



Reach A, Hurricane and Storm Damage Risk Reduction Project Morganza to the Gulf of Mexico, Terrebonne Parish, Louisiana

Draft

Appendix G –

USFWS Coordination Act Report (CAR)

February 2024



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Louisiana Ecological Services
200 Dulles Drive
Lafayette, Louisiana 70506



January 5, 2024

Colonel Cullen Jones
District Engineer
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Jones:

The U.S. Army Corps of Engineers' (USACE) is proposing to construct levees for the proposed Morganza to the Gulf of Mexico, LA (MTG) Project, Hurricane and Storm Damage Risk Reduction System. The objective of the proposed project is to reduce hurricane-related damages up to 100-year recurrent frequency storm events. The features are described in the Final Post Authorization Change Report (PACR) and Revised Programmatic Environmental Impact Statement (PEIS) dated May 2013. The project consists of the construction of 98 miles of levees in the Terrebonne Basin, approximately 84 miles of which would overlay existing hydrologic barriers such as natural ridges, roadbeds, and existing levees. This report covers the first MTG levee reach scheduled to be constructed, Reach A. Reach A begins in southwest Houma approximately 0.5-mile southwest of the intersection of Highway 182 and Sportsman's Court. It continues south to intersect with the Gulf Intercoastal Waterway (GIWW), and proceeds southeast, parallel with Highway 315. It terminates approximately 1.4 miles northwest of the town of Theriot. Reach A is proposed to consist of approximately 2.14 miles (11,318 linear feet) of earthen levee north of the GIWW and approximately 4.8 miles (25,345 linear feet) of earthen levee south of the GIWW.

This report contains a description of existing fish and wildlife resources in the project area, discusses the Tentatively Selected Plan and the No Action Alternative habitat conditions, identifies fish and wildlife-related impacts, and provides recommendations to improve the proposed MTG project. This document does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). The Fish and Wildlife Service (Service) is coordinating with the National Marine Fisheries Service (NMFS) and the Louisiana Department of Wildlife and Fisheries (LDWF). Their comments will be incorporated into the final report.

We appreciate the cooperation of your staff on this project. Should your staff have any questions regarding the enclosed report, please have them contact Hugh O'Connor (337/291-3109) of this office.

Sincerely,



Brigette D. Firmin
Field Supervisor
Louisiana Ecological Services

Enclosures

cc: Environmental Protection Agency, Dallas, TX
CEMVN-PM-R
National Marine Fisheries Service, Baton Rouge, LA
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources (CMD), Baton Rouge, LA
Coastal Protection and Restoration Authority (CPRA), Baton Rouge, La

**Draft Fish and Wildlife Coordination Act Report
for the
Morganza to the Gulf of Mexico, LA (MTG) Project, Hurricane and Storm
Damage Risk Reduction System, Reach A**



SUBMITTED TO
NEW ORLEANS DISTRICT
U.S. ARMY CORPS OF ENGINEERS

PREPARED BY
Hugh O'Connor
FISH AND WILDLIFE BIOLOGIST

U.S. FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
LAFAYETTE, LOUISIANA
January 2024

TABLE OF CONTENTS

TABLE OF CONTENTS	i
EXECUTIVE SUMMARY	1
INTRODUCTION	5
DESCRIPTION OF THE PROJECT AREA.....	7
DESCRIPTION OF APPLICANT’S PREFERRED ALTERNATIVE.....	9
FISH AND WILDLIFE RESOURCES.....	12
Description of Habitats	12
<i>Existing conditions</i>	12
<i>No Action Alternative</i>	13
Fishery/Aquatic Resources	14
<i>Existing conditions</i>	14
<i>No Action Alternative</i>	15
Essential Fish Habitat	15
<i>Existing conditions</i>	15
<i>No Action Alternative</i>	15
Wildlife Resources	15
<i>Existing conditions</i>	15
<i>Wildlife with Conservation Concerns</i>	18
<i>No Action Alternative</i>	18
Endangered and Threatened Species	19
<i>At-Risk Species</i>	21
<i>Proposed Species</i>	21
<i>Candidate Species</i>	22
Migratory Bird Treaty Act (MBTA) and Bald and Golden Eagle Protection Act (BGEPA)	22
Refuges and Wildlife Management Areas and CWPPRA Projects	25
EVALUATION METHODOLOGY.....	25
PROJECT IMPACTS.....	27
<i>Habitat Types</i>	27
<i>Fishery Resources</i>	27
<i>Essential Fish Habitat</i>	28
<i>Wildlife</i>	28
<i>Threatened and Endangered Species</i>	28
<i>Migratory Bird Treaty Act (MBTA) and Bald and Eagle Protection Act (BGEPA)</i>	28
<i>At-Risk Species and Gulf Coast Joint Venture</i>	29
<i>FWS Concerns</i>	29
SERVICE POSITION AND RECOMMENDATIONS	30
LITERATURE CITED	35

EXECUTIVE SUMMARY

This report contains a description of existing fish and wildlife resources in the project area, discusses the future with the Tentatively Selected Plan (TSP) and the future with the No Action Alternative (NAA) habitat conditions, identifies fish and wildlife-related impacts, and provides recommendations to improve the proposed Morganza to the Gulf of Mexico, LA (MTG) Project, Hurricane and Storm Damage Risk Reduction System, Reach A. This document does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). The Fish and Wildlife Service (Service) is coordinating with the National Marine Fisheries Service (NMFS) and the Louisiana Department of Wildlife and Fisheries (LDWF). Their comments have been incorporated into this report.

The features are described in the Final Post Authorization Change Report (PACR) and Revised Programmatic Environmental Impact Statement (PEIS) dated May 2013. The project consists of the construction of 98 miles of levees, approximately 84 miles of which would overlay existing hydrologic barriers such as natural ridges, roadbeds, and existing levees. Reach A will encompass approximately 6.94 miles of the proposed MTG levee system.

Marshes, swamps, and bottomland hardwood forests (BLH) are considered by the Service to be aquatic resources of national importance due to their increasing scarcity and high habitat value for fish and wildlife within Federal trusteeship (i.e., migratory waterfowl, wading birds, other migratory birds, threatened and endangered species, and interjurisdictional fisheries).

The MTG Reach A is anticipated to impact the Penchant subbasin with a decrease of 301.16 marsh acres (-156.58 AAHUs) over the 61-year period of analysis. Additionally, Reach A will result in a decrease of 18.13 swamp acres (-9.69 AAHUS) and 14.39 bottomland hardwood (BLH) acres (-3.64 AAHUs). The TSP would directly impact 333.68 acres of jurisdictional wetlands and vegetated shallows (SAV) (-156.58 AAHUs). There is potential for indirect impacts from Reach A and indirect impacts from Reach A and the entirety of MTG should continue to be considered by USACE. For unavoidable impacts, compensatory mitigation is required to replace the loss of jurisdictional wetland function and area.

The Service supports the MTG Reach A provided that the following fish and wildlife recommendations are carried out concurrently with project implementation:

1. Coastal marshes and forested wetlands are considered by the Service to be aquatic resources of national importance due to their increasing scarcity and high habitat value for fish and wildlife within Federal trusteeship (i.e., migratory waterfowl, wading birds, other migratory birds, threatened and endangered species, and interjurisdictional fisheries). The Service's mitigation policy (Federal Register, Volume 46, Number 15, pages 7656-7663, January 23, 1991) provides guidance to help ensure that the level of mitigation recommended by the Service is consistent with the value and scarcity of the fish and wildlife resources involved. In keeping with that policy, the Service usually recommends that losses of high-value habitats which are becoming scarce be avoided or minimized to the greatest extent possible.

Unavoidable losses of such habitats should be fully compensated by replacement of the same kind of habitat value; this is called “in-kind” mitigation. The Service should be consulted in the development of plans and specifications for mitigation features.

2. If organic soils must be removed prior to levee construction, those organic soils should be used to create or restore emergent wetlands to the greatest extent possible or be used for levee construction as suggested by USACE.
3. Care should be taken to avoid impacts to bald eagles and their nesting habitat. Prior to and during any project construction, on-site personnel should be informed of the possible presence of nesting bald eagles in the vicinity of the project boundary, and should identify, avoid, and immediately report any such nests to this office. Prior to construction, the Service and the LDWF recommend that a qualified biologist inspect the proposed work site for the presence of undocumented nests during the nesting season (October through mid-May). If an active or inactive eagle nest is discovered within 1,500 feet of the project footprint, then follow the [bald and golden eagle guidelines](#) to determine whether disturbance will occur and/or an incidental take permit is needed. Any take should be reported to this office and the LDWF. Bald eagle nest (active, inactive, or seemingly abandoned) should be protected, and no large trees should be removed.
4. 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 contact this office. Should a proposed action directly or indirectly affect the West Indian manatee, further consultation with this office will be necessary.
5. Avoid adverse impacts to nesting wading bird colonies through careful design of project features and timing of construction. The Service and the LDWF recommend that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season (September 1 through February 15).
6. Avoid adverse impacts to alligator snapping turtle by minimizing disturbance and alteration of nesting habitat, particularly in the nesting season (April-June), including minimizing the removal of log jams in streams.
7. The Service recommends avoiding impacts on the Mandalay National Wildlife Refuge (NWR). If impacts cannot be avoided, impacts will need to be mitigated for on the Mandalay NWR. Please coordinate all activities with refuge staff and with Mr.

Pon Dixon, Project Leader of the Bayou Sauvage Urban NWR Complex (985/882-2014).

8. The impacts to Essential Fish 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.
9. Access roads across existing wetlands should be avoided if possible and secondary impacts to wetland hydrology should be prevented or reduced. To avoid changes to hydrology the Service recommends appropriately sized culverts (minimum 24-inch culverts) be installed and maintained every 250 feet across access roads through wetlands with additional culverts placed at stream crossings and drainage features. Alternatively, upon completion of construction activities, access roads should be degraded to restore natural hydrology.
10. To the greatest extent possible, design (e.g., implementation of “T”-walls, sheet-pile, and/or cement floodwall in levee designs) and position flood protection features so that destruction of forested and emergent wetlands is avoided or minimized.
11. North of the GIWW, the Service recommends that the levee alignment be adjusted slightly to avoid impacts to several areas of bald cypress swamp forest (Figure 5).
12. To avoid impacts to swamp forest, the Service recommends that the westernmost levee reach be relocated onto agricultural lands rather in the swamp/wetlands (Figure 6).
13. Please include this office in future considerations of programmatic features and any planned levee lifts as additional consultation will likely be necessary.
14. Where wetlands would be enclosed with the Reach A levee, drainage evaluations should be conducted to ensure that moderate to heavy rainfall events do not result in prolonged elevated water level conditions resulting in adverse wetland impacts.
15. To avoid unplanned shortfalls in mitigation acreage, the Service recommends that the target marsh acreage be calculated to exclude any internal borrow areas used for construction of the marsh creation area containment dikes.
 - a. Marsh creation projects must provide at least the required acreage within 3 years of project implementation to be considered as having achieved the intended mitigation. This will depend on achieving a settled disposal area elevation conducive to growth of marsh vegetation.
16. With the new definition of the Waters of the United States (WOTUS, published Aug 29, 2023) all enclosed (protected side) wetlands may be redefined as non-jurisdictional wetlands because of this project, thus impacting all enclosed wetlands. There is concern that this would increase developmental pressures on enclosed

- wetlands. Currently, the USACE is awaiting guidance on implementation of that new rule. The Service recommends the USACE coordinates with us once that guidance is received to ensure protection of enclosed wetlands. Enclosed Wetlands will still be connected hydrologically and thus will still be tidally influenced via the planned major structures (i.e., floodgates) and any additional environmental structures and/or culverts, etc. For this reason, it is the NMFS' opinion that the enclosed wetlands in question should be exempt from redefinition implications.
17. GIWW Floodgate sluice gates should be kept open, except in the event of a tropical storm, to allow exchange and tidal flow within the system. Operational plans for floodgates and water control structures should be developed to maximize the open cross-sectional area for as long as possible. Water control structure operation manuals or plans should be developed in coordination with the Service and other natural resource agencies.
 18. The trigger for structure closures would be tropical storm events. Therefore, the project would not close the system more often due to higher day-to-day sea level rise impacts. If the sponsor/operator sees a higher level of sea level rise and starts to see increased soil saturation/flooding in developed areas, they may want to change the operations to close the structures at high tides. A change in operations would be considered a separate project purpose and authorization and would require a new NEPA documentation and/or approval for this operational change. It is unknown at present how water levels within the system would be managed if a change in operation due to RSLR is realized. Hence, there is a potential for substantial additional indirect impacts to wetland habitat and fish and wildlife resources to occur. If the system is closed more often due to higher RSLR impacts, the Service recommends additional impacts be evaluated and mitigated.
 19. To minimize impacts to fisheries, flood protection water control structures in any watercourse should maintain pre-project cross section in width and depth to the maximum extent practicable. Water control structures within a waterway should include shoreline baffles and/or ramps (e.g., rock rubble, articulated concrete mat) that slope up to the structure to enhance organism passage. Various ramp designs should be considered. Please coordinate with the NMFS' Craig Gothreaux (craig.gothreaux@noaa.gov) on this issue.
 20. Material from dredging or borrow pits should not be piled outside of the ROW.
 21. If it becomes necessary to use borrow sources other than the previously proposed environmentally cleared sites, the Service recommends USACE begin investigating potential borrow sources in coordination with the Service. Borrow sites to be considered should have minimal impacts to fish and wildlife resources. The Service identified a priority selection process and list for borrow sites in our November 15, 2023, Planning-aid letter to USACE (Appendix 1). That prioritization process should be utilized if additional borrow sites are needed (please contact Cathy Breaux (337) 291-3122 for more information).

