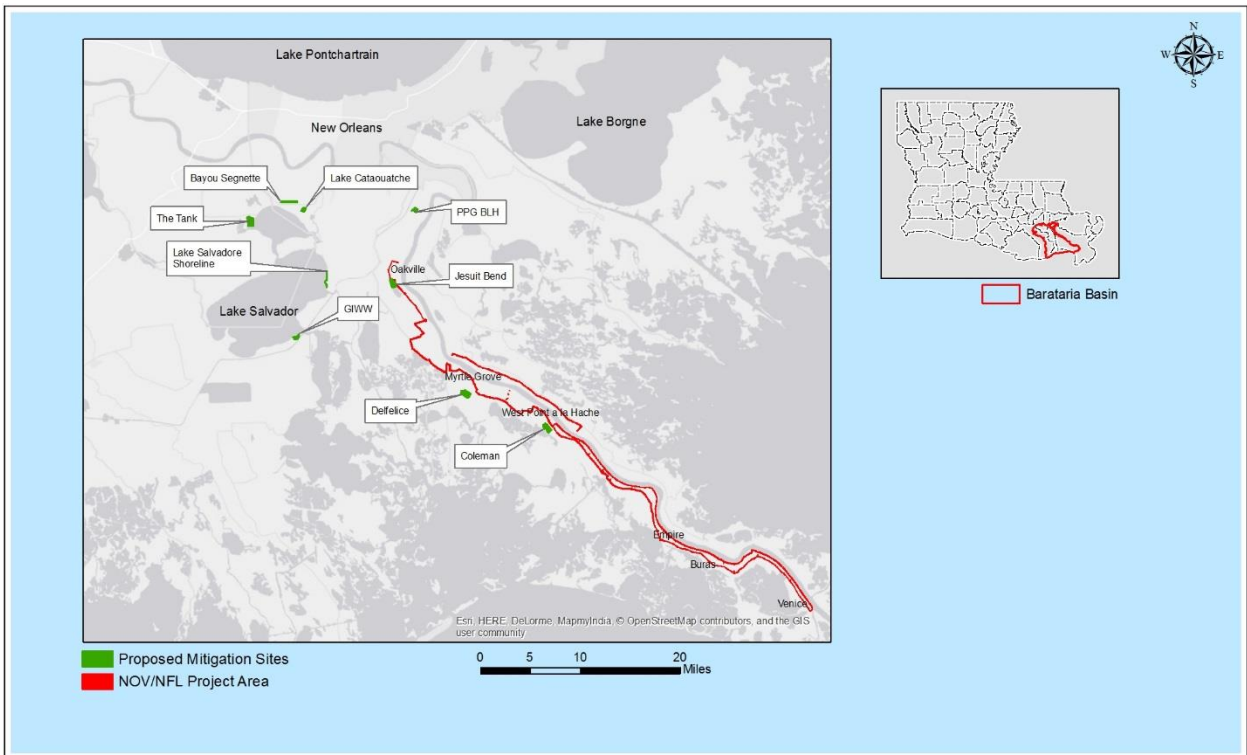
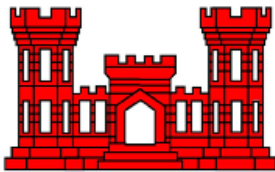


ENVIRONMENTAL ASSESSMENT #543

NEW RIGHT OF WAY AND 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



6/27/2017



U.S. Army Corps of Engineers
Mississippi Valley Division
New Orleans District
Regional Planning and Environment Division South

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ENVIRONMENTAL ASSESSMENT #543

NEW RIGHT OF WAY AND 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

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE; see Appendix I for a list of acronyms included in this document), Regional Planning and Environment Division South (RPEDS), New Orleans District (CEMVN), has prepared this Environmental Assessment (EA #543) to evaluate the potential impacts associated with proposed modifications to the required right of way (ROW) for the approved New Orleans to Venice Non-Federal Levees (NFL) and the New Orleans to Venice (NOV) Federal Hurricane Protection Levee (HPL) projects. EA #543 also evaluates the potential impacts associated with completing compensatory mitigation for the impacts that would be incurred from construction of the NFL NOV levees using the currently identified ROW as modified by the proposed new ROW in this EA. As result of the NFL NOV levee construction within the Barataria Basin (“The Basin”), dry bottomland hardwoods (BLH-Dry), wetland bottomland hardwoods (BLH-Wet), scrub shrub, swamp, wet pasture, freshwater marsh, intermediate marsh, brackish marsh, saline marsh, and open water habitats are being impacted.

The NFL project was originally documented and assessed in the Final Environmental Impact Statement (FEIS) 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 (ROD) signed October 31, 2011. The NFL project consists of approximately 32 miles of levees along the west bank of the Mississippi River. Currently, the levee heights vary throughout the NFL alignment (see figures A-1 and A-3 in Appendix A). The Selected Plan in the ROD, Alternative C, included replacement or modification of 21 miles of existing non-federal back levees on the west bank of the Mississippi River in Plaquemines Parish from Oakville to Citrus Lands (Sections 1-3) for incorporation into the existing NOV federal levee system. Work on Sections 1-3 of the NFL system included raising the levee to an authorized 2 percent design elevation, or approximately a 50-year LORR based on hurricane modeling techniques current at the time.

After the ROD was signed for this project, a risk analysis was performed for the Non-Federal Levees project by the USACE Risk Management Center in August 2015. The results determined that changing the level of risk reduction elevation from 50-year to approximately 25-year for NFL Section 2 and Section 3 would allow for construction of

levees in Section 4 and Section 5, despite funding constraints. The change would be a modification to original Alternative B, which had been the preferred alternative in the 2011 FEIS due to the increased level of protection that it could provide. The modifications to Alternative B, the associated environmental impacts, and the mitigation requirements as defined in the FEIS necessitated a Supplemental Environmental Assessment (SEA #537). The 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", Finding of No Significant Impact (FONSI) 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. The decrease in the LORR to the 25 year/4 percent in those reaches allowed for the construction and incorporation of all NFL Sections 1-5 into the Federal Hurricane and Storm Risk Reduction System. Other modifications included: work in areas outside of the original ROW, the construction of an earthen levee across the Jefferson Lake Canal Marina, and relocation of an existing drainage canal and lateral ditches. The FEIS, ROD, and SEA #537 are hereby incorporated into this document by reference.

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 NOV SEIS described the recommended plan for restoration to the 50 year/2 percent LORR, armoring, and accelerating completion of 90 miles of existing Federal NOV levees and pump stations on the east bank of the Mississippi River in Plaquemines Parish from Phoenix to Bohemia. It includes NOV 01 and NOV 02 and the levees, floodwalls, and pump stations on the west bank from St. Jude to Venice, Louisiana in the following reaches: NOV 05, NOV 06, NOV 07, NOV 08, NOV 09, NOV 10, NOV 11, NOV 12, NOV 13, NOV 14, NOV 15, and NOV 16 (see figures A-2 and A-3 in Appendix A).

After the ROD was signed, a risk analysis was also performed by the USACE Risk Management Center in December 2015 for the NOV project and determined that the following levee sections were of lower priority and would not proceed to construction at this time: NOV 01, NOV 06A, NOV 08A, NOV 12, NOV 15, and NOV 16. As such, the alternatives discussed herein do not include mitigation for the impacts arising from construction of these reaches. In the future, if additional funding becomes available and these unconstructed levee reaches proceed to construction, a reassessment of impacts incurred from their construction and the actions necessary to mitigate such impacts would be presented in a supplemental National Environmental Policy Act of 1969 (NEPA) document.

Please see Table 1 (also Appendix B Table B-1) for an accounting of the impacts by habitat type that will require mitigation for construction of the following NFL NOV reaches: NFL sections 1-5, NOV 02, NOV 05A and B, NOV 06B, NOV 07 A and B, NOV

08B, NOV 09, NOV 10, NOV 11, NOV 13, NOV 14, P-14a, and P-17a. If a reach is not listed in the table, it did not incur impacts that required mitigation. Figure A-3 in Appendix A shows what reaches are being constructed. Those reaches in grey are not being constructed.

This EA #543 is prepared in accordance with NEPA and the Council on Environmental Quality's Regulations (40 Code of Federal Regulations [CFR] §1500-1508), as reflected in USACE Engineer Regulation (ER) 200-2-2. In accordance with the Procedures for Implementing NEPA, 40 CFR Part 1502.20, this EA #543 provides sufficient information on the potential adverse and beneficial environmental effects of the proposed action to allow the District Commander to make an informed decision on the appropriateness of a Supplemental Environmental Impact Statement (SEIS) or FONSI.

1.1 PROJECT NAME AND LOCATION

Project Name: New ROW and Mitigation for 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.

Project Location: The Basin is bounded to the north and east by the Mississippi River, to the west by Bayou Lafourche, and to the south by the Gulf of Mexico (Figure 1). Parishes within the Basin include parts of Plaquemines, St. Charles, Lafourche, and Jefferson Parishes, Louisiana. Major estuaries within the Basin include Barataria Bay, an estuary of the Gulf of Mexico, lies on the west side of the Mississippi River delta, Lake Salvador, and Lake Cataouatche.

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

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 NFL	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 temporary and self-mitigate within 1 year. As such, these acres and AAHUs are not included in the total.

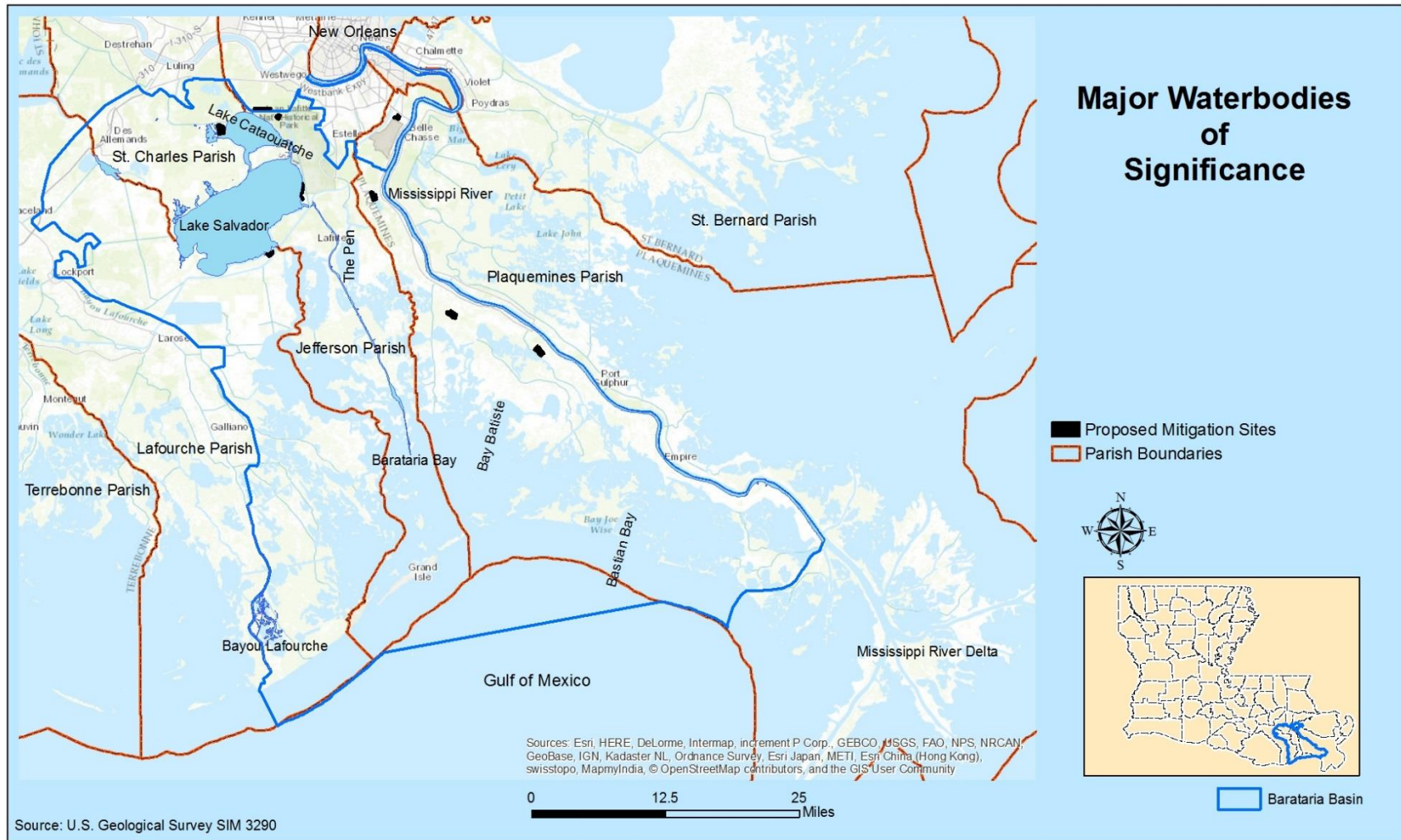
**Note: Intermediate Marsh impacts are combined with Brackish Marsh impacts for total AAHUs.

***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.

*****Note: All BLH Dry and wet pasture impacts occurred on the protected side of the levees. All other impacts occurred on the flood side of the levees.

Figure 1. Barataria Basin Study Area with Major Waterbodies



1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to assess impacts from utilizing the proposed new ROW for the NFL NOV levees and to compensate for habitat losses incurred during construction of the overall NFL NOV project. Although efforts to avoid and minimize impacts to wetlands and other habitat types, such as a protected side levee shifts, were utilized during plan formulation for all NFL NOV reaches, unavoidable impacts to the following ten habitat types were still incurred: BLH-Dry, BLH-Wet, scrub shrub, swamp, wet pasture, freshwater marsh, intermediate marsh, brackish marsh, saline marsh, and open water. The proposed compensatory mitigation would replace the lost functions and services of the impacted habitat through restoration activities designed to create/increase/improve the habitat functions and services at specific mitigation sites. Impacts to these habitats would be mitigated within the same watershed where the impacts occurred. Additionally, a teleconference was held with United States Fish and Wildlife Service (USFWS), Environmental Protection Agency (USEPA), and National Marine Fisheries Service (NMFS) on July 18, 2011 prior to signing the RODs for the NFL EIS and the NOV SEIS, and a letter from USEPA dated April 12, 2012 which stipulates:

Compensatory mitigation for the New Orleans to Venice projects should be completed by no later than 18 months from the initiation of levee construction.

In this context, the word “completed” means that the compensatory mitigation for all unavoidable impacts has either been addressed through the purchase of credits at an appropriate mitigation bank or, if applicable, through sufficient contributions to an approved in-lieu fee program. In the event that the Corps of Engineers performs the mitigation, “completion” means that initial fill elevations have been achieved (in the case of marsh creation). For forested wetland restoration, “completion” would mean that the initial phases of reforestation (including land protection), any necessary hydrologic improvements, and re-planting have been achieved. As noted above, additional mitigation could be required to compensate for temporal losses in the event that there is a delay in implementation of compensatory mitigation and/or cases where there is a substantial lag time between the completion of construction of the mitigation project and the full functioning of the restored area. Under any scenario, there would remain critical compensatory mitigation obligations (e.g. monitoring, ensuring success criteria are met, long term site protection...) consistent with the 2008 final rule.

In response to this coordination, USACE formed a Project Delivery Team (PDT) consisting of USACE members and other interested state and Federal agencies to identify potential mitigation sites, develop screening criteria to determine the sites that would undergo further engineering as part of the final array, and develop plans to implement and monitor the mitigation projects in the tentatively selected alternative (TSA).

1.3 PROJECT AUTHORITY

Congress approved a series of supplemental appropriations acts following Hurricanes Katrina and Rita to repair or improve Federal and non-Federal hurricane and storm damage reduction

and flood damage reduction projects and related works in the affected area. The USACE, New Orleans and Vicksburg Districts, conducted the study described in this document under the authorities described below.

Under these authorities, a total of \$671,000,000 was allocated for construction at full Federal expense to replace or modify the NFL on the west bank in Plaquemines Parish from Oakville to St. Jude, and to incorporate the levees into the Federal levee system for the purpose of providing enhanced storm surge risk reduction and protection of the evacuation route.

The New Orleans to Venice, Louisiana Project is originally authorized in section 203, Title II, Flood Control, Lower Mississippi River Basin, P.L. 87-874, and was previously named “Mississippi River Delta At and Below New Orleans, Louisiana.”

The Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery of 2006 (4th Supplemental - Public Law 109-234, Title II, Chapter 3, Flood Control and Coastal Emergencies [120 STAT. 454-455]) provides: “For an additional amount for ‘Flood Control and Coastal Emergencies,’ as authorized by section 5 of the Act of August 18, 1941 (33 U.S.C. 701n), for necessary expenses relating to the consequences of Hurricane Katrina and other hurricanes, \$3,145,024,000, to remain available until expended: Provided, that the Secretary of the Army is directed to use the funds appropriated under this heading to modify, at full Federal expense, authorized projects in southeast Louisiana to provide hurricane and storm damage reduction and flood damage reduction in the greater New Orleans and surrounding areas; . . . \$215,000,000 shall be used to replace or modify certain non-Federal levees in Plaquemines Parish to incorporate the levees into the existing New Orleans to Venice hurricane protection project,” The Flood Control and Coastal Emergencies Section of Title II, Chapter 3, of the Joint Explanatory Statement of the Committee of Conference, page 115, states: “Funds totaling \$3,145,024,000 are recommended to continue repairs to flood and storm damage reduction projects *These projects are to be funded at full Federal expense* Additionally, the Conferees include: . . . \$215,000,000 for incorporation of non-Federal levees on the west bank of the Mississippi River in Plaquemines Parish in order to provide improved storm surge protection and to protect evacuations routes;”

The U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007 (5th Supplemental - Public Law 110-28, Title IV, Chapter 3, Flood Control and Coastal Emergencies [121 STAT. 153-154]) provides: “For an additional amount for ‘Flood Control and Coastal Emergencies,’ as authorized by section 5 of the Act of August 18, 1941 (33 U.S.C. 701n), for necessary expenses relating to the consequences of Hurricanes Katrina and Rita and for other purposes, \$1,407,700,000, to remain available until expended: “Provided, . . . The Secretary of the Army is . . . to prosecute these projects in a manner which promotes the goal of continuing work at an optimal pace, while maximizing, to the greatest extent practicable, levels of protection to reduce the risk of storm damage to people and property”

The Act Making Appropriations for Military Construction, the Department of Veterans Affairs, and Related Agencies for the Fiscal Year Ending September 30, 2008, and For Other

Purposes (6th Supplemental – Public Law 110-252, Title III, Chapter 3, Flood Control and Coastal Emergencies [122 STAT. 2349-2350]) provides: “For an additional amount for ‘Flood Control and Coastal Emergencies,’ as authorized by section 5 of the Act of August 18, 1941 (33 U.S.C. 701n), for necessary expenses relating to the consequences of Hurricane Katrina and other hurricanes of the 2005 season, \$2,926,000,000, to become available on October 1, 2008, and to remain available until expended: *Provided*, That funds provided herein shall be used to reduce the risk of hurricane and storm damages to the greater New Orleans metropolitan area, at full Federal expense, for the following: . . . \$456,000,000 shall be used to replace or modify certain non-Federal levees in Plaquemines Parish to incorporate the levees into the existing New Orleans to Venice hurricane protection project;”

1.4 PRIOR REPORTS

Information and data on previous and existing floodwall and levee conditions associated with the proposed action were derived from the following reports and are incorporated herein by reference:

1974, *Final EIS, New Orleans to Venice, Louisiana, Hurricane Protection, U.S. Army Engineer District, New Orleans*. This document discussed the enlargement of the west bank back levee from City Price to Venice (Reaches A, B1, and B2) and construction of a new levee from Phoenix to Bohemia on the east bank of the Mississippi River (Reach C). Barrier levees from Bohemia to 10 miles Above Head of Passes (AHP) on the east bank and Fort Jackson to Venice on the west bank were also discussed in the EIS. The ROD was signed on December 9, 1974.

1985, *Final Supplement I to the EIS, New Orleans to Venice Hurricane Protection Project*. This document discussed the deficiencies of the 1974 Final EIS and also the enlargement of the locally constructed west bank back levee from City Price to Venice, Reaches A (City Price to Tropical Bend), B1 (Tropical Bend to Fort Jackson), and B2 (Fort Jackson to Venice). The ROD was signed on June 27, 1985.

1985, *Mitigation Report, New Orleans to Venice Hurricane Protection Project*. This document discussed the mitigation for the levees from Tropical Bend to Venice – Reaches B1 and B2. This mitigation was accomplished with the creation of 300 acres of marsh in the Delta National Wildlife Refuge (NWR) by breaching the existing Main Pass bank resulting in accretion of marsh by natural deposition of sediments.

1987, *Final Supplement II to the EIS, New Orleans to Venice Hurricane Protection Project*. This document discussed additional impacts for the east bank (Reach C) and west bank Mississippi River Levee (MRL). The east bank barrier levee (1974 EIS, from Bohemia to 10 miles AHP) was dropped from further consideration. The ROD was signed on January 25, 1988.

2010, *Final SEIS, New Orleans to Venice (NOV), Federal Hurricane Protection Levee, Plaquemines Parish, Louisiana*. This document discussed restoring, armoring, and accelerating

completion of the NOV Federal levee system in Plaquemines Parish that would provide enhanced storm risk reduction. The ROD was signed on October 31, 2011.

2011, *Final EIS, New Orleans to Venice (NOV), Hurricane Risk Reduction Project: Incorporation of Non-Federal Levees from Oakville to St. Jude, Plaquemines Parish, Louisiana*. This document discussed the replacement or modification of the NFL system for incorporation into the NOV Federal project in Plaquemines Parish. The Recommended Plan, Alternative C, included replacement or modification of 21 miles of existing non-federal back levees on the west bank of the Mississippi River in Plaquemines Parish from Oakville to Citrus Lands (Sections 1-3) for incorporation into the existing NOV federal levee system. The southern terminus of Section 3, at Myrtle Grove, was designed to turn 90 degrees to the east and tie into the existing MRL. Enhancement of Sections 1-3 of the NFL system included raising the levee to an authorized 2 percent design elevation, or approximately a 50-year LORR based on hurricane modeling techniques current at the time. The ROD was signed on October 31, 2011.

2012, *EA #508, New Orleans to Venice Hurricane Protection Project, West Bank River Levee, Staging Areas and Rights-of-Way (ROW) Additions, Contracts p-14A and P-17A, Plaquemines Parish, Louisiana*. This document was prepared to evaluate the potential impacts associated with additional acreages for construction rights-of-way and staging areas for Contracts P-14A and P-17A reaches located between the communities of Empire and Buras in Plaquemines Parish, Louisiana. The FONSI was signed on July 3, 2012.

2012, *EA #513, New Orleans to Venice Hurricane Protection Project, Federal Hurricane Protection Levee, Fronting Protection for Diamond and Ollie, Louisiana, Pump Stations Plaquemines Parish, Louisiana*. This document discussed the potential impacts of the expansion of construction right-of-way beyond the scope addressed in the NOV SEIS and NFL EIS that are necessary to complete the fronting protection features at the Diamond and Ollie pump stations. The FONSI was signed on September 6, 2012.

2014, *EA #528, New Orleans to Venice Hurricane Protection Project, Federal Hurricane Protection Levee, Utilization of the Woodland North Borrow Area for Use at the Wilkinson Pump Station (Contract NF-05b), Plaquemines Parish, Louisiana*. This document discussed the utilization of the Woodlands North Borrow Area as a source of clay borrow material for use in construction of a new pump station, the levee tie-in features, and fronting protection features. The FONSI was signed on June 16, 2014.

2014, *EA #529, New Orleans to Venice Hurricane Protection Project, Federal Hurricane Protection Levee, Utilization of the Woodland North Borrow Area for Use on the Oakville to La Reussitte Levees, USACE Contract NF-04a (W912P8-13-C-0024), Plaquemines Parish, Louisiana*. This document discussed the utilization of the Woodlands North Borrow Area as a source of clay borrow material for modification of 8.2 miles of non-federal levees between Oakville and La Reussite in Plaquemines Parish. The FONSI was signed on July 9, 2014.

2016, *SEA #537, New Orleans to Venice Hurricane Risk Reduction Project: Changes to the Non-Federal Levees Project, Oakville to St. Jude, Plaquemines Parish, Louisiana*. This document builds upon the 2011 FEIS and reverting the NFL project design back to Alternative

B with modifications related to impacts outside the original project ROW as well as a relocation of a drainage canal. The FONSI was signed on March 25, 2016.

1.5 PUBLIC INVOLVEMENT

As committed to in the ROD for both the NFL EIS and the NOV SEIS, USACE formed a mitigation PDT consisting of USACE members and other interested state and Federal agencies to identify potential mitigation sites, develop screening criteria to determine the sites that would undergo further engineering as part of the final array, and develop plans to implement and monitor the mitigation projects in the TSA. In addition, on October 28, 2014 letters were sent by Plaquemines Parish Government (PPG) to property owners in Plaquemines Parish, Louisiana to solicit interest and identify willing sellers of properties for use as mitigation for the NFL NOV project. Mitigation measures were developed from input received during public meetings held for the NFL EIS and NOV SEIS, from responses to the October 28, 2014 letters, and from the PDT and stakeholders.

This EA will be mailed to the public for 45 day public review and comment starting June 27, 2017 and available for download on <http://www.mvn.usace.army.mil/About/Projects/>. Any comments received during the review period would be considered part of the official record. After the 45-day public review period, the CEMVN Commander would review all comments received and make a determination on whether they rise to the level of being substantive. If no substantive comments are received the CEMVN Commander would make a decision on the proposed action that would be documented in a FONSI. If any comment or comments are determined to be substantive, either the EA would be revised responding to the comment(s) and would be published for an additional public review and comment period or a Notice of Intent (NOI) to prepare an EIS would be prepared. If a revised EA is prepared, the CEMVN Commander would, after the expiration of the public comment period, make a decision on the proposed action that would be documented in a FONSI.

1.6 NFL NOV MITIGATION COMPLETED TO DATE

Compensatory mitigation bank credits were acquired in 2013 for 2.3 acres (0.97 average annual habitat units, or "AAHUs") of fresh marsh impacts resulting from construction of the Diamond (NOV-05B) and Ollie (NOV NF-W-04B) Pump Station Fronting Protections projects. Impacts resulting from the construction of the Diamond and Ollie Pump Stations were assessed in EA #513, signed FONSI dated September 6, 2012.

1.7 OUTSTANDING NFL NOV MITIGATION

Approximately 594 acres and 350 AAHUs of wetlands and bottomland hardwoods remain to be mitigated for the NFL NOV reaches currently moving forward for construction, including the new ROW. See Table 1 for impacts by habitat type and levee section.

