs transport time equates to reducing the duration of eggs handled, therefore reducing the potential for eggs to be injured or destroyed from movement.</td>
</tr>
<tr>
<td>Provide efficient access</td>
<td>Yes and No. The existing cabin is</td>
<td>Yes. The new cabins would replace the</td>
</tr>
</tbody>
</table>
locations for park staff to facilitate the sea turtle program’s daily patrol operations.  
more convenient for facilitating backcountry patrols compared with starting out at the park’s headquarters; however, the daily commutes to and from patrollers’ survey areas are inefficient.  
current cabin, providing more convenient, efficient survey start and end point locations for the program’s operations. The increased efficiency for this action would reduce fuel demands, lowering park expenses, the park’s carbon footprint, and maintenance needs in relation to the miles surveyed and applied to sea turtle patrols. Park personnel would also be applying time to monitoring survey areas as opposed to commuting to survey site.

<table>
<thead>
<tr>
<th>Prevent impairment to park resources and values.</th>
<th>Yes. Without constructing the new cabins and the additional incubation facilities there would be no potential for park resources and values to be impaired.</th>
<th>Yes. With the applied mitigation measures no impairment of park resources and values would result.</th>
</tr>
</thead>
</table>

Table 3 summarizes the anticipated environmental impacts for alternatives A and B. Only those impact topics that have been carried forward for further analysis are included in this table. The *Environmental Consequences* chapter provides a more detailed explanation of these impacts.

Table 3 – Environmental Impact Summary by Alternative

<table>
<thead>
<tr>
<th>Impact Topic</th>
<th>Alternative A – No Action</th>
<th>Alternative B – Preferred Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topography, Geology, and Soils</td>
<td>No new disturbance of topography, geology, or soils would occur from this alternative.</td>
<td>Placement and construction of new cabins would require access through dunes, which could result in minor, direct, adverse effects. Any impacts or loss of dune features would be reestablished by re-contouring, reassembling, and through natural processes. Placement of the Headquarters incubation facility expansion allows for access across previously modified surfaces and will not alter the surface from its current condition.</td>
</tr>
<tr>
<td>Special Status Species</td>
<td>No new disturbance to special status species would occur from this alternative.</td>
<td>Negligible to minor, direct, adverse effects would occur to piping plovers by disturbance of vehicle while beach driving; however, mitigation measures would address this by minimizing beach travel. The proposed action would have minor to moderate beneficial effects for establishment of the Kemp’s ridley sea turtle, as well as all five of the nesting sea turtle species on the National Seashore. Formal Consultation will occur to address any type of take on piping plovers or sea turtle species.</td>
</tr>
<tr>
<td>Visitor Use and Experience</td>
<td>No new disturbance of lands would occur under this alternative; therefore, no disturbance to view shed. Negligible effects to visitor safety.</td>
<td>Minor, direct, adverse effects resulting from changes to the view shed, and also from noise generated during construction. The impact to the view shed is expected to be long-term, lasting the duration of the cabins’ presence. Beneficial effects to visitors’ safety, by providing additional locations where visitors may reach park staff and communications during times of emergency.</td>
</tr>
<tr>
<td>Park Operations</td>
<td>Minor, direct, adverse effects resulting from employees working in a less efficient program. The inefficiency could ultimately lead to safety.</td>
<td>Minor to moderate, direct and indirect, beneficial effects from an improved work environment that meets health and safety standards. Minor, direct, short-term, adverse effects from time needed for planning and constructing new cabins.</td>
</tr>
<tr>
<td>Impact Topic</td>
<td>Alternative A – No Action</td>
<td>Alternative B – Preferred Alternative</td>
</tr>
<tr>
<td>--------------</td>
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<tr>
<td></td>
<td>concerns with a direct, minor to moderate, adverse effect.</td>
<td>Negligible to minor, direct, adverse effects would occur to floodplains from construction of two new sea turtle cabins along the Gulf of Mexico shoreline; however, the two new facilities would be constructed on stilts, placing the facility above storm water velocity elevations.</td>
</tr>
<tr>
<td>Floodplains</td>
<td>No new disturbance to floodplains would occur from this alternative.</td>
<td></td>
</tr>
</tbody>
</table>

**Environmentally Preferred Alternative**

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which guides the Council on Environmental Quality (CEQ). The CEQ provides direction that “[t]he environmentally preferable alternative is the alternative that would promote the national environmental policy as expressed in NEPA’s §101:

- fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life’s amenities; and
- enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Although alternative A, no-action, attains the widest range of beneficial uses of the environment, the risk of health and safety to the National Seashore’s employees working in the backcountry is not addressed; therefore, alternative A only minimally meets the above six evaluation factors. This alternative also does not meet the criteria for improving renewable resources because the existing sea turtle patrol operations are less inefficient with regards to energy.

Alternative B is the environmentally preferred alternative because it best addresses these six evaluation factors. Alternative B, *Construction of Two New Sea Turtle Patrol Cabins and expand the Headquarters incubation facility*, would provide a working environment for park staff that meets health and safety recommendations, while minimizing environmental impacts to the extent possible. As a permanent facilities, the new sea turtle cabins and incubation facility would be used by future generations. The new cabins would also be more energy efficient and more environmentally-friendly than the existing sea turtle patrol cabin. The carbon footprint and maintenance cycle would be minimized by reducing commute time of UTVs to and from their specific, daily survey areas.

No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document. Because it meets the purpose and need for the project, the project objectives, and is the environmentally preferred alternative, alternative B is also recommended as the National Park Service preferred alternative. For the remainder of the document, alternative B will be referred to as the preferred alternative.
ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the potential environmental consequences, or impacts, that would occur as a result of implementing the proposed project. Topics analyzed in this chapter include topography, geology, and soils; special status species; park operations; visitor use and experience; and floodplains. Direct, indirect, and cumulative effects, as well as impairment are analyzed for each resource topic carried forward. Potential impacts are described in terms of type, context, duration, and intensity. General definitions are defined as follows, while more specific impact thresholds are given for each resource at the beginning of each resource section.

- **Type** describes the classification of the impact as either beneficial or adverse, direct or indirect:
  - **Beneficial**: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
  - **Adverse**: A change that moves the resource away from a desired condition or detracts from its appearance or condition.
  - **Direct**: An effect that is caused by an action and occurs in the same time and place.
  - **Indirect**: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.

- **Context** describes the area or location in which the impact will occur. Are the effects site-specific, local, regional, or even broader?

- **Duration** describes the length of time an effect will occur, either short-term or long-term:
  - **Short-term**: Impacts generally last only during construction, and the resources resume their pre-construction conditions following construction.
  - **Long-term**: Impacts last beyond the construction period, and the resources may not resume their pre-construction conditions for a longer period of time following construction.

- **Intensity** describes the degree, level, or strength of an impact. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. Because definitions of intensity vary by resource topic, intensity definitions are provided separately for each impact topic analyzed in this environmental assessment.

**Cumulative Impact Scenario**

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), require assessment of cumulative impacts in the decision making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for both the no-action and preferred alternative.

Padre Island National Seashore’s development consists of the Malaquite Visitor Center and concession facility, the park headquarters, two park residences, a 40-site recreational vehicle and tent campground, a hazardous waste facility, a wastewater treatment facility, Bird Island Basin and Yarborough Pass visitor use areas, a 185’ communications monopole, and a 1 mile paved Grasslands Nature Trail. The paved, two-lane Park Road 22 provides access into the park, westward to Bird Island Basin, and south to the Gulf of Mexico beach. The beach then becomes the primary transportation corridor, 60 miles to the south end of the park. The beach is hard and accessible by both two and four-wheel drive vehicles for the first five miles of Gulf beach, at which point the remaining 55 miles of beach corridor is accessible only by
four-wheel drive vehicles. Access to the park is also available via boat in the Laguna Madre and Gulf shorelines.

In total, existing park development occupies approximately 400 acres or 0.3% of the park. There are no past park developments or activities that continue to impact the park’s resources or values. New developments are planned in the future and include the installation of a new 200’ communications tower and a new Law Enforcement facility. Park operations that could contribute to impacts on park resources and values include prescribed fires, routine maintenance of the park roads, future park development, park and visitor vehicle use, and public recreational activities such as motor boating, and burning of campfires.

Cumulative impacts were determined by combining the impacts of the preferred alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Padre Island National Seashore and, if applicable, the surrounding region. Because the scope of this project is relatively small, the geographic and temporal scope of the cumulative analysis is similarly small. The geographic scope for this analysis includes actions within the National Seashore’s boundaries, while the temporal scope includes projects within a range of approximately ten years. Given this, the following projects were identified for the purpose of conducting the cumulative effects analysis, listed from past to future:

- **Oil and Gas Management Plan, 2000**: The 2000 Oil and Gas Management Plan for Padre Island National Seashore was prepared for the purpose of guiding the management of activities associated with the exploration and development of nonfederal oil and gas within the park. The Oil and Gas Management Plan identifies those park resources and values most sensitive to oil and gas exploration and development disturbance, and defines impact mitigation requirements to protect such resources and values. In order to protect park resources and values, the plan establishes performance standards for oil and gas exploration and development, and it provides pertinent information to oil and gas owners and operators to facilitate compliance with applicable regulations (NPS 2000).