22. 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 this consultation should occur before changes are made and or finalized.

INTRODUCTION

This report contains a description of existing fish and wildlife resources in the project area, discusses the future with the Tentatively Selected Plan (TSP) and the future with the No Action Alternative (NAA) habitat conditions, identifies fish and wildlife-related impacts, and provides recommendations to improve the proposed Morganza to the Gulf of Mexico, LA (MTG) Project, Hurricane and Storm Damage Risk Reduction System, Reach A. This document does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). The Fish and Wildlife Service (Service) is coordinating with the National Marine Fisheries Service (NMFS) and the Louisiana Department of Wildlife and Fisheries (LDWF). Their comments have been incorporated into this report.

This project was authorized in May of 2011 through the Water Resource Development Act of 2007. Please reference the Service's Fish and Wildlife Coordination Act Report from April 2013 and the Service's June 2013 comment letter on the Morganza to the Gulf Post Authorization Change Report (PACR).

The features are described in the Final Post Authorization Change Report (PACR) and Revised Programmatic Environmental Impact Statement (PEIS) dated May 2013. The project consists of the construction of 98 miles of levees, approximately 84 miles of which would overlay existing hydrologic barriers such as natural ridges, roadbeds, and existing levees. Reach A begins in southwest Houma approximately 0.5 miles southwest of the intersection of Highway 182 and Sportsman's Ct (Figure 1). It continues south to intersect with the Gulf Intercoastal Waterway (GIWW), and proceeds southeast, parallel with Highway 315. It terminates approximately 1.4 miles northwest of the town of Theriot. Figure 1 provides an overview of the authorized federal alignment.

Project construction is expected to take place in a series of sequential construction contracts, the first of which includes construction of a 6-foot levee embankment (less than the 2035 1% annual exceedance probability design height of elevation +12.5 feet) within the portion of Reach A between Station 3512+00.00 and 3684+00.00. The portion of the reach north of the GIWW includes 2.14 miles (11,318 linear feet) of earthen levee running north to south between Station 1828+22.13 at the beginning of the reach, located approximately 2,740 feet west-southwest of the intersection of Bayou Black Drive (Parish Road 182) and Sportsman's Court, to Station 1941+40.00 immediately north of the proposed West GIWW Gate. South of the GIWW, the

reach includes approximately 4.8 miles (25,345 linear feet) of earthen levee generally running north to south between Station 1941+40.00 immediately north of the West GIWW flood gate to Station 2259+26.11 located approximately 7,090 feet west-southwest of the intersection of Bayou Dularge Rd. (LA 315) and Seven Oaks Court. The work is being divided by the USACE between currently constructible (Figure 2) features and programmatic features that will need additional NEPA analysis. Please include this office in future considerations of programmatic features and any planned levee lifts as additional consultation will likely be necessary.

DESCRIPTION OF THE PROJECT AREA

The MTG study area lies within a region dominated by extensive wetlands created by deltaic processes of the Mississippi River. The study area occupies portions of three hydrologic subbasins within the Terrebonne Basin. Reach A is contained within the Penchant subbasin. The Penchant subbasin is discussed below.

Penchant Subbasin

The Penchant subbasin is bounded by Atchafalaya Bay and the Atchafalaya River on the west and Bayou du Large on the east. The Gulf of Mexico forms its southern boundary; the subbasin extends north to the natural levee along Bayou Black. The northern rim of the basin supports bottomland hardwood forests and cypress-tupelo swamps. South of those forested wetlands is an extensive zone of fresh marshes. Those marshes are usually underlain by floating or semi-floating organic soils, except near the Atchafalaya River and Atchafalaya Bay where more mineral soils are found. The fresh marshes that dominate the northern half of the subbasin grade into intermediate, brackish, and, finally, saline marshes along the Gulf coast. That portion of the study area within the Penchant Subbasin lies roughly east of a line extending southward from Bayou Copasaw to Lake Mechant. The Mauvais Bois and Marmande ridges bisect this portion of the study area, separating the fresh marsh zone from the more brackish and tidally influenced marshes to the south. The Small Bayou LaPointe ridge further subdivides this tidal zone. Wetlands between the Small Bayou LaPointe ridge and Bayou du Large grade from fresh marsh at the upper end to brackish marsh adjacent to Lake Mechant. During high Atchafalaya River stages, water levels are elevated throughout the northern Penchant Subbasin. Under those conditions, Atchafalaya River water and drainage from the Lake Verret Basin flows eastward via the Gulf Intracoastal Waterway (GIWW) across the northern Penchant Subbasin toward Houma (Paille 1997). From the GIWW, water also flows southward down Bayou Copasaw and Minor's Canal into the tidal zone. During low Atchafalaya River stages, water levels tend to be lower and the freshwater supply is limited to rainfall and runoff from a portion of the Lake Verret Basin drainage. During high Atchafalaya River flows, fresh water from Minor's Canal and other sources bathes the tidal marshes south of the Marmande and Mauvais Bois ridges. The marshes south of the Small Bayou LaPointe ridge are less influenced by this fresh water. During the late summer and fall, low to moderate salinities occur throughout most of this tidal zone.

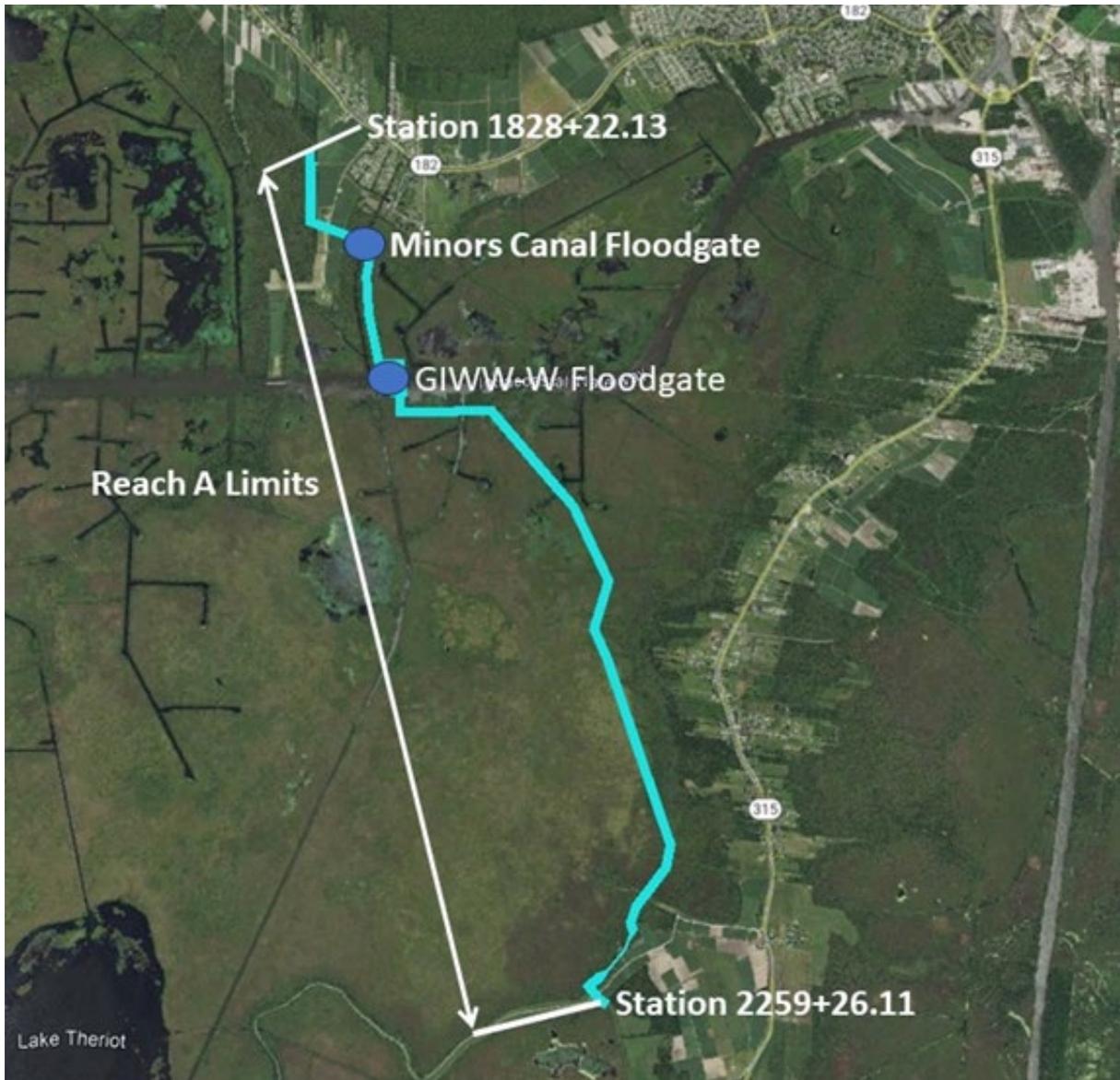


Figure 1 Project Area

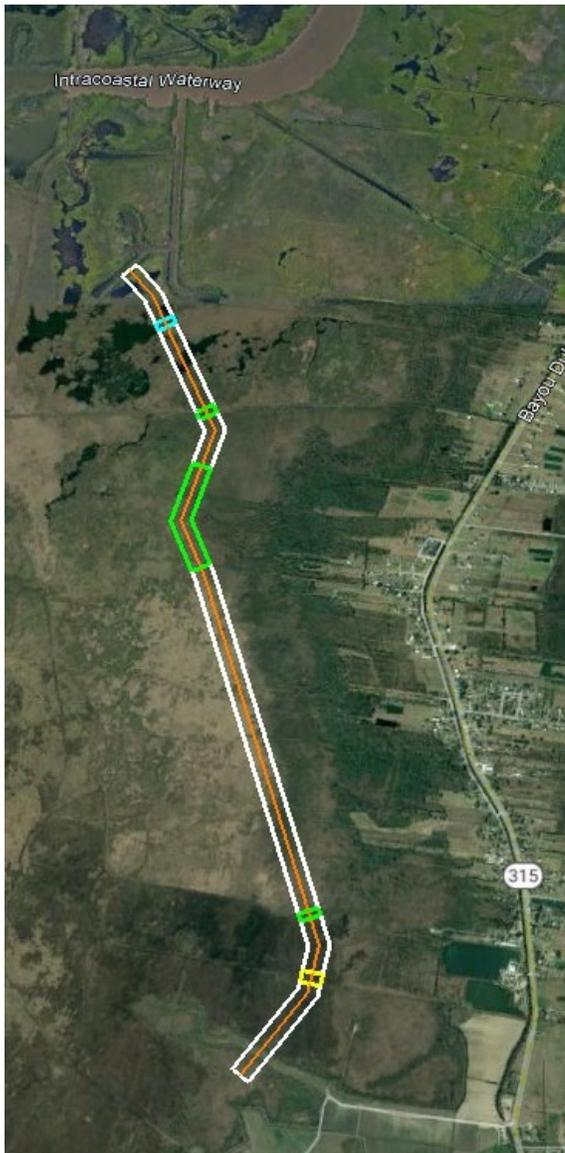


Figure 2 – Constructible Section of Reach A

DESCRIPTION OF APPLICANT’S PREFERRED ALTERNATIVE

Project construction is expected to take place in a series of sequential construction contracts, the first of which includes construction of a 6-foot-high levee embankment (less than the 2035, 1 percent annual exceedance probability design height of elevation +12.5 feet) within the portion of Reach A between Station 3512+00.00 and 3684+00.00. The portion of the reach north of the GIWW includes 2.14 miles (11,318 linear feet) of earthen levee running north to south between Station 1828+22.13 at the beginning of the reach, located approximately 2,740 feet west-southwest of the intersection of Bayou Black Drive (Parish Road 182) and Sportsman’s Court, to Station 1941+40.00 immediately north of the proposed West GIWW Gate. South of the GIWW,

the reach includes approximately 4.8 miles (25,345 linear feet) of earthen levee generally running north to south between Station 1941+40.00 immediately north of the West GIWW flood gate to Station 2259+26.11 located approximately 7,090 feet west-southwest of the intersection of Bayou Dularge Road (LA 315) and Seven Oaks Court. The work is being divided by the USACE between currently constructible (Figure 2) features and programmatic features that will need additional NEPA analysis.

