

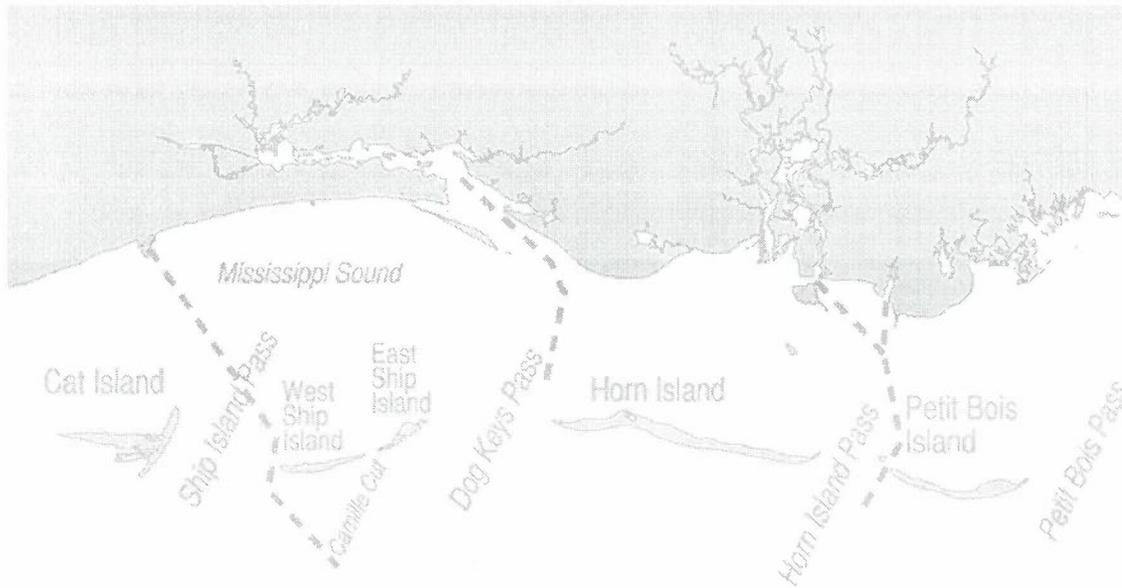
**National Park Service
U.S. Department of the Interior**



Gulf Islands National Seashore

**Record of Decision
Mississippi Coastal Improvements Program
Comprehensive Barrier Island Restoration**

August 2016



Recommended:

Date:

A handwritten signature in blue ink that reads "Daniel R. Brown".

A handwritten date in blue ink that reads "8/10/16".

Daniel R. Brown
Superintendent
Gulf Islands National Seashore

Approved:

Date:

A handwritten signature in black ink that reads "Stan Austin".

A handwritten date in black ink that reads "9/22/16".

Stan Austin
Regional Director
Southeast Region



The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resources conservation and outdoor recreation throughout this country and the world.

**UNITED STATES DEPARTMENT OF INTERIOR NATIONAL PARK SERVICE
RECORD OF DECISION**

Mississippi Coastal Improvements Program, SPECIAL USE AUTHORIZATION

Gulf Islands National Seashore

The Department of the Interior, National Park Service (NPS), has prepared this Record of Decision (ROD) on the Supplemental Environmental Impact Statement (SEIS) for the barrier island restoration elements as recommended in the Mississippi Coastal Improvements Program (MsCIP), Comprehensive Barrier Island Restoration. The U.S. Army Corps of Engineers (USACE) is the lead agency for this project. The NPS is a cooperating agency on this project because impacts from the Selected Plan affect lands within the Gulf Islands National Seashore (GUIS) managed by the NPS.

The purpose of this ROD is to formally adopt the 2016 USACE Final SEIS and June 16, 2016, ROD and to document the decision to issue Special Use Permits for: 1) the construction of this project within the boundaries of GUIS, and 2) the placement of dredged material in a revised disposal location in Disposal Area 10 (DA-10) within the boundaries of GUIS. The NPS served as a cooperating agency during the development of the SEIS and has determined, after an independent review, that the comments and suggestions submitted to the lead agency during the National Environmental Policy Act (NEPA) process have been satisfied, and that the SEIS complies with all NEPA-related requirements applicable to the NPS. Therefore, the NPS adopts the SEIS without recirculating it (40 CFR 1506.3, 43 CFR 46.320).

This ROD includes a description of the background of the project; a description of other alternatives considered; a statement of the decision made including key actions and a summary of mitigating measures/monitoring to minimize environmental harm; the basis for the decision; an overview of public involvement and agency consultation in the decision-making process; and a description of the environmentally preferred alternative. Attached to this ROD are the NPS Non-impairment Determination and Wetlands Statement of Findings for the Selected Plan.

PROJECT BACKGROUND

The USACE Mobile District, proposes to restore a portion of the Mississippi barrier islands in the Gulf of Mexico. This action is related to the consequences of Hurricane Katrina, other hurricanes in the Gulf of Mexico in 2005, and past navigational dredging and disposal activities that have altered sediment availability and transport along the islands. The MsCIP Comprehensive Plan and Integrated Programmatic Environmental Impact Statement (PEIS) was developed to support the long-term recovery of Hancock, Harrison, and Jackson Counties from the devastation caused by these hurricanes, as well as to make the coast more resilient against damage from future storms. The MsCIP PEIS was prepared under the authority of the Department of Defense Appropriations Act of 2006 (Public Law 109-148), dated December 30, 2005, and was completed in June 2009. The Report of the Chief of Engineers dated September 15, 2009, and the Record of Decision (ROD) signed by the Assistant Secretary of the Army for Civil Works dated January 14, 2010,

was submitted to Congress on January 15, 2010. The MsCIP PEIS evaluated an array of measures to address cost-effective solutions for hurricane and storm damage risk reduction, saltwater intrusion, shoreline erosion, preservation of fish and wildlife, and other water-related issues.

The ROD for the MsCIP PEIS recommended a number of key elements for phased implementation over the next 30–40 years. The Comprehensive Plan, as evaluated in the MsCIP PEIS, includes the comprehensive restoration of the Mississippi barrier islands; restoration of over 3,000 acres of wetland and coastal forest habitat; acquisition of approximately 2,000 parcels, with relocation of residents, within the high hazard area; improvement of a levee at the Forest Heights community in Gulfport, Mississippi; a flood-proofing demonstration in Waveland, Mississippi; and the study of 53 other hurricane and storm damage risk reduction and ecosystem restoration options across the coastal area.

The SEIS evaluated alternatives designed to accomplish the purpose of and need for the barrier island restoration elements as recommended in the MsCIP Comprehensive Plan and authorized by Congress, as well as the potential environmental impacts and benefits associated with the USACE final design for the plan to implement the authorized construction action in compliance with NEPA and applicable regulations. The action alternatives considered in this SEIS include potential sand borrow locations and site-specific options for implementing restoration at the sand placement locations authorized for construction. Alternatives considered are tiered from the MsCIP PEIS (40 Code of Federal Regulations [C.F.R.] 1508.28). Thus, those alternatives that were evaluated and rejected under the MsCIP PEIS were not carried forward for analysis in this document.

PROJECT AREA

The project area includes the mainland coast of Mississippi (Hancock, Harrison, and Jackson Counties), the Mississippi Sound, the Mississippi-Alabama barrier islands, and the northern Gulf of Mexico to about 8 miles seaward of the barrier islands (Figure ES-1). A chain of sandy barrier islands located from 6 to 12 miles offshore separates the Mississippi Sound from the northern Gulf of Mexico. From east to west, the islands are Dauphin Island in Alabama, and Petit Bois, Horn, East Ship, West Ship, and Cat Islands in Mississippi. In addition, Sand Island, which has been created through the deposition of dredged material within Disposal Area 10 (DA-10) of the Pascagoula Harbor Federal Navigation project, lies between Petit Bois and Horn Islands.

Dauphin, Sand, Petit Bois, Horn, East Ship, and West Ship Islands are located along the modern littoral drift zone that moves sand westward across the islands, resulting in their elongated shapes and westward migration over time (Figure ES-1). The westernmost island, Cat Island, is believed to have originated as part of the Alabama-Mississippi barrier chain. However, wave climate altered by the growth of the St. Bernard Delta into the northern Gulf of Mexico significantly sheltered the island from south and southeast waves that supplied sediment to the island around 4,000 years ago. Due to the change in oceanic conditions, Cat Island is not part of the modern littoral drift system that supplies sand along the Alabama-Mississippi barrier island chain. Thus, Cat Island has experienced more limited migration. Ship Island currently exists as two island segments, East Ship and West Ship, separated by Camille Cut. In 1969, Hurricane Camille

substantially breached a part of Ship Island that had been historically vulnerable to breaching. This breach remains today as a 3.5-mile-wide shallow sandbar between the two small islands.

All of Sand, Petit Bois, Horn, East Ship, West Ship Islands, and portions of Cat Island are located within the boundaries of the GUI Mississippi unit under the jurisdiction of the NPS. Petit Bois and Horn Islands have also been designated by the U.S. Congress as the Gulf Islands Wilderness under the Wilderness Act. The remainder of Cat Island is currently under State and private ownership.

PURPOSE AND NEED

The MsCIP PEIS evaluated the need for restoring the Mississippi Barrier Islands as part of a comprehensive plan to increase the resiliency of the coast to future storm events. The PEIS recommended a general plan that included the placement of up to 22 million cubic yards (MCY) to restore islands within the GUI Mississippi unit and an undetermined quantity of sand in the vicinity of Cat Island. The PEIS also discussed the need to evaluate refinements to the barrier island restoration plan, including locating additional borrow sites and specific design options. The SEIS has been prepared to evaluate and document the impacts of specific alternatives for sand borrow areas, placement options, engineering and design alternatives, and construction methods.

The SEIS supports the NEPA compliance requirements for the federal agencies with jurisdiction over parts of the Selected Plan, including USACE, the NPS, and the Bureau of Ocean Energy Management (BOEM). As a federal agency with jurisdiction to manage the resources available on the Outer Continental Shelf (OCS), BOEM was invited by USACE to participate as a cooperating agency in the preparation of the SEIS. BOEM's connected, though separate, proposed action is to issue a negotiated agreement pursuant to its authority under the Outer Continental Shelf Lands Act for use of sand, gravel, and shell resources for Coastal Storm Damage Reduction (CSDR) projects from the OCS. It also serves to support BOEM's connected, though separate, proposed action to issue a negotiated agreement pursuant to its authority under the Outer Continental Shelf Lands Act for use of sand, gravel, and shell resources for CSDR projects from the OCS. Additionally, consultations and coordination with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) were completed under the Endangered Species Act and the Biological Assessments (BA) and Biological Opinions (BO) were updated for the Final SEIS to evaluate potential protected species impacts at the OCS borrow sites. Consultation and/or coordination for cultural resources under the National Historic Preservation Act, Archaeological Resources Protection Act, Abandoned Shipwreck Act, and Sunken Military Craft Act has occurred between USACE, Mobile District, and the State Historic Preservation Offices of Mississippi and Alabama, NPS, BOEM, and interested Federally Recognized Tribes throughout the development of the barrier island restoration program.