- **Septic System Conversion to Wetland Lagoons, 2001**: The National Seashore converted the septic system from agitation pools to wetland lagoons, benefiting wildlife that use the facility, in addition to lowering operational costs and maintenance of the facility.

- **Development of BNP Petroleum’s Peach Pad, 2004**: Two plans of operations with 5 wells were approved and developed at the end of Pan Am Rd. The site consists of a 2.92 acres pad, and a 0.7 mile extension of Pan Am Rd. The site is currently scheduled to be plugged, abandoned, and reclaimed.

- **Development of Fire Management Plan, 2004**: The National Seashore’s fire management plan was completed in December 2004. One of the primary actions prescribed by the plan is the reduction of hazardous fuels around the National Seashore’s northern end of the park, where urban interface and park developments occur. The prescribed area for fire, the Malaquite Beach Fire Management Unit, encompasses 5,018 acres, consisting of five rotating annual treatment areas that vary in size from a few hundred acres to over 3,300 acres. There are three other fire treatment areas in the Down Island Fire Management Unit, totaling 38,000 acres.

- **Construction of Sea Turtle Lab Facility, 2005**: New Sea Turtle Science offices and incubation laboratory, supporting the recovery of Kemp’s ridley and four other sea turtle species.

- **Construction of Communications Monopole, 2005**: Installation of a 185 foot communication monopole at Park Headquarters in 2005 for improved park communication and border related safety issues.

- **Improvements to Bird Island Basin Recreational Area, 2005**: This development included the repair and enlargement of Bird Island Basin’s boat ramp and parking facilities. A 0.6 mile road was constructed, separating the boat ramp from the wind surfing facility, while also restoring hydrology to
one of the park’s sensitive wind tidal flats. Three vault toilet systems were installed, and a building to facilitate sales was constructed by the National Seashore’s wind surfing recreation concessionaire.

- **Development of Kindee Oil and Gas Texas’ Wilson Pad and Road, 2006:** The National Seashore is currently awaiting a reclamation plan from Kindee Oil and Gas Texas to restore the 2.6 acre pad and 0.8 mile road. The other approved well has been abandoned by Kindee Oil and Gas.

- **Reclamation of Malaquite Beach Visitors Center’s Parking Lot, 2008:** The National Seashore removed 2.3 acres of the over-engineered Malaquite Beach Visitors Center’s parking lot. This parking lot was completed in 1969 with expectations of larger numbers of visitors than what the park experiences. Because the parking lot has never been utilized to its full extent, the National Seashore removed approximately one quarter of the area, restoring the area to the natural landscape.

- **Boundary Installation, 2010:** The National Seashore is currently installing buoys for water marking the Laguna Madre boundary to support law enforcement and jurisdiction over wildlife poaching cases.

- **Development of BNP Petroleum Lemon Pad, Ongoing:** The 2002 approved plan of operations was developed in 2008, drilling one of the two wells for this site, consisting of a 2.7 acre pad and a 200 meter road. One well is still permitted and may be developed anytime in the near future.

- **Development of BNP Petroleum DM 11A, ST 991 #1, and ST991 #2, Ongoing:** The 2007 approved plan of operations still has one of three wells that may be developed on this 1.5 acre site.

- **Exotic Vegetation Management, Ongoing:** The National Seashore has been treating its exotic vegetation for the past five years. In fiscal year 2007, stands of *Arundo donax* were treated. Because success is achieved by treating the same areas for 4 to 5 years, future work would focus on maintaining the already treated areas and limiting the number of new areas treated. Currently, Resource Management is having some genetic work completed to determine if the park’s *Phragmites australis* is of the old or new world phenotypes.

- **Implementation of the NMFS and USFWS 1992 Recovery Plan for Kemp’s ridley Sea Turtle, Ongoing:** The National Seashore continues to comply with Section 7 of the Endangered Species Act and follow guidance of the U.S. Fish and Wildlife Service and National Marine and Fisheries Service Kemp’s ridley recovery plan.

- **Reclamation of BNP Petroleum A6 Pad and Road, Ongoing:** The National Seashore is currently awaiting a reclamation plan from BNP Petroleum to restore this site’s 0.4 acre pad and the associated 0.3 mile road.

- **Construction of Law Enforcement Ranger Station, Ongoing:** During late winter, 2005, the National Seashore’s Law Enforcement and Resources Management facility burnt down due to electrical problems. While Resources Management moved operations into the Administration building at Park Headquarters, Law Enforcement moved to a temporary facility in the Malaquite Visitor Center parking lot. The park has secured funding to build a new facility that will be within the footprint of the temporary facility currently in place. Construction is scheduled to begin in 2011.

- **Maintenance Activities, Ongoing:** Throughout the park unit, regularly-scheduled maintenance activities are conducted to ensure visitor health and safety. These activities have involved infrastructure maintenance and upkeep, such as ensuring water quality and access. Regular repairs to roads and concrete ramps have also occurred on a continuing basis. Regular park facility maintenance is continually occurring at the National Seashore. To ensure historic structures remain in good condition, the NPS continually monitors the condition of the Novillo Line Camp to ensure that if any degradation occurs, funding can be sought to stabilize and repair the structure (NPS
The potential for impacts to soils, vegetation, park operations, and visitor experience exists from maintenance activities.

**Increasing Demand for Regional Public Lands; Ongoing:** Padre Island National Seashore is the largest stretch of undeveloped public beach within the United States, providing numerous opportunities for access to diverse, affordable outdoor land- and water-based recreation activities. In the State of Texas, only 3% of total land base is open to the public; this reflects a relative dearth of public recreational opportunities compared to other states (NPS 2007c). Increasing demand for regional public lands can affect visitor use and experience.

**Reclamation of Non-federal mineral sites, Future:** As wells are plugged and abandoned within the park, reclamation of the pads and road would occur. There is potential for half of the sites to be reclaimed within the next five years.

**Installation of 200 Foot Communications Tower, Future:** The Department of Homeland Security (DHS) has proposed installing a 200 foot communications tower within the park boundary to better support communications and national security. If developed, the National Seashore would dismantle the current tower and move all park communications to the DHS tower.

### Soils, Geology, and Topography

#### Intensity Level Definitions

The methodology used for assessing impacts to soils, geology, and topography is based on how the project would affect the features for which the structure is significant. To analyze these impacts, all available information on soils, geology, and topography in the park was compiled from personal observations, consultation with other agencies, approved park documents, NRCS Soil Series and Classification Surveys, and USGS landcover classification data. The thresholds for this impact assessment are as follows:

**Negligible:** Operations would not cause discernible alteration to geologic layers, surficial, and shallow geology. Alteration to soils and geology would be so slight that it would not affect the geology/soils ability to sustain biota, water quality, and hydrology, such that reclamation would not be necessary.

**Minor:** Operations would cause localized or limited alteration to geologic layers, surficial, and shallow geology. Alteration to soils and geology would affect its ability to sustain biota, water quality, and hydrology, such that reclamation would be achievable within 2 years. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

**Moderate:** Operations would cause alteration to geologic layers, surficial, and shallow geology. Alteration to soils and geology would affect its ability to sustain biota, water quality, and hydrology, such that reclamation would be achievable within 3-5 years. Mitigation measures, if needed to offset adverse effects, could be extensive but would likely be successful.

**Major:** Operations would cause substantial alteration to geologic layers, surficial, and shallow geology. Alteration to soils and geology would have a lasting effect on the geology/soil’s ability to sustain biota, water quality, and hydrology, such that reclamation could not successfully be achieved. Extensive mitigation measures would be needed to offset any adverse effects and their success could not be guaranteed.

#### Impacts of Alternative A (No-Action Alternative)

The no-action alternative would have no effects on soils, geology, and topography because the National Seashore would remain unchanged. In particular, the natural processes of the Gulf beach and its
environment would remain unchanged, thereby not affecting the current form of the beach and its surrounding areas.

**Impacts of Alternative B (Preferred Alternative)**

The preferred alternative would have minor adverse, direct effects to soils, geology, and topography at the National Seashore. The construction of two new sea turtle patrol cabin under the preferred alternative would consist of ground disturbance, which at its largest extant could include the removal or repositioning of a small area of dunes. Sand transport and dune migration would continue to be an issue, so revegetating and routine maintenance would be ongoing. Construction of the incubation facility in the headquarters compound would take place on ground previously disturbed that has not been reclaimed and no new disturbance would be created. This area currently has an engineered caliche base with a maintained native grass and sand burr lawn covering.