Reasonable range of alternatives carried forward for detailed analysis in this EIS included the following:

Alternative 1:

Reach A of the authorized PACR alignment with side-cast borrow.

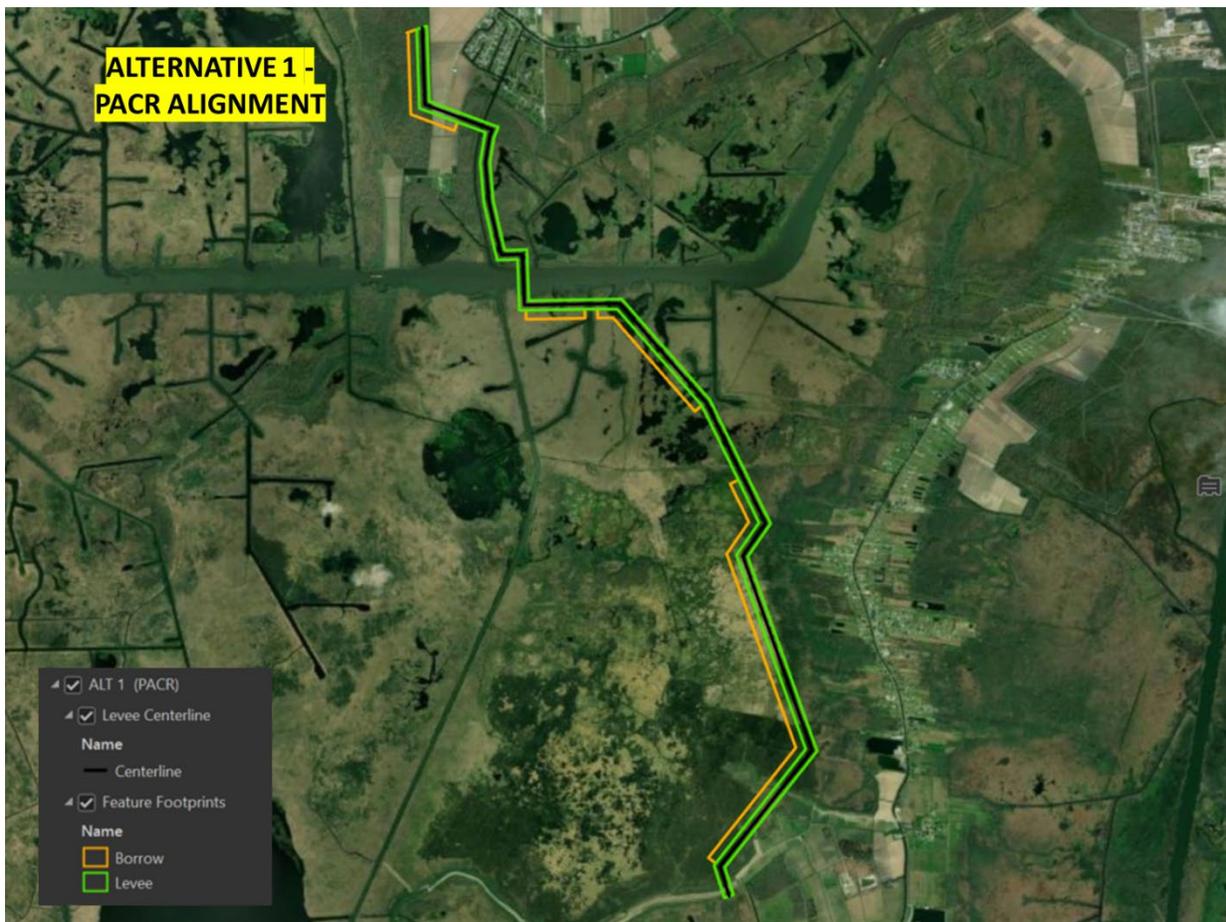


Figure 3: Reach A alternative 1

Alternative 2:

Modified PACR alignment as described in the project description with off-site borrow.



Figure 4: Reach A alternative 2 with potential borrow, structures, haul routes and mitigation.

Alternative 2 (Figure 4) is USACE’s preferred alignment. Alternative 2 utilizes off-site borrow while Alternative 1 (Figure 3) utilizes side-cast borrow. Alternative 2 also avoids some forested wetlands and utilizes a sheet rock wall in the southern portion of the levee. For both alternatives the Service recommends, to the greatest extent possible, design and position flood protection features (e.g., implementation of “T”-walls, sheet-pile, and/or cement floodwall in levee designs) so that destruction of forested and emergent wetlands are avoided or minimized. Specifically, the Service recommends adjusting the levee alignment North of the GIWW slightly to avoid impacts to several areas of bald cypress swamp forest (Figure 5). Additionally, the Service recommends that the westernmost levee reach be relocated onto agricultural lands rather in the swamp/wetlands (Figure 6).

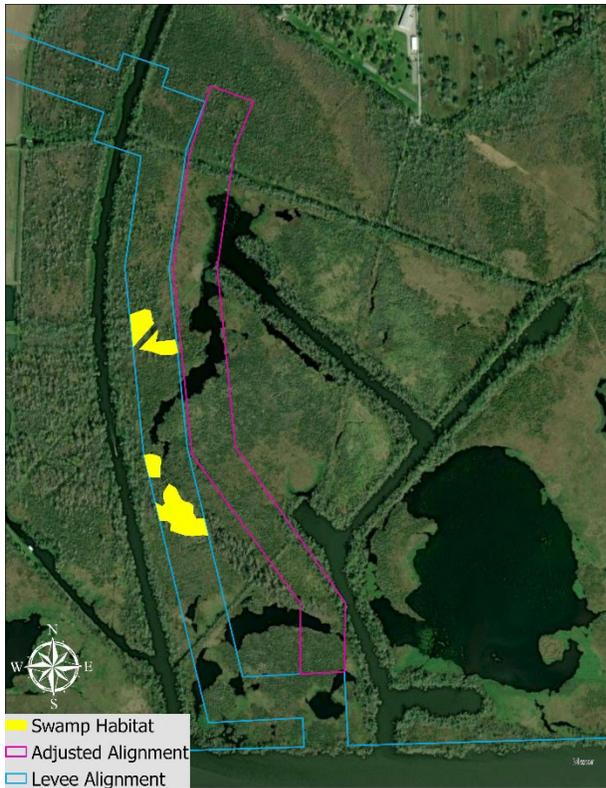


Figure 6: Suggested Adjustment to section North of GIWW.

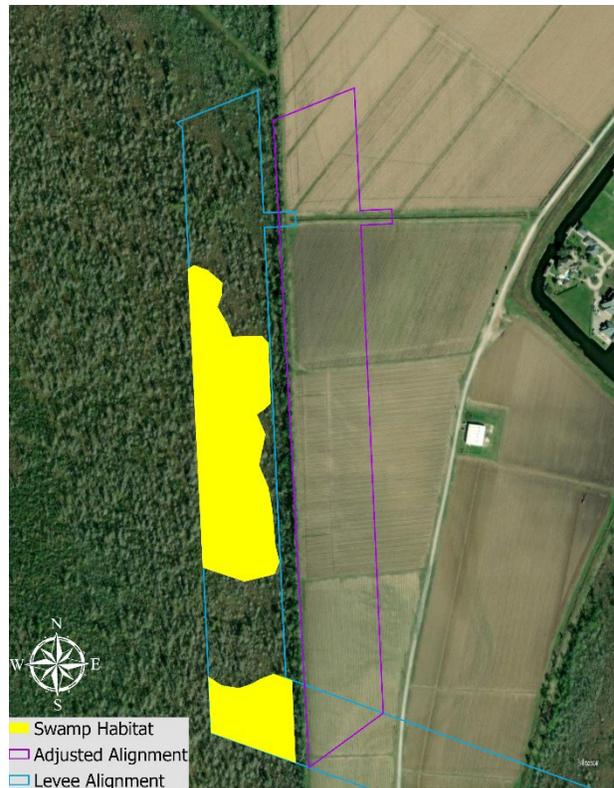


Figure 5: Suggested Adjustment to westernmost section.

FISH AND WILDLIFE RESOURCES

Description of Habitats

Existing conditions

Forested Wetlands - Forested wetlands in the study area were divided into two major types; i.e., bottomland hardwood forests and cypress-tupelo swamp. Bottomland hardwood forests found in coastal portions of the project area occur primarily on the natural levees of distributary channels. Dominant vegetation may include sugarberry (*Celtis laevigata* Willd), water oak (*Quercus nigra* L.), live oak (*Quercus virginiana* Mill.), bitter pecan (*Carya aquatica* (Michx. f.) Nutt.), black willow (*Salix nigra* Marshall), American elm (*Ulmus americana* L.), Drummond red maple (*Acer rubrum* L.), Chinese tallow-tree (*Triadica loureiro*), boxelder (*Acer negundo* L.), green ash (*Fraxinus pennsylvanica* Marshall), baldcypress (*Taxodia* Rich.), and elderberry (*Sambucus* L.). Cypress-tupelo (*Nyssa* L.) swamps are located along the flanks of larger distributary ridges as a transition zone between bottomland hardwoods and lower-elevation marsh or scrub-shrub habitats. Cypress-tupelo swamps exist where there is little or no salinity and usually minimal daily tidal action.

Scrub-Shrub - Scrub-shrub habitat is often found along the flanks of distributary ridges. Typically, it is bordered by marsh at lower elevations and by developed areas, cypress-tupelo

swamp, or bottomland hardwoods at higher elevations. Typical scrub-shrub vegetation includes elderberry (*Sambucus* L.), wax myrtle (*Morella cerifera* (L.) Small), buttonbush (*Cephalanthus* L.), black willow (*Salix nigra* Marshall), Drummond red maple (*Acer rubrum* L.), Chinese tallow-tree (*Triadica Loureiro*), and groundselbush (*Baccharis halimifolia* L.).

Fresh Marsh - Fresh marshes occur at the upper ends of intertributary basins and are often characterized by floating or semi-floating organic soils. Most fresh marshes exhibit minimal daily tidal action; fresh marshes in the Atchafalaya River delta and adjacent to Atchafalaya Bay are the exceptions. Vegetation may include maidencane (*Panicum hemitomon* Schult.), bulltongue (*Sagittaria lancifolia* L.), cattail (*Typha* L.), California bulrush (*Schoenoplectus californicus* (C.A. Mey.) Palla), pennywort (*Hydrocotyle* L.), giant cutgrass (*Zizaniopsis miliacea* (Michx.) Döll & Asch.), American cupscale (*Sacciolepis striata* (L.) Nash), spikerushes (*Eleocharis* R. Br.), bacopa (*Bacopa* Aubl.), and alligatorweed (*Alternanthera philoxeroides* (Mart.) Griseb.). Associated open water habitats may often support extensive beds of floating-leaved and submerged aquatic vegetation including water hyacinth (*Eichhornia Kunth*), Salvinia (*Salvinia* Ség.), duckweeds (*Lemna* L.), American lotus (*Nelumbo lutea* Willd.), white waterlily (*Nymphaea odorata* Aiton), water lettuce (*Pistia stratiotes* L.), coontail (*Ceratophyllum demersum* L.), Eurasian milfoil (*Myriophyllum spicatum* L.), hydrilla (*Hydrilla* Rich.), pondweeds (*Potamogeton* L. or *Stuckenia* Börner), naiads (*Najas* L.), fanwort (*Cabomba* Aubl.), wild celery (*Apium graveolens* L.), water stargrass (*Heteranthera dubia* (Jacq.) MacMill.), elodea (*Egeria densa* Planch.), and others.

