APPENDIX M: AGENCY COORDINATION

20170526_EA-543_NOV

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF

May 26, 2017

Regional Planning and
Environment Division, South
Environmental Planning Branch

Mr. Joseph Ranson
U.S. Fish and Wildlife Service (USFWS)
646 Cajundome Blvd - Suite 400
Lafayette, LA 70506

This project has been reviewed for effects to Federal trust resources under our jurisdiction and currently protected by the Endangered Species Act of 1973 (Act). The project, as proposed,
( ) Will have no effect on those resources
(✓) Is not likely to adversely affect those resources.
This finding fulfills the requirements under Section 7(a)(2) of the Act.

Joseph H. R 07 Jul 17 (ps, WIM)

Acting Supervisor — Date
Louisiana Field Office
U.S. Fish and Wildlife Service

Dear Mr. Ranson:

The US Army Corps of Engineers, New Orleans District (CEMVN), is preparing an Environmental Assessment (EA) #543, entitled "*New Right of Way and Mitigation for the New Orleans to Venice (NOV) Hurricane Risk Reduction Project: Incorporation of Non-Federal Levees (NFL) from Oakville to St. Jude and the NOV Federal Hurricane Protection Levee, Plaquemines Parish, Louisiana*". CEMVN is initiating coordination under Section 7 of the Endangered Species Act of 1973 as amended (16 USC 1531). A Biological Assessment (BA) to address the potential impacts to T&E species and their critical habitat, as well as other protected species, is attached for your review.

Based on our assessment, and with the employment of avoidance measures recommended through guidelines set up during coordination with United States Fish and Wildlife Service (USFWS), the CEMVN requests concurrence with a "no effect" determination on the piping plover and the red knot and a "not likely to adversely affect" determination on the West Indian Manatee or the pallid sturgeon. CEMVN has also made the determination that the proposed action would not adversely impact other protected species that could potentially be found in the project area.

Please review the enclosed information and provide your opinion on the determination. Any questions or concerns should be directed to the attention of Ms. Tammy Gilmore; U.S. Army Corps of Engineers; Planning Division; Environmental Studies Branch; Coastal Section: CEMVN-PDN-CEP; P.O. Box 60267; New Orleans, Louisiana 70160-0267. Ms. Gilmore may be contacted at (504) 862-1002, by E-mail tammy.h.gilmore@usace.army.mil, or by fax to (504) 862-1892.

Sincerely,

for Eo M. Williams

Marshall K. Harper
Chief, Environmental Studies Branch

Enclosures

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

June 16, 2017

Colonel Michael N. Clancy
District Commander
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Clancy:

Please find enclosed the draft supplemental Fish and Wildlife Coordination Act Report for the proposed New Orleans to Venice, Louisiana, Hurricane Protection Project (NOV) – Incorporation of Nonfederal Levees from Oakville to St. Jude, Plaquemines Parish, Louisiana (NFL), project. This report is transmitted under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 United States Code (U.S.C.) 661 et seq.). The National Marine Fisheries Service and Louisiana Department of Wildlife and Fisheries have been provided a copy for comments; their comments will be incorporated into our final report.

Should your staff have any questions regarding the enclosed report, please have them contact David Walther of this office at 337/291-3122.

Sincerely,

Joseph Ranson
Supervisor
Louisiana Ecological Services Office

Enclosure

cc: EPA, Dallas, TX
NMFS, Baton Rouge, LA
LDWF, Baton Rouge, LA
LDNR, CMD, Baton Rouge, LA
CPRA, Baton Rouge, LA

Supplemental Draft
Fish and Wildlife Coordination Act Report

New Orleans to Venice, LA, Hurricane Protection Project: Incorporation of Nonfederal Levees from Oakville to St. Jude Plaquemines Parish, Louisiana

Provided to:
U.S. Army Corps of Engineers
New Orleans, Louisiana

Prepared by:
David Walther
Ecological Services
Lafayette, Louisiana

U.S. Fish and Wildlife Service
Southeast Region
Atlanta, Georgia

June 2017

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EXECUTIVE SUMMARY

The U.S. Fish and Wildlife Service (Service) has prepared this supplemental Fish and Wildlife Coordination Act Report for the proposed New Orleans to Venice, Louisiana, Hurricane Protection Project (NOV) – Incorporation of Nonfederal Levees from Oakville to St. Jude, Plaquemines Parish, Louisiana (NFL), under the authority of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 United States Code (U.S.C.) 661 et seq.). The U.S. Army Corps of Engineers, New Orleans District (CEMVN) is preparing an Environmental Assessment (EA) 543 to fulfill the CEMVN' compliance with the National Environmental Policy Act (NEPA) of 1969 (83 Stat. 852; 42 U.S.C. 4321 et seq.). Work proposed in that EA would be conducted under the authority of Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4). That law authorized the CEMVN to upgrade and incorporate certain nonfederal levees into the existing NOV project in Plaquemines Parish, Louisiana.

This report contains a description of the existing fish and wildlife resources of the project area, discusses future with- and without-project habitat conditions, identifies fish and wildlife-related impacts of the proposed project, and provides recommendations for the proposed project. This report incorporates and supplements the November 26, 2007, Draft Programmatic FWCA Report that addresses the hurricane protection improvements authorized in Supplemental 4; our draft and final reports on this project dated December 20, 2010, April 27, 2011, and March 10, 2016 report. Impacts and mitigation needs resulting from government and contractor provided borrow areas have been addressed in the October 25, 2007, and November 1, 2007, FWCA Reports, respectively; therefore, this report will not address those project features. This document, when finalized, constitutes the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. This report has been provided to the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) for comment; their comments will be incorporated into this report when finalized.

The NFL study area is located within the Barataria Basin of the Mississippi River Deltaic Plain of the Lower Mississippi River Ecosystem. It is defined by the Mississippi River to the east; forested and emergent wetlands to the west; a forested and emergent marsh complex and the town of Oakville, Louisiana, to the north; and the NOV hurricane protection system, emergent marsh, and the town of Magnolia, Louisiana, to the south. Within the NFL hurricane protection system, natural levees and lower lying wetlands have been leveed and drained to accommodate residential, commercial, and agricultural development; however, a majority of the land remains undeveloped. Undeveloped lands generally consist of bottomland hardwood and scrub-shrub habitats.

Study area wetlands support nationally important fish and wildlife resources including fresh marsh and cypress swamp. Factors that will strongly influence future fish and wildlife resource conditions outside of the protection levees include freshwater and sediment input and loss of coastal wetlands. Regardless of which of the above factors ultimately has the greatest influence, emergent wetlands within and adjacent to the project area will likely experience losses due to subsidence, erosion, and relative sea-level rise.

The CEMVN' selected alternative in the previous Final Environmental Impact Statement's (FEIS) included raising the existing hurricane protection levee system to provide a 50-year (yr) level of

protection. However, a risk analysis that was prepared for the project recommended changing the level of flood risk reduction from 50-yr to approximately 25-yr for two NFL reaches (i.e., Sections 2 and 3). The decreased level of risk reduction in some of the reaches made it possible to expand some level of flood protection throughout NFL Sections 1-5 and increase the level of risk reduction in areas that currently have limited or no flood protection. Changes addressed in this report include the expansion of levee right-of-way in levee reach NOV 05A that has resulted in additional impacts. Other project modifications are proposed at levee reaches NOV 09 and NOV-NF-W-05a.1 (La Reussite to Wilkinson Pump Station Levee); however these modifications will result in a decrease in impacts to wet bottomland hardwoods and wet pasture, respectively.

Those proposed modifications would require changes to the project's design that would result in realignments of the levees and floodwalls, as well as the need for additional access roads, staging areas, ramps, and other temporary work easements that were identified during design and not accounted for in the FEIS. Construction of the NFL hurricane protection system would result in direct impacts to non-wet and wet bottomland hardwood habitat (-37.5, and 120.2 AAHUs, respectively), swamp habitat (-33.8 AAHUs), fresh marsh and wet pasture (-53 AAHUs), and brackish, saline and intermediate marsh (-105.6 AAHUs).

SERVICE POSITION AND RECOMMENDATIONS

Construction of the NFL hurricane protection system would result in direct impacts to non-wet and wet bottomland hardwood habitat (-37.5, and 120.2 AAHUs, respectively), swamp habitat (-33.8 AAHUs), fresh marsh and wet pasture (-53 AAHUs), and brackish, saline and intermediate marsh (-105.6 AAHUs).

The Service does not object to providing improved hurricane protection to Plaquemines Parish, provided the following fish and wildlife conservation recommendations are incorporated into future project planning and implementation.

1. The CEMVN shall fully compensate for any unavoidable losses to non-wet and wet bottomland hardwood habitat (-37.5, and 120.2 AAHUs, respectively), swamp habitat (-33.8 AAHUs), fresh marsh and wet pasture (-53 AAHUs), and brackish, saline and intermediate marsh (-105.6 AAHUs) caused by project features. All aspects of mitigation planning should be coordinated with the Service, NMFS, the Environmental Protection Agency (EPA), the Louisiana Department of Natural Resources (LDNR), Coastal Protection and Restoration Authority (CPRA) and LDWF.

2. The Service recommends that mitigation alternatives include locating the mitigation within the basin where impacts occurred.

3. If a proposed project feature is changed significantly or is not implemented within one year of our latest Endangered Species Act consultation letter, we recommend that the CEMVN reinitiate coordination with the Service to ensure that the proposed project would not adversely affect any federally listed threatened or endangered species or their critical habitat.

4. Avoid adverse impacts to wading/colonial bird nesting colonies and bald eagle nesting locations through careful design of project features and timing of construction. A qualified biologist should inspect the proposed work site for the presence of undocumented wading bird nesting colonies and bald eagle nests within 1,000 feet of the work during the nesting seasons (i.e., February 16 through August 31 for wading bird colonies, and October through mid-May for bald eagles). In addition, we recommend that on-site contract personnel be informed of the need to identify colonial nesting birds and their nests, and should avoid affecting them during the breeding season.

5. For colonies containing nesting gulls, terns, and/or black skimmers (which may nest on newly deposited marsh creation material or retaining dikes), all activity occurring within 650 feet of a nesting site 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).

6. If a bald eagle nest is discovered within or adjacent to the proposed project area, then an evaluation must be performed to determine whether the project is likely to disturb nesting bald eagles. That evaluation may be conducted on-line at: http://www.fws.gov/southeast/es/baldeagle. Following completion of the evaluation, that website will provide a determination of whether additional consultation is necessary and those results should be forwarded to this office.

7. Forest clearing associated with project features should be conducted during the fall or winter to minimize impacts to nesting migratory birds to the maximum extent practicable.

8. Impacts to EFH should be avoided and minimized to the greatest extent possible. For proposed project areas that impact designated EFH habitat, coordination with the NMFS should be conducted.

9. Construction of mitigation or purchasing credit from an approved mitigation bank for all compensatory mitigation should be conducted concurrent with construction of the NOV - NFL projects, to ensure that mitigation obligations are met on behalf of the public interest.

10. We recommend that the CEMVN consider the availability of credits at a bank and within a hydrologic unit when evaluating the mitigation bank alternative to avoid exhausting credits available for individual landowners/permittee within a particular hydrologic unit.

11. Further detailed planning of mitigation features (e.g., Design Documentation Report, Engineering Documentation Report, Plans and Specifications, or other similar documents) should be coordinated with the Service, NMFS, EPA, LDNR, and LDWF, and the CEMVN shall provide them with an opportunity to review and submit recommendations on all work addressed in those reports.

12. Refinement of the mitigation potential as determined by the Wetland Value Assessment (WVA) for CEMVN constructed projects should be undertaken at the 30, 60 and 90 percent design stages. These refinements should be an interagency task and should utilize the most recent detailed design, geotechnical information, and relative sea level rise rates (RSLR).

13. Any proposed change in mitigation features or plans should be coordinated in advance with the Service, NMFS, LDWF, EPA and LDNR.

14. If applicable, a General Plan should be developed by the CEMVN, the Service, and the managing natural resource agency in accordance with Section 3(b) of the FWCA for mitigation lands.

15. Mitigation success criteria, monitoring and reporting requirements, and adaptive management should adhere to those developed for the Hurricane Storm Damage and Risk Reduction Study (HSDRRS) as presented in Appendix A.

16. The Service encourages the CEMVN to finalize mitigation plans and proceed to mitigation construction so that it will be concurrent with project construction. If construction is not concurrent with mitigation implementation then revising the impact and mitigation period-of-analysis to reflect additional temporal losses will be required.

17. The CEMVN should implement prior to initiation of construction and maintain during construction non-point source erosion control measures to protect wetlands and water bodies.