The need for the Selected Plan remains the same as that described in the MsCIP PEIS, which is that implementation of the recommended comprehensive restoration of the barrier islands is required to achieve the goals outlined in the MsCIP PEIS. The restoration of the Mississippi barrier island system is needed to:

- Protect and maintain the estuarine ecosystem of the Mississippi Sound and to reduce storm damage incurred along the mainland coast of Mississippi;
- Preserve and protect the Mississippi barrier islands and their natural and cultural resources;
- Reduce erosion and land loss of the barrier islands, especially East and West Ship Islands, and Cat Island to the west; and
- Enhance the long-term sand supply to the littoral drift system, which historically has maintained the Mississippi barrier islands through natural processes.

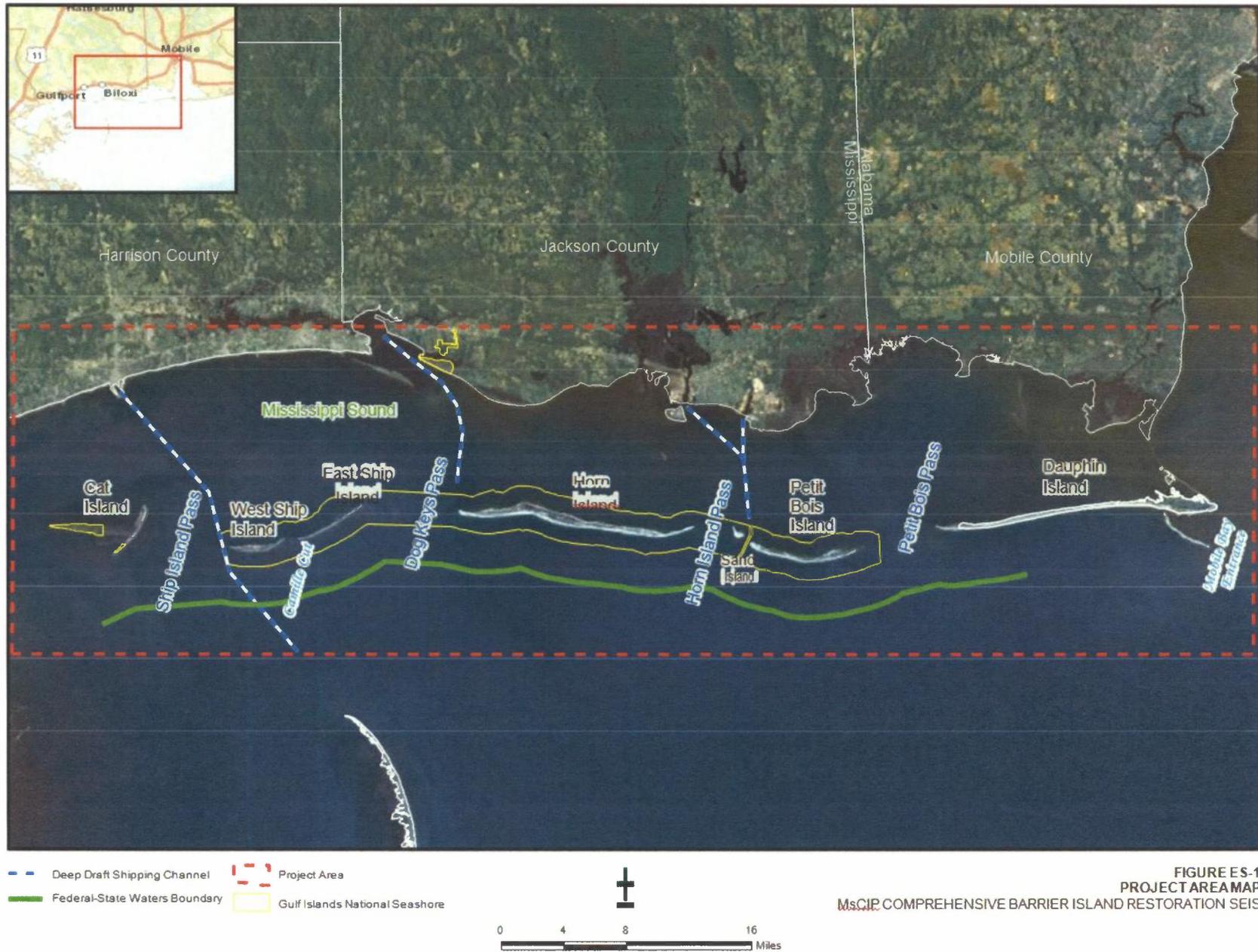


FIGURE ES-1
PROJECT AREA MAP
MsCIP COMPREHENSIVE BARRIER ISLAND RESTORATION SEIS

PROPOSED ACTION, PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT OF JUNE 2009

The USACE initial plan for restoration under the PEIS serves as the basis for development of alternative actions in the SEIS. The proposed Comprehensive Barrier Island Restoration element as described in the MsCIP PEIS includes restoration of the Mississippi barrier islands through the placement of up to 22 MCY of sand within the GUIS Mississippi unit and an undetermined quantity of sand in the vicinity of Cat Island. In the MsCIP PEIS, the overall recommendation to return sand to the system included:

- Filling Camille Cut, the 3.5-mile breach in Ship Island;
- Adding sand to the littoral system on the east end of Petit Bois Island;
- Adding sand to the littoral system on the east end of East Ship Island; and
- Adding sand to the Littoral System on the East End of Cat Island.

SELECTED PLAN (ALTERNATIVE)

The MsCIP PEIS evaluated a general restoration plan that included the placement of material between East and West Ship Islands to fill Camille Cut and placement of sand within the littoral zones of Cat, East Ship, and Petit Bois Islands, with preliminary estimates of the volume of fill material required. The PEIS also recommended that additional analyses be completed prior to implementation of restoration to identify the most effective plan(s) for restoring the barrier island system. The alternatives evaluated for the SEIS are based on additional information including geophysical and geotechnical evaluations, revised sediment budget analysis, and a suite of hydrodynamic, sediment transport, and morphological modeling efforts. These updated alternatives are based on differing design configurations using varying quantities and multiple sources of sand with different median grain sizes and include:

- Restoration of Ship Island, including Sand Placement in Camille Cut and Replenishment of the Southern Shoreline of East Ship Island;
- Beach-front Placement of Sand Along Cat Island; and
- Management of Future Dredged Material from Pascagoula Ship Channel.

From the updated evaluations, the Selected Plan has been developed which fulfills the goals identified in the MsCIP PEIS for restoration of the Mississippi barrier islands to sustain the Mississippi Sound's productive ecological system while also providing the first line of defense, resulting in a more resilient coast. Additionally, a Monitoring and Adaptive Management (MAM) Plan was developed to determine progress toward restoration success and to increase the likelihood of achieving desired project outcomes in the face of uncertainty. The MAM Plan will be regularly updated to reflect monitoring-acquired and other new information as well as resolution of and progress on resolving key uncertainties and discovering lessons learned to help with management of coastal resources.

The 2016 USACE Final SEIS and ROD details the evaluation process of the environmental effects of specific design templates for the restoration of Ship and Cat Islands and the possible

use of up to 19 specific borrow sites within 5 geographic areas located in state waters of Mississippi (MS) and Alabama (AL) and waters of the Outer Continental Shelf.

The Selected Plan, as detailed in the 2016 USACE Final SEIS and ROD, includes the restoration of Ship Island and the use of material as described in Borrow Site Option 4 in the Final SEIS. The following paragraphs provide additional details on each of the Selected Plan (Alternative) components:

SHIP ISLAND RESTORATION

The restoration of Ship Island includes the closure of Hurricane Camille Cut (Camille Cut) and restoration of the shoreline of the current East Ship Island. This restoration will be accomplished in five phases over an approximately 2.5-year period and is summarized below, by component. The combined Camille Cut and East Ship Island equilibrated fill would encompass approximately 1,500 acres, of which roughly 800 acres would be above mean high water level (MHWL). The placement on Ship Island would be a one-time event. The NPS will issue a special use permit for the construction of this project within the boundary of GUIIS.

- DIRECT SAND PLACEMENT IN CAMILLE CUT

To restore East Ship Island and West Ship Island to a single elongated barrier island, the approximately 3.5-mile-long Camille Cut would be filled with approximately 13.5 MCY of sand. The newly formed island segment would be constructed as a low-level dune system connecting existing West Ship and East Ship Islands. Under the proposed design template, the constructed Camille Cut closure would be approximately 1,100 feet wide. The fill would tie into the existing island shoreline just below the frontal dune line at an elevation of approximately +7 feet North American Vertical Datum of 1988 (NAVD88) with a 1V:12H (vertical:horizontal) slope to the MHWL and an approximate 1V:20H slope below the MHWL. The fill at its western and eastern ends would tie into the existing berm along the eastern end of West Ship Island and transition into the proposed East Ship Island placement.

As sand placement in Camille Cut progresses, the newly created island segment may be stabilized with sand fencing and will be planted with native dune vegetation, including sea oats and/or other grasses and forbs, to restore stable dune habitat. The planting would include dune grasses in groupings along the newly created beach.

- REPLENISHMENT OF EAST SHIP ISLAND

The restoration of East Ship Island would consist of the placement of approximately 5.5 MCY of sand along the southern shoreline. In addition to restoring the southern shoreline, placement of sand in this area would add material to the newly restored Camille Cut fill and therefore support the overall replenishment of the system as identified in the sediment budget analysis and sediment transport modeling. The construction template for the restored southern shoreline would consist of an average berm crest width of approximately 1,200 feet at an elevation of +6 feet NAVD88 with a 1V:12H to 1:20 slope from the seaward edge of the berm to the toe of the fill (intersection with the existing bottom).