Developed Areas - Most developed areas are located on higher elevations of former distributary channels and are typically well drained. They include agricultural lands, and commercial and residential developments.

Canals and Bayous - Canals and larger bayous typically range in depth from 4 or 5 feet, to over 15 feet. Strong tidal flows may occur at times through those waterways, especially where they provide hydrologic connections to other large waterbodies. Such canals and bayous may have mud or clay bottoms that range from soft to firm. Dead-end canals and small bayous are typically shallow and their bottoms may be filled in to varying degrees with semi-fluid organic material. Erosion due to wave action and boat wakes, together with shading from overhanging woody vegetation, tends to retard the amount of intertidal marsh vegetation growing along the edges of those waterways.

Forested wetland (bottomland hardwood and swamp) areas are no longer sustainable in many areas. This is due to relative sea level rise (RSLR) causing inundation and saltwater intrusion in low elevation wetlands. On the other hand, fresh marsh is surviving and is generally expected to survive for the immediate future. Hence, where impacts to either forested wetlands or fresh marsh would occur, the Service recommends that the less sustainable impacts to swamp be avoided.

No Action Alternative

Under the no action alternative there is the expectation of increased salinity and inundation from the effects of relative sea level rise (RSLR). At the same time there is some marsh accretion, from freshwater inputs, in the area leading to a net gain in marsh at this time. Assuming RSLR

and accretion predictions stay the same there is the possibility of increasing marsh habitat from forested wetland and open water conversation to marsh habitats. RSLR would increase salinity in the area potentially leading to conversion of fresh/intermediate marsh to more brackish/salt marshes.

Fishery/Aquatic Resources

Existing conditions

Wetlands throughout the study area abound with small resident fishes and shellfishes such as least killifish (*Heterandria formosa*), rainwater killifish (*Lucania parva*), sheepshead minnow (*Cyprinodon variegatus*), mosquitofish (*Gambusia affinis*), sailfin molly (*Poecilia latipinna*), grass shrimp (*Palaemonetes*), and others. Those species are typically found along marsh edges or among submerged aquatic vegetation, and provide forage for a variety of fish and wildlife. Fresh water and low-salinity marshes provide habitat for commercially and recreationally important resident freshwater fishes such as largemouth bass (*Micropterus salmoides*), yellow bass (*Morone mississippiensis*), black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), redear sunfish (*Lepomis microlophus*), warmouth (*Lepomis gulosus*), blue catfish (*Ictalurus furcatus*), channel catfish (*Ictalurus punctatus*), buffalo (*Ictiobus*), freshwater drum (*Aplodinotus grunniens*), bowfin (*Amia calva*), and gar (*Lepisosteidae*). Areas supporting stable freshwater fisheries occur in the northern portion of the Penchant Subbasin. Freshwater fishes may also utilize low-salinity areas (intermediate marsh zone), provided they have access to fresher areas during periods of high salinity.

The coastal marshes also provide nursery habitat for many estuarine-dependent commercial and recreational fishes and shellfishes. Because of the protection and abundant food afforded by those wetlands, they are critical to the growth and production of species such as blue crab (*Callinectes sapidus*), white shrimp (*Litopenaeus setiferus*), brown shrimp (*Farfantepenaeus aztecus*), Gulf menhaden (*Brevoortia patronus*), Atlantic croaker (*Micropogonias undulatus*), red drum (*Sciaenops ocellatus*), spotted seatrout (*Cynoscion nebulosus*), black drum (*Pogonias cromis*), sand seatrout (*Cynoscion arenarius*), spot (*Leiostomus xanthurus*), southern flounder (*Paralichthys lethostigma*), striped mullet (*Mugil cephalus*), and others. Those species are generally most abundant in the brackish and saline marshes; however, blue crab, white shrimp, Gulf menhaden, red drum, and Atlantic croaker as well as several other species also utilize fresh and low-salinity marshes.

Because tidal marshes provide essential nursery habitat, commercial shrimp harvests are positively correlated with the area of tidal emergent wetlands, not open water area (Turner 1977 and 1982). Future commercial harvests of shrimp and other fishes and shellfishes could be adversely impacted by the high rates of marsh loss throughout the study area (Turner 1982).

The eastern oyster (*Crassostrea virginica*) occurs throughout much of the brackish and saline marsh zones within the study area. Oyster harvesting constitutes a valuable fishery in the northern portions of that zone, where salinities range from 10 to 15 parts per thousand (ppt).

No Action Alternative

The potential for increases in marsh due to accretion would provide more nursery habitat for fisheries and aquatic resources. At the same time the possibility of increased salinization would change the dominant species in the area to more salt tolerant ones.

Essential Fish Habitat

Existing conditions

The project is located within an area identified as Essential Fish Habitat (EFH) by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA, Magnuson-Stevens Act; P.L. 104-297). The updated and revised 2006 generic amendment of the Fishery Management Plans for the Gulf of Mexico, prepared by the Gulf of Mexico Fishery Management Council (GMFMC), identifies estuarine wetlands and associated waters in the project area that are considered EFH for various life stages of multiple federally managed species. Specific habitat types designated as EFH include estuarine emergent marsh, submerged aquatic vegetation, soft bottom, sand and shell bottom, and associated water column. These habitat types serve as EFH for Federally managed species including brown shrimp, white shrimp, red drum, lane snapper (*Lutjanus synagris*), and gray snapper (*Lutjanus griseus*). The 2017 Amendment 10 to the 2006 Consolidated Atlantic Highly Migratory Species (HMS) Fishery Management Plan describes EFH for HMS spatially rather than by habitat type, and estuarine waters in the project area would be considered EFH for bull sharks (*Carcharhinus leucas*).

In addition to being designated as EFH for these species, water bodies and wetlands in the project area provide nursery and foraging habitats supportive of a variety of economically important marine fishery species, such as striped mullet, Eastern oyster, pinfish (*Lagodon rhomboides*), spot, Gulf killifish (*Fundulus grandis*), bay anchovy (*Anchoa mitchilli*), Atlantic croaker, Gulf menhaden, spotted seatrout, sand seatrout, southern flounder, black drum, white shrimp, brown shrimp, and blue crab. Some of these species also serve as prey for other fish species managed under the Magnuson-Stevens Act by the GMFMC (i.e., mackerels, snappers, and groupers) and highly migratory species managed by the NMFS (i.e., billfishes and sharks). Wetlands in the project area also produce nutrients and detritus, important components of the aquatic food web, which contributes to the overall productivity and economic value of the estuary.

No Action Alternative

Increases in marsh habitats from accretion would provide more essential fish habitat for many species. If salinities rose many of the currently present species would not be able to cope leading to a domination of more salt tolerant species.

Wildlife Resources

Existing conditions

Numerous species of birds utilize study-area marshes, including large numbers of migratory waterfowl which winter there. Project-area fresh and intermediate marshes provide excellent wintering habitat for migratory waterfowl, especially puddle ducks. For this reason, the North American Waterfowl Management Plan's Gulf Coast Joint Venture has recognized this area, the

Terrebonne Unit (which includes fresh and intermediate marshes in this study area), as a key waterfowl wintering area. Brackish marshes having abundant submerged aquatic vegetation may also support large numbers of puddle ducks. Puddle ducks that occur in the study area include mallard (*Anas platyrhynchos*), gadwall (*Anas strepera*), northern pintail (*Anas acuta*), blue-winged teal (*Spatula discors*), green-winged teal (*Anas carolinensis*), American widgeon (*Mareca americana*), wood duck (*Aix sponsa*), and northern shoveler (*Spatula clypeata*). The resident mottled duck also utilizes project-area coastal marshes. Diving ducks prefer larger ponds, lakes, and open water areas. Common diving duck species include lesser scaup (*Aythya affinis*), canvasback (*Aythya valisineria*), redhead (*Aythya americana*), ring-necked duck (*Aythya collaris*), red-breasted merganser (*Mergus serrator*), common merganser (*Mergus merganser*), and hooded merganser (*Lophodytes cucullatus*). The snow goose (*Anser caerulescens*) and the greater white-fronted goose (*Anser albifrons*) also utilize coastal marshes. Other migratory game birds found in coastal marshes include the king rail (*Rallus elegans*), clapper rail (*Rallus crepitans*), Virginia rail (*Rallus limicola*), sora (*Porzana carolina*), American coot (*Fulica americana*), common moorhen (*Gallinula chloropus*), and common snipe (*Gallinago gallinago*).

Marshes and associated shallow open water areas provide habitat for a number of wading birds, shorebirds, seabirds, and other nongame birds. Common wading birds include the little blue heron (*Egretta caerulea*), great blue heron (*Ardea herodias*), green-backed heron (*Butorides striatus*), yellow-crowned night heron (*Nyctanassa violacea*), black-crowned night heron (*Nycticorax nycticorax*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), cattle egret (*Bubulcus ibis*), reddish egret (*Egretta rufescens*), white-faced ibis (*Plegadis chihi*), white ibis (*Eudocimus albus*), and roseate spoonbill (*Platalea ajaja*). Shorebirds include the killdeer (*Charadrius vociferus*), American avocet (*Recurvirostra americana*), black-necked stilt (*Himantopus mexicanus*), common snipe (*Gallinago gallinago*), and various species of sandpipers (*Scolopacidae*) including western sandpiper (*Calidris mauri*). Seabirds include American white pelican (*Pelecanus erythrorhynchos*), brown pelican (*Pelecanus occidentalis*), black skimmer (*Rynchops niger*), herring gull (*Larus argentatus*), laughing gull (*Leucophaeus atricilla*), and several species of terns (*Sterna*). Other nongame birds such as boat-tailed grackle (*Quiscalus major*), red-winged blackbird (*Agelaius phoeniceus*), seaside sparrow (*Ammodramus maritima*), neotropic cormorant (*Phalacrocorax brasilianus*), northern harrier (*Circus hudsonius*), belted kingfisher (*Megaceryle alcyon*), and sedge wren (*Cistothorus platensis*) also utilize coastal areas.

Common mammals occurring in the coastal marshes include nutria (*Myocastor coypus*), muskrat (*Ondatra zibethicus*), mink (*Mustela vison*), river otter (*Lontra canadensis*), raccoon (*Procyon lotor*), swamp rabbit (*Sylvilagus aquaticus*), white-tailed deer (*Odocoileus virginianus*), and coyote (*Canis latrans*).

Reptiles are most abundant in fresh and low-salinity coastal wetlands. Common species include the American alligator (*Alligator mississippiensis*), cottonmouth (*Agkistrodon piscivorus*), water snakes (*Nerodia*), mudsnake (*Farancia abacura*), speckled kingsnake (*Lampropeltis holbrooki*), eastern ribbon snakes (*Thamnophis sauritus*), western ratsnakes (*Pantherophis obsoletus*), red-eared slider (*Trachemys scripta elegans*), common snapping turtle (*Chelydra serpentina*), alligator snapping turtle (*Macrochelys temminckii*), common mud turtles (*Kinosternon subrubrum*), smooth softshell turtles (*Apalone mutica*), and spiny softshell turtles (*Apalone*

spinifera). Amphibians commonly found in the area include the American bullfrog (*Lithobates catesbeianus*), pig frog (*Lithobates grylio*), bronze frog (*Lithobates clamitans*), southern leopard frog (*Lithobates sphenoccephalus*), cricket frogs (*Acris*), tree frogs (*Pseudacris*) (*Hyla*), chorus frogs (*Pseudacris*), three-toed amphiuma (*Amphiuma tridactylum*), sirens (*Siren*), and several species of toads. In brackish and saline marshes, reptiles are limited primarily to the American alligator and the diamond-backed terrapin (*Malaclemys terrapin*), respectively.

