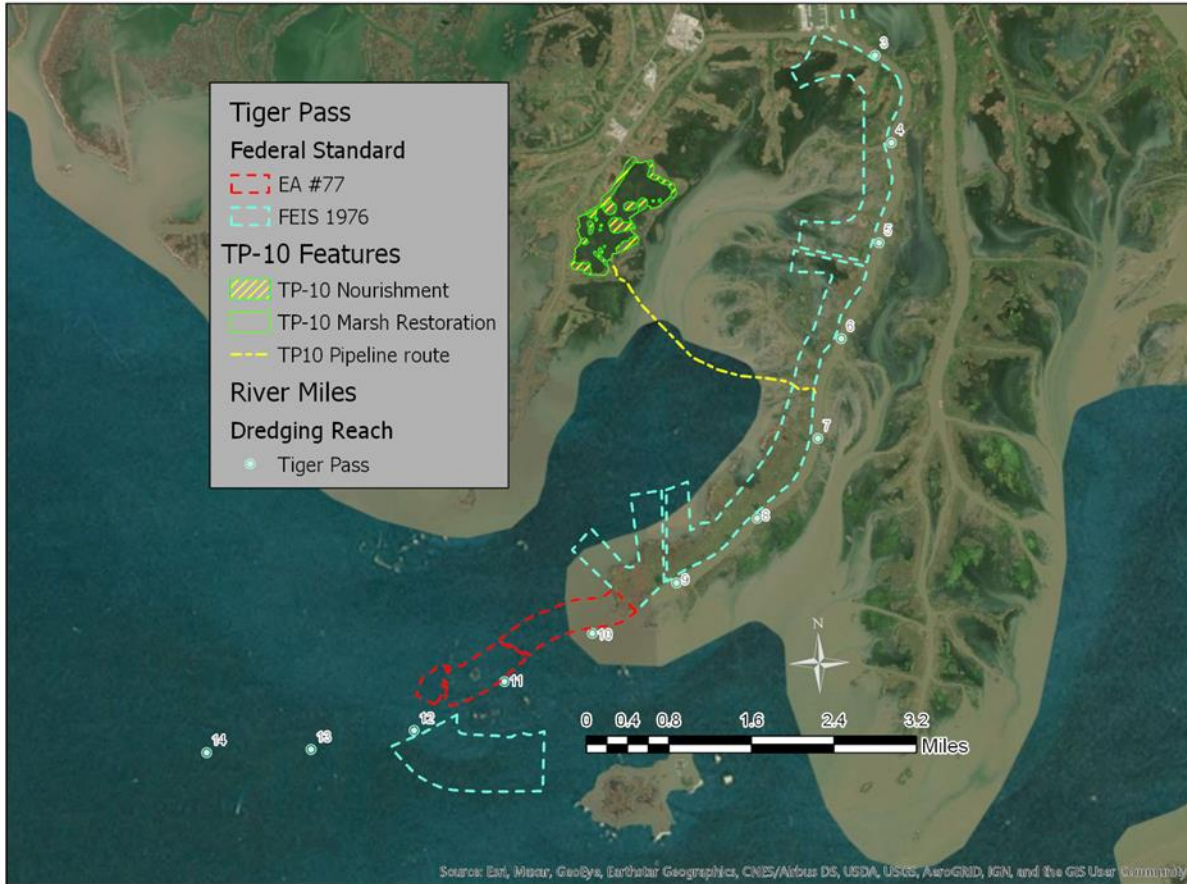


ENVIRONMENTAL ASSESSMENT #578

LOUISIANA COASTAL AREA BENEFICIAL USE OF DREDGED MATERIAL PROGRAM MISSISSIPPI RIVER OUTLETS AT VENICE PROJECT IN PLAQUEMINES PARISH, LOUISIANA



**US Army Corps
of Engineers**

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Prepared by:

**U.S Army Corps of Engineers
New Orleans District**

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1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Mississippi River Valley Division, Regional Planning and Environment Division South, has prepared this draft Environmental Assessment (EA) #578 for New Orleans District (CEMVN) to evaluate the potential impacts of using approximately 2 million cubic yards (cyd) of dredged material to restore and nourish approximately 332 acres of fresh-intermediate marsh over a 50 year period of analysis. The source of the dredged material will be from regular operation and maintenance dredging of the federally authorized Mississippi River Outlets at Venice, Louisiana Federal Navigation Project in the vicinity of Tiger Pass from Channel Mile 7 to Channel Mile 14.

This draft EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality's Regulations (40 Code of Federal Regulations [CFR] 1500-1508), as reflected in the USACE Engineering Regulation (ER) 200-2-2. This draft EA provides sufficient information on the potential adverse and beneficial environmental effects to allow the District Commander to make an informed decision on the appropriateness of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

Please see Appendix F for a list of acronyms included in this document.

1.1 Proposed Action

Alternative TP-10

This EA #578 tiers off the LCA BUDMAT Programmatic EIS (2010), which is located at the following site: <https://www.mvn.usace.army.mil/Missions/Environmental/Louisiana-Coastal-Area/Beneficial-Use-of-Dredged-Material/>.

USACE proposes to construct an approximately 227-acre marsh restoration site and nourish approximately 105 acres of existing marsh (site) located west of Tiger Pass at Channel Mile 4 and 5, and along Pass Tante Phine in Plaquemines Parish. The proposed action (also referred to herein as the Tentatively Selected Plan or TSP) would consist of hydraulically dredging approximately 2 million cubic yards (cyd) of material, consisting of clayey silt, from reach Mile 7.3 to 14.0 (approximately 100 acres of open water) in Tiger Pass and disposing of it in such a manner as to restore and nourish approximately 332 acres of marsh (See Figure 1-1). Dredging would be performed by cutterhead dredge, and in conjunction with a USACE operation and maintenance (O&M) dredging contract. Transportation of the dredged material from Tiger Pass to the restoration site would occur via pipeline situated in existing open water. For containment, approximately 10,265 linear feet of retention dikes and approximately 9,635 linear feet of earthen weir would be built, using approximately 93,000 cyd of interior borrow. See Section 2.3 for more details.

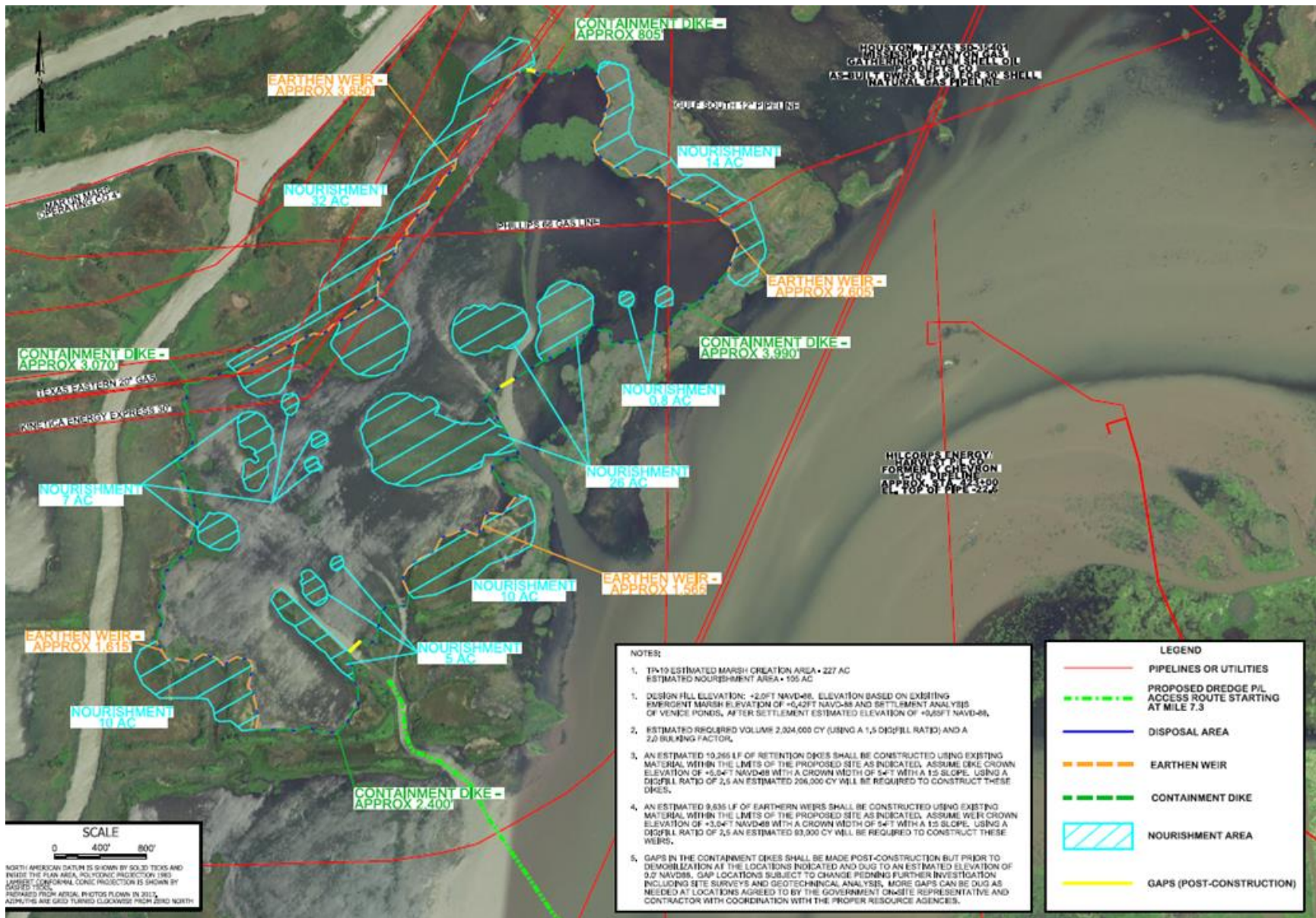


Figure 1-1. LCA BUDMAT Mississippi River Outlets at Venice Proposed Action, Site TP-10

1.2 Authority

Title VII of the Water Resources Development Act of 2007 (“WRDA 2007”) (Public Law [PL] 110-114) authorized an ecosystem restoration Program for the Louisiana Coastal Area substantially in accordance with the Near-Term Plan identified in the 2005 Chief’s Report. Section 7006(d) of WRDA 2007 authorizes the Secretary, substantially in accordance with the Report of the Chief of Engineers dated January 31, 2005, to implement a program for the Beneficial Use of Dredged Material dredged from federally maintained waterways in the coastal Louisiana ecosystem.

Mississippi River Outlets at Venice, LA Federal Navigation Project authorized in Section 101 of The Rivers and Harbors Act of 1968, approved 13 August 1968 (PL 483-90) (House Document 361, 90th Congress, 2nd Session), provides for, among other things, additional federally authorized navigation outlets from the Mississippi River in the vicinity of Venice, Louisiana and the enlargement of the existing channels of the Baptiste Collette Bayou, Grand Pass and Tiger Pass.

1.3 Purpose and Need for the Proposed Action

The purpose of the proposed action is to restore marsh in coastal Louisiana by maximizing the beneficial use of dredged material from the O&M of Tiger Pass within Plaquemines Parish, LA in vicinity of the Port of Venice. The materials removed from Tiger Pass would be deposited in a manner to maximize habitat output beyond what would be achieved by disposal within the Federal Standard. The Federal Standard requires disposal of dredged material utilizing the least costly alternative that is consistent with sound engineering practices and environmental standards. This results in disposal being restricted to lands adjacent to the navigation channel. The LCA BUDMAT Program would fund the incremental cost of placement of material beyond the Federal Standard.

Louisiana's wetlands today represent about 40 percent of the wetlands of the continental United States, and account for about 80 percent of the losses over the past 200 years (<https://pubs.usgs.gov/fs/la-wetlands/>). In recognition of the need to reduce Louisiana coastal wetland loss, programs like LCA BUDMAT have been authorized in support of ecosystem restoration.

1.4 Data Gaps and Uncertainties

Because natural systems are complex and consist of an intricate web of variables that influence the existence and condition of other variables within the system, all restoration projects contain certain inherent uncertainties. The effects of tropical storms, increased sea level rise, and climate change on each project’s performance are uncertain and are addressed through future projections based on existing information. All models used for this study rely on mathematical representations of current and future conditions to quantify and predict the future success and benefits of these mitigation projects. No model can account for all relevant variables in an evolving coastal system. Additionally, there is inherent risk in reducing complex natural systems to mathematic expressions driven by simplified interactions of key variables. As such, how the proposed projects will actually perform and the benefits that will result from their creation are a ‘best guess’ based on what we presently know about existing ecosystems and the results of already constructed restoration projects.

1.5 Prior Beneficial Use Studies and Reports

Additional information on other BUDMAT activities in the vicinity of this project, including Tiger Pass, is available online as New Orleans District Environmental Dredging Conference materials and beneficial use reports:

<http://www.mvn.usace.army.mil/About/Offices/Operations/BeneficialUseofDredgedMaterial.aspx>.

A number of studies, reports, and environmental documents on water resources development in the Project Area have been prepared by the USACE, other Federal, state, and local agencies, research institutes, and individuals. The more relevant prior studies, reports, and projects are described as follows in Appendix B, Table B-1. The environmentally-cleared Federal Standard dredged material disposal sites for Tiger Pass are associated with “Mississippi River Outlets” EIS (1976) and EA #77 “Marsh Creation, Mississippi River Outlets, Louisiana” (USACE) (See Appendix A, Figure A-3b). Below are the listed projects completed in the study area:

- 2018, Supplemental EA #542.B titled “Louisiana Coastal Area Beneficial Use of Dredged Material at Tiger Pass 2 Project, Plaquemines Parish, Louisiana” with a signed FONSI dated 1 November 2018. This document evaluated the impacts associated with the beneficial use of up to 2,000,000 cyd of dredged material removed from the Hopper Dredge Disposal Area (HDDA) to construct approximately 6,800 feet of ridge habitat backed by an approximately 500-foot-wide marsh platform at the Tiger Pass 2 Project Area.
- 2017, Supplemental EA #542.A titled “Tiger Pass Marsh/Ridge Restoration, Louisiana Coastal Area Beneficial Use of Dredged Material Program, Plaquemines Parish, Louisiana” with a signed FONSI dated 12 January 2017. This document assessed the impacts from design adjustments to the ridge and marsh platform (EA #542).
- 2016, EA #542 titled “Louisiana Coastal Area Beneficial Use of Dredged Material Program at Tiger Pass Project, Plaquemines Parish, Louisiana” with a signed FONSI dated 9 March 2016. This document assessed the impacts of restoring an approximately 5,000' long, non-continuous ridge (23 acres without plantings).
- 2015, EA #535 titled “West Bay Marsh restoration Tier 1, Louisiana Coastal Area Beneficial Use of Dredge Material Program, Plaquemines Parish, Louisiana” with a signed FONSI dated 23 March 2015. This document assessed the impacts of constructing 44 acres of marsh in West Bay with the beneficial use-placement of dredged material removed during maintenance dredging of the hopper dredge disposal area between Venice and Mile 11.0 below Head of Passes.
- 2013, EA #517 titled “Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana Designation of Additional Disposal Areas for Head of Passes, Southwest Pass, and South Pass, Plaquemines Parish, Louisiana” with a signed FONSI dated 22 November 2013. This document assessed the impacts of designating additional disposal areas for placement and beneficial use of dredged material from the mainstem Mississippi River, Southwest Pass, South Pass, and the hopper dredge disposal area.