Mitigation measures proposed to offset adverse effects would be simple, including measures to ensure that topsoil is preserved, the Gulf beach and dunes are reshaped into the natural contours, and that there is no unnatural erosion of soils. Excavated material would be reused on site. Construction equipment would be thoroughly pressure washed and checked by park resources staff for cleanliness before entering the park. Appropriate erosion control devices would be used during construction to control any runoff.

All impacts would be site-specific, but could be long-term, lasting the duration of the cabins’ and the Headquarters incubation facilities presence. If the cabins were ever removed, reclamation would occur naturally within two years. There would be no indirect impacts to soils, geology, or topography from the preferred alternative.

**Cumulative Effects:** Construction projects continue at the National Seashore, disturbing various amounts of soils, geology, and topography, which can lead to minor amounts of erosion. Rehabilitation efforts and erosion control are standard practice. Additionally, future oil and gas development and visitors traveling off-trail would continue to cause disturbance of soils, geology, and topography. When added to other projects occurring in the park, construction of these two new cabins would cause minor cumulative impacts to soils, geology, and topography.

**Conclusion:** When combined with other past, present, and foreseeable future actions that would result in impacts to soils, geology, and topography, this alternative would contribute a minor impact to the amount of disturbance to the cumulative scenario. Because there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Padre Island National Seashore; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park’s general management plan or other relevant NPS planning documents, there would be no impairment of the park’s resources or values.

**Special Status Species**

**Intensity Level Definitions**

The methodology used for assessing impacts to special status species is based on how the project would affect the features for which the structure is significant. To analyze these impacts, all available information on special status species in the park was compiled from park documents, outside research, and Federal (USFWS) and State (TPWD) species lists. The thresholds for this impact assessment are as follows:

- **Negligible:** Impacts would result in a change to a population or individuals of a special status species, but the change would be well within the range of natural fluctuations.

- **Minor:** An action that would affect a few individuals of a special status species or have very localized impacts upon their habitat. The change would have barely perceptible consequences to the species or habitat function. Sufficient habitat would remain functional to maintain species viability. Impacts would be outside of critical
reproduction periods. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

**Moderate:** An action that would cause measurable effects on: (1) a relatively small percentage of the species population, (2) the existing dynamics between multiple species (e.g., predator-prey, herbivore-forage, vegetation structure-wildlife breeding habitat), or (3) a relatively large habitat area or important habitat attributes. A population or habitat might deviate from normal levels under existing conditions, but would remain indefinitely viable within the preserve. Response to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, or other factors impacting short-term population levels. Mitigation measures, if needed to offset adverse effects, could be extensive, but would likely be successful.

**Major:** An action that would have drastic and permanent consequences for a species population, dynamics between multiple species, or almost all available unique habitats. A population or its habitat would be permanently altered from normal levels under existing conditions, and the species would be at risk of extirpation from the preserve. Frequent responses to disturbance by some individuals would be expected, with negative impacts to feeding, reproduction, or other factors resulting in a decrease in population levels. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

**Affected Environment**

Under the Endangered Species Act of 1973 (ESA), the NPS has responsibility to address impacts to Federally-listed, candidate, and proposed species. Also, NPS policy requires that State-listed species, and others identified as species of management concern by the park, are to be managed in parks in a manner similar to those that are Federally-listed.

A letter from Texas Parks and Wildlife Department (TPWD), dated March 15, 2010, was received by the park with recommendations concerning rare species and lighting of the cabins. The species identified by the TPWD include: brown pelican (*Pelicanus occidentalis*), northern aplomado falcon (*Falco femoralislis septentrionalis*), piping plover (*Charadrius melodus*), sheep frog (*Hydropus variolosus*), south Texas siren (large form) (*Siren sp. 1*), peregrine falcon (*Falco peregrinus*), reddish egret (*Egretta rufescens*), white-faced ibis (*Plegadis chihi*), white-tailed hawk (*Buteo albicaudatus*), spot-tailed earless lizard (*Holbrookia lacera*), and the succulent plant, roughseed sea-purslane (*Sesuvium trianthemoides*). Of these species, all have been documented within the park except the two amphibian species, sheep frog and south Texas siren. Both of these species are listed as Threatened by TPWD. One other State-listed Threatened species which is not documented as being within the National Seashore, but could be occurring is the scarlet snake (*Cemophora coccinea*).

Padre Island National Seashore does not have any critical habitat designated within the park. According to a March 1, 2010 listing of federally protected species and the Texas Parks and Wildlife Department’s website (http://www.tpwd.state.tx.us/huntwild/wild/species/endang/index.phtml), 47 listed Federal and/or State protected species potentially occur at the National Seashore (Appendix A). Of these, the 25 species that have actually been documented at Padre Island National Seashore are listed in Table 4 below. The remaining 22 species have either not been documented and/or there is not suitable habitat within the park.

**Table 4 – State and Federally-listed species known to occur within Padre Island National Seashore**

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>FEDERAL</th>
<th>STATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(T – Threatened, E – Endangered, C – Candidate, SOC – Species of Concern, and S/A – Similar in Appearance)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reptiles and Amphibians</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Alligator (<em>Alligator mississippiensis</em>)</td>
<td>T (S/A)</td>
<td></td>
</tr>
</tbody>
</table>
The Cerulean Warbler, Black-capped Vireo, and Tropical Parula are neotropical migratory bird species. The following threatened or endangered species do not occur within the proposed construction site due to Impacts of Alternative A (No-Action Alternative) that may be found at park Headquarters during the spring and fall migration. These species do not reside would remain unchanged. In particular, the natural processes of the Gulf beach and its environment would remain unchanged, thereby not affecting the Gulf beach and the species using it.

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>FEDERAL</th>
<th>STATE</th>
</tr>
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<tbody>
<tr>
<td>Atlantic Hawksbill Sea Turtle (<em>Eretmochelys imbricata</em>)</td>
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<tr>
<td>Green Sea Turtle (<em>Chelonia mydas</em>)</td>
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<tr>
<td>Kemp's Ridley Sea Turtle (<em>Lepidochelys kempii</em>)</td>
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<tr>
<td>Loggerhead Sea Turtle (<em>Caretta caretta</em>)</td>
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<tr>
<td>Leatherback Sea Turtle (<em>Dermochelys coriacea</em>)</td>
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<tr>
<td>Spot-tailed Earless Lizard (<em>Holbrookia lacerata</em>)</td>
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<tr>
<td>Texas Horned Lizard (<em>Phrynosoma cornutum</em>)</td>
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<tr>
<td>Texas Indigo Snake (<em>Drymarchon melanurus erebennus</em>)</td>
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<tr>
<td>Texas Tortoise</td>
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<th>Birds</th>
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<tr>
<td>Eastern Brown Pelican (<em>Pelecanus occidentalis</em>)</td>
<td>Delisted</td>
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<tr>
<td>Reddish Egret (<em>Egretta rufescens</em>)</td>
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<td>T</td>
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<tr>
<td>White-faced Ibis (<em>Plegadis chihi</em>)</td>
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<td>T</td>
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<tr>
<td>Wood Stork (<em>Mycteria americana</em>)</td>
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<tr>
<td>Sooty Tern (<em>Sterna fuscata</em>)</td>
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<tr>
<td>Piping Plover (<em>Charadrius melodus</em>)</td>
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<tr>
<td>Bald Eagle (lower 48 states) (<em>Haliaeetus leucocephalus</em>)</td>
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<tr>
<td>Northern Aplomado Falcon (<em>Falco femoralis septentrionalis</em>)</td>
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<tr>
<td>Swallow-tailed Kite (<em>Elanoides forficatus</em>)</td>
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<tr>
<td>White-tailed Hawk (<em>Buteo albicudatus</em>)</td>
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<tr>
<td>American Peregrine Falcon (<em>Falco peregrines anatum</em>)</td>
<td>Delisted</td>
<td>T</td>
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<tr>
<td>Cerulean Warbler (<em>Dendroica cerulea</em>)</td>
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<tr>
<td>Black-capped Vireo (<em>Vireo atricapillus</em>)</td>
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<tr>
<td>Tropical Parula (<em>Parula pitiayumi</em>)</td>
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<tr>
<th>Plants</th>
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<tbody>
<tr>
<td>Roughseed Sea-purslane (<em>Sesuvium triantheomoides</em>)</td>
<td>C</td>
<td>SOC</td>
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<tr>
<td>Slender rush-pea (<em>Hoffmannseggia tenella</em>)</td>
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**Impacts of Alternative A (No-Action Alternative)**

The no-action alternative would have no effects on special status species because the National Seashore would remain unchanged. In particular, the natural processes of the Gulf beach and its environment would remain unchanged, thereby not affecting the Gulf beach and the species using it.