Forested wetlands and scrub-shrub areas provide habitats for songbirds such as the mockingbird (*Mimus polyglottos*), yellow-billed cuckoo (*Coccyzus americanus*), northern parula (*Setophaga americana*), yellow-rumped warbler (*Setophaga coronata*), prothonotary warbler (*Protonotaria citrea*), white-eyed vireo (*Vireo griseus*), Carolina chickadee (*Poecile carolinensis*), and tufted titmouse (*Baeolophus bicolor*). Additionally, these areas also provide important resting and feeding areas for songbirds migrating across the Gulf of Mexico. Other avian species found in forested wetlands include the American woodcock (*Scolopax minor*), common flicker (*Colaptes auratus*), brown thrasher (*Toxostoma rufum*), belted kingfisher (*Megaceryle alcyon*), loggerhead shrike (*Lanius ludovicianus*), pileated woodpecker (*Dryocopus pileatus*), red-headed woodpecker (*Melanerpes erythrocephalus*), downy woodpecker (*Dryobates pubescens*), common grackle (*Quiscalus quiscula*), and American crow (*Corvus brachyrhynchos*). Numerous other bird species use forested wetlands throughout the study area.

Forested habitats and associated waterbodies also support raptors such as the red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), American kestrel (*Falco sparverius*), Mississippi kite (*Ictinia mississippiensis*), northern harrier, screech owl (*Megascops asio*), great horned owl (*Bubo virginianus*), and barred owl (*Strix varia*). Wading bird colonies typically occur in cypress swamp and scrub-shrub habitat. Species found in those nesting colonies include anhinga (*Anhinga anhinga*), great egret, great blue heron, black-crowned night heron, tricolored heron (*Egretta tricolor*), little blue heron, cattle egret, snowy egret, white-faced ibises and glossy ibises (*Plegadis falcinellus*), and reddish egret. Waterfowl species found in forested wetlands and adjacent waterbodies in the project area include, but are not limited to, wood duck, mallard, green-winged teal, gadwall, and hooded merganser.

Game mammals associated with forested wetlands include eastern cottontail (*Sylvilagus floridanus*), swamp rabbit, gray squirrel (*Sciurus carolinensis*) and fox squirrels (*Sciurus niger*), and white-tailed deer. Commercially important fur bearers include river otter, muskrat, nutria, mink, and raccoon. Other mammals found in forested wetlands include striped skunk (*Mephitis mephitis*), coyote, Virginia opossum (*Didelphis virginiana*), bobcat (*Lynx rufus*), armadillo (*Dasypus novemcinctus*), gray fox (*Urocyon cinereoargenteus*), and red bat (*Lasiurus borealis*). Smaller mammal species serve as forage for both mammalian and avian carnivores and include the cotton rat (*Sigmodon hispidus*), marsh rice rat (*Oryzomys palustris*), white-footed deermouse (*Peromyscus leucopus*), eastern wood rat (*Neotoma floridana*), eastern harvest mouse (*Reithrodontomys humulis*), least shrew (*Cryptotis parva*), and southern flying squirrel (*Glaucomys volans*).

Reptiles which utilize study area bottomland hardwoods, cypress swamps, and associated shallow water include the American alligator, ground skink (*Scincella lateralis*), five-lined skink (*Eumeces fasciatus*), broad-headed skink (*Eumeces laticeps*), green anole (*Anolis carolinensis*),

Gulf coast ribbon snake (*Thamnophis proximus orarius*), yellow-bellied water snake (*Nerodia erythrogaster flavigaster*), speckled kingsnake, southern copperhead (*Agkistrodon contortrix contortrix*), cottonmouth, pygmy rattlesnake (*Sistrurus miliarius*), broad-banded water snake (*Nerodia fasciata confluens*), diamond-backed water snake (*Nerodia rhombifer*), spiny softshell turtle, red-eared slider, southern painted turtle (*Chrysemys dorsalis*), Mississippi mud turtle, stinkpot (*Sternotherus odoratus*), common snapping turtle and alligator snapping turtle, in addition to numerous other species.

Some of the amphibians believed to be in study-area forested wetlands include dwarf salamander (*Eurycea quadridigitata*), three-toed amphiuma, lesser siren (*Siren intermedia*), central newt (*Notophthalmus viridescens louisianensis*), Gulf coast toad (*Incilius nebulifer*), eastern narrow-mouthed toad (*Gastrophryne carolinensis*), green treefrog (*Hyla cinerea*), squirrel treefrog (*Hyla squirella*), pigfrog, bullfrog, southern leopard frog, bronze frog, upland chorus frog (*Pseudacris feriarum*), southern cricket frog (*Acris gryllus gryllus*), and spring peeper (*Pseudacris crucifer*).

Most developed areas provide low-quality wildlife habitat. Sites developed for agricultural purposes are located on low ridges and on lower elevation areas that have improved drainage. In agricultural areas, wildlife habitat is primarily provided by unmaintained ditch banks and field edges, fallow fields, pasture lands, and rainfall-flooded fields. Cultivated crops, especially soybeans, provide forage for some wildlife species. Game species that utilize agricultural lands include the white-tailed deer, mourning dove (*Zenaida macroura*), northern bobwhite (*Colinus virginianus*), eastern cottontail, and common snipe. Seasonally flooded cropland and fallow fields may provide important feeding habitat for wintering waterfowl, wading birds, and other waterbirds.

Wildlife with Conservation Concerns

Many of the wildlife resources are species with conservation concern in Louisiana. These include pygmy rattle snake, reddish egret, black-rail, gull-billed tern, black skimmer, mottled duck, bobwhite, little blue heron, roseate spoonbill, king rail, sandwich tern, seaside sparrow, bald eagle, red head, lesser scaup, dickcissel and west Indian manatee. Additionally: northern pintail, gadwall, lesser scaup, blue-winged teal, mottled duck, redhead, northern bobwhite, loggerhead shrike, seaside sparrow, western sandpiper, reddish egret, little blue heron, king rail, black rail, gull-billed tern and black skimmer are all considered priority species by the Gulf Coast Joint Venture.

No Action Alternative

Increases in marsh due to accretion could lead to greater foraging habitat for many wildlife species. RSLR and the accompanying salinity increase could greatly change the wildlife species composition in the area, particularly for aquatic and plant species. These changes in dominant plant and aquatic species could have a domino effect, leading to the loss of other species in the area. Additionally, the potential loss of forested wetland habitat in the area would decrease the amount of nesting habitat for many birds and terrestrial species in the area.

Endangered and Threatened Species

West Indian Manatee (Trichechus manatus) – Threatened – Marine Mammal (Protection Act)

The endangered West Indian manatee (*Trichechus manatus*) is known to regularly occur in Lakes Pontchartrain and Maurepas and their associated coastal waters and streams. It also can be found less regularly in other Louisiana coastal areas, most likely while the average water temperature is warm. Based on data maintained by the Louisiana Wildlife Diversity Program, approximately 84 percent of reported manatee sightings (1990-2019) in Louisiana have occurred from the months of June through December. Manatee occurrences in Louisiana appear to be increasing and they have been regularly reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of southeastern Louisiana. Manatees may also infrequently be observed in the Mississippi River and coastal areas of southwestern Louisiana. Cold weather and outbreaks of red tide may adversely affect these animals. However, human activity is the primary cause for declines in species number due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution.

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.

All on-site personnel are responsible for observing water-related activities for the presence of manatee(s). We recommend the following to minimize potential impacts to manatees in areas of their potential presence:

- All work, equipment, and vessel operation should cease if a manatee is spotted within a 50-foot radius (buffer zone) of the active work area. Once the manatee has left the buffer zone on its own accord (manatees must not be herded or harassed into leaving), or after 30 minutes have passed without additional sightings of manatee(s) in the buffer zone, in-water work can resume under careful observation for manatee(s).
- If a manatee(s) is sighted in or near the project area, all vessels associated with the project should operate at “no wake/idle” speeds within the construction area and at all times while in waters where the draft of the vessel provides less than a four-foot clearance from the bottom. Vessels should follow routes of deep water whenever possible.
- If used, siltation or turbidity barriers should be properly secured, made of material in which manatees cannot become entangled, and be monitored to avoid manatee entrapment or impeding their movement.
- Temporary signs concerning manatees should be posted prior to and during all in-water project activities and removed upon completion. Each vessel involved in construction

activities should display at the vessel control station or in a prominent location, visible to all employees operating the vessel, a temporary sign at least 8½ " X 11" reading language similar to the following: "CAUTION BOATERS: MANATEE AREA/ IDLE SPEED IS REQUIRED IN CONSRUCTION AREA AND WHERE THERE IS LESS THAN FOUR FOOT BOTTOM CLEARANCE WHEN MANATEE IS PRESENT". A second temporary sign measuring 8½ " X 11" should be posted at a location prominently visible to all personnel engaged in water-related activities and should read language similar to the following: "CAUTION: MANATEE AREA/ EQUIPMENT MUST BE SHUTDOWN IMMEDIATELY IF A MANATEE COMES WITHIN 50 FEET OF OPERATION".

- To ensure manatees are not trapped due to construction of containment or water control structures, we recommend that the project area be surveyed prior to commencement of work activities. Should manatee be observed within those areas, the contractor should immediately contact the Service's Louisiana Ecological Services Office (337/291-3100) and the Louisiana Department of Wildlife and Fisheries, Wildlife Diversity Program (225/765-2821).
- Collisions with, injury to, or sightings of manatees should be immediately reported to the Service's Louisiana Ecological Services Office (337/291-3100) and the Louisiana Department of Wildlife and Fisheries, Wildlife Diversity Program (225/765-2821). Please provide the nature of the call (i.e., report of an incident, manatee sighting, etc.); time of incident/sighting; and the approximate location, including the latitude and longitude coordinates, if possible.

Eastern Black Rail (Laterallus jamaicensis ssp. Jamaicensis) – Threatened

The eastern black rail (*Laterallus jamaicensis ssp.*) is a wetland-dependent bird requiring dense emergent cover and extremely shallow water depths (< 6 cm) over a portion of the wetland-upland interface to support its resource needs. Birds are found in a variety of salt, brackish, and freshwater marsh habitats that can be tidally or non-tidally influenced. Plant structure is considered more important than plant species composition in predicting habitat suitability (Flores and Eddleman 1995). In Louisiana, occurrences have been documented in high brackish marsh vegetated with Gulf cordgrass (*Spartina spartinae*), saltgrass (*Distichlis spicata*), sea oxeye (*Borrchia frutescens*), and saltmeadow cordgrass (*Spartina patens*) and often interspersed with shrubs such as marsh elder (*Iva frutescens*) or groundselbush. The high marsh is only inundated during extreme high tide events. In general, the character of the high marsh is a short grassy savannah. It may also occur in working wetland habitats such as rice fields. Recent surveys conducted within southwestern Louisiana have revealed that the eastern black rail occurs along the Cameron, Vermilion, and St Charles Parish coastlines in both the breeding and non-breeding season.

On October 8, 2020, the eastern black rail was added to the list of threatened species along with a 4(d) rule, which became effective on November 9, 2020. If the proposed action would directly or indirectly affect the eastern black rail or its habitat, further consultation with the Service will be

necessary.

At-Risk Species

The Service's Southeast Region has defined "at-risk species" as those that are: 1) proposed for listing under the ESA by the Service; 2) candidates for listing under the ESA, which means the species has a "warranted but precluded 12-month finding"; or 3) petitioned for listing under the ESA, which means a citizen or group has requested that the Service add them to the list of protected species. Petitioned species include those for which the Service has made a substantial 90-day finding as well as those that are under review for a 90-day finding. As the Service develops proactive conservation strategies with partners for at-risk species, the states' Species of Greatest Conservation Need (defined as species with low or declining populations) will also be considered.

The Service's goal is to work with private and public entities on proactive conservation to conserve these species, thereby precluding the need to federally list as many at-risk species as possible. While not all species identified as at-risk will become ESA listed species, their potentially reduced populations warrant their identification and attention in project planning. Listed below are species currently designated as "at-risk" that may occur within the proposed study area.