- 2010, Final Programmatic EIS titled “Louisiana Coastal Area Beneficial Use of Dredged Material Program” with a signed record of decision (ROD) dated 13 August 2010. This document presented the findings of the study, which established the structure and management architecture of the BUDMAT Program to take greater advantage of existing sediment resources made available by the maintenance activities of authorized Federal navigation channels to achieve restoration objectives in coastal Louisiana.
- 2009, EA #488 titled “Mississippi River Outlets, Vicinity of Venice, Louisiana, Extension of Tiger Pass Jetties, Plaquemines Parish” with a FONSI signed 17 November 2009. This document evaluated the impacts of a three-mile landward extension of jetties for the Tiger Pass feature of the Mississippi River Outlets, Vicinity of Venice, Louisiana project.
- 2005, Programmatic EIS titled “Louisiana Coastal Area, Louisiana, Ecosystem Restoration Program, November 2004” with a signed ROD dated 18 November 2005. This document described the purpose of the LCA program.

1.6 Public Concerns

The public is concerned about maintaining safe and efficient navigable channels in support of commercial activity associated with Mississippi River ports. Additionally, Louisiana accounts for 40 percent of the total coastal marsh and accounts for 80 percent of the coastal marsh loss in the lower 48 states (<https://pubs.usgs.gov/fs/la-wetlands/>). There is widespread public support to avert further loss of coastal habitats and to beneficially use dredged material in support of that effort.

2.0 Alternatives Including the Proposed Action

Alternative plans for BUDMAT Projects are developed to the level of detail necessary to select a justified, acceptable, and implementable plan that: (1) is consistent with federal law and policy and (2) is consistent with the goals of the Non-Federal Sponsor (NFS) to the extent of the project authorization and law and policy permits. Risk and uncertainty, cost effectiveness, and incremental cost analyses are undertaken using procedures that are most appropriate for the scope and complexity of the Project. Opportunities to reasonably avoid or minimize adverse environmental impacts and mitigation requirements are considered in formulating the proposed action. The Project Delivery Team (PDT) has relied on existing data and existing environmental clearances for other USACE projects that are located within the study area. Additionally, the locations of all alternatives under consideration are generally in open water to minimize real estate issues and impacts to existing wetlands.

In formulating alternatives to maximize the benefits achieved from beneficially utilizing dredged material for ecosystem restoration in the vicinity of Tiger Pass, several management measures were identified to address coastal habitat degradation in the study area.

Measure 1: Restoration of coastal ridge habitat

This measure involves the construction of land, above water and above typical wetland elevation, along the footprint of a degraded coastal ridge. The ridge would be constructed using material dredged during federal O&M navigation channel maintenance dredging activities. Dredged material

would be deposited to an elevation conducive to the establishment of representative vegetation for ridge habitat.

- Coastal ridge habitat is unique to southeastern coastal Louisiana and is a critical component of the coastal wetland complex. Ridge habitat provides refuge, resting and nesting habitat necessary for terrestrial and avian wildlife species and essential habitat for Neotropical migrants. Ridges are associated with distributaries from the Mississippi River formed from the deposition of heavier materials adjacent to and along the bankline during periods of high water or flooding. These areas tend to be high enough above water that they lack wetland characteristics and are usually colonized by hardwood species. In most cases, the distributary has been cut off from its source of material so over time the ridge settles under its own weight or is degraded through natural or anthropogenic causes or both.

Measure 1 was screened because material dredged from Tiger Pass was determined not to be suitable for the creation and/or restoration of ridges or islands due to the material type. The latest material dredged in 2012 was clayey silt and the material dredged in 2010, 2009 and 2005 was mostly fat and lean clays with little to no silt, which is not suitable for stacking.

Measure 2: Restoration of coastal wetland habitat

This measure involves the construction of marsh in areas of open water to restore previously existing marsh habitat. Marsh would be constructed using material dredged during federal O&M navigation channel maintenance dredging activities. Dredged material would be deposited to an elevation conducive for marsh establishment.

The entire Louisiana coast is losing valuable coastal wetland habitat. In some areas the rate of wetland loss is as high as 25 square miles per year. Wetlands provide diverse habitat between the open waters of the Gulf of Mexico and upland habitat or coastal ridges. Numerous fisheries species and aquatic and non-aquatic wildlife species utilize wetlands as refuge, nursery grounds, and a source of food.

Because the LCA BUDMAT Program does not provide for additional operation, maintenance, repair, replacement and rehabilitation activities and the quality of the material would require these activities under any other measure, Management Measure 2 is the only measure that would satisfy the goals and objectives of the LCA BUDMAT program (2010 Report). All LCA BUDMAT MROV project alternatives were developed based on this measure.

Measure 3: Restoration of a coastal ridge and wetland complex

This measure involves the construction of a coastal ridge and marsh simultaneously in the same location. The coastal ridge would be constructed above water and above typical marsh elevation, along the footprint of a degraded coastal ridge. The marsh would be constructed in areas of open water to restore previously existing marsh habitat parallel and adjacent to the coastal ridge habitat. The coastal ridge and marsh would be constructed using material dredged during federal O&M navigation channel maintenance dredging activities. Dredged material would be deposited to an elevation conducive to the establishment of representative vegetation for coastal ridge habitat and to an elevation conducive for marsh establishment.

- Coastal ridge habitat is associated with wetland habitat on the landward side of a ridge face. This ridge and marsh create a mosaic of diverse habitats in close proximity to one another with upland habitat adjacent to wetlands. The ridges of coastal Louisiana are unique features that provide critical habitat to many species of aquatic and non-aquatic wildlife. These areas provide refuge, resting and nesting habitat as well as a food source. The ridge also provides protection to wetland habitat, which provide fish and wildlife habitat, by reducing storm surge and protecting the estuary behind it from dynamic tidal fluctuations, waves, and (depending on location) salinity intrusion.

Management Measure 3 was screened because material dredged from Tiger Pass was determined not to be suitable for creation and or restoration of ridges or islands due to the material type. The latest material dredged in 2012 was clayey silt and the material dredged in 2010, 2009 and 2005 was mostly fat and lean clays with little or no silt, which is not suitable for stacking.

Measure 4: Restoration of colonial nesting and wading bird habitat

This measure involves the construction of an island feature in areas of open water. The island would be constructed using material dredged during federal O&M navigation channel maintenance dredging activities. Dredged material would be deposited to an elevation that is not conducive for marsh establishment and does not promote the recruitment of vegetation typical of, for example, a coastal ridge.

Commonly associated with coastal barrier systems or other areas where mud flats are exposed during low tide, these features provide resting and foraging habitat for numerous wetland dependent avian and wildlife species.

Management Measure 4 was screened because the BUDMAT Program does not provide for additional operation, maintenance, repair, replacement and rehabilitation activities and the quality of the material and high energy environment this measure would be situated in would require these activities for the measure to be successful.

Measure 5: Planting of a restored coastal wetland habitat

Vegetative plantings typically involve planting nursery stock or rooted cuttings or broadcasting seeds. This restoration technique is usually used to supplement other restoration activities and improve ecological function through the production of life above and below ground biomass, surface structure, reduction of soil erosion, and enhanced ability to store and cycle nutrients (Louisiana Regional Restoration Planning Program 2007).

Management Measure 5 was screened using lessons learned from previous BUDMAT projects. Previous projects have self-vegetated and have not needed additional plantings.

2.1 Planning Goals, Objectives and Constraints

The intent of this Project is to maximize the beneficial use material obtained from the O&M dredging of the Mississippi River Outlets at Venice, Louisiana (MROV) federal navigation project. Utilization of the

LCA BUDMAT Program allows for a more specific plan of action for the placement of dredged material in a manner that attains environmental benefits beyond those that could be realized during routine disposal of dredged material removed during O&M of federal navigation channels. The planning horizon, or period of analysis, for this project is 50 years.

Planning Goals

- Restore critical coastal geomorphic landscape features in order to reduce impacts to remaining coastal habitat and critical infrastructure (coastal ridges, hurricane and storm damage risk reduction features)
- Increase wetland habitat by restoring coastal marsh habitat

Planning Objectives

- 1) Increase or restore critical coastal geomorphic landscape and habitat near Tiger Pass, LA, and
- 2) Increase or restore coastal wetland habitat in the vicinity of Tiger Pass, LA.

Planning Constraints

The constraints identified in the 2004 LCA Study and the 2010 Report remain applicable for this Project.

- Limitations of the availability of material for beneficial use
- Limitation on funding for normal operations and maintenance of the Federal navigation channels
- Dredging must be within existing authorized Federal navigation channels
- Dredged material transport distances must use current capabilities and techniques
- Funding limitations for the BUDMAT Program
- Minimize impacts to utilities located within the TSP site
- Minimize impacts to T&E species
- Impacts to existing marsh and aquatic vegetation
- Potential conflicts with and impacts on authorized projects and permitted actions are to be avoided
- Known hazardous, toxic, and radioactive waste (HTRW) and cultural resource sites are to be avoided

2.2 Description of Alternatives

The term “study area” typically describes a broad area of interest and the geographic area that was taken into consideration when formulating plans. For this EA, the study area was determined by the jurisdiction of the Non Federal Sponsor and encompasses the boundaries of Plaquemines Parish (Figure 2-2). The term “project area” typically describes the area directly and indirectly impacted by construction or operation of a project (typically a smaller footprint than the study area). It may consider the surrounding area, such as communities, industry, infrastructure, and known economic and environmental factors in the area. For the proposed action, the project area encompasses Tiger Pass Dredging limits

from River Miles 7.3 to 14.0, the pipeline corridor from Tiger Pass to the marsh restoration site (TP-10), and the marsh restoration site itself.

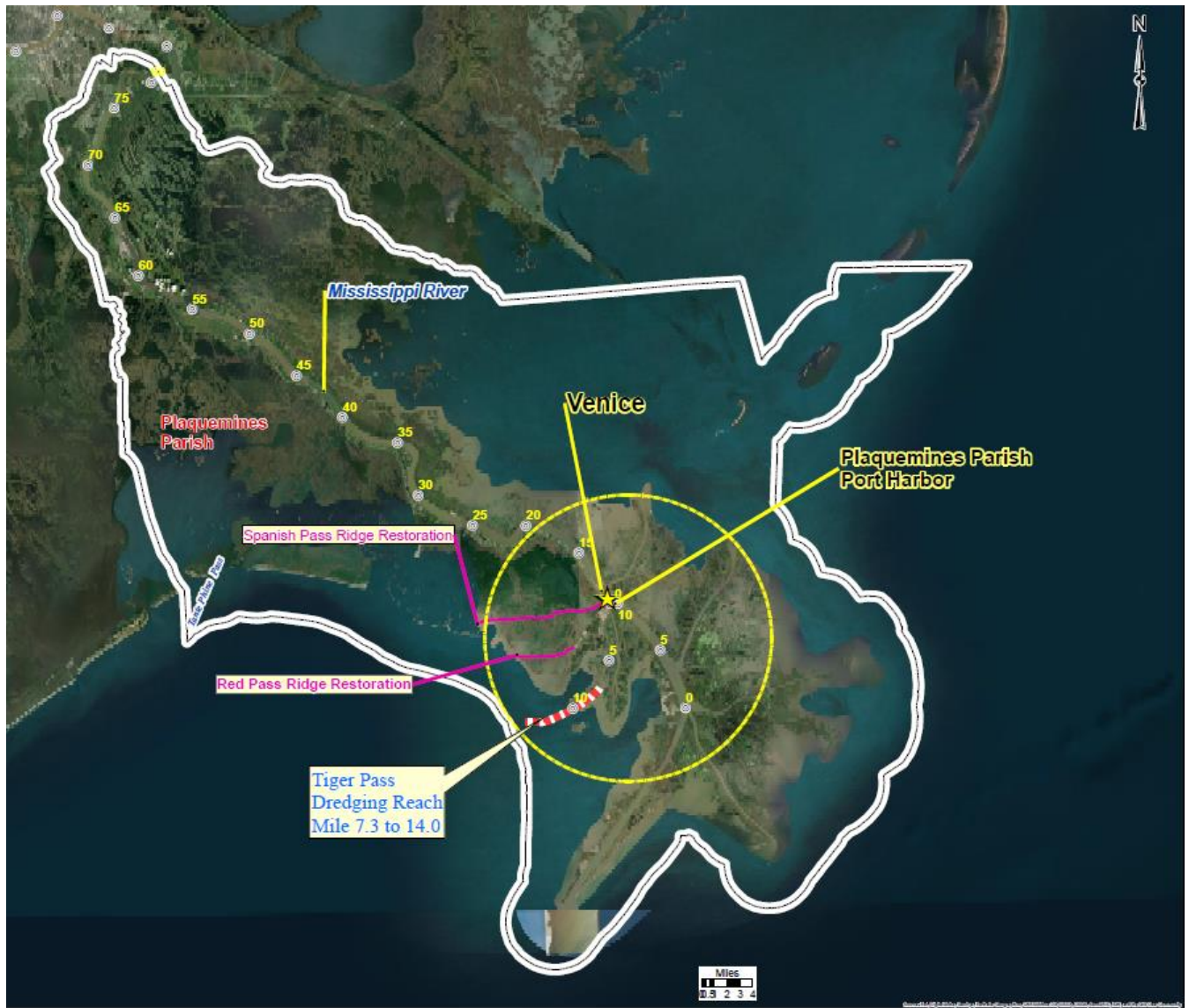


Figure 2-2. LCA BUDMAT Mississippi River Outlets at Venice study area features

Alternative plans were formulated from Management Measure 2 - Restoration of coastal wetland habitat) to meet the project objectives to restore critical coastal geomorphic landscape and coastal and wetland habitat in Plaquemines Parish, Louisiana.

The Project Delivery Team (PDT) utilized existing information and available data from previous ecosystem restoration studies and projects in the area including those performed by the state of Louisiana, Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), and previous LCA BUDMAT projects in the same vicinity in Plaquemines Parish, Louisiana.

The PDT identified 20 potential deposition sites by examining previous studies and exploring potential new sites. These sites were screened based on technical feasibility/constructability, distance from dredge

source, site access due to active oil and gas, overlapping with the Federal Standard, and overlapping with existing ongoing projects.

Through coordination between the PDT, the NFS, and natural resource agencies, the following list of alternatives, in addition to the FWOP (the no-action alternative), were developed from Management Measure 2. The resulting initial array and their preliminary descriptions are included below (See Figure 3). Please note that the descriptions for the alternatives in this section are the preliminary information used during the screening process and the details for the alternatives including refinement in acreage sizes were refined as the study progressed. The final project description for the TSP is included in Section 6.2.