2.0 ALTERNATIVE FORMULATION

The following sections walk the reader through the planning process for the NFL NOV new ROW and mitigation, from identification of impacted habitats requiring compensatory mitigation to identification of the tentatively selected alternative (TSA).

2.1 NEW ROW PROPOSED ACTION

Since 2011, as design of the NFL NOV project reaches is completed, construction has commenced. The latest design efforts have revealed that additional ROW is necessary in order to safely construct the project in levee sections NOV 05A, NOV 09, and NOV-NF-W-05a.1. The additional ROW is adjacent to the existing NFL NOV levee alignments and would be used to accommodate construction staging and access areas and to allow for limited levee alignment shifts. Because the alignment of the NFL NOV levees and floodwalls was already approved in the NFL EIS and the NOV SEIS, no additional plan formulation to consider alternative levee alignments was conducted.

With the exception of NOV 05A, utilization of the additional ROW has not yet occurred. Because construction in NOV 05A is nearly complete, NOV 05A is discussed as part of the No Action Alternative in section 2.9.1 and in section 5. Construction of NOV 05A impacted an additional 24.4 acres of saline marsh habitat and 2.6 acres of scrub shrub habitat than what was originally assessed for this reach in the NOV SEIS. These impacts will be mitigated along with all other impacts incurred from construction of the NFL NOV project. The new ROW Proposed Action includes NOV 09 and NOV-NF-W05a.1, for which construction would commence following the signing of the FONSI for this EA #543. Specific details for construction for these levee reaches are discussed below:

2.1.1 New ROW TSP

2.1.1.1 NOV 09

NOV 09 consists of 2.5 miles of the West Bank 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 ft (see blue lines on Figure A-2 in Appendix A). The new proposed design requires additional ROW to provide working room to tie the NOV 09 levee enlargement into the existing Mississippi River Levee and the NOV 05A levee project reach, and to provide for two additional staging areas and two access roads for the temporary storage of construction materials and access to locations along the project area (see blue lines on Figure A-4 in Appendix A). The staging and access route locations were chosen in areas that would not impact wetlands. Upon completion of construction activities, the staging areas would be returned to pre-construction conditions and allowed to revegetate naturally. The new ROW will reduce the impacts to BLH-Wet in this reach that were assessed in the NOV SEIS by 17.1 acres. See Table 1 for total impacts to be mitigated that reflect the decreased impacts of the new ROW design.

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

This levee contract reach is on the west bank NFL back levee between La Reussite and Myrtle Grove and was part of Section 2 as evaluated in the NFL FEIS and SEA #537. Design modifications to NOV-NF-W-05a.1 include a shift in the existing ROW as indicated on figures A-1 and A-5 in Appendix A (blue lines) 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, NFL "Section 2," for impacts to be mitigated that reflect the decreased impacts of the new ROW design.

2.2 MITIGATION MEASURE DEVELOPMENT AND SCREENING CRITERIA

The CEMVN is required by law and regulation to compensate for habitat losses through in-kind mitigation. For NFL NOV, this means that CEMVN is required to compensate for impacts to ten habitat types: open water, fresh marsh, intermediate marsh, brackish marsh, saline marsh, scrub shrub, wet pasture, BLH-Dry, BLH-Wet, and swamp. Open water impacts are assessed using the model for the marsh type closest to the impacts; and mitigation of open water impacts occurs through establishment of the marsh type closest to the impacts. As such, the NFL NOV marsh mitigation projects mitigate for both marsh and open water impacts. Since scrub shrub habitat is early successional transitional habitat, it is being mitigated as the kind of habitat it would develop into overtime. In the case of NFL NOV, the scrub shrub habitat would transition into higher quality BLH-Dry. As such, scrub shrub impacts are being mitigated together with the BLH-Dry impacts. Similarly, wet pasture, if left undisturbed, would transition to fresh marsh so, wet pasture impacts are being mitigated together with the fresh marsh impacts. Since brackish marsh and saline marsh provide similar functions and services for many of the same species, brackish and saline marsh impacts are being mitigated with a brackish marsh project. Additionally, since the brackish marsh mitigation projects are located in areas where salinities fluctuate to such an extent that the sites could support both intermediate and brackish marsh species, and since the intermediate marsh impacts were so small (1.4 acres), the brackish marsh mitigation projects were designed to mitigate for all intermediate, brackish, and saline marsh impacts.

Freshwater marsh is found in low-lying frequently flooded areas, with the water level remaining on or near the surface for extended periods of time during growing season. It contains emergent herbaceous (non-woody) vegetation adapted to predominantly non-tidal freshwater conditions. In the Basin, species found in fresh marsh (salinity 0-3 parts per thousand, or "ppt") are a combination of *Panicum hemitomom* (maidencane), *Hydrocotyle* sp. (pennyworts), *Pontederia cordata* (pickerelweed), *Sagittaria lancifolia* (bulltongue), and *Althernantera philoxeroides* (alligator weed) (Visser et al., 1998).

Intermediate marsh is found between brackish marsh and freshwater marsh and has an irregular tidal regime. This marsh is characterized by a diversity of species, many of which are found in freshwater marsh and some of which are found in brackish marsh (e.g. *Cyperus* spp., wiregrass). In the Basin, species found in intermediate marsh (salinity 2-8 ppt) are a combination of saltmeadow cordgrass, *Vigna luteola* (yellow cowpea), *Scirpus californicus*

(California bullwhip), *Echinochloa walteri* (coast cockspur), bulltongue, *Cladium jamaicense* (sawgrass), and *Phragmites australis* (Visser et al., 1998).

Brackish marsh is found in low-lying frequently flooded tidally influenced areas, with the water level remaining on or near the surface for extended periods during growing season. It contains emergent herbaceous vegetation adapted to tidal conditions. In the Basin, species found in brackish marsh (salinity 4-18 ppt) are a combination of saltmeadow cordgrass, *Scirpus americanus* (chairmaker's bulrush), *Scirpus robustus* (saltmarsh bulrush), and *Eleocharis parvula* (dwarf spikerush) (Visser et al., 1998).

Saline Marsh is similar habitat to brackish marsh but at a lower elevation and more tidally influenced. In the Basin, species found in saline marsh (salinity 8-29 ppt) are a combination of smooth cordgrass, *Juncus roemerianus* (needlegrass rush), *Batis maritima* (turtleweed), *Avicennia germinans* (black mangrove), and *Distichlis spicata* (saltgrass) (Visser et al., 1998).

Bottomland hardwoods are broadleaf deciduous forested wetlands. They are generally found along the edges of lakes and rivers and in sinkholes. Bottomland forests represent a transition between drier upland hardwood forest and swamp. While trees and plants in this ecosystem cannot tolerate long periods of flooding (as in a swamp), they are flooded periodically when water levels rise. Species common to bottomland hardwoods include oaks, hickories, *Ulmus americana* (American elm), *Ulmus crassifolia* (cedar elm), *Fraxinus pennsylvanica* (green ash), *Liquidambar styraciflua* (sweetgum), *Celtis laevigata* (sugarberry), *Acer negundo* (boxelder), *Diospyros virginiana* (common persimmon), *Gleditsia triacanthos* (honey locust), *Morus rubra* (red mulberry), *Populus deltoides* (eastern cottonwood), *Salix nigra* (black willow), *Platanus occidentalis* (American sycamore), etc. The designation of 'wet or dry' (e.g. BLH-Wet or BLH-Dry) refers to the amount of flooding experienced by the habitat in question. Dry bottomland hardwoods seldom or never experience inundation by flood waters and are not jurisdictional wetlands.

Swamps are broadleaf and needleleaf deciduous forested wetlands that experience inundation either permanently or seasonally throughout the year. They are generally found along the edges of lakes and rivers. A swamp is defined as an area supporting or capable of supporting a canopy of woody vegetation that covers at least 33 percent of the area's surface and with at least 60 percent of that canopy consisting of any combination of *Taxodium distichum* (bald cypress), *Nyssa aquatica* (tupelo gum), *Acer rubrum* (red maple), *Cephalanthus occidentalis* (buttonbush), and/or *Planera aquatica* (planer tree).

The proposed compensatory mitigation would replace the lost functions and values of the impacted areas through restoration or enhancement activities that increase/improve the habitat functions and services within a particular mitigation site. Enhancement would involve implementing actions to improve already existing low quality habitat. Restoration would involve creating a habitat type from open water or agricultural fields where none currently exists, but which historically occurred in the vicinity of the project area.

2.2.1 Mitigation Formulation Requirements:

In accordance with the USACE Implementation Guidance for Section 2036 of the Water Resources Development Act (WRDA) 2007, Mitigation for Fish and Wildlife and Wetlands Losses, as well as the standards and policies set forth in 33 CFR Part 332, compensatory mitigation was formulated to occur within the same watershed or hydrologic basin as the impacts and to replace the functions and services of each habitat type with functions and services of the same habitat type. If habitat impacts were mitigated in a different watershed than the one impacted, there would be an overall loss of that habitat in the impacted watershed. Loss of such habitat would result in permanent impacts to some wildlife populations in the impacted watershed, some of which could be T&E species, and may also result in impacts to aquatic resources, recreation, and water quality in the impacted watershed. The impacts from the approved NFL NOV improvements as well as the proposed new ROW would occur in the Basin watershed boundaries. As such, the mitigation options were also planned to occur within this watershed. The Water Resources Development Act of 2007 requires the Corps to select and design mitigation projects using a watershed approach. The Corps has done that in this instance.

The WIIN Act of 2016 (PL 114-322) does not alter this requirement. Although the WIIN Act states that mitigation banks with service areas that include the impacted areas should be considered as "reasonable" alternatives, the WIIN Act also states that it does not modify or alter any requirement for a water resources development project to comply with Section 906 of the Water Resources Development Act of 1986.

For one habitat evaluated in this document - brackish marsh - only one approved mitigation bank has an approved service area that encompasses the anticipated impacts of the levee project. Unfortunately, the service area for that bank is broader than the watershed containing the project's anticipated impacts. This results in a conflict between the requirements of the WIIN 2016 Act (evaluate service area) and WRDA Section 906 as amended (evaluate impacted watershed).

However, the WIIN Act itself states that WRDA Section 906 trumps the WIIN Act. Consequently, the Corps has applied a watershed approach (rather than a service area approach) to determine its TSMP, which resolution satisfies the requirements of both WRDA 1986 Section 906 as amended by the WIIN Act of 2016, Section 1163.

Additionally, in accordance with the WRDA of 1986 and 2007, unavoidable habitat impacts would be offset through compensatory mitigation by replacing the lost habitats' functions and services in-kind to the extent possible. WRDA 1986, Section 906(d)(1), as amended by WRDA 2007, Section 2036(a), provides: "IN GENERAL. - After November 17, 1986, the Secretary shall not submit any proposal for the authorization of any water resources project to Congress in any report, and shall not select a project alternative in any report, unless such a report contains (A) a recommendation with a specific mitigation plan to mitigate fish and wildlife losses created by such project, or (B) a determination by the Secretary that such project will have negligible adverse impact on fish and wildlife. Specific mitigation plans shall ensure that impacts to bottomland hardwood forests are mitigated in-kind and other habitat types are

mitigated to not less than in kind conditions to the extent possible." As such, mitigation measures were required to either restore or enhance the same habitat types that were impacted (e.g. "habitat type for habitat type") from the NFL NOV construction. The phrase "mitigation measures" refers to potential actions at a given site that could mitigate NFL NOV impacts.

Design of the mitigation measures was completed in cooperation with the PDT which included CEMVN staff, the non-Federal Sponsor (NFS), and the state and Federal resource agencies. In the case of impacts to BLH-Dry habitats, the PDT determined that the potential mitigation measures could involve restoring or enhancing BLH-Wet habitat instead of BLH-Dry habitat. This is possible because BLH-Wet habitat has an added hydrologic component that allows a greater diversity of species to thrive while still supporting the species that utilize BLH-Dry habitat. The result is an increase in habitat functions and services for BLH-Wet over and above what BLH-Dry would provide. The reverse would not be possible because using BLH-Dry to mitigate BLH-Wet would result in the loss of wetland related functions and services essential to that system. Similarly, impacts to fresh marsh and intermediate marsh could involve restoring or enhancing fresh marsh or intermediate marsh as these marsh types provide similar functions and services for many of the same species. The same is true for brackish and saline marshes.

2.2.2 Measure Development

Measures were developed from input received during NFL NOV project public meetings, obtained through responses to scoping letter mail-outs, and developed by the PDT with input from the NFS and the state and Federal resource agencies. Additionally, multiple sources were considered when developing measures including, but not limited to the 2012 Louisiana State Master Plan (the 2017 plan is still in draft form at this time), Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) projects, projects submitted by the PPG, and projects proposed or evaluated under other programs. Initially, measures were identified without regard to potential conflicts or screening criteria. The intent of this process was to be unconstrained in proposing a potential mitigation measure and to identify as many potential measures as possible. Once the measures were identified, initial research was conducted to gather readily available information on these measures and plot each of the potential measures with Geographic Information System (GIS) software. This process resulted in the identification of approximately 300 potential mitigation measures within the watershed.

Two other mitigation options were also considered in the planning process. First, USACE approved mitigation banks with perpetual conservation servitudes, within the Basin, currently in compliance with their mitigation banking instrument (MBI), and able to service the habitat types impacted by the work were considered as a potential mitigation measure.

Second, use of the Louisiana Department of Natural Resources (LDNR) In Lieu Fee (ILF) Program to offset marsh impacts was also considered as a viable mitigation option. The ILF is similar to mitigation banks in that the program sells mitigation credits to permittees, whose obligation to provide compensatory mitigation is then transferred to the ILF program sponsor (LDNR). LDNR then builds a marsh project with those funds in the geographic area impacted

(Chenier Plain or Deltaic Plain), within the Louisiana Coastal Zone. Consistent with how the USACE 404 Mitigation Bank Program mitigates marsh impacts, credits mitigate either fresh/intermediate impacts or brackish/saline impacts. Additionally, since when credits are purchased there is no certainty which project will actually be built with those funds, the assumption is that because numerous projects will be built within the plain, over time impacts to a particular watershed in that plain will eventually be mitigated in that watershed.

2.2.3 Initial Screening

The following screening criteria were developed by the PDT. Screening criteria respond to Congressional authority, USACE internal policy, law (such as NEPA, et al), and the MVN Commander's Intent (see Appendix F). The screening criteria were developed to achieve large contiguous tracts of land for the purposes of obtaining greater ecological output within the watershed and to produce cost efficiencies that would be experienced during construction and operation, maintenance, repair, replacement and rehabilitation (OMRR&R) phases. Measures that did not meet any one of the following criteria were eliminated from further consideration.

- Measures must meet 100% of the mitigation requirement by habitat type
- No conversion of existing wetlands to uplands
- Compliant with applicable laws and policies
- Within NFL NOV mitigation basin for area of impact (Barataria, Breton Sound, Mississippi River Delta)
- No known hazardous, toxic, and radioactive wastes (HTRW) risk
- In kind replacement of impact AAHUs by habitat type (exception: BLH-Dry can be mitigated as BLH-Wet, wet pasture and intermediate marsh can be mitigated as fresh marsh; and saline marsh can be mitigated as brackish marsh)
- Technically viable (e.g. constructability, salinity suitable for target habitat type, etc.)
- Screen out measures that are in the Future Without Project Condition
- Must have independent utility (not dependent on implementation of or modification to other projects)
- Can be easily scaled to meet changing mitigation acreage requirements
- No stand-alone marsh nourishment measures
- No preservation measures

Initial screening reduced the number of potential mitigation measures from approximately 300 to 17. A higher level of investigation was then conducted on the 17 measures that remained after the initial screening, including site visits in some cases. As new information was gleaned about each measure, details emerged that allowed the PDT to eliminate measures that had potential issues that would affect constructability (e.g., pipeline presence). Also, as design of the levees proceeded, impacts to habitats in the Breton Sound and Mississippi River Delta were avoided. As such, the only watershed that experienced impacts requiring mitigation was the Barataria watershed. This restricted compensatory mitigation planning to the Barataria watershed. In all, the additional evaluation eliminated 9 measures. After the 9 measures were eliminated, 3 additional public land measures were identified that satisfied the screening criteria and two of the Coleman measures were reshaped into a single viable measure. In

total, 10 potential measures remained after screening and were refined and developed into the final array of projects that were carried forward into further analysis.

At the time of screening, mitigation banks existed in the watershed that had both protected side (PS) and flood side (FS) BLH-Wet, FS swamp, and FS fresh marsh credits in sufficient number to mitigate the BLH-Dry, BLH-Wet, swamp, and fresh marsh mitigation requirements for NFL NOV. As a result, the final array of potential mitigation projects included the option to purchase mitigation bank credits to satisfy the BLH-Dry, BLH-Wet, swamp, and fresh marsh mitigation requirements only. It is not known which banks would be available when the decision whether to purchase bank credits is made: some banks may not have enough credits remaining, some may be closed, and additional mitigation banks may be approved. As such, a general mitigation bank project for each of these habitat types was created for the next step of the analysis, using information obtained from existing banks in the Basin, although no specific banks were identified. The Regulatory ILF and Bank Information Tracking System (RIBITS) (<http://geo.usace.army.mil/ribits/index.html>) has information on all currently approved banks in the Basin including their credit availability.

Also at the time of screening, the ILF program did not have sufficient credits to satisfy 100% of the need for the marsh types impacted. However, since sufficient fresh marsh mitigation bank credits existed in the watershed to meet 100% of the impacts being mitigated as fresh marsh, a measure that consisted of the purchase of ILF and mitigation bank credits could in combination meet 100% of the fresh marsh need. As such, the final array of potential mitigation projects included the option to purchase a combination of mitigation bank and ILF credits to satisfy the fresh marsh impacts.

2.3 FINAL ARRAY OF MITIGATION PROJECTS BY HABITAT TYPE

The following are the measures that remained after screening that became final array of projects, listed by habitat type:

BLH-Dry Impacts

- Mitigation Bank
- PPG BLH-Dry
- Bayou Segnette BLH-Dry Enhancement

BLH-Wet Impacts

- Mitigation Bank
- Jesuit Bend BLH-Wet Restoration
- The Tank BLH-Wet Restoration

Swamp Impacts

- Mitigation Bank
- Jesuit Bend Swamp Restoration
- Lake Salvador Swamp Restoration

Fresh Marsh Impacts

- Mitigation Bank

- Mitigation Bank/ILF
- Cataouatche Ponds Fresh Marsh Restoration
- GIWW / Salvador Fresh Marsh Restoration

Brackish Marsh Impacts

- Coleman Brackish Marsh Restoration
- Defelice Brackish Marsh Restoration

See Appendix A for the maps of these projects from the Engineer Alternative Report (EAR). This consists of plate G-01 for an overall map of all project areas and plate C-01 through C-10A for each individual project.

All mitigation projects were designed using site specific land loss rates and the intermediate sea level rise (SLR) scenario. See section 2.7.3 and Table B-9 in Appendix B for details. Sea level rise is measured by a tide gauge with respect to the land upon which it is situated. There are three classifications of SLR: low (historic), intermediate, and high. The intermediate and high SLR scenarios are predictions of possible future sea level change. Utilizing the intermediate SLR scenario for project design may result in a larger mitigation project than required, as the intermediate SLR rate is higher than the historic. However, it would be inefficient and expensive to remobilize to construct additional marsh habitat if reliance upon the historic SLR scenario for planning purposes resulted in less mitigation than was actually necessary. In addition, if an increase in elevation became necessary for forested habitats, borrow placement would be extremely problematic and likely result in an unacceptable increase in mortality of already established forest species, which could necessitate complete rebuild of the project. Since the USACE is required to mitigate the lost habitat's functions and services due to construction of the NFL NOV improvements and since future funding for additional construction is uncertain, overbuilding of the mitigation projects (in size, not elevation) was determined to be the least risk design.

Additionally, because there are approximately 10 remaining NFL NOV levee and floodwall contracts that are in design, there could be future minor additional ROW requirements. See Appendix A Figure A-3 for these levees sections (in blue). Though the USACE continues to minimize impacts to wetlands and BLH during design and construction, and remain within the environmentally cleared ROW, design changes could occur to account for additional factors of safety, needs for staging, access, etc. that incur additional environmental impacts. If these occur, additional NEPA compliance documents addressing these changes would be produced and made available for public review. However, in an attempt to avoid redesigning and completing additional NEPA on the mitigation projects if future minor increases in impacts occur, the USACE constructed mitigation project acreages have been increased by 10% (Table 2).

2.4 TENTATIVELY SELECTED PROJECTS

The next step in the planning process for the NFL NOV mitigation was to compare the projects in the final array to each other by habitat type.

2.4.1 Alternative Evaluation Process

The Alternative Evaluation Process (AEP) was utilized to compare projects mitigating for the same habitat type to determine the best project for that habitat type (tentatively selected project, or “TSP”). Each TSP is a feature of the overall plan to mitigate for all the NFL NOV impacts. It is only the combination of projects by habitat type that can together fully mitigate NFL NOV impacts. During the AEP, mitigation projects within the same habitat type were compared to one another using the following weighted selection criteria:

- Risk and Reliability – This criterion considers issues such as a proposed projects’ susceptibility and resiliency to stressors, long-term sustainability, uncertainty relative to CEMVNs ability to implement the project, and uncertainty relative to project success.
- Environmental – This criterion evaluates a proposed project’s adverse and beneficial impacts to human and natural resources.
- Time - Time evaluates the duration to contract award and to initial ecological success or Notice of Construction Complete.
- Cost Effectiveness –This criterion evaluates the average annual cost per average AAHU.
- Other Cost Considerations – This criterion evaluates total proposed project costs including construction, real estate, operations and maintenance, total project and average annual costs over the 50-year period of analysis.
- Watershed and Ecological Site Considerations – This criterion evaluates the proposed project site characteristics such as the role that a potential project would play in terms of creating habitat linkages or wildlife corridors, whether the project is consistent with watershed plans such as Coast 2050, and its proximity to the NFL NOV impacts.

The relative scoring of each project for each criterion under each habitat type produced an overall score. A ranking was then established for the projects under each habitat type based on each project’s overall score. The highest ranked project was selected as the TSP for that habitat type. The TSPs were then combined like building blocks to form the tentatively selected mitigation plan (TSMP), see section 2.6 for more details on the TSMP. Chapter 4 provides an impact assessment on the final array of mitigation projects by habitat type that could be utilized in developing alternative mitigation plans. Chapter 5 looks at the environmental impacts of the NFL NOV alternatives, of which the TSMP is part, as required by NEPA. Selection criteria matrices used during the AEPs are located in Appendix B, tables B-2 through B-8. Details on the AEP Plan Selection Criteria are located in Appendix F. The TSPs of the TSMP are found in Table 2 (below) and a summary of the selection rationale for each habitat type is explained in section 2.4.2.

2.4.2 Selection Rationale

Protected Side BLH-Dry Impacts

Mitigation Banks performed better than all other projects in terms of Risk and Reliability, Time, Cost Effectiveness and Other Cost Considerations. Mitigation banks have minimal uncertainty relative to achieving ecological success and implementability because they are already in place and do not require any real estate transactions. Banks are governed by mitigation banking instruments, binding agreements that obligate the bank to monitor ecological success, adaptively manage the site to ensure ecological success, and provide financial assurances for such actions. Credits are not available for purchase until certain success criteria are met. Purchase of bank credits can proceed considerably faster than the design, contract award and construction of the other projects. Because multiple mitigation banks may be eligible to sell credits, the CEMVN anticipates that competition would keep the price of credit purchases reasonable. However, there is some uncertainty regarding the price per credit available at the time of purchase. If the bid price per credit would result in a significant cost increase over the estimated cost for the mitigation bank project, or credits are not available at the time of required purchase, then the PDT may re-examine the AEP results and may consider moving to the next ranked (or “fall back”) project.

The second highest ranked project for this habitat type, PPG BLH-Dry, had more risk and less reliability than the Mitigation Bank project. However, PPG BLH-Dry was considered to have less risk and more reliability than Segnette BLH-Dry given that Segnette BLH-Dry is on private land which could impede implementation, has a higher risk of needing intense invasive species control given the adjacent invasive seed bank, and it is located much further from the NFS which would complicate O&M activities. PPG BLH-Dry could also be implemented more quickly and is substantially more cost effective than Segnette BLH-Dry.

Flood Side BLH-Wet Impacts

Mitigation Banks performed better than all other projects in terms of Risk and Reliability, Time, Cost Effectiveness and Other Cost Considerations, as described above for BLH-Dry. However, if the bid price per credit would result in a significant cost increase over the estimated cost for the mitigation bank project, or credits are not available at the time of required purchase, then the PDT may re-examine the AEP results and may consider moving to the next ranked (or “fall back”) project.

Jesuit Bend, the second highest ranked project for this habitat type, performed better than The Tank in terms of Watershed/Ecological Considerations, Cost Effectiveness and Other Cost Considerations. While The Tank is located within the Salvador/Timken Wildlife Management Area, which is a resource managed area that provides added significance within the watershed, the site is outside Plaquemines Parish (the parish of impact). And while Jesuit Bend will take longer to implement than The Tank, it is more cost effective than The Tank.

Flood Side Fresh Marsh Impacts

The ILF/Mitigation Bank project performed better than the Corps constructed projects in terms of Risk and Reliability, Environmental and Time. It scored equal to the Mitigation Bank project in all criteria except Other Cost Considerations, in which it is slightly less expensive than the Mitigation Bank project. However, if the price per ILF credit or Mitigation Bank changed such that it would result in a significant cost increase over the estimated cost for these projects, or credits are not available at the time of required purchase, then the PDT may re-examine the AEP results and may consider moving to the next ranked (or “fall back”) Corps constructed project.

Cataouatche Ponds, the third highest ranked project for this habitat type, had more risk and less reliability than the ILF/Mitigation Bank and Mitigation Bank projects. However, Cataouatche Ponds was considered to have less risk and more reliability than Gulf Intracoastal Waterway (IWW)/Salvador due to the GIWW/Salvador’s placement of rock on both sides of the constructed marsh, leading to uncertainty regarding the achievement of ecological success at the site. GIWW/Salvador is also located further south in the watershed, which could make it more susceptible to salinity impacts than Cataouatche Ponds. Cataouatche Ponds could also be constructed more quickly than GIWW/Salvador, and is substantially more cost effective and less expensive than GIWW/Salvador.

Flood Side Intermediate/Brackish/Saline Marsh Impacts

Coleman Marsh performed better than Defelice Marsh in terms of Risk and Reliability, Time, and Other Cost Considerations. Coleman Marsh would have higher long-term sustainability in terms of the percent vegetated cover at the end of the project life, which increases its reliability. Defelice Marsh could take slightly longer to construct, and is twice as expensive to construct. These two projects were scored the same under all other criteria.