- BORROW SITE OPTION 4

Ship Island restoration would involve use of sand from five borrow areas (referred to as Borrow Site Option 4, based on multiple alternatives being initially considered). A total of approximately 19.0 MCY of in-placed sand based on 2012 surveys, would be required to fill Camille Cut and to restore East Ship Island. The term “in-placed” refers to the actual volume of sand material on the beach, assuming that some fraction above this net volume might be lost in the process:

- Ship Island (1.2 MCY)
- Horn Island Pass (3.2 MCY)
- Petit Bois Pass-AL (PBP-AL) (8.5 MCY)
- Petit Bois Pass-MS (PBP-MS) (2.0 MCY)
- Petit Bois Pass-Outer Continental Shelf (PBP-OCS) (4.1 MCY).

The selected alternative of Borrow Site Option 4 does not involve the excavation of sand from Sand Island or of sand from within the boundaries of GUIS or its littoral system.

Total available borrow areas are listed below with total volumes of allowable sand available before factoring construction losses and inefficiencies:

- Ship Island (2.7 MCY);
- Horn Island Pass (4.9 MCY);
- Petit Bois Pass–Alabama (PBP-AL) (19.8 MCY);
- Petit Bois Pass–Mississippi (PBP-MS) (2.0 MCY); and
- Petit Bois Pass–Outer Continental Shelf (PBP-OCS) (19.6 MCY).

Sand from borrow sites would likely be dredged with a hopper dredge or hydraulic cutterhead dredge, loaded into scows, hauled to the placement vicinity, and then pumped directly onto the site. Placement of the material would be concurrent with the fill of Camille Cut.

The five borrow sites listed above include sub-areas, several of which are outside, or partially outside, waters of the State of Mississippi. These include Petit Bois-AL (PBP-AL East and PBP-AL West) and Petit Bois Pass-OCS (PBP-OCS East 1-5, PBP-OCS West 1, and PBP-OCS West 3-6). PBP-AL East and PBP-AL West are located within Alabama state waters, PBP-OCS West 1 and 3 are located within Mississippi state waters, and the OCS and PBP-OCS West 2, 4, 5, and 6 as well as PBP-OCS East 1 through 5 are located completely within OCS waters.

The BOEM is the agency of the Department of the Interior tasked with managing the extraction of offshore minerals from the OCS. While the largest component of this management is related to exploration for and development of oil and gas resources, the BOEM is also responsible for what are loosely referred to as "non-energy minerals" (primarily sand and gravel) obtained from the ocean floor. BOEM jurisdiction for leasing and regulating the recovery of minerals extends to the subsoil and seabed of all submerged lands seaward of State-owned waters to the limits of the OCS. 43 U.S.C. 1337(k)(2) allows the BOEM to negotiate, on a noncompetitive basis, the

rights to OCS sand, gravel, or shell resources for shore protection, beach or wetlands restoration projects, or for use in construction projects funded in whole or part by or authorized by the Federal Government, without payment of fees. Any sand removed from the OCS requires review and an agreement from the BOEM.

CAT ISLAND RESTORATION

Dune and beach restoration on Cat Island, including revegetation, would be implemented through the direct placement of approximately 2 MCY of sand on the eastern beach fronting Cat Island. The recommended design is largely based on restoring the eastern shoreface of Cat Island to 1998 conditions. The construction template would include an average dune crest width of 40 feet at an elevation of approximately +7.5 feet NAVD88. The construction berm would have an average constructed crest width of approximately 250 feet at an elevation of approximately +5 feet NAVD88 with a 1V:12H to 1V:20H slope from the seaward side of the berm to the toe of the fill. Direct placement of sand on the eastern beach would restore the island habitats, thereby enhancing the island's ability to absorb energy from westward-propagating waves. The construction profile would be expected to adjust rapidly through the erosion of the upper profile and mimic the natural nearshore profile once it reaches equilibrium. The equilibrium design berm width averages 175–200 feet. The total equilibrated fill area encompasses approximately 305 acres.

Sand used in the restoration of Cat Island would come from an approximately 429-acre sand deposit in an area about 2 miles long and 0.2-mile wide centered about 1.25 miles off the eastern shoreline of Cat Island. The proposed borrow site is located east of the placement area and outside of GUIS boundaries. The borrow site would be dredged to a depth of approximately 6 feet, which includes 4 feet for required dredging plus an additional 2 feet of allowable overdepth.

The proximity of the borrow area to the eastern shoreline of Cat Island in relatively shallow water would allow for the rapid placement of sand on the beach, likely using a hydraulic cutterhead pipeline dredge. The material would be pumped directly onto the beach and reworked (shaped) by land-based equipment. Following placement, the area would be revegetated with native grasses. Restoration would occur over approximately six months. The placement of sand would be a one-time event.

MANAGEMENT OF LITTORAL PLACEMENT OF FUTURE DREDGED MATERIAL FROM PASCAGOULA FEDERAL NAVIGATION CHANNEL

The Selected Plan includes revisions to the dredged material placement practices within the littoral zone of the Horn Island Pass portion of the Pascagoula Federal Navigation Channel. The intent of the revisions is to ensure that placement of future dredged material within the littoral zone best replicates natural sediment pathways in the system and minimizes potential adverse impacts to the surrounding area while not increasing costs to operation of the Pascagoula Federal Navigation Channel. The Selected Plan includes placement of suitable sandy material dredged from the Horn Island Pass portion of the Pascagoula Federal Navigation Channel along the shallow shoals exposed to the open Gulf waves with the greatest sand transport potential. These shoals are located in the south and west portions of the existing specified DA-10 and the northern

portion of the existing specified Littoral Zone disposal site. The total area for potential direct placement would encompass approximately 1,600 acres, including a portion of the existing DA-10 and the existing Littoral Zone placement site, with existing depths generally between 5 and 30 feet. The optimum dredge placement location for hydraulic cutterhead pipeline dredges is in the shallow waters just southwest of Sand Island. This area is preferred from the standpoint of both sediment transport potential and operations to minimize unnecessary pumping distances. The deeper waters are required for hopper dredges that cannot operate on the shallow shoals. The NPS will request that USACE obtain a Special Use Permit for the revised dredge disposal location within the boundaries of GUIIS.

OTHER ALTERNATIVES CONSIDERED

Four borrow site options were developed for use in the closure of Camille Cut and restoration of East Ship Island. These options include identical placement locations, design and engineering methods, and construction methods and phasing, but different combinations and volumes from borrow area sites. Table 1-1 reflects the quantities of sand to be placed within the template from the specified borrow sites. The quantities shown in this table do not reflect the volumes that would be dredged from the specified borrow sites but rather the volumes placed in the template after considering dredging inefficiencies and placement losses. Use of sand from Petit Bois Alabama (PBP-AL) has been reduced as much as possible and depending on dredged efficiency may not be needed to complete the restoration. Additional sand for placement beyond the total volumes shown in Table 1-1 (up to an additional 22 MCY) could be needed to account for background erosion and/or losses before and/or during construction from unforeseen events such as tropical and winter storms. This additional sand could be dredged from any of the identified borrow sites with suitable sand and adequate volume remaining.

TABLE 1-1

Potential Combined Borrow Areas for Camille Cut and East Ship Island Placement								
Alternative ID	Placement Volumes from Borrow Source (mcy)						Total	Rough Order of Magnitude Cost (\$ million)
	Ship Island	DA-10/Sand Island	Horn Island Pass	PBP-MS	PBP-AL	PBP-OCS		
Borrow Option 1	1.1	5.1	0	0	12.2	0	18.5	\$402,000
Borrow Option 2	1.1	5.1	2.2	1.3	0	9.4	19.0	\$314,000
Borrow Option 3	1.1	3.7	2.2	1.3	1.0	9.7	19.0	\$307,000
Borrow Option 4	1.1	0	2.2	1.3	4.7	9.7	19.0	\$385,500

PBP = Petit Bois Pass

All four borrow site options are sources of sandy material that could be used to restore the barrier islands. The only differences among them are costs, access to the sandy material, and their specific locations in Alabama, Mississippi, or the OCS. All four options are evaluated in Section 5 of the Final SEIS. Borrow Site Option 4 was selected as the preferred borrow site option for the Selected Plan. Borrow Site Option 1 is more expensive than other options and thus was not

considered viable compared to the others. Borrow Site Option 4 is more costly than Options 2 or 3 because of the reduced/no use of borrow material from DA-10/Sand Island and higher use of sand from the PBP-AL site, which would require payment to the state of Alabama. Borrow Site Option 4 was selected to avoid using DA-10/Sand Island, because of concerns raised by NPS relative to impairment of GUIIS resources and the loss of upland and wetland island habitat supporting a variety of wildlife and extensive recreational uses by park visitors. In addition, the use of this borrow site would be inconsistent with NPS' Management Policies.

NO-ACTION ALTERNATIVE

The No-Action Alternative represents the future without-project conditions that would occur in the project area without comprehensive restoration of the Mississippi barrier islands. The MsCIP PEIS, from which this SEIS is tiered, describes future without-project conditions and evaluates the environmental effects of the No-Action Alternative. The No-Action Alternative serves in this SEIS as the baseline against which potential environmental impacts and benefits associated with site-specific implementation aspects of the barrier island restoration are compared.

As described in the Final SEIS, the No-Action Alternative would involve continuing erosion of the barrier islands, increasing salinity of the Mississippi Sound, and continuing degradation and loss of estuarine habitats and productive fisheries. The No-Action Alternative assumes that net land loss and morphological changes would continue along the barrier islands into the future, primarily as a result of storms. Historical analysis of barrier island change indicates that East Ship Island would continue to narrow and lose land area under this alternative. Sand available for transport from East Ship Island would be depleted in a matter of decades, as storm and normal transport processes reduce the island to a shoal. Dog Keys Pass would become wider as East Ship Island evolves to a shoal, and natural sediment bypassing to West Ship Island would be greatly diminished. In addition, Cat Island would continue to lose land area from persistent erosion due to increased exposure to southeast waves from the Gulf.

Under the No-Action Alternative, loss of coastal ecotone habitat would continue. Barrier islands and beaches along eroding margins of the islands would transition to open-water habitat. These changes would alter and reduce the integrity of existing beach and nearshore habitats for use by communities of terrestrial and benthic invertebrates, fish, wetland plants, submerged aquatic vegetation, marine mammals, and marine and coastal birds. Beach and littoral habitats for threatened and endangered species such as Gulf sturgeon, sea turtles, and piping plover would also diminish. Loss of the barrier structure provided by the presence of the barrier islands would allow for the free exchange of higher-salinity Gulf waters into the Mississippi Sound in an area which has historically been impacted by a reduction in the quantity and timing of freshwater flows from river systems entering the Sound. This alteration of water quality in the Mississippi Sound as a result of increasing salinity would threaten commercial and recreational fishing as well as essential fish and shellfish habitats for estuarine species. In addition, unprotected significant cultural resource sites along eroding shorelines of the barrier islands could be lost.