- No Action Alternative
- Alternative TP-2 Marsh restoration cell to be constructed between Tiger Pass and Grand Pass in open water to reestablish marsh habitat. Originally designed as the "Venice Ponds Marsh Creation" project under CWPPRA (MR-15). The northern cell (TP-2) had approximately 113 open water acres available for placement. This marsh restoration site is fresh-intermediate marsh. Restoration of this site would protect the following critical landscape or infrastructure: pipelines and other oil & gas infrastructure, Venice Marina, Plaquemines Parish Government facilities, Cypress Cove Lodge & Marina, and PPHTD properties.
- Alternative TP-3 Marsh restoration cell to be constructed between Tiger Pass and Grand Pass in open water to reestablish marsh habitat. Originally designed as the "Venice Ponds Marsh Creation" project under CWPPRA (MR-15). The southern cell (TP-3) is approximately 208 open water acres available for placement. This marsh restoration site is fresh-intermediate marsh. Restoration of this site would protect the following critical landscape or infrastructure: pipelines and other oil & gas infrastructure, Venice Marina, Plaquemines Parish Government facilities, Cypress Cove Lodge & Marina, and PPHTD properties.
- Alternative TP-4 Marsh restoration to be constructed west of Tiger Pass Channel Mile 2. The area is bounded by Tide Water Road, Venice Boat Harbor Drive, Coast Guard Road and Cypress Point Road. The main open water cell is approximately 210 open water acres available for placement; there is also a smaller cell separated by existing marsh in the Southwest corner that could be included for an additional 37 open water acres available for placement. This marsh restoration site is fresh-intermediate marsh. Restoration of this site would protect the following critical landscape or infrastructure: pipelines and other oil & gas infrastructure, LA-23/ Tidewater Road and other local road access to PPHTD facilities, Venice Marina, Plaquemines Parish Government facilities Cypress Cove Lodge & Marina, and PPHTD properties.
- Alternative TP-5 Marsh restoration to be constructed west of Tiger Pass Channel Mile 2 and 3. The area is bounded by Venice Boat Harbor Drive to the North and Sports Marina Road to the East. The main open water cell is approximately 227 open water acres available for placement. This marsh restoration site is fresh-intermediate marsh. There is an existing containment dike around the perimeter constructed by Plaquemines Port that would be used to retain the dredged material to reestablish marsh habitat. Restoration of this site would protect the following critical landscape or infrastructure: pipelines and other oil & gas infrastructure, LA-23/ Tidewater Road and other local road access to PPHTD facilities, Targa Resources, Inc. and Hilcorp Energy facilities, Venice Marina, and Plaquemines Parish Government facilities.
- Alternative TP-6 Marsh restoration to be constructed west of Tiger Pass Channel Mile 0 to 2. The area is bounded by Tide Water Road to the east and Yellow Cotton Bay to the west. The main open water cell is approximately 1,321 acres. This marsh restoration site is fresh-

intermediate marsh. Restoration of this site would support the critical infrastructure of Tide Water Road and PPHTD.

- Alternative TP-9 Marsh restoration to be constructed west of Tiger Pass Channel Mile 6 and west of Tante Phine Pass. The main open water cell is approximately 256 acres. This marsh restoration site is fresh-intermediate marsh. Restoration of this site would protect the following critical landscape or infrastructure: pipelines and other oil & gas infrastructure and Tenenergy Corporation facilities.
- Alternative TP-10 Marsh restoration to be constructed west of Tiger Pass Channel Mile 5 and 6 along Tante Phine Pass. The area is bounded the banks of Tante Phine Pass to the West. The main open water cell is approximately 227 acres. This marsh restoration site is fresh-intermediate marsh. Restoration of this site would protect the following critical landscape or infrastructure: pipelines and other oil & gas infrastructure and Tenenergy Corporation facilities.

The initial array of alternatives were then screened based on criteria listed below followed by a field visit to determine the final array (See Figure A-1a in Appendix A for the 20 sites investigated and Figure A-1b for the initial array of alternatives).

- The size of the site must be adequate for placement of dredged material.
- The site must have maximum containment to maximize restoration acres.
- The site must support critical infrastructure.
- The site must have appropriate access for pipeline and construction equipment.

The final array consisted of 4 alternatives: 1) TP-2 and TP-3 combined, 2) TP-4, 3) TP-5, and TP-10. These alternatives were then ranked based on the degree to which they satisfied the project objectives (i.e. restoring coastal landscape and increasing and restoring coastal wetland habitat), the degree to which they avoided constraints, degree of support for landscape features, and degree of support to infrastructure, and cost and benefits.

TP-10 which is further detailed in Section 2.3, satisfies all of the aforementioned criteria.

Wetland Value Assessment

The effects (both positive and negative) the alternatives would have on fish and wildlife resources were assessed using the Wetland Value Assessment (WVA) methodology. The WVA requires that habitat quality and quantity (acreage) are measured for baseline conditions, and predicted for future without-project and future with-project conditions. Each WVA model utilizes an assemblage of variables considered important to the suitability of that habitat type to support a diversity of fish and wildlife species.

The WVA provides a quantitative estimate of project-related impacts to fish and wildlife resources based on the habitat being evaluated. There are separate WVAs for bottomland hardwoods, chenier/coastal ridge, fresh/intermediate marsh, brackish marsh, and saline marsh. Although, the WVA may not include every environmental or behavioral variable that could limit populations below their habitat potential, it is widely acknowledged to provide a cost-effective means of assessing restoration measures in coastal wetland communities.

The WVA models operate under the assumption that optimal conditions for fish and wildlife habitat within

a given coastal wetland type can be characterized, and that existing or predicted conditions can be compared to that optimum to provide an index of habitat quality. Habitat quality is estimated and expressed through the use of a mathematical model developed specifically for each wetland type. Each model consists of: (1) a list of variables that are considered important in characterizing community-level fish and wildlife habitat values; (2) a Suitability Index (SI) graph for each variable, which defines the assumed relationship between habitat quality (Suitability Index) and different variable values; and, (3) a mathematical formula that combines the SI for each variable into a single value for wetland habitat quality, termed the Habitat Suitability Index (HSI).

The product of an HSI value and the acreage of available habitat for a given target year is known as the Habitat Unit (HU) and is the basic unit for measuring project effects on fish and wildlife habitat. HUs are annualized over the period of analysis to determine the Average Annual Habitat Units (AAHUs) available for each habitat type. The change (increase or decrease) in AAHUs for each future with-project scenario, compared to future without-project conditions, provides a measure of anticipated impacts. A net gain in AAHUs indicates that the project is beneficial to the fish and wildlife community within that habitat type; a net loss of AAHUs indicates that the project would adversely impact fish and wildlife resources.

All alternative WVAs were calculated using the intermediate relative sea level rise (RSLR) scenario and a 50 year period of analysis. See Appendix C for the WVA model results and summary of assumptions. The draft U.S. Fish and Wildlife Coordination Act Report (FWCAR) dated March 24, 2020 (Appendix D) also offers information about the WVA process. In the final FWCAR, the WVA Appendix will be updated in the final EA for the assumptions associated with the containment features (i.e. 205.8 net acres or 66.7 AAHUs for Intermediate RSLR; 100.42 acres Low RSLR; 236.19 acres for High RSLR).

Cost Effectiveness

The incremental costs for the BUDMAT project are the costs that exceed the “base plan costs” of the authorized Federal navigation project. The term “base plan costs” means the costs, as determined by the Government, to carry out the dredging and disposal of material for the construction or operation and maintenance of the Federal Navigation Project in the most cost effective way, consistent with economic, engineering, and environmental criteria, for the quantity of dredged material that would be used to construct the Project (the Federal Standard).

Essentially, the BUDMAT Program pays the additional costs to beneficially place dredged material removed during routine Federal navigation channel maintenance dredging activities in areas beyond those determined to be in the Federal Standard.

The final evaluation and comparison of the array of alternative plans is based on the incremental cost of each average annual habitat unit (AAHU) earned or the highest output/least costly plan.

2.3 Proposed Action Project Description

Alternative TP-10

The proposed project, referred to as Alternative TP-10, consists of a marsh restoration site totaling

227 acres. The site is located west of Tiger Pass Channel Mile 4 and 5, southeast of site TP-5, and along Tante Phine Pass in Plaquemines Parish.

The site perimeter totals approximately 19,890 linear feet, and a combination of earthen weirs and retention dikes would be used to contain dredge pumped material. Approximately 10,265 linear feet of retention dike and approximately 9,635 linear feet of earthen weirs would be built along the perimeter of the site in open water to minimize impacts to existing marsh. The retention dikes would be constructed to an elevation of +5.0' NAVD88 with 1 on 5 slopes and a 5' crown width. Approximately 206,000 cubic yards of interior borrow would be required to construct these dikes. Earthen weirs would be constructed to allow nourishment of adjacent marsh and would be built to an elevation of +3.0' NAVD88 with 1 on 5 side slopes and a 5' wide crown width. Approximately 93,000 cubic yards of interior borrow would be required to construct these weirs. All borrow used to create these retention features will be taken from material within the limits of the marsh creation site. A pipeline would be laid in Tiger Pass and then placed in one of three canals west of Tiger Pass that lead to open water which leads to the eastern limits of the site. Nourishment of existing marsh includes a combination of marsh inside and outside the limits of TP-10. The nourishment of marsh outside TP-10 totals approximately 56 acres and nourishment of marsh from within the site totals approximately 49 acres with the total nourishment being approximately 105 acres.

After fill operations are completed but prior to demobilization, three gaps in the containment dikes would be placed at the locations specified on the drawings to promote dewatering and fish access. These gaps would be excavated to an estimated elevation of 0.0' NAVD88 with a bottom width between 20ft to 100ft depending on the preconstruction inlet width at the gap locations. The location of these gaps and excavation elevation is subject to change pending further data collection including surveys and geotechnical analysis. More gaps may be required to ensure tidal flow and fisheries access at the site. The location of these additional gaps would be determined by the Government on-site representative and the contractor in coordination with resource agencies.

An average existing elevation of -1.1' NAVD88 was used along with a design fill elevation after pumping of +2.00' NAVD88 \pm 0.5' NAVD88 to estimate the cubic yards needed to establish the marsh platform. Based off of the information in the Geotech design report and P&S for the CWPPRA Venice Ponds project (MR-15), approximately 2 million cubic yards would be needed to construct this site which includes borrow used for constructing the retention features. After a 5-year settlement period, the elevation within TP-10 would be approximately +0.65' NAVD88.

2.4 No-Action Alternative Description (Future without Project)

In the Future without Project, or No-Action alternative, the proposed action would not be implemented and the predicted additional environmental gains would not be achieved. Maintenance dredged material would continue to be disposed within the Federal Standard (See Appendix A; Figure A-3b) along Tiger Pass (the base operations and maintenance disposal plan). Although wetlands could be created at these locations, since disposal would be uncontained since no or little natural containment exists in these areas, and these areas are largely open and exposed to wave action, less functional marsh acres would be created than under the LCA BUDMAT program.

Other Federal, state, local, and private restoration efforts within or near the proposed Project Area, the Louisiana state coastal area, and the nation's coastal areas that may still occur without implementation

of the proposed action include the following:

- Other ecosystem restoration opportunities under the BUDMAT program.
- State Master Plan ecosystem restoration projects. The 2017 Louisiana's Comprehensive Master Plan for a Sustainable Coast (Source: <http://coastal.la.gov/our-plan/2017-coastal-master-plan/>) is not authorized and not funded and is therefore not reasonably foreseeable in the future. However, the Louisiana State Master Plan is mentioned here since there is some potential that these projects would become funded. The State Master Plan indicates that the Coastal Protection and Restoration Authority (CPRA) Board of Louisiana has, since 2007:

- Benefited 36,000 acres of coastal habitat
- Identified and used dozens of different Federal, state, local and private funding sources of projects
- Completed or funded construction of 135 projects
- Constructed or is currently constructing 60 miles of barrier islands/berms

- CWPPRA Program projects – Between 1990 and 2020, CWPPRA has constructed, or funded for construction, projects to protect and restore more than 100,000 net acres (156 square miles) of Louisiana's coastal wetlands (CWPPRA 2019). As of April 2020, 113 projects have been constructed, 17 are currently under construction, and 32 are in an engineering and design phase.

3.0 Affected Environment

Sections 3.1 to 3.3 of this EA describes the historic and existing conditions of the affected environment.

3.1 Description of the Study Area

The proposed project area is located in Plaquemines Parish in southeastern Louisiana. Parish lands occupy part of the active delta of the Mississippi River, in a dynamic area dependent upon the disbursement and settlement of river sediments to maintain land elevations above water. The Mississippi River splits into three main channels within the delta region: Pass a Loutre, South Pass, and Southwest Pass. Land elevations range from sea level along the Gulf coast, to approximately +10-feet above sea level along the natural levee ridges. It is a sparsely populated region characterized by river channels with attendant channel banks, natural bayous, and man-made canals interspersed with intermediate and fresh marshes. Water levels fluctuate within the river, and passes estuarine bays and marshes according to river flow from upstream, tide, and wind influences. The property adjacent to the proposed disposal areas includes fresh and intermediate marshes, private camps, the Delta NWR, and the navigation channels of the Mississippi River—Pass a Loutre, South Pass, Southwest Pass, and Southeast Pass.

Water depths range from less than an inch to a foot and a half in the vegetated areas and up between three to four feet in the open water areas. Freshwater fish that are tolerant of low salinity conditions and estuarine fish and shellfish abound. The marshes and estuarine bays provide excellent spawning and nursery areas for recreational and commercial species. The Mississippi River Delta provides important nesting and brooding habitat for mottled ducks, wading birds, and shore birds. Migratory and

resident waterfowl are also abundant in the project area.

The National Audubon Society designated the Mississippi River Delta an Important Bird Area. The active delta provides habitat for wintering waterfowl, wading birds, marsh birds, and shore birds. The higher elevations of shrub-dominated spoil banks and willow-dominated uplands provide important stopover habitat for numerous Neotropical migratory songbird species which breed in North America and spend the winter in Mexico, the Caribbean, and Central or South America. Tens of thousands of wintering waterfowl utilize the delta's rich food resources. There are numerous wading birds in the marshes, and thousands of shorebirds are found on tidal mudflats and deltaic splays. Commonly observed are greater and lesser yellowlegs, long-billed dowitchers, dunlins, Western sandpipers, Wilson's plovers, killdeer and willets. (Audubon 2020).

3.2 Description of the Watershed

The Mississippi River drains approximately 41 percent of the 48 contiguous states of the United States. The Mississippi River basin covers more than 1,245,000 square miles, includes all or parts of 31 states and two Canadian provinces, and roughly resembles a funnel which has its spout at the Gulf of Mexico. Waters from as far east as New York and as far west as Montana contribute to flows in the lower river.

The lower alluvial valley of the Mississippi River is a relatively flat plain of about 35,000 square miles bordering on the river which would be overflowed during time of high water if it were not for man-made protective works. This valley begins just below Cape Girardeau, Missouri, is roughly 600 miles in length, varies in width from 25 to 125 miles, and includes parts of seven states—Missouri, Illinois, Tennessee, Kentucky, Arkansas, Mississippi, and Louisiana.

The Mississippi River is the mainstem of the world's most highly developed waterway system, about 12,350 miles in length. The Mississippi River discharges the headwater flows from about 41 percent of the contiguous 48 states. Discharge at Baton Rouge ranges from 1,500,000 cubic feet per second (cfs) once every 16 years, on average, to a low of 75,000 cfs recorded once during the period 1930 to the present, and average annual discharge is 450,000 cfs. Southwest Pass of the Mississippi River discharges roughly one-third of the river's total flow, with an average discharge of about 145,000 cfs. South Pass of the Mississippi River discharges roughly one-sixth of the river's total flow, with an average discharge of about 78,000 cfs. Pass a Loutre of the Mississippi River discharges almost one-third of the river's total flow or slightly less than the Southwest Pass flow. The average discharge through Pass a Loutre is just under 145,000 cfs. The combined discharge of Southwest Pass, South Pass, and Pass a Loutre is approximately 80 percent of the total river flow into the Gulf of Mexico. The remaining flow is distributed through minor passes upstream of Head of Passes.