Proposed Species

Alligator Snapping Turtle

The alligator snapping turtle (AST, *Macrochelys temminckii*) has a wide geographic range and occurs in bayous, rivers, streams, swamps, and lakes in Texas, Louisiana, Oklahoma, Arkansas, Missouri, Illinois, Kentucky, Tennessee, Mississippi, Alabama, Georgia, and Florida. They prefer water bodies (small streams [perennial], bayous, canals, swamps, lakes, reservoirs, ponds, and oxbows) with overhang banks and adjacent riparian forest, especially bald cypress bordered banks. Sections of waterways with steep-sloped banks, or those lined with concrete, stone, etc. are likely avoided, especially when there are no trees on the bank. However, relatively short sections of non-preferred bank composition do not necessarily preclude occupation of the entire waterway. They may venture onto the adjacent floodplain during high water events. Although they have been found at the edge of the Gulf of Mexico, coastal marshes and saline water are not their preferred habitat type. They also prefer waterbodies with snags and submerged logs, tree root masses, or other debris in the water. Adults generally stick to deeper water (enough to cover their body to deeper than 20ft), but in areas with deep, loose mud, they have been found in 10 inches of water with a mud layer of several feet. Juveniles can be found in shallow streams less than 1 foot deep. AST are sensitive to water temperature and will change locations as needed to thermoregulate. AST generally stay on the water bottom, but they do move along the bottom, and can travel considerable distances (miles) in just days or weeks. Trapping surveys are generally effective at locating AST, but lack of capture, especially during short-term limited area survey efforts, does not confirm absence.

AST rarely leave the water except for nesting females generally from April to early July (typically April-May in southern parts of the range including Louisiana and May-July in north/western portion of the range). Egg incubation time is generally between 96 and 143 days.

Nesting areas may have varying amounts of canopy cover. Nests are generally located between 4 and 656 feet from the water line, and more likely less than 300 feet from the water line.

Alligator snapping turtle is considered vulnerable (S3) by the LDWF. The LDWF recommends minimizing disturbance and alteration of nesting habitat, particularly during nesting season (April – June). Nesting typically occurs close to riverbanks and lake shores. Additionally, the LDWF recommends minimize removal of log jams in streams, as woody debris provides cover and hunting areas used by this species. Stream alteration should be avoided to protect turtle habitat. If dredging is needed, material should be dumped away from potential turtle nesting sites or dumped prior to egg laying (May – early June). Please contact Keri Lejeune at 337-735-8676 for more information.

Should the proposed project directly or indirectly affect the alligator snapping turtle or its habitat, further conference with this office will be necessary.

Candidate Species

Monarch Butterfly

The monarch butterfly (*Danaus plexippus*) is a candidate species and not yet listed or proposed for listing. Consultation with U.S. Fish and Wildlife Service under section 7 of the Endangered Species Act is not required for candidate species, like the monarch. We encourage agencies, however, to take advantage of any opportunity they may have to conserve the species.

On June 20, 2014, President Obama signed a Presidential Memorandum, “Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators,” outlining an expedited agenda to address the devastating declines in honey bees and native pollinators, including the monarch butterfly. Recent research has shown dramatic declines in monarchs and their habitats leading conservation groups to petition the Service to list the species under Endangered Species Act (ESA). Ensuring adequate and sustainable habitats, meeting all the life history needs of these species is of paramount importance. The Service and its partners are taking immediate actions to replace and restore monarch and pollinator habitat on both public and private lands across the U.S. landscape. Therefore, the Service recommend revegetation of disturbed areas with native plant species, including species of nectar-producing plants and milkweed endemic to the area, we recommend consultation with state botanists to determine appropriate species where possible.

Migratory Bird Treaty Act (MBTA) and Bald and Golden Eagle Protection Act (BGEPA)

There are several species found throughout the project area that are protected under the Migratory Bird Treaty Act (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.) and/or the Bald and Golden Eagle Protection Act (54 Stat. 250, as amended, 16 U.S.C. 668a-d), including bald eagle, brown pelican and other colonial nesting birds, and most native bird species.

During project construction, on-site personnel should be informed of the possible presence of nesting bald eagles (*Haliaeetus leucocephalus*) near the project boundary, and should identify, avoid, and immediately report any such nests to this office. The LDWF and the Service recommend all bald eagle nests (active, inactive, or seemingly abandoned) should be protected,

and no large trees should be removed. Additionally, no major activities should occur within the nesting period (September 1 – June 1). If an active or inactive eagle nest is discovered within 1,500 feet of the project footprint, then follow the [bald and golden eagle guidelines](#) to determine whether disturbance will occur and/or an incidental take permit is needed.

Colonial Nesting Waterbirds

In accordance with the Migratory Bird Treaty Act of 1918 (as amended) and Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), please be advised that the project area is located in habitats which are commonly inhabited by colonial nesting waterbirds and/or seabirds.

Please be aware that entry into or disturbance of active breeding colonies is prohibited by the LDWF. In addition, the LDWF prohibits work within a certain radius of an active nesting colony.

Colonies may be present that are not currently listed in the database maintained by the LDWF. Though the waterbird colony database is extensive and updated often, colony nesting site locations are very fluid, particularly, in marsh habitats where late nesters or new colonies can be established between surveys. Due to the difficult nature of documenting all nesting colonies, the Service recommends that a qualified biologist inspect the proposed construction site for the presence of documented and undocumented nesting colonies during the nesting season of each year that project construction is ongoing. This field visit should take place no more than two weeks before project construction begins.

Following the field visit a survey report should be provide the LDWF and the Service which is to include the following information:

1. qualifications of survey personnel;
2. survey methodology including dates, site characteristics, and size of survey area;
3. species of birds present, activity, estimates of number of nests present, and general vegetation type including digital photographs representing the site; and
4. topographic maps and ArcGIS shapefiles projected in UTM NAD83 Zone 15 to illustrate the location and extent of the colony.

Please email to the Service and mail survey reports on CD to:

Wildlife Diversity Program
La. Dept. of Wildlife & Fisheries
P.O. Box 98000
Baton Rouge, LA 70898-9000

To minimize disturbance to colonial nesting birds, the following conservation measures should be considered:

1. For colonies 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 rookery should be restricted to the non-nesting period (i.e., September 1 through February 15, exact dates may vary within this window depending on species present).
2. For colonies containing nesting gulls, terns, and/or black skimmers, all activity occurring within 650 feet of a rookery should be restricted to the non-nesting period (i.e., September 16 through April 1, exact dates may vary within this window depending on species present).

In addition, we recommend that on-site contract personnel including project-designated inspectors be trained to identify colonial nesting birds and their nests and avoid affecting them during the breeding season (i.e., the time period outside the activity window). Should on-site contractors and inspectors observe potential nesting activity, coordination with the LDWF and the Service should occur. If no nesting colonies are found within 1000 feet (2000 feet for Brown Pelicans) of the proposed project, no further consultation with the LDWF and the Service will be necessary. If you have any questions or need additional information on birds from the LDWF, please contact Rob Dobbs at 337-735-8675.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior [authorization](#) by the Department of Interior U.S. Fish and Wildlife Service. The following migratory birds may be present at your project location at certain times of the year.

Common Name	Species name	Breeding Season
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Sep 1 to Jun 1
Chimney Swift	<i>Chaetura pelagica</i>	Mar 15 to Aug 25
Dickcissel	<i>Spiza americana</i>	May 5 to Aug 31
Gull-billed Tern	<i>Gelochelidon nilotica</i>	May 1 to Jul 31
Kentucky Warbler	<i>Oporornis formosus</i>	Apr 20 to Aug 20
Lesser Yellowlegs	<i>Tringa flavipes</i>	Breeds Elsewhere
Little Blue Heron	<i>Egretta caerulea</i>	Mar 10 to Oct 15
Painted Bunting	<i>Passerina ciris</i>	Apr 25 to Aug 15
Pectoral Sandpiper	<i>Calidris melanotos</i>	Breeds elsewhere
Prairie Warbler	<i>Dendroica discolor</i>	May 1 to Jul 31
Prothonotary Warbler	<i>Protonotaria citrea</i>	Apr 1 to Jul 31
Reddish Egret	<i>Egretta rufescens</i>	Mar 1 to Sep 15
Rusty Blackbird	<i>Euphagus carolinus</i>	Breeds elsewhere
Sandwich Tern	<i>Thalasseus sandvicensis</i>	Apr 25 to Aug 31
Swallow-tailed Kite	<i>Elanoides forficatus</i>	Mar 10 to Jun 30
Wood Thrush	<i>Hylocichla mustelina</i>	May 10 to Aug 31

Table 1: Migratory birds of note in study area.

Refuges and Wildlife Management Areas and CWPPRA Projects

It is likely the proposed levee construction will impact Mandalay National Wildlife Refuge (NWR). Should levee construction fall within the Mandalay NWR, said construction would not be compatible with the purposes for which the refuge was established. The Service recommends avoiding impacts on the Mandalay NWR. If impacts cannot be avoided, impacts will need to be mitigated for on the Mandalay NWR. Please coordinate all activities that may take place on Mandalay NWR with refuge staff and with Mr. Pon Dixon, Project Leader of the Bayou Sauvage Urban NWR Complex (985/882-2014).

EVALUATION METHODOLOGY

To quantify anticipated indirect project impacts to fish and wildlife resources, the Service used the 2017 (version 2) USACE Approved Wetland Value Assessment (WVA) models. The WVA model was developed to evaluate restoration projects proposed for funding under Section 303 of the CWPPRA and was modified through the USACE approval process for use in the USACE planning process. These models are approved for regional use on USACE Civil Works projects. Further information on this model may be obtained from the USACE's New Orleans District, Regional Planning and Environmental Division South at <https://ecolibrary.planusace.us/> (use the search term "WVA"). The WVA quantifies changes in fish and wildlife habitat quality and quantity that are expected to result from a proposed project. The WVA operates under the assumption that optimal conditions for fish and wildlife habitat within a given coastal wetland habitat 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 or expressed using community models developed specifically for each habitat type. The results of the WVA, measured in Average Annual Habitat Units (AAHUs), can be combined with cost data to provide

a measure of the effectiveness of a project in terms of cost per AAHU gained or lost.

The WVA community models have been designed to function at a community level and therefore attempt to define an optimum combination of habitat conditions for all fish and wildlife species utilizing a given habitat type. 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. Each model consists of 1) a list of variables that are considered important in characterizing fish and wildlife habitat, 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 Suitability Index for each variable into a single value for habitat quality; that single value is referred to as the Habitat Suitability Index, or HSI. The output of each model (the HSI) is assumed to have a linear relationship with the suitability of a coastal wetland system in providing fish and wildlife habitat. The WVA models assess the suitability of each habitat type for providing resting, foraging, breeding, and nursery habitat to a diverse assemblage of fish and wildlife species. This standardized, multi-species, habitat-based methodology facilitates the assessment of project-induced impacts on fish and wildlife resources.

Field data were used in conjunction with the above-discussed mathematical models to compute an HSI value for each target year (TY). Target years were established when significant changes in habitat quality or quantity were expected during the 61-year project life, under future with-project and future without-project conditions.

The product of an HSI value and the acreage of available habitat for a given target year is known as the Habitat Unit (HU). The HU is the basic unit for measuring project effects on fish and wildlife habitat. Future HUs change according to changes in habitat quality and/or quantity. Results are annualized over the project life 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 habitat being evaluated; a net loss of AAHUs indicates that the project is damaging to that habitat type. In determining future with-project conditions, all project-related direct (construction) impacts were assumed to occur in TY1.

Three types of USACE certified WVAs were used to determine direct impacts to fish and wildlife resources: bottomland hardwood (BLH), swamp, and fresh/intermediate marsh. For all three WVAs, data was collected both in the field, using satellite imagery, and Coastwide Reference Monitoring System (CRMS) data.

The WVA fresh/intermediate marsh model consists of six variables: 1) percent of wetland covered by emergent vegetation; 2) percent open water dominated by submerged aquatic vegetation (SAV); 3) degree of marsh edge and interspersion; 4) percent of open water less than or equal to 1.5 feet deep; 5) mean high salinity during the growing season; and 6) aquatic

organism access. The WVA model for swamp consists of seven variables: 1) stand structure; 2) stand maturity; 3) water regime; 4) mean high salinity during the growing season; 5) size of contiguous forested area; 6) Suitability and traversability of surrounding land uses and 7) disturbance. The WVA model for bottomland hardwood consists of seven variables: 1) tree species composition; 2) stand maturity; 3) understory/midstory cover; 4) hydrology; 5) size of contiguous forested area; 6) Suitability and traversability of surrounding land uses and 7) disturbance. Changes in each variable are predicted for future without-project and future with-project scenarios over a 61-year project life. By incorporating variables for SAV and shallow open water into each of the marsh models, impacts to those habitat components are combined with impacts to emergent marshes. Because emergent marsh is of higher overall fish and wildlife value than SAV, and because SAV is of higher value than shallow open water, those latter components receive proportionally less weight when combined into one AAHU value. The swamp and BLH models do not include SAV or shallow open water variables; hence, impacts to those habitats are not included in the WVA analysis for swamp.