Table 2. Summary Final Array of Mitigation Projects

Mitigation Project	Habitat & Type of Mitigation	Acres Required / +10% buffer	Mitigation Potential (AAHUs/ac.)	Minimum AAHUs Generated
<i>BLH-Dry (includes Scrub/Shrub) Impacts</i> (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 (restore protected side)	178.57 / 200	0.21	37.5
Mitigation Bank (TSP)	BLH Credit Purchase	TBD*	TBD*	37.5
<i>BLH-Wet Impacts</i> (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 (TSP)	BLH Credit Purchase	TBD*	TBD*	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	0.41	33.8
Mitigation Bank (TSP)	Swamp Credit Purchase	TBD*	TBD*	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 (TSP)	Fresh Marsh Credit Purchase	TBD*	TBD*	53
Brackish Marsh (includes Intermediate Marsh and Saline Marsh) Impacts (mitigation required: 105.6 AAHUs)				
Coleman Brackish Marsh (TSP)	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

Note: Bold print identifies the TSPs combined to form the TSMP.

*Since the mitigation bank that will ultimately be selected for use is unknown at this time, the mitigation potential at that bank and the number of acres necessary to satisfy the mitigation requirement is similarly unknown.

2.5 FINAL ARRAY PROJECT DESCRIPTIONS

Below are the project descriptions for the projects in the final array which have been designed, at minimum, to mitigate for the following impacts (Table 3).

Table 3. NFL NOV Mitigation Requirement

Habitat Type	AAHUs Impacted
PS BLH-Dry (includes scrub shrub)	37.5 AAHUs
FS BLH-Wet	120.2 AAHUs
FS Swamp	33.8 AAHUs
FS Fresh Marsh (includes wet pasture)	53 AAHUs
FS Brackish Marsh (includes intermediate and saline marsh)	105.6 AAHUs

General Mitigation Bank/ILF projects were only formulated for the habitat types where sufficient ILF and/or mitigation bank credits were available that could to meet 100% of the mitigation need for a given habitat type within the watershed. This enabled the

purchase of ILF credits to be considered because at the time of AEP there were not enough ILF credits available to meet 100% of the mitigation need for any marsh type. There were no brackish marsh banks in the watershed at the time of plan formulation for the NFL NOV mitigation. As such, neither a general Mitigation Bank/ILF nor a general Mitigation Bank project for brackish marsh was evaluated as potential project.

2.5.1 Common Elements in the Project Descriptions

Elements common to all BLH and swamp mitigation projects are:

- It is anticipated that not all plants installed at the time of the initial planting would survive through the first year; thus, it was estimated that about 20 percent of the total number of plants initially installed in each feature would need to be re-planted one year after the completion of the initial plantings. Additional activities that would occur during the project construction phase would include periodic eradication of invasive/nuisance plant species within the mitigation feature as well as mitigation monitoring and reporting conducted in accordance with the applicable guidelines contained in Appendix J (i.e. monitoring and reporting necessary prior to transfer of the project to the NFS).
- Various activities would be necessary during the Operations, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) phase of the project. At a minimum, these would include periodic eradication of invasive/nuisance plants in the mitigation feature and mitigation monitoring and reporting as prescribed in Appendix J. Additional activities may need to be performed to ensure compliance with applicable mitigation success criteria (Appendix J).

Elements common to all mitigation projects constructed within open water unless otherwise stated within the specific description are:

- Earthen retention dikes would be mechanically constructed along the perimeter of the proposed mitigation feature.
- The retention dike borrow would be obtained from within the mitigation project footprint.
- A freeboard of one foot is required on all retention dikes.
- Adjustable spill boxes would be placed in the retention dikes to drain excess water from the mitigation site during the hydraulic fill operation.
- Borrow for the mitigation feature would be obtained using a hydraulic cutter-head dredge.
- The fill material would be piped from the borrow site to the mitigation feature in slurry.
- The pipeline corridor would be 100-feet wide except when crossing some land and roadways where it would be reduced as necessary.

- Floating pipeline would be marked on 150-foot centers to prevent navigation hazards. Markers would include lighted and reflective buoys.
- Lake borrow sites would be situated a minimum 2,000 feet from the lake shoreline.
- Marsh tracked vehicles would move the discharge pipeline within the restoration sites when pumping, and maintain the retention dikes as needed for the duration of the dredge fill operation.
- Existing lake bottom elevations vary (Lakes Salvador and Cataouatche); however, in designing the projects, an existing average lake bottom elevation within the footprint of the borrow site of -8.0 feet was assumed.
- Once the dredge and fill operation required to establish the land platforms for the restoration features is complete, an idle period of approximately one year would allow hydraulically placed fill time to settle and dewater to the desired final target elevation.
- At the end of the idle period the perimeter dikes would be degraded to equal the final target elevation.
- After degrading the retention dikes, each mitigation feature (except marsh) would be planted in accordance with the applicable planting guidelines contained in Appendix C. It is anticipated that native herbaceous marsh plants would rapidly colonize the degraded marsh dikes.

2.5.2 MITIGATION FOR PS BLH-DRY IMPACTS

2.5.2.1 Mitigation Bank Project TSP

This project assumes that all of the 35 PS BLH-Dry and 2.5 scrub shrub AAHUs could be satisfied through the purchase of BLH-Wet mitigation bank credits and that purchase of mitigation bank credits from a bank with a perpetual conservation servitude would yield a result similar to a mitigation project constructed by the USACE.

If, at the time of solicitation, there are not sufficient mitigation banking credits available to meet 100 percent of the mitigation requirement for the habitat type in the watershed, or if the USACE does not receive satisfactory bids (based on cost and/or other factors), then the second-ranked mitigation project would become the TSP for this habitat type in the TSMP. In addition, if the actual costs for purchasing the mitigation bank credits turn out to be more than what was estimated for the general mitigation bank project during AEP, a re-analysis comparing the mitigation bank project to the other mitigation projects would be conducted to re-evaluate the ranking of the projects and re-consider the selection of the mitigation bank project as the TSP. If the costs for implementing the mitigation bank project based on the proposals received exceed those for the second ranked project, then the second ranked project would likely become the new TSP for this habitat type in the TSMP.

If purchase of mitigation bank credits were included in the NFL NOV Mitigation TSMP, all PS BLH-Dry and scrub/shrub impacts would be mitigated with the purchase of BLH-Wet credits equaling 37.5 AAHUs. Mitigation banks would be required to run the same version of the WVA model as was used to assess the impacts from constructing the NFL NOV 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.

2.5.2.2 PPG BLH-Dry

This proposed project would involve enhancement of BLH forests on site that is currently degraded BLH and upland pasture habitat as mitigation for PS BLH-Dry and scrub shrub impacts incurred as a result of the NFL NOV project. The proposed mitigation feature is owned by PPG and is located in Plaquemines Parish, south of Louisiana Highway 23 (LA Hwy 23) and north of the Naval Air Station (NAS) Joint Reserve Base, and is bounded on the west by an existing drainage canal and Barriere Road. Plate C-01 in Appendix A provides an illustration of the proposed PS BLH mitigation enhancement features. The total area is approximately 105 acres.

The area is fenced and maintained as pasture with some existing BLH tree species such as black willow, green ash, American elm, sweetgum, *Celtis occidentalis* (hackberry), *Quercus virginiana* (Southern live oak), bald cypress, *Quercus texana* (nuttall oak), however there are a few invasive *Triadica sebifera* (Chinese tallow trees) present. The Chinese tallow trees would be eradicated by either mechanized removal (ex. hydroaxes, gyro-tracs, heavy machinery used in areas slated for topographic alterations), non-mechanized removal (use of hand implements such as chain saws and machetes, direct uprooting by hand), aerial herbicide applications (applications using aircraft), or ground herbicide applications (on-the-ground applications using backpack sprayers, wick applicators, etc.) and either chipped or burned on site or properly disposed of offsite. Regardless of the methods involved, care will be exercised to avoid damage to the existing BLH and cypress trees, and site would be planted with desired native, high-quality BLH species.

The proposed BLH-Dry mitigation features would not require significant alterations to the existing topography since the current hydroperiod is satisfactory. The site drains south and west toward existing drainage canals that border Barriere Road and a drainage ditch that borders the NAS. There is no dedicated water source for the area other than rain events. It is assumed that borrow material would not be required for grading the site to required elevations. Access to the site would be either from Barriere Road or J Street, both of which are accessible from LA Hwy 23.

The proposed work would consist of mowing the site in preparation for planting, and planting BLH-Dry canopy seedlings (estimated 53,955 seedlings, 545 seedlings per acre) and mid-story seedlings (estimated 13,464 seedlings, 136 seedlings per acre) in

accordance with the BLH-Dry planting guidelines set forth in Appendix J. The proposed work also includes the installation of predation guards on the seedlings for protection from wildlife herbivory and the mowing of the site (approximately four times per year for two years) to control invasive species and herbaceous growth. The construction duration, with the exception of mowing, would be approximately 1.5 years.

During the OMRR&R phase of the project, prior to transfer of monitoring responsibilities to the NFS, the site would be monitored to ensure the BLH-Dry restoration area has met the initial success criteria. It is anticipated that not all plants installed at the time of the initial planting would survive through the first year. To account for some natural mortality, replant of approximately 30 percent of the total number of plants initially installed after one year was assumed. Following the initial planting event, periodic eradication of invasive/nuisance plant species within the mitigation site would occur as prescribed in Appendix J. It is estimated that the additional planting would require a construction duration of 5 to 6 months.

2.5.2.3 Bayou Segnette BLH

This proposed project would involve the enhancement of low quality BLH forests to mitigate for PS BLH-Dry and scrub shrub impacts incurred as result of the NFL NOV project. The project is located west of the Bayou Segnette State Park and east of Avondale Gardens Road in Jefferson Parish. The project is bounded to the south by the existing Westbank HPL and to the north by Nicolle Boulevard and the NOLA Motorsports Park. Access to the proposed site would be via the West Bank Expressway, to Avondale Garden Road, and through the Cataouatche Pump Station Access road. Plate C-02 in Appendix A provides an illustration of the proposed PS BLH mitigation enhancement features. The total area is approximately 200 acres.

The existing BLH has wetland species present, but is currently dominated almost exclusively by a monoculture of invasive plant species (mainly Chinese tallow) with very few native hardwood species remaining. Enhancement activities would include invasive species eradication and installation of native, high-quality, BLH seedlings. The proposed work would consist of applying herbicide to 200 acres by air or ground, mechanically clearing and removing the remaining vegetation, construction of drainage ditches and swales for site drainage, and planting of BLH canopy seedlings (estimated 100,280 seedlings, 545 seedlings per acre) and mid-story seedlings (Estimated 18,496 seedlings, 136 seedlings per acre). The Chinese tallow trees could be eradicated by either mechanized removal (ex. hydroaxes, gyro-tracs, heavy machinery used in areas slated for topographic alterations), non-mechanized removal (use of hand implements such as chain saws and machetes, direct uprooting by hand), aerial herbicide applications (applications using aircraft), or ground herbicide applications (on-the-ground applications using backpack sprayers, wick applicators, etc.) and either chipped or burned on site or properly disposed of offsite. In addition, work would include the installation of tree and shrub predation guards for protection from wildlife herbivory.

Due to the high density of invasive plant species on the site, the project area would receive multiple herbicidal treatments prior to the initial planting of native, high-quality BLH species. Initially the entire area would be aerial sprayed prior to mechanical clearing. Approximately one month after spraying, the site would be mechanically cleared without grubbing. Woody debris generated during the clearing operations would be chipped and left within the site, although some may be burned on-site if conditions allow. Following the clearing activities, a second herbicidal treatment would be applied from the ground targeting the remaining invasive plants. The mitigation features would subsequently be planted with native BLH canopy and midstory species in accordance with the BLH planting guidelines set forth in Appendix J. It is anticipated that a third ground application of herbicides would be conducted shortly after completion of plantings to eradicate invasive plants that develop after the first ground treatment event. The construction duration for this project would be approximately 1.5 to 2 years.

The proposed BLH mitigation enhancement would not require significant alterations to the existing topography since the current wetland hydroperiod appears to be satisfactory. To attain the desired wetland hydroperiod, enhancement features may include construction of drainage ditches and swales to drain surface water runoff. Jefferson Parish currently operates the Lake Cataouatche Pump Station at the south end of the Avondale Garden Canal. The pump station is operated until the water in the inflow channel (Inner Cataouatche Canal) reaches elevation -10.43 feet (ft). The pumps are operated to this elevation in anticipation of rain events and are not operated below this elevation. The regional water table has been lowered as a result of pumping. This drawdown of the water table combined with the effects of past alterations to area sheet-flow patterns (construction of canals, drainage ditches, developments, etc.) has adversely affected the historic hydroperiod once typical of the area.

Surface water runoff within the proposed project area drains from Nicole Boulevard southward toward the HPL. There is no dedicated water source for the area other than rain events. It is assumed that borrow material would not be required for grading the site to required elevations.

During the OMRR&R phase of the project, prior to transfer of monitoring responsibilities to the NFS, the site would be monitored to ensure the BLH enhancement area has met the initial success criteria. It is anticipated that not all plants installed at the time of the initial planting would survive through the first year. To account for some natural mortality, replant of approximately 30 percent of the total number of plants initially installed after one year was assumed. Following the initial planting event, periodic eradication of invasive/nuisance plant species within the mitigation feature would occur as prescribed in Appendix J. It is estimated that the additional planting will require a construction duration of 6 to 7 months.

2.5.3 MITIGATION FOR BLH-WET IMPACTS

2.5.3.1 Mitigation Bank Project TSP

This project assumes that all of the 120.2 FS BLH-Wet AAHUs could be satisfied through the purchase of BLH-Wet mitigation bank credits and that purchase of mitigation bank credits from a bank with perpetual conservation servitude would yield a result similar to a mitigation project constructed by the USACE (“Corps-constructed”).

If, at the time of solicitation, there are not sufficient mitigation banking credits available to meet 100 percent of the mitigation requirement by habitat type or if the USACE does not receive satisfactory bids (based on cost and/or other factors), then the second-ranked mitigation project would become the TSP for this habitat type in the TSMP. In addition, if the actual costs for purchasing the mitigation bank credits turn out to be more than what was estimated for the general mitigation bank project during AEP, a re-analysis comparing the mitigation bank project to the other mitigation projects would be conducted to re-evaluate the ranking of the projects and re-consider the selection of the mitigation bank project as the TSP. If the costs for implementing the mitigation bank project based on the proposals received exceed those for the second ranked project, then the second ranked project would likely become the new TSP for this habitat type in the TSMP.

If purchase of mitigation bank credits were included in the NFL NOV Mitigation TSMP, all FS BLH-Wet impacts would be mitigated with the purchase of BLH-Wet credits equaling 120.2 AAHUs. Mitigation banks would be required to run the same version of the WVA model as was used to assess the impacts from constructing the NFL NOV 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.

2.5.3.2 Jesuit Bend BLH-Wet

This proposed project would involve the creation of BLH-Wet forest from shallow open water adjacent to the existing NFL levees to mitigate for FS BLH-Wet impacts incurred as result of the NFL NOV project. The proposed project is located in Plaquemines Parish, west of LA Hwy 23 between river mile 68 and 69, just north of the Ollie Pump Station and Ollie canal, and is adjacent and flood side to the existing NFL back levee. Plates C-10 and C-10A in Appendix A provide an illustration of the proposed FS BLH-Wet restoration features. The total area is approximately 225 acres.

The area previously supported swamp and BLH forests, but transitioned to open water once the agricultural practices that cleared and drained the site were abandoned. The proposed work would consist of hydraulically dredging approximately 3,300,000 CY of fill material from a 258 acre borrow site within the Mississippi River to fill 225 acres of open water for BLH-Wet restoration. Access to the proposed BLH-Wet creation area

would be along the levee access road from New Ollie Pump Station and Ollie Drive. The pipeline/access corridor would use the existing culverts placed under LA Hwy 23 from the south and along the levee access road. Approximately 400 linear feet (LF) (20 ft wide and 6 inch thick) of timber matting would be used to protect the existing levee during the transportation of construction equipment over the levee in the pipeline corridor.

Work for this project would include construction of retention dikes around the perimeter of the proposed BLH-Wet creation area. The water bottom elevation for this location is approximately -2.5 ft North American Vertical Datum 88 (NAVD88). Retention dikes for this project are comprised of a front retention dike, 2,046 LF, and a back retention dike, 11,450 LF. The front retention dike would be constructed within the open water, the back retention dike would be constructed along the existing bank line. Both retention dikes would be constructed to elevation 5.5 ft NAVD88 and constructed with a 5 ft wide crown and 1:3 side slopes. Borrow for the front dike, an estimated 27,700 CY, and borrow for the back dike, an estimated 52,900 CY, would be obtained from within the BLH-Wet creation footprint.

Once the construction of the retention dikes are complete, dredged material from the Alliance Borrow Area, within the Mississippi River, would be pumped via pipeline to the BLH-Wet creation area. The 259 acre borrow site within the river would be dredged to a max depth of -90.0 ft NAVD88. The dredge slurry would be placed within the retention dikes to a maximum elevation of 5.0 ft NAVD88 in an effort to achieve an initial fill elevation of 4.5 ft NAVD88. Approximately 3,300,000 CY would be dredged for the project. After a one year settling and dewatering period, the internal elevations should have settled to approximately 3.0 ft NAVD88. Suitable elevations for BLH-Wet establishment in this area is between 3.0 ft to 3.5 ft NAVD88. The estimated construction duration is 8 to 9 months.

Planting of the site would begin once the settling and dewatering period is complete (approximately 1 year). Work would consist degrading the retention dikes to the BLH-Wet target elevation. Degraded dike material would be placed adjacent to, and along, the retention dikes by marsh buggies to a maximum elevation of 3.0 ft NAVD88. In conjunction with the dike degrading, 130,800 canopy BLH-Wet seedlings and 32,640 midstory seedlings would be planted in accordance with the BLH-Wet planting guidelines set forth in Appendix J. Additionally each seedling would have predation guards installed to protect against wildlife herbivory. The estimated duration for the planting phase is 6 to 7 months.

During the OMRR&R phase of the project, prior to transfer of monitoring responsibilities to the NFS, the site would be monitored and surveyed to ensure the BLH-Wet creation area has met the initial success criteria. It is anticipated that not all plants installed at the time of the initial planting would survive through the first year. To account for some natural mortality, replant of approximately 30 percent of the total number of plants

initially installed after one year was assumed. In following the initial planting event, periodic eradication of invasive/nuisance plant species would occur within the mitigation feature. It is estimated that the additional planting would require a construction duration of 3 to 4 months.

2.5.3.3 The Tank BLH-Wet

This proposed project would involve the creation of BLH-Wet habitat from open water to mitigate for FS BLH-Wet impacts incurred as result of the NFL NOV project. The proposed project is located in St. Charles Parish, on the western edge of Lake Cataouatche, south of the Louisiana Cypress Lumber Canal, and within the Salvador/Timken Wildlife Management Area (WMA). Plates C-09 and C-09A in Appendix A provide an illustration of the proposed FS BLH-Wet restoration features. The total area is approximately 310 acres.

The area previously supported swamp, BLH-Wet, and farmland but erosion and subsidence has converted the site to open water. The proposed work would consist of hydraulically dredging borrow material from a 7,000 ft by 4,000 ft section of water bottom within the Lake Cataouatche to fill 310 acres of shallow open water for BLH-Wet restoration. Various navigable waterways including Bayou Segnette, can be used to access to Lake Cataouatche.

Creation of the BLH platform would be completed in two lifts with a planting phase to follow. The water bottom elevation in the fill site is approximately -3.5 ft NAVD88. During the first lift, 15,325 LF of retention dikes would be constructed to an elevation of 4.5 ft NAVD88 with a 5 ft crown width and 1:3 side slopes with material taken from within the BLH-Wet footprint. Approximately 184,000 cubic yards (CY) of borrow material would be necessary for construction of the retention dikes. This material would be obtained from the Lake Cataouatche side adjacent to the dike and would also provide the required floatation needed for construction. To protect the BLH-Wet creation area from lake waves, the dike adjacent to Lake Cataouatche would be armored with 23,000 tons of stone placed on a geotextile foundation.

Once the construction of the retention dikes are complete, approximately 4,865,000 CY of dredged material would be pumped via pipeline from Lake Cataouatche and placed in the BLH-Wet creation area to a maximum elevation of 3.5 ft NAVD88 in an effort to achieve an initial target elevation of 2.5 ft NAVD88. The 7,000 ft by 4,000 ft borrow site would be dredged to a maximum depth of -20.0 ft NAVD88. The estimated construction duration for the first lift is 11 to 12 months. Once the first lift is complete, the Contactor would de-mobilize and mobilize one year later to perform the second lift. It is anticipated that after one year, the initial 2.5 ft NAVD88 fill elevation would settle to an approximate elevation of 1.0 ft NAVD88.

During the second lift the retention dikes would be raised to an elevation 7.0 ft NAVD88. Borrow to construct the lift of the retention dikes would be obtained from within the BLH-Wet creation footprint. Once the lift is complete, approximately 3,300,000 CY of dredged material would be pumped via pipeline from Lake Cataouatche and placed in the BLH-Wet creation area to a maximum elevation of 6.0 ft NAVD88 in an effort to obtain a fill elevation of 5.0 ft NAVD88. The estimated construction duration for the second lift would be 7 to 8 months. Once the second lift is complete, the contractor would de-mobilize and mobilize one year later to perform the planting phase. It is anticipated that after one year, the initial 5.0 ft NAVD88 fill elevation would settle to between 2.5 ft to 3.0 ft NAVD88, the target elevation for BLH-Wet habitat at this site.

Work for the planting phase would begin approximately one year after the second lift is complete. Work would consist of degrading the back dikes to the target BLH-Wet elevation. Degraded dike material would be placed within the project area and adjacent to the retention dikes, that are not armored, by marsh buggies to a maximum elevation of 2.5 ft NAVD88. In conjunction with the dike degrading, 189,660 canopy BLH-Wet seedlings and 47,328 midstory seedlings would be planted in accordance with the BLH-Wet planting guidelines set forth in Appendix J. Additionally each seedling would have predation guards installed to protect against wildlife herbivory. The estimated duration for the planting phase is 4 to 5 months.

During the OMR&R phase of the project, prior to transfer of monitoring responsibilities to the NFS, the site would be monitored and surveyed to ensure the BLH-Wet creation area has met the initial success criteria. It is anticipated that not all plants installed at the time of the initial planting would survive through the first year. To account for some natural mortality, replant of approximately 30 percent of the total number of plants initially installed after one year was assumed. Additional activities that would occur following the initial planting event would include periodic eradication of invasive/nuisance plant species within the mitigation feature. It is estimated that the additional planting would require a construction duration of 2 to 3 months.

2.5.4 MITIGATION FOR SWAMP IMPACTS

2.5.4.1 Mitigation Bank Project TSP

This project assumes that all of the 33.8 FS swamp AAHUs could be satisfied through the purchase of swamp mitigation bank credits and that purchase of mitigation bank credits from a bank with perpetual a conservation servitude would yield a result similar to Corps constructed mitigation project.

If, at the time of solicitation, there are not sufficient mitigation banking credits available to meet 100 percent of the mitigation requirement by habitat type or if the USACE does not receive satisfactory bids (based on cost and/or other factors), then the second-ranked mitigation project would become the TSP for this habitat type in the TSMP. In

addition, if the actual costs for purchasing the mitigation bank credits turn out to be more than what was estimated for the general mitigation bank project during AEP, a re-analysis comparing the mitigation bank project to the other mitigation projects would be conducted to re-evaluate the ranking of the projects and re-consider the selection of the mitigation bank project as the TSP. If the costs for implementing the mitigation bank project based on the proposals received exceed those for the second ranked project, then the second ranked project would likely become the new TSP for this habitat type in the TSMP.

If purchase of mitigation bank credits were included in the NFL NOV Mitigation TSMP, all FS swamp impacts would be mitigated with the purchase of swamp credits equaling 33.8 AAHUs. Mitigation banks would be required to run the same version of the WVA model as was used to assess the impacts from constructing the NFL NOV 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.

2.5.4.2 Lake Salvador FS Swamp

This proposed project would involve the restoration of swamp habitat from open water adjacent to the existing Lake Salvador shoreline in Jean Lafitte National Historical Park and Preserve (JLNHPP) to mitigate for FS swamp impacts incurred as result of the NFL NOV project. The project is located in Jefferson Parish, along the eastern edge of Lake Salvador, north of the GIWW. Access to the proposed site would be via various navigable waterways and the GIWW to Lake Salvador. Plates C-07 and C-07A07A in Appendix A provides an illustration of the proposed FS swamp restoration features. The total area is approximately 95 acres.

The area previously supported swamp habitat, but erosion and subsidence has converted the site to open water. The proposed work would consist of hydraulically dredging borrow material from a 7,500 ft. by 1,400 ft. section of water bottom within Lake Salvador to fill 94 acres of shallow water for swamp restoration.

Creation of the swamp platform would be completed in two lifts with a planting phase to follow. The water bottom elevation for this location varies from -2.0 ft NAVD88 along the bank line and to -4.0 ft NAVD88 into Lake Salvador. During the first lift a 9,678 LF front retention dike in Lake Salvador and a 10,894 LF rear retention dike along the existing bank line would be constructed to an elevation of 4.5 ft NAVD88 with a 5-ft crown width and 1:3 side slopes. Approximately 140,000 CY of borrow material for construction of the front dike would be obtained from Lake Salvador adjacent to the front dike; such excavation would also provide the required floatation needed for construction of the dikes. Approximately 43,000 CY of borrow for construction of the back dike would be obtained adjacent to the back dike from within the swamp creation footprint. To protect the swamp creation area from lake waves, the front dike would be armored with approximately 43,000 tons of stone placed on a geotextile foundation.

Once the construction of the retention dikes are complete, approximately 1,010,000 CY of dredged material would be pumped via pipeline from Lake Salvador and placed in the swamp creation area to a maximum elevation of 3.5 ft NAVD88 in an effort to meet an initial target elevation of 1.5 ft NAVD88. The 7,500 ft by 1,400 ft borrow site would be dredged to a max elevation depth of -20.0 ft NAVD88. The estimated duration for the first lift is 9 to 10 months. Once the first lift is complete, the Contactor would de-mobilize and mobilize one year later to perform the second lift. It is anticipated that after one year, the initial 1.5 ft NAVD88 fill elevation would settle to an elevation between 0.0 ft and 0.5 ft NAVD88.