18. The CEMVN should ensure that clearing of forested vegetation does not result in impacts outside of the construction rights-of-way.

19. Fee title or an equivalent conservation easement should be acquired for any mitigation lands to preclude incompatible development and to ensure that the recommended mitigation values are maintained.

INTRODUCTION

The New Orleans to Venice Hurricane Protection (NOV) Project provides hurricane protection to developed and agricultural areas of Plaquemines Parish, Louisiana, along the Mississippi River below New Orleans. In coordination with the U.S. Army Corps of Engineers' (CEMVN) New Orleans District and the Louisiana Coastal Protection and Restoration Authority (CPRA, the nonfederal sponsor), the Vicksburg District prepared a Final Environmental Impact Statement (FEIS) for the incorporation of the nonfederal levees from Oakville to St. Jude (NFL), in Plaquemines Parish, Louisiana, into the existing NOV federal levee system. Based on a risk analysis the nonfederal levees revised plan of protection is to provide a 25-year level of protection. Detailed planning and engineering studies have revealed the need to further modify the project to provide access and staging areas, avoid existing oil and gas infrastructure and required rights-of-way (ROW) modifications. In addition, the selection of a tentative mitigation plan for project impacts has been completed. The proposed project would be built under the authority of Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery 2006 (Supplemental 4).

This report incorporates and supplements the November 26, 2007, Draft Programmatic Fish and Wildlife Coordination Act (FWCA) Report that addressed the hurricane protection improvements authorized in Supplemental 4 and our final reports on this project dated December 20, 2010, April 27, 2011, and March 10, 2016. Impacts and mitigation needs resulting from government and contractor provided borrow areas have been addressed in the October 25, 2007, and November 1, 2007, FWCA Reports, respectively; therefore, this report will not address those project features. This report only addresses the most recent modifications to the project and the tentatively selected mitigation plan. This document, when finalized, will constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. This report has been provided to the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) for comment; their comments will be incorporated into this report when finalized.

Our previous reports on this project contain a description of the existing fish and wildlife resources (including habitats) that occur within the study area. For brevity, that discussion is incorporated by reference herein but the following information is provided to supplement the previously mentioned reports and discusses future with- and without-project habitat conditions, identifies fish and wildlife-related impacts of the proposed project, and provides recommendations for the proposed project

Project Description

The goal of the proposed action is to improve the storm damage reduction capability of the NFL system in Plaquemines Parish, Louisiana (Figure 1). The proposed action would involve upgrading and providing new flood protection to the existing NFL system. The CEMVN' selected alternative in the previous FEIS included raising the existing hurricane protection levee system to provide a 50-yr level of protection. However, a risk analysis that was prepared for the project recommended changing the level of flood risk reduction from 50-yr to approximately 25-yr for two NFL reaches (i.e., Sections 2 and 3). The decreased level of risk reduction in some of the reaches would make it possible to

expand some level of flood protection throughout NFL Sections 1-5 and increase the level of risk reduction in areas that currently have limited or no flood protection.

The proposed change would require changes to the project's design that would result in realignments of the levees and floodwalls, as well as the need for additional access roads, staging areas, ramps, and other temporary work easements that were identified during design and not accounted for in the FEIS.

DESCRIPTION OF THE STUDY AREA

The NFL study area is located within the Barataria Basin of the Mississippi River Deltaic Plain of the Lower Mississippi River Ecosystem. It is defined by the Mississippi River to the east; forested and emergent wetlands to the west; a forested and emergent marsh complex and the town of Oakville, Louisiana, to the north; and the NOV hurricane protection system, emergent marsh, and the town of Magnolia, Louisiana, to the south. Within the NFL hurricane protection system, natural levees and lower lying wetlands have been leveed and drained to accommodate residential, commercial, and agricultural development; however, a majority of the land remains undeveloped. Undeveloped lands generally consist of bottomland hardwood and scrub-shrub habitats.

Description of Habitats

The major habitat types in the study area can be classified as estuarine emergent marsh, estuarine scrub-shrub wetlands, palustrine forested wetlands, wetland pasture, open water, and developed upland. Due to development and a forced-drainage system, the hydrology of the forested habitat within the Plaquemines Parish hurricane protection system has been altered. The forced-drainage system has been in operation for many years, and subsidence is evident throughout the areas enclosed by levees.

The coastal wetlands within the study area provide plant detritus to adjacent coastal waters and thereby contribute to the production of commercially and recreationally important fishes and shellfishes. Wetlands in the project area also provide valuable water quality functions such as reduction of excessive dissolved nutrient levels, filtering of waterborne contaminants, and removal of suspended sediment. In addition, coastal wetlands buffer storm surges reducing their damaging effect to man-made infrastructure within the coastal area.

Factors that will strongly influence future fish and wildlife resource conditions outside of the protection levees include freshwater input and loss of coastal wetlands. Depending upon the deterioration rate of marshes, the frequency of occasional short-term saltwater events may increase. Under that scenario, tidal action in the project area may increase gradually as the buffering effect of marshes is lost, and use of that area by estuarine-dependent fishes and shellfish tolerant of saltwater conditions would likely increase. Regardless of which of the above factors ultimately has the greatest influence, freshwater wetlands within and adjacent to the project area will probably experience losses due to development, subsidence, and erosion.

The ongoing loss of coastal Louisiana wetlands (approximately 1,149 square miles between 1956 and 2004; average loss rate of 24 square miles per year) was recently exacerbated by Hurricanes Katrina and Rita in 2005. Those hurricanes caused an initial loss of wetlands equivalent to 9 years

(approximately 217 square miles) of mean annual losses. Louisiana wetlands provide 26 percent of the seafood landed in the conterminous United States and over 5 million migratory waterfowl utilize those wetlands every year. In addition, those wetlands provide protection to coastal towns, cities and their infrastructure, as well as important infrastructure for the nation's oil and gas industry.

Non-wet bottomland hardwoods within the project area also provide habitat for wildlife resources. Between 1932 and 1984, the acreage of bottomland hardwoods in Louisiana declined by 45 percent (Rudis and Birdsey 1986). A large percentage of the original bottomland hardwoods within the Mississippi River floodplain in the Deltaic Plain are located within levees. However, losses of that habitat type are not regulated or mitigated with the exception of impacts resulting from CEMVN of Engineers projects as required by Section 906(b) of the Water Resources Development Act of 1986.

Terrestrial Habitats/Wildlife Resources

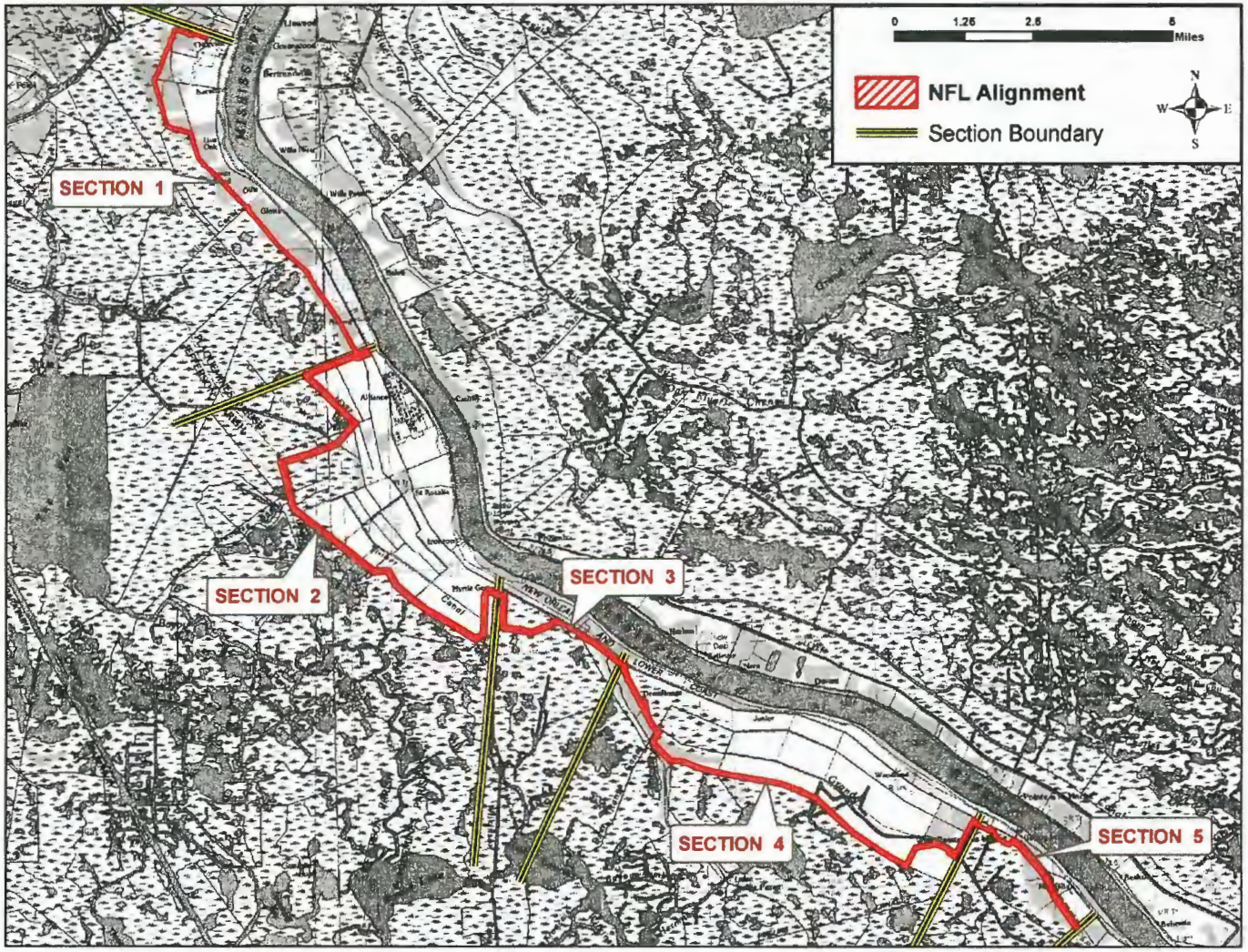
Forested habitats in the study area are divided into two major types; bottomland hardwood forests and cypress-tupelo swamps. Bottomland hardwood forests found in the study area occur primarily on the natural levees of the Mississippi River or former distributary channels. Most bottomland hardwoods that are located within the constructed hurricane protection projects have been degraded by forced drainage and resultant subsidence. Those areas are also often fragmented by development. Conversely, those bottomland hardwoods located outside the protection levees or in areas where structures through the levees maintain a hydrologic connection, still retain many wetland functions and values.

Cypress-tupelo 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, usually minimal daily tidal action and are usually flooded throughout most of the growing season. Cypress swamps that are within the levee system and under forced drainage are often dominated by bald cypress, but vegetative species more typical of bottomland hardwoods dominate the under- and mid-story vegetation. These sites often have ecological functions closer to those of a bottomland hardwood. Because of their altered hydrology, these areas may potentially convert to sites dominated by bottomland hardwood species.

Scrub-shrub habitat is often found along the flanks of distributary ridges and in marshes altered by spoil deposition, drainage projects, or agriculture. Typically it is bordered by marsh at lower elevations and by developed areas, cypress-tupelo swamp, or bottomland hardwoods at higher elevations. Some scrub-shrub habitat is an early successional stage of bottomland hardwood forests. Within the project area, scrub-shrub habitat occurs within abandoned agricultural fields, cattle pastures, at sites disturbed by hurricanes, or at sites experiencing subsidence.

Wetland pasture is often found between the distributary ridges and in marshes altered by spoil deposition, drainage projects, or agriculture. Typically it is bordered by marsh at lower elevations and by active agriculture lands, scrub-shrub habitat, or residential development at higher elevations. Some wetland pasture consists of marsh that is used for grazing cattle. Within the project area, wetland pasture occurs along the development/marsh interface or adjacent to or within the existing hurricane protection system.

Figure 1. New Orleans to Venice – Incorporation of Nonfederal Levees, Plaquemines Parish, Louisiana, (NFL) Study Area.



