

**DRAFT
ENVIRONMENTAL ASSESSMENT AND 404 (B) (1) EVALUATION
FOR
BAYOU CADDY ECOSYSTEM RESTORATION (SHORELINE STABILIZATION)
HANCOCK COUNTY, MISSISSIPPI**



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Environmental Resources Branch
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**DRAFT ENVIRONMENTAL ASSESSMENT
FOR
BAYOU CADDY ECOSYSTEM RESTORATION (SHORELINE STABILIZATION)
HANCOCK COUNTY, MISSISSIPPI**

Table of Contents

Acronyms and Abbreviationsv

1.0 INTRODUCTION.....1

 1.1 **Project Background**.....1

 1.2 **Location**3

 1.3 **Description of the Proposed Action**.....3

 1.4 **Purpose and Need for the Proposed Action**.....3

 1.5 **Authority**.....4

 1.6 **Non-Federal Sponsor**.....4

 1.7 **History of the Navigation Channel**.....4

2.0 ALTERNATIVES TO THE PROPOSED ACTION5

 2.1 **No Action Alternative**5

 2.2 **Construct a Rock Breakwater**6

 2.3 **Construct a Rock Breakwater Combined with Living Shoreline**.....6

3.0 AFFECTED ENVIRONMENT6

 3.1 **Fish and Wildlife Resources**.....7

 3.2 **Terrestrial Wildlife**8

 3.3 **Benthos, Motile Invertebrates, and Fishes**8

 3.4 **Essential Fish Habitat**.....9

 3.5 **Threatened and Endangered Species**11

 3.6 **Water Quality**.....13

 3.7 **Hazardous Materials**14

 3.8 **Air Quality**.....14

 3.9 **Esthetics**15

 3.10 **Noise**15

 3.11 **Cultural Resources**15

 3.12 **Sea Level Rise**15

4.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

 4.1 **Fish and Wildlife Resources**.....16

 4.2 **Terrestrial Wildlife**16

 4.3 **Benthos, Motile Invertebrates, and Fishes**17

 4.4 **Essential Fish Habitat**.....17

 4.5 **Threatened and Endangered Species**18

 4.6 **Water Quality**.....18

4.7 **Hazardous Materials** 19

4.8 **Air Quality**19

4.9 **Esthetics**19

4.10 **Noise**19

4.11 **Cultural Resources**19

4.12 **Sea Level Rise**19

5.0 **CUMULATIVE EFFECTS SUMMARY** 20

6.0 **OTHER CONSIDERATIONS**.....20

 6.1 **Coastal Zone Management Act**19

 6.2 **State Water Quality Certification**20

 6.3 **Clean Water Act**.....20

 6.4 **Rivers and Harbors Act**.....20

 6.5 **Marine Mammal Protection Act**.....21

 6.6 **Fish and Wildlife Coordination Act**21

 6.7 **Protection of Children**21

 6.8 **Environmental Justice**21

7.0 **COORDINATION** 22

8.0 **CONCLUSION** 22

9.0 **REFERENCES**..... 22

10.0 **LIST OF AGENCIES CONSULTED** 26

11.0 **LIST OF PREPARERS**..... 26

List of Figures

- Figure 1 – Vicinity Map of Cadet Bayou Federally Authorized Navigation Channel
- Figure 2 – Location Map for Bayou Caddy Ecosystem Restoration Area
- Figure 3 – Site Plan for Bayou Caddy Restoration Project Constructed in 2010
- Figure 4 – Large Site Plan for Bayou Caddy Restoration Project Constructed in 2010
- Figure 5 – Aerial View of Bayou Caddy Ecosystem Restoration Site Constructed in 2010
- Figure 6 – Aerial View of Bayou Caddy Restoration Project Damaged Geotubes 2011
- Figure 7 – Close-up View of Damaged Geotube 7 November 2013
- Figure 8 – New Geotube Installed at Bayou Caddy Ecosystem Restoration Site
7 November 2013
- Figure 9 – Proposed Breakwater Site Plan for Bayou Caddy
- Figure 10 – Temporary Access Channel Location Map for Bayou Caddy

List of Tables

- Table 1 – Dredged Material Removed from Cadet Bayou 1966-2010
- Table 2 – Fishery Management Plans and Managed Species for the Gulf of Mexico
(NMFS 2012)
- Table 3 – Threatened and Endangered Species (NOAA 2014)
- Table 4 – Federally Listed Threatened and Endangered Species in Hancock County,
Mississippi (USFWS 2014)

List of Enclosures

EA-Enclosure 1– Letter from NMFS PRD dated February 27, 2007 granting a 10-year concurrence for dredging and geotube construction at the Cadet Bayou ecosystem restoration site. The letter states that “NMFS has analyzed the routes of potential effects from the proposed project and concurs with the Corps determination that listed sea turtles and Gulf sturgeon are not likely to be adversely affected.”

EA-Enclosure 2 – No Effect Determination for Cultural Resources by the USACE District Cultural Resource Officer dated October 20, 2014.

EA-Enclosure 3 – Draft 404 (b) (1) Analysis for Bayou Caddy Ecosystem Restoration (Shoreline Stabilization) January 2015.

Enclosure 4 – Public Notice FP15-CB05-05 Bayou Caddy Ecosystem Restoration (Shoreline Stabilization) February 13, 2015.

ACRONYMS AND ABBREVIATIONS

BO	Biological Opinion
BMP	Best Management Practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Corps	United States Army Corps of Engineers
cys	Cubic Yards
CZC	Coastal Zone Consistency
DA	Disposal Area
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	Environmental Protection Agency
ER	Engineering Regulation
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FONSI	Findings of No Significant Impact
GMFMC	Gulf of Mexico Fishery Management Council
GIWW	Gulf Intracoastal Waterway
HCD	Habitat Conservation Division
HWD	Hazardous Waste Division
ITS	Incidental Take Statement
MDAH	Mississippi Department of Archives & History
MDEQ	Mississippi Department of Environmental Quality
MDMR	Mississippi Department of Marine Resources
Mg/l	Milligrams per liter
MLW	Mean Low Water
MLLW	Mean Lower Low Water
MsCIP	Mississippi Coastal Improvements Program
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
O&M	Operations and Maintenance
PRD	Protected Resource Division
Register	National Register of Historic Places
SAV	Submerged Aquatic Vegetation
SHPO	State Historic Preservation Officer
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
WRDA	Water Resources Development Act
WQC	Water Quality Certification

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**DRAFT ENVIRONMENTAL ASSESSMENT
FOR
BAYOU CADDY ECOSYSTEM RESTORATION (SHORELINE STABILIZATION)

HANCOCK COUNTY, MISSISSIPPI**

1.0 INTRODUCTION

This Environmental Assessment (EA) presents impacts potentially resulting from the construction of an offshore breakwater and living shoreline located at the Bayou Caddy Ecosystem Restoration Site, Hancock County, Mississippi (**Figures 1 and 2**). This project is needed to protect the restoration site from further storm damage and enhance its function as a dredged material placement site for beneficial use. The breakwater is needed to reduce wave energy, protect the geotubes and provide an additional level of protection to the established wetland after the geotubes have degraded. The purpose of this EA is to determine whether or not the proposed action has the potential for creating significant impacts to the environment and would thereby warrant a more detailed study on possible impacts, mitigation, and alternative courses of action.

The National Environmental Policy Act (NEPA) of 1969, as amended, excuses or excludes Federal agencies from the preparation of any formal environmental analysis with respect to actions that result in minor or no environmental effects, which are known as "categorical exclusions." An intermediate level of analysis, an EA, is prepared for an action that is not clearly categorically excluded, but does not clearly require an Environmental Impact Statement (EIS) [40 Code of Federal Regulations (CFR) §1501.3 (a) and (b)]. Based on the EA, Federal agencies either prepares an EIS, if one appears warranted, or issues a "Finding of No Significant Impact" (FONSI), which satisfies the NEPA requirement. This EA is prepared according to the USACE' Engineer Regulation (ER) 200-2, Procedures for Implementing NEPA, and the Council of Environmental Quality (CEQ) Regulations (40 CFR § 1508.27) for Implementing the Procedural Provisions of NEPA (40 CFR § 1500-1508).

1.1 Project Background. The U.S. Army Corps of Engineers (USACE), Mobile District, proposes to restore and provide additional shoreline protection to the Bayou Caddy marsh restoration/dredged material beneficial use site. This action is related to the consequences of tropical storm Lee that made landfall on September 5, 2011 with additional damage resulting from Hurricane Isaac in 2012. Large waves and high tides damaged the existing geotube containment structure by displacing the sandy material within the geotubes. This sand displacement caused an uneven elevation on the perimeter of the containment structure which greatly reduced its capability to contain dredged material and function properly as a beneficial use site. The damaged geotubes were repaired in November 2013. The intent for this project is to protect the site from further storm damage, extend the life of the newly constructed geotubes, provide an additional level of protection to the established wetlands after the geotubes have

degraded and enhance the habitat for oysters, fish and other marine organisms.

The Bayou Caddy marsh restoration project was identified by the USACE as a potential restoration site in coastal Mississippi along with 38 other sites during the development of the Comprehensive Master Plan for Beneficial Use of Dredged Materials along Coastal Mississippi (Master Plan). This effort began as a reconnaissance study funded under the General Investigations Program and was completed in September 2002.

The Mississippi Coastal Improvements Program (MsCIP) Near Term Improvements EA dated June 2006 identified 15 projects in coastal Mississippi that would benefit the overall coastal environment. One of those projects was the Bayou Caddy Ecosystem Restoration project. The project consists of restoration and preservation of fresh and saltwater wetlands by constructing a confined open-water dredged material beneficial use site to restore eroded fresh and saltwater marsh along the western shoreline of Cadet Bayou (USACE 2006).

The MsCIP Comprehensive Plan and Integrated Programmatic Environmental Impact Statement (MsCIP PEIS) (USACE, 2009) 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, were 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, and preservation of fish and wildlife (USACE, 2009).

The MsCIP PEIS evaluated an array of measures to promote the recovery of coastal Mississippi from the hurricanes of 2005 and to increase the resilience of the coast against damage from future storms. 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.

Due to the infrequency of dredging the Cadet Bayou (locally known as Bayou Caddy) navigation project, the site was divided into two sites – Phase I consisted of a 4-acre site and Phase II consisted of a 18-acre site. Construction began in 2010 with the placement of the geotubes. The 4-acre portion of the overall beneficial use site was constructed next from sandy type materials obtained within the site to allow marsh plantings to occur. The site was planted with *Spartina alterniflora* (saltmarsh cordgrass), *Juncus roemerianus* (black needlerush) and *Spartina patens* (saltmeadow cordgrass). This site is fully functional with significant natural plant growth. The 18-acre Phase II site was filled with approximately 50,000 cubic yards (cys)

of dredged material from the navigation channel in 2010. Since then, the material contained in this site has consolidated and the site consists primarily of open water. The 18-acre site must be filled again with dredged sediments before it will be ready for planting.

During the period of October 28, 2013 to November 20, 2013 the ecosystem restoration site's damaged geotubes were replaced. The existing damaged geotubes were partially removed (tops cut off) and the sandy material was reworked to make a solid foundation for the new scour apron and geotubes. The geotubes were filled with existing sandy material on site over a period of approximately ten days. The replacement geotubes are now fully functional and the site is capable of containing more beneficial use material.

1.2 Location. This project is located in the southwestern most part of the state near the community of Waveland, Hancock County, Mississippi (**Figure 1**). The Cadet Bayou is about 21 miles to the west of the Port of Gulfport and is about 44 miles to the east of New Orleans, Louisiana. The mouth of the bayou enters the Mississippi Sound at coordinates (Latitude 30° 14' 19" and Longitude 89° 25' 25"). The project site is adjacent to and west of the federally authorized Cadet Bayou navigation project along the shoreline facing to the south and east. The north terminus of the project site is the entrance channel to Cadet Bayou. A map of the Cadet Bayou Navigation Project is shown in Figure 1.

1.3 Description of the Proposed Action. The proposed action consists of constructing a 650-foot long by 25-foot wide rock breakwater combined with a 1,925 foot long segmented living shoreline to protect the Bayou Caddy ecosystem restoration project from excessive wave action and storm damage. This site will also provide additional storage capacity for the beneficial use of dredged material and eventual creation of additional tidal marsh.

1.4 Purpose and Need for the Proposed Action. The purpose of this proposed action is to provide additional protection to the existing 22 acre Bayou Caddy ecosystem restoration project and adjacent marshland. The intent is for the breakwater and living shoreline to provide protection to the geotube structure during critical storm and high wave events (i.e. wave breaking at the structure crest) for containment purposes, and also provide an additional level of protection to the established wetlands after the geotubes have degraded. There is also great need for a dredged material beneficial use site in Hancock County which currently lacks an easily accessible site for local contractors to place and beneficially use their dredged material. This is due to recently passed legislation in the State of Mississippi (MS Code § 49-27-61) that requires a permittee to beneficially use dredged material for projects with over 2,500 cubic yards of material when beneficial use sites are available and the material is suitable for placement (CH2MHILL, 2011). This proposed project will provide additional space for the beneficial use of dredge material and eventual creation of additional tidal marsh habitat.

1.5 Authorization. The MsCIP was authorized by the Department of Defense Appropriations Act, 2006 (P.L. 109-148) 30 December 2005, which states:

“For an additional amount for “investigations” to expedite studies of flood and 11 storm damage reduction related to the consequences of hurricanes in the Gulf of Mexico and Atlantic Ocean in 2005, \$37,300,000 to remain available until 13 expended: Provided, that using

*\$10,000,000 of the funds provided, the Secretary 14 shall conduct an analysis and design for comprehensive improvements or modifications to existing improvements in the coastal area of Mississippi in the 16 interest of **hurricane and storm damage reduction, prevention of saltwater 17 intrusion, preservation of fish and wildlife, prevention of erosion, and other 18 related water resource purposes** at full Federal expense; Provided further, that 19 the Secretary shall recommend a cost-effective project, but shall not perform an incremental benefit-cost analysis to identify the recommended project, and shall 21 not make project recommendations based upon maximizing net national 22 economic development benefits; Provided further, that interim recommendations 23 for near term improvements shall be provided within 6 months of enactment of 24 this act with final recommendations within 24 months of this enactment.”*

The Bayou Caddy restoration project was one of the priority projects listed in the 2006 EA and FONSI MsCIP Near Term Improvements report for Hancock, Harrison, and Jackson Counties, Mississippi.

1.6 Non-Federal Sponsor. There is no local sponsor for this project. This project is 100% federally funded.

1.7 History of the Navigation Channel. The federally authorized Cadet Bayou navigation channel is located in Hancock County, Mississippi. The Federal project provides for a shallow draft channel from Mississippi Sound north into the small harbor. The channel is primarily utilized by commercial shrimp and oyster vessels and private boaters. From 1926 until 1970, when the Federal government assumed responsibility for dredging the existing channel, local interests had only dredged the shoal from the mouth of the bayou on five different occasions. In 1966, the Federal government removed approximately 43,000 cubic yards of material from the shoal as emergency action following Hurricane Betsy. No dredging within Mississippi Sound or the bayou portion was performed until 1970.