**Impacts of Alternative B (Preferred Alternative)**

The following threatened or endangered species do not occur within the proposed construction site due to unsuitable habitat and therefore would not be affected by the proposed action: American alligator, wood stork, bald eagle, white-tailed hawk, swallow-tailed kite, cerulean warbler, black-capped vireo, and tropical parula. The proposed construction sites locations do not include habitat utilized by these species; however, in the case of an accidental or vagrant species, the impacts caused by construction traffic would be negligible, lasting only as long as required for the vehicle to pass. In addition, due to the rarity of these species occurring at the proposed site locations, impacts from construction activities would be negligible and short term, lasting only the duration for time of construction.

The Cerulean Warbler, Black-capped Vireo, and Tropical Parula are neotropical migratory bird species that may be found at park Headquarters during the spring and fall migration. These species do not reside
at the park for longer than a few days as they rebuild fat stores and gather enough energy to continue migration. If present at park Headquarters, these species are located in the common reed and giant reed vegetation located on the north side of Headquarters, approximately 200 feet away from the proposed construction site. Construction activities traveling to and from the construction site could have an adverse effect by flushing birds resting in the cane as they pass along the entrance road to park Headquarters. This impact would be negligible and short term lasting only as long as it takes the vehicle to pass. In addition, this effect is no different than other NPS or visitor vehicles that enter and leave the park Headquarters. The proposed construction site for the expansion of the Headquarters incubation facilities and the proposed construction site for the sea turtle patrol cabins does not include habitat utilized by these species.

Northern Aplomado Falcons, Swallow-tailed Kites, and White-tailed Hawks do not generally occur in the area of the proposed construction sites. These species forage for small mammals and reptiles located in grassland communities throughout the park. These species are routinely seen foraging along Park Road 22 despite vehicular traffic traveling along this road. Due to their apparent tolerance for vehicles and pedestrian traffic any impacts from construction traffic would be negligible, lasting only as long as required for the vehicle to pass. In addition, due to the rarity of these species occurring at park Headquarters, impacts from construction activities would be negligible.

American Peregrine Falcons are routinely observed within the park during the fall, winter, and spring seasons. For the past several years, a Peregrine Falcon has utilized the park’s radio tower located at the Headquarters to roost. This individual has tolerated vehicular traffic, construction, people, and other bird species without vacating the area. Any impact associated with the construction of the new laboratory would be minimal and short term lasting only as long as the activity. Peregrine Falcons may also be found along the Gulf beach, foraging on shorebirds. Construction activities traveling to and from the proposed sea turtle patrol cabins construction site could have an adverse affect by flushing birds resting or foraging as they pass along the Gulf beach. This impact would be negligible and short term lasting only as long as it takes the vehicle to pass. In addition, this effect is no different than other NPS or visitor vehicles that enter and leave the park Headquarters.

Sooty Terns, Reddish Egrets, White-faced Ibis, and Eastern Brown Pelicans can be found loafing or foraging along the Gulf beach. Construction activities traveling to and from the proposed cabin construction sites would have an adverse effect by flushing birds as they pass along the beach. These individual have tolerated vehicular traffic, construction, people, and other bird species without vacating the area. This effect is no different than other NPS or visitor vehicles that enter and leave the Gulf beach. Any impact associated with the construction of two new sea turtle patrol cabins, i.e., displacement, would be minor and short term lasting only as long as the activity.

Spot-tailed Earless Lizards, Texas Horned Lizards, and Texas Indigo Snakes may be found within the proposed location for the Headquarters incubation facility. As this is within a previously disturbed area, within the common area of the park Headquarters with heavy foot traffic, any impact to these two species is considered negligible. These species have tolerated park staff and visitors, and any impact to them through this action, i.e., displacement, is considered short-term lasting only the duration of construction. These species may also be found at the sites for the proposed cabins. To prevent any type of take on these species, a monitor would be onsite for any sightings for these reptile species; therefore, the proposed action would be negligible and short-term, lasting only the duration for time of construction.

The proposed sites have been surveyed for Roughseed Sea-purslane, and no purslanes, of any variety, were located. As an additional measure, a monitor will be onsite during construction to prevent any take of a listed vegetative species. The proposed construction sites, as well as the sites which would be accessed for this proposed action are not suitable for Slender Rush-pea.
The expansion of the Headquarters incubation facility will have little to no effect on special status species because construction will be within a highly modified area that is heavily used by park staff and provides very little suitable habitat for listed or proposed species. NPS determines that the construction of the Headquarters incubation facility would have no effect to State or Federally-listed threatened and endangered species or their habitat within the park. This determination is based upon a combination of factors. First, the habitat in the action area is not suitable for several of the species identified by U.S. Fish and Wildlife Service (i.e., sea turtles, piping plover). Second, there is an absence of observations for many of the species listed in Appendix B (e.g., Ocelot). Third, the construction site and associated activities would have negligible, short-term impacts on few species that possibly could occur within the construction site. Fourth, discussions with the U.S. Fish and Wildlife Service did not identify a need to enter into the consultation process for the Headquarters incubation facility, only the proposed sea turtle patrol cabins.

As a connected action, the ultimate use of the proposed project would be to locate, incubate, research, and protect sea turtles, all of which are State and Federally-listed species. The new cabins would provide many beneficial effects for each sea turtle species occurring within the park. An existing U.S. Fish and Wildlife Recovery Plan for the Kemp’s Ridley sea turtle assigns the task of patrolling for nesting sea turtles and incubating sea turtle eggs located within the park. The incubation facilities proposed under this project would enhance and increase the park’s ability to protect sea turtle species and assist with the removal of these species from the Endangered Species list. However, a visit with the U.S. Fish and Wildlife Service (USFWS) on March 16, 2010 indicated that since the proposed action of constructing cabins would occur in areas where endangered sea turtles nest, and since the proposed action would be occurring during the nesting sea turtle season, additional consultation under §7 of the Endangered Species Act is necessary (USFWS 2010). The park and the Corpus Christi USFWS field office have initiated formal consultation, where the National Seashore will develop a biological assessment, and the USFWS will develop a biological opinion. Through the consultation process, impacts to nesting sea turtles will be analyzed.

Mitigation (conservation) measures for the proposed cabin construction to offset adverse effects would be simple, including measures to ensure that (1) fewer miles are driven along the Gulf beach, by placing a travel trailer on the construction site, thereby reducing access miles driven on the Gulf beach; (2) using trained sea turtle monitoring escorts to lead convoys for any large trucks or heavy equipment traversing the Gulf beach, (3) controlling noise and light, with construction activities to occur only between the time of 30 minutes prior to dawn and 30 minutes after dusk; and (4) stockpiling construction materials up and off the beach, thereby allowing for nesting sea turtles uninhibited access to the Gulf beach and dunes. As for expanding the size of the incubation facility, the proposed action of expanding the facility would take place outside of the sea turtle nesting season to avoid impacts to eggs within the current incubation facility. Further detail of mitigation measures will be covered under the Conservation Measures section within the National Seashore’s biological assessment and the USFWS’ biological opinion for this proposed project.

To fulfill requirements of Section 7 of the Endangered Species Act (16 U.S.C. Section 1536(a)(2)), the National Seashore is currently preparing a biological assessment to insure that proposed action is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species. Therefore, the analysis for special status species (i.e., sea turtles and piping plovers) is being carried forward, and the conclusive results, with findings from the NPS and the USFWS, for special status species will be presented within this project’s Finding of No Significant Impact (FONSI).

Cumulative Effects: Daily park operations and future construction projects continue at the National Seashore, disturbing various species, which can lead to minor impacts to special status species. Additionally, future oil and gas development, visitor activities, and beach driving will continue to cause disturbance to special status species. When added to other projects occurring in the park, construction of
these two new cabins would cause minor cumulative impacts to the National Seashore’s special status species.

**Conclusion:** When combined with other past, present, and foreseeable future actions that would result in impacts to special status species, this alternative would contribute a minor impact to the amount of disturbance to the cumulative scenario. Because there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Padre Island National Seashore; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park’s general management plan or other relevant NPS planning documents, there would be no impairment of the park’s resources or values.

**Visitor Use and Experience**

**Intensity Level Definitions**

The methodology used for assessing impacts to visitor use and experience is based on how construction of two new cabins along the Gulf of Mexico shoreline would affect the visitor, including levels of use, recreational experience, and public health and safety considerations. The impact on the ability of the visitor to experience a full range of park resources was analyzed by examining resources mentioned in the purpose and significance statements for the park. The construction of the Headquarters incubation facilities expansion was not used because the area is not open to park visitors and not visible from accessible vantage points. The thresholds for this impact assessment are as follows:

**Negligible:** Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. Any effects would be short-term. The visitor would not likely be aware of the effects associated with the alternative.

**Minor:** Changes in visitor use and/or experience would be detectable, although the changes would be slight and likely short-term. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.