During the second lift the retention dikes would be raised to elevation 6.5 ft NAVD88. Borrow for the second lift for both front and back retention dikes would be obtained from within the swamp creation footprint. Once the lift is completed, 1,100,000 CY of dredged material would be pumped via pipeline from Lake Salvador and placed in the swamp creation area to a maximum elevation of 5.5 ft NAVD88 in an effort to achieve an initial fill elevation of 3.5 ft NAVD88. After one year, the initial 3.5 ft NAVD88 fill elevation would settle to an elevation between 2.0 ft to 2.5 ft NAVD88, the target swamp elevation at this location. During this phase, approximately 57,000 tons of stone would also be placed along the front dike to account for settlement of the initially placed rock. The estimated duration for the second lift would be 8 to 9 months.

Work for the planting phase would begin approximately one year after the second lift is complete. Work consists of degrading the back dikes to the target swamp elevation. Degraded dike material would be placed within the project area and adjacent to the back retention dikes by marsh buggies to a maximum elevation of 2.0 ft NAVD88. In conjunction with the dike degrading, 59,950 canopy swamp seedlings and 14,960 midstory would be planted in accordance with the swamp planting guidelines set forth in Appendix J. Additionally each seedling would have predation guards installed to protect against wildlife herbivory. The estimated duration for the planting phase is 5 to 6 months.

During the OMRR&R phase of the project, prior to transfer of monitoring responsibilities to the NFS, the site would be monitored and surveyed to ensure the swamp creation area has met the initial success criteria. It is anticipated that not all plants installed at the time of the initial planting would survive through the first year. To account for some natural mortality, replant of approximately 30 percent of the total number of plants initially installed after one year was assumed. Additional activities that would occur following the initial planting event include periodic eradication of invasive/nuisance plant species within the mitigation feature. It is estimated that the additional planting will require a construction duration of 6 to 7 months.

2.5.4.3 Jesuit Bend Swamp

This proposed project would involve the restoration of swamp habitat from open water adjacent to the existing NFL levees to mitigate for FS swamp impacts incurred as result of the NFL NOV project. The proposed project is located in Plaquemines Parish, west of LA Hwy 23 between river mile 68 and 69, just north of the Ollie Pump Station and Ollie canal, and is adjacent and flood side to the existing NFL back levee. Plates C-08 and C-08A in Appendix A provide an illustration of the proposed FS swamp restoration features. The total area is approximately 95 acres.

The area previously supported swamp and BLH habitat, but transitioned to open water once the agricultural practices that cleared and drained the site were abandoned. The proposed work would consist of hydraulically dredging 1,300,000 CY of fill material from a 258 acre borrow site within the Mississippi River to fill 94 acres of shallow open water (-2.5 ft NAVD88) for swamp restoration. Access to the proposed swamp creation area would be along the levee access road from New Ollie Pump Station and Ollie Drive. The pipeline/access corridor would use the existing culverts placed under LA Hwy 23 from the south and along the levee access road. Approximately 400 LF (20 ft wide and 6 inch thick) timber matting would be required to protect the levees during the transportation of construction equipment over the existing levee in the pipeline corridor.

Work for this project would consist of the construction of 2,953 LF of front retention dike within open water and 6,759 LF of back retention dike along the existing bank line to elevation 4.5 ft NAVD88 with a 5 ft crown width and 1:3 side slopes. Approximately 27,700 CY of borrow material for the front dike and 52,900 CY of borrow material for the back dike would be obtained from within the swamp creation footprint.

Once the construction of the retention dikes is complete, approximately 1,300,000 CY of borrow material would be dredged from 258 acres of the Alliance Borrow Area, within the Mississippi River, and placed in the swamp creation area to a maximum elevation of 3.5 ft NAVD88 in an effort to achieve an initial target elevation of 3.0 ft NAVD88. The borrow area would be dredged to a maximum depth of -90.0 ft NAVD88. The final target elevation for swamp at this location ranges from 2.0 ft to 2.5 ft NAVD88. The estimated construction duration is 8 to 9 months. Once the dredging operations are complete, the contractor would de-mobilize from the site and mobilize one year later to perform the planting phase. After one year the initial 3.0 ft NAVD88 fill elevation would settle to the approximate elevation of 2.0 ft NAVD88.

Work for the planting phase consists of degrading the retention dikes to the target swamp elevation. Degraded dike material would be placed within the project area and adjacent to the retention dikes by marsh buggies to an elevation of 2.0 ft NAVD88. In conjunction with the dike degrading, 63,220 canopy swamp seedlings and 15,776 midstory swamp seedlings would be planted in accordance with the swamp planting guidelines set forth in Appendix J. Additionally each seedling would have predation

guards installed to protect against wildlife herbivory. The estimated duration for the planting phase is 5 to 6 months.

During the OMRR&R phase of the project, prior to transfer of monitoring responsibilities to the NFS, the site would be monitored and surveyed to ensure the swamp creation area has met the initial success criteria. It is anticipated that not all plants installed at the time of the initial planting would survive through the first year; thus. To account for some natural mortality, replant of approximately 30 percent of the total number of plants initially installed after one year was assumed. Additional activities that would occur following the initial planting event would include periodic eradication of invasive/nuisance plant species within the mitigation feature. It is estimated that the additional planting will require a construction duration of 4 to 5 months.

2.5.5 MITIGATION FOR FRESH MARSH IMPACTS

2.5.5.1 Mitigation Bank Project

This project assumes that all of the 17.6 FS fresh marsh and 35.3 wet pasture AAHUs could be satisfied through the purchase of fresh marsh mitigation bank credits and that purchase of mitigation bank credits from a bank with a perpetual conservation servitude would yield a result similar to a Corps constructed mitigation project.

If, at the time of solicitation, there are not sufficient mitigation banking credits available to meet 100 percent of the mitigation requirement by habitat type or if the USACE does not receive satisfactory bids (based on cost and/or other factors), then the second-ranked mitigation project would become the TSP for this habitat type in the TSMP. In addition, if the actual costs for purchasing the mitigation bank credits turn out to be more than what was estimated for the general mitigation bank project during AEP, a re-analysis comparing the mitigation bank project to the other mitigation projects would be conducted to re-evaluate the ranking of the projects and re-consider the selection of the mitigation bank project as the TSMP. If the costs for implementing the mitigation bank project based on the proposals received exceed those for the second ranked project, then the second ranked project would likely become the new TSP for this habitat type in the TSMP.

If purchase of mitigation bank credits were included in the NFL NOV Mitigation TSMP, all FS fresh marsh and wet pasture impacts would be mitigated with the purchase of fresh marsh credits equaling 53 AAHUs. Mitigation banks would be required to run the same version of the WVA model as was used to assess the impacts from constructing the NFL NOV 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.

2.5.5.2 ILF/Mitigation Bank Project TSP

This project assumes that all of the 17.6 FS fresh marsh and 35.3 wet pasture AAHUs could be satisfied through the purchase of fresh marsh ILF and mitigation bank credits and that purchase of ILF credits and mitigation bank credits from a bank with a perpetual conservation servitude would yield a result similar to a Corps constructed mitigation project.

If, at the time of solicitation, purchase of ILF credits and credits from eligible banks cannot meet 100 percent of the mitigation requirement by habitat type or if the USACE does not receive satisfactory bids (based on cost and/or other factors), then the second-ranked mitigation project would become the TSP for this habitat type in the TSMP. In addition, if the actual costs for purchasing the ILF and mitigation bank credits turn out to be more than what was estimated for the general mitigation bank project during AEP, a re-analysis comparing the ILF/mitigation bank project to the other mitigation projects would be conducted to re-evaluate the ranking of the projects and re-consider the selection of the mitigation bank project as the TSP. If the costs for implementing the ILF/mitigation bank project based on the proposals received exceed those for the second ranked project, then the second ranked project would likely become the new TSP for this habitat type in the TSMP.

If purchase of ILF/mitigation bank credits were included in the NFL NOV Mitigation TSMP, all FS fresh marsh and wet pasture impacts would be mitigated with the purchase of fresh marsh credits equaling 53 AAHUs. The ILF and mitigation banks would be required to run the same version of the WVA model as was used to assess the impacts from constructing the NFL NOV to ensure that the assessment of the functions and services provided by the ILF program and the mitigation bank(s) match the assessment of the lost functions and services at the impacted site.

2.5.5.3 Cataouatche Ponds FS Fresh Marsh

This proposed project would involve the restoration of fresh marsh habitat as mitigation for FS fresh marsh impacts incurred as result of the NFL NOV project. The proposed project is located in Jefferson Parish, northeast of Lake Cataouatche, west of Bayou Segnette, south of the Lake Cataouatche Outfall Canal, and within JLNHPP. Figures C-03 and C-03A in Appendix A provides an illustration of the proposed FS fresh marsh restoration mitigation feature. The total areas is approximately 110 acres.

This site once supported fresh marsh habitat, but has transitioned to open water over time. Access to Lake Cataouatche can be accomplished from the GIWW, Lake Salvador, and other navigable waterways. From Lake Cataouatche to the proposed marsh site, access with shallow draft vessels can be accomplished through Whiskey Bayou to the Cataouatche Outfall Canal, and then through an open water channel to the

proposed marsh site. A pipeline/access corridor would be provided through Whiskey Bayou, the Outfall Canal, and the open water channel.

Work for this project would consist of the construction of approximately 8,450 LF of retention dikes to an elevation of 4.5 ft NAVD88 with a 5-ft crown with and side slopes of 1:3. Additionally, 10-ft wide stability berms on each side of the dike would be built to elevation -0.5 ft NAVD88. The approximate water bottom elevation in the marsh creation area is approximately -2.0 ft. NAVD88. The 66,500 CY of borrow for retention dike construction would be obtained from within the marsh creation area. Once construction of the retention dikes are complete, approximately 1,355,000 CY of borrow material would be dredged from the 2,600 ft by 2,000 ft Lake Cataouatche borrow site and placed in the marsh creation area to a maximum elevation of 3.5 ft NAVD88 to achieve an initial fill elevation of 2.5 ft NAVD88. The borrow site would be dredged to a max depth of -20.0 ft NAVD88. After one year, the initial 2.5 ft NAVD88 fill elevation should settle to between 1.5 ft and 1.0 ft NAVD88; the target marsh elevation for fresh marsh habitat at this project location. The construction duration is estimated to be 5 to 6 months.

During the OMRR&R phase of the project, prior to transfer of monitoring responsibilities to the NFS, the site would be monitored and surveyed to ensure the marsh creation area has met the initial success criteria. Approximately one year after construction of the marsh platform is complete, once dewatering and settlement of the marsh platform has occurred, the retention dikes would be degraded to the target marsh elevation. Degraded dike material would be placed within the marsh creation area and adjacent to the retention dikes by marsh buggies to a maximum elevation of 1.0 ft NAVD88. In conjunction with degrading the retention dikes, trenasses may be established within the feature if additional hydraulic conveyance is necessary. The acceptable trenasse width, if constructed in this fashion, would be the width of a 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 ft bottom width by 1 ft deep channel. The marsh feature would not be planted, since rapid colonization of the site by native, herbaceous, marsh plants should occur naturally. The construction duration for degrading the dikes would be approximately 1 month. Additional time would be necessary if trenasses are required. Additional activities would include periodic eradication of invasive/nuisance plants in the mitigation feature and mitigation monitoring and reporting as prescribed in Appendix J.

2.5.5.4 Gulf Intracoastal Waterway / Salvador FS Fresh Marsh

This proposed project would involve the restoration of fresh marsh from shallow open water for FS fresh marsh impacts incurred as result of the NFL NOV project. The proposed project is located in Lafourche Parish, along the southern shoreline of Lake Salvador that borders the GIWW. Figures C-04 and C-04A in Appendix A provide an

illustration of the proposed FS fresh marsh restoration mitigation feature. The proposed total area is approximately 160 acres.

This site once supported fresh marsh habitat, but erosion and subsidence has converted the site to open water. Access to the proposed marsh creation site could occur through various navigable waterways and the GIWW to Lake Salvador. The proposed work would consist of hydraulically dredging fill material from a borrow site within Lake Salvador to construct, in two lifts, a fresh marsh platform for marsh creation.

The first lift would consist of the construction of a 4,002 LF front retention dike along Lake Salvador, and 7,721 LF back retention dike along the existing GIWW bank line to an elevation 4.0 ft NAVD88 with a 5 ft crown and 1:3 side slopes. Approximately 52,000 CY of borrow for the front dike would be obtained from Lake Salvador outside of the project area and adjacent to the front dike; such excavation would also provide the required floatation needed for construction. Approximately 49,000 CY borrow material for the back dike would be obtained from within the marsh creation footprint. To protect the dikes/marsh creation area from lake waves, the front dike would be armored with approximately 18,400 tons of stone placed on geotextile foundation. To account for prop wash from vessel traffic on the GIWW, a foreshore stone dike, consisting of approximately 14,500 tons of stone placed on geotextile foundation, would be constructed adjacent to the back dike along the GIWW.

Once the construction of the retention dikes are complete, approximately 1,285,000 CY of borrow material would be dredged from the 4,000 ft by 1,800 ft Lake Salvador borrow site and placed within the marsh creation area to a maximum elevation of 3.0 ft NAVD88 in an effort to achieve an initial fill elevation of 1.5 ft NAVD88 for the first lift. The borrow site at the lake would be dredged to a max elevation depth of -20.0 ft NAVD88. After one year, the initial 1.5 ft NAVD88 fill elevation material would settle to an approximate elevation of 0.5 ft NAVD88. The estimated duration for the first lift is 6 to 7 months. Once the first lift is complete, the contractor would de-mobilize and mobilize one year later to perform the second lift.

Work for the second lift would consist of raising the retention dikes to elevation 5.0 ft NAVD88 using borrow from within the marsh creation footprint. Once the dike lift is completed, 800,000 CY of borrow material from the Lake Salvador borrow site would be placed within the marsh creation area to a maximum elevation of 4.0 ft NAVD88 in an effort to achieve an initial fill elevation of 3.0 ft NAVD88. After one year, the initial 3.0 ft NAVD88 fill elevation material would settle to between 1.0 ft and 1.5 ft NAVD88, the target marsh elevation for fresh marsh at this project. Additionally, approximately 19,000 tons of stone will be added to the front dike and foreshore stone dike to account for settlement. The estimated duration for the second lift would be 3 to 4 months.

During the OMR&R phase of the project, prior to transfer of monitoring responsibilities to the NFS, the site would be monitored and surveyed to ensure the marsh creation

area has met the initial success criteria. At a minimum, these would include periodic eradication of invasive/nuisance plants in the mitigation feature and mitigation monitoring and reporting as prescribed in Appendix J. Approximately one year after construction of the marsh platform is complete, once dewatering and settlement of the marsh platform has occurred, the back retention dike would be degraded to the target marsh elevation. Degraded dike material would be placed within the marsh creation area and adjacent to the back retention dike by marsh buggies to a maximum elevation of 1.0 ft NAVD88. In conjunction with degrading the retention dikes, trenasses may be established within the feature if additional hydraulic conveyance is necessary. The acceptable trenasse width, if constructed in this fashion, 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 ft bottom width by 1 ft deep channel. The marsh feature would not be planted, since rapid colonization of the site by native, herbaceous, marsh plants should occur naturally. The construction duration for degrading the dikes will be approximately 1 month. Additional duration would be necessary if trenasses are required.

2.5.6 MITIGATION FOR FS BRACKISH MARSH IMPACTS

2.5.6.1 Coleman FS Brackish Marsh (TSMP)

This proposed project would involve the restoration of brackish marsh habitat from shallow open water adjacent to the existing levees in Plaquemines Parish to mitigate for open water; intermediate, brackish, and saline marsh FS impacts incurred as result of the NFL NOV project improvements. The proposed project is located in Plaquemines Parish near West Pointe a La Hache, west of LA Hwy 23 between River mile 46 and 49. Figures C-05 and C-05A in Appendix A provide an illustration of the proposed FS brackish marsh restoration mitigation feature. The total area is approximately 230 acres.

The water bottom in the Coleman marsh creation site is approximate elevation -2.0 ft NAVD88. Marsh restoration would require approximately 2,371,000 CY of material hydraulically dredged from within a 348 acre borrow site in the Mississippi River to construct a brackish marsh platform. Access to the proposed marsh creation area and transport of hydraulically dredged borrow material would be via unnamed navigable waterways and the Mississippi River. The dredge pipeline/access corridor would use the existing culverts under LA Hwy 23 placed there for other Louisiana dredging projects. Approximately 15,754 LF retention dikes would be constructed to elevation 4.0 ft NAVD88 with a 5 ft wide 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 ft NAVD88, the material pumped via pipeline, and placed within the marsh creation area to a maximum elevation of 3.0 ft NAVD88 in

an effort to achieve an initial fill elevation of 2.0 ft NAVD88. After one year, it is estimated that the initial 2.0 ft NAVD88 fill elevation would settle to an approximate elevation of 1.0 ft NAVD88. The target marsh elevation for brackish marsh habitat would range from 1.0 ft to 1.5 ft NAVD88. The construction duration would be approximately 6 months.

During the OMRR&R 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 in the mitigation feature and mitigation monitoring and reporting as prescribed in Appendix J. Approximately one year after the construction of the marsh platform is complete, once dewatering and settlement of the marsh platform has occurred, the retention dikes would be degraded to the target marsh elevation. Degraded dike material would be placed within the marsh creation area and adjacent to the retention dikes by marsh buggies to a maximum elevation of 1.0 ft NAVD88. In conjunction with the degradation the retention dikes, trenasses may be constructed by marsh buggy within 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, 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.

2.5.6.2 Defelice FS Brackish Marsh

The proposed work at the Defelice site would be the restoration of brackish marsh in open water adjacent to the existing levees in Plaquemines Parish to mitigate for brackish and saline marsh FS impacts as result of the NFL NOV project. The proposed Defelice mitigation feature is located in Plaquemines Parish, west of LA Hwy 23 and Lake Hermitage Road between river mile 55 and 56, north of Lake Hermitage, and east of L Bayou Mc Cutchen. Figures C-06 and C-06A in Appendix A provides an illustration of the proposed FS brackish marsh restoration mitigation feature. The total area is approximately 345 acres.

Marsh restoration would require approximately 2,788,400 CY of material hydraulically dredged from within a 348 acre borrow site in the Mississippi River to construct a brackish marsh platform. Access to the proposed Defelice marsh creation area and river borrow would be accomplished through unnamed navigable waterways and the Mississippi River. The pipeline/access corridor would use the existing culverts under LA Hwy 23 that were used for other state dredging projects. Work would consist of the

construction of retention dikes to contain the dredge slurry, dredging material from the borrow site in the river, pumping material to the marsh creation area, and the placement of dredged material into the marsh platform to the required fill elevation.

Work would consist of the construction of approximately 16,796 LF retention dikes to contain the dredge slurry. The retention dikes would be constructed to elevation 4.0 ft NAVD88, with a 5-ft crown and 1:3 side slopes of 1:3. Approximately 107,300 CY of borrow for the retention dikes would be obtained from within the marsh creation area. Once the construction of the retention dikes are complete, dredging of borrow material from the Point Celeste borrow area within the Mississippi River would be pumped via pipeline to the marsh creation area. The 348 borrow site in the river will be dredged to a max elevation depth of -90.0 ft NAVD88. Once dredge material was pumped to the site, the dredge slurry would be placed within the retention dikes to a maximum elevation of 3.0 ft NAVD88 and to the required fill elevation of 2.0 ft NAVD88. The approximate water bottom elevation and the Defelice marsh creation site is approximately -2.0 ft NAVD88. After one year, it is estimated that the 2.0 ft NAVD88 fill elevation would settle to an approximate elevation of 1.0 ft NAVD88. The target marsh elevation for brackish marsh habitat would be in the range of elevation 1.0 ft to 1.5 ft NAVD88. The estimated construction duration is estimated to be 9 to 10 months.

During the OMRR&R phase of the project, prior to transfer of monitoring responsibilities to the NFS, the site would be monitored and surveyed to ensure the marsh creation area has met the initial success criteria. At a minimum, these would include periodic eradication of invasive/nuisance plants in the mitigation feature and mitigation monitoring and reporting as prescribed in Appendix J. Approximately one year after the construction of the marsh platform is complete, once dewatering and settlement of the marsh platform has occurred, the retention dikes would be degraded to the target marsh elevation. Degraded dike material will be placed adjacent to, and along, the retention dikes by marsh buggies to a maximum elevation of 1.0 ft NAVD88. In conjunction with degrading the retention dikes, trenasses may be established within feature if additional hydraulic conveyance is necessary. The acceptable trenasse width, if constructed in this fashion, would be the width of a marsh buggy. If the resulting depression is not adequate for minimal water flow, the marsh equipment can 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 the colonization of the site by native brackish marsh plants should occur naturally. If the appropriate brackish marsh plant species do not colonize the site on their own within 3 years, the site would be planted. The construction duration for degrading the dikes would be approximately 2 months. Additional duration would be required if trenasses and brackish marsh plantings are required. Additional activities may need to be performed to ensure compliance with applicable mitigation success criteria (see Appendix J).

2.6 TENTATIVELY SELECTED ALTERNATIVE (PROPOSED ACTION)

The Tentatively Selected Alternative (TSA) consists of the new proposed ROW for NOV 09, and NOV-NF-W-05a.1 as described in section 2.1 and the TSMP as identified in Table 4. For a project description of the Coleman Brackish Marsh project please see section 2.5.6.1.

Table 4. NFL NOV TSMP

Habitat Type	TSPs	AAHUs Impacted	Mitigation Project Acres
PS BLH-Dry	Mitigation Bank	37.5 AAHUs	TBD
FS BLH-Wet	Mitigation Bank	120.2 AAHUs	TBD
FS Swamp	Mitigation Bank	33.8 AAHUs	TBD
FS Fresh Marsh	ILF + Mitigation Bank	53 AAHUs	TBD
FS Brackish Marsh	Coleman	105.6 AAHUs	230 (includes 10% buffer)

2.7 WVA MODEL AND SEA LEVEL RISE ANALYSES

2.7.1 WVA Model Certification

The WVA Bottomland Hardwood and Swamp Community Models used for NFL NOV completed model certification in accordance with EC 1105-2-412 and were approved by USACE Headquarters for regional use November 8, 2011. Version 1.0 of the Coastal Marsh Community WVA model was also approved for use for the NFL NOV project (Appendix H).

2.7.2 WVAs for new ROW

The WVAs that were run to assess the impacts in the NFL EIS, NOV SEIS, and EA #537 have been revised to reflect the change in acreage resulting from the new proposed ROW. The reduction in the number of AAHUs required by habitat type to mitigate for NOV 09, and NOV-NF-W-05a.1 is reflected in Table 1.

2.7.3 WVA for Mitigation Proposed Projects

WVA models have been applied in accordance with the guidance provided in “Memorandum for CEMVN-PD, Subject: Wetlands Value Assessment (WVA) Models, Guidance for Application, dated 21 March 2011” (Staebell, 2011). Spring 2012 versions of the WVA models were used, and all WVA models are approved for use and considered certified as planning models for USACE studies in accordance with EC 1105-2-412 (<https://cw-environment.erd.cdrn.mil/model-library.cfm?CoP=Restore&Option=View&Id=1> and Kitch, 2012). Attachment H-1 “Plaquemines New Orleans to Venice (NOV) and Non Federal Levee (NFL) Mitigation:

Wetland Value Assessment Model Assumptions and Related Guidance (Revised/Updated: 31 January 2017)” gives a detailed description of the assumptions utilized for the WVA assessments for the Plaquemines mitigation project and was updated using lessons learned from reviews and sensitivity analysis made on the Lake Pontchartrain and Vicinity (LPV) and Westbank and Vicinity (WBV) Hurricane Storm Damage Risk Reduction System WVAs (Appendix H).

WVAs

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

The following WVA models (version 1.0) were used for the NFL NOV mitigation effort: 1) CWPPRA, WVA Methodology, Bottomland Hardwood Community Model; 2) CWPPRA, WVA Methodology, Swamp Community Model; 3) CWPPRA, WVA Methodology, Coastal Marsh Community Model for Fresh/Intermediate Marsh; and 4) CWPPRA, WVA Methodology, Coastal Marsh Community Model for Brackish Marsh.

The WVA models assess the suitability of each habitat type for providing resting, foraging, breeding, and nursery habitat to a diverse assemblage of fish and wildlife species. This standardized, multi-species, habitat-based methodology facilitates the assessment of project-induced impacts on fish and wildlife resources. The coastal marsh WVA models consists of six variables: 1) percent of wetland area covered by emergent vegetation; 2) percent of open water area covered by aquatic vegetation; 3) marsh edge and interspersion; 4) percent of open water area ≤ 1.5 feet deep in relation to marsh surface; 5) salinity; and 6) aquatic organism access. The swamp WVA model consists of four variables: 1) stand structure; 2) stand maturity; 3) water regime; and 4) salinity. The Bottomland Hardwood Community Model, which was used for BLH-Wet and BLH-Dry features, consists of seven variables: 1) stand structure; 2) stand maturity; 3) understory/midstory; 4) hydrology; 5) size of contiguous forests areas; 6) suitability and traversability of surrounding land uses; and 7) disturbance.

Values for variables used in the models are derived from existing conditions and are estimated for conditions projected into the future if no mitigation efforts are applied (i.e., future without project conditions, or “FWOP”), and for conditions projected into the

future if the proposed mitigation project is implemented (i.e., future with project, or “FWP”), providing an index of habitat quality, or habitat suitability, for the period of analysis. The Habitat Sustainability Index is combined with the acres of habitat to generate a number that is referred to as “habitat units.” Expected project impacts/benefits are estimated as the difference in habitat units between the FWP scenario and the FWOP scenario. To allow comparison of WVA benefits to costs for overall project evaluation, total benefits are averaged over a 57-year period, with the result reported as AAHUs. Assumptions used for the NFL NOV mitigation WVAs are found in Appendix H.

2.7.3 Sea Level Rise Analysis

Wetland Acreage Predictions Under Increased SLR Rates

In compliance with USACE policy (Engineering Circular (EC) 1165-2-212), the performance of all projects under all three SLR (Table B-9 Appendix B) scenarios was analyzed to verify selection of the TSMs. Potential increases in SLR could affect the performance and therefore ability of a mitigation project to achieve replacement of the services and functions of the impacted habitat types. Because all of the mitigation projects were designed based on the intermediate SLR scenario to account for potential uncertainties in future SLR impacts, the risk of the proposed projects not successfully meeting the mitigation requirement due to SLR has been minimized.