Initial construction of the Federal project in 1970 used approximately 46 acres of emergent tidal salt marsh as dredged material disposal sites to contain all construction material and projected future maintenance material. Prior to 1970, dredging activities within the bayou resulted in the unconfined deposition of material on the emergent salt marsh. Since this time, these areas have been re-colonized by salt marsh plant species and have almost completely recovered. The practice of indiscriminate disposal of dredged material in wetland areas is no longer allowed. The USACE, Mobile District has since maintained the federally authorized Cadet Bayou navigation project.

Over the past 47 years, the channel has been dredged ten times. A total of 1,605,823 cys of dredged material has been removed from the channel. A summary of the dredging is listed in **Table 1**.

Table 1: Dredged Material Removed from Cadet Bayou 1966-2010

<u>Date</u>	<u>Quantity in Cubic Yards</u>
1966	43,097
1970	352,757
1972	206,699
1977	188,838
1982	123,739
1989	234,877
1995	153,900
2002	154,316
2006	74,600
2010	<u>73,000*</u>
Total	1,605,823 cys

***Note: The last Cadet Bayou dredging event was in 2010. Most of the dredged material was placed inside the containment cell for beneficial use and marsh creation.**

2.0 ALTERNATIVES TO THE PROPOSED ACTION. In 2014, the Mobile District evaluated a shoreline protection system for the beneficial use site. A series of meetings were held to determine the best course of action for protecting the geotubes and enhancing the ecosystem. A combination of a breakwater and living shoreline was determined to be the best way forward. It would also allow for the future expansion of the beneficial use site providing space for the placement of several thousand more cubic yards of dredged material and additional acres of tidal marsh creation. Final design of the project was completed in October 2014. Three different living shoreline structures were proposed which consisted of reef balls, wave attenuation devices and/or oysterbreaks. All three technologies are beneficial in that the structures provide attenuation of the wave energy and create substrate for oysters and other organisms to colonize.

For this analysis, three alternatives were considered for this project. These alternatives are:

1. No Action Alternative/ No breakwater construction
2. Construct a Rock Breakwater
3. Construct a Rock Breakwater Combined with a Living Shoreline Component

2.1 No Action Alternative In addition to the proposed alternative plan, the ‘no action’ alternative was considered. The No-Action Alternative represents the future without-project conditions that would occur in the project area without further restoration of the beneficial use site. Under the No-Action Alternative, the project (breakwater/living shoreline) would not be built. The loss of coastal habitat would continue along with continuing degradation of the restoration site and the recently repaired geotubes. Eventually, there would be a net loss of tidal marsh, estuarine habitat and productive fisheries. There would also be a lack of area to

beneficially use dredged material in Hancock County. Dredged material from the navigation channel and other local projects would have to be placed in the open-water or upland disposal sites instead of being beneficially used for tidal marsh creation and shoreline protection. Mainland wetlands and coastal habitats would continue to diminish, reducing the resilience of the coast against damage from future storms.

As documented in the MsCIP June 2006 EA and the MsCIP 2009 PEIS, the intent of the program is to reduce storm damage, prevent saltwater intrusion, preserve fish and wildlife habitat, and prevent erosion. The No-Action Alternative would fail to address the need for these comprehensive improvements in the coastal area of Mississippi in the interest of hurricane and storm damage risk reduction. Without corrective action, shoreline erosion would continue and the geotubes would be damaged again resulting in loss of valuable tidal marsh habitat. Therefore, the “no action” alternative was deemed unacceptable and not considered any further.

2.2 Construct a Rock Breakwater. This alternative involves constructing a 2,700-foot long by 25-foot wide rock breakwater along the entire open-water side of the Bayou Caddy beneficial use site. The breakwater would be anchored into the existing shoreline, project out into the open-water and then run parallel approximately 300 feet offshore from the geotubes for a distance of about 1,925 feet to provide additional protection to the ecosystem restoration site. It would also add additional storage capacity for the beneficial use of dredged sediments by providing the opportunity to create additional salt marsh. This alternative would provide long term protection to the existing shoreline and newly constructed geotubes making them less susceptible to excessive wave action and storm damage. It would not promote the exchange of fresh water when compared to a living shoreline. This alternative was not selected by itself. However, it was included as a component of the preferred alternative.

2.3 Construct a Rock Breakwater Combined with a Living Shoreline Component. This alternative involves constructing a 650-foot long by 25-foot wide rock breakwater along with a 1,925 foot long living shoreline component that would run approximately 300 feet offshore and parallel to the existing geotubes to provide additional protection to the Bayou Caddy ecosystem restoration site (**Figure 9**). Like the previous alternative--this alternative would provide additional protection to the existing geotubes while also providing additional storage capacity for beneficial use of dredged sediments in Hancock County. However, it will also add a living shoreline component which will provide a more ecologically sound alternative that will promote the exchange of freshwater and provide a more favorable habitat for the benefit of fish, shellfish and other marine organisms. This is the preferred alternative.

Note: A temporary access channel would have to be constructed to provide access for work barges into the project area. This channel would be constructed using either a hydraulic or mechanical dredge. The excavated material would either be placed along the side of the channel or inside of the geotube contained beneficial use area. The access channel would be approximately 3,000-foot long, 40-foot wide with a depth of 6-8 feet below MLW and run parallel to the geotubes inside the living shoreline area. See **Figure 10** for an approximate location of the access channel.

3.0 AFFECTED ENVIRONMENT. The area is characterized by a humid subtropical climate and is partially isolated from the Gulf of Mexico. Average annual air temperatures are 66–68 degrees Fahrenheit (°F). The normal annual rainfall is 65–67 inches, distributed relatively evenly throughout the year. The area is subject to hurricanes from June through the end of November, with most occurring in August and September. In 1969, Hurricane Camille damaged the coastal area of Mississippi, and in 2005, Hurricanes Katrina and Rita damaged coastal areas from Galveston, Texas, through the Mississippi and Alabama coasts (USACE 2013).

Mississippi Sound is a shallow, estuarine body of water averaging 6–12 miles wide and extending roughly 100 miles along the coast from Mobile Bay, Alabama, west to Lake Borgne, Louisiana. The average mean low water depth of the Sound is 10 feet, and over 99 percent of the area is less than 20 feet deep (USACE 2013).

Cadet Bayou (known locally as Bayou Caddy) is a small winding tidal stream in the southwest portion of Hancock County, Mississippi. Hancock County is the westernmost of Mississippi's three coastal counties. Unlike the other two counties, Harrison and Jackson, the coastal strip of Hancock County is relatively undeveloped. Cadet Bayou and its tributary stream flow through approximately 2,600 acres of tidal marsh before emptying into Mississippi Sound. The open-water and estuarine marshes provide habitat for various species of plants, animals and fish. The species composition of the estuarine and offshore area along the northern Gulf of Mexico is of a high diversity due to the variety of environmental conditions, which exist in the area.

The bayou area is in a low-lying area of slight relief known as the Coastal Pine Meadows. Surface elevations range from sea level to approximately 15 feet above mean sea level (MSL). The area surrounding Cadet Bayou contains coastal deposits of loam, sand, gravel, and clay. West of the bayou, the coastal area is flat, drainage is poor and the shoreline, with the exception of a few small, poor, unused beaches, is virtually all low salt marsh broken by numerous bayous and streams. These conditions indicate a stable, non-eroding shoreline. East of the bayou, elevations are generally higher and the shoreline has experienced considerable erosion, especially that segment of the shore north and east of the bayou. Groundwater lies near the surface over the whole area and comes to the surface in occasional depressions, forming marshes, which drain into tidal streams, which in turn flow into Mississippi Sound. Flows in Cadet Bayou are almost completely influenced by tidal action since the bayou has a relatively small drainage basin (about 8,000 acres) with no major inland sources of water.

3.1 Fish and Wildlife Resources

Oyster Reefs. Oyster reefs of commercial importance are subtidal and form aggregates that cover thousands of acres throughout the Mississippi Gulf Coast. The oysters inhabit shallow estuarine waters during all life stages. The Mississippi Department of Marine Resources (MDMR) manages 17 natural oyster reefs. The areal extent of oyster reefs in Mississippi is estimated at approximately 10,000 to 12,000 acres, of which approximately 7,400 acres are located in western Mississippi Sound. Approximately 97 percent of the commercially harvested oysters in Mississippi come from the reefs in western Mississippi Sound, primarily from Pas Marianne, Telegraph, and Pass Christian reefs (MDMR 2009). Oyster reefs are particularly productive biological areas. The animals and plants, which are associated with the oyster reef community, are varied and numerous and include algae, sponges, hydroids, polychaetes, other mollusks, barnacles, bryozoans, tunicates, and a number of species of fish.

Submerged Aquatic Vegetation. Mississippi Sound encompasses an area of 4,792km² and contains 12,140 ha of submerged aquatic vegetation (SAV) (USEPA 1999). Seagrass represents the primary component of SAV. Approximately 810 ha of seagrass beds have been identified along coastal Mississippi (MDFWP, 2005). Seven species of seagrass can be found in the Gulf of Mexico. Mississippi coastal waters contain three submergent bed types: barrier island seagrass, widgeon grass, and American wild celery beds. Widgeon grass beds occur in shallow, moderate turbidity waters that are low in salinity. These beds occur in bays along bayous, and in mudflats and barrier island ponds. Size and distribution of widgeon grass beds have varied over time due to damage from hurricanes (MDFWP, 2005).

Wetlands. Tidal marshes are located along the bay shorelines and the shoreline of the Mississippi Sound. These marshes are flat areas dominated by salt-tolerant grasses and few other plant species. Smooth cordgrass (*Spartina alterniflora*), and black needlerush (*Juncus roemerianus*) are the most prominent plants, with salt meadow cordgrass (*Spartina patens*), leafy sedge and three-square also common. Some Mississippi tidal marsh feature unique habitats called “salt flats” or “salt pans.” Salt grass and succulents are found here in association with black needlerush, marsh aster and sea lavender (MDMR 2004).

Sediments. The sediments within the Mississippi Sound consist of sand to clays. The sediments dredged from the cadet Bayou project consist primarily of silts and clays. The USACE, Mobile District performed a District-wide sediment analysis in 1974. Five stations at Cadet Bayou were sampled and analyzed for physical, chemical, heavy metal, and pesticide characteristics. An elutriate analysis was performed for one station. The surface sediment types for the Cadet Bayou area, utilizing the Unified Soil Classification System, ranged from silt with low liquid limits to silty clay with low liquid limits around Cadet Bayou (USACE 2005).

3.2 Terrestrial Wildlife. Animals inhabiting the terrestrial region in the vicinity of the project include reptiles (alligators and turtles), small mammals (armadillos, muskrat, mice, raccoon and fox). Birds in the vicinity of the project may include: Gulls, osprey, great blue heron, great egret, piping plover, sandpiper, gulls, brown and white pelicans. Among the species of birds, which are abundant in Cadet Bayou’s marshes, are several species of rails, herons, egrets, and bitterns.

3.3 Benthos, Motile Invertebrates, and Fishes. The benthic community in the Mississippi Sound was classified by Vittor and Associates in a study of the Mississippi Sound and selected sites in the Gulf of Mexico (Vittor, 1982). A total of 437 taxa were collected at densities ranging from 1,097 to 35,537 individuals per square meter. Generally, densities increase from fall through the spring months since most of the dominant species exhibit a late winter to early spring peak in production. These species, though sometimes low to moderate in abundance, occur in a wide range of environmental conditions. They are usually the most successful at early colonization and thus tend to strongly dominate the sediment subsequent to disturbances such as dredging activities. These species include polychaetes *Mediomastus spp.*, *Paraprionospio pinnata*, *Myriochele oculata*, polychaete worm *Owenia fusiformis*, *Lumbrineris spp.*, *Sigambra tentaculata*, the *Linopherus-Paraphinome* complex, and *Magelona cf. phyllisae*. The *phoronid*, *Phoronis sp.* and the *cumacean* *Oxyurostylis* also fit this category. *M. oculata* and *O. fusiformis*

are predominate species in the Mississippi Sound. The numerically dominant species collected during the study were polychaete worm *M. californiensis* and *P. pinnata*.

The fish community present in the vicinity of the Cadet Bayou navigation project represents a wide array of species from both near-shore and off-shore taxa. The majority of the fish species present are estuarine-dependent for part of their lifecycle. Typically, these species spawn in the Gulf of Mexico and the larvae are carried inshore to estuaries to mature (USACE, 1989). These small, immature forms (ichthyoplankton) are susceptible to flow regimes changes around the barrier islands where the surrounding grassbeds provide nursery grounds.

The major fisheries of the area include Gulf menhaden (*Brevoortia patronus*), striped mullet (*Mugil cephalus*), and Atlantic croaker (*Micropogonias undulatus*) (USACE 1989). All of these species are commercially important and the estuaries within the vicinity of the project site play a key role in their lifecycle and survival. Christmas and Waller (1973) reported 138 species of finfish taken from Mississippi Sound. The most abundant species was the bay anchovy (*Anchoa mitchilli*) which serve an important forage fish for many other fish species. Cadet Bayou does not provide the only habitat necessary to maintain the existing population levels of the bay anchovy. Other areas in the Gulf of Mexico also provide the required habitat needed to maintain successful bay anchovy populations.

The most commercially important shellfish found in the area include the brown and white shrimp, blue crab, and American oyster (Swingle, 1971 and Swingle and Bland, 1974). Marine shrimp is by far the most popular seafood in the United States. There are many species of shrimp found in the Gulf of Mexico; however, only those of the family *Penaeidae* are large enough to be considered seafood. Brown shrimp (*Penaeus aztecus*), white shrimp (*P. setiferus*) and pink shrimp (*P. duorarum*) make up the bulk of Mississippi shrimp landings.

The life cycles of brown, white and pink shrimp are similar. They spend part of their life in estuaries, bays and the Gulf of Mexico. Spawning occurs in the Gulf of Mexico. One female shrimp releases 100,000 to 1,000,000 eggs that hatch within 24 hours. The postlarvae shrimp develop through several larval stages as they are carried shoreward by winds and currents. Postlarvae drift or migrate to nursery areas within shallow bays, tidal creeks, and marshes where food and protection necessary for growth and survival are available. There they acquire color and become bottom dwellers. If conditions are favorable in nursery areas, the young shrimp grow rapidly and soon move to the deeper water of the bays. When shrimp reach juvenile and subadult stages (3-5 inches long) they usually migrate from the bays to the Gulf of Mexico where they mature and complete their life cycles. Most shrimp will spend the rest of their life in the Gulf. Shrimpers actively fish and moor their boats in the vicinity of Cadet Bayou. However, shrimp is also actively fished outside of the boundaries of the site.

3.4 Essential Fish Habitat. Congress defines Essential Fish Habitat (EFH) as “those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity.” The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. The Gulf of Mexico Fishery Management Council (GMFMC) and National Marine Fisheries Service (NMFS) have identified EFHs for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine areas, such as

estuarine emergent wetlands, seagrass beds, algal flats, and mud, sand, shell, and rock substrates. In addition, marine areas, such as the water column, vegetated and non-vegetated bottoms, artificial and coral reefs, geologic features and continental shelf features have also been identified. The habitat within the vicinity of the project consists of open-water marine environment with a sandy bottom and subject to high wave action and currents.