Deep-draft navigation is a major component of waterborne traffic on the river. Currently, the river is maintained to a depth of -45 feet for deep-draft access from mile marker -22.0 in the bar channel reach up to river mile 232.4 at Baton Rouge, Louisiana. There is extensive urban and industrial development near the Baton Rouge and New Orleans metropolitan areas. The remaining areas adjacent to the river are developed primarily for agriculture; however, industrial and urban development in these areas does occur. The Mississippi River is a source for drinking water, recreation, and commerce.

3.2.1 Sustainability

Coastal habitat, whether wetland, ridge, or other type of coastal feature, is ephemeral in nature. The LCA BUDMAT Program is not intended to construct ecosystem restoration projects that last in perpetuity. A healthy and resilient coastal complex is dynamic, not static, and is subject to the ebb and flow of the various effects, adverse or beneficial, that impact conditions at any given point in time. The benefits calculated consider subsidence, sea-level rise, and other impacts to determine the condition of the ecosystem restoration project over the 50-year period of analysis.

3.2.2 Climate, Weather Patterns, and Climate Change

The climate in the project area is humid, subtropical with a strong maritime character. Warm, moist southeasterly winds from the Gulf of Mexico prevail throughout most of the year, with occasional cool, dry fronts dominated by northeast high pressure systems. The influx of cold air occurs less frequently in autumn and only rarely in summer. Tropical storms and hurricanes are likely to affect the area 3 out of every 10 years, with severe storm damage approximately once every 2 or 3 decades. The majority of these occur between early June and November. The largest recent hurricanes were Katrina and Rita in 2005 which caused damage in the project area. Hurricanes Gustav and Ike in 2008, and more recently, Isaac in 2012, caused additional damage in the project area. Summer thunderstorms are common, and tornadoes strike occasionally. Average annual temperature from the Boothville-Venice climate monitoring station (1981 to 2010 NOAA dataset) is around 70°F, with average temperatures ranging from 82.9°F in July and August to 54.3°F in January. Average annual precipitation is 59.4 inches, varying from a monthly average of 7.5 inches in August, to an average of 2.8 inches in May. (<https://atmos.uw.edu/marka/normals/la.normals.2010.v3.html>).

The 2014 USACE Climate and Resiliency Policy Statement states the “USACE shall continue to consider potential climate change impacts when undertaking long-term planning, setting priorities, and making decisions affecting its resources, programs, policies, and operations.” The most significant adverse potential impact on a coastal wetland as a product of climate change is sea-level change (rise).

3.2.3 Sea-level Change

ER 1100-2-8162 (https://www.publications.usace.army.mil/Portals/76/Users/182/86/2486/ER_1100-2-8162.pdf?ver=2019-07-02-124841-933) provides guidance for incorporating direct and indirect physical effects of projected future SLC across the project life cycle in managing, planning, engineering, designing, constructing, operating, and maintaining USACE projects and systems of projects. Potential relative sea level change must be considered in every USACE coastal activity as far inland as the extent of estimated tidal influence.

Research by climate science experts predict continued or accelerated climate change for the 21st century and possibly beyond, which would cause a continued or accelerated rise in global mean sea level. The resulting local RSLC will likely impact USACE coastal project and system performance. As a result, managing, planning, engineering, designing, operating, and maintaining for SLC must consider how sensitive and adaptable natural and managed ecosystems and human and engineered systems are to climate change and other related global changes. Planning studies and engineering

designs over the project life cycle, for both existing and proposed projects, will consider alternatives that are formulated and evaluated for the entire range of possible future rates of SLC, represented here by three scenarios of “low,” “intermediate,” and “high” SLC. These alternatives will include structural, nonstructural, nature based, or natural solutions, or combinations of these alternatives. In compliance with USACE policy (Engineering Regulation (ER) 1100-2-8162), the performance of all projects under all three SLC scenarios will be analyzed for the final array of alternatives in the final EA.

Using USACE-predicted future water levels under the SLC scenarios, those water levels were converted into RSLC rates, incorporating sea level rise effects measured at the gauges and land loss experienced in the extended project area for each project. No operations and maintenance activities were planned for any of the projects in relation to future elevation changes. Long-term sustainability (percent of land left at the end of the period of analysis) was used to analyze the impact that different SLC scenarios had on the project areas. Comparison between the long-term sustainability numbers experienced under the intermediate and high SLC scenarios for all of the mitigation projects in the final array supported the choice of the TSP because all habitat types performed the best under the influence of both the intermediate and high SLC scenarios.

Table 3-2 shows the frequency associated with tropical storms and major hurricanes in the study area.

Table 3-2. North Atlantic Basin Tropical Storms and Major Hurricanes based on the Plausible Range of Future Tropical Storm Frequency

	1981-2010 Average	Projected Average for 2015-2065	Range of Frequency change (2015-2065)
All tropical storms	12.1	8.8 to 12.6	-28%
Major Hurricanes	2.7	3.1 to 8.6	+13% and +83%

3.2.4 Geology

Four main physiographic surfaces exist within Plaquemines Parish: natural levees, back swamps, coastal marshes, and barrier islands. The Mississippi River Delta complex was formed by river deposits between 700 and 7,400 years ago. The Natural Resources Conservation Service (NRCS) classifies soils within the proposed project area as typically peat, mucks, and clays mixed with organic matter, and silts derived from river deposits. The soil composition is subject to change as floodwaters and storm surges deposit new sediments. They are composed predominantly by Balize and Larose soil types. These soils are classified as continuously flooded deep, poorly drained and permeable mineral clays and mucky clays. Marsh and swamp deposits are found in the vicinity of the river from New Orleans to the Heads of Passes at the Gulf of Mexico. Marsh deposits are primarily organic, consisting of 60 percent or more by volume of peat and other organic material with the remainder being a composition of various types of clays. Total organic thickness is normally 10 feet, with variances less than one foot. Inland swamp deposits are composed of approximately 70 percent clay and 30 percent peat and organic materials. The percentage of sand and sandy silts increases with proximity to the open waters of the Gulf of Mexico (USACE 1974).

3.3 Relevant Resources

This section contains a description of relevant resources that could be impacted by the project. The important resources described are those recognized by laws, executive orders, regulations, and other standards of National, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. Table 3-3 provides summary information of the institutional, technical, and public importance of these resources.

A wide selection of resources were initially considered and determined not to be affected by the project—mainly due to the remote and uninhabited nature of the project area and general lack of significant populated areas in the vicinity. Resources not impacted by this project include Aesthetics, Prime and Unique Farmland, Noise and Vibration, and Scrub-shrub habitat. Socioeconomic resources, including land use, population, transportation, oil and gas, environmental justice, environmental health and safety, community cohesion, desirable community growth, tax revenues, property values, public facilities and services, business activity and employment, and displacement of people, would not be affected by the proposed project and are not discussed further.

The objectives of Executive Order (EO) 11988 (Floodplain Management) were considered; however, CEMVN has determined that floodplain impacts, if any from the proposed action, would be mainly positive (i.e., improving the adjacent flood plain and associated habitats, and thus, maintaining their natural and beneficial values). Additionally, there is no practicable alternative for project construction outside the 100-year floodplain. No portion of the project area has been designated a Louisiana Natural and Scenic River; therefore, a Scenic Rivers permit is not warranted.

The following relevant resources are discussed in this report: navigation, wetlands, wildlife, aquatic resources/fisheries, essential fish habitat (EFH), threatened and endangered species, water and sediment quality, air quality, cultural resources, and recreational resources (See Table 3-3a).

Noise, environmental justice, other social effects, prime and unique farmlands, Louisiana Natural and Scenic Rivers, and Aesthetics would not be affected by the proposed project.

Table 3-3a. Relevant Resources and Their Institutional, Technical, and Public Importance

Resource	Institutionally Important	Technically Important	Publicly Important
Navigation	Rivers and Harbors Act of 1899 and River and Harbor Flood Control Act of 1970 (PL 91-611).	The Corps provides safe, reliable, efficient, and environmentally sustainable waterborne transportation systems (channels, harbors, and waterways) for movement of commerce, national security needs, and recreation.	Navigation concerns affect area economy and are of significant interest to community.
Wetlands	Clean Water Act of 1977, as amended; Executive Order 11990 of 1977, Protection of Wetlands; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968., EO 11988, and Fish and Wildlife Coordination Act.	They provide necessary habitat for various species of plants, fish, and wildlife; they serve as ground water recharge areas; they provide storage areas for storm and flood waters; they serve as natural water filtration areas; they provide protection from wave action, erosion, and storm damage; and they provide various consumptive and non-consumptive recreational opportunities.	The high value the public places on the functions and values that wetlands provide. Environmental organizations and the public support the preservation of marshes.
Aquatic Resources/ Fisheries	Fish and Wildlife Coordination Act of 1958, as amended; Clean Water Act of 1977, as amended; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968.	They are a critical element of many valuable freshwater and marine habitats; they are an indicator of the health of the various freshwater and marine habitats; and many species are important commercial resources.	The high priority that the public places on their esthetic, recreational, and commercial value.
Essential Fish Habitat (EFH)	Magnuson-Stevens Fishery Conservation and Management Act of 1996, Public Law 104-297	Federal and state agencies recognize the value of EFH. The Act states, EFH is “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity.”	Public places a high value on seafood and the recreational and commercial opportunities EFH provides.
Wildlife	Fish and Wildlife Coordination Act of 1958, as amended and the Migratory Bird Treaty Act of 1918	They are a critical element of many valuable aquatic and terrestrial habitats; they are an indicator of the health of various aquatic and terrestrial habitats; and many species are important commercial resources.	The high priority that the public places on their esthetic, recreational, and commercial value.
Threatened, Endangered, and Protected Species	The Endangered Species Act of 1973, as amended; the Marine Mammal Protection Act of 1972; and the Bald Eagle Protection Act of 1940.	USACE, USFWS, NMFS, NRCS, EPA, LDWF, and LDNR cooperate to protect these species. The status of such species provides an indication of the overall health of an ecosystem.	The public supports the preservation of rare or declining species and their habitats.

Cultural Resources	National Historic Preservation Act of 1966, as amended; the Native American Graves Protection and Repatriation Act of 1990; and the Archeological Resources Protection Act of 1979	State and Federal agencies document and protect sites. Their association or linkage to past events, to historically important persons, and to design and construction values; and for their ability to yield important information about prehistory and history.	Preservation groups and private individuals support protection and enhancement of historical resources.
Recreation Resources	Federal Water Project Recreation Act of 1965 as amended and Land and Water Conservation Fund Act of 1965 as amended	Provide high economic value of the local, state, and national economies.	Public makes high demands on recreational areas. There is a high value that the public places on fishing, hunting, and boating, as measured by the large number of fishing and hunting licenses sold in Louisiana; and the large per-capita number of recreational boat registrations in Louisiana.
Air Quality	Clean Air Act of 1970, Louisiana Environmental Quality Act of 1983.	State and Federal agencies recognize the status of ambient air quality in relation to the NAAQS.	Virtually all citizens express a desire for clean air.
Water Quality	Clean Water Act of 1977, Fish and Wildlife Coordination Act, Coastal Zone Mgt Act of 1972, and Louisiana State & Local Coastal Resources Act of 1978.	USACE, USFWS, NMFS, NRCS, EPA, and State DNR and wildlife/fishery offices recognize value of fisheries and good water quality and the national and state standards established to assess water quality.	Environmental organizations and the public support the preservation of water quality and fishery resources and the desire for clean drinking water.
Tribal Resources	The requirement to conduct coordination and consultation with federally recognized Tribes finds its basis in the constitution; supreme court cases; EO 13175 "Consultation and Coordination with Indian Tribal Governments U.S. President 2000; and USACE Tribal Consultation Policy, 1 Nov 2012,	USACE consults with federally recognized Tribes to determine if Tribal Rights, Tribal lands, or protected tribal resources, would be significantly adversely affected by a proposed action.	Tribal governments and the public-at-large support the recognition of tribal lands, resources, and protected tribal resources.

3.3.1 Navigation

Existing Conditions

Tiger Pass provides access to the Mississippi River from Venice, Louisiana and has historically provided support for offshore petrochemical production/exploration efforts, the commercial fishing industry and recreational fishing and boating for the Port of Venice. Shoaling along Tiger Pass has rendered the channel unsafe for boat traffic, diverting boat traffic frequently through Red Pass. Continued maintenance of the current dimensions of the Tiger Pass, as stated in Section 1.2 Authority, are vital to the continued growth and health of the industries and commerce they serve.

3.3.2 Wetlands

Existing Conditions

Wetlands in the vicinity are tidally influenced and classified as mainly fresh marsh, with areas of intermediate marsh near the gulfward open water areas north of West Bay, East Bay, and west/northwest of the Delta NWR. Water levels fluctuate from 6 to 12-inches or more in the vegetated areas. The wetlands are strongly influenced by freshwater discharges from the Mississippi River and associated distributary outlets. Mean annual salinity within the project ranges from 0.20 ppt at CRMS2608 and 0.37 ppt at CRMS0163 (2019, https://www.lacoast.gov/crms_viewer/Map/CRMSViewer).

See Appendix B, Table B-2 for a listing of wetland plant species in the study area and their scientific names.

Common reed, also known as Roseau cane, occurs in expansive monotypic clumps (monoculture) in shallow open water areas and has displaced a variety of freshwater vascular plant species that have historically occupied the area. This could have been caused by periodic storms generating extremely high saltwater tides killing off a majority of the sensitive freshwater vegetation (Hauber et. al. 1991). Rattlebox and black willow occur along the banks of channels and on the higher crowns of areas previously used for disposal of dredged material.

Cattail, bulltongue arrowhead, maidencane, common threesquare bulrush, and various sedges are common throughout the wetlands of East Bay. Other common species in the East Bay area include numerous non-native species, such as common reed, alligator weed, elephant ear, giant cutgrass, California bullwhip, and delta duck potato. Submerged aquatic vegetation (SAV) found in the shallow water areas includes various pondweeds, coontail, and parrotfeather.

Vast acreages of wetlands have been lost and would continue to be lost in this portion of the Mississippi Deltaic Plain. Wetlands within Plaquemines Parish have undergone substantial loss due to subsidence, sea-level rise, and salt-water intrusion. The current trend of wetlands loss was compounded over a 4 year period from 2004 to 2008.

Hurricanes Katrina, Rita, Gustav and Ike transformed approximately 328 square miles of marsh to open water. (Barras et al., 2009). More losses resulted from Katrina than from Rita, and were concentrated south and east of New Orleans, with almost half the total loss occurring in Plaquemines Parish (Zinn 2006). Overall marsh loss (i.e., conversion to open water) resulting from Katrina and Rita throughout the entire Mississippi Deltaic Plain of southeastern Louisiana was as follows: fresh marsh—22 square miles; intermediate marsh—49 square miles; brackish marsh—18 square miles; and salt marsh—27 square miles (USGS 2006).

3.3.4 Aquatic Resources/Fisheries

Existing Conditions

The estuarine nature of the area provides a dynamic aquatic environment where freshwater and saltwater meet, providing a transitional zone between the two aquatic ecosystems. The marshes and waterways provide important spawning and nursery habitat and a food source for a wide variety of fresh and saltwater fish species. Vegetation and marsh loss degrades the utility of the area as nursery habitat and a food source for fisheries.

The influx of freshwater from the Mississippi River, particularly during floods and other high water flow periods, potentially allows for riverine fisheries species to migrate downriver to the delta region. The U.S. Fish and Wildlife Service (USFWS) published Habitat Suitability Index (HSI) Models in 1982 and 1983, which included salinity tolerances for a variety of freshwater fisheries. Potential species that could occur during high water/low salinity periods include channel catfish, blue catfish, flathead catfish, smallmouth bass, largemouth bass, black crappie, white crappie, sunfish, gizzard shad, and smallmouth buffalo among others.