Marsh types within the study area include fresh, intermediate, brackish, and saline. Fresh marshes occur at the upper ends of inter-distributary basins and are often characterized by floating or semi-floating organic soils and minimal daily tidal action. Associated open water habitats may often support extensive beds of floating-leafed and submerged aquatic vegetation. Intermediate marshes are a transitional zone between fresh and brackish marshes and are often characterized by organic, semi-floating soils. Typically, intermediate marshes experience low levels of daily tidal action. Salinities are negligible or low throughout much of the year, with salinity peaks occurring during late summer and fall. Ponds and lakes within the intermediate marsh zone often support extensive submerged aquatic vegetation. Brackish marshes are characterized by low to moderate daily tidal energy and by soils ranging from firm mineral soils to organic semi-floating soils. Freshwater conditions may prevail for several months during early spring; however, low to moderate salinities occur during much of the year, with highest salinities in the late summer or fall. Shallow brackish marsh ponds occasionally support abundant beds of wigeongrass. Saline marshes occur along the fringe of the coastal wetlands. Those marshes usually exhibit fairly firm mineral soils and experience moderate to high daily tidal energy. Submerged aquatic vegetation is rare. Within the study area, intertidal mud flats are most common in saline marshes.

Mammals known to occur in the study-area bottomland hardwoods and marshes include white-tailed deer, mink, raccoon, swamp rabbit, nutria, river otter, and muskrat. Those habitats also support a variety of birds including herons, egrets, ibises, least bittern, rails, gallinules, olivaceous cormorant, anhinga, white pelicans, pied-billed grebe, black-necked stilt, sandpipers, gulls, and terns. Forested and scrub-shrub habitats within the study area also provide habitat for many resident passerine birds and essential resting areas for many migratory songbirds; many of these and other passerine birds have undergone a decline in population primarily due to habitat loss.

Given the extent of development and drainage, waterfowl use within the hurricane protection system is likely minimal, except in the adjacent wetlands outside the levees. Swamps and fresh and intermediate marshes usually receive greater waterfowl utilization than brackish and saline marshes because they generally provide more waterfowl food.

Developed Areas

Developed habitats in the study area include residential and commercial areas, as well as roads and existing levees. Those habitats do not support significant wildlife use. Most of the development is located on higher elevations of the Mississippi River natural levees and former distributary channels. Large amounts of agricultural lands occur throughout the area; agriculture includes citrus farming, cattle production, and hay production.

Aquatic Habitat/Fishery Resources

Open-water habitat within the project area consists of ponds, lakes, canals, bays, and bayous. Natural marsh ponds and lakes are typically shallow, ranging in depth from 6 inches to over 2 feet. Typically, the smaller ponds are shallow and the larger lakes and bays are deeper. In fresh and low-salinity areas, ponds and lakes may support varying amounts of submerged and/or floating-leaved aquatic vegetation. Brackish and, much less frequently, saline marsh ponds and lakes may support wigeongrass beds.

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.

Drainage canals enclosed within the hurricane protection project are stagnant except when pumps are operating to remove water. Runoff from developed areas has likely reduced the habitat value of that aquatic habitat by introducing various urban pollutants, such as oil, grease, and excessive nutrients. Clearing and development has eliminated much of the riparian habitat that would normally provide shade and structure for many aquatic species.

Drainage canals in the study area do not support significant fishery resources because of dense vegetation, poor water quality, and inadequate depth. Estuarine-dependent fishes and shellfishes are found in the intermediate to saline marshes.

Some of the waterbodies in the project area meet criteria for primary and secondary contact recreation and partially meet criteria for fish and wildlife propagation, while others do not meet the criteria for fish and wildlife propagation. Causes for not fully meeting fish and wildlife propagation criteria include excessive nutrients, organic enrichment, low dissolved oxygen levels, flow and habitat alteration, pathogens and noxious aquatic plants. Indicated sources of those problems include hydrologic modification, habitat modification, recreational activities, and unspecified upstream sources. Municipal point sources, urban runoff, storm sewers, and onsite wastewater treatment systems are also known contributors to poor water quality in the area.

Deteriorating water quality in the Barataria Basin, at least partially correlated to wetlands loss and a commensurate reduction in the area's waste assimilation capacity, is a major problem affecting fish and wildlife in that portion of the study area. According to Bahr et al. (1983), factors that currently adversely affect water quality in the Barataria Basin are those generally related to urban development and associated urban pollution (including non-point source discharge), altered land-use patterns, and hydrologic modifications (drainage, etc.) within the watershed. Two major human-related causes of water quality degradation include eutrophication and increased levels of toxic substances.

Essential Fish Habitat

Estuarine wetlands and associated intertidal and sub-tidal areas within the study area have been identified as Essential Fish Habitat (EFH) for post-larval, juvenile and sub-adult stages of brown shrimp, white shrimp, red drum, and Gulf stone crab, as well as the adult stages of those species in near-shore and offshore waters. EFH requirements vary depending upon species and life stage. Categories of EFH in the project area include estuarine emergent wetlands, estuarine water column, submerged aquatic vegetation, and estuarine water bottoms. Detailed information on federally managed fisheries and their EFH is provided in the 2005 generic amendment of the Fishery Management Plans for the Gulf of Mexico prepared by the Gulf of Mexico Fishery Management

Council. The generic amendment was prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; P.L. 104-297).

In addition to being designated as EFH for various federally managed species, wetlands and water bottoms in the project area provide nursery and foraging habitats for a variety of economically important marine fishery species such as blue crab, gulf menhaden, spotted seatrout, sand seatrout, southern flounder, and striped mullet. Some of these species serve as prey for other fish species managed under the Magnuson-Stevens Act by the Gulf of Mexico Fishery Management Council (e.g., mackerels, snappers, and groupers) and highly migratory species managed by NMFS (e.g., billfishes and sharks). Wetlands in the project area also produce nutrients and detritus, important components of the aquatic food web, which contribute to the overall productivity of the Barataria Bay estuary.

Endangered and Threatened Species

To aid the CEMVN in complying with their proactive consultation responsibilities under the Endangered Species Act (ESA), the Service provided a list of threatened and endangered species and their critical habitats within the coastal parishes of the New Orleans District in an August 7, 2006, letter to the CEMVN regarding construction of and improvements to Federal and nonfederal hurricane/flood protection levees throughout southern Louisiana. The Service recommended that the CEMVN conduct ESA consultation as soon as project-specific plans were developed and impact locations were identified. In our response dated June 9, 2017, the Service provided our concurrence that there are no federally listed species would be adversely impacted by the proposed project. However, should plans be changed significantly, or if work is not implemented within 1 year following that coordination, we recommend that the CEMVN conduct annual re-initiation of ESA coordination with this office to ensure that the proposed project (or any future changes or modifications) would not adversely affect any federally listed threatened or endangered species or their habitat.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.) and the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d) offer additional protection to many bird species within the project area including colonial nesting birds and the bald eagle (*Haliaeetus leucocephalus*).

The project area is located where colonial nesting waterbirds may be present. LDWF currently maintains a database of these colonies locations. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, we recommend that a qualified biologist inspect the proposed work sites for the presence of undocumented nesting colonies during the nesting season (e.g. February through September depending on the species). If colonies exist work should not be conducted within 1,000 feet of the colony during the nesting season.

The study-area forested wetlands provide nesting habitat for the bald eagle (*Haliaeetus leucocephalus*), which was officially removed from the List of Endangered and Threatened Species on August 8, 2007. Bald eagles nest in Louisiana from October through mid-May. Bald eagles generally nest in large trees located near coastlines, rivers, or lakes that support adequate food supplies. In the southeastern

Parishes, eagles typically nest in mature trees (e.g., bald cypress, sycamore, willow, etc.) near fresh to intermediate marshes or open water. Eagles may also nest in mature pine trees near large lakes in central and northern Louisiana. Major threats to this species include habitat alteration, human disturbance, and environmental contaminants (i.e., organochlorine pesticides and lead).

Breeding bald eagles defend "territories" that may be reoccupied annually. In addition to the active nest, a territory may include one or more alternate nests that are built and maintained by the eagles, but which are not used for nesting in a given year. Potential nest trees within a territory may, therefore, provide important alternative bald eagle nest sites. Bald eagles are vulnerable to disturbance during courtship, nest building, egg laying, incubation, and brooding. Disturbance during these periods may lead to nest abandonment, cracked and chilled eggs, and exposure of small young to the elements. Human activity near a nest late in the nesting cycle may also cause flightless birds to jump from the nest tree, thus reducing their chance of survival.

There are three known nest locations within 660 feet of Sections 1 and 2 of the NFL alignment. Although the bald eagle has been removed from the List of Endangered and Threatened Species, bald eagles and their nests continue to be protected under the MBTA and the BGEPA. The Service developed the National Bald Eagle Management (NBEM) Guidelines to provide landowners, land managers, and others with information and recommendations to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance," which is prohibited by the BGEPA. A copy of the NBEM Guidelines is available at: http://www.fws.gov/southeast/es/baldeagle/NationalBaldEagleManagementGuidelines.pdf. Those guidelines recommend: (1) maintaining a specified distance between the activity and the nest (buffer area); (2) maintaining natural areas (preferably forested) between the activity and nest trees (landscape buffers); and (3) avoiding certain activities during the breeding season. On-site personnel should be informed of the possible presence of nesting bald eagles within the project boundary, and should identify, avoid, and immediately report any such nests to this office. If a bald eagle nest occurs or is discovered within or adjacent to the proposed project area, then an evaluation must be performed to determine whether the project is likely to disturb nesting bald eagles. That evaluation may be conducted on-line at: http://www.fws.gov/southeast/es/baldeagle. Following completion of the evaluation, that website will provide a determination of whether additional consultation is necessary. Results of that determination should be provided to this office. The Division of Migratory Birds for the Southeast Region of the Service (phone: 404/679-7051, e-mail: SEmigratorybirds@fws.gov) has the lead role in conducting such consultations. If after consulting those guidelines you need further assistance in determining the appropriate size and configuration of buffers or the timing of activities in the vicinity of a bald eagle nest, please contact this office.

Future Fish and Wildlife Resources

The combination of subsidence and sea level rise is called submergence or land sinking. As the land sinks the wetlands become inundated with higher water levels, stressing most non-fresh marsh plants, bottomland hardwood plants and even cypress-tupelo swamps leading to plant death and conversion to open water. Other major causes of wetland losses within the study area include altered hydrology, storms, saltwater intrusion (caused by marine processes invading fresher wetlands), shoreline erosion, herbivory, and development activities including the direct and indirect impacts of dredge and fill (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation

and Restoration Authority 1998). The continued conversion of wetlands and forested habitat to open water or developed land represent the most serious fish and wildlife-related problems in the study area. Those losses could be expected to cause significant declines in coastal fish and shellfish production and in the study area's carrying capacity for numerous migratory waterfowl, wading birds, other migratory birds, alligators, furbearers, and game mammals. Wetland losses will also reduce storm surge protection of developed lands, and will likely contribute to water quality degradation associated with excessive nutrient inputs.

PROJECT MODIFICATIONS AND IMPACTS

Changes addressed in this report include the expansion of levee right-of-way in levee reach NOV 05A that has resulted in additional impacts. Other project modifications are proposed at levee reaches NOV 09 and NOV-NF-W-05a.1 (La Reussite to Wilkinson Pump Station Levee); however these modifications will result in a decrease in impacts to wet bottomland hardwoods and wet pasture, respectively. These modifications are described in greater detail below.

NOV-05A

NOV-05A originally described in the NOV Supplemental Environmental Impact Statement (SEIS) consisted of 3.2 miles of back levee on the West Bank near City Price (see red lines on Figure 2). The earthen levee is bounded on the east by LA 23 and on the west by marsh, open water ditches, and lakes. The NOV- 05 levee is currently being brought up to the authorized design grade of 13 feet for which additional ROW in NOV-05A was required to provide for the expanded footprint of the levee and to improve stability.

The modifications to the original design in the NOV SEIS necessary to complete raising the levees in NOV-05A include a floodside shift in the levee alignment to improve stability of the new levee adjacent to LA Highway (Hwy) 23. Since the original ROW was bounded by LA Hwy 23 and an Entergy power line on the east side, the additional levee footprint expanded westward into marsh and open water areas along the entire length of the levee. Additionally twenty temporary access ramps have been added to provide access to construction areas from across LA Hwy 23. On Grand Bayou/Fosters Road, the ROW was increased to account for the construction of one additional permanent ramp to connect to LA Hwy 23. Construction easements and lay down areas on the northern end of the project have also been added. The floodside shift for levee stability and the access ramp on Grand Bayou/Fosters Road are permanent impacts, however, the additional access ramps along HWY 23, construction easements, and laydown areas are temporary (see blue lines on Figure 1). Construction in NOV-05A has increased impacts to 24.4 acres of saline marsh habitat and 2.6 acres of scrub/shrub habitat. Refer to Table 1 for impacts being mitigated from the NOV SEIS as changed by this new ROW design. Construction of NOV-05A is nearly complete.