Open-water and estuarine marshes provide habitat for various species of invertebrates and vertebrates. Epibenthic crustaceans and infaunal polychaetes dominate the diets of higher trophic levels, such as flounder, catfish, croaker, porgy, and drum. The fish species composition of the estuarine and offshore area along the northern Gulf of Mexico is of a high diversity due to the variety of environmental conditions, which exist within the area. The major fisheries landed along the Mississippi and Alabama Gulf coast are Spanish mackerel (*Scomberomerus maculatus*), king mackerel (*Scomberomerus cavalla*), cobia (*Rachycentron canadum*), bluefish (*Pomatomus saltatrix*), pompano (*Trachinotus carolinus*), little tunny (*Euthynnus alletteratus*), spotted sea trout (*Cynoscion nebulosus*), red drum (*Sciaenops ocellatus*), and several shark species. In addition, numerous species of less interest may be taken, including ladyfish (*Elops saurus*), crevalle jack (*Caranx hippos*), blue runner (*Caranx crysos*), and black drum (*Pogonias cromis*). Trawlers work the area primarily for brown and white shrimp (*Peneus aztecus* and *P. setiferus*), but occasional trawlers seeking finfish species, including menhaden (*Brevoortia patronus*) and croaker (*Micropogonias undulatus*), as well as other industrial species may trawl this bottom (GMFMC-1998, 2004 and 2005, and Fishbase 2007).

The Mississippi Sound and adjacent waters have been identified as important nursery areas for nine sharks, primarily Atlantic sharpnose, blacktip, finetooth, and bull sharks. Less prevalent species are the spinner, blacknose, sandbar, bonnethead, and scalloped hammerhead. Typically sharks migrate inshore in the early spring around March and April, remain inshore during the summer months and then migrate offshore during the late fall around October. Most shark species in the Mississippi waters give birth during late spring and early summer, with young sharks spending just a few months of their life's in shallow coastal waters. Most shark species are abundant around barrier islands, with adult sharks commonly located south of the barrier islands (Carlson *et al.*, 2003).

The species managed by the Gulf of Mexico Fishery Management Council are listed in **Table 2** below.

Table 2: Fishery Management Plans and Managed Species for the Gulf of Mexico. (NMFS 2012)	
Shrimp Fishery Management Plan	
brown shrimp – <i>Farfantepenaeus aztecus</i>	
pink shrimp - <i>F. duorarum</i>	
royal red shrimp - <i>Pleoticus robustus</i>	
white shrimp - <i>Litopenaeus setiferus</i>	
Reef Fish Fishery Management Plan	
almaco jack – <i>Seriola rivoliana</i>	
anchor tilefish - <i>Caulolatilus ntermedius</i>	
banded rudderfish – <i>S. zonata</i>	
blackfin snapper - <i>Lutjanus buccanella</i>	
blackline tilefish - <i>Caulolatilus cyanops</i>	
black grouper- <i>Mycteroperca bonaci</i>	
blueline tilefish – <i>C. microps</i>	
cupera snapper – <i>L. cyanopterus</i>	
dog snapper – <i>L. jocu</i>	
dwarf sand perch - <i>Diplectrum ivittatum</i>	
gag grouper - <i>M. microlepis</i>	
goldface tilefish – <i>C. chrysops</i>	
goliath grouper - <i>Epinephelus itajara</i>	
gray snapper – <i>L. griseus</i>	
gray triggerfish - <i>Balistes capriscus</i>	
greater amberjack – <i>S. dumerili</i>	
hogfish - <i>Lachnolaimus maximus</i>	
lane snapper - <i>Lutjanus synagris</i>	
lesser amberjack - <i>S. fasciata</i>	
mahogany snapper – <i>L. mahogoni</i>	
marbled grouper – <i>E. inermis</i>	
misty grouper – <i>E. mystacinus</i>	
mutton snapper – <i>L. analis</i>	
Nassau grouper – <i>E. striatus</i>	
queen snapper - <i>Etelis oculatus</i>	
red hind - <i>Epinephelus guttatus</i>	
red grouper – <i>E. morio</i>	
red snapper - <i>L. campechanus</i>	
rock hind – <i>E. adscensionis</i>	
sand perch - <i>Diplectrum formosum</i>	
scamp grouper - <i>M. phenax</i>	
schoolmaster – <i>L. apodus</i>	
silk snapper – <i>L. vivanus</i>	
snowy grouper – <i>E. niveatus</i>	
speckled hind - <i>E. drummondhayi</i>	
tilefish - <i>Lopholatilus chamaeleonticeps</i>	
vermillion snapper - <i>Rhomboplites aurorubens</i>	
Warsaw grouper – <i>E. nigritus</i>	
wenchman - <i>Pristipomoides aquilonaris</i>	
yellowedge grouper <i>E. lavolimbatus</i>	
yellowfin grouper – <i>M. venenosa</i>	
yellowmouth grouper – <i>M. interstitialis</i>	
yellowtail snapper – <i>Ocyurus chrysurus</i>	
	Stone Crab Fishery Management Plan FL
	stone crab - <i>Menippe mercenaria</i>
	gulf stone crab – <i>M. adina</i>
	Spiny Lobster Fishery Management Plan
	spiny lobster - <i>Panulirus argus</i>
	slipper lobster - <i>Scyllarides nodife</i>
	Coral and Coral Reef Fishery Management Plan
	varied coral species and coral reef communities
	comprised of several hundred species
	Coastal Migratory Pelagic Fishery Management Plan
	cobia - <i>Rachycentron canadum</i>
	king mackerel – <i>Scomberomorus cavalla</i>
	Spanish mackerel - <i>S. maculatus</i>
	Red Drum Fishery Management Plan
	red drum - <i>Sciaenops ocellatus</i>

Within the project area, EFH has been designated for managed species of Gulf of Mexico Dolphin, Wahoo, Red Drum, sharks (11 species), coastal migratory pelagics (3 species), reef fish (43 species), stone crab (2 species) and shrimp (4 species). No habitat areas of particular concern were identified for this area.

3.5 Threatened and Endangered Species. Several species of threatened and endangered marine mammals, turtles, fish and birds occur in the Gulf of Mexico off the coast of Mississippi. The National Oceanic and Atmospheric Administration (NOAA) lists the following species in **Table 3** as either threatened and/or endangered that may potentially occur within the project area:

Table 3: Threatened and Endangered Species (NOAA 2014)

LISTED SPECIES	SCIENTIFIC NAME	STATUS	DATE LISTED
Marine Mammals			
Blue Whale	<i>Balaenoptera musculus</i>	Endangered	12/2/1970
Finback Whale	<i>Balaenoptera physalus</i>	Endangered	12/2/1970
Humpback Whale	<i>Megaaptera novaengliae</i>	Endangered	12/2/1970
Sei Whale	<i>Balaenoptera borealis</i>	Endangered	12/2/1970
Sperm Whale	<i>Physeter macrocephalus</i>	Endangered	12/2/1970
North Atlantic Right Whale	<i>Eubalaena glacialis</i>	Endangered	12/2/1970
West Indian Manatee	<i>Trichechus manatus</i>	Endangered	3/11/1967
Turtles			
Green Sea Turtle	<i>Chelonia mydas</i>	Threatened	7/28/1978
Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>	Endangered	6/2/1970
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	Endangered	12/2/1970
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Endangered	6/2/1970
Loggerhead Sea Turtle	<i>Caretta caretta</i>	Threatened	7/28/1978
Fish			
Gulf Sturgeon	<i>Acipenser oxyrinchus desotoi</i>	Threatened	9/30/1991

The U.S. Fish and Wildlife Service (USFWS) lists the following species in **Table 4** as either threatened and/or endangered that may occur within Hancock County, Mississippi.

Table 4: Federally Listed Threatened and Endangered Species in Hancock County, MS (USFWS 2015)
T – Louisiana black bear (<i>Ursus a. luteolus</i>)
E – West Indian manatee (<i>Trichechus manatus</i>)
T – Alabama heelsplitter (<i>Potamilus inflatus</i>)
* – Bald Eagle (<i>Haliaeetus leucocephalus</i>)
T – Piping plover (<i>Charadrius melodus</i>)
T – Gopher tortoise (<i>Gopherus polyphemus</i>)
T – Loggerhead sea turtle (<i>Caretta caretta</i>)
E – Kemp's ridley sea turtle (<i>Lepidochelys kempii</i>)

T – Green sea turtle (<i>Chelonia mydas</i>)
E – Leatherback sea turtle (<i>Dermochelys coriacea</i>)
T – Ringed Map turtle (<i>Graptemys oculifera</i>)
TCH – Gulf sturgeon (<i>Acipenser oxyrinchus desotoi</i>)
E – Louisiana quillwort (<i>Isoetes louisianensis</i>)
T – Red Knot (<i>Calidris canutus rufa</i>)
<u>Key to codes on list:</u>
* – Bald Eagle is now delisted but their nest trees are protected by federal law.
E – Endangered C – Candidate Species
T – Threatened TCH – Listed with Critical Habitat

Reference: http://ecos.fws.gov/tess_public/reports/species-by-current-range-county?fips=28045. Site Accessed 12 January 2015

Of these species listed, those that could possibly be found within the project area include the following:

- Green sea turtle
- Loggerhead sea turtle
- Kemp's ridley sea turtle
- Leatherback sea turtle
- Piping plover
- Red Knot
- Gulf sturgeon

In the southeastern United States, green sea turtles are found around the U.S. Virgin Islands, Puerto Rico, and the continental United States from Texas to Massachusetts. Green sea turtles are mottled brown in color. The name is derived from the greenish fat of the body. The carapace is light or dark brown. It is sometimes shaded with olive, often with radiating mottled or wavy dark markings or large dark brown blotches. This species is considered medium to large in size for sea turtles with an average length of 36 to 48 inches. The record was set at about 60 inches in length. Its weight ranges from about 250 to 450 pounds with the record at more than 650 pounds. The upper surfaces of young green turtles are dark brown, while the undersides are white.

Loggerhead sea turtles inhabit continental shelves, bays, estuaries, and lagoons in temperate, subtropical, and tropical waters. In the Atlantic, loggerhead sea turtles' range extends from Newfoundland to as far south as Argentina. Loggerhead sea turtles are a medium to large turtle. Adults are reddish-brown in color and generally 31 to 45 inches in shell length with the record set at more than 48 inches. Loggerheads weigh between 170 and 350 pounds with the record set at greater than 500 pounds. Young loggerhead sea turtles are brown above and whitish, yellowish, or tan beneath, with three keels on their back and two on their underside. During summer, green and loggerhead sea turtles nest in the lower latitudes. Primary Atlantic nesting sites are along the east coast of Florida, with additional sites in Georgia, the Carolinas, and along the Gulf coast.

Kemp's ridley sea turtles are the smallest and most endangered of all sea turtles. Adults do not exceed 30 inches in shell length and range in weight from about 80 to 100 pounds. The broadly oval-shaped shell is usually olive gray, but the young are black. Primarily all Kemp's

ridley nesting occurs on a single beach at Rancho Nuevo, Mexico about 30 kilometers south of the Rio Grande. In recent years, Kemp's ridley nests have been documented on Padre Island, Texas, as well as in Florida and South Carolina. Nesting occurs from mid-April through August (Rabalais and Rabalais 1980).

The leatherback is the largest, deepest diving, and most migratory and wide ranging of all sea turtles. The adult leatherback can reach 4 to 8 feet in length and 500 to 2000 pounds in weight. Its shell is composed of a mosaic of small bones covered by firm, rubbery skin with seven longitudinal ridges or keels. The skin is predominantly black with varying degrees of pale spotting; including a notable pink spot on the dorsal surface of the head in adults. A toothlike cusp is located on each side of the gray upper jaw; the lower jaw is hooked anteriorly. The paddle-like clawless limbs are black with white margins and pale spotting. Cadet Bayou and its vicinity could be possible habitat for all of these species of sea turtles.

The piping plover is a small, stocky shorebird resembling a sandpiper. Piping plovers arrive on their breeding grounds, such as the Gulf Coast barrier islands, in late March or early April. Critical Habitat for the piping plover has been designated by the USFWS along the Gulf Coast barrier islands. Thus, piping plover could be in the vicinity of Bayou Caddy. The rufa red knot is a medium sized shorebird with breast and sides of head cinnamon-brown and a wing span of 20 inches. It can travel long distances with some flying more than 9,300 miles from south to north every spring and north to south every fall making this bird one of the longest-distance migrants in the animal kingdom. They winter along the coasts of southern Chili and Argentina and during the spring migrate to the U.S. coast and Delaware Bay. They eat small clams, mussels, snails and other invertebrates. They may stop on the Mississippi coast for a brief period to rest and refuel on their annual migrations and could be in the vicinity of this project.

Gulf sturgeon is a subspecies of the Atlantic sturgeon. It is an anadromous species—inhabiting both marine and freshwater environments. In early spring, subadult and adult fish migrate into rivers from the Gulf of Mexico and continue until early May. In late September or October, subadult and adult sturgeon begin downstream migrations. Adult fish spend 8 to 9 months each year in rivers and 3 to 4 of the coolest months in estuarine or Gulf waters. The Gulf sturgeon are bottom-feeders. They feed by rooting with their sharp snouts along the bottom and sucking prey into the protrusile mouth (Ross 2001). The Gulf sturgeon was listed as Federally threatened in 1991 and the USFWS designated critical habitat for this species in 2003. Unit 8 of the designated critical habitat for the Gulf sturgeon encompasses 62 mi² of the Mississippi Sound (NMFS 2003).

3.6 Water Quality. Water quality within Mississippi Sound is influenced by several factors, including the discharge of freshwater from rivers, seasonal climate changes, and variations in tide and currents. The primary driver of water quality is the rivers that feed into the Sound. Freshwater inputs from 172,160 acres of watersheds provide nutrients and sediments that serve to maintain productivity both in the Sound and in the extensive salt marsh habitats bordering estuaries of the Sound. The salt marsh habitats act to regulate the discharge of nutrients to coastal waters and serve as a sink for pollutants. Suspended sediments enter the Sound from fresh water sources, but are hydraulically restricted due to barrier islands. The barrier islands, combined with the Sound's shallow depth and mixing from wind, tides, and currents, promote

re-suspension of sediments. These suspended sediments give Mississippi Sound a characteristic brownish color (MDEQ 2008).

Dynamic features such as the Loop Current, eddies, and river plumes create variations in temperature, salinity, and water density. Temperature and salinity strongly influence chemical, biological, and ecological patterns and processes. Differences in water density affect vertical ocean currents and may also concentrate buoyant materials such as detritus, and plankton. Greatest stratification in the water occurs in summer (Thompson et al., 1999)

The Mississippi Department of Environmental Quality (MDEQ) has classified the coastal water in the project area as suitable for recreation, propagation of fish and wildlife and shellfish harvesting. Sufficient dissolved oxygen concentrations, water clarity, and typical salinity ranges with little to no stratification in the water column occur within this site. Water quality within the project area is influenced mainly by non-point source pollution. According to the 2008 MDEQ water quality report, the main causes of water quality degradation within the area are pathogens, introduced into the system by urban runoff and storm sewers.

3.7 Hazardous Materials. Statewide, the Mississippi Department of Environmental Quality, Office of Pollution Control (MDEQ-OPC), Hazardous Waste Division (HWD) regulates hazardous wastes. The HWD oversees the assessment and remediation of both abandoned and responsible party sites where hazardous and toxic substances have been released to the environment. No known hazardous materials are present within the project area or immediate vicinity.

3.8 Air Quality. Existing air quality near the project study area was assessed in terms of types of sources contributing to emissions that are regulated by National Ambient Air Quality Standards (NAAQS). NAAQS have been developed for oxides of nitrogen, hydrocarbons, particulate matter, carbon monoxide, sulfur dioxide, lead, volatile organic compounds and other hazardous air pollutants.