Under the No-Action Alternative, the loss of the barrier islands would threaten the estuarine ecosystem of the Mississippi Sound and expose the mainland coast and its associated wetlands and coastal habitats to increasing saltwater intrusion and damage from future storms. In addition,

the structural integrity and efficacy of the barrier islands as a first line of defense of mainland habitats would continue to diminish, reducing the resilience of the coast against damage from future storms.

As documented in the MsCIP PEIS, the No-Action Alternative would fail to address the need for comprehensive improvements in the coastal area of Mississippi in the interest of hurricane and storm damage risk reduction, prevention of saltwater intrusion, preservation of fish and wildlife, prevention of erosion, and other related water resource purposes. Although it was determined not to meet the purpose and need for implementing barrier island restoration, the No-Action Alternative is considered herein to meet the requirements of NEPA and to serve as the baseline for evaluating the effects of the Selected Plan.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

Implementation of the Selected Plan to restore the Mississippi barrier island system would result in both negative and beneficial impacts to placement and borrow areas and to the users of these areas. Negative impacts include the permanent loss of open water habitat at Camille Cut, construction-related short- to long-term disruptions to birds and other wildlife on Ship and Cat Islands, and construction-related disruptions to public use of borrow and placement areas.

However, the overall significant long-term system-wide benefits to the ecosystem and associated losses outweigh the negative impacts. Restoration would provide for additional nesting habitat for threatened and endangered sea turtles and over-wintering critical habitat for the piping plover as well as habitat for neotropical migrants and waterfowl. Closure of Camille Cut would help to maintain the salinity regime in the Sound and the habitat conditions for oysters and numerous estuarine dependent fish and crustacean species that are essential for commercial and recreational fishing. In addition, the barrier island restoration would help to continue to protect the significant historical and cultural sites within the GUIs. The anticipated reduction in storm surges would also help to protect unique coastal mainland habitats and wetlands.

After consideration of the environmental consequences of the alternatives and the proposed mitigation measures, NPS has decided that the USACE Selected Plan is the preferred option in this ROD.

ENVIRONMENTAL COMPLIANCE AND COMMITMENTS

To satisfy environmental compliance laws and regulations for this project, the status of the determinations, coordination, and consultations pertaining to the environmental compliance with the cooperating agencies is summarized below. A BA was prepared and submitted on November 12, 2012, to USFWS and NOAA Fisheries also known as National Marine Fisheries Service, Protected Resources Division (NMFS-PRD). An amended BA was prepared on September 16, 2014, and January 2015 to include updates and changes in the plans, and resubmitted to USFWS and NMFS-PRD. The USFWS and NMFS-PRD issued a draft BO on the action identifying reasonable and prudent measures to minimize impacts in June and July 2015. After review, the USACE provided comments suggesting minor changes in quantities and acreages, updating borrow site and fill language in the long-term monitoring, and clarifying requirements for

escarpment removal. The USFWS concurred with comments and submitted a final BO on September 8, 2015. NMFS-PRD also concurred with comments and submitted their final BO (SER-2012-09304) on September 14, 2015. The BA, USFWS BO, and NMFS-PRD BO are included in the Final SEIS, Appendix N.

Clean Water Act, Sec 401 Water Quality Certifications was received on April 8, 2016, from the Mississippi Department of Environmental Quality subject to the following conditions:

1. The dredging activities shall be conducted in such a manner that no sumps are created in dredge areas.
2. All fill material and excavated areas shall have side slopes of at least 3:1 (horizontal:vertical) and shall be immediately seeded, stabilized, and maintained.
3. Best management practices should be used at all times during construction to minimize turbidity at both the dredge and restoration sites. The restoration sites shall be constructed and maintained in a manner that minimizes the discharge of turbid waters into waters of the Mississippi Sound. Best management practices should include, but not limited to, the use of staked hay bales; staked filter cloth; sodding, seeding and mulching; staged construction; and the installation of turbidity screens around the immediate project site.
4. The applicant shall submit detailed monitoring plans documenting water quality monitoring activities to confirm compliance with existing water quality criteria, prior to the beginning of construction. The plan shall establish baseline conditions and monitor conditions. If the monitoring identifies problems with water quality, corrective actions shall be described. The plan shall be approved by the Department prior to implementation of any monitoring and will be in compliance with methods as outlined in the Mississippi Water Quality Certification regulations including an approved Quality Assurance Project Plan (QAPP).
5. Turbidity outside the limits of a 750-foot mixing zone shall not exceed the ambient turbidity by more than 50 Nephelometric Turbidity Units. The turbidity within the Ship Island and Cat Island project areas may reasonably exceed this turbidity standard for temporary periods of time but shall not result in permanent environmental harm.
6. No sewage, oil, refuse, or other pollutants shall be discharged into the watercourse.

The Coastal Zone Consistency determination has been coordinated with the Mississippi Department Marine Resources (MDMR) via the SEIS and Notice of Intent and final coordination and consistency certification was received April 6, 2016.

A 404(b)(1) evaluation of dredged and fill material has been prepared and is included as an Appendix in the Final SEIS.

Coordination with NMFS-Habitat Conservation Division has been initiated via the SEIS, and the USACE submitted an Essential Fish Habitat (EFH) Assessment letter on January 27, 2016. NMFS-HCD concurred with the USACE's determination that project implementation would not result in adverse impacts to EFH on April 13, 2016.

Effects determinations under Section 106 of the National Historic Preservation Act have been coordinated with the State Historic Preservation Offices, and letters of concurrence of a finding of no adverse effect to historic properties have been received for the project from the State of Mississippi on October 7, 2014, May 21, 2015, and April 29, 2016; and the State Alabama on October 17 and 20, 2014. All coordination letters received to date are located in Appendix T of the Final SEIS and accompanying ROD.

A MAM Plan was developed for the ecosystem restoration plan consistent with the requirements of the Water Resources Development Act 2007 Section 2039 (a) and implementation guidance “CECW-PB Memorandum dated August 31, 2009, Implementation Guidance for Section 2039 of the WRDA 2007 – Monitoring Ecosystem Restoration “ and is included as Appendix S in the Final SEIS. The primary purpose for implementing a MAM Plan is to determine progress toward restoration success and to increase the likelihood of achieving desired project outcomes in the face of uncertainty. Monitoring results will be used through an assessment process to determine whether the project outcomes are consistent with original project goals and objectives. The MAM Plan provides an organized and documented process that defines management actions in relation to measured project performance and establishes a feedback loop between continued project monitoring and corresponding project management, operation, and adjustments. The MAM Plan describes the monitoring design proposed to determine barrier island restoration success and avoid impacts to threatened and endangered species, describes the organization structure for the MAM process, describes the developed Conceptual Ecological Model, identifies key uncertainties, and provides potential adaptive management/contingency actions that may be needed to ensure project success. The MAM Plan will be regularly updated to reflect monitoring-acquired and other new information as well as resolution of and progress on resolving key uncertainties and/or discovering lessons learned to help with management of coastal resources.

Heavy machinery, vehicles, sediment retaining structures, and other construction equipment will be parked or staged before and during use. Contractor staging areas and access channels will be placed outside of environmentally sensitive areas, identified in coordination with NPS staff.

PUBLIC SCOPING AND AGENCY COORDINATION

NEPA is intended to ensure full public participation in the EIS process. Public participation includes effective communication between all federal, state, and local agencies, tribal governments, and other persons or organizations that may have an interest in the project. As required by NEPA, the public was invited to attend public scoping meetings and public hearings as part of the development of the MsCIP PEIS.

Further public communications included maintaining contact with public officials and agency representatives, ensuring that calls from the public were addressed in a timely manner, and contacting stakeholders. In addition, the SEIS was widely circulated and comments were requested. Public involvement materials are presented in Appendix R of the Final SEIS. These materials include copies of the Notice of Intent (NOI), newsletters, notices of public meetings, and the project mailing list.

The USACE conducted extensive public involvement throughout the development of the MsCIP PEIS and the SEIS. A Notice of Intent to prepare the Draft SEIS was published in the Federal Register (Vol. 75, No. 203) on October 21, 2010. The Draft SEIS was made available for a 45-day public review period on March 7, 2014. The Final SEIS was made available for review on January 22, 2016. A public involvement and agency correspondence summary is presented in Chapter 7 and Appendix R of the Final SEIS.

CONCLUSION

Among the alternatives considered, the Selected Plan meets the purpose, need and objectives of the PEIS and the SEIS and is expected to support the long-term protection, preservation and restoration of the natural and cultural resources of GUIIS. With the mitigation measures as described in the SEIS, USACE ROD, and the *Environmental Compliance and Commitments* section above, all practical means to avoid or minimize environmental harm from the Selected Plan have been adopted. Because there would be no major adverse impacts to resources whose conservation is: (1) necessary to fulfill specific purposes in the enabling legislation for GUIIS; (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (3) identified as a goal in relevant NPS planning documents, there would be no impairment of the park's resources or values. After a review of these effects, the alternative selected for implementation will not impair park resources or values and will not violate the NPS Organic Act.

NON-IMPAIRMENT DETERMINATION

MISSISSIPPI COASTAL IMPROVEMENTS PROGRAM COMPREHENSIVE BARRIER ISLAND RESTORATION SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Why is a Non-Impairment Determination Required:

Section 1.4.7 of National Park Service (NPS) *Management Policies 2006* states that:

[b]efore approving a proposed action that could lead to an impairment of park resources and values, an NPS decision-maker must consider the impacts of the proposed action and determine, in writing, that the activity will not lead to an impairment of park resources and values.

Actions that require preparation of EAs and EISs constitute actions that may have the potential to impair park resources or values. Therefore, a non-impairment determination must be made for any action selected in a FONSI or ROD that could impact park resources and values and to which the NPS is a signatory. The non-impairment determination is completed only for the selected action.

What is Impairment?

Sections 1.4.5 and 1.4.6 of *Management Policies 2006* provide an explanation of impairment. Section 1.4.5 defines impairment as:

[a]n impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values.

Section 1.4.5 goes on to state that:

[a]n impact to any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects 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 to opportunities for enjoyment of the park, or

- Identified as a goal in the park's general management plan or other relevant NPS planning documents as being of significance.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.