During low water periods, storm surges, and seasonally strong tidal influences, the increased saltwater intrusion from the Gulf restricts the abundance and diversity of freshwater fisheries, and provides opportunities for estuarine (brackish) species. Many of these species are economically and recreationally important, including red drum, black drum, spotted sea trout, sand seatrout, striped mullet, Gulf menhaden, Atlantic croaker, sheepshead, southern flounder, Spanish mackerel, southern kingfish, and spot.

Commercially important shellfish found include blue crab, brown shrimp, pink shrimp, white shrimp, and oysters. Other commercially less important species include grass shrimp, mysid shrimp, roughneck shrimp, and mud crab.

The area also supports populations of phytoplankton and zooplankton (e.g., copepods, rotifers, fish larvae, and molluscan and crustacean larvae). Benthic invertebrate populations are comprised of both epifaunal and infaunal species (e.g., polychaete and oligochaete worms, crustaceans, bivalves and gastropod mollusks). These organisms constitute vital components of the aquatic food chain and may comprise the diets of numerous finfish and shellfish species.

The saltwater topminnow is an aquatic species at risk for federal listing as threatened or endangered. The saltwater topminnow is a small, approximately 2 inch coastal fish within the Fundulidae family. It is considered a resident species of coastal marsh and closely related to other killifish species such as the Gulf killifish (*Fundulus grandis*).

3.3.5 Wildlife

Existing Conditions

The area contains a variety of birds, mammals, and other wildlife. See Appendix B, Table B-3 for a list of common wildlife species. Both migratory and resident birds occur in or near the project area. Common birds include ibis, egrets, cormorants, terns, gulls, skimmers, pelicans, ospreys, herons, hawks, the American kestrel, vultures, magnificent frigatebirds, grackles, red-winged blackbirds, and several species of swallows, flycatchers, wrens, warblers, and sparrows. Wintering migratory waterfowl using the surrounding marshes include snow geese, gadwalls, pintails, mallards, blue-winged teal, green-winged teal, shovelers, American coots, redheads, lesser scaup, red-breasted mergansers, wigeons, canvasbacks, and some black ducks. The mottled duck (*Anas fulvigula*), highly sought by sportsmen, is the only species of waterfowl nesting and wintering in the area. Grebes (*Podilymbus podiceps*; *Podiceps* spp.) and loons (*Gavia immer*) are nongame migratory waterfowl wintering in the area, and the common snipe (*Gallinago gallinago*) is the only game species of shorebird wintering in the area. Numerous other shorebirds use the area as a resting and staging area during migration.

The reddish egret (*Egretta rufescens*) is an at-risk species of medium-sized heron that nests locally in the Northern Gulf Coast and along islands in southeast Louisiana. They are restricted to sandy beaches or shallow ponds near the coast or on barrier islands when feeding. Threats to the reddish egret include entanglement in fishing lines, beach development, and coastal land loss.

Mammals using the marshes and scrub-shrub habitat include numerous furbearers, such as nutria, muskrat, swamp rabbit, mink (*Mustela vison*), river otter (*Lontra canadensis*), raccoons, and white-tailed deer. Scrub-shrub provides habitat for salamanders, toads, frogs, turtles, and several species of poisonous and nonpoisonous snakes. The American alligator (*Alligator mississippiensis*) is abundant in fresh to intermediate marsh and is caught commercially for its hide and meat.

The rare diamondback terrapin (*Malaclemys terrapin*), an at-risk turtle that nests on mud or sand bars, may also be found in the study area. Threats to this turtle includes water pollution, human disturbances to nesting habitat, and coastal land loss.

3.3.6 Essential Fish Habitat

Existing Conditions

All of the marine and estuarine waters of the northern Gulf of Mexico have been designated as Essential Fish Habitat (EFH). In the northern Gulf of Mexico, EFH has

generally been defined as areas where individual life-stages of specific federally-managed species are common, abundant or highly abundant. In estuarine areas, EFH is defined as all estuarine waters and substrates (mud, sand, shell, rock and associated biological communities, including the sub-tidal vegetation (seagrasses and algae) and adjacent inter-tidal vegetation (marshes and mangroves). The open waters, waterbottom substrates, and inter-tidal marshes of the West Bay Sediment Diversion project area are considered EFH under the estuarine component.

Specific categories of EFH include all estuarine waters and substrates (mud, sand, shell, rock, and associated biological communities), including subtidal vegetation (sea grasses and algae) and adjacent intertidal wetland vegetation (marshes and mangroves). In addition, estuarine aquatic habitats provide nursery and foraging areas that support economically important marine fishery species that may serve as prey for federally-managed fish species such as mackerels, snappers, groupers, billfishes and sharks. The estuarine waters in the proposed project area include EFH for several federally-managed species (Table 3-3b). These species use the area for foraging and nursery habitat, as well as a migration route to other areas considered to be EFH. Specific categories of EFH in the project area include estuarine emergent wetlands, mud/sand substrates, and estuarine water column.

Table 3-3b: EFH Species in the Project Area

Common Name	Life Stage	EFH
red drum	adult	Gulf of Mexico & estuarine mud bottoms, oyster reef
red drum	juvenile	SAV, estuarine mud bottoms, marsh/water interface
red drum	larvae/post larvae	all estuaries planktonic, SAV, sand/shell/soft bottom, emergent
brown shrimp	adult	Gulf of Mexico <110 m, silt sand, muddy sand
brown shrimp	juvenile	marsh edge, SAV, tidal creeks, inner marsh
brown shrimp	larvae/post larvae	planktonic, sand/shell/soft bottom, SAV, emergent marsh, oyster reef
white shrimp	adult	Gulf of Mexico <33 m, silt, soft mud
white shrimp	juvenile	marsh edge, SAV, marsh ponds, inner marsh, oyster reef
white shrimp	larvae/post larvae	planktonic, soft bottom, emergent marsh

3.3.7 Threatened, Endangered and Protected Species

Existing Conditions

In coordination with USFWS and NMFS there were comments that addressed the Fish and Wildlife Coordination Act (FWCA), Endangered Species Act (ESA), Bald and Golden Eagle Protection Act (BGEPA), and the Migratory Bird Treaty Act (MBTA) for those areas within CEMVN-proposed Fiscal Year 2020 (FY20) Operations and Maintenance Dredging and Disposal Plans presented at the FY20 Environmental Dredging Conference.

Protected species that may occur in the project vicinity include the West Indian manatee (*Trichechus manatus*), piping plover (*Charadrius melodus*), pallid sturgeon (*Scaphirhynchus albus*), and sea turtles. In addition, USFWS has provided general comments suggesting that the Gulf sturgeon (*Acipenser oxyrhynchus desotoi*) may occur along the east side of the Mississippi Delta. Brown pelicans and other colonial nesting wading birds and seabirds protected under the MBTA may be encountered in the project area as well. The red knot (*Calidris canutus rufa*) may occur in some portions of the project area. No critical habitat for any threatened or endangered species has been designated within the proposed project area, and none of these species are known to breed within the project vicinity.

West Indian manatees, also known as sea cows, are large aquatic mammals found in shallow, slow-moving rivers, estuaries, salt water bays, canals, and coastal areas. Manatees forage on submerged, floating, and shoreline vegetation including seagrasses, algae, and invasive water hyacinth. There is a low chance that manatees would be found in the project area and surrounding shallow open waters; however, if manatees are observed within 100 yards of the “active work zone” during proposed construction and dredging activities, the appropriate special operating conditions would be implemented as provided by the USFWS, Lafayette, Louisiana Field Office. Special operating conditions for manatees would be included in any plans and specifications developed prior to dredging and disposal activities (See Appendix G).

The piping plover, as well as its designated critical habitat, occurs along the Louisiana coast. (<http://criticalhabitat.fws.gov/crithab>) Piping plovers winter in Louisiana and may be present eight to ten months of the-year (LDWF 2011). They depart for the wintering grounds from mid- July through late October and remain until late March or April. Piping plovers forage on intertidal beaches, mudflats, sand flats, algal flats, and wash-over passes with no or very sparse vegetation. They roost in unvegetated or sparsely vegetated areas, which may have debris, detritus, or micro-topographic relief offering refuge from high winds and cold weather. They also forage and roost in wrack deposited on beaches. Piping plovers could occur along the shoreline and in the intertidal of the project vicinity during winter migration, but are not permanent residents of the area. Critical habitat has been designated south of Pass a Loutre—mainly near the mouth of South Pass and in portions of East Bay between South and Southwest passes.

The pallid sturgeon (*Scaphirhynchus albus*) is an endangered fish found in Louisiana, in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of

the Old River Control Structure Complex); it is possibly found in the Red River as well. The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical characteristics that are in a constant state of change. Pallid sturgeon occur in the Mississippi River downstream of its confluence with the Missouri River; Ohio River, and inhabit large, deep turbid river channels, usually in strong current over firm sand or gravel.

The Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is an anadromous fish inhabiting coastal rivers from Louisiana to Florida during the warmer months and overwintering in estuaries, bays, and the Gulf of Mexico (NMFS 2011). Historically, Gulf sturgeon occurred from the Mississippi River east to Tampa Bay. Its present range extends from Lake Pontchartrain and the Pearl River system in Louisiana and Mississippi east to the Suwannee River in Florida; however, sporadic occurrences have been recorded as far west as the Rio Grande between Texas and Mexico, and as far east and south as Florida Bay. The only documented catches of Gulf sturgeon in the Mississippi River have reportedly taken place near its mouth; however, these are considered incidental occurrences since no resident (i.e., reproducing) population for the Mississippi River is believed to exist. The USFWS and NMFS published a final rule in the Federal Register (Volume 68, No. 53) designating critical habitat for the Gulf sturgeon in Louisiana, Mississippi, Alabama, and Florida. Portions of the Pearl and Bogue Chitto Rivers, Lake Pontchartrain east of the Lake Pontchartrain Causeway, all of Little Lake, The Rigolets, Lake St. Catherine, and Lake Borgne within Louisiana were included in that designation. The proposed project area is outside those portions of Louisiana designated as critical habitat.

The brown pelican (*Pelecanus occidentalis*), a year-round resident of coastal Louisiana that may occur in the project area, was removed from the Federal List of Endangered and Threatened Wildlife (i.e., “delisted”) by USFWS on November 17, 2009. Despite its delisting, brown pelicans, and other colonial nesting wading birds and seabirds, remain protected under the MBTA. Portions of the proposed project area may contain habitats commonly inhabited by colonial nesting wading birds and seabirds.

The red knot is a medium-sized shorebird that has been listed as a threatened species. The red knot breeds in the central Canadian arctic but is found in Louisiana during spring and fall migrations and the winter months (generally September through March). During migration and on their wintering grounds, red knots forage along sandy beaches, tidal mudflats, salt marshes, and peat banks. Observations along the Texas coast indicate that red knots forage on beaches, oyster reefs, and exposed bay bottoms, and they roost on high sand flats, reefs, and other sites protected from high tides. In wintering and migration habitats, red knots commonly forage on bivalves, gastropods, and crustaceans. Coquina clams, a frequent and often important food resource for red knots, are common along many Gulf beaches.

3.3.8 Water and Sediment Quality

Existing Conditions

As part of its surface water quality monitoring program, the Louisiana Department of Environmental Quality (LDEQ) routinely monitors 25 parameters on a monthly or bimonthly basis using a fixed station, long-term network (Monitored Assessments) (LDEQ 1996). Based upon those data and the use of less-continuous information (Evaluated Assessments), such as fish tissue contaminants data, complaint investigations, and spill reports, the LDEQ has assessed water quality fitness for the following uses: primary contact recreation (swimming), secondary contact recreation (boating, fishing), fish and wildlife propagation, drinking water supply and shellfish propagation (LDEQ 1996). Based upon existing data and more subjective information, water quality is determined to either fully, partially, or, not support those uses. A designation of “threatened” is used for waters that fully support their designated uses but that may not fully support certain uses in the future because of anticipated sources or adverse trends in pollution.

According to the 2016 Louisiana Water Quality Inventory: Integrated Report, Subsegment LA070401: “Mississippi River Passes-Head of Passes to Mouth of Passes; includes all passes in the birdfoot delta (Estuarine)” is currently supporting its designated uses of primary contact recreation, secondary contact recreation, and fish and wildlife propagation. Suspected source of impairment to oyster propagation is associated with marina/boating sanitary on-vessel discharges.

In September 16, 2004, Hurricane Ivan passed within 62 miles (100 km) of the Taylor Energy Mississippi Canyon 20 site, and caused submarine landslides that capsized the drill rig and moved it 560 feet (170 m) from its original location. This resulted in between 25 and 28 leaking wells being buried beneath the sea floor, approximately 475 feet (145 m) below the surface.

On July 23, 2008, a tanker collided with a barge in the Mississippi River near downtown New Orleans, Louisiana. Severe damage to the barge resulted in the release of about 380,000 gallons of No. 6 fuel oil approximately 100 miles upriver from the dredging reaches in the Southwest and South Pass navigation channels from which dredged material would be removed to the project area for permanent placement. Almost two years later, on April 21, 2010, an explosion occurred onboard the mobile drilling platform *Deepwater Horizon* in the Gulf of Mexico. Destruction of the rig and damage at the wellhead resulted in the release of about 206 million gallons of crude oil over an 85-day period about 40 miles southeast of navigation dredging areas at the river’s mouth. Due to the magnitude of both oil spills, their proximity to the river delta, and potential for river or ocean currents to transport the oil to dredging sites from which dredged material destined for the project area could originate, CEMVN conducted a series of evaluations to determine if oil was accumulating in the river’s navigation channels – and if dredged material from the river could cause adverse environmental impacts at proposed dredged material placement sites.

Evaluations were conducted on dredged material collected from hopper dredges working

in Southwest Pass in July and August of 2008; on dredged material collected after the 2008 spill from two placement sites used by hopper dredges; and on shoal material collected from South Pass in August of 2010 and from Southwest Pass in October 2010, following containment of the *Deepwater Horizon* leak. All evaluations followed a tiered approach. Chemical analyses were first conducted on shoal material and dredged material slurry to determine if oil-related contaminants were present. Detected contaminants were compared to background levels observed prior to the spills in sediment and water from the Mississippi River and adjacent marsh areas. In cases where background levels were exceeded, the ecological significance of contaminants was determined by comparison of observed concentrations to screening values developed by the National Oceanic and Atmospheric Administration (Screening Quick Reference Table for Inorganics & Organics in Sediment) and the EPA (Water Quality Screening Values). Comparison to screening values is useful in determining whether adverse ecological impacts are likely to occur and whether any additional biological testing is needed. Biological tests involve the exposure of sensitive aquatic animals to shoal material to evaluate toxicity from direct contact and to determine if contaminants accumulate in the tissues of test animals. The October 2010 evaluation of Southwest Pass was performed to evaluate the EPA- designated Ocean Dredge Material Disposal Site, (ODMDS) just west of the Southwest Pass bar channel, and biological testing was performed as a requirement of the permit (and not to ascertain the presence of a particular contaminant). Sediment and water from a reference area in East Bay were used to provide control data for shoal material test results; therefore, results from these tests are applicable to this water and sediment quality assessment.