Existing air quality conditions near the project study area reflect the ongoing industrial and commercial operations in the immediate vicinity, as well as surrounding traffic and residential outputs. Hancock County, which includes Cadet Bayou is in attainment for all NAAQS (MDEQ, 2013).

3.9 Esthetics. Cadet Bayou is a small winding tidal stream in the southwest portion of Hancock County, Mississippi, which empties into Mississippi Sound. Hancock County is Mississippi's westernmost coastal county. Cadet Bayou is a partially developed area with many shrimp and recreational boaters continuously entering and exiting the channel. In addition, many recreational and commercial vessels utilize the channel to access the Mississippi Sound and the Gulf of Mexico. The Cadet Bayou area is a fully exposed shoreline facing to the south and east. The shoreline and adjacent area of Cadet Bayou consists mostly of marshland, and is uninterrupted toward the south.

3.10 Noise. Noise levels in the area are typical of recreational, boating, and fishing activities. Noise levels fluctuate with the highest levels usually occurring during the spring and summer months due to increased recreational activities.

3.11 Cultural Resources. Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended and implementing regulations 36 CFR Part 800 requires consultation with other agencies to avoid or minimize adverse effect on historical, architectural, archaeological, and cultural resource. In order to ensure compliance, cultural resources were evaluated via a literature review and remote sensing data which focused on archaeological resources (shipwrecks). The information gathered from these sources was used to characterize and assess the potential effects of the proposed project. Previous data searches conducted by the Mississippi Department of Archives & History (MDAH) data search revealed that no cultural resources are likely to be affected in the vicinity of Cadet Bayou.

3.12 Sea Level Rise. Systematic long-term tide elevation observations suggest that the elevation of oceanic water bodies is gradually rising and this phenomenon is termed “sea level rise.” The rate of rise is neither constant with time nor uniform over the globe. In addition to elevation of oceanic water bodies, however, is the gradual depression of land surface along the coast of Mississippi, referred to as “subsidence,” which becomes an additional factor in the relationship between the land’s elevation over time and changing sea levels. Because the coast of Mississippi is affected by both subsidence and global sea level rise (adjusted for local conditions), these factors combine in a single element of “relative” sea level rise. Relative sea level rise at a given location is the change in mean sea level at that location with respect to an observer standing on or near the shoreline. Analysis of historical data suggests a relative sea level rise of roughly 9 inches along the Mississippi coast during the 20th century (USACE, 2013). Sea level rise is an issue of paramount importance for the state of Mississippi due to its vulnerable coastline, low relief, coastal population, economically vital beaches, estuaries, and wetlands. The rate of sea level rise in Mississippi is roughly 3 mm per year and is slowly gaining public attention as a significant threat to the natural and socioeconomic future of the state.

4.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

4.1 Fish and Wildlife Resources.

Oyster Reefs. Oyster reefs are particularly productive biological areas. The animals and plants, which are associated with the oyster reef community, are varied and numerous and include algae, sponges, hydroids, polychaetes, other mollusks, barnacles, bryozoans, tunicates, and a number of species of fish. Cadet Bayou and adjacent Sound waters offshore for a distance of about 700 feet are classified as restricted for oyster harvesting particularly during the oyster’s reproductive period. Hurricane Katrina damaged about 90-95 percent of Mississippi’s 12,000 acres of oyster beds on August 29, 2005. Since that time MDMR has been restoring the beds damaged by the storm (MDMR 2007). No actively managed oyster reefs are present in or near the Cadet Bayou navigation channel (MDMR 2009). The closest reef is approximately one mile away in a southwest direction from the mouth of the entrance channel.

Submerged Aquatic Vegetation. No significant impacts to the SAVs were identified in this evaluation. The closest known SAVs are located several miles from the construction site.

Wetlands. Emergent wetlands and tidal marsh are located in the vicinity of the project site. A small amount of tidal marsh (less than ¼ acre) will be temporarily impacted during construction of the breakwater.

Sediments. Construction operations will result in the temporary increases of suspended sediments, the loss of benthic organisms, increases in nutrients, and bathymetry changes in the vicinity of the project site. The increase in turbidity will reduce light penetration through the water column, thereby reducing photosynthesis, surface water temperatures, and esthetics. These conditions could potentially alter visual predator-prey relations in the immediate project vicinity. In addition, sediment adheres to fish gills, resulting in respiratory stresses, and natural movement of eggs and larvae could be potentially altered as a result of the sediment adherence. However, the salinity of water associated with the construction of the breakwater is high enough to promote rapid settling of finer particles. Ninety-eight percent of discharged sediments from hydraulic dredging have been observed to settle out within 200 feet of discharge points during similar operations in the project vicinity (USACE 1978). This project involving rock placement will have much less turbidity generated than normal dredging operations.

All of these described impacts are temporary and are anticipated to return to previous conditions shortly after construction operations. In addition, the Section 404(b)(1) Evaluation Report concluded that the proposed project will not jeopardize or adversely impact any oyster reefs, SAVs, wetlands or other critical habitat (**Enclosure 3**).

4.2 Terrestrial Wildlife. The proposed work would create disturbance to species utilizing the terrestrial habitats within the project limits. This would mainly involve short-term disturbance from equipment, vehicles and personnel movements for the duration of work. However, these species are mobile and would generally avoid the site during construction. As a result of this evaluation, no adverse impacts to the terrestrial wildlife located in the vicinity of project were identified.

4.3 Benthos, Motile Invertebrates, and Fishes. There would be temporary disruption of the aquatic community caused by the construction of the breakwater and living shoreline. Non-motile benthic fauna within the area would be destroyed by the rock placement operations, but should repopulate upon project completion. Some of the motile benthic and pelagic fauna, such as crabs, shrimp, and fishes are able to avoid the disturbed area and should return shortly after the activity is completed. Larval and juvenile stages of these forms may not be able to avoid the activity due to limited mobility. Permanent loss of benthic invertebrate populations would occur within the project footprint of the breakwater. However, these areas combined comprise less than 0.01% of estuarine water bottom of the state within the Mississippi Sound system. The new rock structure and living shoreline would be a favorable habitat for a variety of species not normally associated with the normal muddy estuarine water bottoms.

Cadet Bayou does not provide important habitat that could not be found in other areas of the Sound. There is no significant resource at this site that is essential for the continued survival of

any particular species. With the small area (percentage wise) of ecosystem that will be affected at a given point in time but no significant long-term impacts to the benthos, motile invertebrates, and fishes are expected to occur as a result of the proposed action. Therefore, it was determined that no adverse impacts to the aquatic community would result from the construction of the breakwater or placement of the living shoreline.

4.4 Essential Fish Habitat. The USACE, Mobile District will take extensive steps to reduce and avoid potential impacts to EFH as well as other significant area resources. No estuarine emergent wetlands, oyster reefs, or SAVs would be adversely affected by the proposed action. Most of the motile benthic and pelagic fauna, such as crab, shrimp, and fish, should be able to avoid the disturbed area and should return shortly after the activity is completed. No long-term direct impacts to managed species of finfish or shellfish populations are anticipated. However, it is reasonable to anticipate some non-motile and motile invertebrate species will be physically affected through disposal operations. These species are expected to recover rapidly soon after the construction operations are complete. As detailed in Section 4.3 of this assessment, no significant long-term impacts to this resource are expected as result of this action.

Increased water column turbidity during construction would be temporary and localized. The spatial extent of elevated turbidity is expected to be within 400 feet of the operation, with turbidity levels returning to ambient conditions within a few hours after completion of the construction activities. Pre- and post-monitoring of water quality suggests turbidity and TSS are temporarily affected by disposal operations. However, the magnitude of the increases with construction operations is consistent with those caused by frontal storms (USACE, 1999). Only minor changes are anticipated to occur to the habitat types. Due to the phased nature of the project and the small area (percentage wise) of ecosystem that would be affected at a given point in time no significant long-term impacts are expected to occur. In addition, the USACE, Mobile District previously coordinated with the NMFS Habitat Conservation Division (HCD) on the EFH in the project vicinity during the permitting process for the initial construction of the ecosystem restoration area. NMFS supported the project as a benefit to the overall estuarine environment. Therefore, the USACE, Mobile District does not anticipate any adverse impacts to occur to EFH during this proposed project.

4.5 Threatened and Endangered Species. Federally protected species, such as the Louisiana black bear, gopher tortoise, inflated heelspitter, and the Louisiana quillwort, would not be adversely impacted by constructions operations at Cadet Bayou because these species are not found within the aquatic environment of the project site. The Alabama heelspitter and Louisiana quillwort would not be impacted because they are not indigenous to marine and brackish water environments. Furthermore, if these motile species, such as the tortoise or bear, happen to be in the vicinity (i.e. adjacent marsh area), it is likely they would hear the activity and avoid the area. The piping plover, rufa red knot and bald eagle are also anticipated to avoid the area during maintenance operations. Although it is unlikely that sea turtles would be in the operation's vicinity, the USACE, Mobile District anticipates they would likely hear the activity and avoid the construction operations. The USACE, Mobile District does not anticipate any adverse impacts to federally protected species, such as the blue whale, finback whale, humpback whale, sei whale, and the sperm whale, as a result of construction operations because Mississippi Sound is a shallow area with an average depth of only 9.9 feet. It is unlikely that these protected

whales would be in the Sound. Furthermore, these motile species would be able to avoid construction operations in areas with suitable depths.

Cadet Bayou is a highly industrialized channel that does not lead to any Gulf sturgeon spawning sites. Gulf sturgeon typically do not utilize industrialized channels during their migration; therefore, it is unlikely Gulf sturgeon would occur in the Cadet Bayou vicinity. The motile species would be able to avoid construction operations. Although, the USACE anticipates construction operations would temporarily disrupt the aquatic community, the non-motile benthic fauna within the area should repopulate within several months.

Under Section 7 coordination of the Endangered Species Act (ESA) and the Marine Mammal Protection Act, the USACE, Mobile District requested and received concurrence from the USFWS and the NOAA Fisheries (as part of MsCIP) on the threatened and endangered species in the project vicinity for the ecosystem restoration project as part of the (15) fifteen MsCIP Interim Projects. During the permitting process for this project, the USACE will coordinate with USFWS and NOAA by official letter for the construction of the breakwater and living shoreline. In a letter dated February 27, 2009, NOAA Fisheries Protected Resource Division (PRD) issued a 10-year concurrence of not likely to be adversely affected for listed sea turtles and Gulf sturgeon for the Bayou Caddy O&M dredging activities and the tidal marsh restoration project (**Enclosure 1**). This project covers that same area.

4.6 Water Quality. Water quality in the immediate vicinity of the project and the disposal site would be slightly impaired for a short period of time due to the construction of the breakwater and living shoreline. Material placed in the open-water is anticipated to quickly settle out of the water column and site would not significantly impact water quality. Best management practices (BMP) would be implemented to reduce disturbance to the area. However, these operations are minor, short-duration, and insignificant impacts that are typical of these operations.

4.7 Hazardous Materials. No hazardous materials are known to exist in the project area. The contractor would be responsible for proper storage and disposal of any hazardous materials, such as oils and fuels used during the construction operations.

4.8 Air Quality. Hancock County has been designated in attainment with the National Ambient Air Quality Standards (NAAQS). Air quality in the immediate vicinity of the heavy equipment would be slightly affected for a short period of time by the fuel combustion and resulting engine exhausts. The standards would not be violated by the implementation of the proposed project. In light of prevailing winds in the area, these emissions are insignificant.

4.9 Esthetics. Esthetics will be temporarily reduced in the immediate vicinity of the proposed project operations due to the physical presence of the equipment required to construct the breakwater and living shoreline. Impacts would primarily occur as a result of the physical presence of heavy equipment. However, these impacts would be temporary and insignificant. Some minor increases in turbidity may be noted in the immediate vicinity during the placement activities, but these increases would be minor and short term in nature.

4.10 Noise. Noise impacts from project equipment are expected to increase in the vicinity during construction as a result of engine noise from the job related equipment. While there is little that can be done to reduce noise during the operation, these impacts would be short term and restricted to the immediate vicinity of the activity. No long-term increase in noise would occur in or around the project area. Noise is not expected to be a significant impact.

4.11 Cultural Resources. The National Register of Historic Places has been consulted during past re-certification efforts and no properties listed on, being nominated to or determined eligible for the National Register are located in the project vicinity. A cultural resources survey of the project area was conducted by the USACE, Mobile District archeologists in December of 1979 and no eligible cultural resources were located. As a result of these investigations, our office recommended that this project would have no effect on cultural properties, and that no further work at Cadet Bayou is warranted. This recommendation was confirmed with the Mississippi Department of Archives and History in January of 1980. Based on the history of this project, the USACE, Mobile District anticipates the same concurrence. The USACE, Mobile District Cultural Resource Officer reviewed the proposed project and made a No Effect determination on October 20, 2014 (**Enclosure 2**). The District will continue to coordinate this activity with the State Historic Preservation Officer (SHPO) through the Public Notice FP15-CB05-05 dated February 6, 2015 (**Enclosure 4**).

4.12 Sea Level Rise. The Bayou Caddy restoration area is located in a vulnerable area and subject to the consequences of climate change and storm damage. Serious threats to the bayou come from the combination of elevated sea levels and intense hurricanes. The Mississippi coastline consists primarily of low-lying topography which lies in the hurricane-prone Gulf of Mexico. As a result, the low-lying bayou is more susceptible to the effects of storm surge than other areas. Rising sea levels result in pushing the high-water mark landward, potentially causing the marsh to disappear. Losses could be accelerated by a combination of other environmental and oceanographic changes such as an increase in the frequency of storms and changes in prevailing currents, both of which could lead to increased shoreline loss through erosion. This could translate into continued loss of valuable habitat along the Mississippi coastline, including sea turtle nesting habitat, shorebird foraging and roosting areas, dune habitat supporting various flora and fauna, and general island ecosystem functions (USACE 2013). The Bayou Caddy restoration project seeks to minimize the losses by placement of sediments back into the ecosystem in critical areas that have been lost to erosion and storm impacts and placement of a hardened structure that will protect the shoreline from additional erosion.

5.0 CUMULATIVE EFFECTS SUMMARY. Federal regulations implementing the NEPA (40 CFR Sections 1500-1508) require that the cumulative impacts of a Proposed Action be assessed. NEPA defines cumulative effects as an “impact on the environment which results from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or nonfederal) or person undertakes such other actions.” Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. This section analyzes the proposed action as well as any connected, cumulative, and similar existing and potential actions occurring in the area and surrounding the site.

The cumulative impacts of development and other activities throughout the watershed that have acted in combination to degrade the health and productivity of much of the entire aquatic ecosystem, thus diminishing the human benefits the system provides. Areas of inland and coastal wetlands within the bayou and other important habitats have been and continue to be lost throughout the watershed. These include tidal marshes, seagrass and other benthic communities. Much of this loss is due to the cumulative impacts of development, storms and sea level rise and is not directly recoverable. This project has the potential to improve environmental quality by providing favorable conditions for additional marsh creation and protection. Therefore, the proposed project and restoration activities are not projected to have any significant adverse cumulative effects. Also, no future projects were known to be dependent upon this action.

6.0 OTHER CONSIDERATIONS.

6.1 Coastal Zone Management Act of 1972. The USACE, Mobile District determined that the proposed action is consistent with the Mississippi Coastal Management Program to the maximum extent practicable. MDMR issued Coastal Zone Consistency (CZC) for the project during the previous ecosystem restoration efforts. CZC will be requested from MDMR for this project area via official letter.