**Moderate:** Changes in visitor use and/or experience would be readily apparent and likely long-term. The visitor would be aware of the effects associated with the alternative, and would likely be able to express an opinion about the changes.

**Major:** Changes in visitor use and/or experience would be readily apparent and have substantial long-term consequences. The visitor would be aware of the effects associated with the alternative, and would likely express a strong opinion about the changes.

**Impacts of Alternative A (No-Action Alternative)**

Under the no-action alternative there would be no change; therefore, as the intensity levels are written above, there would be no effect. However, it can be said, the current backcountry beach of the National Seashore poses a threat to down-island travelers. There could be a direct, long-term, minor to moderate adverse effect on visitor use and experience as a result of visitors’ safety while traveling through the backcountry beach. The backcountry beach is remote and visitors would be removed from any emergency medical service or law enforcement, which could pose a threat during times of sickness, injury, inclement weather, or when a dangerous situation arises. While true with any remote setting, in the event of a visitor becoming sick or injured, there is potential for a long duration of time to elapse before the visitor can safely find help or assistance. Visitors need to plan accordingly prior to venturing into the National Seashore’s backcountry. Up to 60 miles removed from the nearest source of freshwater, with nearly no available mobile phone service for the entire 60-mile stretch, a poorly planned trip can result in serious injury or death.

Visually, there would be no direct or indirect adverse effects, because the physical features of the National Seashore would remain unchanged. In particular, the Gulf beach would not change, and visitors
would continue to use the beach in its current form. The visual resources of the area would remain unchanged because no new cabins would be constructed.

**Impacts of Alternative B (Preferred Alternative)**

Visually, implementation of the preferred alternative would have a direct, long-term (duration of the cabins), minor adverse effect to visitor experience. There could be some aesthetic value lost for the project area; however, with nearly 66 miles of Gulf beach for visitors to experience, and with only the Malaquite Visitor Center, the park’s communication tower, an information kiosk, and the existing cabin at the 39-mile mark as the only other structures visible from the Gulf beach, there are many miles to experience without sight of any park structures. Therefore, the addition of two small cabins along the Gulf beach would only slightly affect how visitors use or experience the park. To mitigate for this, the location, size, and aesthetics of the new cabins were chosen to blend with the natural surroundings; however, changes to the visual environment would be noticeable. The expansion of the incubation facility at the headquarters compound would not be visible from the Gulf beach or from Park road 22. New construction will be similar in height, color and construction to existing buildings and will not draw the eye of the casual observer.

Direct, temporary, minor adverse impacts to visitor use and experience would result from construction activities. The proposed turtle patroller cabin area is currently used by visitors, and during construction, portions of this area would be limited to visitor use. Noise from construction activities would also adversely affect visitor use and experience; however, all construction-related impacts would be temporary and cease following construction activities. During construction, there would also be additional vehicles being driven along the Gulf beach by park staff. To help mitigate this, a travel trailer would be temporarily set up at the project area, providing overnight accommodations while minimizing additional beach traffic.

The headquarters incubation facility would be constructed in an area that is restricted to visitors and any additional noise created by construction would be beyond the hearing range of visitors. Staff at the headquarters compound may experience some increase in noise level during construction and the availability of parking may be reduced to maintain a safety zone around construction materials and machinery.

As part of the preferred alternative, the existing cabin would be decommissioned by the Division of Sea Turtle Science and Recovery and gifted to the Division of Visitor Safety and Resource and Protection. Because of this action, there would be greater opportunities for visitors during a time of emergency need to either find a law enforcement ranger or locate other park staff at one of the new cabins who could either provide first aid, shelter, or communications, thereby providing additional assistance. As a result, this action would have a minor to moderate beneficial effect on visitor use and experience.

**Cumulative Effects:** Any construction activity has the potential to affect visitor use and experience. The construction of the two sea turtle patrol cabins would have an adverse effect on the visitor experience as a result of noise and additional vehicle traffic along the Gulf beach. Projects such as road improvements, prescribed fire, exotic vegetation management, and general park maintenance have had or could have an adverse effect on visitor use and experience because of the inconvenience of construction noise, dust, and possible park enclosures. Ultimately, however, these actions would have a beneficial effect on visitor use and experience because of the potential for long-term improvements to the human health and safety aspects of the National Seashore. Additionally, future oil and gas development, visitor activities, and beach driving would continue to cause disturbance to visitor use and experience. When added to other projects occurring in the park, construction of these two new cabins would cause minor cumulative impacts to the National Seashore’s visitor use and experience.

**Conclusion:** Under the preferred alternative, the visual changes to the area from construction of a new building would have a minor adverse effect on visitor experience because while the changes would be
readily noticeable, actual change to visitor use or experience would be slight. Construction disturbances (noise and additional beach traffic) would have a minor, temporary adverse effect to visitor use and experience. The construction of two sea turtle patrol cabins would have a minor to moderate beneficial effect on visitor use and experience. Cumulatively, this alternative would have a minor beneficial effect to visitor use and experience because ultimately this project combined with other past, present, and reasonably foreseeable future actions would benefit a number of visitor resources.

**Park Operations**

**Intensity Level Definitions**

Implementation of a project can affect the operations of a park such as the number of employees needed; the type of duties that need to be conducted; when/who would conduct these duties; how activities should be conducted; and administrative procedures. For the purpose of this analysis, the human health and safety of park employees is also evaluated. The thresholds for this impact assessment are as follows:

- **Negligible:** Park operations would not be affected or the effect would be at or below the lower levels of detection, and would not have an appreciable effect on park operations.
- **Minor:** The effect would be detectable, but would be of a magnitude that would not have an appreciable adverse or beneficial effect on park operations. If mitigation were needed to offset adverse effects, it would be relatively simple and successful.
- **Moderate:** The effects would be readily apparent and would result in a substantial adverse or beneficial change in park operations in a manner noticeable to staff and the public. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.
- **Major:** The effects would be readily apparent and would result in a substantial adverse or beneficial change in park operations in a manner noticeable to staff and the public, and be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, could be expensive, and their success could not be guaranteed.

**Impacts of Alternative A (No-Action Alternative)**

The no-action alternative would have a minor to moderate, direct, adverse effect on park operations at Padre Island National Seashore. The existing sea turtle patrol cabin would continue to be used; therefore, the expansion of facilities, providing overnight accommodations for additional staff, would not occur. Backcountry patrollers would continue to work out of the current patrol cabin, located approximately at the park’s 39-mile mark. This location poses the inability to monitor for sea turtle nest efficiently by having the starting and ending points for the daily surveys in non-optimum locations, resulting in lost time, unnecessary fuel and maintenance expenses, and additional carbon emissions.

The existing patrol cabin would continue to provide overnight accommodations for the backcountry sea turtle patrollers and would also continue to provide controlled space where sea turtle eggs are incubated in a predator excluding facility; however, the backcountry sea turtle patrollers would continue to have to travel long distances to reach this controlled incubation facility.

As identified by a NPS advisory board, patrolling the backcountry beach for sea turtles carries risk for the sea turtle patroller. Accidents do occur when driving in the deep sand and uneven terrain of the Gulf beach at the National Seashore. Heat and fatigue are factors of working during the summer months in south Texas, and border related issues and criminal behavior can all pose threats to the backcountry sea turtle patrollers. Under the no-action alternative, the existing patrol cabin would continue to provide shelter and refuge from a dangerous event; however, this would be isolated to the current location of the cabin. In time, this could have a minor to moderate, direct, adverse effect on the employees and operations.
Cumulative Effects: Any project that occurs at the National Seashore has an effect on park operations; therefore, most of the actions listed in the cumulative scenario in the introduction of this chapter would have some degree of effect on employees and park operations. Planning projects such as the development of a fire management plan and planning for improvements to the visitor center typically involve the majority of the National Seashore’s staff to contribute their expertise and assistance. Resource management projects such as exotic vegetation management or endangered species management would primarily involve resources staff. Building construction would primarily involve the maintenance staff. Visitor contact, interpretation, and safety activities usually involve rangers and interpretive specialists. Under this alternative, there would be a minor to moderate effect on park operations associated with the current and future use of the existing sea turtle patrol cabin; therefore, there would be a moderate beneficial effect on park operations when considered with other past, present, and reasonably foreseeable future actions.

Conclusion: Under this alternative, the impact of the inability of being able to provide overnight accommodations for additional staff, the inefficiency for starting and ending daily patrol efforts, the additional distance needed to be driven for depositing sea turtle eggs, and the potential for a dangerous situation arising on the backcountry beach, would have a direct minor to moderate adverse effect on park operations and employee health and safety. Cumulatively, these effects would have a moderate beneficial impact on park operations when considered with other past, present, and reasonably foreseeable future actions.