NOV-09

NOV-09 reach consists of 2.5 miles of the West Bank Mississippi River Levees (MRL) from St. Jude Church to City Price Church. The NOV-09 levees are currently being brought up to the authorized design grade of 18.5 feet (see red lines on Figure 2). The new proposed design required additional ROW to provide working room to tie the NOV-09 levee enlargement into the existing MRL and the NOV-05a levee project, and to provide for two additional staging areas and two access roads for the temporary storage areas and access to locations along the project area (see blue lines on Figure 2). The

staging and access route locations were chosen in areas that would not impact wetlands, and within areas previously investigated for cultural resources to avoid impacts to historic properties. Upon completion of construction activities, the staging areas would be returned to pre-construction conditions allowed to revegetate naturally. Impacts from these modifications will reduce impacts to BLH-Wet in this reach by 17.1 acres; see Table 1 for impacts to being mitigated from the NOV SEIS as changed by this new ROW design.

NOV-NF-W-05a.1 - La Reussite to Wilkinson Pump Station Levee

This levee reach is on the west bank NFL back levee between La Reussite and Myrtle Grove and was originally part of Section 2 as evaluated in the NFL Final Environmental Impact Statement (FEIS), and SEA #537. Design modifications to NOV-NF-W-05a.1 include a shift in the existing ROW as indicated on Figure 2 to avoid existing orphaned and abandoned oil and gas wells, and to eliminate a 90 degree turn in the levee for the purpose of allowing for the safe relocation of the three existing pipelines. The shift in the levee footprint would reduce the permanent impacts as assessed in the NFL EIS and SEA #537 in this reach to wet pasture by 8.4 acres, see Table 1 for impacts to being mitigated from the NFL EIS and SEA #537 as changed by this new ROW design.

Construction of the NFL hurricane protection system would result in direct impacts to wet and non-wet bottomland hardwood habitat (-37.5, and 120.2 AAHUs, respectively), swamp habitat (-33.8 AAHUs), fresh marsh and wet pasture (-53 AAHUs), and brackish, saline and intermediate marsh (-105.6 AAHUs). Previously mentioned design changes have reduced the overall impacts to fish and wildlife habitat (Table 1).

Tentatively Selected Mitigation Plan (TSMP)

The Tentatively Selected Mitigation Plan (TSMP) would mitigate bottomland hardwoods (BLH-Dry), bottomland hardwoods (BLH-Wet), scrub shrub, swamp, wet pasture, and fresh marsh impacts incurred from construction of the NFL NOV improvements through the purchase mitigation bank and ILF credits; and would mitigate open water, intermediate, brackish and saline marsh impacts through the construction of the Coleman Floodside (FS) Brackish Marsh project.

BLH-wet impacts would be mitigated by purchase of BLH-wet credits from a mitigation bank. Non-wetland bottomland hardwood (BLH-dry) and scrub shrub impacts would be mitigated by purchase of BLH-wet credits. Swamp impacts would be mitigated by purchasing available swamp credits from a mitigation bank. Freshwater marsh and wet pasture impacts would be mitigated by purchasing available ILF credits and mitigation bank credits. Based on the proposals received, if the costs for implementing the mitigation bank projects exceed those for the next ranked project, then the next ranked project would likely become the new plan for this habitat type in the TSMP. To ensure that the assessment of the functions and services provided by the mitigation bank match the assessment of the lost functions and services at the impacted site credits from mitigation banks would be determined by the same version of the WVA model used to assess the impacts from constructing the NFL NOV.

Intermediate marsh, brackish marsh, saline marsh, and open water impacts would be mitigated by constructing the Coleman FS Brackish Marsh project. Mitigation of these four habitat types in the same location is possible because salinities in this area fluctuate such that both intermediate and

brackish marsh species are found in this area, because brackish marsh provides similar functions and services for many of the same species as saline marsh, and open water impacts are mitigated with the establishment of the marsh type closest to the impacted water body.

Table 1 details the acreages and average annual habitat units (AAHUs) impacted by the NFL NOV construction including the additional ROW impacts. Table 2 summarizes the mitigation alternatives and components including habitat, type of mitigation, acres required to be created as well as a 10% buffer, the mitigation potential, total net AAHUs generated, and the TSA is identified in bold text.

Coleman Floodside Brackish Marsh

The approximately 230 acre Coleman FS Brackish Marsh project consists of the restoration of brackish marsh habitat in open water adjacent to the existing levees in Plaquemines Parish (Figure 3). This site would mitigate open water; intermediate, brackish, and saline marsh FS impacts resulting from NFL and NOV project improvements. The proposed Coleman mitigation project is located in Plaquemines Parish near West Pointe a La Hache, west of LA Hwy 23 between Mississippi River mile 46 and 49 (Figure 4).

The water bottom in the Coleman marsh creation site is approximate elevation -2.0 feet NAVD88. Marsh restoration would require approximately 2,371,000 cubic yards (CY) of hydraulically dredged borrow material would be transport in pipe following unnamed navigable waterways and the Mississippi River. The dredge pipeline/access corridor would use the existing culverts under Louisiana Highway 23 placed there for other restoration dredging projects. Approximately 15,754 linear feet of retention dikes would be constructed to elevation 3.5 feet NAVD88 with a 5 feet crown and 1:3 side slopes using approximately 58,400 CY of borrow obtained from within the marsh creation area. Once the construction of the retention dikes is complete, dredging of material from the Point Celeste borrow area within the Mississippi River would commence. The 348 acre borrow site would be dredged to a max elevation depth of -90.0 feet NAVD88.

Figure 2. NOV-09 is the northern section of levee; NOV-05A is the southern section of levee. Red lines depict original ROW and blue lines new ROW.

Figure 3. NOV-NF-W-05a.1in the NFL Section 2, redlines depict the original levee alignment, blue lines depict new ROW for levee and floodwall alignment.

Table 1. Total Impacts for NFL NOV Projects Currently Moving to Construction Including New Proposed ROW (in red and underline)

NOV	BLH Wet		BLH Dry		Wet Pasture		Swamp		Scrub Shrub		Intermediate Marsh		Freshwater Marsh		Brackish Marsh		Open Water		Saline Marsh		Total	
Levee Reach	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs
NOV 05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.3	30.6	**51.9**	**33.2**
NOV 07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.1	14.7	**22.1**	**14.7**
NOV 09	23.5	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**23.5**	**14.3**
NOV 10	30.1	18.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**30.1**	**18.4**
NOV 11	9.8	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.4	5.2	0.0	0.0	0.0	0.0	0.0	0.0	**30.2**	**11.2**
NOV 02, NOV 06b, NOV 08b, NOV 13, NOV 14, P14A, P17A	12.8	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	64.0	48.5	**77.6**	**56.7**
Total NOV	**76.2**	**46.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**5.6**	**2.5**	**0.8**	**0.4**	**20.4**	**5.2**	**0.0**	**0.0**	**0.0**	**0.0**	**132.4**	**93.8**	**235.4**	**148.5**
NFL	**BLH Wet**		**BLH Dry**		**Wet Pasture**		**Swamp**		**Scrub Shrub**		**Intermediate Marsh**		**Freshwater Marsh**		**Brackish Marsh**		**Open Water**		**Saline Marsh**		**Total**	
Levee Reach	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs
NFL Section 1	19.3	13.8	12.0	7.7	0.0	0.0	39.1	33.5	0.0	0.0	0.0	0.0	18.7	12.4	0.0	0.0	0.2	0.0	0.0	0.0	**89.2**	**67.4**
NFL Section 2	0.0	0.0	0.0	0.0	34.9	11.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**35.2**	**11.6**
NFL Section 3	5.7	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	3.2	0.4	0.0	0.0	0.0	**13.7**	**7.3**
NFL Section 4	9.4	6.7	20.0	13.0	70.0	22.8	0.0	0.0	1.5	0.0	0.6	0.0	0.0	0.0	5.1	4.6	10.4	0.0	0.0	0.0	**117.0**	**48.1**
Section 2+ 4 Canals	2.5	1.8	0.0	0.0	55.7*	18.2*	0.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**11.5**	**7.6**
Section 2+ 4 Canal Access Road	0.3	0.2	0.0	0.0	3.5	1.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.1**	**1.6**
NFL Section 5	66.0	47.1	11.3	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	3.4	4.3	0.0	0.0	0.0	**87.5**	**57.7**
Total	**103.1**	**73.6**	**43.3**	**35.0**	**108.4**	**35.3**	**39.4**	**33.8**	**10.8**	********	**0.6**	******	**18.7**	**12.4**	**18.7**	**11.4**	**15.3**	*******	**0.0**	**0.0**	**358.2**	**201.2**
Total NOV + NFL	**179.2**	**120.2**	**43.3**	**35.0**	**108.4**	**35.3**	**39.4**	**33.8**	**16.5**	**2.5**	**1.4**	**0.4**	**39.1**	**17.6**	**18.7**	**11.4**	**15.3**	**-**	**132.4**	**93.8**	**593.7**	**350.0**

*Note: Wet pasture impacts for Section 2 and 4 Canals are considered temporal only (1 year) and no mitigation was determined. As such, these acres and aahus are not included in the total.

**Note: Intermediate Marsh impacts are combined with Brackish Marsh impacts for total AAHUs.

***Note: Open Water habitat impacts are captured within all the Marsh Model AAHUs.

****Note: BLH Dry impacts are combined with Scrub Shrub impacts for total AAHUs.

Table 2. Summary for the Mitigation Project Alternatives and Components: Habitat and Type of Mitigation, Acres Required + 10% Buffer, Mitigation potential, and Total Net AAHUs Generated.

Mitigation Alternative	Habitat & Type of Mitigation	Acres Required / +10% buffer	Mitigation Potential (AAHUs/ac.)	Total Net AAHUs Generated
BLH-Dry (includes Scrub/Shrub) Impacts (NFL NOV mitigation required: BLH-Dry = 37.5 AAHUs)				
Plaquemines Parish Gov't	BLH-Dry (restore protected side)	93.75/105	0.4	37.5
Bayou Segnette	BLH-Dry (restore protected side)	178.57/200	0.21	37.5
Mitigation Bank (TSA)	**BLH Credit Purchase**	**59.5**	**0.63**	**37.5**
BLH-Wet Impacts (mitigation required: 120.2 AAHUs)				
Jesuit Bend BLH-Wet	BLH-Wet (restore flood side)	203.7/225	0.59	120.2
The Tank BLH-Wet	BLH-Wet (restore flood side)	279.47/310	0.43	120.2
Mitigation Bank (TSA)	**BLH Credit Purchase**	**190.8**	**0.63**	**120.2**
Swamp Impacts (mitigation required: 33.8 AAHUs)				
Jesuit Bend Swamp	Swamp (restore flood side)	85.47/95	0.40	33.8
Lake Salvador Swamp	Swamp (restore flood side)	85.25/95	0.40	33.8
Mitigation Bank (TSA)	**Swamp Credit Purchase**	**78.5**	**0.43**	**33.8**
Fresh Marsh (includes Wet Pasture) Impacts (mitigation required: 53 AAHUs)				
Cataouatche Ponds Fresh Marsh	Fresh Marsh (restore flood side)	98.07/110	0.54	53
GIWW/Salvador Fresh Marsh	Fresh Marsh (restore flood side)	143.12/160	0.37	53
ILF + Mitigation Bank (TSA)	**Fresh Marsh Credit Purchase**	**54.4 + 80.6**	**0.45 / 0.56**	**53**
Brackish Marsh (includes Intermediate Marsh and Saline Marsh) Impacts (mitigation required: 105.6 AAHUs)				
Coleman Brackish Marsh (TSA)	**Brackish Marsh (restore flood side)**	**207.04/230**	**0.51**	**105.6**
Defelice Brackish Marsh	Brackish Marsh (restore flood side)	310.56/345	0.34	105.6

Pumped dredge material would be placed within the retention dikes to a maximum elevation of 3.0 feet NAVD88 and to the required fill elevation of 2.0 feet NAVD88. After one year, it is estimated that the marsh platform at 2.0 feet NAVD88 would settle 1 foot to elevation 1.0 feet NAVD88. The target marsh elevation for brackish marsh habitat would range from 1.0 feet to 1.5 feet NAVD88. The construction duration would be approximately 6 months.