The intent of compensatory mitigation is to offset unavoidable habitat losses by replacing those impacted habitats by restoring (re-establishment or rehabilitation), establishing (creation), or enhancing a naturally functioning system. Once the project meets its long term success criteria, it will experience natural successional phases common to that habitat type. Once the functions and services of the affected habitat have been replaced and the mitigation project becomes a naturally functioning, self-sustaining system whose habitat is protected in perpetuity, the compensatory mitigation obligation is satisfied.

Using USACE-predicted future water levels under the SLR scenarios, those water levels were converted into relative sea level rise (RSLR) rates, incorporating sea level rise effects measured at the gauges and land loss experienced in the extended project area for each project. No operations and maintenance activities were planned for any of the projects in relation to future elevation changes. The WVA then utilized the RSLR rates and project design to predict FWP acres left at the end of the 50-year period of analysis. Long term sustainability (percent land left at the end of the period of analysis) was used to analyze the impact that different SLR scenarios had on the project areas. Comparison between the long term sustainability numbers experienced under the intermediate and high SLR scenarios for all of the mitigation projects in the final array supported the choice of the TSPs, namely all the TSPs for all habitat types performed the best under the influence of both the intermediate and high SLR scenarios. This

comparison also supported the second place ranking for the projects (Appendix B, Table B-9).

2.8 DATA GAPS AND UNCERTAINTIES

Impact Assessment

The NFL NOV mitigation requirement has been assessed through review of 35 to 95 percent design plans and specifications for 22 levee and floodwall contracts that have been awarded and constructed (Appendix A Figure A-3). However there are approximately 10 remaining levee and floodwall contracts that are undergoing design and construction that could necessitate additional adjustments to the ROW requirement. To account for the possibility of future, minor changes related to these contracts that could potentially increase the mitigation requirement, the size (acres) of the mitigation projects has been increased by 10%. If impacts beyond what could be mitigated within this 10% are identified, then a supplemental NEPA document would address both the changes in the ROW requirement and the additional mitigation required.

Tropical Storms

Tropical storm events can directly and indirectly contribute to coastal land loss through erosion from increased wave energies, removal and/or scouring of vegetation from storm surge and saltwater intrusion into estuaries and interior wetlands. Wetland loss and degradation of large areas can occur over a short period of time as a result of storms.

Approximately 56,958 acres (converted from square kilometers) of land permanently or temporarily converted to open water in the Deltaic Plain which includes the Barataria Basin following Hurricane Katrina, (Barras, 2009). There is a risk that a single storm event, or multiple storms over a short period of time, could significantly reduce or eliminate anticipated benefits of mitigation plans in areas susceptible to storm surge and shearing. All of the features of the TSMPA (and the associated costs and benefits) are at some risk from storm damage. The extent of potential damage is dependent upon several unknown variables, including: the track and intensity of the storm, the development stage of the project, changes in future conditions in the study area, and variability of project performance from forecast conditions due to other factors of risk and uncertainty.

The benefits of shoreline protection features could also be reduced by a storm through the displacement of rocks and damage to the structures. Repair of storm damage to these features could necessitate maintenance of the shoreline protection features in order to secure anticipated erosion reduction benefits, reducing the cost-effectiveness of these features.

Increased Sea Level Rise

Increased sea level rise could convert emergent wetlands to shallow open water, and shallow open water to deeper water habitat, reducing or eliminating the effectiveness of mitigation plans.

Climate Change

Extreme changes in climate (temperature, rain, evaporation, wind) could result in conditions that cannot support the types of habitat restored, reducing the effectiveness of the mitigation plan. Extreme climate change could essentially eliminate the benefits of vegetative plantings, if the change resulted in plant mortality. The monitoring plan for all USACE constructed projects, mitigation banks, and ILF projects would monitor the success of any vegetative plantings and includes provisions for replanting if mortalities become such that meeting the required success criteria is in jeopardy.

Errors in Analysis

Future conditions are inherently uncertain. The forecast of future conditions is limited by existing science and technology. Future conditions described in this study are based on an analysis of historic trends and the best available information. Some variation between forecast conditions and reality is certain. Mitigation features were developed in a risk-aware framework to minimize the degree to which these variations would affect planning decisions. However, errors in analysis or discrepancies between forecast and actual conditions could affect plan effectiveness.

All of the models used in this study are mathematical representations of existing and predicted future conditions. Models simulate complex systems by simplifying real processes into expressions of their most basic variables. These tools assist with finding optimal solutions to problems, testing hypothetical situations, and forecasting future conditions based on observed data. No model can account for all relevant variables in a system. The interpretation of model outputs must consider the limitations, strengths, weaknesses, and assumptions inherent in model inputs and framework. Inaccurate assumptions or input errors could change benefits predicted by models used in this study. The potential for significant changes due to errors has been reduced through technical review, sensitivity analyses, and quality assurance procedures. However, there is inherent risk in reducing complex natural systems to mathematic expressions driven by the simplified interaction of key variables.

WVA Model Uncertainties

WVAs models were run on the entire final array of mitigation projects using site-specific data collected at all project sites except for some portions of the Coleman and Defelice projects. Right of entry (ROE) was not available for all portions of the Coleman and

Defelice projects at the time the WVAs were run. Where ROE was unavailable, assumptions were made based on aerial photography and field data from similar projects for the WVAs at Lake Hermitage. Aerial inspections of all the project areas were completed and the WVAs utilized data from projects with similar existing conditions. We have reasonable confidence that these data are representative of actual site conditions, and that the WVAs have produced results representative of what would be found if ROE to the sites had been available.

As design proceeds, final WVAs would be completed for each TSP to determine their final size. Currently, final WVAs have not been run for any of the mitigation projects; however final WVAs would be completed for all the projects and their acreages verified prior to the signing of the FONSI.

Implementation

Due to budgetary constraints, and to ensure adequate funding is available for satisfaction of all compensatory requirements, a staged method of mitigation implementation would be pursued. Initially, mitigation for impacts from any reaches under construction or awarded for construction would be executed. Then, in coordination with the NFS, and as the USACE prioritizes the remaining NFL NOV levee reaches for construction, mitigation associated with such construction would also be executed. In this manner, the USACE can ensure that the NFL NOV levee improvements only proceed to the extent that the budget allows the USACE meet its compensatory mitigation obligations. In the case where a mitigation project would be constructed by the USACE, the design of such project may meet the whole mitigation requirement for that habitat type, but what is actually implemented may be a smaller project if budget constraints require the levee construction to be scaled back and less mitigation is required.

The timing for implementation is an uncertainty that must be considered. If the plan is not implemented in the near future, the conditions in the study area could continue to degrade due to subsidence and/or other natural processes. The impact of the uncertainties associated with the future condition of the study area could increase mitigation costs, decrease mitigation benefits, or both.

If a proposed mitigation project becomes infeasible due to difficulties in implementation or changed conditions, the CEMVN will take appropriate action to ensure satisfaction of its mitigation requirement.

If any of the TSP projects cannot be implemented, the CEMVN would either fall back to one of the other projects evaluated in the AEP in order of ranking for that habitat type or would in coordination with the resource agencies and the NFS explore other options to mitigate these impacts. Potential mitigation options could include identification of other opportunities on or within the acquisition boundary of the JLNHPP or the Salvador -

Timken WMA; or the movement of a mitigation project within the vicinity of the originally identified project, on land similarly owned, and incurring similar impacts as those identified for its implementation at the original location.

Additionally, if, at the time of implementation, any of the TSP projects cannot satisfy 100 percent of the mitigation requirement, the TSP project would be utilized to the maximum extent possible and the remaining need satisfied with the next ranked project for that habitat type in the AEP.

Mitigation for Coastal Zone Impacts

LDNR administers the Federal Coastal Zone Management Act in Louisiana through its Louisiana Coastal Resources Program (LCRP). Depending on the projects implemented, LDNR may determine that, in its view, such projects do not mitigate for coastal zone impacts. If deemed necessary, additional mitigation for coastal zone impacts may be required and would be assessed and coordinated in a subsequent NEPA document.

2.9 ALTERNATIVES TO THE PROPOSED ACTION

NEPA requires that in analyzing alternatives to a proposed action, a Federal agency consider an alternative of “No Action.” The No Action alternative evaluates conditions if no alternative is implemented; it represents the FWOP condition against which alternatives considered in detail are compared. It provides a baseline essential for impact assessment and alternative analysis. However, because compensatory mitigation for unavoidable habitat losses due to the construction of the NFL NOV is required by law (e.g. Clean Water Act, WRDAs of 1986 and 2007), and the NFL NOV project cannot be safely constructed without impacting the new areas outside of ROW, the CEMVN does not consider the No Action Alternative to be a reasonable or legally viable alternative.

2.9.1 No Action Alternative

No Action Plan for proposed new ROW impacts (EIS/SEA/SEIS approved action)

Under the no-action alternative all construction activities, staging areas, access roads, and other project features in NOV 09 and NOV-NF-W-05a.1 would remain within the ROW as evaluated and approved in the NFL FEIS and ROD dated October 31, 2011, the NOV SEIS and ROD dated October 31, 2011, and the SEA #537 and FONSI dated March 25, 2016, with the exception of NOV 05A. NOV 05A has already resulted in additional impacts to areas outside of the original ROW as described below.

NOV 05A

NOV 05A as originally described in the NOV SEIS consisted of 3.2 miles of back levee on the West Bank near City Price (see Figure A-2 and red lines on Figure A-4 in Appendix A). The earthen levee is bounded on the east by LA Hwy 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 ft 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 flood side shift in the levee alignment to improve stability of the new levee adjacent to LA 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 Rd, 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 flood side shift for levee stability and the access ramp on Grand Bayou/Fosters Road are permanent impacts, however, the additional access ramps along LA Hwy 23, construction easements, and laydown areas are temporary (see blue lines on Figure A-4 in Appendix A). Construction in NOV 05A impacted an additional 24.4 acres of saline marsh habitat and 2.6 acres of scrub shrub habitat over what was originally assessed for this reach in the NOV SEIS. See Table 1 for the total impacts to be mitigated, which reflects the increased impacts upon saline marsh and scrub shrub caused by the new ROW for NOV 05A. Construction of NOV 05A is nearly complete.

No Action Plan for proposed Mitigation Plan

Under the No Action Alternative for EA #543, the Barataria Basin would continue a trend of land loss caused by both natural factors such as subsidence, erosion, tropical storms and sea level rise, and human factors such as flood risk reduction, canal dredging, development, interruption of accretion processes and oil and gas exploration. The No Action alternative would not provide compensatory mitigation for the unavoidable impacts incurred during the construction of the NFL NOV.

The analysis for the No Action alternative considers previous, current, and reasonably foreseeable future projects, which could impact the resources evaluated in the NFL EIS, SEA #537, and NOV SEIS. The location of these projects is shown in Appendix A Figure A-6. For the purpose of this analysis, a project is considered “reasonably foreseeable” if it meets one of the following criteria:

- USACE authorized ecosystem restoration, flood risk reduction, and/or navigation project with a Tentatively Selected Plan;
- CWPPRA project authorized at a Phase 2 – construction status;
- Coastal Impact Assistance Program (CIAP) ecosystem restoration or flood risk reduction project which is funded for construction;
- Community Development Block Grant (CDBG) ecosystem restoration or flood risk reduction project funded for construction;
- Natural Resource Damage Assessment (NRDA) ecosystem restoration or flood risk reduction project funded for construction;
- State of Louisiana Wetland Conservation and Restoration Program Act (LWCRPA) ecosystem restoration or flood risk reduction project funded for construction;
- State of Louisiana Surplus-funded ecosystem restoration or flood risk reduction project funded for construction; or
- Louisiana Levee District permitted flood risk reduction project.

Appendix B tables B-10, B-11, and B-12 includes a list of projects involving wetland or ecosystem restoration activities considered part of the no action alternative that could counter, to a degree, the current land loss trends throughout the Basin and progression of wetlands to open water. In addition to the name, general location, and a general description of each project, the tables note whether a project directly overlaps with one of the mitigation projects evaluated in this EA #543 or whether the extended boundary of the project's wetland value assessment overlaps with one of the mitigation projects evaluated in this EA #543.

In addition to these ecosystem restoration projects, a number of flood risk reduction and navigation projects are listed that have been built or would be built within the Basin that would continue to influence the hydrodynamics within the Basin. Previously constructed flood risk reduction and navigation projects include:

- Algiers Lock: The lock, constructed in 1956, provides a navigation passage between the Mississippi River and the Gulf Intracoastal Waterway via the Algiers Canal. The lock is operated and maintained by the USACE (American Canal Society 2012).
- Algiers Non-federal Levee (Donner Canal Levee): This segment of the non-federal levee was built prior to the construction of the Algiers Canal in 1956 near the southern boundary between the Orleans and Jefferson Parish line to provide flood protection to the communities in the vicinity of Algiers and Cutoff in Orleans Parish, Louisiana. The levee is owned and under the authority of the Algiers Levee District (SLFPAW 2012).
- Bayou Gauche Ring Levee (Sunset Levee): The construction of levees and pumping stations in the 1970s to prevent tidal surges from flooding developed areas near the community of Paradis in northern St. Charles Parish (Schiltz 2011).

- Coastal Protection and Restoration Authority (CPRA) and North Lafourche Conservation, Levee and Drainage District, Valentine to Larose Levee, TE-111: Construction to provide flood risk reduction improvements to the current flood protection system along approximately 2,000 LF of levee along Bayou Lafourche, from the town of Valentine to the town of Larose. The project is part of the Lockport-to-Larose Levee Project. Project construction was complete February 2014 (CPRA 2013b; CPRA 2017a; Miller 2014).
- Empire Lock: The lock is located on the west bank of the Mississippi River at Mississippi River mile 29.5 and was originally constructed prior to 1936 to provide navigation between the Mississippi River and the Gulf of Mexico through the Empire Canal. It is operated by the Louisiana Department of Transportation and Development (American Canal Society 2012).
- English Turn Non-Federal Levee (Donner Canal Levee): This segment of the non-federal levee was built prior to the construction of the Algiers Canal in 1956 to provide flood risk reduction to the communities east of Algiers Canal on the west bank of Orleans Parish, Louisiana. The levee extends westerly along the southern Orleans Parish line from the west bank levee of the Mississippi River near Caernarvon and ties into the West Bank and Vicinity –East of Algiers federal levee near Highway 407. The levee is owned and under the authority of the Algiers Levee District (SLFPAW 2012).
- GIWW Navigation System: A continuous waterway located inland and parallel to the Gulf of Mexico coast extending approximately 1,100 miles from Brownsville, Texas to Carrabelle, Florida. The Federally-authorized navigation project was designed to provide interstate commerce among the Gulf Coast States (Alperin 1983).
- Harvey Canal Lock: The lock was constructed in the early 1930s by the USACE to provide a navigational passage between the Mississippi River and the GIWW via the Harvey Canal. The lock is operated and maintained by the USACE (American Canal Society 2012).
- Mississippi River Levees: Mississippi River & Tributaries (MR&T) Project: The Flood Control Act of 1928 was enacted as a response to the 1927 flood and authorized the MR&T Project as a comprehensive flood control project. The purpose of the MR&T Project is to control riverine flooding in the alluvial valley of the lower Mississippi River below Cape Girardeau, Missouri. The four major elements of the MR&T Project are: (1) levees for containing flood flows; (2) floodways for the passage of excess flows past critical reaches of the Mississippi River; (3) channel improvement and stabilization in order to provide an efficient navigation alignment, increase the flood-carrying capacity of the River, and for protection of the levee system; and (4) tributary basin improvements for major drainage and flood control, such as dams, reservoirs, pumping plants, auxiliary channels. Due to the large spatial area of the Mississippi River, implementing the MRL Program is a joint effort of USACE Vicksburg District (CEMVK), the New Orleans District (CEMVN) and the Memphis District (CEMVM). The MRL system in the CEMVN extends along the Mississippi River west bank from the vicinity of

Black Hawk, LA, generally southward to the vicinity of Venice, LA and on the east bank from Baton Rouge, LA to Bohemia, LA, encompassing over 500 miles of levee and associated infrastructure (USACE 2004a).

- Mississippi River Navigation Operations and Maintenance: Operations and maintenance of the Mississippi River by the USACE for navigational purposes.
- Oakville to La Reussite NFL: The non-federal hurricane risk reduction levee located in Plaquemines Parish was built in the late 1960s, early 1970s to reduce flood risk in the vicinity of the communities of Oakville, Jesuit Bend, Ollie, Naomi and La Reussite. The levee system is under the authority of the PPG and currently varies in elevation from 2 feet to 7 feet. This is a non-federal project (USACE 2011a).
- State of Louisiana-Surplus Fund 2007 project, East of Harvey Canal Interim Hurricane Protection – Phase 1 (EOH-HP): The project was designed and constructed by the Southeast Flood Protection Authority - West as an interim non-federal flood risk reduction levee, prior to the WBV Greater New Orleans Hurricane and Storm Damage Risk Reduction System (HSDRRS) floodwall construction, along the east side of the Harvey Canal from the sector gate at Lapalco Boulevard to the existing WBV levee at Hero Pump Station. The interim earthen flood risk reduction levee was completed in July 2009. The second phase of the project involves a study to evaluate the feasibility of elevating the interim levee to a permanent flood protection structure. Phase 2 is currently on hold in the planning phase (McMenis 2012; CPRA 2012a).
- State of Louisiana-Surplus Fund 2007 project, Lafitte Tidal Protection, BA-75-3, 2007: The project is bordered by Bayou Barataria on the west, Goose Bayou to the north, The Pen to the west and Reserve Canal to the south. This project involves the uplift of existing levee segments originally constructed by the West Jefferson Levee District on the western shore of The Pen near the community of Lafitte, Louisiana to provide flood risk reduction to the community of Lafitte, Louisiana. Construction was completed. The portion of the project constructed by West Jefferson Levee District consists of earthen levees reinforced with sheet pile along the northwestern shore of The Pen from Goose Bayou to Reserve Canal to provide limited flood risk reduction to the community of Lafitte, Louisiana (Harper 2012; CPRA 2012a).
- West Plaquemines NFL: The non-federal HPL was largely constructed in the late 1960s, early 1970s by the PPG and private entities to reduce flooding risk to the communities between La Reussite and Point Celeste, Louisiana. The levee system is under the authority of the PPG and currently varies in elevation from 2 feet to 7 feet. This is a non-federal project (USACE 2011a).

Flood risk reduction and navigation projects currently under construction or reasonably foreseeable include:

- Community Development Block Grant funded project, Lafitte Area Levee Repair, BA-82: This project will repair damages to the existing levees in the Fisher Basin

Area. This damage was caused by heavy equipment and vehicles used on the levee for flood fighting activities during Ike and Gustav. This project will provide for a 4 inch lift on approximately a 5 mile stretch of levee. Construction is scheduled to begin in January 2018 is anticipated for completion by August 2018 (CPRA 2017a; CPRA 2017b).

- HSDRRS, WBV: The Federal HSDRRS is currently under construction by the USACE to provide risk reduction against a storm which has a 1% chance of occurring in a given year (100-year level of risk reduction). The 91-mile risk reduction system includes the construction, enhancement and/or replacement of levees, floodwalls, floodgates, closure structures, and pumping stations to provide hurricane and storm damage risk reduction to the New Orleans Metropolitan Area on the west bank of the Mississippi River including portions of Jefferson, Orleans, Plaquemines, and St. Charles parishes. The project was originally authorized and modified by the Water Resources Development Acts of 1986, 1996, 1999 and became known as the West Bank and Vicinity, Louisiana Project (WBV). Additional emergency supplemental appropriations aimed at completing the system were authorized by Congress following Hurricane Katrina and include 3rd Supplemental-2006 (PL 109-148, Title 1, Chapter 3, [119 STAT. 2761-2763]), 4th Supplemental-2006 (PL 109-234, Title II, Chapter 3, [120 STAT. 454-455]), 5th Supplemental-2007 (PL 110-28, Title IV, Chapter 3, [121 STAT. 153-154]), 6th Supplemental-2008 (PL 110-252, Title III, Chapter 3, [122 STAT. 2349-2350]), and 7th Supplemental-2009 (PL 110-329 Title I, Chapter 3 [122 STAT. 3589-3590]). Construction began in March 2007 and is approximately 95% complete. Anticipated completion date for the construction of the WBV HSDRRS (excluding armoring) is October 2019 (USACE 2017; USACE 2012a).
- Larose to Golden Meadow, Louisiana, Project (LGM): The project, originally authorized by the Flood Control Act of 1965 (PL-89-298), consists of approximately 48 miles of levees and floodwalls including two floodgates across Bayou Lafourche at the project's northern and southern ends. Eight (8) pumping stations were constructed in place of the authorized gravity drainage structures at the request and additional expense of the South Lafourche Levee District. The project is designed to provide risk reduction to the communities along the east and west banks of Bayou Lafourche, extending from Larose to just south of Golden Meadow in Lafourche Parish, Louisiana from tidal and hurricane surge flooding. The majority of the original 1965 project has been constructed as authorized, however due to subsidence and datum changes the project is not currently at the 1965 authorized elevations. The remaining unconstructed features are expected to be completed no later than 2017. A Post-Authorization Change, Limited Reevaluation Report, (Level 3 Economic Update) was submitted to CEMVD on 3 June 2015. This report provided the total benefit cost ratio (BCR), the remaining BCR, and an initial assessment of potential Federal interest in modifying the 1965 authorized project should the non-Federal sponsor decide to cost share a new General Reevaluation Report (USACE 2017; Wilson-Prater 2013; USGPO 2011; USACE 1985).

- LWCRPA project, Kraemer Bayou Boeuf Levee Lift, BA-169: This project will improve and raise ring levees surrounding the Kraemer Community, a forced drainage area. Construction is scheduled to begin in November 2017 and is anticipated for completion by April 2019 (CPRA 2017a, CPRA 2017b).
- New Orleans to Venice (NOV) Project, St Jude to Venice: The Federal hurricane and storm damage risk reduction project, originally authorized by the Flood Control Act of 1962, was designed to provide risk reduction to the communities between St. Jude to Venice, Louisiana located on the west bank of the Mississippi River including the back levee in Plaquemines Parish. The project was approximately 85 percent complete prior to Hurricane Katrina. Following Hurricane Katrina, Congress authorized repair, restore, armor, and accelerate the completion of the project through additional emergency supplemental appropriations: 3rd Supplemental-2006 (PL 109-148, Title 1, Chapter 3, [119 STAT. 2761-2763]), 4th Supplemental-2006 (PL 109-234, Title II, Chapter 3, [120 STAT. 454-455]), 6th Supplemental-2008 (PL 110-252, Title III, Chapter 3, [122 STAT. 2349-2350]), and 7th Supplemental-2009 (PL 110-329 Title I, Chapter 3 [122 STAT. 3589-3590]). Post-Hurricane Katrina construction began in October 2012 and construction is anticipated for completion by 2023 (USACE 2017; USACE 2011b).
- NOV, Incorporation of non-Federal Levees (NFL) into NOV: The NFL provides approximately 34 miles of risk reduction for the communities between Oakville and St. Jude, Louisiana, including evacuation routes, located on the west bank of the Mississippi River in upper Plaquemines Parish. The NFL connects to the WBV HSDRRS levees at the Eastern Tie-In near Oakville, Louisiana. Construction will improve and incorporate the NFL, into the Federal NOV project. The incorporation of certain levee components into NOV was authorized by Congress following Hurricane Katrina through additional emergency supplemental appropriations: 4th Supplemental-2006 (PL 109-234, Title II, Chapter 3, [120 STAT. 454-455]), 5th Supplemental-2007 (PL 110-28, Title IV, Chapter 3, [121 STAT. 153-154]), and 6th Supplemental-2008 (PL 110-252, Title III, Chapter 3, [122 STAT. 2349-2350])). Construction began in September 2012 and is anticipated for completion by 2023 (USACE 2017; USACE 2011a; USACE 2009).
- St. Charles Parish West Bank Hurricane Protection Levee – West Bank Magnolia Ridge Phase 1, BA-85-1: Uplift of the existing non-federal earthen levee on the west bank of Magnolia Ridge in St. Charles Parish to reduce the risk of flooding to communities near Boutte and Paradis, Louisiana. Other structures to be built include pumping stations and other freshwater interchange features including the closure of Paradis Canal. Construction began in December 2013 and phase 1 currently has a partially constructed earthen levee, including a first lift. A second lift, tidal interchange structures, concrete t-walls, maintenance access road, a canal gate, and the Magnolia Ridge Pump Station remain to be completed. The Magnolia Ridge Pump Station will be advertised for bids in the second quarter of 2017 (CPRA 2017e; CPRA 2017a; Fonseca 2013; Schiltz, 2012).

- St. Charles Parish West Bank Hurricane Protection Levee – West Bank Willow Ridge Phase 2, BA-85-2: includes earthen levees, a maintenance access road, drainage canals, tidal exchange structures, concrete t-walls, and a drainage pumping station. Construction of the major portion of the Willowridge earthen levee and drainage canals was completed in November 2015. The Willowridge Pump Station, tidal exchange structures, Willowdale Pump Station T-Wall, and earthen levee tie-in to the Davis Pond Freshwater Diversion West Guide Levee on the eastern terminus is under construction with an anticipated completion date of June 16, 2017. Upon completion of these projects, the initial lift of the WBHPL Willowridge Phase 2 portion will be complete (CPRA 2017e; Fonseca 2013; St Charles Parish, 2013; Schiltz 2012).
- St. Charles Parish West Bank Hurricane Protection Levee – West Bank Ellington Phase 3, BA-85-3: Construction of a non-federal levee with estimated crown elevation of seven feet to reduce the risk of flooding in the vicinity of Ellington in St. Charles Parish. Phase 3 includes an earthen levee, a maintenance access road, drainage canals, tidal exchange structures, concrete t-walls, and the Ellington Pump Station. Approximately 2 of the 3 miles of the Ellington earthen levee, drainage canals, and maintenance access road is under construction with an anticipated completion date of November 30, 2017. A sewer line that intersects with the levee footprint of this phase is currently being relocated. The final mile of the earthen levee is scheduled for bid advertisement following the completion of the utility relocation. (CPRA 2017e; Fonseca 2013; St Charles Parish, 2013; Schiltz 2012).
- State of Louisiana-Surplus Fund 2007 project, Jean Lafitte Tidal Protection/Fisher School Basin, BA-75-1: This project involves the enhancement of existing levees originally constructed by the West Jefferson Levee District on the eastern and southern side of the community of Jean Lafitte, Louisiana. It also includes new levee construction and installation of floodwalls and floodgates along the eastern bank of Bayou Barataria and in gaps in the levee system on the eastern and southern side of Jean Lafitte, Louisiana to provide flood risk reduction to the community within the Fischer School Basin. The project will be implemented by Jefferson Parish and the Lafitte Area Independent Levee District. Construction began in February 2014 and is anticipated for completion by July 2018. Funding for construction is also provided through Surplus Fund 2009 project, BA-75-4, Lafitte Levee Protection (CPRA 2017a; CPRA 2012a; Harper 2012).
- State of Louisiana-Surplus Fund 2007 project, Jean Lafitte Tidal Protection/Rosethorne Basin, BA-75-2: This project will provide flood risk reduction improvements consisting of new earthen levees, reinforced concrete floodwall and flood gates to 8.0 NAVD88. This project is being led by the Lafitte Area Independent Levee District. Construction is scheduled to begin in March 2018 and is anticipated for completion by September 2019 (CPRA 2017a; CPRA 2017c).