6.2 State Water Quality Certification. No work would occur until the State of Mississippi has issued water quality certification for the proposed action. All State water quality standards would be met. Section 401 water quality certification (WQC) will be requested from the MDEQ by letter for the project area.

6.3 Clean Water Act of 1972. No work would occur until the State has issued water quality certification for the proposed action. All State water quality standards will be met. A draft Section 404(b)(1) Evaluation is included in this report as **Enclosure 3**.

6.4 Rivers and Harbors Act of 1899. The proposed work would not obstruct navigable waters of the United States.

6.5 Marine Mammal Protection Act of 1972, as amended. Incorporation of the safe guards used to protect threatened or endangered species during project implementation will also protect any marine mammals in the area; therefore, the project is in compliance with this Act.

6.6 Fish and Wildlife Coordination Act of 1958, as amended. This project will be coordinated with the USFWS through official letter, and is in full compliance with the act.

6.7 E.O. 11988, Protection of Children. On April 21, 1997, President Clinton issued Executive Order (EO) 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. This EO directs each federal agency to ensure that its policies, programs, activities and standards address disproportionate risks to children that result from environmental health risks or safety risks. These risks arise because:

- Children’s neurological, immunological, digestive, and other bodily systems are still developing.

- Children eat more food, drink more fluids, and breath more air in proportion to their body weight than adults.
- Children’s size and weight might diminish their protection from standard safety features.
- Children’s behavior patterns make them more susceptible to accidents because they are less able to protect themselves.

Therefore, to the extent permitted by law, and appropriate and consistent with each agency’s mission, the President directed each federal agency to:

- Make it a high priority to identify and assess environmental health risks and safety risks that might disproportionately affect children.
- Ensure that the agency’s policies, programs, and standards address disproportionate health risks to children that result from environmental health risks or safety risks.

Examples of risks to children include increased traffic volumes and industrial or production-oriented activities that would generate substances or pollutants children might come into contact with or ingest.

The proposed action complies with Executive Order 13045, “Protection of Children from Environmental Health Risks and Safety Risks”, and does not represent disproportionately high and adverse environmental health or safety risks to children in the United States. The proposed project at Bayou Caddy does not involve activities that would pose any disproportionate environmental health risk or safety risk to children.

6.8 E.O. 11990, Environmental Justice. On February 11, 1994, the President issued EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*. The Environmental Justice (EJ) Policy requires agencies to incorporate into NEPA documents and analysis of the environmental effects of their proposed programs on minorities and low-income populations and communities. EJ is defined by the USEPA as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group, should bear the disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies.”

The proposed action complies with EO 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” and does not represent disproportionately high and adverse human health or environmental effects on minority populations and low-income populations in the United States. The proposed project does not create disproportionately high or adverse human health risks or environmental impacts on minority or low income populations of the surrounding community. Review and evaluation of the proposed project have not disclosed the existence of identifiable minority or low income communities that would be adversely impacted by the proposed project.

7.0 COORDINATION. Under the agency and public coordination guidelines of the NEPA process, numerous persons have been contacted for input on the proposed action. The general

public will be notified of the proposed action via public notice. Copies of the public notice will be made available to Federal and state agencies and the interested public for a 30-day review period. Comments on the proposed action are requested in writing by the end of that 30-day period. Comments on the action will be considered prior to a decision on the action.

8.0 CONCLUSION. Following an assessment of this EA, it is anticipated that the implementation of the proposed action would not have a significant adverse impact on the quality of the environment or critical habitat and an EIS is not required.

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10.0 LIST OF AGENCIES CONSULTED.

Gulf of Mexico Fishery Management Council
Mississippi Department of Marine Resources
Mississippi Department of Environmental Quality
Mississippi State Historic Preservation Officer
Mississippi Department of Wildlife, Fisheries and Parks
National Register of Historic Places
Regional Director, National Park Service
U.S. Army Corps of Engineers, Mobile District
U.S. Department of Commerce, National Marine Fisheries
Service, Baton Rouge, Louisiana
U.S. Department of Commerce, National Marine Fisheries

Service, St. Petersburg, Florida
U.S. Environmental Protection Agency, Region IV
U.S. Fish and Wildlife Service, Jackson, Mississippi Field Office
Appropriate federally recognized tribes

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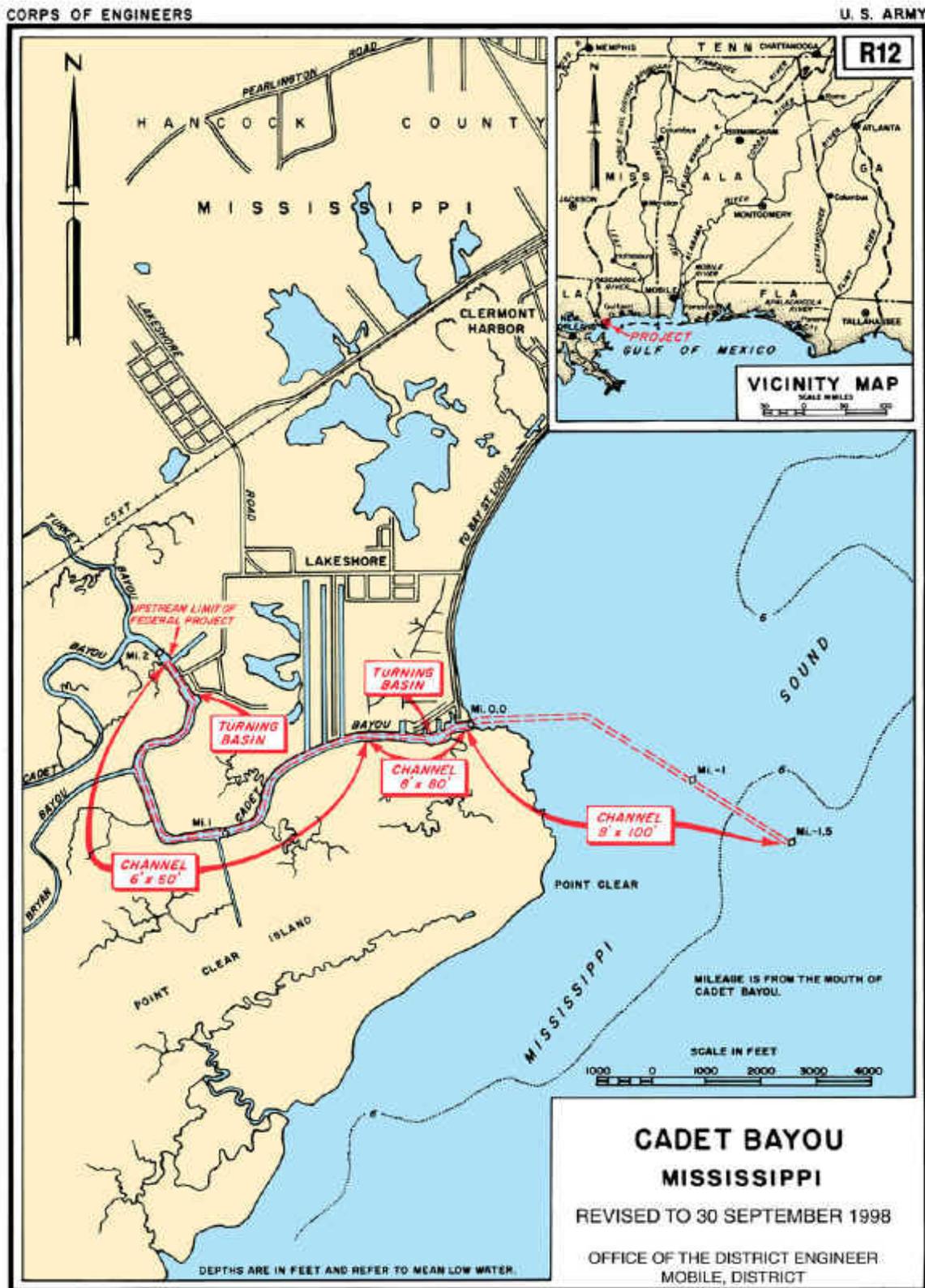


Figure 1. Vicinity Map of Cadet Bayou Federally Authorized Navigation Channel



Figure 2: Location Map for Bayou Caddy Ecosystem Restoration Site.

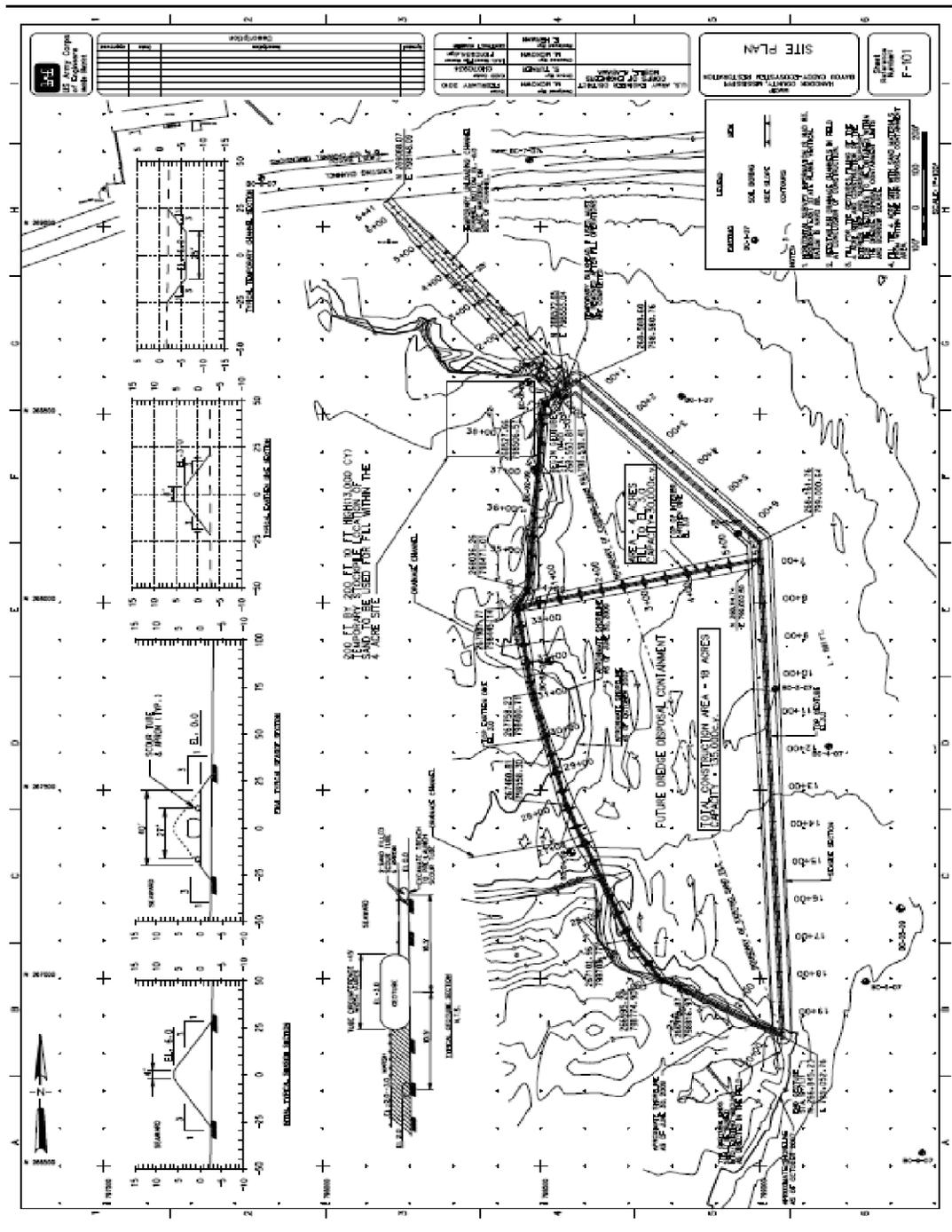


Figure 3. Site Plan for Bayou Caddy Restoration Project Constructed in 2010



Figure 5. Aerial View of Bayou Caddy Restoration Project Constructed in 2010



Figure 6. Aerial View of Cadet Bayou Ecosystem Restoration Area Damaged Geotubes in 2011



Figure 7. Close-up View of Damaged Geotube 7 November 2013.



Figure 8. New Geotube Installed at Bayou Caddy Ecosystem Restoration Site 7 November 2013.

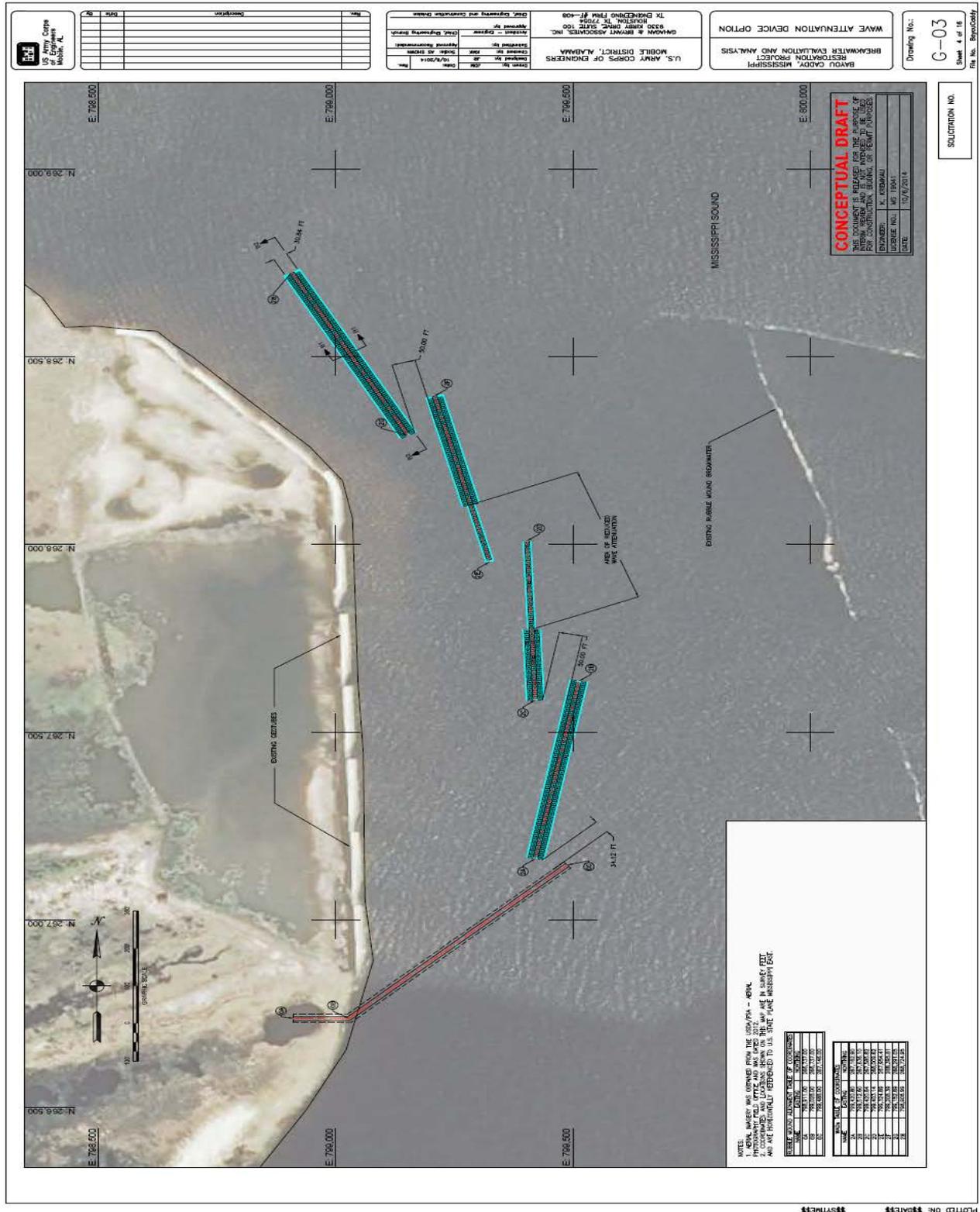


Figure 9. Proposed Breakwater and Living Shoreline Site Plan for Bayou Caddy



Figure 10. Temporary Access Channel Location Map for Bayou Caddy

Enclosures

EA-Enclosure 1 – Letter from NMFS PRD dated February 27, 2009. Granting a 10-year concurrence of not likely to be adversely affected has already been issued by the NOAA National Marine Fisheries Service (NMFS) St. Petersburg, FL office for sea turtles and Gulf sturgeon for the Bayou Caddy ecosystem restoration site. This letter was signed by the Regional Administrator.