Section 1.4.6 of *Management Policies 2006* identifies the park resources and values that are subject to the no-impairment standard:

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 condition 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, structure, 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.

How is a Non-Impairment Determination Made?

Section 1.4.7 of *Management Policies 2006* states that

[i]n making a determination of whether there would be an impairment, an NPS decision maker must use his or her professional judgment. This means that the decision-maker must consider any environmental assessments or environmental impact statements required by the National Environmental Policy Act of 1969 (NEPA); consultations required under Section 106 of the National Historic Preservation Act (NHPA); relevant scientific and scholarly studies; advice or insights offered by subject matter experts and others who have relevant knowledge or experience; and the results of civic engagement and public involvement activities relating to the decision.

Management Policies 2006 further define "professional judgment" as

a decision or opinion that is shaped by study and analysis and full consideration of all the relevant facts, and that takes into account the decision-maker's education, training, and experience; advice or insights offered by subject matter experts and others who have relevant knowledge and experience; good science and scholarship; and, whenever appropriate, the results of civic engagement and public involvement activities relation to the decision.

How is a Written Non-Impairment Determination Prepared?

This determination on impairment has been prepared for the Selected Plan described on page 3-73 of the Final Supplemental Environmental Impact Statement (SEIS), U.S. Army Corps of Engineers (USACE 2016). An impairment determination is made for all resource impact topics analyzed for the Selected Plan that have been identified to have the potential to affect the Gulf Islands National Seashore (GUIS). An impairment determination is not made for visitor experience, socioeconomics, public health and safety, environmental justice, land use, and park operations because impairment findings relate back to park resources and values, and these impact areas are not generally considered to be 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.

PHYSICAL ENVIRONMENT

Physiography

The Selected Plan would cause no temporary or long-term change to geology, including bedrock, in the project area. Therefore, the Selected Plan would have no impacts on the physiography of the project area. Therefore there would be no impairment of GUIS resources from the implementation of the Selected Plan.

Meteorology

The scale and type of activities associated with the Selected Plan (e.g., construction and related movement of materials) would not change the climate or weather patterns in the project area. As a result, there would be no impacts on meteorology in the project area. Therefore there would be no impairment of GUIS resources from the implementation of the Selected Plan.

Hydrology and Coastal Processes

Localized changes to hydrology would occur following restoration, with the greatest changes associated with the closure of Camille Cut and the restoration of the connection of West Ship and East Ship Islands. These localized changes would reduce scour and widening caused by wind and tidal influences in Camille Cut, resulting in greater stability for the park resources located on

East and West Ship Islands. Placement of sand on East Ship Island would further protect and replenish this island system as longshore transport moves the new material to the west along the island.

Placement of sand at Cat Island would occur primarily on existing upland and beach areas. Therefore, no significant impacts to hydrology or coastal processes would occur from the proposed restoration of Cat Island.

This localized alteration to hydrology would enhance the recreational, cultural, and natural uses of GUIS.

Modification of the continuing placement of dredged material in the combined DA-10 and littoral zone disposal site would provide up to 1 million cubic yards of material into the littoral transport system every 18 months. Future placement of dredged material, in the south and west parts of the disposal area would provide a source of material for sediment transport to the downdrift barrier islands. This activity would have a long-term beneficial impact on the availability of sand in the littoral system and island morphology. Therefore there would be no impairment of GUIS resources from the implementation of the Selected Plan.

Bathymetry

The Selected Plan would cause a permanent change in bathymetry at East and West Ship Islands. Following restoration, the combined Camille Cut and East Ship Island equilibrated fill areas would encompass approximately 1,500 acres, of which approximately 700 acres would be below the MHWL. Within Camille Cut, subaqueous bottom currently at an elevation averaging -5 feet NAVD88 between West and East Ship Islands would be converted to barrier island habitat.

Analysis indicates that the restoration of the littoral sediment transport system and changes to local currents resulting from the closing of Camille Cut could potentially result in increased sedimentation in the Ship Island Pass over a 10- to 15-year period under average wave climate conditions. However, given the frequency of hurricanes it is likely that sediment accumulation along the island will diffuse throughout the system with only a negligible effect on Ship Island Pass, given the large morphological changes induced by hurricanes (Final SEIS, Appendix C). There could be an increase in sedimentation in the pass and outer bar segments of the navigation channel during hurricane events. Larger hurricane events could result in potential 10 to 30 percent increase in sedimentation in the entrance channel, and smaller hurricanes could result in a potential 5 to 10 percent increase (Final SEIS, Appendix C). This would require some additional maintenance of the Ship Island Pass after these events, although the overall frequency of dredging would not be expected to increase (Final SEIS, Appendix C). Therefore, impacts to required maintenance dredging would not be significant.

Overall, there would be long-term, beneficial, significant changes to bathymetry from the restoration of Camille Cut and East Ship Island. The closure of Camille Cut and the restoration of Ship Island would restore a protective barrier and reduce storm waves at the mainland as

described in Appendix C of the Final SEIS. The effects of sediment transport from placement of material in the East Ship Island and Camille Cut are expected to be localized to Ship Island, and impacts to the Gulfport Navigation Channel in Ship Island Pass are anticipated to be minimal.

Although the Selected Plan would alter bathymetry within the GUIS, these changes would be implemented as part of a restoration program that would result in a net benefit to the park's integrity. Park resources would be enhanced and protected by the transfer of sand from borrow areas to placement locations.

At Cat Island, approximately 305 acres of eastern shoreline and nearshore areas of Cat Island would be filled and converted to upland habitat. This placement would address ongoing erosion and would result in beneficial impacts to Cat Island.

Removal of material for placement on Cat Island would cause a long-term change in bathymetry at the Cat Island borrow area. Near Cat Island, bottom depth would increase by approximately 5 feet to a depth of approximately -20 feet NAVD88 (from current average depths of -15 feet NAVD88) across an area of approximately 429 acres. Modeling of removal sites associated with the Ship Island restoration found no significant impacts (Final SEIS, Appendix D), and modeling results would be expected to be similar at the Cat Island borrow site (Final SEIS, Appendix E). The slopes of the inshore borrow area would be expected to flatten and backfill with sand over time. Therefore, bathymetric impacts would not be significant.

DA-10 would continue to be used for disposal of material from the Pascagoula Harbor Navigation Channel. However, placement would primarily occur in a different part of the site. This continued use, focused in the south and west parts of the disposal area would maintain bathymetry that is conducive to sediment transport to the downdrift GUIS barrier islands.

Although the Selected Plan would alter bathymetry within the GUIS, these changes would be implemented as part of a restoration program that would result in a net benefit to the park's integrity. Park resources would be enhanced and protected by the transfer of sand from borrow areas to placement locations. Therefore there would be no impairment of GUIS resources from the implementation of the Selected Plan.

Sediment Characteristics

The sediments placed on Ship Island would be consistent in grain size, as measured by the D50 size, and color found on the existing East Ship Island and West Ship Island. The sediment used for the final application, removed from the Ship Island borrow area, would be similar in color, but slightly smaller in grain size. The placement of material would not negatively impact the overall sediment characteristics of the restored Ship Island.

The sediments placed on Cat Island would be consistent in color and grain size, although slightly finer as measured by the D50 size, with the sediments currently found on Cat Island. The

placement of material would not negatively impact the overall sediment characteristics of the restored island.

Modification of the placement of dredged material at the combined DA-10/littoral zone site would not result in changes to sediment characteristics or sediment quality. As a result, there would be no impacts on sediment in the project area. Therefore there would be no impairment of GIS resources from the implementation of the Selected Plan.

WATER QUALITY

Dredging and dredged material placement activities associated with the Selected Plan would result in short-term direct impacts but would not significantly degrade water quality in or near the barrier islands. Temperature, salinity, dissolved oxygen (DO), and density profiles would be affected as a result of water column mixing during sediment removal and placement activities. Profiles would return to previous conditions following completion of activities. Any impacts to profiles would be temporary and minor. Following restoration of Ship Island, salinity along the north side of Ship Island (shoreward of Camille Cut) could decrease, since more saline waters from the Gulf of Mexico would no longer have direct access to that area. This would restore a more natural salinity profile to this area.

Changes in DO and nutrients could occur due to mixing and release of sediments into the water column during sediment removal and placement. DO concentrations could decrease during and immediately following dredging due to the movement of anoxic water and sediments through the water column. DO could also be affected by short-term increases in organic material and associated aerobic decomposition. Any impacts would be expected to be restricted to the immediate vicinity of the removal and placement areas. Once activities cease and disturbed material settles, DO concentrations would return to pre-disturbance levels. Any impacts would be temporary and minor.

Concentrations of nutrients could increase locally for short periods following sediment removal and placement. However, inflow from coastal rivers and the currents and waves in Mississippi Sound would quickly dilute material in the water column and not promote nutrient concentration and eutrophication. Any impacts would be temporary and minor.

Construction could temporarily impact localized turbidity around the borrow and placement areas. The generation of turbidity is a concern since turbidity would increase as a result of these activities and could reduce light penetration through the water column, thereby reducing photosynthesis, surface water temperatures, and aesthetics in the vicinity. These conditions could also alter visual predator-prey relations and result in respiratory stresses in fish. During construction, turbidity levels around the removal and placement locations would be monitored, as appropriate, to confirm that turbidity levels outside the 750-foot mixing zone do not exceed the background turbidity levels set by Mississippi Department of Environmental Quality (MDEQ).

Sand placement near submerged aquatic vegetation (SAV) areas could require site-specific best management practices (BMPs) to avoid temporary or permanent impact. It is not anticipated that the activities from this project would impact the turbidity of the water after the project is completed.

BMPs would be implemented to protect Cat Island and Ship Island during restoration activities. They could include plantings of native vegetation to stabilize new upland areas, use of turbidity barrier around sensitive upland and aquatic habitats, inspection of equipment for leaks, and establishment of containment areas for the storage of equipment fuels and lubricants.

Modification of dredged material placement into the combined DA-10/littoral zone site would not result in changes to water quality.

Because BMPs would be used where applicable and negative impacts would be short-term, the restoration would not cause impairment to park resources as a result of a change in water quality. Therefore there would be no impairment to GUIS resources from the implementation of the Selected Plan.

BIOLOGICAL RESOURCES

Coastal Habitats

Coastal habitats in the proposed area include barrier island beaches, dry beach and dune systems on barrier islands, coastal wetlands, and wet habitats on barrier islands, SAV, estuarine scrublands, coastal forests, and mainland beaches.