Further explanation of how impacts/benefits are assessed within the WVA process and an explanation of the assumptions affecting HSI values for each target year are available for review at the Fish and Wildlife Service’s (Service) Louisiana Ecological Services field office (<https://ecos.fws.gov/ServCat/Reference/Profile/163129>).

PROJECT IMPACTS

Habitat Types

A total of 333.7 acres of habitat are expected to be negatively impacted leading to a loss of 169.9 AAHUs. This includes 18.1 acres of swamp (-9.7 AAHUs), 14.4 acres bottomland hardwood (-3.6 AAHUs) and 301.2 acres marsh (-156.6 AAHUs).

Reach A Segment	Swamp Impact Acres	Swamp Impact AAHUs	BLH Impact Acres	BLH Impact AAHUs	Marsh Impact Acres	Marsh Impact AAHUs
North of GIWW						
West of Hansons Ridge	13.86	-7.25	0.86	-0.37	14.16	-7.30
East of Hansons Ridge	4.28	-2.44	5.53	-1.11	56.27	-30.24
South of GIWW						
On Mandalay National Wildlife Refuge	0.00	0.00	0.85	-0.15	51.32	-29.06
From Refuge boundary southward to Constr Segment	0.00	0.00	0.69	-0.18	17.75	-9.93
Construction Segment	0.00	0.00	1.76	-0.63	145.70	-72.47
South of Constr segment to north of Marmande Ridge	0.00	0.00	4.10	-1.16	15.08	-7.14
On Marmande Ridge*	0.00	0.00	0.49	0.00	0.00	0.00
South of Marmande Ridge	0.00	0.00	0.10	-0.04	0.89	-0.44
TOTALS	18.13	-9.69	14.39	-3.64	301.16	-156.58

Table 2: Impact acres and AAHUs

Fishery Resources

Based on hydrologic modeling by the USACE and coordination between the Service and the NMFS impacts to fisheries resources from the construction of Reach A have been minimized. There will be direct impacts to channel beds due to the construction of structures. This may

result in take of species on, or within, the substrate. The USACE should continue to coordinate with the Service and the NMFS when developing water control structure operational plans.

To minimize impacts to fisheries, flood protection water control structures in any watercourse should maintain pre-project cross section in width and depth to the maximum extent practicable. Water control structures within a waterway should include shoreline baffles and/or ramps (e.g., rock rubble, articulated concrete mat) that slope up to the structure to enhance organism passage. Various ramp designs should be considered. Please coordinate with the NMFS' Craig Gothreaux (craig.gothreaux@noaa.gov) on this issue.

Essential Fish Habitat

Based on hydrologic modeling by USACE and coordination between the Service and the NMFS, both direct and indirect impacts to EFH from the construction of Reach A have been minimized. Total direct impacts to EFH include the constructible features and is represented as the marsh impact acres of 301.16 from Table 2. Indirect impacts to enclosed marshes is still being negotiated. USACE should mitigate for all impacts to essential fish habitat and continue to coordinate with the Service and the NMFS when developing water control structure operational plans that might lead to increased impacts.

Wildlife

Wildlife will likely be disturbed during levee construction. The majority of take will be plant life with some take of animals that do not vacate construction areas. Wildlife will likely return to areas post construction but will face the loss and fragmentation of habitat. Full recovery of affected areas may take many years due to the slow repopulation of some species.

Threatened and Endangered Species

The USACE is responsible for determining whether the proposed Project is likely (or not likely) to adversely affect any listed species and/or critical habitat, and for requesting the Service's concurrence with that determination. If USACE determines, and the Service concurs, that the selected alternative is likely to adversely affect listed species and/or critical habitat, a request for formal consultation in accordance with Section 7 of the ESA should be submitted to the Service. That request should also include USACE's rationale supporting their determination.

Migratory Bird Treaty Act (MBTA) and Bald and Eagle Protection Act (BGEPA)

During project construction, the Service recommends that on-site contract personnel be informed of the need to identify nesting bald eagles and colonial nesting birds and their nests and should avoid affecting them during the breeding season.

At-Risk Species and Gulf Coast Joint Venture

The project is not expected to have long term benefits or negative impacts to Gulf Coast Venture species. But there will be some level of habitat destruction and fragmentation that will impact species' historic feeding, resting and nesting habits.

FWS Concerns

The Service highly recommends adjusting the northern (Figure 5) and western (Figure 6) reaches of the levee to avoid swamp forest habitats. Additionally, if organic soils must be removed prior to levee construction, those organic soils should be used to create or restore emergent wetlands to the greatest extent possible or be used for levee construction as suggested by USACE.

Material from dredging or borrow pits should not be piled outside of the ROW. If it becomes necessary to use borrow sources other than the previously proposed environmentally cleared sites, the Service recommends USACE begin investigating potential borrow sources in coordination with the Service. Borrow sites to be considered should have minimal impacts to fish and wildlife resources. The Service identified a priority selection process and list for borrow sites in our November 15, 2023, Planning-aid letter to USACE (Appendix 1). That prioritization process should be utilized if additional borrow sites are needed (please contact Cathy Breaux (337)291-3122 for more information).

The President's Council on Environmental Quality defined the term "mitigation" in the National Environmental Act regulations to include:

- avoiding the impact altogether by not taking a certain action or parts of an action;
- minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- compensation for the impact by replacing or providing substitute resources or environments.

Coastal marshes and forested wetlands are considered by the Service to be aquatic resources of national importance due to their increasing scarcity and high habitat value for fish and wildlife within Federal trusteeship (i.e., migratory waterfowl, wading birds, other migratory birds, threatened and endangered species, and interjurisdictional fisheries). The Service's mitigation policy (Federal Register, Volume 46, Number 15, pages 7656-7663, January 23, 1991) provides guidance to help ensure that the level of mitigation recommended by the Service is consistent with the value and scarcity of the fish and wildlife resources involved. In keeping with that policy, the Service usually recommends that losses of high-value habitats which are becoming scarce be avoided or minimized to the greatest extent possible. Unavoidable losses of such habitats should be fully compensated by replacement of the same kind of habitat value; this is called "in-kind" mitigation. The Service should be consulted in the development of plans and specifications for mitigation features.

To avoid unplanned shortfalls in mitigation acreage, the Service recommends that the target marsh acreage be calculated to exclude any internal borrow areas used for construction of the marsh creation area containment dikes. Internal borrow areas for containment dike construction often never vegetate. Hence all the acreage within the containment dikes does not become marsh and a shortfall in created marsh may occur. Marsh creation projects must provide at least the required acreage within 3 years of project implementation to be considered as having achieved the intended mitigation. This will depend on achieving a settled disposal area elevation conducive to growth of marsh vegetation.

With the new definition of the Waters of the United States (WOTUS, published Aug 29, 2023) all enclosed (protected side) wetlands may be redefined as non-jurisdictional wetlands because of this project, thus impacting all enclosed wetlands. There is concern that this would increase developmental pressures on enclosed wetlands. Currently, the USACE is awaiting guidance on implementation of that new rule. The Service recommends the USACE coordinates with us once that guidance is received to ensure protection of enclosed wetlands. Enclosed Wetlands will still be connected hydrologically and thus will still be tidally influenced via the planned major structures (i.e., floodgates) and any additional environmental structures and/or culverts, etc. For this reason, it is the NMFS' opinion that the enclosed wetlands in question should be exempt from redefinition implications.

Where wetlands would be enclosed with the Reach A levee, drainage evaluations should be conducted to ensure that moderate to heavy rainfall events do not result in prolonged elevated water level conditions resulting in adverse wetland impacts. GIWW Floodgate sluice gates should be kept open, except in the event of a tropical storm, to allow exchange and tidal flow within the system. Operational plans for floodgates and water control structures should be developed to maximize the open cross-sectional area for as long as possible. Water control structure operation manuals or plans should be developed in coordination with the Service and other natural resource agencies.

The trigger for structure closures would be tropical storm events. Therefore, the project would not close the system more often due to higher day-to-day sea level rise impacts. If the sponsor/operator sees a higher level of sea level rise and starts to see increased soil saturation/flooding in developed areas, they may want to change the operations to close the structures at high tides. A change in operations would be considered a separate project purpose and authorization and would require a new NEPA documentation and/or approval for this operational change. It is unknown at present how water levels within the system would be managed if a change in operation due to RSLR is realized. Hence, there is a potential for substantial additional indirect impacts to swamp and fish and wildlife resources to occur. If the system is closed more often due to higher RSLR impacts, the Service recommends additional impacts be evaluated and mitigated.

SERVICE POSITION AND RECOMMENDATIONS

1. Coastal marshes and forested wetlands are considered by the Service to be aquatic resources of national importance due to their increasing scarcity and high habitat value for fish and wildlife within Federal trusteeship (i.e., migratory waterfowl,

- wading birds, other migratory birds, threatened and endangered species, and interjurisdictional fisheries). The Service's mitigation policy (Federal Register, Volume 46, Number 15, pages 7656-7663, January 23, 1991) provides guidance to help ensure that the level of mitigation recommended by the Service is consistent with the value and scarcity of the fish and wildlife resources involved. In keeping with that policy, the Service usually recommends that losses of high-value habitats which are becoming scarce be avoided or minimized to the greatest extent possible. Unavoidable losses of such habitats should be fully compensated by replacement of the same kind of habitat value; this is called "in-kind" mitigation. The Service should be consulted in the development of plans and specifications for mitigation features.
2. If organic soils must be removed prior to levee construction, those organic soils should be used to create or restore emergent wetlands to the greatest extent possible or be used for levee construction as suggested by USACE.
 3. Care should be taken to avoid impacts to bald eagles and their nesting habitat. Prior to and during any project construction, on-site personnel should be informed of the possible presence of nesting bald eagles in the vicinity of the project boundary, and should identify, avoid, and immediately report any such nests to this office. Prior to construction, the Service and the LDWF recommend that a qualified biologist inspect the proposed work site for the presence of undocumented nests during the nesting season (October through mid-May). If an active or inactive eagle nest is discovered within 1,500 feet of the project footprint, then follow the [bald and golden eagle guidelines](#) to determine whether disturbance will occur and/or an incidental take permit is needed. Any take should be reported to this office and the LDWF. Bald eagle nest (active, inactive, or seemingly abandoned) should be protected, and no large trees should be removed.
 4. 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 contact this office. Should a proposed action directly or indirectly affect the West Indian manatee, further consultation with this office will be necessary.
 5. Avoid adverse impacts to nesting wading bird colonies through careful design of project features and timing of construction. The Service and the LDWF recommend that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season (September 1 through February 15).

6. Avoid adverse impacts to alligator snapping turtle by minimizing disturbance and alteration of nesting habitat, particularly in the nesting season (April-June), including minimizing the removal of log jams in streams.
7. The Service recommends avoiding impacts on the Mandalay National Wildlife Refuge (NWR). If impacts cannot be avoided, impacts will need to be mitigated for on the Mandalay NWR. Please coordinate all activities with refuge staff and with Mr. Pon Dixon, Project Leader of the Bayou Sauvage Urban NWR Complex (985/882-2014).
8. The impacts to Essential Fish 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.
9. Access roads across existing wetlands should be avoided if possible and secondary impacts to wetland hydrology should be prevented or reduced. To avoid changes to hydrology the Service recommends appropriately sized culverts (minimum 24-inch culverts) be installed and maintained every 250 feet across access roads through wetlands with additional culverts placed at stream crossings and drainage features. Alternatively, upon completion of construction activities, access roads should be degraded to restore natural hydrology.
10. To the greatest extent possible, design (e.g., implementation of “T”-walls, sheet-pile, and/or cement floodwall in levee designs) and position flood protection features so that destruction of forested and emergent wetlands is avoided or minimized.
11. North of the GIWW, the Service recommends that the levee alignment be adjusted slightly to avoid impacts to several areas of bald cypress swamp forest (Figure 5).
12. To avoid impacts to swamp forest, the Service recommends that the westernmost levee reach be relocated onto agricultural lands rather in the swamp/wetlands (Figure 6).
13. Please include this office in future considerations of programmatic features and any planned levee lifts as additional consultation will likely be necessary.
14. Where wetlands would be enclosed with the Reach A levee, drainage evaluations should be conducted to ensure that moderate to heavy rainfall events do not result in prolonged elevated water level conditions resulting in adverse wetland impacts.
15. To avoid unplanned shortfalls in mitigation acreage, the Service recommends that the target marsh acreage be calculated to exclude any internal borrow areas used for construction of the marsh creation area containment dikes.