Impacts of Alternative B (Preferred Alternative)

The construction of two new sea turtle patrol cabins and the expansion of the headquarters incubation facilities under the preferred alternative would provide working environment for National Seashore employees that meet current health and safety standards. Under this alternative, backcountry sea turtle patrollers would begin and end their monitoring efforts from each of the proposed cabins. Distributed at two different latitudes of the park, efficiency of the sea turtle program would be maximized because patrollers would not have to overlap other survey sections to reach their scheduled survey section. Division of Sea Turtle Science and Recovery staff would have appropriate spaces to work within the expanded incubation facilities and staff would have greater control over incubation conditions by being able to control environmental conditions at different stages of egg development.

For the purpose of this analysis, the human health and safety of park employees is also evaluated. Under this alternative, there would be potentially up to three locations within the backcountry beach where park staff could find shelter or refuge from inclement weather, fatigue, or a dangerous situation arising along the Gulf beach. In the event of an emergency, park staff could potentially find other park staff, rendezvous, or if necessary, find communications and first aid supplies at one of the cabins. As a result, these impacts could ultimately have a minor to moderate beneficial effect on the health and safety of park employees.

Under this alternative, the proposed cabins would also provide for improved working environments for employees of the Division of Sea Turtle Science and Recovery. The new cabins would provide improved work areas for employees, including office space, and improved kitchen and bathroom facilities. The effect would be detectable, and would likely have an appreciable beneficial effect on park operations; therefore, this alternative would have a minor to moderate benefit on park operations.

Other changes related to the construction of two sea turtle patrols cabins would also include the decommissioning of the existing sea turtle patrol cabin and gifting it to the Division of Visitor Safety and Resource Protection. This would provide a backcountry station for law enforcement staff, accommodating down-island activities with overnight provisions.

During construction, a construction crew would use a temporary trailer for overnight accommodations at the project locations. This action would expedite construction time by removing the associated travel
time to project locations, while also mitigating the amount of park traffic and associated impacts of beach driving. This would temporarily disrupt employee efficiency to a minor degree. The typical work load for employees would also be increased during implementation of this project from the need to finalize project plans and complete construction. Should this alternative be carried forward, normal workloads and patterns are expected to return once construction is completed. These adverse effects would be minor and short-term, lasting only the duration of the planning and construction period.

One last element to think of when considering impacts to park operations is the funding for this project. It could be considered this project would make use of funds that could be use elsewhere, therefore causing impact to some other are where these funds could be applied. The total cost for this proposed action would be $400,000 for both of the cabins, as well as $400,000 for the lab expansion. Because much of this funding would come in the form of any combination of grant funds, base funds, donations, and restitution funding from previous disasters, such as oil spills, it is too difficult at this time to determine what would be affected by the use of these funds. Since the park does consider the management of nesting sea turtle species as its number one resource issue, any monies spent for this action would be consistent with the mission of Padre Island National Seashore.

**Cumulative Effects:** Any project that occurs at the National Seashore has an effect on park operations; therefore, most of the actions listed in the cumulative scenario in the introduction of this chapter would have some degree of effect on employees and park operations. Planning projects such as the development of a fire management plan and planning for improvements to the visitor center typically involve the majority of the National Seashore’s staff to contribute their expertise and assistance. Resource management projects such as exotic vegetation management or endangered species management would primarily involve resources staff. Building construction would primarily involve the maintenance staff. Visitor contact, interpretation, and safety activities usually involve rangers and interpretive specialists. Under this alternative, park operations associated with the current and future use of the new sea turtle patrol cabins would be improved to a moderate degree, which would cumulatively have a moderate beneficial impact to park operations when considered with other past, present, and reasonably foreseeable future actions.

**Conclusion:** Construction of two new sea turtle patrol cabins and expansion of the headquarters incubation facilities under the preferred alternative would have a minor to moderate benefit on employees at the National Seashore because the new cabins and incubation facilities would provide a safer and healthier work environment, as well as provide an improved work place. There would be a direct, adverse effect to park operations from planning and construct the cabins; however, this displacement of park staff would be short-term, lasting only the time necessary for planning and constructing of the cabins. Cumulatively, the improvements associated with this alternative would have a moderate beneficial effect on park operations when considered with other past, present, and reasonably foreseeable future actions.

**Floodplains**

**Intensity Level Definitions**

To analyze the impacts on floodplains, all available information on floodplains in the park was compiled from personal observations, consultation with other agencies, approved park documents, and Federal Emergency Management Agency (FEMA) floodplains data.

The methodology used for assessing impacts to floodplains is based on how the project would affect the features for which the structure is significant. The thresholds for this impact assessment are as follows:

**Negligible:** Impacts could result in a change to floodplains and values or increase flood hazards, but the change would not be of any measurable or perceptible consequence.
Minor: Impacts could result in a change to floodplains, and values or increase flood hazards, but the change would be of little consequence. Operations would have minimal risk and have few mitigation measures.

Moderate: Impacts could result in a change to floodplains, and values or increase flood hazards; the change would be measurable and consequential. Mitigation measures, if needed to offset adverse effects, could be extensive, but would likely be successful.

Major: Impacts would result in a noticeable change to floodplains, and values or increase flood hazards; the change would result in a severely adverse or substantially beneficial impact. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed.

Affected Environment

Padre Island National Seashore is located on a largely undeveloped barrier island in southern Texas, along the Gulf of Mexico. The barrier island is a dynamic system subject to many geologic forces and climatic events. The island was formed by accretion, and is continually being reshaped by the actions of wind, rain, ocean currents, waves, and storm events. The National Seashore's landscape changes from broad, white, fine-sand beaches on the Gulf side, to ridges of fore-island sand dunes, to grassy interior upland flats dotted with smaller dunes, ephemeral ponds, and freshwater wetlands. The Laguna Madre, back-island dunes, and wind tidal flats that merge with the waters of the Laguna Madre define the western portion of the National Seashore.

Fore dunes of the park provide protection from hurricanes and tropical storms for the island's backcountry and the Texas mainland. The dunes are fragile and once impacted, can easily be destroyed through erosion and wind action. A line of dunes forming parallel to the beach vary in height from less than six feet to approximately 50 feet above sea level. This primary dune line extends the entire length of Padre Island National Seashore, broken only in a few places where storm wash over channels have occurred, or road cuts have been constructed.

Executive Order 11988, *Floodplain Management*, requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. According to the Padre Island National Seashore Final Oil and Gas Management Plan/Environmental Impact Statement (PAIS, 2000), and FEMA floodplains maps, most of the park and all of the project area lies within the 100-year floodplain for the Gulf of Mexico and the Laguna Madre. The exception is the higher fore dune areas located along the Gulf beach shoreline. The park is subjected to periodic flooding from tropical storm events, hurricanes, and severe rainfall. The hurricane season begins June 1 and continues through November 30. Storm surge levels can range from 9 to 12 feet above sea level (Weise and White 1980).

The park would provide a draft floodplains statement of findings to the various state and federal agencies required by the NPS’s Director’s Order and Procedural Manual #77-2: Floodplain Management.

**Impacts of Alternative A (No-Action Alternative) on Floodplains**

Under Alternative A, No Action, the sea turtle patrol cabins and Headquarters incubation facility expansion would not be built, resulting in no new impacts on floodplains. However, impacts on floodplains in the analysis area would continue as a result of park, commercial, and recreational vehicle use, oil and gas operations, and current park development.

Existing vehicle use, oil and gas operations, and park development would continue to impact floodplains within the analysis area. Since the entire park is located within the 100-year floodplain, with the exception of a few of the fore dunes, there are no practicable alternatives to locating these operations outside the 100-year floodplains. Vehicles associated with recreational use of the park, park operations, and ongoing oil and gas operations may leak fluids that could be transported via surface waters thereby affecting floodplain values.
Existing park development including the Malaquite Visitor Center and the Bird Island Basin, park administrative offices, residences, access roads, and water treatment facility continue to impact floodplains within the analysis area. As nearly the entire park lies within floodplains, no practicable alternative exists for locating these facilities outside of the 100-year floodplain. In the event of a major tropical storm or significant flooding event, existing park facilities and infrastructure could alter surface flow thereby affecting floodplain values. However, given the minimal acreage impacted from current park development and the range of storm surges associated with severe tropical storms, it is not likely that the floodplain values would be appreciably affected.

Existing uses, including park infrastructure, oil and gas operations, and vehicle usage of the park, would result in localized, long-term, negligible, adverse impacts on water resources and floodplains within the analysis area.

**Cumulative Effects:** Under Alternative A, No Action, cumulative impacts on and floodplains throughout the park would result from the continuing operation of 13 nonfederal oil and gas operations within the park on 358 acres, park development on 400 acres, future drilling and production of up to 16 wells projected in the park’s reasonably foreseeable development scenario on up to 241.75 acres (NPS 2001b). As some oil and gas operations are developed in the park, others would be plugged, abandoned, and reclaimed; therefore, impacts would be distributed over time. A recent reduction in the size of the Malaquite Visitors Center parking lot by approximately 2.3 acres occurred in 2008. Other activities that could impact water resources and floodplains park-wide include prescribed fires, future park developments, routine maintenance of park roads, park, commercial and recreational vehicle use, and recreational activities.