During the maintenance phase of the project, prior to transfer of monitoring responsibilities to the non-Federal sponsor (NFS), the site would be monitored and surveyed to ensure the marsh creation area has met the initial success criteria. At a minimum, these actions would include periodic eradication of invasive/nuisance plants feature and mitigation monitoring and reporting as prescribed in Appendix A. Approximately one year after the construction of the marsh platform is complete, which is the typical duration required for dewatering and settlement of the marsh platform, the retention dikes would be degraded to the target marsh elevation. Degraded dike material would be placed within the marsh creation area adjacent to, and along, the retention dikes by marsh buggies to a maximum elevation of 1.0 feet NAVD88. In conjunction with the degradation the retention dikes, trenasses may be constructed by marsh buggy within the feature if additional hydraulic conveyance is necessary. Trenasse width would be the width of marsh buggy. If the resulting depression is not adequate for minimal water flow, the marsh equipment could excavate material along the proposed trenasse alignment, not to exceed a 5-foot bottom width by 1-foot deep channel. The marsh feature is not expected to require planting, since it was assumed that native brackish marsh plants would colonize the marsh naturally. If brackish marsh species do not colonize the site on their own according to the success criteria, brackish marsh plant species would be planted. The construction duration for degrading the dikes would be approximately 2 months. Additional duration would be necessary if trenasse construction and brackish marsh plantings are required. Additional activities may need to be performed to ensure compliance with applicable mitigation success criteria (see Appendix A).

Refinement of the mitigation potential as determined by the Wetland Value Assessment (WVA) (Appendix B) for the Coleman Site should be undertaken at the 30, 60 and 90 percent design stages. These refinements should be an interagency task and should utilize the most recent detailed design, geotechnical information, and relative sea level rise rates (RSLR). As designed the mitigation potential as determined by the Wetland Value Assessment would produce approximately 0.51 Average Annual Habitat Units (AAHU) per acre of marsh restored. Refinement of the mitigation potential as determined by the Wetland Value Assessment (WVA) for CEMVN constructed projects should be undertaken at the 30, 60 and 90 percent design stages. These refinements should be an interagency task and should utilize the most recent detailed design, geotechnical information, and relative sea level rise rates (RSLR).

FISH AND WILDLIFE CONSERVATION AND MITIGATION MEASURES

The President's Council on Environmental Quality (CEQ) defined the term "mitigation" in the NEPA regulations to include:

1. avoiding the impact altogether by not taking a certain action or parts of an action;
2. minimizing impacts by limiting the degree or magnitude of the action and its implementation;
3. rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
4. reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and

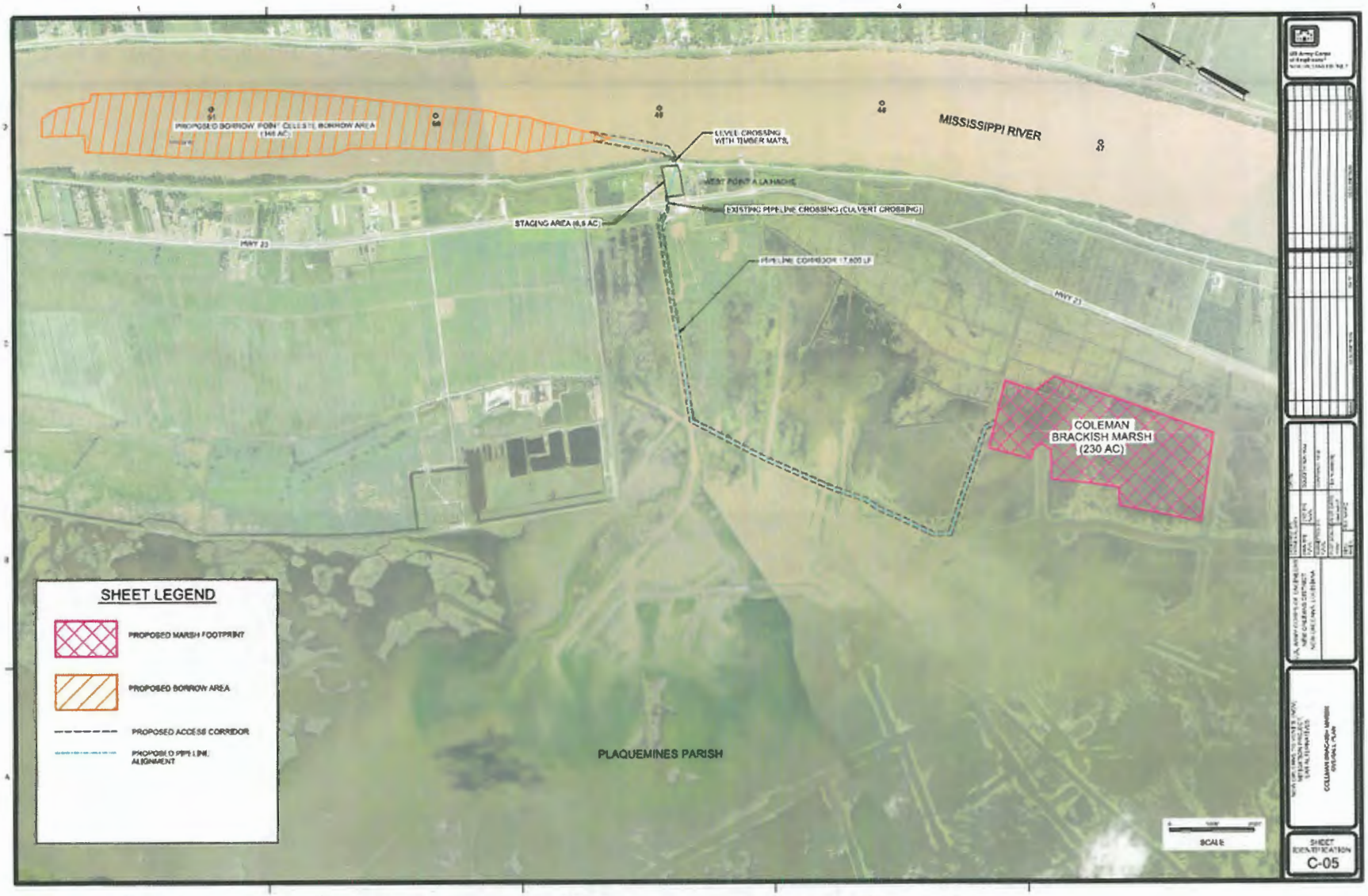


Figure 3. NOV- Coleman Floodside Brackish Marsh borrow and mitigation sites.

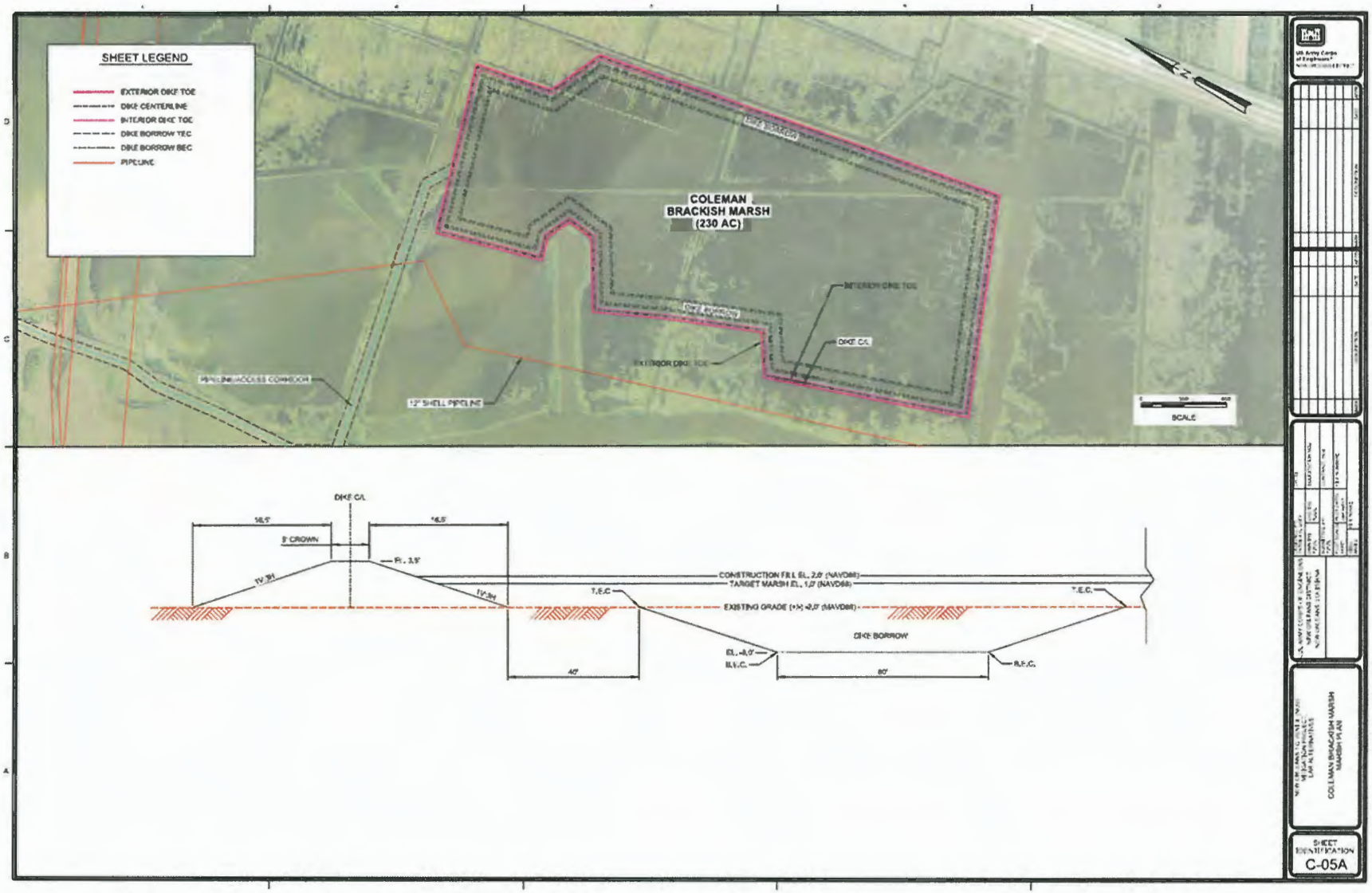


Figure 4. NOV- Coleman Floodside Brackish Marsh borrow site.

5. compensating for the impact by replacing or providing substitute resources or environments.

The Service supports and adopts this definition of mitigation and considers its specific elements to represent the desirable sequence of steps in the mitigation planning process. Based on current and expected future without-project conditions, the planning goal of the Service is to develop a balanced project (i.e., one that is responsive to demonstrated hurricane protection needs while addressing the co-equal need for fish and wildlife resource conservation).

The Service's Mitigation Policy (Federal Register, Volume 46, No. 15, January 23, 1981) identifies four resource categories that are used to ensure that the level of mitigation recommended by Service biologists will be consistent with the fish and wildlife resource values involved. Considering the high value of forested and emergent wetlands and the relative scarcity of those habitat types, those wetlands are usually designated as Resource Category 2 habitats, the mitigation for which is no net less of in-kind habitat value. Remaining direct and indirect project impacts to forested wetlands should be mitigated via in-kind compensatory replacement of the habitat values lost. Degraded (i.e., non-wet) bottomland hardwood forest and any wet pastures that me be impacted, however, are placed in Resource Category 3 due to their reduced value to wildlife, fisheries, and lost/degraded wetland functions. The mitigation goal for Resource Category 3 habitats is no net loss of habitat value.

Impacts to open water bottoms are anticipated as a result of construction activities. Regardless of depth, open water bottoms with no submerged aquatic vegetation (SAVs) will remain a Category 4 Resource; impacts to those areas are discouraged, if feasible. SAV beds located in open water are currently considered a Category 2, and lost functions and values should be replaced. However, because of the relatively low success rate of SAV replanting, mitigating in-kind may not be practicable. Potential impacts to any SAVs should first go through the mitigation sequencing of avoidance, minimization, and rectification, prior to compensation of impacts.

Because open water bottoms without SAVs are considered a Category 4 Resource for our trust resources the Service does not recommend mitigation. However, some tidally-influenced un-vegetated water bottoms are designated as EFH, and the loss of that habitat would result in a loss of EFH. Should EFH be impacted, coordination with the NMFS is recommended as mitigation for impacts to these areas is necessary.

SERVICE POSITION AND RECOMMENDATIONS

Construction of the NFL hurricane protection system would result in direct impacts to non-wet and wet bottomland hardwood habitat (-37.5, and 120.2 AAHUs, respectively), swamp habitat (-33.8 AAHUs), fresh marsh and wet pasture (-53 AAHUs), and brackish, saline and intermediate marsh (-105.6 AAHUs).

The Service does not object to providing improved hurricane protection to Plaquemines Parish, provided the following fish and wildlife conservation recommendations are incorporated into future project planning and implementation.