- a. Marsh creation projects must provide at least the required acreage within 3 years of project implementation to be considered as having achieved the intended mitigation. This will depend on achieving a settled disposal area elevation conducive to growth of marsh vegetation.
16. With the new definition of the Waters of the United States (WOTUS, published Aug 29, 2023) all enclosed (protected side) wetlands may be redefined as non-jurisdictional wetlands because of this project, thus impacting all enclosed wetlands. There is concern that this would increase developmental pressures on enclosed wetlands. Currently, the USACE is awaiting guidance on implementation of that new rule. The Service recommends the USACE coordinates with us once that guidance is received to ensure protection of enclosed wetlands. Enclosed Wetlands will still be connected hydrologically and thus will still be tidally influenced via the planned major structures (i.e., floodgates) and any additional environmental structures and/or culverts, etc. For this reason, it is the NMFS' opinion that the enclosed wetlands in question should be exempt from redefinition implications.
17. GIWW Floodgate sluice gates should be kept open, except in the event of a tropical storm, to allow exchange and tidal flow within the system. Operational plans for floodgates and water control structures should be developed to maximize the open cross-sectional area for as long as possible. Water control structure operation manuals or plans should be developed in coordination with the Service and other natural resource agencies.
18. The trigger for structure closures would be tropical storm events. Therefore, the project would not close the system more often due to higher day-to-day sea level rise impacts. If the sponsor/operator sees a higher level of sea level rise and starts to see increased soil saturation/flooding in developed areas, they may want to change the operations to close the structures at high tides. A change in operations would be considered a separate project purpose and authorization and would require a new NEPA documentation and/or approval for this operational change. It is unknown at present how water levels within the system would be managed if a change in operation due to RSLR is realized. Hence, there is a potential for substantial additional indirect impacts to wetland habitat and fish and wildlife resources to occur. If the system is closed more often due to higher RSLR impacts, the Service recommends additional impacts be evaluated and mitigated.
19. To minimize impacts to fisheries, flood protection water control structures in any watercourse should maintain pre-project cross section in width and depth to the maximum extent practicable. Water control structures within a waterway should include shoreline baffles and/or ramps (e.g., rock rubble, articulated concrete mat) that slope up to the structure to enhance organism passage. Various ramp designs should be considered. Please coordinate with the NMFS' Craig Gothreaux (craig.gothreaux@noaa.gov) on this issue.
20. Material from dredging or borrow pits should not be piled outside of the ROW.

21. If it becomes necessary to use borrow sources other than the previously proposed environmentally cleared sites, the Service recommends USACE begin investigating potential borrow sources in coordination with the Service. Borrow sites to be considered should have minimal impacts to fish and wildlife resources. The Service identified a priority selection process and list for borrow sites in our November 15, 2023, Planning-aid letter to USACE (Appendix 1). That prioritization process should be utilized if additional borrow sites are needed (please contact Cathy Breaux (337) 291-3122 for more information).

22. 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 this consultation should occur before changes are made and or finalized.

LITERATURE CITED

- Flores, R.E., and W.R. Eddleman. 1995. California black rail use of habitat in southwestern Arizona. *The Journal of Wildlife Management* 59:357–363.
- Paille, R.F. 1997. Lower Atchafalaya Basin Re-Evaluation Study: a Planning Aid Report on Freshwater Inflows to the Terrebonne Basin. U.S. Fish and Wildlife Service, Ecological Services, Lafayette, LA. 28 pp.
- Turner, R.E. 1977. Intertidal vegetation and commercial yields of penaeid shrimp. *Trans. Am. Fish. Soc.* 106:411-416,
- Turner, R.E. 1982. Wetland losses and coastal fisheries: an enigmatic and economically significant dependency, Pages 112 - 120. *In* Boesch, D.F., ed. 1982. Proceedings of the conference on coastal erosion and wetland modification in Louisiana: causes, consequences, and options. U.S. Fish and Wildlife Service, Biological Service Program, Washington, D.C. FWS/OBS-82/59. 256 pp.

APPENDIX A



United States Department of the Interior

FISH AND WILDLIFE SERVICE
200 Dulles Drive
Lafayette, Louisiana 70506



November 15, 2023

Colonel Cullen Jones
District Commander
U.S. Army Corps of Engineers
New Orleans District
7400 Leake Avenue
New Orleans, LA 70118-3651

Dear Colonel Jones:

As you know, the U.S. Fish and Wildlife Service (Service) is assisting the U.S. Army Corps of Engineers (USACE) in assessing impacts of, and mitigation requirements for, borrow sites which are needed to complete authorized improvements, and to construct Federal and non-Federal hurricane/flood protection levees in southern Louisiana. This planning-aid letter is provided in accordance with the Endangered Species Act of 1973 (ESA, 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), Fish and Wildlife Coordination Act (FWCA, 48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and the Migratory Bird Treaty Act (MBTA, 40 Stat. 755, as amended; 16 U.S.C. 703 et seq.), but it does not constitute the final report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act.

Identification of borrow areas are needed to complete multiple flood risk reduction projects. To first avoid and then minimize impacts to wetlands and fish and wildlife resources, the Service recommends the use of a protocol that prioritizes selection of borrow sites. In previous projects, such as the Hurricane and Storm Damage Risk Reduction System (HSDRRS) a protocol for borrow was developed which prioritized site selection in the following order: (1) existing commercial pits, (2) upland sources, (3) previously disturbed/manipulated wetlands within a levee system, and (4) low-quality wetlands outside a levee system. The Service supports the use of such protocols to avoid and minimize impacts to wetlands and bottomland hardwoods within project areas. Avoidance and minimization of those impacts helps to provide consistency with restoration strategies and compliments the authorized hurricane/flood protection efforts. Such consistency is also required by Section 303(d)(1) of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA).

Accordingly, the Service recommends that prior to utilizing borrow sites, every effort should be made to reduce impacts by using sheet-pile and/or floodwalls to increase levee heights wherever feasible. In addition, the Service recommends that the following protocol be adopted and utilized to identify borrow sources in descending order of priority:

1. First consider permitted commercial sources, authorized borrow sources for which environmental clearance and mitigation have been completed, or non-functional levees after newly constructed adjacent levees are providing equal protection.
2. Next consider areas under forced drainage that are protected from flooding by levees, and that are:
 - a. non-forested (e.g., pastures, fallow fields, abandoned orchards, former urban areas) and non-wetlands;
 - b. wetland forests dominated by exotic tree species (i.e., Chinese tallow-trees) or non-forested wetlands (e.g., wet pastures), excluding marshes; or,
 - c. disturbed wetlands (e.g., hydrologically altered, artificially impounded).
3. Third, consider sites that are outside a forced drainage system and levees, and that are:
 - a. non-forested (e.g., pastures fallow fields, abandoned orchards, former urban areas) and non-wetlands;
 - b. wetland forests dominated by exotic tree species (i.e., Chinese tallow-trees) or non-forested wetlands (e.g., wet pastures), excluding marshes; or,
 - c. disturbed wetlands (e.g., hydrologically altered, artificially impounded).

The Service offers the following additional recommendations for reducing borrow site impacts on fish and wildlife resources and, where feasible, enhancing those resources. However, these additional recommendations should not be implemented if they would result in the expansion of existing borrow pits or construction of new borrow pits in wetlands or bottomland hardwoods.

1. A minimum of 30 percent of the borrow pit's edge should slope no greater than 5 horizontal (H):1 vertical (V), starting from the water line down to a depth of approximately 5 feet.
2. Most of the woody vegetation removed during clearing and grubbing should be placed into the deepest parts of the borrow pits, and the remaining debris should be placed in the water along the borrow pit shorelines, excluding those areas where the 5H:1V slope, per recommendation 1, have been constructed.
3. Following construction, perimeter levees (if constructed) around each borrow pit should be gapped at 25-foot intervals with an 8-foot-wide breach, the bottom elevation of which should be level with the adjacent natural ground elevation.

When avoidance and minimization of bottomland hardwood and wetland impacts is not practicable, all unavoidable net losses of those habitats should be fully offset via compensatory mitigation. Such compensatory mitigation should be sited within the watershed and/or hydrologic unit where the impact occurred, and should be completed concurrently with borrow operations, or as soon as possible thereafter.

To assist in expediting the identification of borrow sites that potentially meet the protocol, the Service has utilized a Geographic Information System to develop a map identifying potential borrow areas (Attached). A National Resource Conservation Service soils database was combined with a National Oceanic and Atmospheric Administration land classification database for the parishes where Federal hurricane protection projects exists. Only those soils and land use categories having the highest probability of providing soils suitable for levee construction while minimizing

impacts to fish and wildlife resources were identified. The Service realizes that those databases may contain errors or that conditions could have changed since the databases were developed. Therefore, some identified sites may not meet the borrow protocol, and site inspections would be necessary. The Service also recognizes that other factors may also limit the use of the identified sites, such as prior land use and size. Nonetheless, the Service recommends that the USACE investigate all borrow areas identified on the attached map and maintain a record for each site including site conditions and reasons for rejecting a site. Prior to investigating wetlands as a potential borrow source the Service recommends that a review of those records be conducted with the Service and other natural resource agencies. However, such a review would not automatically result in the Service's agreement that due diligence to avoid wetlands has been achieved and that other areas not indicated on the map should not be investigated. The Service is willing to assist in the site assessment of the borrow areas.

The combined need for borrow necessary to complete authorized improvements to and construction of Federal and non-Federal hurricane/flood protection levees, and the potential construction of levees capable of withstanding a category 5 hurricane, will require substantial amounts of borrow. It is highly likely such amounts would exceed local availability. In the case of ongoing hurricane/flood protection projects (e.g., Morganza to the Gulf, West Shore Lake Pontchartrain, Saint Tammany Parish, Upper Barataria Basin, etc.) the search for levee-building material has been conducted primarily on project-by-project basis. In the context of such project-by-project searches for borrow material, the least-expensive and easiest sources of borrow material are usually located within wetlands and/or bottomland hardwoods, adjacent to the proposed levee. Such on-site sources, however, often involve adverse impacts to wetlands, thus exacerbating the overall wetland loss problem in all coastal basins, especially those in the deltaic plain of southeast Louisiana. In short, while such on-site sources are relatively inexpensive, they will frequently be inconsistent with coastal restoration efforts and, to the extent that wetlands will be adversely impacted, use of those sites will be counterproductive with respect to minimizing wetland impacts and attaining the goal of increasing non-structural hurricane protection within a sustainable ecosystem.

Large-scale, off-site borrow sources could have the potential to reduce environmental impacts from levees and expedite project-by-project environmental review. Such potential "programmatic" borrow sources could include uplands along the Mississippi River, beneficial use of sediments dredged for navigation purposes (including the mining of disposal sites), the Mississippi River, and offshore deposits (e.g., Ship Shoal). As part of the planning process, we recommend that the USACE begin investigating the practicability of various large-scale, off-site borrow sources and actively involve all resource agencies with the Regional Planning and Environment Division, South (RPEDS) Office's Borrow Team efforts.

Programmatic planning would be essential to identify borrow sites of acceptable quantity and quality, while avoiding and/or minimizing adverse environmental impacts. We therefore recommend that a plan be developed that integrates borrow resources, uses, and needs for various programs and activities. Guiding principles should be developed to identify borrow resources, borrow-site designs, and prioritize uses to avoid competing for resources, maximize benefits with those resources, and avoid adverse environmental impacts.

We appreciate the opportunity to provide this planning-aid letter and would be pleased to assist your agency in further identification of potential borrow sources. Should you or your staff have any questions regarding this letter, please contact Cathy Breaux (337/291-3122) of this office.

Sincerely,



Brigitte D. Firmin
Field Supervisor
Louisiana Ecological Services Office

Enclosure

cc: National Marine Fisheries Service, Baton Rouge, LA
EPA, Dallas, TX
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources, CMD, Baton Rouge, LA
CPRA, Baton Rouge, LA

ENCLOSURE: Map of suitable habitat and soils for borrow sites.