2.9.2 Alternatives Eliminated from Further Consideration

Two alternatives were considered, but eliminated from further consideration during the planning process: an alternative comprised of utilizing the new ROW for NOV 09 and NOV-NF-W-05a.1 and mitigating NFL NOV impacts to all habitat types utilizing mitigation banks and/or a Mitigation Bank/ILF only; and an alternative comprised of utilizing the new ROW for NOV 09 and NOV-NF-W-05a.1 and mitigating NFL NOV impacts with Corps-constructed projects only.

2.9.2.1 New ROW and Mitigation Bank/ILF Only Alternative

This alternative would have utilized the new ROW for NOV 09 and NOV-NF-W-05a.1 and satisfied the mitigation requirements for all habitat types through the purchase of mitigation bank/ILF credits of the same habitat type. Because mitigation banks and ILF in the Basin do not have sufficient available credits to meet the mitigation requirements for all of the impacted habitat types, this alternative was eliminated from further consideration.

2.9.2.2 New ROW and Corps Constructed Mitigation Project Only Alternative

This alternative would have utilized the new ROW for NOV 09 and NOV-NF-W-05a.1 and satisfied the mitigation requirements for all habitat types through the implementation of Corps constructed alternatives for each of the impacted habitat types. WRDA 2007, §Section 2036(c) requires that where appropriate, mitigation banks should be considered when mitigating habitat impacts if the impacts occur within the service area of an approved bank and the bank contains sufficient credits to offset the impact. Mitigation banks do exist in the Basin that can meet some of the NFL NOV mitigation requirements. In addition, mitigation banks can represent a cost effective option when compared to the costs and time necessary to construct a mitigation project. For these reasons the New ROW and Corps Constructed Mitigation Project Only Alternative was eliminated from further consideration.

3.0 AFFECTED ENVIRONMENT

This section describes the natural and human environment as well as the relevant resources of the project area. A description of the affected environment of the complete NFL project area is presented in the FEIS and SEA #537 and the NOV project area is presented in the SEIS and both documents are incorporated herein by reference.

3.1 ENVIRONMENTAL SETTING

The Basin is bounded to the north by the Mississippi River starting east in Ascension Parish to west in Plaquemines Parish, then the south is the Gulf of Mexico and western boundary follows Bayou Lafourche. Major features in the Basin include: Lac des Allemands and its adjacent wetlands in St. John the Baptist Parish, Lakes Cataouatche, Salvador and the adjacent wetlands in St. Charles Parish, the Pen and Barataria Bay and adjacent wetlands in Jefferson Parish, Lake Judge Perez, Bay Batiste, and Bastian Bay as well as adjacent wetlands and small lakes and waterbodies in Plaquemines Parish, Louisiana (Appendix A figures A-7 and A-8).

The NFL NOV projects are located in Plaquemines Parish on both the east and west banks of the Mississippi River within the Deltaic Plain of the lower Mississippi River ecosystem. The NFL project is approximately 15 miles south of downtown New Orleans, between Oakville and St. Jude on the east bank of the Mississippi River. The NOV project area includes levees and floodwalls between Phoenix and Bohemia on the east bank and St. Jude and Venice on the west bank of the Mississippi River. Dominant physiography of this extremely low relief area includes the Mississippi River, its natural levees and abandoned distributaries, and the marshlands and bodies of water that lie outside the NFL-NOV levee area.

LA Hwy 23 is the main roadway, connecting the towns of Belle Chasse and Venice, LA Hwy 23 and LA Hwy 39 and LA Hwy 15 connect Phoenix to Bohemia on the west bank. These corridors are sparsely developed with small residential subdivisions, undeveloped marshlands, borrow areas, and agricultural fields interspersed with a petrochemical plants and other industrial uses on the Mississippi River side of the highway.

Description of the Watershed

The mitigation project sites are located within the East Central Coastal Watershed (Hydrologic Unit Code [HUC] 08090301) within the Barataria Basin. A chain of barrier islands separates the Basin from the Gulf of Mexico. The southern half of the Basin consists of tidally influenced marshes connected to a large bay system behind the barrier islands.

Geomorphic and Physiographic Setting

Most of the present landmass of southeast LA was formed by deltaic processes of the Mississippi River. Over the past 7,000 years, the Mississippi River deposited massive volumes of sediment in five deltaic complexes. The Barataria Basin lies within the Mississippi Delta Region comprised of three geomorphic regions, which are further divided into multiple smaller geomorphic areas.

The NFL NOV project area is comprised primarily of agricultural pastures with little topographic relief that receive water inputs only from rainfall, flow wells, and

groundwater inflow. Area soils are alluvial and generally level. Storm-water runoff is collected in the drainage network that consists of man-made canals and lateral ditches connected to pump stations. The NFL NOV area is hydrologically disconnected from the Basin by the levee system and water exchange between protected and floodside habitat is by freshwater discharged into the Basin at the pump outfalls.

The project area falls within the Central Gulf Coastal Plain. More specifically, the area is situated on the Deltaic Plain of the Mississippi River in a region of extremely low relief. Dominant physiographic features in the vicinity of the project area include the Gulf of Mexico, the Mississippi River and its natural levees and abandoned distributaries, and the marshlands and bodies of water that lie between the natural levees. The predominant soil types within the Basin come from Holocene deposits and consist of fat clays (CH) and lean clays (CL) with some interbedded strata of organic clays (OH), silts (ML) and sands. None of the soil types within the proposed excavation area are listed as Prime and Unique Farmland.

Climate

The Basin is located within a subtropical latitude. The climate is influenced by the many water surfaces of the nearby wetlands, rivers, lakes, streams, and the Gulf of Mexico. Throughout the year, these water areas modify relative humidity and temperature conditions, decreasing the range between the extremes. Summers are long and hot, with an average daily temperature of 82° Fahrenheit (°F), average daily maximum of 91°F, and high average humidity. Winters are influenced by cold, dry polar air masses moving southward from Canada, with an average daily temperature of 54°F and an average daily minimum of 44°F. Annual precipitation averages 54 inches.

3.2 RELEVANT RESOURCES

Table 5 of this section contains a list of the relevant resources located in the project areas of the new ROW and mitigation projects in the final array and describes those resources that would be impacted, directly or indirectly, by construction of them. There would be no impacts to Louisiana Natural and Scenic Rivers because there are no designated natural and scenic rivers that are present within the proposed project areas. There would be no impacts to prime and unique farmlands as neither of have been identified in any of the project areas. There would be no impacts to visual aesthetics as the resource has been identified as insignificant in the project areas. Therefore, these resources will not be discussed further.

The resources described in this section are those recognized as significant by laws, executive orders (EOs), regulations, and other standards of Federal, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. See Appendix A Figure A-7, for the habitats found in the Barataria

Basin. See Appendix B tables B-13, B-14, B-15 and B-16, for scientific names of species identified throughout the document.



Table 5. Relevant Resources.

Resource	Institutionally Important	Technically Important	Publicly Important
Wetlands	Clean Water Act of 1977, as amended; Executive Order 11990 of 1977, Protection of Wetlands; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968., EO 11988, and Fish and Wildlife Coordination Act.	They provide necessary habitat for various species of plants, fish, and wildlife; they serve as ground water recharge areas; they provide storage areas for storm and flood waters; they serve as natural water filtration areas; they provide protection from wave action, erosion, and storm damage; and they provide various consumptive and non-consumptive recreational opportunities.	The high value the public places on the functions and values that wetlands provide. Environmental organizations and the public support the preservation of marshes.
Essential Fish Habitat (EFH)	Magnuson-Stevens Fishery Conservation and Management Act of 1996, Public Law 104-297	Federal and state agencies recognize the value of EFH. The Act states, EFH is "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity."	Public places a high value on seafood and the recreational and commercial opportunities EFH provides.
Bottomland Hardwood Forest	Section 906 of the Water resources Development Act of 1986 and the Fish and Wildlife Coordination Act of 1958, as amended.	Provides necessary habitat for a variety of plant, fish, and wildlife species; it often provides a variety of wetland functions and values; it is an important source of lumber and other commercial forest products; and it provides various consumptive and non-consumptive recreational opportunities.	The high priority that the public places on its esthetic, recreational, and commercial value.
Wildlife	Fish and Wildlife Coordination Act of 1958, as amended.	They are a critical element of many valuable aquatic and terrestrial habitats; they are an indicator of the health of various aquatic and terrestrial habitats; and many species are important commercial resources.	The high priority that the public places on their esthetic, recreational, and commercial value.
Threatened and Endangered Species	The Endangered Species Act of 1973, as amended; the Marine Mammal Protection Act of 1972; and the Bald Eagle Protection Act of 1940, and the Migratory Bird Treaty Act of 1918.	USACE, USFWS, NMFS, Natural Resource Conservation Service (NRCS), USEPA, LDWF, and LDNR cooperate to protect these species. The status of such species provides an indication of the overall health of an ecosystem.	The public supports the preservation of rare or declining species and their habitats.

Table 5. Relevant Resources.

Resource	Institutionally Important	Technically Important	Publicly Important
Estuarine Water Bodies	Clean Water Act of 1977, Fish and Wildlife Coordination Act, Coastal Zone Mgt Act of 1972, La State & Local Coastal Resources Act of 1978	USACE, USFWS, NMFS, NRCS, USEPA, LDWF, and LDNR recognize value of fisheries and good water quality.	Environmental organizations and the public support the preservation of water quality and fishery resources.
Cultural Resources	National Historic Preservation Act of 1966, as amended; the Native American Graves Protection and Repatriation Act of 1990; and the Archeological Resources Protection Act of 1979	Cultural resources are finite and non-renewable resources that include, but are not limited to both prehistoric and historic archaeological sites, historic standing structures, landscapes, and other culturally valued aspects of the environment, as well as sociocultural attributes, such as social cohesion, social institutions, lifeways, religious practices, and other cultural institutions. Historic properties include districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places, and federal agencies are required to consider the effects of their actions on such properties.	Humans relate to their environment through their culture, and historic and cultural resources provide insights into ways of life, both past and present. The protection and enhancement of historic and cultural resources is in the best interest of the public, and federal agencies also have trust and treaty responsibilities to tribes, which are partially fulfilled through the preservation and protection of trust resources and the consideration of potential effects on natural and cultural resources.
Recreation Resources	Federal Water Project Recreation Act of 1965 as amended and Land and Water Conservation Fund Act of 1965 as amended	Provide high economic value to local, state, and national economies.	Public makes high demands on recreational areas. There is a high value that the public places on fishing, hunting, and boating, as measured by the large number of fishing and hunting licenses sold in Louisiana; and the large per-capita number of recreational boat registrations in Louisiana.
Socio-Economic Resources	River and Harbor Flood Control Act of 1970 (PL 91-611).	N/A	Social concerns and items affecting area economy are of significant interest to community.

Table 5. Relevant Resources.

Resource	Institutionally Important	Technically Important	Publicly Important
Environmental Justice	Executive Order 12898 and the Department of Defense's Strategy on Environmental Justice of 1995,	The social and economic welfare of minority and low-income populations may be positively or disproportionately impacted by the tentatively selected plans.	Public concerns about the fair and equitable treatment (fair treatment and meaningful involvement) of all people with respect to environmental and human health consequences of federal laws, regulations, policies, and actions.
Air Quality	Clean Air Act of 1963, Louisiana Environmental Quality Act of 1983.	State and Federal agencies recognize the status of ambient air quality in relation to the NAAQS.	Virtually all citizens express a desire for clean air.
Hydrology and Water Quality	Clean Water Act of 1977, Fish and Wildlife Coordination Act, Coastal Zone Mgt Act of 1972, and La State & Local Coastal Resources Act of 1978.	USACE, USFWS, NMFS, NRCS, USEPA, and State DNR and wildlife/fishery offices recognize value of fisheries and good water quality. the national and state standards established to assess water quality	Environmental organizations and the public support the preservation of water quality and fishery resources and the desire for clean drinking water.

Wetlands and Other Surface Waters

Wetlands and other surface waters originally described in the NFL EIS, NOV SEIS and EA #537 are incorporated herein by reference. Wetlands include ditches, drainage canals, wet bottomland hardwoods (BLH-Wet), cypress tupelo swamp, wet pasture, freshwater marsh, intermediate marsh, brackish marsh, saline marsh comprise the affected environment of the Basin project area. The majority of the aquatic habitats present in the Basin project area are wetlands.

Wetlands are semiaquatic lands that are flooded or saturated by water for varying periods of time. For an area delineated as a wetland it must exhibit appropriate hydrology, contain hydric soils, and support hydrophytic vegetation (USACE 1987). Palustrine habitats consist of freshwater wetlands that support natural vegetation that is either primarily woody or herbaceous. Palustrine wetlands are dominated by woody vegetation such as BLH-Wet, swamp, wet subsided ridge, wet scrub shrub, and batture forest. BLH-Wet forests are dominated by *Quercus nigra* (water oak), nuttall oak, green ash, red maple, and *Carya glabra* (pignut hickory) which have seasonal flooding. Swamps are flooded forests dominated by bald cypress and water tupelo gum trees. Wet pasture and freshwater marsh are dominated by herbaceous or non woody vegetation. Fresh marsh species include *Typha latifolia* (cattail), *Nymphaea odorata* (water lily), iris (*Iris* sp.), *Lemna* sp. (duckweed), *Zizaniopsis miliaceae* (cutgrass), *Zizania aquatic* (wild rice), and bulltongue. Among estuarine habitats, intermediate marsh, brackish marsh, saline marsh. Submerged aquatic vegetation (SAV)/open water habitat are also prevalent within the Basin. Intermediate marsh can have fresh and brackish marsh species present. Brackish marsh species include *Carex* sp. (sedges), *Juncus* sp. (rushes), *Phragmites* sp. (reeds), and are mostly dominated by saltmeadow cordgrass. Saline marshes are dominated by *Spartina alterniflora* (smooth cordgrass) and *Juncus roemerianus* (black needle rush) however, brackish species can also be present. See Appendix A Figure A-7 for the habitats within the Basin and Appendix, Table B-13 for a list of plant species referenced in this document and their scientific names.

Various mitigation banks exist within the Basin that have restored wetland habitat. These banks may be capable of supplying credits to meet the Swamp, BLH-Dry/BLH-Wet, and freshwater marsh mitigation requirements. Since the bank(s) that may ultimately be selected to provide the necessary mitigation credits is unknown, the existing conditions present at the bank site(s) are also unknown. Existing bank habitat quality varies depending on the success criteria met, as specified in the bank's Mitigation Banking Instrument (MBI). Typically, as mitigation success criteria are met and the quality of the habitat increases within the bank, more credits are released for purchase.

Wildlife

Louisiana's coastal wetlands support numerous neotropical and other migratory avian species, such as rails, gallinules, shorebirds, wading birds, and numerous songbirds. The rigors of long distance flight require most neotropical migratory birds to rest and refuel several times before they reach their final destination. Louisiana coastal wetlands provide neotropical migratory birds with essential stopover habitat on their annual migration routes. Passerine birds common to the project areas include sparrows, vireos, warblers, *Mimus polyglottos* (northern mockingbirds), *Quiscalus quiscula* (common grackles), *Agelaius phoeniceus* (red-winged blackbirds), *Cistothorus palustris* (marsh wrens), *Cyanocitta cristata* (blue jays), *Cardinalis cardinalis* (northern cardinals), and *Corvus brachyrhynchos*. (American crows). The coastal wetlands in the Basin provide important fish and wildlife habitats, especially transitional habitat between estuarine and marine environments, used for shelter, nesting, feeding, roosting, cover, nursery, and other life requirements.

Emergent and submerged aquatic vegetation (SAV) and fresh, intermediate, brackish marsh and saline marsh wetlands are typically used by many different wildlife species, including: *Myocaster coypus* (nutria), *Ondatra zibethicus* (muskrat), *Mustela vison* (mink), *Lutra canadensis* (river otter), *Odocoileus virginianus* (white-tailed deer), *Didelphis virginiana* (Virginia opossum), *Mephitis mephitis* (striped skunk), *Sylvilagus aquaticus* (swamp rabbit), *Sylvilagus floridanus* (eastern cottontail), *Sciurus carolinensis* (gray squirrel), *Sciurus niger* (fox squirrel), *Dasypus novemcinctus* (nine-banded armadillo), *Canis latrans* (coyote), and a variety of smaller mammals. The Basin also provides habitat for the *Alligator mississippiensis* (American alligator), various species of salamanders, frogs, toads, turtles, as well as several species of venomous and non-venomous snakes.

Open water habitats such as Lakes Salvador and Cataouatche provide wintering and multiple use functions for *Pelecanus erythrorhynchos* (American white pelican) and *P. occidentalis* (brown pelicans), seabirds, and other open water residents and migrants. Open water habitats provide wintering and multiple use functions for brown pelicans, seabirds, dabbling and diving ducks, coots, and gallinules as well as other open water residents and migrants (LCWCRTF & WCRA, 1999). Various raptors such as *Bubo virginianus* (great horned owl), *Strix varia* (barred owl), *Buteo lineatus* (red-shouldered hawk), *Circus cyaneus* (northern harrier), *Falco sparverius* (American kestrel), *Buteo jamaicensis* (red-tailed hawk), and *Haliaeetus leucocephalus* (bald eagle) may be present.

A list of common wildlife species found in the Basin and their scientific names is provided in Appendix B, Table B-14.

Threatened, Endangered, and Protected Species

Within the State of Louisiana, there are 19 animal and three plant species (some with critical habitat) under the jurisdiction of the USFWS and/or the NMFS, presently

classified as endangered or threatened. Of those 22 species, Table B-15 of Appendix B identifies 11 species that are known to occur in the parishes where projects in the final array are situated. *Acipenser oxyrinchus desotoi* (Gulf sturgeon) is listed in Plaquemines Parish, however, its range doesn't extend west of the Mississippi River. Therefore, it is not included in the analyses. The USFWS and the NMFS share jurisdictional responsibility for sea turtles. CEMVN has made a 'no effect' determination for *Charadrius melodus* (piping plover), *Calidris canutus* (red knot), *Chelonia mydas* (green sea turtle), *Eretomchelys imbricata* (hawksbill sea turtle), *Lepidochelys kempii* (Kemp's Ridley sea turtle), *Dermochelys coriacea* (leatherback sea turtle), and *Caretta caretta* (loggerhead sea turtle) species, and a 'not likely to adversely affect' determination for *Scaphirhynchus albus* (pallid sturgeon) and *Trichechus manatus* (the West Indian manatee). Currently, the West Indian manatee has been reclassified from endangered to threatened as a result of improvements to its population and the habitat necessary for its survival (https://www.fws.gov/news/ShowNews.cfm?ref=u.s.-fish-and-wildlife-service-to-reclassify-west-indian-manatee-from-&_ID=35428).

Other species that were listed on the Endangered Species List, but have since been de-listed because population levels have improved are the bald eagle and the brown pelican. The bald eagle is protected under the Bald and Golden Eagle Protection Act ((BGEPA), and the Migratory Bird Treaty Act ((MBTA) 40 Stat. 755, as amended; 16 U.S.C. 703 et seq.). In southeastern Louisiana parishes, eagles typically nest in mature trees (e.g., bald cypress, sycamore, willow, etc.) near fresh to intermediate marshes or open water.

Colonial nesting wading/waterbirds and shorebirds are protected under the Migratory Bird Treaty Act ((MBTA) 40 Stat. 755, as amended; 16 U.S.C. 703 et seq.). Colonial nesting wading/waterbirds are generally considered all species of herons, egrets, night herons, ibis, roseate spoonbill, pelicans, anhinga and cormorants. These birds typically nest and forage in wetlands and open water areas so could be in the project area. Shorebirds are considered all species of gulls, terns and skimmers. These species typically forage and nest on sandy shorelines and mudflats so have the potential to be in the project area but it is unlikely.

The Louisiana Natural Heritage Program (LNHP) of Louisiana Department of Wildlife and Fisheries (LDWF) has developed its own lists and monitors the status of rare, threatened and endangered species, and natural communities for each parish of the state. This information includes the state and global rank and state and Federal status for species and the state and global rank for rare habitats. The species and habitats listed by the State of Louisiana may be found at <http://www.wlf.louisiana.gov/wildlife/species-parish-list>.

Fisheries, Aquatic Resources, and Water Quality

The NMFS oversees and manages our Nation's domestic fisheries through development and implementation of fishery management plans and actions. The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), first

enacted in 1976, amended in 1996, and reauthorized in 2006, is the primary law governing marine fisheries management in United States Federal waters to end overfishing, promote market-based management approaches, improve science, serve a larger role in decision-making, and enhance international cooperation.

Major water bodies within the Basin that may be impacted include Lake Salvador, Lake Cataouatche, and the Mississippi River. These water bodies and adjacent wetlands provide nursery and foraging habitats which support varieties of economically, recreationally, and ecologically important marine and freshwater fish, crustacean, and mollusk species listed in Appendix B-16. Some of these species also serve as prey for other fish species managed under the MSFCMA by the Gulf of Mexico Fishery Management Council (e.g., mackerel, snapper, and grouper) and highly migratory species managed by NMFS (e.g., billfish and shark).

The project area encompasses U.S. Geological Survey (USGS) Cataloging Unit: 08090301 – East Central Louisiana Coastal Watershed. Within this cataloging units, the state has delineated hydrologic units, or sub-segments, within the state (<https://water.usgs.gov/lookup/getwatershed?08090301/www/cgi-bin/lookup/getwatershed>).

Section 305(b) of the Clean Water Act requires each state to monitor and report on surface and groundwater quality, which USEPA synthesizes into a report to Congress. The Louisiana Department of Environmental Quality (LDEQ) produces a Section 305(b) Water Quality Report that provides monitoring data and water quality summaries for hydrologic units (sub-segments) throughout the state.

Water quality criteria are elements of state water quality standards that represent the quality of water that will support a particular designated use. These criteria are expressed as constituent concentrations, levels, or narrative statements. There are currently eight designated uses adopted for Louisiana's surface waters: Primary Contact Recreation, Secondary Contact Recreation, Fish and Wildlife Propagation ("subcategory" for Limited Aquatic life and Wildlife), Drinking Water Supply, Oyster Propagation, Agriculture, and Outstanding Natural Resource Waters. Appendix A Figure A-8 shows those hydrologic units or sub-segments which include both water bodies which are considered "impaired" according to the 2010 Integrated Report and one of the NFL NOV mitigation project footprints. Appendix A Figure A-9 shows the location of the sub-segments within which these impaired water bodies and project footprints are found.

Essential Fish Habitat

The public places a high value on seafood and recreational and commercial opportunities provided by EFH. Specific categories of EFH include all estuarine waters and substrates (mud, sand, shell, rock, and associated biological communities), sub-tidal vegetation (sea grasses and algae), and adjacent intertidal vegetation (marshes and mangroves). The existing emergent wetlands and shallow open water within the

project area provide important habitat that may be classified as EFH, including transitional habitat between estuarine and marine environments used by migratory and resident fish, as well as other aquatic organisms for nursery, foraging, spawning, and other life requirements. Historically and currently, the area provides valuable recreational and commercial fishing habitat, oyster culture, and nursery areas for a wide variety of finfish and shellfish.

Wetlands and water bottoms provide nursery and foraging habitats for a variety of economically important marine species such as *Callinectes sapidus* (blue crab), *Brevoortia patronus* (Gulf menhaden), *Cynoscion nebulosus* (spotted seatrout), *Cynoscion arenarius* (sand seatrout), *Paralichthys lethostigma* (southern flounder), and *Mugil cephalus* (striped mullet). Some of these species serve as prey for other fish species managed under the MSFCMA (Magnuson-Stevens Act; P.L. 104-297) by the Gulf of Mexico Fishery Management Council (GMFMC) (e.g., mackerels, snappers, and groupers) and highly migratory species managed by NMFS (e.g., billfishes and sharks). Wetlands also produce nutrients and detritus which are important components of the aquatic food web and contribute to the overall productivity of the Barataria Bay estuary.

Shrimp species - Shrimp species include the brown shrimp, white shrimp, and pink shrimp. Adult penaeids generally occupy offshore areas of higher salinity where spawning occurs. After hatching, larvae enter estuaries and remain there throughout the juvenile stage. Estuarine habitat serves as a nursery area offering a suitable substrate, an abundant food supply, and protection from predators. Subadult shrimp consume organic matter, including marsh grasses and microorganisms found in estuarine sediments. Adult shrimp are omnivorous. The EFH includes shallow inshore waters, marsh edge, SAV, tidal creeks, inner marsh, mud bottoms, and sand/shell substrate. The Habitat Areas of Particular Concern (HAPC) includes tidal inlets and state nursery and overwintering habitats. These areas contain a high abundance of juvenile specimens and are critical for early growth and development. No designated HAPC for the assemblage occurs within the project area.

Red drum - *Sciaenops ocellatus* (red drum) is an important recreational gamefish found in coastal waters throughout the Gulf of Mexico. Adults inhabit near-shore waters, particularly areas within the surf zone or in the vicinity of inlets. Spawning occurs in near-shore areas, and eggs and larvae are transported by tides and wind currents into estuaries. Larvae and juveniles occupy estuarine environments until maturation. Red drum are predatory in all stages of life; however, the type of prey consumed varies with life stage. Subadult red drum primarily consume small marine invertebrates including mysids and copepods, while adult specimens feed on large marine invertebrates, including shrimp and crabs, and small fishes. The EFH for red drum includes tidal inlets, mud bottoms, SAV, the marsh-water interface, mangrove communities, oyster reefs, and near-shore waters with depths of less than 164 feet. The HAPC for red drum includes tidal inlets, state nursery areas, spawning sites, and SAV. No designated HAPC for the assemblage occurs within the project area.