EA-Enclosure 2 – No Effect Determination for Cultural Resources by the USACE District Cultural Resource Officer dated October 20, 2014.

EA-Enclosure 3 – Draft 404 (b) (1) Analysis for Bayou Caddy Ecosystem Restoration (Shoreline Stabilization) January 2015.

Enclosure 4 – Public Notice FP15-CB05-05 Bayou Caddy Ecosystem Restoration (Shoreline Stabilization) February 6, 2015.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
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<http://sero.nmfs.noaa.gov>

F/SER31:KS

FEB 27 2009

Ms. Jennifer L. Jacobsen
 Mobile District Corps of Engineers
 P.O. Box 2288
 New Orleans, Louisiana 70160-0267

Re: MsCIP Interim Projects, Bayou Caddy

Dear Ms. Wiggins:

This responds to your letter dated September 4, 2008, requesting section 7 consultation pursuant to the Endangered Species Act (ESA) for the Army Corps of Engineers' (COE) project to restore tidal marsh using material dredged from the Cadet Bayou navigation channel. The project is authorized as part of the Mississippi Coastal Improvements Program (MsCIP) and is evaluated in the Biological Assessment (BA) entitled "MsCIP Interim Projects, Bayou Caddy (i.e., Cadet Bayou) Interim Project" provided with your letter. The project will occur in Mississippi Sound in Hancock County, Mississippi. You requested concurrence from the National Marine Fisheries Service (NMFS) with your determinations that the project may affect, but is not likely to adversely affect, any endangered or threatened species or designated critical habitat under NMFS' purview. NMFS requested additional information from the COE via e-mail on October 31, 2008. The requested information was provided by the COE via e-mail on November 6, 2008. Formal consultation was previously completed for the proposed dredging of the Bayou Caddy navigation channel and NMFS issued its biological opinion (BO) on May 12, 2005. However, that action was not implemented due to the occurrence of Hurricane Katrina, and a new consultation is required. NMFS' determinations regarding the effects of the proposed action are based on the description of the action in this informal consultation. You are reminded that any changes to the proposed action may negate the findings of the present consultation and may require reinitiation of consultation with NMFS.

This project is located at 30.2385°N, 89.4241°W (WGS84) in Hancock County, Mississippi. The Bayou Caddy federal navigation project provides for a 3.5-mile, 18-acre channel from the 8-foot depth contour in Mississippi Sound to a turning basin just south of the confluence of Turkey and Cadet Bayous. The authorized depth of the channel is 8 feet, with an additional allowance of 4 feet for advance maintenance and over-depth dredging. Currently, only the 1.5-mile portion of the channel within Mississippi Sound is maintained. The total footprint of the channel is 18 acres. Historically, material dredged from this portion of the channel has been placed in a 250-acre certified open-water disposal area adjacent to the channel. However, the COE is proposing



EA-Enclosure 1

to place a portion of this material on the shoreline to the south and west of the channel in order to restore tidal marsh in a rapidly eroding area. Approximately 175,000 cubic yards (cy) of material will be removed from the channel via hydraulic dredge during each dredging cycle, with average cycles occurring every five to six years. Due to the infrequency of dredging cycles and NMFS' request to consult on the COE's operations and maintenance projects on 5- to 10-year scales, the COE is requesting consultation on dredging activities in Bayou Caddy occurring during the ensuing 10-year period, which will include one to two dredging cycles. The COE is proposing to use approximately 110,000 cy of dredged material to restore 18 acres of marsh. Approximately 12 acres of marsh in this area was lost due to Hurricanes Katrina and Rita in 2005. A 2,000-foot geotube with a scour apron (occupying 2.4 acres of water bottom) will enclose the seaward side of the restoration site. The geotube is designed to minimize erosion and maximize capture and retention of new sediment during overtopping by waves. Construction of the geotube will require 120 days. An earthen dike will be constructed on the landward side of the geotube to contain the dredged material and will take 60 days to complete. All material used in the construction of the geotube and earthen dike will be taken from within the restoration site to minimize impacts from the project. A 650- by 50-foot floatation channel 6 feet deep will be dredged to allow equipment to access the site. Dredged material from the floatation channel will be sidecast in a 30-foot-wide area running the length of the channel. The total footprint of the floatation channel and the adjacent area where dredged material will be sidecast is 1.5 acres. Water depths at the restoration site, including in the floatation channel and the area where dredged material will be sidecast, are less than 4 feet. The approximately 65,000 cy of dredged material not used at the marsh restoration site will be disposed of in an existing 250-acre nearshore disposal area. Water depths in the disposal area are 9 to 10 feet. Dredged material will be placed in such a manner that it will not reduce water depths at the site to less than 4 feet mean low water. Because of the high energy wave environment at the site, the dredged material placed in the nearshore disposal area is expected to be rapidly dispersed and pre-project conditions are likely to return in a short period of time.

Five listed species of sea turtles (the endangered leatherback, Kemp's ridley, and hawksbill; the threatened/endangered¹ green; and the threatened loggerhead) and the threatened Gulf sturgeon may occur at the project site. The proposed project is located within designated Gulf sturgeon critical habitat Unit 8. The primary constituent elements (PCEs) essential for the conservation of Gulf sturgeon present in Unit 8 include: abundant prey items; water quality and sediment quality necessary for normal behavior, growth, and viability of all life stages; and, safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats. Of these PCEs, NMFS believes water quality, sediment quality, and prey abundance may be affected.

NMFS has analyzed the routes of potential effects from the proposed project and concurs with your determination that listed sea turtles and Gulf sturgeon are not likely to be adversely affected. Though the COE is not adhering to a June to November dredging window, the risk of injury to listed species from dredging will be discountable due to the type of dredge being used. The effects of hydraulic dredging on sea turtles were first analyzed in the November 19, 2003,

¹Green turtles are listed as threatened, except for breeding populations in Florida and the Pacific Coast of Mexico, which are listed as endangered.

Regional Biological Opinion (RBO) entitled “Dredging of Gulf of Mexico Navigation Channels and Sand Mining (“Borrow”) Areas Using Hopper Dredges by Corps of Engineers (COE) Galveston, New Orleans, Mobile, and Jacksonville Districts”. The most recent available information presented in the 2009 “Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle” validates NMFS’ conclusions in the 2003 RBO that hydraulic dredges are not known to take sea turtles. The 2003 RBO also states that no take of Gulf sturgeon by a hopper dredge (or any other type of dredge) in the Gulf of Mexico has ever been reported. Further, the likelihood of sea turtles and Gulf sturgeon being struck by the transit and anchoring of equipment and vessels at the project site is discountable due to these species’ mobility. NMFS considers the temporary loss of 19.5 acres (plus a small portion of the 250-acre, previously certified, open-water disposal area) of benthic habitat due to dredging and placement of the dredged material, as well as the permanent loss of 20.4 acres of habitat due to construction of the geotube and restoration of tidal marsh, as having insignificant effects on sea turtles and Gulf sturgeon. The project area encompasses only a small portion of Mississippi Sound and there is similar habitat available in the vicinity such that impacts to foraging success, reproduction, resting, or other behaviors are expected to be minor and insignificant. Further, the site is likely a poor source of forage resources for sea turtles and Gulf sturgeon due to the shallow water, high wave energy, and the presence of the navigation channel in the project area.

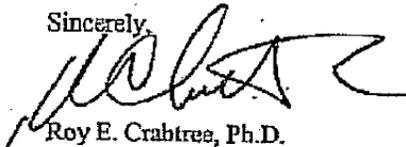
NMFS and the U.S. Fish and Wildlife Service jointly designated Gulf sturgeon critical habitat on April 18, 2003 (50 CFR 226.214). NMFS believes the project is not likely to adversely affect Gulf sturgeon critical habitat in Unit 8. Water quality impacts from dredging, dredged material disposal, construction, and restoration activities will be insignificant because increases in turbidity will be minimal, temporary, and similar to conditions already present in the area due to storms, erosion, and routine operations in the navigation channel. Potential effects to sediment quality resulting from dredging, construction, dredged material placement, and restoration activities will also be insignificant. The composition and grain size of dredged materials is similar to that of the sediments remaining in the navigation channel post-dredging, as well as to that of the sediments at the placement/disposal sites. In addition, all sediments at the site are free of contaminants. Prey abundance will be temporarily affected by impacts to 19.5 acres, plus a small portion of the 250-acre nearshore disposal area, of benthic habitat due to dredging and placement of the dredged material. However, the project area encompasses only a very small portion of the available habitat in Mississippi Sound supporting Gulf sturgeon prey items. Benthic invertebrates utilized by Gulf sturgeon are expected to recolonize the areas affected by dredging and placement of dredged material rapidly, as they have been found to recolonize within one year when sediment composition and depth remain consistent. Of the 20.4 acres permanently occupied by the restored marsh and geotube, 6.2 acres are located in Gulf sturgeon critical habitat. The permanent loss of 6.2 acres of habitat on prey abundance is expected to be insignificant. Water depths at the project site are less than 4 feet and the area is rapidly eroding due to high wave energy. Gulf sturgeon are suction feeders; due to their feeding morphology, they are usually found at deeper depths (6.5 to 13 feet), where lower wave energy at the substrate, compared to the shallower swash zone, interferes less with feeding.

This concludes your consultation responsibilities under the ESA for species under NMFS’ purview. Consultation must be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a

manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. We have enclosed additional information on other statutory requirements that may apply to this action, and on NMFS' Public Consultation Tracking System (PCTS) to allow you to track the status of ESA consultations.

Thank you for your continued cooperation in the conservation of threatened and endangered species under NMFS' purview. If you have any questions on this consultation or PCTS, please contact Kelly Shotts at (727) 824-5312, or by e-mail at kelly.shotts@noaa.gov.

Sincerely,



Roy E. Crabtree, Ph.D.
Regional Administrator

Enclosure

cc: F/SER46, Mark Thompson

File: 1514-22.F.1.MS

Ref: I/SER/2008/07814

Malsom, Michael F SAM

From: Fedoroff, Michael P. SAM
Sent: Monday, October 20, 2014 4:01 PM
To: Malsom, Michael F. SAM
Cc: Jacobson, Jennifer L. SAM; Zettle, Brian A. SAM
Subject: PDC-014-006 Bayou Caddy Ecosystem Restoration (Shoreline Stabilization)

Importance: High

Mike,

Please find the review of No Effect below for project PDC-014-006 Bayou Caddy Ecosystem Restoration (Shoreline Stabilization) received 15-Oct-14. Unless something further is needed, I plan on closing this review. Please let me know if this is acceptable.

PDC-014-006

Reviewed by: Allen Wilson

Approved by: Michael P. Fedoroff RPA

20 October 2014

After reviewing the information provided in the packet for PDC-014-006, the Bayou Caddy Ecosystem Restoration (Shoreline Stabilization), and comparing it against information in the National Register of Historic Places, the Mississippi Master Site File, and previous research in the area, the following cultural resource guidance has been offered:

This undertaking involves shoreline stabilization in an area previously surveyed by USACE, Mobile District (1979). Even though the USACE survey found no cultural resources in the project area, the extensive damage to the shoreline by Hurricane Katrina necessitating this stabilization likely would have destroyed or significantly damaged any sites in the project area. There are two potentially eligible sites in the surrounding area: 22HA520, the Cedar Island Site; and 22HA522, Bryan Bayou. Two sites of indeterminate eligibility are also in the surrounding area: 22HA502, Lakeshore Midden Site; and 22HA521, the Carver Site (Figure 1). These sites were inspected in 2006 as part of a post Hurricane Katrina assessment. Several of the sites were deemed currently threatened by erosion. While stabilization of this project area may not help in preserving these sites, it does show the impact the storm had on cultural resources in the region. Given the previous survey work and storm damage, I concur with the initial Mississippi SHPO findings (1980) in that this project is unlikely to impact cultural resources and needs no additional survey.

However, should any archaeological material be discovered, work must cease and the Mississippi SHPO and District Archaeologist must be notified before work resumes. Additionally, keep in mind that cultural resources are not a static value. What is not eligible for nomination to the National Register of Historic Places during this review could indeed be eligible in the future, thus please provide cultural resource reviews during future certifications.

In Service,

Michael P. Fedoroff RPA
District Archaeologist/ Tribal Liaison
USACE Inland Environmental Team

Last Update: 20 Jan 15

**Draft SECTION 404(b)(1) EVALUATION REPORT
FOR
BAYOU CADDY ECOSYSTEM (SHORELINE STABILIZATION)
HANCOCK COUNTY, MISSISSIPPI**

I. PROJECT DESCRIPTION.

A. Location. The Bayou Caddy ecosystem shoreline stabilization project is located in the southwestern most part of the state near the community of Waveland, Hancock County, Mississippi (**Figure 1 of EA**). The site is about 21 miles to the west of the Port of Gulfport and it is about 44 miles to the east of New Orleans, Louisiana.

B. General Description of the Proposed Action. The proposed action consists of constructing a 650-foot long by 25-foot wide rock breakwater, a 1,925-foot long segmented living shoreline and a temporary 3,000-foot long by 40-foot wide access channel to provide additional shoreline protection to the Bayou Caddy marsh restoration/dredged material beneficial use site. This action is related to the consequences of tropical storm Lee that made landfall on September 5, 2011, with additional damage resulting from Hurricane Isaac in 2012. Large waves and high tides damaged the existing geotube containment structure by displacing the sandy material within the geotubes. This sand displacement caused an uneven elevation on the perimeter of the containment structure which greatly reduced its capability to contain dredged material and function properly as a beneficial use site. The damaged geotubes were repaired in November 2013 by the U.S. Army Corps of Engineers (USACE). The intent for this project is to protect the site from further storm damage, extend the life of the newly constructed geotubes, provide an additional level of protection to the created wetlands after the geotubes have degraded and enhance the habitat for oysters, fish and other marine organisms. There is also great need for a dredged material beneficial use site in Hancock County which currently lacks an easily accessible site for local contractors. This site has the potential to fill that role and serve as a future tidal marsh creation project.