A CEMVN report dated January 8, 2009 entitled “Southwest Pass Dredged Material Evaluation – 2008,” provides a summary of all evaluations associated with the 2008 barge incident on the Mississippi River, and makes recommendations on the management of dredged material from the channel south of Venice, Louisiana. As to the presence of hydrocarbon contaminants in the dredged material removed by hopper dredges operating after the 2008 spill, the report concluded that:

Analytical results and visual inspection of hopper dredges working in (Southwest Pass) suggest that trace amounts of oil were present in sediment in all dredging reaches approximately from mile 11.0 (Below Head of Passes) to mile 5.0 (Above Head of Passes). However, analytes indicative of oil contamination in the dredged material were either below detection limits (for polycyclic aromatic hydrocarbons or “PAHs”, generally less than 3.5 – 10 µg/kg for dredged material solid fraction; and <0.1 µg/kg for dredged material liquid fraction) or at concentrations that are not expected to result in adverse ecological impacts... Based on the analytical results of samples taken in the hopper dredge bins, dredged material from (Southwest Pass) is suitable for placement in open water without special management actions.

A MVN report dated October 28, 2010 entitled “Dredged Material Evaluation of Six Federal Navigation Channels Following the Deepwater Horizon Incident” provides a

summary of shoal material evaluations of Federal navigation channels in coastal areas potentially impacted by the *Deepwater Horizon* incident, including Southwest Pass and South Pass of the Mississippi River. The report observed for South Pass that:

PAHs were generally at or below analytical reporting limits (less than 4 µg/kg) for the two inland-most stations, and somewhat more prevalent at the two stations nearest to the jetties but with the sum of detected PAHs not exceeding 121 µg/kg. PAH results were compared to freshwater sediment quality benchmarks reflective of intermediate marsh adjacent to the channel's dredged material disposal areas. All detected PAHs were below applicable (Threshold Effects Level) and (Probable Effects Level) benchmarks.

The report concludes for all channels investigated that:

... navigation channels traversing areas along the Louisiana coast that were impacted by the (Deepwater Horizon) incident do not show any evidence of oil contamination. Analytes indicative of oil contamination were present in shoal material only in trace amounts, and at concentrations that are not expected to adversely impact benthic organisms. Therefore, additional biological effects-based testing is not warranted and special management of dredged material is not required during channel maintenance.

A report prepared by PBS&J (2010) entitled "Mississippi River-Southwest Pass Contaminant Assessment" provides a detailed account of collection and analysis of shoal material taken from Southwest Pass following containment of the *Deepwater Horizon* spill. The report was prepared in support of the EPA-designated ODMS just west of the Southwest Pass bar channel. Sediment and water from a reference area in East Bay were used as control samples to compare against test results from samples of Southwest Pass shoal material. The following findings from the PBS&J report are relevant to this EA's water and sediment quality assessment:

(a) dredging "elutriates" were prepared from shoal material and site water collected in Southwest Pass and mixed in a 1:4 ratio representative of dredge material slurry. Two oil-related contaminants (Acenaphthene and Phenanthrene) were observed in one of six channel elutriates, but at concentrations less than 1 µg/l (or about 9 and 175 times lower than their respective water quality screening values). All other oil-related contaminants were below detection limits (0.3 to 1.3 µg/l for PAHs) in the elutriates;

(b) amphipods and mysid shrimp were exposed to channel shoal material and sediment from East Bay during a 10-day toxicity experiment. Survival in all channel treatments ranged between 92 percent and 96 percent, and was comparable to or exceeded survival in animals exposed to East Bay sediment (90 percent to 95 percent); and

(c) benthic worms and clams were exposed to channel shoal material

and sediment from East Bay during a 28-day bioaccumulation experiment. Oil-related contaminants did not accumulate in the tissue of any of the test animals.

The results of these evaluations indicate that fuel oil from the 2008 barge incident and crude oil from the 2010 *Deepwater Horizon* incident have left only trace quantities of hydrocarbons, if any, in the dredged material removed from the Southwest Pass and South Pass reaches of the Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana Federal navigation project. Oil-related contaminants were either absent from sample shoal material removed from these reaches for testing or below concentrations associated with adverse environmental impacts. Moreover, direct exposure of sensitive aquatic animals to shoal material from Southwest Pass did not result in significant mortality or the bioaccumulation of oil-related contaminants.

3.3.9 Air Quality

Existing Conditions

National ambient air quality standards (NAAQS; see Table 3-3c) have been set by the EPA for six common pollutants (also referred to as criteria pollutants) including: ozone, particulate matter, carbon monoxide (CO), nitrogen dioxide, sulfur dioxide, and lead. States are required by the Code of Federal Regulations to report to the EPA annual emissions estimates for point sources (major industrial facilities) emitting greater than, or equal to, 100 tons per year of volatile organic compounds, nitrogen dioxide, sulfur dioxide, particulate matter less than 10 microns in size; 1,000 tons per year of CO; or 5 tons per year of lead. Since ozone is not an emission, but the result of a photochemical reaction, states are required to report emissions of volatile organic compounds, which are compounds that lead to the formation of ozone. Plaquemines Parish is currently classified as in attainment of all NAAQS. This classification is the result of area-wide air quality modeling studies. Therefore, further analysis required by the general conformity rule of Section 176(c) of the Clean Air Act would not apply for the proposed Federal action.

Table 3-3c. National Ambient Air Quality Standards

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)	primary	8 hours	9 parts per million (ppm)	Not to be exceeded more than once per year
		1 hour	35 ppm	
Lead (Pb)	primary and secondary	Rolling 3 month average	0.15 µg/m ³ (1)	Not to be exceeded
Nitrogen Dioxide (NO ₂)	primary	1 hour	100 parts per billion (ppb)	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years

		primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O ₃)		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	PM _{2.5}	primary	1 year	12.0 µg/m ³	Annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m ³	Annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m ³	98th percentile, averaged over 3 years
	PM ₁₀	primary and secondary	24 hours	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO ₂)		primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year
<p>(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m³ as a calendar quarter average) also remain in effect.</p> <p>(2) The level of the annual NO₂ standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.</p> <p>(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O₃ standards additionally remain in effect in some areas. Revocation of the previous (2008) O₃ standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.</p> <p>(4) The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO₂ standards or is not meeting the requirements of a SIP call under the previous SO₂ standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.</p>					

3.3.10 Cultural Resources

Existing Conditions

The National Historic Preservation Act of 1966 (NHPA) (P.L. 89 80 655), NEPA, and other applicable laws and regulations require Federal agencies to take into account the effects of their undertaking on the environment and any significant cultural resources within the project area of the proposed undertaking, as well as its area of potential effect

(APE). Typically, these studies require archival searches and field surveys to identify any cultural resources. When significant sites are recorded, efforts are made to minimize adverse effects and preserve the site(s) in place. If any significant sites cannot be avoided and would be adversely impacted, an appropriate mitigation plan would be implemented to recover data that would be otherwise lost due to the undertaking.

This area is a part of the Balize Delta formation, and at 500 years old, is relatively recent in geologic terms. Previously known cultural resources on the Mississippi River (Greene et al. 1984, 22-918) have been recorded in the state archaeological file. The two recorded archaeological sites in the project vicinity are Campbell's Derrick (16PL60) and the Jump site at Venice (16PL48) both of which have been significantly altered by recent petroleum exploration. Intensive (Phase I) cultural resource surveys have been conducted across TP-6 (Pearson and Ryan 2012, SHPO report 22-4120) and immediately north of TP-6 (Gougeon 2005, SHPO report 22-2680). No historical properties were observed in those areas by either of these investigations. The proposed marsh restoration areas for this project are unlikely to contain undiscovered cultural resources due to recent land use as well as the erosion and subsidence.

3.3.11 Tribal Resources

Existing Conditions

Nine federally recognized tribes have an aboriginal/historic interest in Plaquemines Parish, Louisiana. The tribes are: 1) the Alabama Coushatta Tribe of Texas, 2) the Chitimacha Tribe of Louisiana, 3) the Choctaw Nation of Oklahoma, 4) the Coushatta Tribe of Louisiana, 5) the Jena Band of Choctaw Indians, 6) the Mississippi Band of Choctaw Indians, 7) the Seminole Nation of Oklahoma, 8) the Seminole Tribe of Florida, and 9) the Tunica-Biloxi Tribe of Louisiana.

There are no tribal lands, nor are there specific tribal treaty rights related to access or traditional use of the natural resources in Plaquemines Parish. There are many protected tribal resources within the parish. For example, there are many recorded pre-contact archaeological multi-mound sites, which represent prehistoric occupation of and use of the landscape. However, there is no evidence of them being in the project area.

3.3.12 Recreational Resources

Existing Conditions

The Delta National Wildlife Refuge (NWR) is approximately 4.5 miles east of the project area. The NWR was established in 1935 with the legislative purposes to serve as a breeding ground for migratory birds and other wildlife, and to serve as a migratory waterfowl refuge. The refuge lands are accessible only by boat. Despite this limitation, the area has a long record of public use. The majority of this public use has been in the form of consumptive uses such as hunting and fishing (fresh and saltwater). Other public use includes wildlife observation, bird watching, boating, canoeing and kayaking and

photography. Camping is not allowed on the refuge.

Recreation use in the project area is expected to be similar to the NWR and includes boating, fishing (fresh and saltwater), wildlife observation, bird watching, and photography.

4.0 Environmental Consequences

This section describes the direct, indirect and cumulative effects of the No Action Alternative and the Proposed Action (TSP).

A wide selection of resources were initially considered and several were determined not to be affected by the project—mainly due to the remote and uninhabited nature of the project area and general lack of significant populated areas in the vicinity. Noise, environmental justice, other social effects, prime and unique farmlands, Louisiana Natural and Scenic Rivers, and Aesthetics would not be affected by the proposed project. Table 4 provides a list of resources in the project area and anticipated impact(s) from implementation of the proposed action.

Table 4. Relevant Resources Impacts In and Near the Project Area

Relevant Resource	Negative Impact	Positive Impact	Not Impacted
Navigation	temporary		
Wetlands	temporary	X	
Aquatic Resources/Fisheries	temporary	X	
Wildlife	temporary	X	
Essential Fish Habitat	temporary	X	
Threatened, Endangered, and Protected Species			*With contractor guidance; NLAA
Water and Sediment Quality	temporary		
Air Quality	temporary		
Cultural Resources ¹			X
Tribal Resources			X
Recreational	temporary	potential	
HTRW ²			X

¹Although not impacted, cultural resources are addressed to comply with the National Historic Preservation Act.

²Hazardous, Toxic, and Radioactive Waste. Although the area has been determined to have a low probability of containing HTRW, it is assessed in this document to comply with USACE policy.

4.1 Navigation

Future Conditions with No-Action

Direct and Indirect Impacts

Hydraulic cutterhead dredges and disposal pipelines for continued maintenance of Tiger Pass may cause minor and temporary interference with navigation by blocking sections of the channel, but are not expected to interfere significantly with shipping traffic. Dredging operations would be closely coordinated with representatives of the navigation industry and a Notice to Mariners would be posted by the US Coast Guard. O&M activities would dredge Tiger Pass and dispose of excavated materials in one of the dredged material disposal sites in the Federal Standard.

Future Conditions with the Proposed Action

Direct and Indirect Impacts

Disposal pipelines may cause minor and temporary interference with navigation by blocking sections of the channel, but are not expected to interfere significantly with shipping traffic. Dredging operations would be closely coordinated with representatives of the navigation industry and a Notice to Mariners would be posted by the US Coast Guard. Beneficial use-placement of dredged material in the proposed shallow open water areas could cause minor disruptions to small vessels using these portions of the project area; however, the effects on navigation would be mainly temporary. Portions of the site may become inaccessible to some watercraft as wetland vegetation eventually colonizes the area; however, the shallow nature of the area currently limits most vessel access anyway.

4.2 Wetlands

Future Conditions with No-Action

Direct and Indirect Impacts

The overall habitat value and acreage of the remaining wetlands in the project area would continue to be directly and indirectly impacted by the natural and anthropogenic factors affecting the area. Salinity intrusion would continue to impact vulnerable marsh habitats, causing them to either convert to another habitat type (more saline marsh or mud flat) or convert to open water. Subsidence and erosional land loss would continue at the present rate. Some wetlands and mudflat in the Federal Standard may be created, but the amount is unknown since no containment would be provided.

Future Conditions with the Proposed Action

Direct and Indirect Impacts

The proposed action would create approximately 227 acres and nourish approximately 105 acres of fresh-intermediate marsh habitat in the Basin. The proposed action would also offer some wave impact reduction to adjacent wetlands and would help to offset substantial wetlands loss currently taking place in the area.

4.3 Aquatic Resources/Fisheries

Future Conditions with No-Action

Direct and Indirect Impacts

The proposed marsh creation area would remain as shallow open water and eroding marsh. Increases in the average depth of the open-water and the conversion of existing marsh to open water in the project area would continue as a consequence of continued subsidence and erosion thus negatively affecting fish and shellfish populations inhabiting the area. Wetland vegetation loss and the decrease in the amount of open water less than or equal to 1.5 feet deep would result in the loss of forage and nursery habitat for fisheries.

Placement of dredged material in the Federal Standard would result in either the shallowing or loss of aquatic habitat along Tiger Pass. Affected fish and shellfish species would have to relocate to adjacent aquatic habitat or expire. However, the natural creation of some new marsh and SAV habitat could provide highly productive fisheries habitat, increase detrital food material, and contribute to an increase in fisheries productivity adjacent to Tiger Pass.

Future Conditions with the Proposed Action

Direct and Indirect Impacts

With implementation of the proposed action some minimal direct and indirect effects to aquatic/fisheries resources in the form of altered open water bottom habitat would result. Approximately 227 acres of aquatic habitat would be impacted by the marsh restoration.

Some positive indirect impacts to fisheries are also expected. Creation of new marsh and SAV habitat would provide highly productive fisheries habitat, increase detrital food material, and would likely contribute to an overall increase in fisheries productivity in the area.

Brown shrimp, white shrimp, and crabs may be directly impacted through the filling of shallow open water areas with dredged materials; however, these species could also indirectly benefit from the abundance of introduced detritus, and subsequent food resources, from these materials. Sessile or slow moving benthic organisms may be smothered in areas where dredged material is deposited for marsh restoration. Sediment particles that become suspended due to disposal activities may impact filter-feeding benthic invertebrates by fouling feeding apparatus if the concentration of such particles is excessively high. Since the project area is a naturally turbid environment and the majority of resident finfish and shellfish species are generally adapted to, and very tolerant of, high suspended sediment concentrations, the effects of turbidity and suspended solids on fisheries would likely be negligible.

4.4 Wildlife

Future Conditions with No-Action

Direct and Indirect Impacts

Without implementation of the proposed action, land loss in the proposed marsh creation area would likely continue at the present rate resulting in a reduction of habitat diversity and availability for resident terrestrial wildlife such as nutria, muskrat, mink and river otter; migratory waterfowl such as snow geese, gadwalls, pintails, mallard, teal, coot, redheads, lesser scaup, mergansers, wigeons, canvasbacks and black ducks; and other avian species such as ibis, egrets, cormorants, terns, gulls, skimmer, pelicans, and various raptors.

However, the natural creation of some new marsh and SAV habitat in the Federal Standard could provide some habitat for foraging, refugia, nesting, and loafing of terrestrial wildlife, migratory waterfowl, and other avian species.

Future Conditions with the Proposed Action

Direct and Indirect Impacts

The proposed action would create approximately 227 acres and nourish approximately 105 acres of fresh-intermediate marsh habitat thereby providing valuable and diverse habitat for foraging, refugia, nesting, and loafing of terrestrial wildlife, migratory waterfowl, and other avian species.