Current park development has a long-term disturbance of approximately 400 acres of park habitat within the 100-year floodplains. Existing and future development of oil and gas access roads and pads within the park could result in altering surface water flow and locally increasing soil erosion. Leaks and spills from oil and gas operations could be localized to widespread, with minor to major, impacts on floodplains. Spills from oil and gas operations or tankers in the Laguna Madre or Gulf of Mexico could be transported by water into the park and cause widespread impacts and result in long-term clean-up and remediation.

Cumulative impacts on floodplains throughout the park are expected to be localized near developments, with short to long-term, negligible to minor, adverse impacts; but in the event of a spill from offshore oil and gas operations or tankers, impacts could be widespread, with negligible to moderate, adverse impacts on the park’s floodplains, primarily along the park’s shorelines.

**Conclusion:** Under Alternative A, No Action, the two new sea turtle patrol cabins and the Headquarters incubation facility expansion would not be constructed, resulting in no new impacts on floodplains. Existing vehicle use on the Gulf of Mexico beach and access roads, continuing operation of pipelines and wells, and continuing operation and use of park facilities and development would result in localized, long-term, negligible to minor, adverse impacts on floodplains within the analysis area. Cumulative impacts from existing and future oil and gas operations in the park, park developments and operations, and visitor uses are expected to result in short to long-term, negligible to minor, adverse impacts localized near developments throughout the park. However, in the event of a spill from offshore oil and gas operations or tankers, impacts could be long-term and widespread, ranging from negligible to moderate, adverse impacts. No impairment to floodplains would result from implementation of this alternative.

**Impacts of Alternative B (Preferred Alternative) on Floodplains**

Under Alternative B, Proposed Action, the two new sea turtle patrol cabins would be constructed, resulting in the long-term disturbance of approximately 0.15 acres within the 100-year floodplain. The expansion of the incubation facilities in the headquarters compound would take place on the engineered caliche surface so would not create new impacts to the floodplain. Existing impacts on floodplains within the analysis area would be similar to Alternative A, No Action, with localized, long-term, negligible to
minor, adverse impacts associated with existing park development, vehicle use, and the continued operation of oil and gas pipelines and wells.

There is no practicable alternative to locating the proposed cabins or incubation facilities expansion outside the 100-year floodplain because the entire park, with the exception of the higher dunes, is located within floodplains. Impacts associated with the construction of the new cabins could result in minor changes in surface hydrology due to the presence of structure where one did not exist before. Mitigation measures designed to minimize the risk of erosion would be implemented to reduce the impact on floodplain values stemming from sedimentation. The proposed facility would be elevated to a lowest floor elevation of 11 feet, to mitigate structure investment within the Gulf of Mexico Base Flood Elevation of 9-10 feet (FEMA 1983). Flooding risk associated with the new cabins is reduced given that previously documented storm surges were less than the elevated height of the new cabins. In addition, the minimal impact of 0.15 acres is negligible compared to the 740 acres currently developed in the park. Alternative B, Proposed Action would result in a localized, long-term, negligible, adverse impact on floodplains.

Cumulative Effects: Under Alternative B, Proposed Action, cumulative impacts on floodplains throughout the park would be similar to those described under No Action, with impacts from existing and future oil and gas operations in the park, park developments and operations, and visitor uses, resulting in short to long-term, negligible to minor, adverse impacts localized near developments throughout the park; however, in the event of a spill from offshore oil and gas operations or tankers, impacts could be long-term and widespread, ranging from negligible to moderate, adverse impacts to the park’s floodplains.

Conclusion: Under Alternative B, Proposed Action, the two sea turtle patrol cabins and the expansion of the incubation facilities would be constructed, resulting in the long-term occupancy of 100-year floodplains. Constructing the new cabins would result in a localized, long-term, negligible, adverse impact on floodplains. Cumulative impacts from existing and future oil and gas operations in the park, park development and operations, and visitor uses are expected to result in short to long-term, negligible to minor adverse impacts, localized near developments throughout the park; however, in the event of a spill from offshore oil and gas operations or tankers, impacts could be long-term and widespread, ranging from negligible to moderate adverse impacts. No impairment to floodplains would result from implementation of this alternative.
CONSULTATION AND COORDINATION

Internal Scoping

Internal scoping was conducted by an interdisciplinary team of professionals from Padre Island National Seashore. The interdisciplinary team members met at various occasions during 2009 and 2010 to discuss the purpose and need for the project; various alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures. The team also gathered background information and discussed public outreach for the project. Over the course of the project, team members have conducted individual site visits to view and evaluate the proposed construction sites.

External Scoping

External scoping was conducted to inform the public about the proposal to construct the two new sea turtle patrol cabins at Padre Island National Seashore and to generate input on the preparation of this environmental assessment. This effort was initiated February 20, 2010 with the distribution of a scoping letter, which was bulk-mailed to over 500 people on the National Seashore’s mailing list, offering 30 days to comment on the project.

During the scoping period, 20 responses were received from the public through letters, telephone calls, and visitor contact. Nearly all (17) responses were in favor of the proposed project and supportive of the sea turtle recovery program. One response challenged the Kemp’s ridley sea turtle recovery plan—a plan created by the National Marine Fisheries Service and the U.S. Fish and Wildlife Service.

Agency Consultation

In accordance with the Endangered Species Act, the National Park Service contacted the U.S. Fish and Wildlife Service with regards to federally listed special status species, and in accordance with National Park Service policy, the National Seashore also contacted the Texas Parks and Wildlife Department with regards to state-listed species. The results of these consultations are described in the Special Status Species section in the Purpose and Need chapter.

In accordance of Section 10 of the Rivers and Harbor Act and Section 404 of the Clean Water Act the National Park Service contacted the U.S. Army Corps of Engineers in regards to jurisdictional wetlands. The results of this consultation are described in the Wetlands section in the Environmental Consequences chapter.

In accordance with Section 106 of the National Historic Preservation Act, the National Park Service provided the State Historic Preservation Officer at the Texas Historic Commission an opportunity to comment on the effects of this project. The results of this consultation are described in the Archeological Resources section in the Environmental Consequences chapter.

Native American Consultation

The Tonkawa Tribe of Oklahoma is the only known Native American tribe that has potential lineage to the Native Americans that once inhabited Padre Island. They were contacted at the beginning of this project to determine if they had any concern over ethnographic resources in the project area, and asked if they wanted to be involved in the environmental compliance process. There were no objections received from the Tonkawa Tribe to the proposed project.
Environmental Assessment Review and List of Recipients

The environmental assessment will be released for public review in September 2010. To inform the public of the availability of the environmental assessment, the National Park Service will publish and distribute a letter or press release to various agencies, tribes, and members of the public on the park’s mailing list, as well as place an ad in the local newspaper. Copies of the environmental assessment will be provided to interested individuals, upon request. Copies of the document will also be available for review at the National Seashore’s visitor center and on the internet at http://parkplanning.nps.gov/pais.

The environmental assessment is subject to a 30-day public comment period. During this time, the public is encouraged to submit their written comments to the National Park Service address provided at the beginning of this document. Following the close of the comment period, all public comments will be reviewed and analyzed, prior to the release of a decision document. The National Park Service will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the environmental assessment, as needed.

Interdisciplinary Team

From the National Park Service, Padre Island National Seashore, Texas:

- Joe Escoto, Superintendent
- Donna Shaver, Chief, Division of Sea Turtle Science and Recovery
- Jim Lindsay, Chief, Division of Science and Resources Management
- Deanna Mladucky, Chief, Division of Visitor and Resource Protection
- Larry Turk, Chief, Division of Facilities Management
- Cynthia Rubio, Biologist, Division of Sea Turtle Science and Recovery
- Jennifer Shelby-Walker, Biologist, Division of Sea Turtle Science and Recovery
- Shauna Ertolacci, Biologist, Division of Sea Turtle Science and Recovery
- Travis Clapp, GIS Technician, Division of Science and Resources Management
- Wade Stablein, NEPA/106 Specialist, Division of Science and Resources Management

From the National Park Service, Intermountain Regional Office, Denver, CO:

- Chris Turk, Regional Environmental Quality Coordinator
- Laurie Domler, Regional NEPA/106 Specialist
- Cheryl Eckhardt, Regional NEPA/106 Specialist
- Jacqueline St. Clair, Archeologist
- Michael Martin, Hydrologist (Floodplain Specialist)
- Kevin Noon, Natural Resource (Wetland) Specialist

List of Preparers

From the National Park Service, Padre Island National Seashore, Corpus Christi, Texas:

- Wade Stablein, Project Lead, Writer, NEPA , NHPA, Biology
- Travis Clapp, GIS, Maps
- Jim Lindsay, Geology, Paleontology, Project Review
REFERENCES

NPS 2000 Oil and Gas Management Plan Padre Island National Seashore, Texas.
FWS 2010 Concurrence from FWS on T&E.
THC 2010 Texas Historical Commission (State Historic Preservation Officer), letter affirming a determination of “no historic properties affected” for the project, dated May 27, 2010.
TPWD 2010 Concurrence from TPWD on T&E.
APPENDIX A - IMPAIRMENT

National Park Service’s Management Policies, 2006 require analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values.