C. Authority and Purpose. The Mississippi Coastal Improvements Program (MsCIP) was authorized by the Department of Defense Appropriations Act, 2006 (P.L. 109-148) 30 December 2005, which states:

“For an additional amount for “investigations” to expedite studies of flood and 11 storm damage reduction related to the consequences of hurricanes in the Gulf of 12 Mexico and Atlantic Ocean in 2005, \$37,300,000 to remain available until 13 expended: Provided, that using \$10,000,000 of the funds provided, the Secretary 14 shall conduct an analysis and design for comprehensive improvements or modifications to existing improvements in the coastal area of Mississippi in the 16 interest of hurricane and storm damage reduction, prevention of saltwater 17 intrusion, preservation of fish and wildlife, prevention of erosion, and other 18 related water resource purposes at full Federal expense; Provided further, that 19 the Secretary shall recommend a cost-effective project, but shall not perform an incremental benefit-cost analysis to identify the recommended project, and shall 21 not make project recommendations based upon maximizing net national 22 economic development benefits; Provided further, that interim

recommendations 23 for near term improvements shall be provided within 6 months of enactment of 24 this act with final recommendations within 24 months of this enactment.”

The Bayou Caddy restoration project was one of the projects listed in the MsCIP Comprehensive Plan and Integrated Programmatic EIS dated June 2009.

D. General Description of Dredged or Fill Material.

(1) **General Characteristics of Material.** Bottom sediments within the vicinity of the project consist of sandy silts and clays. Boring logs indicate that loose poorly graded sand dominated the surficial sediments of the area to the east of the existing geotubes; however, surficial clay also was found near northern limits of the site. The armor stone for the breakwater is 22 inch angular cube with a median weight of 1,000 pounds per stone.

(2) **Quantity of Material.** Approximately 2,620 cubic yards of rock will be used to construct the 650-foot long by 25-foot wide breakwater. The 1,925-foot long segmented living shoreline material volume will depend on which type of living shoreline structure is used. The footprint of the living shoreline will be approximately 66,400 square feet if a marine mattress is used. If the mattress is not used, the water bottom impacts will be approximately 20% less. The estimated volume of living shoreline material installed on site will be determined once the final design is completed.

(3) **Source of Material.** The rock for the breakwater will be trucked and barged from a local quarry site to-be-determined once the construction contract is awarded. The source of material for the living shoreline is currently unknown and will depend on what type of structure is used and where it is manufactured.

E. Description of the Proposed Discharge Site.

(1) **Location.** See Section I A of this report. The rock placement area is the open-water area approximately 300 to 500 feet in front of the reconstructed geotubes.

(2) **Size.** The open-water site covers an area of approximately 30 acres.

(3) **Type of Site.** The area consists of open-water in the Mississippi Sound that consists of sandy/silty bottoms.

(4) **Type of Habitat.** The area is former salt marsh/estuarine habitat that has been eroded away and now consists of open-water. No submerged aquatic vegetation or oyster reefs are present at this site.

(5) **Timing and Duration of Discharge.** Timing and duration of the proposed project are dependent upon when the contract is award. Construction of the project would take three to six months, depending upon the weather and water/wave conditions.

F. Description of Placement Method. Breakwater will be constructed using a barge and backhoe which will place the rock in its designated area. The living shoreline will also be placed with similar equipment.

II. Factual Determinations.

A. Physical Substrate Determinations.

(1) **Substrate Elevation and Slope.** Bottom topography within this site is relatively flat and gentle sloping. Average water depth within the placement area is approximately three to four feet.

(2) **Sediment Type.** Bottom sediments within the vicinity of the project consist of sandy silts and clays. Boring logs indicate that loose poorly graded sand dominated the surficial sediments of the area to the east of the existing geotubes; however, surficial silt and clay also was found near northern limits of the site.

(3) **Dredged/Fill Material Movement.** Once the material is placed on the site, it should not move. However, after placement some materials may move under extreme storm events outside the designated area.

(4) **Physical Effects on Benthos.** Disruption of the benthic community is expected to be temporary but some open-water bottoms will be lost to the living shoreline and rock placement. Non-motile benthic fauna within the open-water placement site may be destroyed by the proposed operations, but should repopulate within several months after completion. Some of the motile benthic and pelagic fauna, such as crabs, shrimp, and fishes, are able to avoid the disturbed area and should return shortly after the activity is completed. Larval and juvenile stages of these forms may not be able to avoid the activity due to limited mobility. The overall impact to these organisms is expected to be minimal.

(5) **Other effects.** No other effects are anticipated.

(6) **Actions Taken to Minimize Impacts.** No other actions to minimize impacts to the physical substrate are deemed appropriate for this project.

B. Water Column Determinations.

(1) Water

(a) **Salinity.** Salinity would not be impacted as a result of the construction operations.

(b) **Water Chemistry (pH, etc.).** No effect.

(c) **Clarity.** Minor increases in turbidity may be experienced in the immediate

Section 404 (b)(1) Evaluation – Bayou Caddy Ecosystem (Shoreline Restoration)

January 2015

vicinity of the project area during construction. However, these increases will be temporary and would return to pre-project conditions shortly after completion.

(d) **Color.** No effect.

(e) **Odor.** No effect.

(f) **Taste.** No effect.

(g) **Dissolved Gas Levels.** Temporary decreases in dissolved oxygen will likely result from the construction operations, but this will only be of a short duration. No significant effect to the water column is anticipated.

(h) **Nutrients.** Slight increases in nutrient concentrations may occur from construction operations; however, these concentrations would rapidly disperse. These described increases would have no significant effect to the water column.

(i) **Eutrophication.** No effect.

(2) Current Patterns and Circulation.

(a) **Current Patterns and Flow.** Placement of the rock and living shoreline into the open-water will have an effect on current patterns and flow in the vicinity of the project area. Erosive wave action will be reduced significantly.

(b) **Velocity.** There will be slight disruptions to current velocity. It will be reduced in the vicinity of the geotubes due to the breakwater and living shoreline.

(c) **Stratification.** No effect.

(e) **Hydrologic effects.** No effect.

(3) Normal Water Level Fluctuations. No significant effects.

(4) Salinity Gradient. The salinities in the project vicinity are highly variable due to the inflow of freshwater from surrounding rivers and the tidal influence from the Gulf of Mexico. In addition, the breakwater will be constructed and placed as sections with gaps so water can freely flow between the segments.

C. Suspended Particulate/Turbidity Determination:

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Placement Site. No significant effect.

(2) Effects on Chemical and Physical Properties of the Water Column. No effect.

(a) **Light Penetration.** Light penetration through the water column at the construction site may be temporarily affected but is anticipated to return to previous conditions upon completion of construction activities.

(b) **Dissolved Oxygen.** No significant effects.

(c) **Toxic Metals and Organics.** No effect.

(d) **Pathogens.** No effect.

(e) **Esthetics.** No effect.

(3) **Effects on Biota.** No effect.

(a) **Primary Production Photosynthesis.** No significant effects.

(b) **Suspension/Filter Feeders.** No significant effects.

(c) **Sight Feeders.** Shorebirds tend to be attracted to shoreline construction sites and placement activities due to the presence of food items in the disturbed sediments. The impact of construction at the open-water site on sight feeders is expected to be a beneficial, short-term impact.

(4) **Actions Taken to Minimize Impacts (Subpart H).** No further actions are deemed appropriate.

D. Contaminant Determinations. The materials proposed for placement are naturally occurring materials. There is no reason to believe that the materials are unsuitable for placement. Therefore, the materials are excluded from testing under Section 404(b)(1)(d).

E. Aquatic Ecosystem and Organism Determinations.

(1) **Effects on Plankton.** No significant effects.

(2) **Effects on Benthos.** Temporary disruption of the aquatic community is anticipated at the open-water construction site. Some non-motile benthic fauna within the area may be destroyed by the proposed project, but should repopulate within several months after completion. Some of the water bottoms will be lost due to the footprint of the breakwater and living shoreline and non-motile benthic fauna will be adversely impacted. Many of the motile benthic and pelagic fauna, such as crabs, shrimp, and fishes, are able to avoid the disturbed area and should return shortly after the activity is completed. Larval and juvenile stages of these forms may not be able to avoid the activity due to limited mobility. The overall impact to these organisms is expected to be minimal.

(3) **Effects on Nekton.** No significant effects.

(4) **Effects on Aquatic Food Web.** No significant effects.

(5) **Effects on Special Aquatic Sites.** No effect.

(a) **Sanctuaries and Refuges.** Not applicable.

(b) **Wetlands.** No effect.

(c) **Mud Flats.** Not applicable.

(d) **Vegetated Shallows.** No significant impacts to the submerged aquatic vegetation (SAV) were identified in this evaluation. No SAVs are located within the 30 acre footprint of the project.

(e) **Coral Reefs.** Not applicable.

(f) **Riffle and Pool Complexes.** Not applicable.

(6) **Effects on Threatened and Endangered Species.** The Corps, Mobile District will coordinate with the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration Fisheries under Section 7 of the Endangered Species Act and the Marine Mammals Protection Act. Concurrences are expected for this project.

(7) **Effects on Other Wildlife.** No significant effects.

(8) **Actions to Minimize Impacts.** No other actions to minimize impacts on the aquatic ecosystem are deemed appropriate.

F. Proposed Placement Site Determinations:

(1) **Mixing Zone Determination.** The State of Mississippi will specify a mixing zone not to exceed ambient turbidity by more than 50 nephelometric turbidity units at the outer limits of 750-foot for turbidity compliance. Rock material placed in the open-water area should generate minimal turbidity and it is anticipated to quickly settle out of the water column. Placement of material within the open-water sites is not anticipated to exceed the proposed turbidity compliance requirements. Thus, no mixing violations are expected.

(a) **Depth of water at the placement site.** The construction site ranges in depth from about one to ten feet.

(b) **Current velocity, direction, and variability at the placement site.** Astronomical tides, winds, and freshwater discharge dominate the circulation patterns within Mississippi Sound. Data collected within the Gulf of Mexico between November 1980 and

September 1981 indicate that the progression of the tide through Horn Island Pass segments the Gulf into eastern and western areas dominating circulation within this portion of the Gulf. The eastern area is between Horn Island Pass, Mississippi, and the main pass entering Mobile Bay, Alabama. The western area is between Horn Island Pass and the Chandeleur Islands. As tide propagates from the Gulf into Mississippi Sound, a clockwise movement of water occurs in the eastern area while a counterclockwise movement occurs in the west. The protected area inside the breakwater and living shoreline will be relatively calm with minimal current velocity.

(c) **Degree of turbulence.** No effect.

(d) **Stratification attributable to causes such as obstructions, salinity or density profiles at the disposal site.** No effect.

(e) **Discharge vessel speed and direction, if appropriate.** Not applicable.

(f) **Rate of discharge.** Not applicable.

(g) **Ambient concentrations of constituents of interest.** Not applicable.

(h) **Dredged material characteristics, particularly concentrations of constituents, amount of material, type of material (sand, silt, clay, etc.) and settling velocities.** Not applicable.

(i) **Number of discharge actions per unit of time.** Not applicable.

(2) **Determination of Compliance with Applicable Water Quality Standards.** The proposed activity has been determined to be in compliance with all applicable water quality standards.

(3) **Potential Effects on Human Use Characteristics.**

(a) **Municipal and Private Water Supply.** No applicable.

(b) **Recreational and Commercial Fisheries.** Recreational fishing should increase in the area once the living shoreline is constructed. There should be no negative impacts to commercial fisheries.

(c) **Water Related Recreation.** No effect.

(d) **Esthetics.** No significant effects but the living shoreline will be visible from the shoreline.

(e) **Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves.** Not applicable.

G. Determination of Cumulative Effects on the Aquatic Ecosystem. The proposed action is not expected to have significant cumulative adverse impacts.

H. Determination of Secondary Effects of the Aquatic Ecosystem. The proposed action is not expected to have any significant secondary adverse effects on the aquatic ecosystem.

III. Finding of Compliance With the Restrictions on Discharge.

A. No significant adaptations of the Section 404(b)(1) guidelines were made relative to this evaluation.

B. The proposed construction represents the least environmentally damaging practicable alternative.

C. The planned placement of the breakwater, living shoreline and temporary access channel would not violate any applicable State Water Quality standards; nor will it violate the Toxic Effluent Standard of Section 307 of the Clean Water Act.

D. Construction of the proposed project will not jeopardize the continued existence of any federally listed endangered or threatened species or their critical habitat provided the specified conditions in this document are implemented during construction operations.

E. The proposed construction of the rock breakwater, living shoreline and temporary access channel will not contribute to significant degradation of waters of the United States. Nor will it result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing; life stages of organisms dependent upon the aquatic ecosystem; ecosystem diversity, productivity and stability; or recreational, aesthetic or economic values.

F. Appropriate and practicable steps will be taken to minimize potential adverse impacts of the project on the aquatic ecosystem.

DATE _____

Jon J. Chytka
Colonel, Corps of Engineers
District Commander



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2288
MOBILE, ALABAMA 36628-0001

**CESAM-PD-EC
PUBLIC NOTICE NO. FP15-CB05-05**

13 February 2015

**JOINT PUBLIC NOTICE
U.S. ARMY CORPS OF ENGINEERS, MOBILE DISTRICT
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY,
OFFICE OF POLLUTION CONTROL
MISSISSIPPI DEPARTMENT OF MARINE RESOURCES
BAYOU CADDY ECOSYSTEM (SHORELINE STABILIZATION)
HANCOCK COUNTY, MISSISSIPPI
A FEDERALLY AUTHORIZED NAVIGATION PROJECT**

Interested persons are hereby notified that the U.S. Army Corps of Engineers (USACE), Mobile District proposes to construct a rock breakwater and living shoreline in the vicinity of the federally authorized Cadet Bayou navigation project and Bayou Caddy ecosystem restoration area, Hancock County, Mississippi.

This public notice is issued in accordance with the rules and regulations published in the Federal Register on 26 April 1988. These regulations provide for the review of the dredging programs for federally authorized projects. These laws are applicable whenever dredged or fill material may enter navigable waters. The recipient of this notice is requested specifically to review the proposed action as it may have impact on water quality, relative to the requirements of Section 404(b)(1) of the Clean Water Act. Comments on any other potential impacts are also requested.

WATERWAY AND LOCATION: Cadet Bayou, Mississippi Sound, Hancock County, Mississippi (Figures 1 and 2).

DESCRIPTION OF THE AUTHORIZED PROJECT: The proposed project is authorized by the Department of Defense Appropriations Act, 2006 (P.L. 1090148) dated 30 December 2005. The Mississippi Coastal Improvements Program (MsCIP) Near Term Improvements Environmental Assessment (EA) dated June 2006 identified Bayou Caddy as one of fifteen projects in coastal Mississippi that would benefit the overall coastal

**CESAM-PD-EC
PUBLIC NOTICE NO. FP15-CB05-05****13 February 2015**

environment. The Cadet Bayou navigation project was federally authorized 20 March 1969 by the Chief of Engineers under the authority of Section 107, Rivers and Harbor Act of 1960. The federally authorized project provides for a 6 to 8-foot deep by 60 to 100-foot wide channel for a total length of approximately 16,000 feet. The plane of reference is mean low water (MLW).