Minimal and temporary adverse direct and indirect impacts to wildlife are anticipated from implementation of the proposed action. While construction activities are expected to mainly occur in open water, there is the potential for noise or wave action generated by construction activities to displace terrestrial wildlife in the area; however this would be a temporary disturbance, and wildlife would likely return following completion of disposal activities. Migratory waterfowl and other avian species, if present, would be temporarily displaced from the project area. It is anticipated that wildlife populations would move to existing adjacent habitat areas during construction activities. The placement of dredge material for beneficial use would reduce some shallow open water habitat by converting it to marsh, thereby reducing available foraging habitat for some avian species but creating nesting and resting habitat for other species. However, the reduction in the amount of shallow open water is negligible compared to other shallow open water areas in the vicinity of the project area.

4.5 Essential Fish Habitat

Future Conditions with No-Action

Direct and Indirect Impacts

Without implementation of the proposed action, no direct impacts to EFH would occur in the marsh restoration area. However, land loss, due to subsidence, SLR and saltwater intrusion would continue in the project area at the current rate. Therefore, indirect impacts to EFH would likely occur as existing estuarine emergent marsh areas continue to be converted to open water. There would be minor, short-term impacts associated with placement of material in the Federal Standard similar to the proposed action and existing open water may become shallower due to the potentially slower rate of creation of emergent marsh.

Future Conditions with the Proposed Action

Direct and Indirect Impacts

With implementation of the proposed action, some EFH for brown shrimp, white shrimp, and red drum in the shallow open waters of the proposed marsh creation area would be directly impacted. Approximately 227 of shallow open water bottom and associated EFH habitat (e.g., mud/sand substrates, SAV) would be eliminated by the placement of dredged material for the creation of marsh. However, as the site would be converted to a generally more productive category of EFH, the proposed action would provide mainly positive indirect impacts to EFH, and any direct or temporary adverse impacts would be sufficiently offset by the net benefits from the creation of marsh, new shallow open water habitat, and associated EFH.

Additional, short term EFH impacts would include a temporary and localized increase in estuarine water column turbidity during the placement of dredged material in shallow open water areas; however, the project area is a naturally turbid environment and increased turbidity is not expected to significantly affect EFH needs within or adjacent to the project area.

4.6 Threatened, Endangered, and Protected Species

Future Conditions with No-Action

Direct and Indirect Impacts

Without implementation of the proposed action, minimal direct or indirect impacts to threatened, endangered, or protected species or their critical habitat would occur. There would be minor, short-term impacts associated with placement of material in the Federal Standard in Tiger Pass to West Indian Manatees and protected marine mammals such as dolphins and brown pelicans. Protection measures for avoiding impacts to threatened,

endangered, and protected species are utilized for all O&M contracts.

Future Conditions with the Proposed Action

Direct and Indirect Impacts

Although threatened or endangered species may occur within the general project vicinity, their presence within the project area is highly unlikely due to limited habitat for foraging, refugia, nesting, and loafing and disturbance from navigation activities (See Table 4-6 below). If there are threatened or endangered species present, open water areas surrounding the project area would allow them to easily avoid the project activities and return post-construction. The proposed project area does not contain critical habitat for federally-listed species under USFWS’s or NMFS’s purview.

Table 4-6. Threatened (T), Endangered (E), & Protected (P) Species in Project Area

Scientific name	Common name and status (T, E, or P)	Found in Study Area	Found in Project Area	Determination of Effects
<i>Haliaeetus leucocephalus</i>	Bald Eagle (P)	Yes	No	Not likely to Adversely Affect (NLAA)
<i>Pelecanus occidentalis</i>	Brown Pelican (E)	Yes	No	NLAA
<i>Scaphirhynchus albus</i>	Pallid Sturgeon (E)	Yes	No	NLAA
<i>Acipenser oxyrinchus desotoi</i>	Gulf Sturgeon (T)	Yes	No	NLAA
<i>Charadrius melodus</i>	Piping Plover (T)	Yes	No	NLAA
<i>Calidris canutus</i>	Red Knot (T)	Yes	No	NLAA
<i>Trichechus manatus</i>	West Indian Manatee (T)	Yes	Yes	NLAA
<i>Lepidochelys kempii</i>	Kemp’s Ridley Sea Turtle (E)	Yes	No	May Affect but NLAA (MA-NLAA)
<i>Chelonia mydas</i>	Green Sea Turtle (T)	Yes	No	MA-NLAA
<i>Caretta caretta</i>	Loggerhead Sea Turtle (E)	Yes	No	MA-NLAA

It is extremely unlikely that manatees would be found in the project area or in the surrounding shallow open waters; however, if manatees are observed within 100 yards of the “active work zone” during proposed construction/dredging activities, (e.g., no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of work area; siltation barriers, if used, should be re-secured and monitored; report manatee sightings or collisions), the appropriate special operating conditions, as provided by the USFWS, Lafayette, Louisiana Field Office, would be implemented and would be included in any plans and specifications developed prior to dredging and disposal activities.

Although pallid sturgeon are unlikely to occur in the project area because their range is limited to channels with stronger currents and sandy/rocky bottoms, the USFWS recently

provided the following recommendations in the draft CAR dated March 24, 2020. These are not requirements, but their implementation may further reduce the unlikely chance of encountering pallid sturgeon or other fish species while conducting dredging activities.

1. To the extent possible, schedule dredging activities in the project area during low flow periods, when salt water occurs on the channel bottom further upriver than during normal or high river flows.
2. The cutterhead should remain completely buried in the bottom material during dredging operations. If pumping water through the cutterhead is necessary to dislodge material or to clean the pumps or cutterhead, etc., the pumping rate should be reduced to the lowest rate possible until the cutterhead is at mid-depth, where the pumping rate can then be increased.
3. During dredging, the pumping rates should be reduced to the slowest speed feasible while the cutterhead is descending to the channel bottom.
4. If hopper dredges are utilized, explore the feasibility of using a rigid sea turtle deflector, which is designed to protect sea turtles by preventing them from entering the draghead, and evaluate the effectiveness of that device for pallid sturgeon and other fish species.

The proposed project area is outside those portions of Louisiana where Gulf sturgeon would normally be found. However, if practicable the USFWS encourages the adherence to the above recommendations to reduce the unlikely chance of encountering Gulf sturgeon while conducting dredging activities.

With adherence to the recommendations above, the proposed action is unlikely to cause adverse direct or indirect impacts to (i.e., “not likely to adversely affect”) federally-listed threatened or endangered species, or their critical habitat, under the jurisdiction of USFWS. Additionally, with adherence to the recommendations above, the proposed action is unlikely to cause adverse direct or indirect impacts (i.e., “no effect”) to any federally-listed threatened or endangered species, or their critical habitat, under the jurisdiction of NMFS.

Piping plovers and red knots would not be impacted by the proposed action since the project area does not contain suitable foraging habitat; the nearest suitable foraging habitat, in vicinity of the Mississippi River, is over 3 miles from the project area.

To minimize disturbance to colonial nesting wading birds and seabirds occurring in the area, special operating conditions on construction activity provided by the USFWS, Lafayette, Louisiana Field Office would be included in any CEMVN plans and specifications developed prior to dredging and disposal activities associated with the proposed action. These restrictions address colonial nesting wading birds and seabirds (i.e., reporting presence of birds and/or nests; no-work distance restrictions; bird nesting prevention and avoidance measures; marking discovered nests). In addition, dredging

and disposal activities would be restricted to non- nesting periods for colonial nesting wading birds and seabirds when practicable.

4.7 Water and Sediment Quality

Future Conditions with No-Action

Direct and Indirect Impacts

Without implementation of the proposed action, placement of material within the Federal Standard would occur which would result in short-term, temporary impacts to water quality and increased sedimentation. These impacts would end upon construction completion, including removal of all construction equipment.

Indirect impacts as a result of not implementing the proposed action would be the continued degradation of water quality as the area continues to erode as a result of wave activity.

Future Conditions with the Proposed Action

Direct and Indirect Impacts

With implementation of the proposed action, there would be some disturbances to ambient water quality; however, direct and indirect impacts would be short-lived and highly localized. Beneficial use-placement of dredge material in the proposed open water disposal site may cause temporary increases in turbidity and suspended solids concentrations, and a reduction in light penetration in the immediate vicinity; however, since the project area is a naturally turbid environment and resident biota are generally adapted to, and very tolerant of, high suspended sediment concentrations, the effects would be negligible. A reduction in light penetration may indirectly affect phytoplankton (i.e., primary) productivity in the area as the amount of photosynthesis carried out by phytoplankton is reduced. Localized temporary pH changes, as well as a reduction in dissolved oxygen levels, may also occur during construction efforts. Water quality is expected to return to pre-construction conditions soon after the completion of disposal activities associated with the proposed project.

Based on the results of shoal material analyses following the 2008 fuel oil spill at New Orleans and the 2010 *Deepwater Horizon* incident, CEMVN determined there is no reason to believe that the Southwest Pass and South Pass reaches of the Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana navigation channel were adversely impacted by the spills. The beneficial placement of shoal material from South Pass and Southwest Pass in open water sites would not pose an ecological risk from hydrocarbon contamination because any hydrocarbons in the dredged material have been measured at a concentration “at or below analytical reporting limits” and may pre-date the 2008 and 2010 spills. In short, no significant environmental risk of hydrocarbon pollution is believed to exist with regard to use of the dredged material identified for placement within the

project areas. Consequently, no special management would be required during dredging or disposal activities. In the wake of the *Deepwater Horizon* oil spill, CEMVN continues to closely monitor aerial reconnaissance surveys, shoreline assessment reports, drogoue tracks, and other oil plume tracking and contaminant information available from the National Ocean Service, Office of Response and Restoration.

4.8 Air Quality

Future Conditions with No-Action

Direct and Indirect Impacts

Plaquemines Parish is currently in attainment for all Federal NAAQS pollutants. With implementation of this alternative, the direct or indirect impacts to air quality from placement of material in the Federal Standard would be short-term and minor. Conditions would return to normal following placement. In the future, without the implementation of the Proposed Action, it is likely that the quality of ambient air would not be adversely affected.

Future Conditions with the Proposed Action

Direct and Indirect Impacts

With the implementation of the proposed action there would be adverse, short-term direct and indirect impacts to air quality. However, due to the short duration of the proposed work, any adverse impacts to ambient air quality are expected to be short-term and minor and are not expected to cause or contribute to a violation of Federal or state ambient air quality standards. Once all construction activities associated with the proposed work cease, air quality within the vicinity is expected to return to pre-construction conditions. Thus, the ambient air quality in Plaquemines Parish would not change from current conditions, and the status of attainment for the parish would not be altered.

4.9 Cultural Resources

Future Conditions with No-Action

Direct and Indirect Impacts

Without implementation of the proposed action, the conditions with cultural resources would continue as they have in the past and would be dictated by the natural land use patterns and processes that have dominated the area in the past. No impacts to cultural resources would result from placement of material in the Federal Standard.

Future Conditions with the Proposed Action

Direct and Indirect Impacts

With implementation of the proposed action, land would be rebuilt and nourished by mechanical activity. Any undiscovered cultural resources within the disposal area would be covered by disposed sediment and could be destroyed by the additional weight. However, it is also possible that the additional cap of sediment could protect the survival of any unknown cultural resource, although it would also hide that resource from potential future discovery. The growth of land could provide a buffer to storm surge or wind from Gulf storms, and this could protect cultural resources that are outside of the project area. However, coordination with SHPO for TP-10 began in February 2020 and concluded with a determination of no historic properties affected on 4/9/2020 (See Appendix D).

4.10 Tribal Resources

Future Conditions with No-Action

Direct and Indirect Impacts

Without implementation of the proposed action, the material would be placed in the Federal Standard. There is no potential to significantly adversely affect protected tribal resources, tribal rights, or Indian lands, because none of these types of resources are located within the Federal Standard near the dredge area.

Future Conditions with the Proposed Action

Direct and Indirect Impacts

While Plaquemines Parish has a long history of occupation by Native American communities, prior to its establishment and throughout its history, there are currently no protected tribal resources, tribal rights, or Indian lands that have the potential to be significantly affected by the proposed actions within the project area. Therefore, CEMVN has determined that no tribal resources, rights, or lands will be significantly affected by implementing this action. The results of the NHPA Section 106 process have confirmed this determination. In fact, the development of approximately 332 acres of marsh habitat would provide for interior protection of existing tribal resources outside the project area.

4.11 Recreational Resources

Future Conditions with No-Action

Direct and Indirect Impacts

Without implementation of the proposed action, placement of dredge material in close proximity to the material source would continue. In the short-term, conditions within the recreational environment would present less opportunities for fishing and hunting. The placement of the dredge material would increase turbidity and fish and wildlife would likely relocate outside of the area. Over the long-term, placed dredge material would

disperse since there are no containment dikes. Conditions would continue as they have in the past, under the Federal Standard, and would be dictated by the natural land use patterns and processes.

Future Conditions with the Proposed Action

Direct and Indirect Impacts

Recreationists would be displaced during construction activities in the project area. Fishing in the area adjacent to the project area may also be impacted temporarily as a result of increased turbidity. Approximately 227 acres of open water would be converted to emergent marsh eliminating boating and fishing in this area. However, the creation of marsh would provide an increase in habitat for waterfowl and nursery habitat for fish, thereby benefitting these populations which could improve both consumptive and non-consumptive uses for the recreationist.

4.12 Cumulative Impacts Analysis

The Council on Environmental Quality (CEQ) Regulations define cumulative impacts (CI) as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. CI can result from individually minor but collectively significant actions taking place over a period of time.”

Coastal Louisiana, including the project area, has been greatly impacted by natural subsidence, levees, hurricanes and oil and gas infrastructure. Recent events, such as hurricanes and oil spills, contribute to the loss of habitat but are largely indiscernible from other impacts. Direct and indirect impacts of past, present and reasonably foreseeable future events were considered in the analysis of the proposed action. These impacts include historical and predicted future land loss rates for the area and other restoration projects in the vicinity of the proposed action. The proposed action would have reversible temporary adverse impacts to some environmental resources, but overall cumulative benefits to the environmental resources.

It is anticipated that through the efforts taken to avoid wetlands impacts and the beneficial use of dredged material that functionally compensates unavoidable remaining impacts, the proposed action would not result in overall adverse direct, secondary, or cumulative impacts to the aquatic environment and human environment in or near the project area. Overall, the cumulative impacts of the proposed action are expected to be positive, with long-term benefits to wetlands, EFH, aquatic resources/fisheries, wildlife, water and sediment quality, and potentially recreational opportunities in the project area. Construction of the project would create and nourish an estimated 332 acres of fresh-intermediate marsh over the 50 year period of analysis producing approximately 66.7 AAHUs of benefit to fish and wildlife resources.

Project impacts would be in addition to, and often synergistic with, the impacts and benefits from marsh acres restored, nourished and protected by other Federal, state, local, and private restoration efforts within or near the Project Area, the Louisiana State Coastal Area, and the Nation's coastal areas. Recent CWPRRA and Beneficial Uses projects including the West Bay diversion have resulted in the creation of wetlands and SAV habitat within the surrounding areas which provides highly productive fisheries habitat, increases detrital food material, and likely contributes to overall increased fisheries productivity. When added to other past, present, and reasonably foreseeable ecosystem restoration and mitigation projects in the Basin the proposed action would help retard the loss of wetlands. There would be an overall loss of open water habitat in the Basin, but no permanent adverse impacts are anticipated because this habitat is prevalent throughout the Basin.