Beneficial impacts would occur from a change in habitat type at Camille Cut and restoration of East Ship Island. Approximately 800 acres of open water habitat would be lost and 800 acres of new beach and barrier island habitats would be created, resulting in greater protection for coastal habitats and an increase in less common barrier island habitat.

Short-term to long-term minor impacts would occur to barrier island beach vegetation. These losses would occur at the tips of East Ship and West Ship Islands around Camille Cut. Re-vegetation would occur via plantings and natural recruitment on newly added upland.

Temporary to short-term moderate impacts to unconsolidated shoreline habitat (swash zone habitat) would occur in the vicinity of the placement activities. Marine invertebrates, fishes, and wading birds could be affected until completion of construction activities. These impacts would be temporary to short-term, resulting in a net increase in shoreline habitat after construction.

Long-term, moderate, beneficial impacts to SAV would occur through natural recruitment from the addition of new habitat suitable for SAV colonization.

Placement of sandy material on the frontal dune area of Cat Island would result in short-term disruption to barrier island beach habitats (i.e., barrier island beaches and dry beach and dune systems) and associated flora and fauna within the footprint of the construction areas, including 2.52 acres of marine intertidal habitat. Although flora and fauna occupying these habitats would be lost, the various habitats would become re-established and re-colonized following restoration. Losses would be ongoing during the entire restoration project construction period, but would be limited to the specific locations undergoing restoration at any given time. Re-colonization would begin as soon as construction in a given area is completed and would continue during the post-construction period.

The southern portion of DA-10 would continue to be used for disposal of material from the Pascagoula Harbor Navigation Channel in the combined DA-10 and littoral zone site. This continued use, focused in the south and west parts of the disposal area, would maintain bathymetry that is conducive to sediment transport to the downdrift barrier islands. Ensuring continual placement within the most active littoral transport system would benefit the biological species that utilize the barrier island system.

Implementation of the Selected Plan would result in a net increase in upland habitat within the GUIS and would help to restore and maintain degraded upland habitat, there would a benefit to park resources from impacts to upland habitats. Therefore there would be no impairment of GUIS resources from the implementation of the Selected Plan.

Plankton

The closure of Camille Cut would reduce the movement of higher-salinity water into the Sound, resulting in salinities near pre-Hurricane Katrina conditions. As salinity influences the distribution and diversity of phytoplankton, a restoration to the pre-Hurricane Katrina salinity regime would have a positive impact on phytoplankton in the Mississippi Sound.

Planktonic organisms would be carried into and out of the project area via currents during and after sediment removal and placement activities. Impacts would be restricted to localized patches of plankton. Any impacts would be less than significant. As a result, there would be no potential adverse change in the health of populations, community structure and composition, trophic structure, or system function. Because impacts would be minor and temporary, the park's plankton resources would not be impaired by implementation of the Selected Plan. Therefore there would be no impairment of GUIS resources from the implementation of the Selected Plan.

Benthic Environment

Placement of sediments for restoration uses would cause long-term or permanent impacts to benthic communities as a result of changes in the bathymetric profiles in those locations. Use of staging areas for construction equipment would also temporarily disrupt benthic communities. During staging, both infauna and epifauna invertebrates including mollusks and crustaceans would be displaced.

Placement of sediments for restoration purposes would cause direct impacts to the benthic community. In areas converted to uplands, permanent losses would occur. In littoral placement areas and in newly created littoral habitat, recovery of the communities could range from a few months to several years. There are no oyster or clam beds in the immediate area, so there would be no potential for direct impact on these species. Motile mollusks would likely leave the area during these activities and return after operations cease. The crabs and shrimp are fairly mobile and during placement operations could avoid impact, although there would be some mortality and displacement. Most of these organisms would likely leave the area during placement activities and return after operations cease.

Approximately 800 acres of open water shallow benthic habitat at Ship Island would be converted to a combination of barrier island and intertidal habitat from the placement of material. Given the size of open water habitat within the Mississippi Sound (approximately 1,184,000 acres), this permanent loss of benthic habitat would result in a negligible impact to ecosystem function. The addition of barrier island and intertidal habitat would represent a significant increase in this habitat within the barrier island system and would be essentially a replacement of habitats lost since Hurricane Camille in 1969. Restoration of Ship Island would result in a long-term positive effect on benthic macroinvertebrate communities by protecting coastal ecotone habitat, including intertidal and subtidal habitats used by benthic invertebrate communities, which would likely be lost under the No-Action Alternative.

Approximately 305 acres of barrier island and shallow water habitat along the beach at Cat Island would be converted to a combination of restored barrier island and intertidal habitat from the placement of material. Given the size of open water habitat within the Mississippi Sound (approximately 1,184,000 acres), any loss of benthic habitat associated with placement activities would result in a negligible impact to ecosystem function. The addition of restored barrier island and intertidal habitat would represent a significant increase in this habitat within the barrier island system and would be essentially a replacement of habitats.

Although benthic organisms would be lost during removal and placement, losses would not be significant. There would also be long-term positive effects due to the protection of coastal ecotone habitat, including intertidal and subtidal habitats, used by benthic invertebrate communities that would likely be lost under the No-Action Alternative.

Modification of the placement of dredged material at DA-10/littoral zone would result in littoral movement of newly placed dredged material; thus, benefiting benthic invertebrates by sustaining the habitat rather than filling from retained dredged material at DA-10/Sand Island as past practices had done.

Because of the amount of benthic habitat available in the Mississippi Sound and within GUIIS and the short-term nature of the majority of the impacts to the benthic community associated with the Selected Plan, park resources would not be impaired from impacts to benthic organisms.

Therefore there would be no impairment of GUIS resources from the implementation of the Selected Plan.

Fish

Impacts to fish from Ship Island restoration would include noise, some localized, short-term water quality impacts, such as decreased DO, and increased turbidity. The dredging and placement activities for the Camille Cut and East Ship Island Restoration are estimated to be ongoing for 2.5 years from start to finish. Placement of sandy material to create barrier island habitat on Ship Island would result in temporary disruption to the mature fish community in the vicinity. Placement could cause behavioral impairment (e.g., disruption of migration patterns), physical impairment (e.g., turbidity-induced clogging of gills resulting in suffocation, or abrasion of sensitive epithelial tissue), and potentially acute and chronic effects (on growth, reproduction, behavior, etc.) related to exposure to elevated concentrations of suspended sediment (Newcombe and Jensen, 1996). Specific sites on the barrier islands would be used for placement of clean material; therefore, acute and chronic effects to aquatic organisms related to chemical contaminants would not occur. The closure of Camille Cut would eliminate a direct pathway for fish to move from the Mississippi Sound to the Gulf side of Ship Island; therefore, some species would have to navigate around the island to move offshore. Potential effects to finfish and shellfish associated with placement activities would largely be related to contact with turbidity plumes (placement-induced elevated concentrations of TSS). Although water column turbidity would increase during placement activities, such effects would be temporary and local. Fish would be expected to return after operations cease. Direct impacts to mature fish would be minor and not significant.

Restoration of Ship Island would result in a short-term negative impact to shallow foraging areas and nursery areas during construction. However, it would also result in long-term beneficial impacts to fish habitat by enhancing shallow foraging areas, nursery areas, and SAV areas around the barrier islands in the Mississippi Sound.

Placement of sandy material on Cat Island and removal of material from Cat Island borrow area would result in minor impacts to the mature fish community and incidental losses to low-mobility lifestages in the vicinity of the dredging and placement work, similar to those described in the Ship Island/Borrow Site Option 4 restoration discussion above. As with Ship Island, these impacts would be minor (and therefore not significant).

Because of the amount of habitat available in the Mississippi Sound and within the GUIS, the short-term nature of negative impacts to the fish community and long-term beneficial impacts associated with the Selected Plan, fish resources in GUIS would not be impaired. Therefore there would be no impairment of GUIS resources from the implementation of the Selected Plan.

Marine and Mammal Communities

There are six threatened or endangered whale species (i.e., whale species protected under both the Endangered Species Act and the Marine Mammal Protection Act) that are known to occur in the Gulf of Mexico. However, the occurrence of any whale species in any portion of the project area is highly unlikely.

Ship Island restoration would protect coastal ecotone habitats that would likely be lost under the No-Action Alternative. This would have a positive long-term effect on marine mammal communities that utilize estuarine habitats, including manatees and dolphin. It is unlikely that localized sediment removal and placement operations would affect migration, feeding, or reproduction of marine mammals. Three marine mammals commonly found along the continental shelf of the northern Gulf include Atlantic bottlenose dolphin, Atlantic spotted dolphin, and spinner dolphin.

Manatee could occur within the Mississippi Sound, but would be unlikely to occur beyond the immediate nearshore coastal areas. Given their slow-moving behavior, manatees could be less likely than other marine mammals to quickly avoid placement operations. However, to minimize contact and potential injury to manatees in shallow water/placement areas, the Manatee Construction Conservation Measures would be observed.

Only three protected species of dolphins commonly occur in nearshore waters of the Gulf of Mexico, including bottlenose dolphins, Atlantic spotted dolphins, and Risso's dolphins, all of which have functional hearing in high frequencies. Sound pressure levels (SPL) from dredging and placement activities would occur at peak frequencies below that of the bottlenose, Atlantic, and spotted dolphins. Additionally, SPLs from dredging and placement activities, at a distance of 50 meters, are estimated to be less than or equal to 144.9 dB (Reine et al., 2014), which is below the Level A (180 dB re $1\mu\text{Pa}$ rms) acoustic threshold for cetaceans and the Level B (160 dB re $1\mu\text{Pa}$ rms and 120 dB re $1\mu\text{Pa}$ rms) acoustic thresholds for cetaceans. Therefore, no impacts to marine mammals from the proposed project would be expected.

The project area includes no known mating or breeding habitat. No impacts to reproduction would be expected. Any impacts to foraging during removal and placement would be temporary and minor, and, therefore, impacts would not be significant. The dredging and placement activities for the Camille Cut and East Ship Island Restoration are estimated to be ongoing for 2.5 years from start to finish, as described in the Final SEIS. Underwater noise would occur in association with the placement areas. Manatees, which may be found in the shallower project areas (i.e., the placement areas), have a functional hearing range from 400 to 46,000 Hz, with peak sensitivities between 16,000 and 18,000 Hz. Therefore, dredging and placement activity noise is not within the peak sensitivity range for manatees. Studies by Gerstein (2002) and Miksis-Olds et al. (2007) suggest that manatees may detect underwater sounds generated during dredging and placement activities, but are not likely to be affected by them.