1. The CEMVN shall fully compensate for any unavoidable losses to non-wet and wet bottomland hardwood habitat (-37.5, and 120.2 AAHUs, respectively), swamp habitat (-33.8 AAHUs), fresh marsh and wet pasture (-53 AAHUs), and brackish, saline and intermediate marsh (-105.6 AAHUs) caused by project features. All aspects of mitigation planning should be coordinated with the Service, NMFS, the Environmental Protection Agency (EPA), the Louisiana Department of Natural Resources (LDNR), Coastal Protection and Restoration Authority (CPRA) and LDWF.

2. The Service recommends that mitigation alternatives include locating the mitigation within the basin where impacts occurred.

3. If a proposed project feature is changed significantly or is not implemented within one year of our latest, Endangered Species Act consultation letter, we recommend that the CEMVN reinitiate coordination with the Service to ensure that the proposed project would not adversely affect any federally listed threatened or endangered species or their critical habitat.

4. Avoid adverse impacts to wading bird nesting colonies and bald eagle nesting locations through careful design of project features and timing of construction. A qualified biologist should inspect the proposed work site for the presence of undocumented wading bird nesting colonies and bald eagle nests within 1,000 feet of the work during the nesting seasons (i.e., February 16 through October 31 for wading bird colonies, and October through mid-May for bald eagles). In addition, we recommend that on-site contract personnel be informed of the need to identify colonial nesting birds and their nests, and should avoid affecting them during the breeding season.

5. For colonies containing nesting gulls, terns, and/or black skimmers (which may nest on newly deposited marsh creation material or retaining dikes), all activity occurring within 650 feet of a nesting site 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).

6. If a bald eagle nest is discovered within or adjacent to the proposed project area, then an evaluation must be performed to determine whether the project is likely to disturb nesting bald eagles. That evaluation may be conducted on-line at: http://www.fws.gov/southeast/es/baldeagle. Following completion of the evaluation, that website will provide a determination of whether additional consultation is necessary and those results should be forwarded to this office.

7. Forest clearing associated with project features should be conducted during the fall or winter to minimize impacts to nesting migratory birds to the maximum extent practicable

8. Impacts to EFH should be avoided and minimized to the greatest extent possible. For proposed project areas that impact designated EFH habitat, coordination with the NMFS should be conducted.

9. Construction of mitigation or purchasing credit from an approved mitigation bank for all compensatory mitigation should be conducted concurrent with construction of the NOV - NFL projects, to ensure that mitigation obligations are met on behalf of the public interest.

10. We recommend that the CEMVN consider the availability of credits at a bank and within a hydrologic unit when evaluating the mitigation bank alternative to avoid exhausting credits available for individual landowners/permittee within a particular hydrologic unit.

11. Further detailed planning of mitigation features (e.g., Design Documentation Report, Engineering Documentation Report, Plans and Specifications, or other similar documents) should be coordinated with the Service, NMFS, EPA, LDNR, and LDWF, and the CEMVN shall provide them with an opportunity to review and submit recommendations on all work addressed in those reports.

12. Refinement of the mitigation potential as determined by the Wetland Value Assessment (WVA) for CEMVN constructed projects should be undertaken at the 30, 60 and 90 percent design stages. These refinements should be an interagency task and should utilize the most recent detailed design, geotechnical information, and relative sea level rise rates (RSLR).

13. Any proposed change in mitigation features or plans should be coordinated in advance with the Service, NMFS, LDWF, EPA and LDNR.

14. If applicable, a General Plan should be developed by the CEMVN, the Service, and the managing natural resource agency in accordance with Section 3(b) of the FWCA for mitigation lands.

15. Mitigation success criteria, monitoring and reporting requirements, and adaptive management should adhere to those developed for the Hurricane Storm Damage and Risk Reduction Study (HSDRRS) as presented in Appendix A.

16. The Service encourages the CEMVN to finalize mitigation plans and proceed to mitigation construction so that it will be concurrent with project construction. If construction is not concurrent with mitigation implementation then revising the impact and mitigation period-of-analysis to reflect additional temporal losses will be required.

17. The CEMVN should implement prior to initiation of construction and maintain during construction non-point source erosion control measures to protect wetlands and water bodies.

18. The CEMVN should ensure that clearing of forested vegetation does not result in impacts outside of the construction rights-of-way.

LITERATURE CITED

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APPENDIX A

Mitigation Planting, Monitoring & Related Guidelines/Mitigation Success Criteria

(marsh only)

MITIGATION PLANTING GUIDELINES, OTHER GENERAL MITIGATION GUIDELINES, MITIGATION SUCCESS CRITERIA, MITIGATION MONITORING GUIDELINES, AND MITIGATION MONITORING SCHEDULES AND RESPONSIBILITIES

MITIGATION SUCCESS CRITERIA AND MITIGATION MONITORING: MARSH MITIGATION FEATURES (Fresh, Intermediate, Brackish and Saline Marsh Habitats)

MITIGATION SUCCESS CRITERIA

The success (performance) criteria described herein are applicable to all proposed marsh habitats (fresh marsh, intermediate marsh, brackish and saline marsh restoration features), unless otherwise indicated.

1. General Construction

A. Within approximately 8 months following the start of mitigation construction, complete all initial mitigation construction activities (e.g. construction of temporary retention/perimeter dikes, placement of fill (borrow material/dredged material) into mitigation site, construction of permanent dikes if applicable, etc.).

B. Approximately 1 to 3 years following completion of all initial mitigation construction activities (when the restored marsh feature has attained the desired target soil surface elevation) complete all final mitigation construction activities. Such activities could include, but are not limited to: degrading temporary retention dikes such that the areas occupied by these dikes have a surface elevation equivalent to the desired target marsh elevation; completion of armoring, if required, of any permanent dikes; "gapping" or installation of "fish dips" in permanent dikes; and construction of trenasses or similar features within marsh features as a means of establishing shallow water interspersion areas within the marsh. Finishing the aforementioned construction components will be considered as the "completion of final mitigation construction activities". As noted, this is anticipated to occur approximately 1 year after placement of fill material in the mitigation feature is completed.

2. Topography

A. Upon completion of final mitigation construction activities (approximate Target Year 2) –
- Demonstrate that at least 80% of each mitigation feature has a surface elevation that is within 0.5 feet of the desired target surface elevation.

B. 1 Year following completion of final mitigation construction activities (approximate Target Year 3) –
- Demonstrate that at least 80% of the mitigation site has a surface elevation that is within 0.5 feet of the desired target surface elevation.

C. 3 years following completion of final mitigation construction activities (approximate Target Year 5) –
- Demonstrate that at least 90% of the mitigation site has a surface elevation that is within the functional marsh elevation range.

Notes: The desired target elevation for each marsh feature will be determined during the final design phase. The "functional marsh elevation range", i.e. the range of the marsh surface elevation that is considered adequate to achieve proper marsh functions and values, will also be determined during the final design phase. The target elevation and functional marsh elevation range will be determined by the USACE in conjunction with the Interagency Team. It is currently +1.5 feet NAVD88. These determinations will apply to the topographic success criteria above and could potentially alter the marsh area percentages set forth in these criteria.

3. Native Vegetation

A. For intermediate, brackish and saline marsh restoration features only –
- Complete initial marsh planting in accordance with applicable marsh planting guidelines.

B. For fresh marsh restoration features only; 1 year following completion of final mitigation construction activities:
- Achieve a minimum average cover of 50%, comprised of native herbaceous species.
- Demonstrate that vegetation satisfies USACE hydrophytic vegetation criteria. This criterion will thereafter remain in effect for the duration of the overall monitoring period.

C. For intermediate, brackish and saline marsh restoration features only; 1 year following completion of initial plantings–
- Attain at least 80% survival of planted species, or; Achieve a minimum average cover of 25%, comprised of native herbaceous species (includes planted species and volunteer species).
- Demonstrate that vegetation satisfies USACE hydrophytic vegetation criteria. This criterion will thereafter remain in effect for the duration of the overall monitoring period.

D. For fresh marsh restoration features only; 3 years following completion of final mitigation construction activities:
- Achieve a minimum average cover of 85%, comprised of native herbaceous species.

E. For intermediate, brackish and saline marsh restoration features only; 3 years following completion of initial plantings –
- Achieve a minimum average cover of 75%, comprised of native herbaceous species (includes planted species and volunteer species).

F. For all marsh restoration features (fresh, intermediate, brackish, and saline) –
- For the period beginning 5 years following completion of final mitigation construction activities and continuing through 20 years following completion of final mitigation construction activities, maintain a minimum average cover of 80%, comprised of native herbaceous species.

4. Invasive and Nuisance Vegetation

A. Complete the initial eradication of invasive and nuisance plant species within 1 year of completion of final mitigation construction activities

B. Maintain all areas such that they are essentially free from invasive and nuisance plant species immediately following a given maintenance event and such that the total vegetative cover accounted for by invasive and nuisance species each constitute less than 5% of the total plant cover during periods between maintenance events. These criteria must be satisfied throughout the duration of the overall monitoring period.

MITIGATION MONITORING GUIDELINES

The guidelines for mitigation monitoring provided herein are applicable to all the types of marshes being restored (i.e. fresh, intermediate, brackish and saline) unless otherwise indicated.

"Time Zero" Monitoring Report

The mitigation site will be monitored and a "time zero" or "baseline" monitoring report prepared. Information provided will include the following items:

- A detailed discussion of all mitigation activities completed.

- A plan view drawing of the mitigation site showing the approximate boundaries of the restored marsh features, significant interspersion features established within the marsh features (as applicable), monitoring transect locations, sampling plot locations, photo station locations, and staff gage locations.

- An as-built survey of surface elevations (topographic survey) within each marsh feature, along with an as-built survey of any permanent dikes constructed as part of the marsh restoration features including any "gaps" or "fish dips" established in such dikes. If a particular marsh feature is immediately adjacent to existing marsh habitat, the topographic survey will include spot elevations collected within the existing marsh habitat near the restored marsh feature. In addition to the survey data, an analysis of the data will be provided addressing attainment of topographic success criteria.

- Photographs documenting conditions in each restored marsh feature at the time of monitoring. Photos will be taken at permanent photo stations within the marsh features. At least two photos will be taken at each station with the view of each photo always oriented in the same general direction from one monitoring event to the next. The number of photo stations required as well as the locations of these stations will vary depending on the mitigation site. The USACE will make this determination in coordination with the Interagency Team and will specify the requirements in the Mitigation Monitoring Plan. At a minimum, there will be at least 4 photo stations established within each marsh feature.

- For restored intermediate, brackish and saline marsh features only -- A detailed inventory of all species planted, including the number of each species planted and the stock size planted. For mitigation sites that include more than one restored marsh feature, provide a breakdown itemization indicating the number of each species planted in each marsh and correlate this itemization to the marsh features depicted on the plan view drawing of the mitigation site.

- Water level elevation readings collected at the time of monitoring from a single staff gage installed within one of the restored marsh features. The location of the staff gage will be determined by the USACE in coordination with the Interagency Team during the final design phase of the mitigation project and will be specified in the Mitigation Monitoring Plan. The monitoring report will provide the staff gage data along with mean high and mean low water elevation data as gathered from a tidal elevation recording station in the general vicinity of the mitigation site. The report will further address estimated mean high and mean low water elevations at the mitigation site based on field indicators.

- Various qualitative observations will be made in the mitigation site to help assess the status and success of mitigation and maintenance activities. These observations will include: general estimate of the average percent cover by native plant species; general estimates of the average percent cover by invasive and nuisance plant species; general observations

concerning colonization of the mitigation site by volunteer native plant species; general condition of native vegetation; trends in the composition of the plant community; wildlife utilization as observed during monitoring (including fish species and other aquatic organisms); the condition of interspersion features (tidal channels, trenasses, depressions, etc.) constructed within the marsh features, noting any excessive scouring and/or siltation occurring within such features; the natural formation of interspersion features within restored marshes; observations regarding general surface water flow characteristics within marsh interspersion features; the general condition of "gaps", "fish dips", or similar features constructed in permanent dikes; if present, the general condition of any armoring installed on permanent dikes. General observations made during the course of monitoring will also address potential problem zones and other factors deemed pertinent to the success of the mitigation program.

- A summary assessment of all data and observations along with recommendations as to actions necessary to help meet mitigation and management/maintenance goals and mitigation success criteria.

- A brief description of anticipated maintenance/management work to be conducted during the period from the current monitoring report to the next monitoring report.