Similar wetland restoration projects in the area would operate synergistically with the proposed project to enhance the structural and functional integrity of the ecosystem, improve primary productivity rates, and thereby improve the overall environmental resources. See Appendix A, Figure A-4a for a list of restoration projects in the vicinity. The proposed action is consistent with the 2017 Louisiana Coastal Master Plan.

5.0 Coordination and Public Involvement

A Public Notice for draft EA #578 has been published in the Baton Rouge and New Orleans Advocate for 30 days beginning July 15, 2020 and ending August 14, 2020.

Preparation of this draft EA and a draft FONSI have been coordinated with appropriate Congressional, Federal, Tribal, state, and local interests, as well as environmental groups and other interested parties. The following agencies, as well as other interested parties, have received copies of the draft EA and draft FONSI:

U.S. Department of the Interior, Fish and Wildlife Service
U.S. Environmental Protection Agency, Region VI
U.S. Department of Commerce, National Marine Fisheries Service
U.S. Natural Resources Conservation Service, State Conservationist
U.S. Coast Guard Sector New Orleans
U.S. Coast Guard Marine Safety Unit Baton Rouge Maritime Navigation Safety Association
The Associated Branch (Bar) Pilots Crescent River Port Pilots Association
New Orleans Baton Rouge Steamship Pilot Association Associated Federal Pilots
Big River Coalition
Lower Mississippi River Committee (LOMRC)
Coastal Protection and Restoration Authority Board of Louisiana Advisory Council on Historic Preservation
Governor's Executive Assistant for Coastal Activities Louisiana Department of Wildlife and Fisheries
Louisiana Department of Natural Resources, Coastal Management Division Louisiana
Department of Natural Resources, Coastal Restoration Division Louisiana Department of

Environmental Quality

Louisiana State Historic Preservation Officer Plaquemines Parish Government
Alabama-Coushatta Tribe of Texas

Caddo Nation of Oklahoma Chitimacha Tribe of Louisiana Choctaw Nation of Oklahoma

Coushatta Tribe of Louisiana Mississippi Band of Choctaw Indians Jena Band of

Choctaw Indians Seminole Tribe of Florida

Seminole Nation of Oklahoma Tunica-Biloxi Tribe of Louisiana

US Fish and Wildlife Recommendations

CEMVN received recommendations in a Draft CAR from USFWS dated March 24, 2020. The document and these recommendations can be found in Appendix D. CEMVN's responses are as follows:

1. Avoid adverse impacts to water bird colonies through careful design of project features and timing of construction. We recommend that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season. For areas containing nesting wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbills), anhingas, and/or cormorants, all activity occurring within 1,000 feet of a nesting colony should be restricted to the non-nesting period. For nesting brown pelicans, activity should be avoided within 2,000 feet of the colony. Activity is restricted within 650 feet of black skimmers, gulls, and terns (See Appendix A).

Response 1 - Concur. A qualified biologist will inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season. Bird abatement procedures would be implemented to prevent wading birds (i.e., herons, egrets, night-herons, ibis, and roseate spoonbills), anhingas, and/or cormorants from nesting during their nesting period. In the event that implementation of the bird abatement plan is not successful and nesting does occur, all activity occurring within 1,000 feet of a nesting colony would be restricted to the non-nesting period. For nesting brown pelicans activity should be avoided within 2,000 feet of the colony. Activity would be restricted within 650 feet of nesting black skimmers, gulls, and terns.

2. The impacts to Essential Fishery Habitat should be discussed with the NMFS to determine if the project complies with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), Magnuson-Stevens Act; P.L. 104-297, as amended) and its implementing regulations.

Response 2 – Concur. The NMFS is a part of the Project Delivery Team for the MROV BUDMAT project. The NMFS will receive a copy of this EA during the public comment period to ensure compliance with MSFCMA and its implementing regulations.

3. West Indian manatees occasionally enter Louisiana coastal waters and streams during the summer months (i.e., June through September). During in-water work in areas that potentially support manatees all personnel associated with the project should be instructed about the potential presence of manatees, manatee speed zones, and the

need to avoid collisions with and injury to manatees. All personnel should be advised that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973. Additionally, personnel should be instructed not to attempt to feed or otherwise interact with the animal, although passively taking pictures or video would be acceptable. For more detail on avoiding contact with manatee refer to Appendices A and B [See Appendix D in draft FWCAR] and contact this office. Should a proposed action directly or indirectly affect the West Indian manatee, further consultation with this office will be necessary.

Response 3 – Concur. Manatee conservation procedures would be included in all contracts, plans, and specifications for in-water work in areas where the manatee may occur.

4. Maintain existing tidal creeks as project features within the TP-10 site design and/or the addition of new tidal creeks to maintain hydrologic exchange given the low land loss rate and extended settlement period. An explanation of work should be added to the TP-10 Alternative.

Response 4 – Concur. Tidal creeks will be maintained free of obstructions to allow for hydrologic exchange and fish access. The explanation has been included in Section 2.3 for the proposed action description

5. Refine Alternative TP-10 target construction (+2.0' NAVD88) after pumping and target settled elevations (+0.65' NAVD88) to avoid and/or minimize temporal losses of fisheries functions, given the existing marsh elevation is +0.42' NAVD88, a 10-year settlement period, and the low land loss rate (+0.10% per year for the period 1985-2016).

Response 5 –Target construction and settlement elevations will be refined with input from geotechnical analysis of TP-10 based on the existing elevations, a 5-year settlement period, and the historic (low) land loss rate in an effort to ensure the created marsh persists as long as possible. Construction of the TP-10 site would avoid and/or minimize temporal losses of fisheries functions.

6. Geotechnical analysis should be performed to inform fill and settlement rates for the TP-10 site and a settlement curve should be provided with water levels adjusted for sea level rise over a 20-year period.

Response 6 – Concur. Geotechnical analysis will be completed on site TP-10 including adjustments to the settlement curves for sea level rise over a 20-year period.

7. To ensure that dredged material is placed to each particular habitat's specified elevations, we recommend that the USACE use an updated NAVD88 datum (i.e., current geoid) consistent with the NAVD88 datum that is referenced for the elevations of existing marsh and water level in the project area.

Response 7 – Concur. A current NAVD88 datum will be applied to ensure consistent elevation with existing marsh habitat and water levels.

8. Pipeline access into the TP-10 site should avoid and minimize impacts to fresh-intermediate marsh and/or shallow water during pipeline placement. Unavoidable impacted wetlands should be restored to a substrate elevation similar to the surrounding marsh. Flotation access channels in open water should be backfilled upon project completion. Post-construction surveys (e.g., centerline surveys) should be taken to ensure access channels have been adequately backfilled. That information should be provided to the natural resource agencies for review. Any unavoidable temporal or permanent impacts would require mitigation.

Response 8 – Concur. Flotation access channels across existing wetlands would be avoided if possible. If existing wetlands are impacted they would be restored to pre-project elevation and expected to re-vegetate naturally. If needed, at CEMVN's discretion, post-construction surveys would be taken and provided to the natural resource agencies for review. No unavoidable temporal or permanent impacts are associated with the project.

9. If containment dikes are constructed, they should be breached or degraded to the settled elevations of the disposal area. Such breaches should be undertaken after consolidation of the dredged sediments and vegetative colonization of the exposed soil surface, or a maximum of 3 years after construction.

Response 9 – Concur. Containment dikes will be degraded to settled elevations consistent with elevation of the surrounding disposal area. After fill operations are completed but prior to demobilization, three gaps in the containment dikes shall be placed at the locations specified on the drawings to promote dewatering and fish access. These gaps would be excavated to an estimated elevation of 0.0' NAVD88 with a bottom width between 20ft to 100ft depending on the preconstruction inlet width at the gap locations. The location of these gaps and excavation elevation is subject to change pending further data collection including surveys and geotechnical analysis. More gaps may be required to ensure tidal flow and fisheries access at the site. The location of these additional gaps would be determined by the Government on-site representative and the contractor in coordination with resource agencies.

10. Further detailed planning of project features (e.g., Design Documentation Report, Engineering Documentation Report, Plans and Specifications, Water Control Plans, or other similar documents) should be coordinated with the Service, NMFS, and LDWF, other relevant resource agencies. The Service shall be provided an opportunity to review and submit recommendations on all work addressed in those reports.

Response 10 - Concur. CEMVN will continue to coordinate with the resource agencies.

11. Any proposed change in project features or plans should be coordinated in advance with the Service, NMFS and other resource agencies.

Response 11 - Concur. CEMVN will continue to coordinate with the resource agencies.

12. The LCA BUDMAT Program specifies that monitoring and adaptive management plans are required for beneficial use habitat creation projects. The USACE should coordinate with the Service, LDWF and NMFS during development of those plans.

Response 12 - Concur. The Corps has coordinated with USFWS on various aspects of the project throughout its development and provided USFWS with the Monitoring and Adaptive Management draft report (See Section 7.0 Adaptive Management and Monitoring and Appendix H).

13. The Service recommends that the USACE contact the Service for additional consultation if: 1) the scope or location of the proposed project is changed significantly, 2) new information reveals that the action may affect listed species or designated critical habitat; 3) the action is modified in a manner that causes effects to listed species or designated critical habitat; or 4) a new species is listed or critical habitat designated. Additional consultation as a result of any of the above conditions or for changes not covered in your consultation should occur before changes are made and or finalized.

Response 13 - Concur. Further consultation with USFWS would occur for the abovementioned reasons if they arise.

6.0 Mitigation

An assessment of the potential environmental impacts to important resources found that the proposed project would have only minimal and insignificant impacts to resources in the project area. These impacts would be mainly related to the loss of shallow open water bottom habitat and associated fisheries resources due to construction activities as part of the proposed action. The presence of comparable habitat within the project vicinity minimizes the loss of shallow open water bottom habitats due to the proposed action. Furthermore, any losses of fisheries resources related to the removal of shallow open water bottom by placement of dredged material are out-weighted by the considerable fisheries benefits anticipated from the beneficial use of material dredged from the Tiger Pass navigation channel, which would restore and nourish approximately 332 acres of fresh-intermediate marsh, marsh-related EFH (e.g., marsh edge, inner marsh, tidal creeks, marsh/water interface, etc.), and other aquatic habitat in the surrounding waters. With the creation of marsh and other productive habitat types in the proposed disposal areas, the long-term and cumulative impacts of the placement of dredged material are generally beneficial. Beneficial utilization of the dredged material for marsh restoration and nourishment would result in overall positive environmental benefits including a net increase of valuable breeding, nesting, foraging, and cover habitat utilized by a wide variety of fish and wildlife species. Therefore, no wetlands mitigation is required.

7.0 Adaptive Management and Monitoring

The application of adaptive management requirements pursuant to WRDA 2007, Section 2039 and the Implementation guidance for Section 2039 were considered for all projects implemented under the LCA BUDMAT Program. This project is not a good candidate for adaptive management because it is not applicable to the LCA BUDMAT Program. See Appendix H for the BUDMAT Monitoring and Adaptive Management Plan.

8.0 Compliance with Environmental Laws and Regulations

Environmental compliance for the proposed action would be achieved upon the following:

- Coordination of this draft EA and draft FONSI with appropriate agencies, organizations, and individuals for their review and comments;
- LDNR concurred by letter dated April 8, 2020 with the determination that the proposed action is consistent, to the maximum extent practicable, with the Louisiana Coastal Resources Program; Consistency (C20150185). (Appendix D)
- Receipt of and acceptance or resolution of all USFWS Fish and Wildlife Coordination Act recommendations; CEMVN is in receipt of Draft CAR dated March 24, 2020 (Appendix D), USFWS recommendations have been accepted or resolved and responses are provided in Section 5.0.
- In an email dated July 7, 2020, USFWS concurred with a determination of not likely to adversely affect federally-listed threatened or endangered species, or their critical habitat, under the jurisdiction of USFWS (Appendix D). In formal consultation with NMFS under ESA Section 7, and the MA-NLAA determination for sea turtles, a biological assessment will be included in the final EA.
- A State Water Quality Certificate was received from the Louisiana Department of Environmental Quality on April 14, 2020. (Appendix D)
- A Section 404(b)(1) evaluation was signed on March 10, 2020 (Appendix E)
- In a letter dated April 9, 2020, the Louisiana State Historic Preservation Officer (SHPO) concurred with a recommendation of no effect on historic properties. (Appendix D)
- The CEMVN will offer federally-recognized Tribes the opportunity to review and comment on a “no historic properties affected” finding that included the APE for the proposed action.
- A Phase 1 HTRW was completed on November 18, 2019.

Hazardous, Toxic, and Radioactive Waste

The discharge of dredged material into waters of the United States is regulated under the Clean Water Act (CWA). In the absence of a known Hazardous, Toxic, and Radioactive Waste (HTRW) concern, the proposed action would not qualify for an HTRW investigation.

Engineer Regulation (ER) 1165-2-132 provides that in the Pre-construction, Engineering and Design (PED) Phase that, for proposed project in which the potential for HTRW problems has not been considered, an HTRW initial assessment, as appropriate for a reconnaissance study, should be conducted as a first priority. If the initial assessment indicates the potential for HTRW, testing, as warranted and analysis similar to a feasibility study should be conducted prior to proceeding with the project design. The NFS will be responsible for planning and accomplishing any HTRW response measures, and will not receive credit for the costs incurred.

An American Society for Testing and Materials Phase 1 Environmental Site Assessment (ESA), HTRW 19-09 dated November 18, 2019, has been completed for the project area. A copy of the Phase 1 ESA will be maintained on file at CEMVN. The probability of encountering HTRW for the proposed action is low based on the initial site assessment. If a recognized environmental condition (REC) is identified in relation to the project site, the CEMVN would take the necessary measures to avoid the REC so that the probability of encountering or disturbing HTRW would continue to be low.

The FONSI will not be signed until the proposed action achieves environmental compliance with applicable laws and regulations, as described above.

9.0 Conclusion

The proposed action would allow for the beneficial use of material dredged from routine maintenance dredging of a federal navigation Tiger Pass to be deposited in the Project Area for marsh restoration and nourishment. Beneficial use-placement of dredged material in the proposed Project Area would result in the creation of approximately 332 acres (205.8 net acres or 66.7 AAHUs) of fresh-intermediate marsh habitat over the 50 year period of analysis. Any impacts to existing wetlands incurred during construction would be offset at the end of construction through the restoration and nourishment of new marsh within the project area.

This office has assessed the environmental impacts of the proposed action and has determined that the proposed action would have no significant adverse impact on the human and natural environment.

10.0 Prepared By

Draft EA #578 and the associated FONSI were prepared by Daniel Meden, biologist, U.S. Army Corps of Engineers, New Orleans District; Regional Planning and Environment Division South, CEMVN-CDS-C; P.O. Box 60267; New Orleans, Louisiana 70160-0267.

Title/Topic	CEMVN Team Member
Environmental Manager	Daniel Meden
Senior Project Manager	Darrel Broussard
Project Manager	Daimia Jackson
Plan Formulator	Michelle Meyers
Cultural Resources	John Penman
Tribal Resources	Jason Emery
Recreation	Andrew Perez
HTRW and Air Quality	Landon Parr

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EA #535 entitled “West Bay Marsh restoration Tier 1, Louisiana Coastal Area Beneficial Use of Dredge Material Program, Plaquemines Parish, Louisiana” with a signed FONSI dated 23 March 2015.

EA #517 entitled “Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana Designation of Additional Disposal Areas for Head of Passes, Southwest Pass, and South Pass, Plaquemines Parish, Louisiana” with a signed FONSI dated 22 November 2013.

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