Potential impacts to marine mammals at the Cat Island restoration site would be similar to those described above for the Ship Island restoration. There are no areas critical for migration, feeding, or reproduction of marine mammals in the placement or dredging areas. Because of the ability of these species to relocate, it is unlikely that localized sediment removal and placement operations would affect them.

Modification to the placement of dredged material to the combined DA-10/littoral zone area would not result in changes in potential impacts to marine mammals.

Because marine mammal species are mobile and foraging habitat would be enhanced for some species, no impairment to park marine mammal resources would occur. Therefore there would be no impairment of GUIS resources from the implementation of the Selected Plan.

Marine and Coastal Birds

Marine and coastal birds are common in the area and could utilize the placement sites at Camille Cut and East Ship Island for foraging, nesting, roosting, or stopovers during migration. Nesting birds typically occupy the area between April and August. Monthly surveys have also identified April to October as the period of greatest overall use of the island by birds. Migrants are typically present from mid-April through early May and early September through mid-October. Resident species are present year-round.

Migratory birds, which use the barrier islands as critical stopover locations, specifically those migrating north, normally arrive in a stressed condition due to low body reserves of fat. Disturbance from sediment placement could cause some migrants to avoid portions of the barrier islands during restoration activities and could cause additional stress. These migrants would likely seek other unaffected nearby areas.

Birds could temporarily be displaced during sediment dredging as well as during island placement of the sand. Locations used for sediment discharge could serve as an attractant to some species of birds due to the increase in potential food supply. Impacts to breeding and roosting areas, including nest abandonment, could occur during placement activities on and adjacent to East and West Ship Islands. Activities conducted on or immediately adjacent to barrier islands during the nesting season would be preceded by appropriate shorebird nesting surveys. Appropriate steps, including development of buffer areas around identified nesting sites, would be implemented where practical to reduce impacts. Birds would be expected to resume use of these areas following completion of the work.

Long-term beneficial impacts to birds, including the recently de-listed eastern brown pelican, following restoration would result from the improved island stability, enhanced nearshore foraging habitat, and an increase of 800 acres of barrier island habitat on Ship Island. However, the proposed placements would result in a beneficial impact to migratory birds from the creation of new barrier island habitat, along with associated new forage and nesting areas, and protection of other adjacent barrier island habitats (e.g., interior wetlands, shrub/scrub, and forested

habitats). Proposed vegetation plantings on the new dunes in Camille Cut would provide additional food supply for these coastal, marine, and migratory species. In addition, the restored barrier islands would help protect vital bird habitat along the Mississippi coast from the intensity of storm surges and storm waves.

Marine and coastal birds are common in the area and could utilize the placement sites at Cat Island for foraging, nesting, roosting, or stopovers during migration. Impacts from removal and placement of sediment at Cat Island would be similar to those described for the Ship Island restoration above.

Activities conducted on or immediately adjacent to barrier islands during the nesting season would be preceded by appropriate shorebird nesting surveys. Appropriate steps, including development of buffer areas around identified nesting sites, would be implemented where practical to reduce impacts. When practical, activities would be conducted outside of peak breeding or migration periods to reduce potential impacts.

Because the amount of shorebird habitat would increase upon completion of the Selected Plan, bird resources within the GUIS would not be impaired. Therefore, there would be no impairment of GUIS resource.

Hard Bottom Habitats

No hard bottom habitat is known from the locations associated with the Selected Plan. No impacts would occur. Therefore there would be no impairment of GUIS resources from the implementation of the Selected Plan.

Rare, Threatened, and Endangered Species

Several rare, threatened, or endangered species could occur in the project area, including protected turtle, fish, bird, and mammal species.

Although the islands are not widely used for nesting, at the Camille Cut and East Ship Island placement sites, sea turtle nesting habitat could be affected. In 2012, three loggerhead turtle nests were documented on Cat, West and East Ship Islands, and several additional nests were observed on Horn and Petit Bois Islands. During construction, access would be obtained from the southern and possibly the northern sides of East and West Ship Islands. Land-based equipment and pipelines could temporarily be used on the existing beach. To avoid and minimize potential impacts to nesting sea turtles, daily surveys would be conducted for nests within the construction zone, and the work area would be monitored for potential conflicts with nesting activity throughout the nesting season (April 15 to November 30). If nests are discovered within the work area, the nests would be relocated by appropriate personnel where necessary.

Long-term benefits to potential sea turtle nesting would result from the net increase of 800 acres of new barrier island habitat at Ship Island. No significant long-term impacts to turtle nesting habitat would be anticipated from the sand placement activities.

The Gulf sturgeon migrates through the Mississippi Sound and could occur in the Mississippi Sound at any time. However, recent monitoring has determined that the species appears in greater numbers around East and West Ship Islands in November and December. Sturgeon are a highly mobile species and would likely avoid placement areas due to noise and project activities. The species tends to concentrate around the barrier islands when in the project area, so it would likely be displaced from some preferred areas by placement activities. Following the completion of placement activities, displaced animals would be expected to resume use of the general area.

The placement activities would result in a loss of approximately 511 acres of Gulf Sturgeon Critical Habitat (GSCH) within the Camille Cut and East Ship placement areas, and -168 acres of GSCH at Cat Island. There would be an overall net loss of 0.08 percent of designated critical habitat for the project area. However, beneficial impacts would occur from the creation of new sheltered foraging habitat north of the newly closed 3.5-mile-wide Camille Cut.

The United States Fish and Wildlife Service (USFWS) has designated critical habitat for the wintering piping plover. The project area includes critical habitat for Unit 14. The restoration at Camille Cut and East Ship Island would add approximately 599 acres of usable designated piping plover critical habitat to the existing 139 acres; as a result, there would be 738 acres after the project is completed. This would consist of additional acres of island habitat, including new shoreline and swash zone habitat for the birds to use.

Impacts from aboveground noise could disrupt nesting behavior in birds, resulting in temporary to long-term impacts. Activities conducted on or immediately adjacent to barrier islands during the nesting season would be preceded by appropriate shorebird nesting surveys. Appropriate measures, including the terms and conditions described in the USFWS Biological Opinion (BO), dated September 8, 2015, would be implemented to reduce impacts.

Potential impacts to threatened and endangered species from placement activities on Cat Island and dredging of the Cat Island borrow area would be similar to those described for the Ship Island restoration above. Protective measures utilized for threatened and endangered species would be identical to those described for the Ship Island restoration. When practical, construction activities that can be delayed would be conducted outside of nesting periods for sea turtles. Long-term benefits to potential sea turtle nesting would result from the enhancement of barrier island habitat at Cat Island. No significant long-term impacts to turtle nesting habitat would be anticipated from the sand placement activities.

Future placement of suitable sandy material from the Horn Island Pass portion of the Pascagoula Harbor Navigation Channel would be placed farther south and west in the combined DA-10/littoral zone site along the shallow shoals exposed to the open Gulf waves with the greatest

sand transport potential. The area of potential direct placement would encompass 1,600 acres at depths of 5 to 30 feet.

The overall potential impacts from the Selected Plan to threatened and endangered species are summarized in the Biological Assessments and BOs in the Final SEIS.

Minimization and mitigation measures identified in the BOs will ensure current and future visitors will continue to have the opportunity to enjoy special status species; accordingly, there will be no impairment to special status species from implementation of the Selected Plan.

Essential Fish Habitat

Placement of sand in Camille Cut and on the southern shoreline of East Ship Island could temporarily reduce the quality of Essential Fish Habitat (EFH) in the vicinity and individuals may be displaced. However, ample habitat is available in the vicinity to accommodate these displaced individuals. As noted above, estuarine emergent wetlands (Section 5.4.1), oyster reefs (Section 5.4.3), and SAV (Section 5.4.1) would not likely be adversely affected. Placement operations would cover benthic organisms; however, as detailed in Section 5.4.3, no significant long-term impacts to this resource would likely occur as a result of the Selected Plan. Due to the relatively small area of ecosystem that would be affected (less than 1 percent of the Mississippi Sound), no significant long-term impacts would be expected.

As noted above, and notwithstanding the potential harm to some individual organisms, no significant impacts to managed finfish (Final SEIS, Section 5.4.4) or shellfish (Final SEIS, Section 5.4.3) populations would likely result from sand placement operations. No mitigation would be required for the temporary disruptions to EFH, as the fish would move out of the area during placement activities and would be able to return to the area after activities cease.

Following completion of restoration activities, long-term beneficial impacts to fish and shellfish habitat for breeding and foraging would result from stabilization and enhancement of the shallow water nursery and foraging habitat around the barrier islands and the protection from increasing salinity provided to estuarine waters in the Mississippi Sound.

Dredging of the Cat Island borrow area and placement of sand on the eastern shoreface of Cat Island could temporarily reduce the quality of EFH in the vicinity and individuals may be displaced. However, as with the Ship Island restoration discussed above, ample habitat is available in the vicinity to accommodate these displaced individuals. Estuarine emergent wetlands, oyster reefs, and SAV would not likely be adversely affected. Placement operations would cover benthic organisms; however, as discussed in Section 5.4.3 of the Final SEIS, no significant long-term impacts to this resource would likely occur. Increased water column turbidity during dredging would be temporary and localized. Due to the relatively small area of ecosystem that would be affected (less than 1 percent of the Mississippi Sound), no significant long-term impacts would be expected.

No significant impacts to managed finfish or shellfish populations would likely result from the borrow area dredging and sand placement operations. No mitigation would be required for the temporary disruptions to EFH, as the fish would move out of the area during placement activities and would be able to return to the area after activities cease.

Following completion of restoration activities, long-term beneficial impacts to fish and shellfish habitat for breeding and foraging would result from stabilization and enhancement of the shallow water nursery and foraging habitat around Cat Island.

Modification of the placement of dredged material to the combined DA-10/littoral zone site would not result in changes in potential impacts to EFH.

Following completion of restoration activities, long-term beneficial impacts to fish and shellfish habitat for breeding and foraging would result from stabilization and enhancement of the shallow water nursery and foraging habitat around the barrier islands. Because of these long-term benefits, EFH resources within the GUIs would not be impaired. Therefore there would be no impairment of GUIs resources from the implementation of the Selected Plan.