However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within park, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of these resources or values. An impact to any park resource or value may, but does not necessarily, constitute an impairment, but an impact would be more likely to constitute an impairment when there is a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- identified as a goal in the park’s general management plan or other relevant NPS planning documents.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to pursue or restore the integrity of park resources or values and it cannot be further mitigated.

The park resources and values that are subject to the no-impairment standard include:

- the park’s scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;
- appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;
- the park’s role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and
- any additional attributes encompassed by the specific values and purposes for which the park was established.

Impairment findings are not necessary for visitor use and experience, socioeconomics, public health and safety, environmental justice, land use, and park operations, because impairment findings related back to park resources and values, and these impact areas are not generally considered park resources or values.
according to the Organic Act, and cannot be impaired in the same way that an action can impair park resources and values.

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. The NPS’s threshold for considering whether there could be impairment is based on whether an action would have major (or significant) effects. The following analysis evaluates whether or not the applicable resources carried forward in this document would be impaired by the preferred alternative.

**APPENDIX B - STATE AND FEDERALLY-LISTED SPECIES FOR PADRE ISLAND NATIONAL SEASHORE**

<table>
<thead>
<tr>
<th>Federally Listed Endangered and Threatened Species</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulf Coast Jaguarundi (E)</td>
<td>Herpailurus yagouaroundi cacomitli</td>
</tr>
<tr>
<td>Ocelot (E)</td>
<td>Leopardus pardalis</td>
</tr>
<tr>
<td>West Indian manatee (=Florida) (E)</td>
<td>Trichechus manatus</td>
</tr>
<tr>
<td>Coues’ rice rat (C)</td>
<td>Oryzomys couesi aquaticus</td>
</tr>
<tr>
<td>Green sea turtle (T)</td>
<td>Chelonia mydas</td>
</tr>
<tr>
<td>Loggerhead sea turtle (T)</td>
<td>Caretta caretta</td>
</tr>
<tr>
<td>Hawksbill sea turtle (E w/CH‡)</td>
<td>Eretmochelys imbricata</td>
</tr>
<tr>
<td>Kemp's Ridley sea turtle (E)</td>
<td>Lepidochelys kempii</td>
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<tr>
<td>Leatherback sea turtle (E w/CH‡)</td>
<td>Dermochelys coriacea</td>
</tr>
<tr>
<td>Black-spotted newt (SOC)</td>
<td>Notophthalmus meridionalis</td>
</tr>
<tr>
<td>Rio Grande lesser siren (SOC)</td>
<td>Siren intermedia texana</td>
</tr>
<tr>
<td>Texas horned lizard (SOC)</td>
<td>Phrynosoma cornutum</td>
</tr>
<tr>
<td>American alligator (TSA)</td>
<td>Alligator mississippiensis</td>
</tr>
<tr>
<td>Whooping crane (E w/CH)</td>
<td>Grus americana</td>
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<tr>
<td>Bald eagle (T)</td>
<td>Haliaeetus leucocephalus</td>
</tr>
<tr>
<td>Piping plover (T w/CH)</td>
<td>Charadrius melodus</td>
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<tr>
<td>White-faced Ibis (SOC)</td>
<td>Plegadis chihi</td>
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<tr>
<td>Brown Pelican (E)</td>
<td>Pelecanus occidentalis</td>
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<tr>
<td>Northern Aplomado Falcon (E)</td>
<td>Falco femoralis septentrionalis</td>
</tr>
<tr>
<td>Audubon's Oriole (SOC)</td>
<td>Icterus graduacauda audubonii</td>
</tr>
<tr>
<td>Cerulean Warbler (SOC)</td>
<td>Dendroica cerulea</td>
</tr>
<tr>
<td>Reddish Egret (SOC)</td>
<td>Egretta rufescens</td>
</tr>
<tr>
<td>Sennett's Hooded Oriole (SOC)</td>
<td>Icterus cucullatus sennetti</td>
</tr>
<tr>
<td>Texas Botteri's Sparrow (SOC)</td>
<td>Aimophila botterii texana</td>
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<tr>
<td>Texas Olive Sparrow (SOC)</td>
<td>Arremonops rufivirgatus rufivirgatus</td>
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<tr>
<td>Tropical Parula (SOC)</td>
<td>Parula pitiayumi nigrilora</td>
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<tr>
<td>Mountain Plover (P/T)</td>
<td>Charadrius montanus</td>
</tr>
<tr>
<td>Brownsville Common Yellowthroat (SOC)</td>
<td>Geothlypis trichas insperata</td>
</tr>
<tr>
<td>Bailey's bullmoss (SOC)</td>
<td>Tillandsia baileyi</td>
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<tr>
<td>Roughseed sea-purslane (SOC)</td>
<td>Sesuvium triantheroides</td>
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<tr>
<td>South Texas ambrosia (E)</td>
<td>Ambrosia cheiranthifolia</td>
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<tr>
<td>Black lace cactus (E)</td>
<td>Echinocereus reichenbachii var. albertii</td>
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<tr>
<td>Slender rush-pea (E)</td>
<td>Hoffmannseggia tenella</td>
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<tr>
<td>Welder machaeranthera (SOC)</td>
<td>Psilactis heterocarpa</td>
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<tr>
<td>Texas Ayenia (E)</td>
<td>Ayenia limitaris</td>
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<tr>
<td>Lilia de los llanos (SOC)</td>
<td>Echeandia chandleri</td>
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<tr>
<td>Los Olmos tiger beetle (SOC)</td>
<td>Cicindela nevadica olmosa</td>
</tr>
<tr>
<td>Maculated manfreda skipper (SOC)</td>
<td>Stalligia maculosus</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>State Listed Threatened and Endangered Species</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas horned lizard (T)</td>
<td>Phrynosoma cornutum</td>
</tr>
<tr>
<td>Indigo snake (T)</td>
<td>Drymophis corias</td>
</tr>
</tbody>
</table>
Scarlet snake (T) Cemophora coccinea
Sheep frog (T) Hypopachus variolosus
South Texas siren (large form) (T) Siren sp. 1
Loggerhead sea turtle (T) Caretta caretta
Green sea turtle (T) Chelonia mydas
Atlantic hawksbill sea turtle (E) Eretmochelys imbricata
Kemp’s ridley sea turtle (E) Lepidochelys kempi
Leatherback sea turtle (E) Dermochelys coriacea
Bald Eagle (T) Haliaeetus leucocephalus
Northern Aplomado Falcon (E) Falco femoralis septentrionalis
Southwestern Willow Flycatcher (E) Empidonax trailli extimus
Eastern Brown Pelican (E) Pelecanus occidentalis
Piping Plover (T) Charadrius melodus
Reddish Egret (T) Egretta rufescens
White-Faced Ibis (T) Plegadis chihi
Wood Stork (T) Mycteria Americana
Swallow-Tailed Kite (T) Elanoides forficatus
White-Tailed Hawk (T) Buteo albonotatus
American Peregrine Falcon (E) Falco peregrinus anatum
Black-Capped Vireo (E) Vireo atricapillus
Tropical Parula (E) Parula ptilayumi nigrilora

Fish
No listed species documented at this time within Padre Island National Seashore.

Marine Mammals
All marine mammals, excluding the West Indian Manatee, only occur in the Padre Island National Seashore when stranded due to illness or death.

Index
Statewide or area-wide migrants are not included, except where they breed or occur in concentrations. The whooping crane is an exception; an attempt is made to include all confirmed sightings on this list.

E = Species in danger of extinction throughout all or a significant portion of its range.
T = Species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
C = Species for which the Service has on file enough substantial information to warrant listing as threatened or endangered.

CH = Critical Habitat (in Texas unless annotated ‡)
P/E = Species proposed to be listed as endangered.
P/T = Species proposed to be listed as threatened.
TSA = Threatened due to similarity of appearance.
SOC = Species for which there is some information showing evidence of vulnerability, but not enough data to support listing at this time.
‡ = CH designated (or proposed) outside Texas
~ = Protection restricted to populations found in the —interior— of the United States. In Texas, the least term receives full protection, except within 50 miles (80 km) of the Gulf Coast.