Additional Monitoring Reports

All monitoring reports generated after the initial "time zero" report will provide the following information unless otherwise noted:

- All items listed for the "time zero" (baseline) monitoring report with the exception of: (a) the topographic/as-built survey, although additional topographic/as-built surveys are required for specific monitoring reports (see below); (b) the inventory of planted species; although such an inventory must be provided in any monitoring report generated for a year in which a restored intermediate or brackish or saline marsh feature is re-planted to meet applicable success criteria, and such an inventory must be provided in any monitoring report generated for a year in which a restored fresh marsh feature is planted to meet applicable success criteria.

- Quantitative data concerning plants in the ground cover stratum. Data will be collected from permanent sampling quadrats established at approximately equal intervals along permanent monitoring transects established within each marsh feature. Each sampling quadrat will be approximately 2 meters X 2 meters in size, although the dimensions of each quadrat may be increased if necessary to provide better data in planted marsh features. The number of monitoring transects and number of sampling quadrats per transect will vary depending on the mitigation site. This will be determined the USACE in coordination with the Interagency Team during the final design phase of the mitigation project and the resulting requirements, including quadrat dimensions, will be specified in the final Mitigation Monitoring Plan for the project. Data recorded from the sampling quadrats will include: average percent cover by native plant species; average percent cover by invasive plant species; average percent cover by nuisance plant species; composition of plant species and the wetland indicator status of each species. The average percent survival of planted species (i.e. number of living planted species as a percentage of total number of plants installed) will also be recorded in intermediate and brackish or saline marsh features. However, data for percent survival of planted species will only be recorded until such time as it is demonstrated that success criteria for plant survivorship has been achieved.

- A brief description of maintenance and/or management work performed since the previous monitoring report along with a discussion of any other significant occurrences.

- Rectified aerial photographs of all mitigation features. This aerial photography will only be provided in the monitoring report prepared for monitoring conducted 3 years following completion of mitigation construction activities (estimated TY5).

- In addition to the above items, the monitoring report prepared for 1 year following completion of mitigation construction activities (estimated TY3) and the monitoring report prepared for 3 years following completion of mitigation construction activities (estimated TY5) will include a topographic survey of each marsh restoration feature. These surveys will cover the same components as described for the topographic survey conducted for the "time zero" monitoring report. In addition to the surveys themselves, each of the two monitoring reports involving topographic surveys will include an analysis of the data as regards attainment of applicable topographic success criteria. If the second survey indicates topographic success criteria have not been achieved and supplemental topographic alterations are necessary, then another topographic survey may be required following completion of the supplemental alterations. This determination will be made by USACE in coordination with the Interagency Team.

Monitoring Reports Following Re-Planting Activities in Intermediate, Brackish or Saline Marsh Features & Monitoring Reports Following Planting Activities in Fresh Marsh Features

Re-planting of certain areas within restored intermediate and/or brackish and saline marsh habitats may be necessary to ensure attainment of applicable native vegetation success criteria. Planting of herbaceous species within restored fresh marsh features may also be necessary to attain applicable native vegetation success criteria. Any monitoring report submitted following completion of a re-planting event (for intermediate, brackish and saline marshes) and any monitoring report submitted following completion of initial plantings (for fresh marshes) must include an inventory of the number of each species planted and the stock size used. It must also include a depiction of the areas re-planted or those planted, as applicable, cross-referenced to a listing of the species and number of each species planted in each area.

MITIGATION MONITORING SCHEDULE AND RESPONSIBILITIES

Monitoring will typically take place in mid to late summer of the year of monitoring, but may be delayed until later in the growing season due to site conditions or other unforeseen circumstances. Monitoring reports will be submitted by December 31 of each year of monitoring. Monitoring reports will be provided to the USACE, the Sponsor, and the agencies comprising the Interagency Team.

The USACE will be responsible for conducting the monitoring events and preparing the associated monitoring reports until such time that the following mitigation success criteria are achieved (criteria follow numbering system used in success criteria section):

1. General Construction – A and B.
2. Topography – A and B.
3. Native Vegetation – For intermediate, brackish and saline marsh features, criteria 3.A and 3.C; for fresh marsh features, criteria 3.B.
4. Invasive & Nuisance Vegetation – A, plus B until such time as project is transferred to the Sponsor.

Monitoring events associated with the above will include the "time zero" (first or baseline) monitoring event (estimated in TY2, 2021) and a second monitoring event 1 year after the time zero monitoring event (estimated in TY3, 2022). The USACE will be responsible for conducting these monitoring activities and preparing the associated monitoring reports.

The Sponsor will be responsible for conducting the required monitoring events and preparing the associated monitoring reports after the USACE has demonstrated the mitigation success criteria listed above have been achieved. The overall responsibility for management, maintenance, and

monitoring of the mitigation will be transferred to the Sponsor during the first quarter of the year immediately following submittal of the monitoring report that demonstrates attainment of said criteria. Once monitoring responsibilities have been transferred to the Sponsor, the next monitoring event should take place in 2023 (TY5) in order to demonstrate attainment of success criteria 2.C and either 3.D (for fresh marsh) or 3.E (for intermediate, brackish and saline marsh). Thereafter, monitoring will be conducted every 5 years throughout the remaining life or the mitigation project (based on 50-year project life beginning in 2019 (TY0) and ending in 2069 (TY50).

In certain cases it is possible that the marsh mitigation features may be established along with other mitigation features, like swamp or bottomland hardwood habitats, at the same mitigation site. This scenario could require some adjustments to the typical monitoring schedule described above in order to develop a reasonable and efficient monitoring schedule that covers all the mitigation features. Such adjustments, if necessary, would be made at the time final mitigation plans are generated. This schedule must be in general accordance with the guidance provided above and will be prepared by the USACE in coordination with the Interagency Team and the Sponsor.

If certain success criteria are not achieved, failure to attain these criteria would trigger the need for additional monitoring events not addressed in the preceding paragraphs. The USACE would be responsible for conducting such additional monitoring and preparing the associated monitoring reports. The following lists instances requiring additional monitoring that would be the responsibility of the USACE:

(A) For intermediate, brackish and saline marsh features –

- If the initial survival criterion for planted species or the initial vegetative cover criterion are not achieved (i.e. the criteria specified in success criteria 3.C), a monitoring report will be required for each consecutive year until two sequential annual reports indicate that the applicable survival criterion or vegetative cover criteria have been satisfied (i.e. that corrective actions were successful). The USACE would also be responsible for the purchase and installation of supplemental plants needed to attain the success criteria.

(B) For fresh marsh features --

- If the initial vegetative cover criterion is not achieved (i.e. the requirement specified in success criteria 3.B), a monitoring report will be required for each consecutive year until two sequential annual reports indicate that the applicable vegetative cover criteria have been satisfied (i.e. that corrective actions were successful). Since failure to meet the success criterion would mandate planting the subject marsh, the USACE would also be responsible for the purchase and installation of the required plants.

(C) For all types of marsh features (fresh, intermediate, brackish, saline) –

- If topographic success criteria 2.A or 2.B are not achieved, a monitoring report will be required for each consecutive year until two sequential annual reports indicate the applicable criteria have been satisfied. Since failure to meet topographic success criteria would mandate corrective actions such as addition of fill, removal of fill, or other actions to change grades within the subject marsh feature, the USACE would also be responsible for performing the necessary corrective actions.

There could also be cases where failure to attain certain success criteria would trigger the need for additional monitoring events for which the Sponsor would be responsible:

(A) For intermediate, brackish and saline marsh features –

- If the vegetative cover criterion specified for 3 years after the initial planting of marsh features is not achieved (i.e. success criterion 3.E), a monitoring report will be required for each consecutive year until two sequential annual reports indicate that the vegetative cover

criterion has been satisfied. The Sponsor would also be responsible for the purchase and installation of supplemental plants needed to attain the success criterion.

(B) For fresh marsh features --

- If the vegetative cover criterion specified for 3 years after completion of mitigation construction activities is not achieved (i.e. success criterion 3.D), a monitoring report will be required for each consecutive year until two sequential annual reports indicate that the vegetative cover criterion has been satisfied. The Sponsor would also be responsible for the purchase and installation of supplemental plants needed to attain the success criterion.

(C) For all types of marsh features (fresh, intermediate, brackish, saline) –

- If the topographic success criterion 2.C is not achieved, a monitoring report will be required for each consecutive year until two sequential annual reports indicate success criteria have been satisfied. Since failure to meet this topographic success criteria would mandate corrective actions such as addition of fill, removal of fill, or other actions to change grades within the subject marsh feature, the Sponsor would also be responsible for performing the necessary corrective actions.

- Native vegetation success criterion 3.F is applicable to the period extending from 5 years through 20 years following completion of mitigation construction activities and is applicable to all marsh features. If this criterion is not satisfied at the time of monitoring, the Sponsor would be responsible for implementing corrective actions. Such actions could include installing additional plants in the subject marsh (probable course of action), adding sediment to the subject marsh in problem zones (marsh nourishment), or a combination of these activities. Under this scenario, a monitoring report will be required for each consecutive year following completion of the corrective actions until two sequential annual reports indicate that the vegetative cover criterion has been attained. The Sponsor would be responsible for conducting these additional monitoring events and preparing the associated monitoring reports.

Once monitoring responsibilities have transferred to the Sponsor, the Sponsor will retain the ability to modify the monitoring plan and the monitoring schedule should this become necessary due to unforeseen events or to improve the information provided through monitoring. Twenty years following completion of mitigation construction activities, the number of monitoring transects and/or quadrats that must be sampled during monitoring events may be reduced substantially if it is clear that mitigation success is proceeding as anticipated. Any significant modifications to the monitoring plan or the monitoring schedule must first be approved by the USACE in coordination with the Interagency Team.

DEFINITION OF TERMS

Certain terms used herein shall have the meaning discussed in the following section.

Interagency Team
The "Interagency Team" consists of representatives from the following resource agencies; US Fish and Wildlife Service, National Marine Fisheries Service, US Environmental Protection Agency, Louisiana Department of Wildlife and Fisheries, State of Louisiana Office of Coastal Protection and Restoration, Louisiana Department of Natural Resources. In cases where proposed mitigation features will be established within Jean Lafitte National Historical Park and Preserve, representatives from the National Park Service would also comprise the Interagency Team.

Sponsor
This term refers to the Non-Federal Sponsor for the mitigation projects.

Target Year
This document often refers to mitigation "target years" or a particular mitigation "target year" (abbreviated "TY"). Target Year 0 (TY0) is the year in which mitigation construction activities are anticipated to commence, which is presently estimated to occur in calendar year 2019. Target years increase from this time forward. Hence, based on construction beginning in 2019, target year 1 (TY1) would be calendar year 2020, target year 2 (TY2) would be calendar year 2021, etc.

Invasive Plant Species
All plant species identified as invasive or as non-indigenous (exotic) in the following two sources:

> Louisiana Aquatic Invasive Species Task Force. 2005. State Management Plan for Aquatic Invasive Species in Louisiana, Appendix B. Invasive Species in Louisiana (plants). Center for Bioenvironmental Research, Tulane & Xavier Universities, New Orleans, LA. (Website - http://is.cbr.tulane.edu/docs_IS/LAISMP7.pdf)
>
> U.S. Geological Survey. 2011. NAS – Nonindigenous Aquatic Species, Louisiana. Website - http://nas.er.usgs.gov/queries/SpeciesList.aspx?group=Plants&state=LA&Sortby=2

In addition, invasive plant species include; Japanese climbing fern (*Lygodium japonicum*), tall fescue (*Festuca arundinacea*), chinaberry (*Miscanthus sinensis*), Brazil vervain (*Verbena litoralis* var. *brevibrateata*), and rescuegrass (*Bromus catharticus*).

Nuisance Plant Species
Nuisance plant species will include native species deemed detrimental due to their potential adverse competition with desirable native species. Examples of potential nuisance plant species include; dog-fennel (*Eupatorium* spp.), ragweed (*Ambrosia* spp.), cattail (*Typha* spp.), grapevine (*Vitis* spp.), wild balsam apple (*Momordica charantia*), climbing hempvine (*Mikania scandens, M. micrantha*), pepper vine (*Ampelopsis arborea*), common reed (*Phragmites australis*), catbrier (*Smilax* spp.), black willow (*Salix nigra*), and boxelder (*Acer negundo*). The determination of whether a particular plant species should be considered as a nuisance species and therefore eradicated or controlled will be determined by the USACE in coordination with the Interagency Team, based on conditions present within a particular mitigation area.

Native Plant Species
This category includes all plant species that are not classified as invasive plant species and are not considered to be nuisance plant species.