Gray snapper - *Lutjanus griseus* (gray snapper) is an important recreational gamefish found in coastal waters throughout the Gulf of Mexico. Adults inhabit estuarine, nearshore, and offshore areas of gulf waters, and tend to stay in the same area for long periods once established. Spawning typically occurs around nearshore and offshore reefs, and nearshore shoals and banks. Larvae remain in areas of nearshore and offshore reefs until maturation. Juveniles and young adults occupy estuarine and nearshore areas such as mangroves and emergent marshes. Gray snapper are opportunistic predators. Larvae feed on zooplankton including copepods and amphipods. Juvenile gray snappers feed by day among seagrass beds, mainly on crustaceans and fish and to a lesser degree polychaete worms and mollusks. Foraging nocturnally, adult gray snapper prey upon small fishes, shrimps, crabs, gastropods, and cephalopods. The EFH for gray snapper includes nearshore and offshore reefs, SAV, mangrove communities, emergent marshes, seagrass beds, and sand/shell/soft bottoms. The HAPC for gray snapper includes nearshore and offshore reefs, nearshore sand/shell/soft bottoms, estuarine emergent marshes and mangroves, seagrass, spawning areas, state designated nursery areas, and SAV. No designated HAPC for the gray snapper occurs within the project area.

Lane snapper. *Lutjanus synagris* (lane snapper) is an important recreational gamefish in coastal waters throughout the Gulf of Mexico. Adults typically inhabit reefs, sand/shell bottoms, and offshore shoals/banks. Spawning generally occurs in offshore waters around the shelf edge/slope. Larvae remain in offshore pelagic waters until maturation. Juveniles and young adults occupy mangroves, nearshore reefs, sand/shell bottoms, SAV, and soft bottoms. The lane snapper lives in a wide range of habitats and are opportunistic predators, feeding on a variety of prey that is available. Adult lane snappers feed nocturnally on smaller fishes, shrimp, cephalopods, gastropods, and crabs. The EFH for lane snappers includes offshore/pelagic, nearshore and offshore reefs, mangroves, nearshore and offshore sand/shell/soft bottoms, shoals/banks, offshore shelf edge/slope, and SAV. The HAPC for lane snapper includes nearshore and offshore reefs, nearshore sand/shell/soft bottoms, mangroves, seagrass, spawning areas, state designated nursery areas, and SAV. No designated HAPC for the lane snapper occurs within the project area.

Table 6 lists the expected salinity zones in the Basin and the abundance of the managed species expected (National Oceanic and Atmospheric (NOAA) Administration Mapper: <http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html> or download of datasets at <http://www.habitat.noaa.gov/protection/efh/newInv/index.html>). Table 7 shows the EFH for the managed species expected in those areas.

Table 6. Salinity Zones and Abundance for Federally-managed Species In Barataria Basin

Basin Salinity Zone	Life Stage	Brown Shrimp	White Shrimp	Red Drum	Gray Snapper*	Lane Snapper*
0 – 0.5 ppt.	Adults		R	R		
	Eggs					

	Juveniles	C to HA	R to C	R		
	Larvae					
	Spawners					
0.5 – 5 ppt.	Adults	R	R	R to C		
	Eggs					
	Juveniles	C to HA	C to A	C	R to C	R to C
	Larvae					
	Spawners					
5 – 15 ppt.	Adults	R	C	R to C		
	Eggs					
	Juveniles	C to HA	C to A	C	R to C	R to C
	Larvae					
	Spawners					
Relative Abundance: Blank - Not Present; A – Abundant; R – Rare; HA - Highly Abundant; C – Common (Variation in abundance due to seasonality) (NMFS, 1998) *Indicate reef fish						

Table 7. Essential Fish Habitat For Life Stages

Species	Life Stage	Essential Fish Habitat
Brown Shrimp	Adults	Gulf of Mexico <110 m, silt sand, muddy sand
	Juvenile	Marsh edge, SAV, tidal creeks, inner marsh
White Shrimp	Adults	Gulf of Mexico <33 m, silt, soft mud
	Juvenile	Marsh edge, SAV, marsh ponds, inner marsh, oyster Reefs
Red Drum	Adults	Gulf of Mexico & estuarine mud bottoms, oyster reef
	Juvenile	SAV, estuarine mud bottoms, marsh/water interface
Gray Snapper*	Adult	Emergent marshes, hard bottoms, reefs, sand/bottoms, soft bottoms
	Juvenile	Mangroves, emergent marshes, seagrass, SAV
Lane Snapper*	Adult	Offshore, sand bottom, natural channels, banks, and man-made reefs and structures
	Juvenile	grass flats, reefs, and soft bottom, GOM <20 m

* indicates reef fish

Cultural Resources

Historic and prehistoric sites in the Basin tend to be located along the natural levees of waterways that were used as transportation routes. The Mississippi River was the main means of transportation and its natural levees were the choice location for settlement.

Prehistoric mound sites are still being discovered, like 16PL186 which was first recorded in 2009 as a 3 mound complex spanning from the Marksville through Mississippian periods (100 B.C. – 1700 A.D.) and with a historic component as well. The surrounding coastal lakes and areas were gradually explored for natural resources and utilized as well. As the population along the Mississippi River increased, land along its natural levees became scarce. Settlers began to move further outward following waterways such as Bayou Lafourche, Bayou Segnette, Bayou Verret, Bayou des Allemands, and other bayous and rivers in the coastal area. The Bayou Grand Cheniere Mounds (16PL159) are a collection of 12 prehistoric mounds with burials located just a short distance west of the Mississippi River on a natural ridge and bayou that probably invited exploration and exploitation, and have occupations dating from the Coles Creek period through Plaquemine periods (ca. A.D. 400 - 1200). These sites are among the more than 200 recorded archaeological sites within the Basin, and demonstrate the continuous use of the region and its resources from the earliest prehistory to modern times.

Borrow sources located in Lakes Salvador and Cataouatche also have the potential to contain submerged cultural resources. The eastern shore of Lake Salvador today contains numerous shell middens that are preserved but gradually being swallowed by rising waters. 16JE46, for instance, has reports of cultural material from the Coles Creek (A.D. 400) through the Historic period. 16JE46 is part of the National Register qualification of the Barataria Unit of Jean Lafitte Park.

Prehistoric sites include hunting and food processing camps, hamlets, and village sites. Native Americans relied on hunting, fishing, and gathering of plants. Discovered archeological sites in the Basin represent the continuous span of human occupation in Louisiana's Mississippi River Delta region, beginning approximately with the Tchefoncté period (600-200 B.C.) through the Plaquemine period (A.D. 1000-1200), and in fact carrying over through European arrival to the region and into the Historic period.

Types of historic sites include domestic buildings, plantation sites, farmsteads, military sites, commercial sites, industrial sites, boat landings, and hunting and fishing camps along the coast. In addition to terrestrial historic sites, the project area has the potential to contain historic shipwrecks. Bayou Lafourche, Bayou Segnette, Bayou des Allemands, as well as the other bayous in the area, have been a major means of transportation in the Louisiana "bayou country" since prehistoric times. The smaller bayous that fill the Basin connecting larger bayous and lakes were also used by the local Native Americans as well as by trappers, hunters, and fishermen. The intersection of Bayou Cutler and Bayou Maurice is one area that represents the diversity of resources and activities supported by the Basin. Within 1 mile of this intersection are 11 sites recorded and revisited for the past 50 or more years. These sites are typically reported to include components of shell midden, often with an overlay of historic activity from the Civil War and later. Also typically, these sites have now been destroyed by natural and artificial activities, and often the artifacts found during site update visits has been redeposited by dredge and spoil activities.

Watercraft from all time periods could be present in the area. Most of the vessels used historically in this area were vernacular watercraft that are common to the cultural uses and environments of Coastal Louisiana. Few studies have been done of the vernacular watercraft of Louisiana, but a 1997 study of Bayou DuLarge in Terrebonne Parish commented on the prevalence of this form still plying the waters of coastal Louisiana and its bayous.

In the early 1900s, various subsistence activities that were initially developed prior to the 20th century became more commercial in nature. Moss, first gathered for the making of beds and as filler in the construction of houses, was commercially processed and sold to the upholstery business as stuffing for furniture and car seats. Following World War II, the moss industry declined as the result of the wide availability of foam rubber and the increased cost of gathering moss. The lumber industry that had flourished in the late 1800s continued to grow with the harvesting of cypress throughout south Louisiana. Lumber towns and sawmills dotted the landscape until most of the virgin cypress forests were cut and the lumber companies moved westward.

The trapping of animals for furs or other economic reasons in south Louisiana began with Native Americans and continued on into the 1900s. Otter, muskrat, and nutria were trapped in the marshes and provided furs for the garment industry all over the world. Hunting camps and processing stations were located throughout the marsh. The demand for furs has declined over the years. Nutria are trapped today for food and bounties, to keep the population from expanding and destroying the marsh, or from causing problems in municipal canals.

Seafood, one of the most important natural resources in south Louisiana, has continued to become more important to the economy of Louisiana. In the middle of the 19th century, methods of preservation (such as the drying of shrimp and canning of oysters) made it possible to export seafood. The introduction of the gasoline motor and refrigeration allowed fishermen greater access to markets in New Orleans and the larger towns inland from the coast. Seafood processing camps that had been established all over the coast in the 1800s, including Manila Village, Bayou St. Malo, and the Isle de Caminada, were abandoned after being hit by numerous tropical storms and hurricanes. In the 1900s, many of these fishermen established new settlement and seafood processing businesses along the major waterways leading away from the coast. Fishing remains a major economic activity in south Louisiana.

Rice and sugar remained major cash crops across the coastal parishes. By the eve of World War II, bad weather, plant diseases, and economic policies had almost destroyed sugar production in south Louisiana. Truck farming of vegetables and citrus to towns and cities provided fresh vegetables at local markets. Other industries developed in south Louisiana in the 1900s that have shaped the economy of the state. The oil industry began in the early 1900s and continues to be a major industry. Large oil fields are located in the marshy areas of south Louisiana and offshore. Pockets of sulfur and salt are located across south Louisiana. The extraction of these natural resources became major industrial activities. Accompanying the economic benefits that these

extraction activities have brought to coastal Louisiana, are the destruction of fragile coastal ecosystems and land areas that wither as they are cut by canals are weighted by platforms and other items of extraction infrastructure. Along with the land and other facets of the natural environment, cultural resources that have been known or unknown during the age of archaeological exploration and survey have weathered damages to the lands that contained them and some have eroded into the waters before they are fully understood or studied.

All of these economic activities have contributed to the constructed environment of south Louisiana. In addition to the residential homes, public buildings, and commercial buildings, these industries have contributed to the south Louisiana landscape and to the heritage of the area. Historic standing structures, archaeological sites, and landscape features associated with human activities in the coastal area may be significant cultural resources.

Recreational Resources

Recreation areas in the Basin include Salvador WMA, Timken WMA, JLNHPP, and Bayou Segnette State Park. Other recreational features are provided by parishes and historic communities that attract visitors to a variety of heritage and cultural festivals, historical sites, parks offering opportunities for passive and active recreation that include tennis courts, soccer and softball fields, swimming pools, and golf courses. There are 37 boat launches throughout the Basin.

The Louisiana Statewide Comprehensive Outdoor Recreation Plan (SCORP) provides a statewide inventory of recreation resources and identifies recreational needs. While regions defined in the SCORP do not fit perfectly within the Basin, SCORP Region 1 and 3 and includes the Basin. The state- and Federally-managed areas described previously represent just a portion of the more than 282,000 acres of recreational facilities inventoried for SCORP Region 1. Federal, state, parish, and municipal public recreational facilities within Region 1 provides more than 196,000 acres for hunting, 123 boat ramps, 1,833 picnic tables, 10 beaches, and 320-acres for camping with 263 tent sites and 1,739 trailer sites. Region 3 includes more than 107,000 acres for hunting, 194 boat lanes, at 105 boat ramps; 131 acres with 365 tables for picnicking; 1 beach of 37 acres; and 71 acres for camping, 34 tent-sites and 422 trailer-sites. In a 2008 Residents Survey, most important activities for residents in Region 1 are visiting natural places, fishing, and visiting botanic gardens. Residents in Region 3 are identified fishing, visiting natural places, and public access to state waters as most important. Within the same survey, Region 1 residents had the highest participation rates in the following activities: driving for pleasure, fishing, and camping. Region 3 residents participated most in driving for pleasure, fishing, swimming, and camping.

Funds from the Land and Water Conservation Fund (L&WCF) have supported 65 different recreational projects within the same parishes as the Basin since 1964. L&WCF provides funding for numerous boat ramps, other facilities or lands that enhance opportunities for recreation.

The following is a description of the federal and state recreation areas within the project area:

Salvador Wildlife Management Area

Salvador WMA is 31,520 acres and is located in St. Charles Parish, along the northwestern shore of Lake Salvador about 12 miles southwest of New Orleans. Access is limited to boat travel via three major routes: Bayou Segnette from Westwego into Lake Cataouatche, then west to area; Sellers Canal to Bayou Verrett into Lake Cataouatche, then west to area; or via Bayou Des Allemands. Accessibility into the interior marshes is excellent via the many canals, bayous, and ditches on the area. Game species include waterfowl, deer, rabbits, squirrels, rails, gallinules, and snipe. Furbearing animals present are mink, nutria, muskrat, raccoon, opossum, and otter. Salvador supports a large population of alligators and provides nesting habitat for the endangered bald eagle. Excellent freshwater fishing is available on Lake Salvador. Bass, bream, crappie, catfish, drum, and garfish are abundant. Commercial fishing is prohibited. Non-consumptive forms of recreation available are boating, nature study, and picnicking.

Timken Wildlife Management Area

The Timken WMA is a 3,000 acre marsh island that is leased by the City Park Commission of New Orleans. The area is identified as Couba Island on maps; however, it has been named the Timken WMA after the former landowner who donated it to the City Park Commission of New Orleans. The area is located immediately east of the Salvador WMA and can be accessed by Lake Cataouatche. Like the Salvador WMA, Timken WMA consists of fresh to intermediate marsh and provides excellent habitat for waterfowl, furbearers, and alligators. Game species include waterfowl, deer, rabbits, squirrels, rails, gallinules, and snipe. Furbearing animals present are mink, nutria, muskrat raccoon, opossum, and otter.

Jean Lafitte National Historical Park

The JLNHPP consists of six physically separated sites, including Acadian Cultural Center; Prairie Acadian Cultural Center; Wetlands Acadian Cultural Center; Barataria Preserve; Chalmette Battlefield and National Cemetery; and French Quarter Visitor Center. Only one of which (Barataria Preserve Unit) is within the project area. The Barataria Preserve is a 23,000 acre wetland with trails and canoe tours through bottomland hardwood forests, swamps, and marsh. Additionally, there is an Education Center providing curriculum-based programming for school groups and a visitor center providing a film and exhibits.

Bayou Segnette State Park

Bayou Segnette State Park offers approximately 676 acres of recreational opportunities including, boating, fishing, canoeing, picnicking, playgrounds, a one mile nature trail, boat launches and a wave pool. Bass, catfish, bream, perch, redfish and trout are common in the area. Twenty waterfront cabins are available for overnight rental, as well as 98 locations for recreational vehicle (RV) and tent camping. The park also includes

comfort stations with showers and laundry, an RV dump station, and a group camp with kitchen and dormitories for up to 120 people.

Air Quality

The USEPA, under the requirements of the Clean Air Act of 1963 (CAA), has established National Ambient Air Quality Standards (NAAQS) for seven contaminants, referred to as criteria pollutants (40 CFR 50). These are carbon monoxide, nitrogen dioxide, ozone, particulate matter (PM) less than 10 microns in diameter (PM₁₀), PM less than 2.5 microns in diameter (PM_{2.5}), lead, and sulfur dioxide. The NAAQS standards include primary and secondary standards. The primary standards were established at levels sufficient to protect public health with an adequate margin of safety. The secondary standards were established to protect the public welfare from the adverse effects associated with pollutants in the ambient air.

Areas that meet the NAAQS for a criteria pollutant are designated as being “in attainment;” areas where a criteria pollutant level exceeds the NAAQS are designated as being “in nonattainment.”

Noise

The Noise Control Act of 1972 both regulates and promotes an environment for the public free from noise that jeopardizes their health or welfare. The Occupational Safety and Health Standards (29 CFR, part 1910) set standards regarding protection against the effects of noise exposure. Noise levels exceeding sound pressure levels are technically significant because noise can negatively affect the physiological or psychological well-being of an individual (Kryter, 1994). These effects can range from annoyance to adverse physiological responses, including permanent or temporary loss of hearing, and other types of disturbance to humans and animals, including disruption of colonial nesting birds. Noise is publicly significant because of the public's concern for the potential annoyance and adverse effects of noise on humans and wildlife.

Noise is generally described as unwanted sound, which can be based either on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (such as community annoyance). Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). Sound on the decibel scale is referred to as sound level. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB.

Noise levels are computed over a 24-hour period and adjusted for nighttime annoyances to produce the day-night average sound level (DNL). DNL is the community noise metric recommended by USEPA and has been adopted by most Federal agencies (USEPA 1974). A DNL of 65 weighted decibels (dBA) is the level most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities like construction. (The A-weighted sound level, used extensively in this country for the measurement of

community and transportation noise, represents the approximate frequency response characteristic of the average young human ear.) Areas exposed to a DNL above 65 dBA are generally not considered suitable for residential use. A DNL of 55 dBA was identified by USEPA as a level below which there is no adverse impact (USEPA 1974).

Most parishes in the Basin have noise ordinances addressing loud machinery. Noise is typically associated with human activities and habitations, such as operation of commercial and recreational boats, water vessels, air boats, and other recreational vehicles; operation of machinery and motors; and human residential-related noise (air conditioner, lawn mower, etc.).

The project areas identified as possibilities for Corps constructed mitigation projects are generally remote and uninhabited. The noise from distant urban areas surrounding the uninhabited portions of the project area contributes little, if any, to the natural noise levels of the area.

Hazardous, Toxic, and Radioactive Waste

In accordance with ER 1165-2-132 identification and evaluation of all HTRW contamination within the vicinity of the proposed project is required. USACE policy is to avoid the use of project funds for HTRW removal and remediation activities. Costs for necessary special handling or remediation of wastes (e.g., those regulated by the Resource Conservation and Recovery Act), pollutants and other contaminants, which are not regulated under the Comprehensive Environmental Response, Compensation, and Liability Act, would be treated as project costs if the requirement is the result of a validly promulgated Federal, state, or local regulation.

The new ROW and mitigation projects were surveyed via aerial photographs and database searches in the Zone Improvement Plan (ZIP) code areas where they would be located. Although there were numerous small incidents recorded in the database searches, none of the recorded incidents, either individually or cumulatively, would have any adverse effects on the outside of ROW or mitigation site areas. Other than petroleum pipelines and oil and gas wells, and some agricultural use, the sites are all on property that has not been developed within historic times. The probability of encountering HTRW on any of the sites is low. Prior to use of any site a Phase 1 Environmental Site Assessment would be completed for the individual project area.

Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

The new ROW and mitigation project construction impacts would be mitigated in the Basin, between Bayou Lafourche and the Mississippi River. These resources are institutionally significant because of the NEPA of 1969; the Estuary Protection Act; the Clean Water Act; the River and Harbors Acts; the Watershed Protection and Flood Protection Act; and the Water Resources Development Acts. Of particular relevance is the degree to which the proposed action affects public health, safety, and economic

well-being and the quality of the human environment. These resources are technically significant because the social and economic welfare of the communities of the southeast Louisiana coast may be positively or adversely impacted by the proposed action. These resources are publicly significant because of the public's concern for health, welfare, and economic and social well-being from water resources projects.

3.2.1 New ROW Proposed Action

3.2.1.1 Wetlands and Other Surface Waters

NOV 09

NOV 09 consists of 2.5 miles of the West Bank MRL from St. Jude Church to City Price Church (Appendix A figures A-2, A-3, and A-4). The new ROW for NOV 09 contains various BLH-wet species such as those presented in section 2.2.

NOV-NF-W-05a.1

The new ROW for NOV-NF-W-05a.1 contains cattle pasture with topographical depressions that are wet and as such, are classified as wet pasture which is a jurisdictional wetland (Appendix A figures A-1, A-3 and A-5). Dominant herbaceous species include *Cynodon dactylon* (Bermuda grass) and *Polygonum* sp. (smartweed species), and wet pasture species include *Sagittaria lancifolia* (arrowhead or bulltongue), *Spartina* sp. (cordgrass species), and *Juncus* sp. (rush species). Woody vegetation can be present if the area is not regularly maintained and can grow into scrub shrub layer of *Baccharis halimifolia* (Eastern baccharis) and *Sesbania drummondii* (rattlebox), but this area is for the most part maintained. The low plant species diversity of these wet pasture areas limits their value to wildlife.

3.2.1.2 Wildlife

NOV 09 and NOV-NF-W-05a.1

A variety of mammals, birds, reptiles, and amphibians are found in the additional ROW for NOV 09 and NOV-NF-W-05a.1. Birds inhabiting the area include brown pelicans, seabirds, dabbling and diving ducks, *Fulica americana* (American coots), and gallinules. Mammals in the area include nutria, muskrat, *Mustela vison* (mink), river otter, *Procyon lotor* (northern raccoon), swamp rabbit, and white-tailed deer. American alligator as well as other open water residents and migrants can be found utilizing the habitat within and around the area. Amphibians include *Hyla cinerea* (green treefrogs), toads, and salamanders. See Appendix B, Table B-14 for a full species list.

The project area is known to support various species of shore birds, colonial nesting wading/water birds and seabirds as well as bald eagles. There is potential for nesting of wading/water birds as suitable habitat exists within the project area. There are existing bald eagle nests north of the additional ROW action and potential for more nests to occur closer to the project site.

3.2.1.3 Threatened and Endangered Species

NOV 09 and NOV-NF-W-05a.1

None of the animals under USFWS and/or NMFS jurisdiction are expected to be found in the project area of NOV 09 or NOV-NF-W-05a.

3.2.1.4 Fisheries, Aquatic Resources, and Water Quality

None of the water bodies in the project area of NOV 09 or NOV-NF-W-05a.1 are currently listed on the Section 303(d) list of impaired water bodies by the State of Louisiana.

NOV 09

No fisheries or aquatic resources are in the project area.

NOV-NF-W-05a.1

No fisheries or aquatic resources are in the project area.

3.2.1.5 Essential Fish Habitat

NOV 09

No EFH resources exist within the project area.

NOV-NF-W-05a.1

No EFH resources exist within the project area.

3.2.1.6 Cultural Resources

Phase I cultural resources investigations were conducted for the NFL NOV system by New South Associates and URS from August, 2008 through September, 2009. Similarly, Phase I cultural resource investigations were conducted for the NOV system by GSRC from April to November 2010 (Somers et al. 2011). Results of these investigations were coordinated with State Historic Preservation Officer (SHPO) and Federally-recognized Indian tribes, and have been discussed in several NEPA coordination documents. In November and December 2014, and June 2015, additional cultural resources studies specifically for the PPG drainage canal relocation were conducted. This study overlaps with part of the current and additional ROW for NOV-NF-W-05a.1 presented in this EA #543. A report detailing the findings of the cultural resources studies was submitted to the SHPO in January 2015 with an addendum to the report provided in May 2015.

NOV-NF-W-05a.1

The additional ROW in NOV-NF-W-05a.1 is not significantly different from the original ROW, and does not change the low probability of undiscovered cultural resources. Valk et al. (2010) surveyed across the original ROW footprint and utilized an expanded survey corridor that includes a portion of the new additional ROW. A site visit was

conducted of the new ROW areas and a letter of coordination was sent to the SHPO on January 15, 2016, and the SHPO concurred with a determination of no historic properties affected.

NOV 09

The NOV 09 levee reach overlaps several previously recorded cultural resources within the new ROW (Somers et al. 2011). Most of these sites were determined to be ineligible for the National Register of Historic Places (NRHP). Overlap with Sites 16PL231 Locus 1, 16PL239, and 16PL245 require additional archaeological investigations to determine if the enlarged ROW may reveal information that affect NRHP status. The archaeological investigations would be carried out prior to commencement of construction of NOV 09, and the results would be coordinated with the SHPO and Federally-recognized Indian tribes when available.

3.2.1.7 Recreational Resources

NOV 09 and NOV-NF-W-05a.1

There are no recreational facilities near the NOV 09 ROW alignment, which is located mostly along the Mississippi River. Recreational river fishing may take place in the vicinity of the project area and residents across from the levee may use it for passive recreation, such as walking or more actively, jogging. The additional ROW in NOV-NF-W-05a.1 does not offer recreational opportunities as most of the land is remote, cattle pasture, often wet and for the most part maintained. The low plant species diversity of these wet pasture areas limits their value to recreational hunting or wildlife viewing.

3.2.1.8 Air Quality

NOV 09 and NOV-NF-W-05a.1 are located in Plaquemines Parish which is currently in attainment of NAAQS.

3.2.1.9 Noise

NOV 09

There are commercial and residential housing units located along Diamond Road which runs parallel roughly northwest to southwest along the protected side of the NOV 09 levee project area. Noise is produced by consistent local traffic on this road. The nearest major navigable waterway is the Mississippi River. Sporadic boat traffic along the river may produce noise levels that exceed 55 dBA within the area.

NOV-NF-W-05a.1

The NOV-NF-W-05a.1 is rural pasture land with no commercial or residential housing units or roads or highways within a 1000 ft. The nearest major navigable waterway is the Mississippi River. Sporadic boat traffic along the river may produce noise levels that exceed 55 dBA within the area.

3.2.1.11 Hazardous, Toxic, and Radioactive Waste

The new ROW sites for NOV 09 and NOV-NF-W-05a.1 were surveyed via aerial photographs and database searches in the ZIP code areas where they would be located. Previous database searches that included the area for all three new ROW reaches were also reviewed. Although there were numerous small incidents recorded in the database searches, none of the recorded incidents, either individually or cumulatively, would have any adverse effects on the newly proposed ROW sites. Several dry and plugged oil and gas wells and petroleum pipelines are in the vicinity of the new ROW sites. No additional Recognized Environmental Conditions (REC) were identified and the probability of encountering HTRW within the new project limits is low.

3.2.1.12 Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

NOV 09 and NOV-NF-W-05a.1

Population and Housing

There is no population or housing within the boundaries of the two realigned ROWs. The realigned ROWs are within Plaquemines Parish which has an estimated population of 23,599 (US Census Bureau, 2017).

Plaquemines Parish suffered significant damage from Hurricane Katrina. The population of Plaquemines Parish declined by nearly 4,000 people, or 14%, between the years 2000 and 2010. The Parish is still making efforts to rebuild (Plaquemines Parish, 2017). The population has recovered, but it is not yet back to its levels prior to Katrina.

Business and Industry

The ConocoPhillips Alliance Refinery, an oil and natural gas exploration and production company, is located just west of the ROW alignment NOV-NF-W-05a.1. The refinery processes mainly light, low-sulfur crude oil. The refinery's facilities produce transportation fuels, such as gasoline, diesel fuel and jet fuel. The NOLA Oil terminal is proposed for construction just down river of the Alliance refinery. NOLA Oil is the first fully permitted major petrochemical facility in lower Plaquemines Parish since Alliance Refinery in 1971. Finally, a coal export terminal is also proposed along the Mississippi River just south of the Alliance refinery and the proposed NOLA Oil terminal.