DESCRIPTION OF THE PROPOSED ACTION: The USACE, Mobile District, proposes to construct a 650-foot long by 25-foot wide rock breakwater, a 1,925-foot long segmented living shoreline and a 3,000-foot long temporary access channel to provide additional shoreline protection to the Bayou Caddy marsh restoration/dredged material beneficial use site (Figures 3 and 4). This action is related to the consequences of tropical storm Lee that made landfall on September 5, 2011, with additional damage resulting from Hurricane Isaac in 2012. Large waves and high tides damaged the existing geotube containment structure by displacing the sandy material within the geotubes. This sand displacement caused an uneven elevation on the perimeter of the containment structure which greatly reduced its capability to contain dredged material and function properly as a beneficial use site. The damaged geotubes were repaired in November 2013 by USACE. The intent of this project is to protect the site from further storm damage, extend the life of the newly constructed geotubes, provide an additional level of protection to the established wetlands after the geotubes have degraded and enhance the habitat for oysters, fish and other marine organisms. There is also great need for a dredged material beneficial use site in Hancock County which currently lacks an easily accessible site for locals. This site has the potential to fill that role and serve as a future tidal marsh creation project.

BAYOU CADDY ECOSYSTEM RESTORATION SITE: The Bayou Caddy ecosystem restoration site was constructed in 2010 with the placement of geotubes and dredged material. It is located along the western shoreline of Bayou Caddy and 22 acres in size. Phase I of the project consisted of a 4-acre portion of the overall beneficial use site that was constructed from sandy type materials obtained within the site to allow marsh plantings to occur. The site was planted with *Spartina alterniflora* (saltmarsh cordgrass), *Juncus roemerianus* (black needlerush) and *Spartina patens* (saltmeadow cordgrass). This site is fully functional with significant natural plant growth. The 18-acre Phase II site was filled with approximately 50,000 cubic yards (cys) of dredged material from the navigation channel in 2010. Since then, the material contained in this site has consolidated and the site consists primarily of open water. The site currently has the capacity to beneficially use approximately 140,000 cys of additional dredged material.

WATER QUALITY CERTIFICATION: Pursuant to the Clean Water Act, state water quality certification is required for this proposed action. Water quality certification for a ten-year period will be requested from the Mississippi Department of Environmental Quality, Office of Pollution Control (MDEQ-OPC). A decision relative to water quality certification will be made by MDEQ-OPC upon completion of the required comment period for this public notice.

COASTAL ZONE CONSISTENCY: Pursuant to the Coastal Zone Management Act, the proposed action is consistent with the Mississippi Coastal Management Program to the

**CESAM-PD-EC
PUBLIC NOTICE NO. FP15-CB05-05****13 February 2015**

maximum extent practicable. A ten-year concurrence with this determination will be requested from the Mississippi Department of Marine Resources (MDMR). A decision relative to coastal zone consistency will be made by the MDMR upon completion of the required comment period.

USE BY OTHERS: The proposed action is not expected to create significant impacts on land and water use plans in the vicinity. Use of the waters in the vicinity of the project area includes fishing, shrimping, and recreational boating.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) CONSIDERATIONS: In accordance with the requirements of the NEPA, the Final Environmental Impact Statement (FEIS) for the Cadet Bayou navigation project, Hancock County, Mississippi, was completed in 1979. The FEIS was coordinated with all applicable Federal, state, and local agencies and the interested public. The Bayou Caddy restoration project was one of fifteen priority projects listed in the MsCIP 2006 EA. During the dredging recertification process in February 2010, a Finding of No Significant Impact (FONSI), EA and Section 404(b)(1) Evaluation Report were also completed for this project. A new EA was written to address the potential environmental impacts of the proposed breakwater and living shoreline. These documents are on file and available for review at the USACE, Mobile District at the web address: <http://www.sam.usace.army.mil/Missions/PlanningEnvironmental/EnvironmentalAssessments.aspx>. Based on comments to this public notice, the District Commander will determine the need to incorporate those comments and update the NEPA documents.

SECTION 404 (B)(1) EVALUATION REPORT: Water quality impacts associated with the proposed action have been identified in an evaluation report prepared in accordance with Public Law 92-500, Section 404 (b)(1) Guidelines promulgated by the U. S. Environmental Protection Agency under the Clean Water Act. The draft February 2015 Section 404 (b)(1) Evaluation Report is on file in the USACE, Mobile District office and is available for review at the web address: <http://www.sam.usace.army.mil/Missions/PlanningEnvironmental/EnvironmentalAssessments.aspx>. Should comments be received that warrant consideration, the Section 404(b)(1) report will be updated.

ENDANGERED/THREATENED SPECIES: In compliance with Section 7 of the Endangered Species Act, the proposed restoration project at Bayou Caddy is being coordinated with the U.S. Department of Interior, Fish and Wildlife Service, and the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) Fisheries. Based on review of endangered and threatened species that could occur within the project area, the USACE, Mobile District determined that the proposed action would not likely adversely impact any listed species. Additionally, this project is located within the Gulf sturgeon critical habitat Unit 8. The Bayou Caddy ecosystem restoration site is located near a highly industrialized channel that does not lead to any Gulf sturgeon spawning sites. Gulf sturgeon typically do not utilize industrialized channels during their migration; therefore, it is unlikely Gulf sturgeon would occur in the vicinity of the project. In addition, the sturgeon is a motile species and would be able to avoid the construction operations. Based on review of endangered and threatened species that could occur

**CESAM-PD-EC
PUBLIC NOTICE NO. FP15-CB05-05****13 February 2015**

within the project area, the USACE has determined that the proposed action would not adversely impact any listed species or their critical habitat.

Note: A 10-year concurrence of not likely to be adversely affected has already been issued by the NOAA National Marine Fisheries Service (NMFS) St. Petersburg, FL office for sea turtles and Gulf sturgeon for the Bayou Caddy ecosystem restoration site. This letter is dated February 27, 2009 and signed by the Regional Administrator.

Based on review of endangered and threatened species that could occur within the Bayou Caddy project area, the USACE, Mobile District had determined that the proposed action may affect but is not likely to adversely affect any listed species or their critical habitat. The USACE, Mobile District would also use standard manatee protection conditions during all construction operations.

CULTURAL RESOURCES CONSIDERATION: The National Register for Historic Places has been consulted during past re-certification efforts for dredging projects and no properties listed on, being nominated to or determined eligible for the National Register are located in the project vicinity. A cultural resources survey of the project area was conducted by the USACE, Mobile District archeologist in December of 1979 and no eligible cultural resources were located. As a result of these investigations, our office recommended that this project would have no effect on cultural properties, and that no further work at Cadet Bayou is warranted. This recommendation was confirmed with the Mississippi Department of Archives and History in January of 1980. No sites listed on the National Register of Historic Places were located within the project area. As the lead Federal agency, the USACE, Mobile District Archaeologist looked at this new project on October 20, 2014 and determined that the proposed construction activities would have no effect on historic properties. Copies of this notice are being sent to the Mississippi State Historic Preservation Officer, the U.S. Department of Interior, National Park Service, Atlanta, Georgia, and relevant federally-recognized American Indian tribes.

ESSENTIAL FISH HABITAT (EFH) ASSESSMENT: EFH is defined in the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) as “those waters and substrate necessary to fish spawning, breeding, feeding, or growth to maturity.” The Gulf of Mexico Fishery Management Council, in accordance with the MSFCMA (PL 94-265), has developed management plans for the following fisheries: shrimp, red drum, reef fish, stone crab, spiny lobster, coral and coral reef and coastal migratory pelagic. Of these plans, only those pertaining to shrimp and red drum are applicable to the proposed actions. Although the USACE anticipates construction operations would temporarily disrupt the aquatic community, the non-motile benthic fauna within the area should repopulate within several months after completion of the breakwater placement activities. Motile benthic and pelagic fauna, such as crab, shrimp, and fish, are able to avoid the disturbed area and should return shortly after the activity is completed. The Gulf of Mexico Fishery Management Plans identifies EFH in the project area to be intertidal wetlands, submerged aquatic vegetation, non-vegetated bottoms, shell reefs, and estuarine water column. Habitat Areas of Particular Concern have not been identified for the project area. The USACE does not anticipate any adverse impacts to occur to EFH

**CESAM-PD-EC
PUBLIC NOTICE NO. FP15-CB05-05****13 February 2015**

as a result of this construction project. Coordination for EFH in the project area is being initiated through this public notice and official letter.

CLEAN AIR ACT: Air quality in the vicinity of the proposed action would not be significantly affected by the proposed action. The equipment and machinery would generate some air pollution during construction activities, such as increased particulate levels from the burning of fossil fuels. However, these impacts would be minor and temporary in nature. The proposed action is in compliance with the Clean Air Act, as amended. The project area is in attainment with the National Ambient Air Quality Standards parameters. The proposed action would not affect the attainment status of the project area or the region. A State Implementation Plan conformity determination (42 United States Code 7506(c)) is not required since the project area is in attainment for all critical pollutants.

EVALUATION: The decision whether to proceed with the proposed action will be based on an evaluation of the overall public interest. That decision would reflect the national concerns for both protection and utilization of important resources. The benefits that may be expected to accrue from this proposal must be balanced against its reasonably foreseeable detriments. The decision whether to proceed and the conditions under which the activity would occur would be determined by the outcome of this general balancing process. All factors that may be relevant to the proposal would be considered. Among these are conservation, economics, esthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and in general, the needs and welfare of the public. The proposed action would proceed unless it is found to be contrary to the overall public interest. In as much as the proposed work would involve the discharge of materials into navigable waters, specification of the proposed disposal sites associated with this Federal project is being made through the application of guidelines promulgated by the Administrator of the U.S. Environmental Protection Agency in conjunction with the Secretary of the Army. If these guidelines alone prohibit the specification of any proposed disposal site, any potential impairment of the maintenance of navigation, including any economic impacts on navigation and anchorage that would result from the failure to use this site would also be considered.

COORDINATION: Among the agencies receiving copies of this public notice are:

Region 4, U.S. Environmental Protection Agency
U.S. Department of the Interior, Fish and Wildlife Service, Jackson, Mississippi
Regional Director, National Park Service
U.S. Department of Commerce, National Marine Fisheries
Service, Baton Rouge, Louisiana

U.S. Department of Commerce, National Marine Fisheries
Service, St. Petersburg, Florida
Commander, Eighth Coast Guard District

**CESAM-PD-EC
PUBLIC NOTICE NO. FP15-CB05-05**

13 February 2015

Mississippi Department of Environmental Quality, Office of Pollution Control
Mississippi Department of Marine Resources
Mississippi State Historic Preservation Officer
Gulf of Mexico Fishery Management Council
U.S. Department of Agriculture, Natural Resources Conservation Service
Appropriate federally recognized Indian Tribes

Other Federal, state and local organizations, U.S. Senators and Representatives of the State of Mississippi are being sent copies of this notice and are invited to participate in coordinating the proposed action. The USACE, Mobile District requests the information contained in this notice be communicated to any other parties who may have an interest in the proposed action.

CORRESPONDENCE: Any person who has an interest that may be affected by this proposed activity may request a public hearing. Any comments or requests for a public hearing must be submitted in writing to the District Engineer within 30 days of the date on this public notice. A request for a hearing must clearly set forth the interest, which may be affected, and the manner in which the interest may be affected. Correspondence concerning this public notice should refer to Public Notice No. FP15-CB05-05 and should be directed to the Commander, U.S. Army Engineer District Mobile, Post Office Box 2288, Mobile, Alabama 36628-0001, ATTN: CESAM-PD-EC. For additional information please contact Mr. Michael F. Malsom at (251) 690-2023, or at email address michael.f.malsom@usace.army.mil.

Encls



CURTIS M. FLAKES
Chief, Planning and Environmental
Division

**CESAM-PD-EC
PUBLIC NOTICE NO. FP15-CB05-05**

13 February 2015

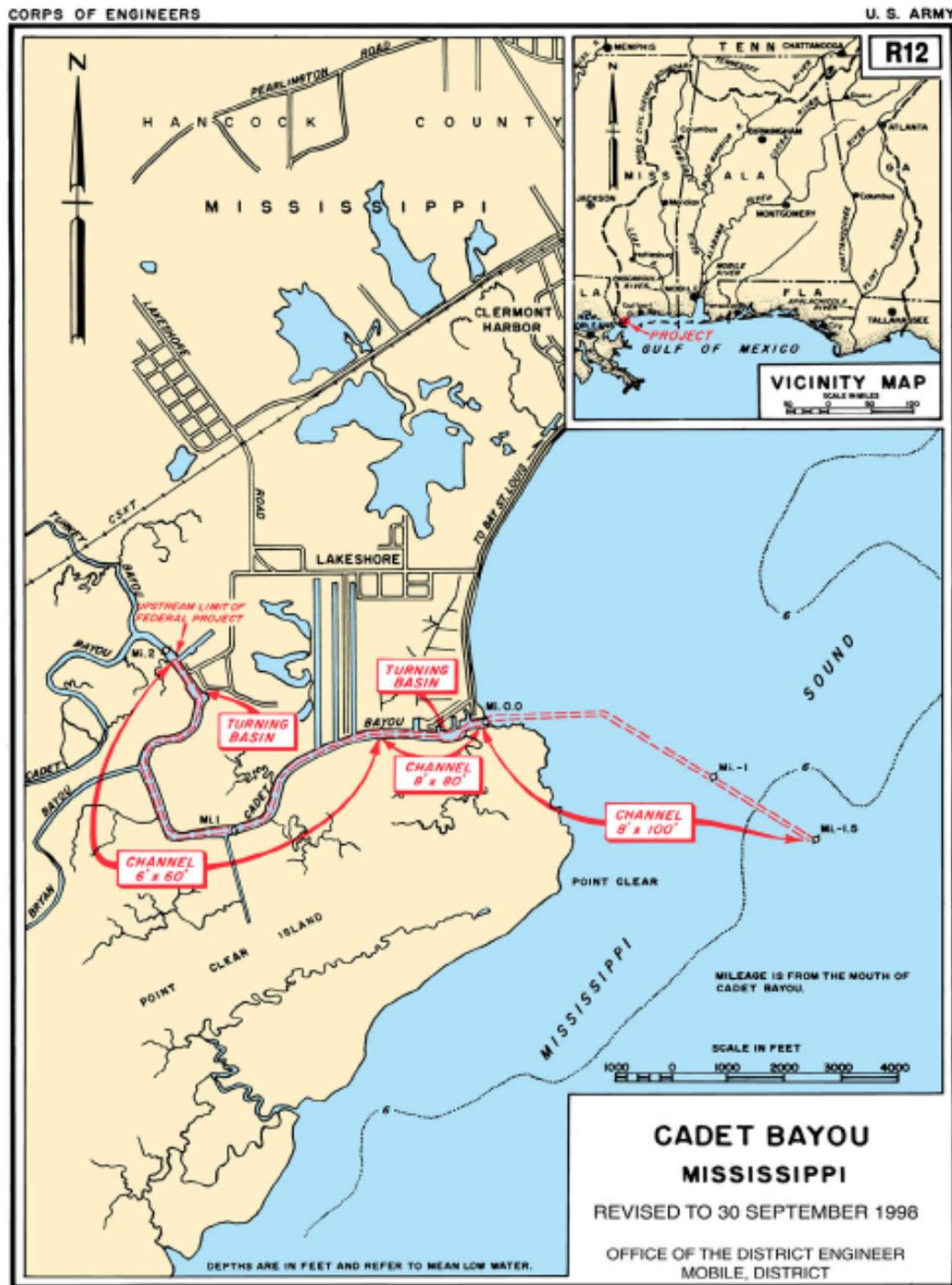


Figure 1: Cadet Bayou Federally Authorized Project

Last Page of EA