USACE Hydrophytic Vegetation Criteria
Reference to satisfaction of USACE hydrophytic vegetation criteria (i.e. plant community is dominated by hydrophytic vegetation) shall mean that sampling of the plant community demonstrates that one or more of the hydrophytic vegetation indicators set forth in the following reference is achieved:

> USACE. 2010. Regional Supplement to the CEMVN of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0); ERDC/EL TR-10-20. USACE Engineer Research and Development Center, Vicksburg, MS.

Wetland Indicator Status of Plant Species
The wetland indicator status of plants is a means of classifying the estimated probability of a species occurring in wetlands versus non-wetlands. Indicator categories include; obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and obligate upland (UPL). The wetland indicator status of a particular plant species shall be as it is set forth in the following reference, using the Region 2 listing contained therein. However, if the USACE approves and adopts a new list in the future, then the currently approved list will apply.

Reed, P. B., Jr. 1988. National List of Plant Species that Occur in Wetlands: 1988 National Summary. Biological Report 88(24). Washington, DC: U.S. Fish and Wildlife Service. (website - http://www.usace.army.mil/CECW/Documents/cecwo/reg/plants/list88.pdf)

Growing Season
As used herein, the growing season is considered to be the period from April through October of any given year, although some deviation from this typical range is allowed.

Planting Season
This is generally considered to be the period from approximately December 15 through March 15, although some deviation from this typical range is allowed.

Point-Centered Quarter Method
A plot-less method of forest sampling. Use of this method will be in general compliance with the applicable methodology described in the following reference:

Cottam, Grant and J. T. Curtis. 1956. The use of distance measures in phytosociological sampling. Ecology, 37(3):451-460.

Piezometer
Typically a small-diameter observation well employed as a means of measuring water elevations in the surficial aquifer (water table elevations). Piezometers used for monitoring purposes should be constructed in general accordance with the following reference, unless otherwise approved by the USACE:

U. S. Army CEMVN of Engineers. 2005. Technical standard for water-table monitoring of potential wetland sites. ERDC TN-WRAP-05-02. Vicksburg, MS: U.S. Army Engineer Research and Development Center. (website - http://el.erdc.usace.army.mil/wrap/pdf/tnwrap05-2.pdf)

Interspersion Features
This term refers to shallow open water features situated within marsh habitats. Examples include tidal channels, creeks, trenasses, and relatively small, isolated ponds. Emergent vegetation is typically absent in such features although they may contain submerged aquatic vegetation. They provide areas of foraging and nursery habitat for fish and shellfish along with associated predators, and provide loafing areas for waterfowl and other waterbirds. The marsh/open water interface forms an ecotone where post-larval and juvenile organisms can find cover and where prey species frequently concentrate.

APPENDIX B

Wetland Value Assessment for Coleman Floodside Brackish Marsh Mitigation Site

DATE: 01 March 2017

SUBJECT: Wetland Value Assessment (WVA) for the Coleman brackish marsh restoration site.

The Coleman Brackish Marsh WVA was developed by the Service and the brackish marsh WVA was used.

WVA

Benefits: 277 acres of open water to be restored and 15 acres to be nourished for a gain of 148.12 AAHUs. Mitigation Potential (AAHU/Ac) = 0.51 (148.88 AAHUs/292 ac).

Land Loss–USGS calculated a historical loss rate for the disposal polygons using a hyper-temporal analysis for the period 1984 to 2010. That analysis utilized TM satellite scenes. The Fish and Wildlife Service calculated land loss rate using the same USGS Land/Water data, but with a different regression (land acres : time). The loss/gain rate during that period was 0.01% per year. That rate was used to calculate land/water values over the life of the project.

Sea Level Rise Effects–Land loss rates estimated by the Service were adjusted by the projected effects of the medium relative sea level rise (RSLR) scenario for these analyses. We used a subsidence rate of 7.5 mm/yr derived from the COE Mississippi River gauge at Carrolton, LA (USACE 2016). The eustatic sea level rise was assumed to be 1.7 mm/yr.

V1 - Emergent Vegetation

Existing Conditions–The marsh creation area is 95% open water.

FWOP–

	Acres	%
TY0	14.91	5.11
TY1	14.89	5.10
TY3	14.84	5.08
TY5	14.78	5.06
TY6	14.75	5.05
TY25	14.02	4.80
TY50	12.55	4.30

FWP–

	Acres	%
TY0	14.91	5.11
TY1	42.57	14.58
TY3	153.06	52.42
TY5	290.88	99.62
TY6	290.67	99.54
TY25	280.26	95.98
TY50	255.09	87.36

V2 – Submerged Aquatic Vegetation

Existing Conditions –The initial WVA site visit conducted 16 September 2016 determined SAV coverage to be approximately 9%.

FWOP– Standardized HSDRRS assumptions for the FWOP scenario require 15% of baseline coverage at TY50.

	% SAV
TY0	9
TY1	9
TY3	9
TY5	9
TY6	9
TY25	9
TY50	1.35

FWP– Standard assumption from LPV & WBV HSDRRS Mitigation: WVA Model Assumptions and Related Guidance (Revised/Updated 3 March 2012) were applied.

	% SAV
TY0	9
TY1	0
TY3	0
TY5	9
TY6	10.35
TY25	10.35
TY50	2.25

V3 – Interspersion

Existing Conditions– The marsh creation area is 95% open water.

FWOP–

	Class	%
TY0	5	100
TY1	5	100
TY3	5	100
TY5	5	100
TY6	5	100
TY25	5	100
TY50	5	100

FWP–Standard assumption from LPV & WBV HSDRRS Mitigation: WVA Model Assumptions and Related Guidance (Revised/Updated 3 March 2012) were applied.

	Class	%	Notes
TY0	5	100	standard assumptions
TY1	5	100	standard assumptions
TY3	3	100	standard assumptions
TY5	1	50	standard assumptions
	3	50	standard assumptions
TY6	1	100	standard assumptions
TY25	1	100	96% marsh
TY50	2	100	87% marsh

V4 – Shallow Open Water Habitat

Existing Conditions– The initial WVA site visit conducted 16 September 2016 determined average water depths across the project area to be between 3.0 and 4.0 ft NAVD88. Based on input from the project team, we assumed 18% SOW (water ≤ 1.5ft) in the project area for the FWOP analysis.

FWOP–

	% SOW
TY0	18.00
TY1	17.84
TY3	17.49

TY5	17.12
TY6	16.92
TY25	12.04
TY50	7.22

FWP–At TY50 the project polygon contains 13.13 acres of open water. Standard HSDRRS assumptions presume 1/6 of SOW becomes deep at TY50. Calculations for SOW at TY50 are as follows: 1/6 X 13.13=2.188 acres of deep water, ((95-2.19)/95) X 100=97.69 % SOW.

	% SOW
TY0	18.00
TY1	0.00
TY3	0.00
TY5	0.00
TY6	0.00
TY25	0.00
TY50	98.00

V5 – Salinity

Mean annual growing season salinity of 8.73 ppt was derived from CRMS 3680 from the period of August 2006 to August 2016. Salinity is not assumed to change for FWOP or FWP.

Salinity	
	(ppt)
TY0-TY50	8.73

V6 – Fish Access

FWOP–There are no restrictions to fishery access and none anticipated.

TY0-TY50	1.00	Full Access

FWP– Standard assumption from LPV & WBV HSDRRS Mitigation: WVA Model Assumptions and Related Guidance (Revised/Updated 3 March 2012) were applied.

TY0	1.00	Baseline conditions
TY1	0.00001	Retention dikes not gapped or degraded
TY3	0.00001	Retention dikes have been gapped or degraded

TY5	1.00	Intertidal
TY6	1.00	Intertidal
TY25	1.00	Intertidal
TY50	1.00	Intertidal

PROJECT BENEFITS

TOTAL BENEFITS IN AAHUs

A. Emergent Marsh Habitat Net AAHUs =	241.07
B. Open Water Habitat Net AAHUs =	-90.82
Net Benefits= (2.6xEMAAHUs+OWAAHUs)/3.6	**148.88**

LITERATURE CITED

US Army CEMVN of Engineers [USACE] 2016. Responses to Climate Change Program: Public Tools Developed by USACE (web application). Available at http://www.CEMVNclimate.us/ccaceslcurves_nn.cfm. Accessed November 8, 2016.

BOBBY JINDAL
GOVERNOR

PEGGY M. HATCH
SECRETARY

CER 20170002
WQC 110520-01
VALID / MODIFIED -
NFA: EStell - 6/19/17

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES

JUL 06 2011

INCLUDES MITIGATION FOR:
NOV HRRP
NFL from OAKDALE TO ST. JUDE
NOV FED HPL
ADDITION OF: COLEMAN MITIGATION
ROW - NOV 09

U.S. Army Corps of Engineers- Vicksburg District
4155 Clay Street
Vicksburg, MS 39180

Attention: Christopher Koeppel

RE: Water Quality Certification (WQC 110520-01/AI 101235/CER 20110002) NOV-NE-W.052.1
New Orleans to Venice Hurricane Risk Reduction Project
Incorporation of Non-Federal Levees from Oakville to St. Jude
Plaquemines Parish

Dear Mr. Koeppel:

The Louisiana Department of Environmental Quality (the Department) has reviewed your application to excavate land and place spoil material for the improvement of hurricane protection levees, in the vicinity between Oakville & St. Jude, Louisiana.

Based on the information provided in the application, the Department made a determination that the requirements for a Water Quality Certification have been met and concludes that the placement of the fill material will not violate water quality standards of Louisiana as provided for in LAC 33:IX.Chapter 11. Therefore, the Department hereby issues a Water Quality Certification to U.S. Army Corps of Engineers- Vicksburg District.

If you have any questions, please call Jamie Phillippe at 225-219-3225.

Sincerely,

Melvin C. Mitchell, Sr.
Administrator
Water Permits Division

MCM/jjp

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF

May 15, 2017

Regional Planning and
Environmental Division, South
New Orleans Environmental Branch

Elizabeth Hill
Louisiana Department of Environmental Quality
Water Quality Certifications Section
P.O. Box 4313
Baton Rouge, LA 70821-4313

Dear Ms. Hill:

Pursuant to Section 401 of the Clean Water Act, the U.S. Army Corps of Engineers, New Orleans District, requests water quality certification modification for Environmental Assessment (EA) #543 entitled "Mitigation for the New Orleans to Venice Hurricane Risk Reduction Project: Incorporation of Non-Federal Levees from Oakville to St. Jude and New Orleans to Venice Federal Hurricane Protection Levee, Plaquemines Parish, Louisiana. The anticipated public release of EA #543 is July 2017. The purpose of this project is to evaluate the proposed new right of way (ROW) impacts for construction of the Non-Federal Levees (NFL) and the New Orleans to Venice (NOV) levee projects and impacts associated with mitigation for wetlands and bottomland hardwoods as result of the construction of the NFL NOV project.

The NFL project was originally documented and assessed in the Final Environmental Impact Statement titled "Final Environmental Impact Statement New Orleans to Venice, Louisiana Hurricane Risk Reduction Project: Incorporation of Non-Federal Levees from Oakville to St. Jude, Plaquemines Parish, Louisiana" with a Record of Decision signed October 31, 2011. The NOV project was documented and assessed in the Final Supplemental Environmental Impact (SEIS) titled "Final Supplemental Environmental Impact Statement New Orleans to Venice Federal Hurricane Protection Levee Plaquemines Parish, Louisiana" with a ROD signed October 31, 2011. The Supplemental Environmental Assessment (SEA) #537 titled "Supplemental Environmental Assessment #537 New Orleans to Venice Hurricane Risk Reduction Project: Changes to the Non-Federal Levees Project, Oakville to St. Jude, Plaquemines Parish, Louisiana." A Finding of No Significant Impact (FONSI) for SEA #537 was signed March 25, 2016. This SEA #537 described impacts for changes to the NFL including the Lower Level of Risk Reduction (LORR) to the 25-year/4 percent in levee Sections 2-5 of the NFL.

Three water certificates were issued previously for this NFL NOV project: 1) NOV SEIS WQC 110718-04/AI 101235/CER 20110006, approved August 18, 2011; 2) NFL EIS WQC 110520-01/AI 101235/CER 20110002, approved July 6, 2011; and 3) SEA #537 WQC 110520-01/AI 101235/CER20160001, approved January 7, 2016.

Please send all inquiries or comments to Mr. Daniel Meden either by mail or email. Mr. Meden's address is U.S. Army Corps of Engineers (PDN), 7400 Leake Ave, New Orleans, LA 70118. Mr. Meden's phone number is (504) 862-1014 and his email address is daniel.c.meden@usace.army.mil.

Sincerely,

Marshall K. Harper

Marshall K. Harper
Chief, New Orleans District
Environmental Branch