Special Aquatic Sites

A portion of the Selected Plan is within the GUIs and is therefore considered a special aquatic site. The Selected Plan was developed in compliance with NPS regulations and management policies for the GUIs. Restoration of the barrier islands would enhance protection for sites, such as the Grand Bay National Estuarine Research Reserve and the Grand Bay National Wildlife Refuge in Jackson County, and Hancock County Marshes by reducing the intensity of storm-related tidal surges.

Because of the distance between the locations associated with the Selected Plan and the nearest marine sanctuaries, implementation of this alternative would not negatively affect any special aquatic sites in the vicinity of the project. Therefore there would be no impairment of GUIs resources from the implementation of the Selected Plan.

Cultural Resources

For the borrow areas, all magnetic and acoustic anomalies are to be avoided by 50 meters 30 (164 feet) from the edge of the contacts. Thus, borrow activities will have No Effect to cultural resources. For the magnetic anomalies within the proposed access corridors: targets that were investigated by divers and determined to be modern debris are not eligible for the National Register of Historic Places and movement or destruction of that modern debris (less than 50 years old) will have No Effect on cultural resources. Those targets that were probed to at least the required 12 feet of depth required for the access corridors with negative results will not be directly impacted by the construction of the access corridors, but must still be considered potentially significant cultural resources. Thus the construction of the access corridors will have No Effect on those potential cultural resources. Those magnetic anomalies that were not probed,

as well as those that were probed with positive returns at less than 12 feet of depth will be considered as potentially eligible and avoided. Thus, construction activities will have No Effect on those potential cultural resources.

It was determined that, provided no disturbance occurs below 2 feet on the seafloor, there will be No Adverse Effect on the Quarantine Station site (22HR639) on East Ship Island. There are no other terrestrial sites on East or West Ship Island that will be impacted by the proposed barrier island restoration. Consequently, this undertaking will have No Effect on terrestrial cultural resources.

A survey located magnetic anomalies in the placement area for the restoration of Cat Island. No eligible resources were identified.

There would be no direct impact on known cultural resources. The restoration of Ship Island would aid in the stability of the existing structures (Fort Massachusetts and French Warehouse) through the addition of sediment to address erosion on the island. This would reduce threats from natural disasters and regular wave action. Because the Selected Plan would protect known cultural resources, these resources would not be impaired. Therefore there would be no impairment of GUIIS resources from the implementation of the Selected Plan.

Visual and Aesthetic Resources

Temporary impacts to aesthetics would occur in the immediate vicinity of placement activities during construction. Many people utilize the Mississippi Sound and the barrier islands within the project area and would likely be disturbed by the presence of heavy equipment and working vessels during the restoration. However, overall sediment placement activities would be short-term and individual placement activities would be temporary. Impacts would be minor, and therefore not significant.

The barrier island restoration project would likely provide residents and visitors with an overall more aesthetically pleasing view as activities are completed and would result in long-term improvements to visual and aesthetic resources.

Temporary impacts to aesthetics at the Cat Island placement and borrow areas would be similar to those described for the Ship Island restoration above. Sediment dredging and placement activities would be temporary and impacts would be minor, and therefore not significant.

Modification of the placement of dredged material to the combined DA-10/littoral zone site would not result in any change in the existing aesthetic environment in the Horn Island Pass vicinity.

Because negative impacts to aesthetics would be temporary and long-term improvements would result, visual and aesthetic park resources would not be impaired by the Selected Plan. Therefore there would be no impairment of GUIIS resources from the implementation of the Selected Plan.

Noise

Underwater noise would occur in association with placement and dredging activities, as described in Section 5.9 of the Final SEIS. There would be no impacts to human receptors due to increases in underwater noise.

Air noise that would occur during construction is detailed in Section 5.9.1 of the Final SEIS. Mechanical dredging produces noise between 58 and 70 dB at a distance of 50 feet from the operation (U.S. Environmental Protection Agency, 2003). These fall in the moderate and high noise level ranges mentioned above.

There are limited numbers of sensitive-noise receptors within a 1-mile radius of any locations in the Ship Island restoration. These receptors consist of people recreating or working in the vicinity of sediment placement and dredging locations and could be temporarily impacted by elevated noise levels. Typically, the amount of noise from a continuous source is halved (reduced by 3 dBA) as the distance from the source doubles. Additionally, wind and surf conditions would play a major role in determining the distances at which the construction-related sounds could be heard by nearby receivers. Studies have shown that the effects of wind on sound propagation can be substantial, with upwind attenuation approaching 25-30 dB more than downwind attenuation at the same distance from the. Thus, construction-related noise levels would vary, but would likely not be substantial.

The potential noise effects would occur for the duration of construction, which is estimated to be 2.5 years. Perceptions of construction noise would be attenuated by background sounds from wind and surf. Because noise impacts would be limited to the duration of construction and would occur only in restoration areas, no significant noise impacts would occur.

Impacts at the Cat Island placement and borrow areas would be similar to those described for the Ship Island restoration above. Noise receptors within a 1-mile radius of any locations associated with restoration include vacation homes on Cat Island, which would be temporarily impacted by elevated noise levels. In addition, receptors include people recreating or working in the vicinity of the Cat Island sediment borrow area. These receptors would experience temporary to long-term impacts, but impacts would not be significant. Because noise impacts would be limited to the duration of construction (2.5 years) and would occur only in restoration areas, no significant noise impacts would occur.

Modification to the placement of navigation dredged material to the combined DA-10/ littoral zone site would not result in any change in the existing noise environment of the area.

Because noise impacts would be limited to the duration of construction and would occur only in restoration areas, no significant noise impacts would occur. Any displacement would be temporary and limited to the duration of the restoration activities. Birds would be expected to resume use of these areas following completion of the work. The noise would not occur at levels

known to cause any injury, temporary or permanent, to marine life. Noise impacts from the Selected Plan would be less than significant. No impairment to park resources would occur from noise. Therefore there would be no impairment of GUIs resources from the implementation of the Selected Plan.

Air Quality

Air emissions associated with sediment removal and placement operations would likely be minor. Sediment removal and placement would be conducted using dredging equipment. The USACE Mobile District has historically dredged the navigation channels for Gulfport, Biloxi, and Pascagoula Harbors, including several improvement projects, without violating an air emission standard. In addition, detailed air quality analyses have been performed for dredging locations in nonattainment areas in San Diego, California and Texas City, Texas. Analysis of those operations determined that they would not cause significant air quality impacts as detailed in Section 5.10 of the Final SEIS. Similar equipment and methods would be used for restoration activities, and any air quality impacts would not be significant.

Appropriate technologies would be used to minimize air emissions in the project area, including the use of electric equipment, low sulfur diesel fuel in equipment (such as dredges, tugs, and other diesel-powered equipment), fuel additives, and particulate filters.

Impacts at the Cat Island placement and borrow areas would be similar to those described under the Ship Island restoration above. These impacts would not be significant.

Modification to the placement of navigation dredged material to the combined DA-10/littoral zone site would not result in any change in the existing air quality in the area.

Because of the minor and temporary nature of air emissions and the good air quality within the Mississippi Sound, air emissions from the Selected Plan would not impair park resources. Therefore there would be no impairment of GUIs resources from the implementation of the Selected Plan.

Wetlands

The Selected Plan includes impacts to marine and estuarine intertidal wetlands on or around the project barrier islands that will either be dredged or filled. The NPS Directors Order #77-1 Wetland Protection requires the NPS to identify and delineate wetlands according to the definition and classification system according to the U.S. Fish and Wildlife Service's (USFWS) definition in Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al., 1979).

The Selected Plan would impact 25.57 acres of marine and estuarine intertidal shoreline wetlands with deposited sand and, at the same time, relocate the marine and estuarine intertidal hydrologic conditions to other locations and result in an increase in the amount of marine intertidal wetland

habitat. There would be impacts on intertidal and estuarine wetland resources, including water quality, benthic invertebrates, fish, mollusks, crustaceans, and marine mammals. The project would result in the creation of 93.39 acres of marine intertidal shoreline wetlands. Although impacts to the intertidal zone's health of flora and fauna populations, community structure and composition, trophic structure, or system function would occur, these impacts are temporary and typically the recovery time ranges from a few months to 1-2 years. The net gain of 67.82 acres of new marine intertidal wetland habitat would compensate for the loss of 25.57 acres. Park resources would be enhanced through the creation of 67.82 acres of new habitat. Therefore there would be no impairment of GUIs resources from the implementation of the Selected Plan.

Monitoring and Adaptive Management Plan

The Monitoring and Adaptive Management (MAM) Plan was developed for the ecosystem restoration plan consistent with the requirements of the Water Resources Development Act (WRDA) of 2007, Section 2039 (a) and implementation guidance "CECW-PB Memorandum dated August 31, 2009, Implementation Guidance for Section 2039 of the WRDA – Monitoring Ecosystem Restoration" and is included as Appendix S of the Final SEIS. The primary purpose for implementing a MAM Plan is to determine progress toward restoration success and to increase the likelihood of achieving desired project outcomes in the face of uncertainty. Monitoring results will be used through an assessment process to determine whether the project outcomes are consistent with original project goals and objectives. The MAM Plan provides an organized and documented process that defines management actions in relation to measured project performance and establishes a feedback loop between continued project monitoring and corresponding project management, operation, and adjustments. The MAM Plan describes the monitoring design proposed to determine barrier island restoration success and avoid impacts to threatened and endangered species, describes the organization structure for the MAM process, describes the developed Conceptual Ecological Model, identifies key uncertainties, and provides potential adaptive management/contingency actions that may be needed to ensure project success. The MAM Plan is a living document and will be regularly updated to reflect monitoring-acquired and other new information as well as resolution of and progress on resolving key uncertainties and/or discovering lessons learned to help with management of coastal resources.

Conclusion

By allowing the Selected Plan to proceed, GUIs will meet its mission of preserving these resources and associated values unimpaired, and retain its significance in assuring the preservation, conservation, and protection of the natural values of the park while providing for the enhancement and public enjoyment of those resources. The Selected Plan will help address the long-term and accelerating erosion and land loss occurring on the barrier islands and specifically benefit East and West Ship Islands and Cat Island. Many of the identified implementation impacts will cease as soon as construction activities end. All of the affected resources would remain available to be enjoyed by current and future generations.

In the best professional judgment of the NPS decision-maker, based upon the impact analysis in the SEIS, relevant studies; advice or insights offered by subject matter experts and others who have relevant knowledge or experience, and the results of civic engagement and public involvement activities, no impairment of GUIIS resources or values will result from implementation of the Selected Plan.