Otherwise, seafood harvesting and exporting is one of the top employers of Plaquemines Parish residents, outside of Oil and Gas, Healthcare, and Education. The parish produces millions of pounds of shrimp, oysters, crabs, and fish every year (Plaquemines Parish, 2017).

Ports

The Plaquemines Harbor and Terminal District, located in Plaquemines Parish, plays an important role in interstate and international commerce. The port sits 20 miles

south of the Port of New Orleans, on the Gulf of Mexico, and connects to 33 states via waterways, highways and rail. More than 53 million tons of cargo passed through the port in 2013 (Plaquemines Parish, 2017).

Land Use

According to the USDA Census of Agriculture (2012), 18% of land in Plaquemines Parish was classified as farmland.

Commercial Fisheries

There are no commercial fisheries associated with the two new ROW alignments.

Environmental Justice

To characterize the environmental justice (EJ) environment for NOV 09 and NOV-NF-W-05a.1, demographic data was collected from the 2013 American Community Survey (ACS) for Census Tract (CT) 504 and, more specifically, Census Tract 504, Block Group 1 (CT 504 BG 1). CT 504 extends geographically along the west bank of the Mississippi River from Belle Chasse to the Grand Terre Islands. BG 1 within CT 504 does not include the populated areas of Belle Chasse. CT 504 BG 1 does include Myrtle Grove and several smaller neighborhoods between the NFL NOV new ROW project areas. Table 8 compares the racial and ethnic characteristics of the populations in the vicinity of the proposed new alignments for NOV 09 and NOV-NF-W-05a.1 with those of the parish and state.

Table 8. Comparison of Racial and Ethnic Characteristics.

		Louisiana	Plaquemines Parish	Census Tract 504	Block Group 1, Census Tract 504	
Total Population		4,567,968	23,385	3,943	896	
Hispanic or Latino	Total	202,145	1,239	14	-	
	Percent	4.4%	5.3%	0.4%	0.0%	
Not Hispanic or Latino	White alone	Total	2,742,184	15,744	2,067	173
		Percent	60.0%	67.3%	52.4%	19.3%
	Black or African American alone	Total	1,454,343	4,923	1,649	723
		Percent	31.8%	21.1%	41.8%	80.7%
	American Indian and Alaska Native alone	Total	25,018	303	58	-
		Percent	0.5%	1.3%	1.5%	0.0%
	Asian alone	Total	72,834	767	155	-
		Percent	1.6%	3.3%	3.9%	0.0%
	Native Hawaiian and Other Pacific Islander alone	Total	1,939	-	-	-
		Percent	0.0%	0.0%	0.0%	0.0%
Some other race alone	Total	6,891	20	-	-	
	Percent	0.2%	0.1%	0.0%	0.0%	
Two or more races	Total	62,614	389	-	-	
	Percent	1.4%	1.7%	0.0%	0.0%	

Source: American Community Survey 5-Year Estimates (2009-2013), Table B02001.

The populations within CT 504 BG 1 are estimated to be 80 percent minority, twice the rate of the entire CT, and four times greater than the entire parish. As shown on Table

9, rates of poverty in Plaquemines Parish, CT 504, and CT 504 BG1 are much lower than the rate of poverty for the entire state.

Table 9. Rates of Poverty Compared.

	Louisiana	Plaquemines Parish	Census Tract 504	Block Group 1, Census Tract 504
Total Households	1,717,852	8,615	1,363	240
Income in the past 12 months below the poverty level	313,990	1,243	135	12
Percent Below the poverty level	18.3%	14.4%	9.9%	5.0%

Source: American Community Survey 5-Year Estimates (2009-2013), Tables B17001, B17017.

Transportation and Navigation

Transportation within the area includes the deep-draft channel of the Mississippi River and ferry service between Pointe a la Hache (on the east bank) to West Pointe a la Hache (on the west bank), as well as several canals located along the project back levees leading to canals, lakes, and bays approaching the Gulf of Mexico. Many canals have been created for the exploration, production, and transport of oil and gas resources important for regional, national, and international economic development. Surrounding waterways have also been used in the commercial and recreational harvest of fish and shellfish. The west bank of the Mississippi River parallels LA Hwy 23 which connects New Orleans to the NFL project area communities and the communities of Port Sulphur, Empire, Buras, and Venice south of the project area. Additionally, the highway is critically important in the transport of residents for hurricane evacuation, as well as the transport of goods and services. The Union-Pacific Rail Company which operates a short spur as far south as the Conoco-Philips refinery, also provides important rail access to area industries.

3.2.2 MITIGATION FOR BLH-DRY IMPACTS

3.2.2.1 Wetlands and Other Surface Waters

3.2.2.1.1 PPG BLH-Dry Project

This area is primarily 105 acres of maintained upland pasture with approximately 130 secondary bottomland hardwood species including American elm, water oak, green ash, sweetgum, black willow, Chinese tallow, and a few bald cypress and scrub shrub species like red maple, boxelder, eastern baccharis and rattlebox scattered throughout the site. The area surrounding mitigation site is predominately secondary BLH-Dry forest, a naval air station, and maintained subdivisions.

3.2.2.1.2 Bayou Segnette BLH Project

This area is primarily 200 acres of forested wetlands consisting of scrub shrub, BLH-Wet and swamp. Majority of the tree species present are Chinese tallow however secondary bottomland hardwoods and scrub shrub species described in the PPG project could also be present. The area is under forced drainage through connections

with the Lake Cataouatche pump station southwest of the site which pumps rain water south to the Outer Cataouatche Canal.

3.2.2.2 Wildlife

3.2.2.2.1 PPG BLH-Dry Project

A variety of mammals, birds, reptiles, and amphibians are located around the NAS Joint Reserve Base in Belle Chase. Small mammals that may be found in the area include squirrels, rabbits, and armadillos. Passerine birds present include sparrows, vireos, warblers, Northern mockingbird, common grackles, red-winged blackbirds, wrens, blue jays, northern cardinals, and American crows. Many of these birds are present primarily during periods of spring and fall migrations although some bird families, like egrets, ibises, and gulls are year-round residents. Reptiles and amphibians found in and around the air base include small lizards and venomous and nonvenomous snakes, salamanders, toads, and various frog species. See Appendix B Table B-14 for a full species list.

3.2.2.2.2 Bayou Segnette BLH Project

A variety of mammals, birds, reptiles, and amphibians are found in the vicinity of the Bayou Segnette project. Species inhabiting the area include white-tailed deer, *Sus scrofa* (feral hogs), skunks, rabbits, squirrels, armadillos, and a variety of smaller mammals. Various raptors such as barred owls, red-shouldered hawks, northern harriers, American kestrels, and red-tailed hawks are present. Passerine birds present include sparrows, vireos, warblers, Northern mockingbirds, grackles, red-winged blackbirds, wrens, blue jays, northern cardinals, and crows. Many of these birds are present primarily during periods of spring and fall migrations. The area provides habitat for salamanders, toads, frogs, turtles, and several species of nonvenomous and venomous snakes. See Appendix B Table B-14 for a full species list.

3.2.2.3 Threatened and Endangered Species

3.2.2.3.1 PPG BLH-Dry Project

None of the animals under USFWS and/or NMFS jurisdiction are expected to be found in the project area of PPG.

3.2.2.3.2 Bayou Segnette BLH Project

None of the animals under USFWS and/or NMFS jurisdiction are expected to be found in the project area of Bayou Segnette.

3.2.2.4 Fisheries, Aquatic Resources, and Water Quality

3.2.2.4.1 PPG BLH-Dry Project

The project is in an upland area and does not have any aquatic species. The water quality of the hydrologic unit encompassing this project footprint does not fully support two of its designated uses: Fish and Wildlife Propagation and Primary Contact Recreation. The suspected sources of this impairment includes industrial point source

discharge, non-irrigated crop production, introduction of non-native organisms (accidental or intentional), on-site treatment systems (septic systems and similar decentralized systems), package plant or other permitted small flows discharges, unpermitted discharge (domestic wastes), and natural sources.

3.2.2.4.2 Bayou Segnette BLH Project

The project is in an upland area and does not have any aquatic species. The water quality of the hydrologic unit encompassing this project footprint does not fully support two of its designated uses: Fish and Wildlife Propagation and Primary Contact Recreation. The suspected sources of this impairment includes drainage/filling/loss of wetlands, habitat modification other than hydromodification, littoral/shore area modification, forced drainage pumping, municipal point source discharge, sewage discharges in unsewered areas, and natural sources.

3.2.2.5 Essential Fish Habitat

3.2.2.5.1 PPG BLH-Dry Project

The project is in an upland area and does not have any EFH.

3.2.2.5.2 Bayou Segnette BLH Project

The project is in an upland area and does not have any EFH.

3.2.2.6 Cultural Resources

3.2.2.6.1 PPG BLH-Dry Project

This project has not been previously surveyed for cultural resources. Historic maps indicate that numerous natural waterways have existed in this vicinity, and that clearing and plowing has occurred on this land. Although the potential does exist, modern activities and disturbance have given this area a low probability of containing intact cultural resources.

A cultural resources survey may be required for ancillary project features such as retention dikes, borrow pits, access corridors and staging areas. The determination for the need to survey and the results of any survey would be coordinated with the SHPO and Federally-recognized Indian tribes as required by Section 106 of the National Historic Preservation Act (NHPA). Cultural resources that are eligible for inclusion in the NRHP and those that are unevaluated for National Register eligibility would be avoided.

3.2.2.6.2 Bayou Segnette BLH Project

Several surveys for cultural resources have been carried out adjacent and near to the proposed project area. Most significantly, in June of 2007, Coastal Environments, Inc. (CEI) undertook a Phase I cultural resources survey for the USACE, New Orleans District of a portion of the West Bank and Vicinity Hurricane Protection Levee in Jefferson Parish, Louisiana, in advance of proposed improvements to the levee system (Wells et al. 2010). The cultural resources survey was conducted immediately adjacent

and to the south of the proposed Bayou Segnette BLH-Dry area. It was determined that there was a very low potential for cultural resources and no further work was recommended.

A cultural resources survey may be required for ancillary project features such as retention dikes, borrow pits, access corridors and staging areas. The determination for the need to survey and the results of any survey would be coordinated with the SHPO and Federally-recognized Indian tribes as required by Section 106 of the NHPA. Cultural resources that are eligible for inclusion in the NRHP and those that are unevaluated for National Register eligibility would be avoided.

3.2.2.7 Recreational Resources

3.2.2.7.1 PPG BLH-Dry Project

The proposed 105-acre mitigation site is currently securely fenced, vacant land surrounded on three sides by residential housing. A few segments of the site look as though housing once stood but has since been removed.

3.2.2.7.2 Bayou Segnette BLH Project

The mitigation site is situated on 200-acres of private lands located south of Bayou Segnette State Park along the Cataouatche Canal. There is no recreational developments or resources within the proposed mitigation area. Bayou Segnette State Park offers hiking trails, picnic areas, cabins, and camping and fishing charging visitors a day use rate or nightly fees.

3.2.2.8 Air Quality

3.2.2.8.1 PPG BLH-Dry Project

The PPG BLH-Dry site is located in Plaquemines Parish which is currently in attainment of NAAQS.

3.2.2.8.2 Bayou Segnette BLH Project

The Bayou Segnette BLH-Dry site is located in Jefferson Parish which is currently in attainment of NAAQS.

3.2.2.9 Noise

3.2.2.9.1 PPG BLH-Dry Project

There are approximately 671 residential houses, townhouses, and apartment complexes in neighborhood communities within 1000 ft surrounding the PPG site to the west, north, and east. The Belle Chasse NAS with airport runways is located directly south of the PPG site. There are commercial units located along Barrier Road which is west of the project area and LA Hwy 23 which is located north and east of the project area. Noise is produced by consistent and sporadically heavy traffic on these roads. The PPG project area is also between two major navigable waterways the GIWW to the west and the Mississippi River to the east. Boat traffic along these waterways as well

as planes taking off from the NAS produce noise levels that regularly exceed 55 dBA within the area.

3.2.2.9.2 Bayou Segnette BLH Project

There are no nearby adjacent communities or commercial properties, the area has a pump station and one house within 1000 ft. North of the site is the Nola Motorsport park which is a car race track and west of the site is Avondale Garden Road and the Churchill Farms borrow pits. The Bayou Segnette project area is predominately surrounded by a forest of Chinese tallow trees, to the south is the WBV levee. North of the site the major thoroughfares include Lapalco Blvd, Nicolle Blvd, and Hwy 90. Noise is produced by consistent and sporadically heavy traffic on these roads as well as on the race track. The Outer Lake Cataouatche Canal is located south the WBV levee and the project area and sporadic boat traffic may produce noise levels that exceed 55 dBA within the area.

3.2.2.10 Hazardous, Toxic, and Radioactive Waste

3.2.2.10.1 PPG BLH-Dry Project

No active wells, no plugged and abandoned wells, no pipelines, or other RECs were identified within the proposed mitigation area. The NAS Joint Reserve Base Belle Chasse, located immediately to the south of the proposed mitigation area, is considered a Large Quantity Generator for hazardous waste; however, the waste is handled and disposed of by properly trained personnel. The probability of encountering HTRW during the course of this mitigation project is very low.

3.2.2.10.2 Bayou Segnette BLH Project

There is one plugged and abandoned oil/gas well adjacent to the proposed mitigation area. No other RECs were identified. As long as this well is not disturbed, the probability of encountering HTRW during the course of this mitigation project is very low.

3.2.2.11 Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

3.2.2.11.1 PPG BLH-Dry Project

The mitigation site, located in Plaquemines Parish, is vacant land surrounded by residential housing. According to 2010 U.S. Census data, the Block Group in which the mitigation site is located has 573 housing units of which 528 are occupied and 31 are vacant. Just under 1,500 people reside in the Block Group. Thirteen percent of the population in the block group surrounding the mitigation site is minority while 5 percent have incomes below the poverty level.

The nearest major thoroughfare is LA Hwy 23 and there are no navigable waterways nor commercial fisheries within the site.

3.2.2.11.2 Bayou Segnette BLH Project

According to 2010 U.S. Census data, there are no residents located within or around the boundaries of the Bayou Segnette BLH-Dry project. There are no EJ communities near the proposed restoration site.

There are no commercial/industrial properties, public facilities, or transportation infrastructure within the project boundaries. The nearest major thoroughfare is Lapalco Boulevard while the nearest navigable waterways are Lake Cataouatche and Bayou Segnette. There are no commercial fisheries located at the Bayou Segnette project site.

3.2.3 MITIGATION FOR BLH-WET IMPACTS

3.2.3.1 Wetlands and Other Surface Waters

3.2.3.1.1 Jesuit Bend BLH-Wet Project

This area is primarily shallow (less than 3 ft deep) open water which depending on time of year could have mostly floating *Salvinia minima* (common salvinia) and some submerged aquatic vegetation could be present. The proposed 225 acre project site is surrounded by developed and bare land, swamp, wet BLH and intermediate marsh. Salinities in the open water area range from 0 to 2 ppt. The 258 acre borrow site is within the regularly dredged and maintained Mississippi River downstream of the project site near mile markers 65 and 64. Existing water depths in the borrow area are -44 to -62 ft NAVD88.

3.2.3.1.2 The Tank BLH-Wet Project

This area is primarily 310 acres of open freshwater and ranges in elevation from 0 to -6 ft NAVD88 with tidally fluctuating water depths ranging from 0 to 8 ft. The salinity in the area from field investigations ranged from 0.05 to 0.15 ppt. Shallower areas near the shoreline have emergent alligator weed, submerged aquatic vegetation mainly *Ceratophyllum demersum* (coontail) and floating aquatic vegetation such as *Eichhornia crassipes* (water hyacinth), *Bidens* sp. (beggar-tick), salvinia and water lilies but cover and acreage varies from year to year. The proposed project site is surrounded by wetlands to the west, north and south consisting of wet BLH, fresh marsh and scrub/shrub habitat and Lake Cataouatche to the east. Lake Cataouatche is a tidally connected and also influenced by fresh Mississippi River water from the Davis Pond Diversion structure. The borrow site for this Tank project is approximately 7,000 ft by 4,000 ft or approximately 643 acres in Lake Cataouatche at an elevation of -6 ft NAVD88.

3.2.3.2 Wildlife

3.2.3.2.1 Jesuit Bend BLH-Wet Project

A variety of mammals, birds, reptiles, and amphibians are found in the project vicinity. Common birds include brown pelicans, seabirds, dabbling and diving ducks, coots, and gallinules. Mammals include the nutria, muskrat, mink, river otter, raccoon, rabbit, and

white-tailed deer. The American alligator as well as other open water residents and migrants can be found utilizing the habitat within and around the area. Amphibians include tree frogs, toads, and salamanders. See Appendix B Table B-14 for a full species list.

3.2.3.2.2 The Tank BLH-Wet Project

An assortment of avian species inhabit this project area. Brown pelicans, seabirds, dabbling and diving ducks, coots, and gallinules as well as other open water residents and migrants can be found utilizing the habitat within and around Lake Cataouatche. The American alligator as well as other open water residents and migrants can be found utilizing the habitat. Amphibians include tree frogs, toads, and salamanders. See Appendix B Table B-14 for a full species list.

3.2.3.3 Threatened and Endangered Species

3.2.3.3.1 Jesuit Bend BLH-Wet Project

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee and pallid sturgeon are expected to potentially occur within the project area.

West Indian Manatee

The West Indian manatee is Federally-listed as threatened and also is protected under the Marine Mammal Protection Act of 1972, under which it is considered depleted. Critical habitat for the manatee has not been designated in Louisiana. The manatee is not a year-round resident in Louisiana, but it may migrate there during warmer months. <https://ecos.fws.gov/ecp0/profile/speciesProfile?sPCODE=A007>

There have been 110 reported sightings of manatees in Louisiana since 1975 (LDWF 2005). Sightings in Louisiana, which have been uncommon and sporadic, have included occurrences in Lake Pontchartrain as well as the Amite, Blind, Tchefuncte, and Tickfaw Rivers. Between 1997 and 2000, there were approximately 16 sightings in the Lake Pontchartrain area and a general increase in the number of manatees per sighting (Abadie et al. 2000). Sightings of the manatee in the Lake Pontchartrain Basin have increased in recent years, and in late July 2005, 20 to 30 manatees were observed in the lake from the air (Powell and Taylor 2005).

Pallid sturgeon

The pallid sturgeon was listed as Endangered (55 Federal Register 36641) on September 6, 1990. Pallid sturgeons are known to inhabit in the Mississippi and Atchafalaya Rivers. Pallid sturgeons live close to the bottom of large, silty rivers with a natural hydrograph. Their preferred habitat has a diversity of depths and velocities formed by braided channels, sand bars, sand flats and gravel bars (<https://ecos.fws.gov/ecp0/profile/speciesProfile.action?sPCODE=E06X> accessed April 24, 2017). Current information indicates that the pallid sturgeon is widely distributed throughout the lower Mississippi River, however for the areas proposed to be dredged south of River Mile 66, entrainment during dredging is reduced because of the large channel size, depth and complexity. Additionally, there have been no reported captures

of pallid sturgeon south of River Mile 95. A “Conservation Plan for the Interior Least Tern, Pallid Sturgeon, and Fat Pocketbook Mussel in the Lower Mississippi River (Endangered Species Act (ESA), Section 7(a)(1)), dated July 23, 2013 (<https://www.fws.gov/mississippiES/pdf/LMR%20Conservation%20Plan%20Final%20USACE%20CIP%2023%20July%202013.pdf>) and the biological opinion titled “Biological Opinion Channel Improvement Program Mississippi River and Tributaries Project Lower Mississippi River (https://www.fws.gov/mississippiES/_pdf/LMRBiologicalOpinion.pdf) document the existing research and population assessment for the pallid sturgeon.

3.2.3.3.2 The Tank BLH-Wet Project

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee are expected to potentially occur within the project area. See section 3.2.3.3.1 for additional species information.

3.2.3.4 Fisheries, Aquatic Resources, and Water Quality

3.2.3.4.1 Jesuit Bend BLH-Wet Project

The placement area is primarily shallow open water with limited fisheries and tidal access. Most of the fisheries species listed in Section 3.1 could be found during part of the year or part of their life cycle in the placement area. SAV (<10% coverage) is prevalent throughout the project area. The dominant species are coontail, *Myriophyllum spicatum* (Eurasian watermilfoil), and *Stuckenia pectinata* (sago pondweed). The average salinity during the growing season in the placement area is 0.44 ppt. The borrow area in the Mississippi River could have the following species: *Ctenopharyngodon idella* (grass carp) and *Hypophthalmichthys molitrix* (silver carp), *Ictiobus bubalus* (smallmouth buffalo), *Morone mississippiensis* (yellow bass), *Micropterus salmoides* (largemouth bass), and *Morone saxatilis* (striped bass), *Lepomis microlophus* (reardear sunfish), *Ictalurus punctatus* (channel catfish), alligator, *Lepisosteus oculatus* (spotted gar), *Lepisosteus osseus* (longnose gar) and *Lepisosteus platostomus* (shortnose gar), *Aplodinotus grunniens* (freshwater drum), *Amia calva* (bowfin) and *Amia calva* (American eel). The water quality of the hydrologic units encompassing this project fully supports its designated uses.

3.2.3.4.2 The Tank BLH-Wet Project

The placement area is primarily shallow open water approximately and has sufficient fisheries access. Most of the fisheries species listed in Section 3.1 could be found during part of the year or part of their life cycle in the placement and borrow area. SAV (50% coverage) is prevalent throughout the project area. The dominant species are Eurasian watermilfoil, alligator weed, water hyacinth, water lilies, American lotus, and *Ludwigia peploides* (water primrose). The water quality of the hydrologic unit encompassing this project footprint does not fully support two of its designated uses: Fish and Wildlife Propagation and Outstanding Natural Resource. The suspected sources of this impairment includes forced drainage pumping, introduction of non-native organisms (accidental or intentional), and sediment re-suspension (clean sediment). Lake Cataouatche, from which borrow would be excavated for this project, does not fully support one of its designated uses: Fish and Wildlife Propagation. The suspected

sources of this impairment includes introduction of non-native organisms (accidental or intentional), sediment re-suspension (clean sediment), and natural sources.

3.2.3.5 Essential Fish Habitat

3.2.3.5.1 Jesuit Bend BLH-Wet Project

EFH has not been designated in this project area or its borrow area.

3.2.3.5.2 The Tank BLH-Wet Project

The placement and borrow areas for the project are located within an area identified as EFH for coastal migratory pelagic, shrimp, red drum, and reef fish. See table 7 for the specific EFH per life stage.

3.2.3.6 Cultural Resources

3.2.3.6.1 Jesuit Bend BLH-Wet Project

The majority of this project is located within a sunken agricultural field. This feature may have also been used as a source of borrow material. The project has not been surveyed for cultural resources, but its current condition make it very unlikely to contain any intact cultural resources. Two previously recorded cultural resources have been identified within 0.5 miles of the project area, archaeological sites 16PL186 and 16PL187. Site 16PL186 is a prehistoric mound complex consisting of a multi-component cultural affiliation from the prehistoric through the historic periods. The site is considered potentially significant and eligible for listing to the NRHP. Site 16PL187 consists of the remains of a possible 19th century sugar mill complex from the Antebellum period. The sites is not considered significant or eligible for listing to the NRHP. The two sites are not located within the proposed project area, and it is not likely the sites would be impacted by project activities.

There is the possibility that cultural resources could exist in ancillary features associated with the proposed project such as borrow areas, retention dikes, access corridors and staging areas, and a cultural resources survey may be required in those areas. The decision to conduct a cultural resources survey and the results would be coordinated with the SHPO and Federally-recognized Indian tribes as required by Section 106 of the NHPA. Cultural resources that are eligible for inclusion in the NRHP and those that are unevaluated for National Register eligibility would be avoided.

3.2.3.6.2 The Tank BLH-Wet Project

No cultural resources surveys have been conducted within the majority of this proposed project. However, a cultural resources survey was conducted and does overlap the northern boundary of the proposed project (Rawls 2009; 22-3197). This northern boundary is the area closest to an existing shoreline and therefore most likely to contain what would be a submerged ancient prehistoric site such as shell midden. The Rawls (2009) cultural resources survey did not locate any such cultural resource, or any other cultural resource. Three previously recorded cultural resources were identified within 1.5 miles of the proposed project area that include archaeological sites 16SC27,

16SC28, and 16SC29. Site 16SC27 is represented by multi-component cultural affiliation indicating prehistoric through historic use of the site. The site is significant and potentially eligible for listing to the NRHP. Sites 16SC28 and 16SC29 are neo-Indian resource collection areas, with a possible function as a modern farm pumping station. It is unknown if either of the two sites are eligible for listing to the NRHP. The three cultural resources sites are located within the proposed project area, and it is not likely the sites would be impacted by project activities. The remainder of the proposed project is in open water and far away from the current shoreline. This proposed project is considered to have no potential to cause effect to cultural resources.

A cultural resources survey may be required for ancillary project features such as containment dikes, borrow areas, staging areas and access use corridors. The results of any cultural resources survey would be coordinated with the SHPO and Federally-recognized Indian tribes as required by Section 106 of the NHPA. Cultural resources eligible for inclusion in the NRHP and those that are unevaluated for National Register eligibility would be avoided.

3.2.3.7 Recreational Resources

3.2.3.7.1 Jesuit Bend BLH-Wet Project

The open water area at this 225-acre project site provides potential recreation uses such as boating and fishing. Currently, public recreation is not available since it is privately-owned. Recreational fish species in the project area include red and black drum, spotted seatrout, gulf menhaden, southern flounder, white and brown shrimp, blue crab, largemouth bass and channel catfish (LCWCRTF and WCRA, 1999).

Borrow material necessary for construction of this project would be obtained from the Mississippi River. Minimal recreation occurs in the Mississippi River while bank fishing does take place.

3.2.3.7.2 The Tank BLH-Wet Project

The project area is located within the Salvador/Timken WMA managed by LDWF and is identified by them as a high use area for waterfowl hunters and fisherman. Current recreation use includes fishing and duck hunting when access is not restricted by thick submerged aquatic vegetation. Recreational fish using the habitat at the project site include red and black drum, spotted seatrout, gulf menhaden, white and brown shrimp, blue crab, largemouth bass, and channel catfish (LCWCRTF and WCRA, 1999).

3.2.3.8 Air Quality

3.2.3.8.1 Jesuit Bend BLH-Wet Project

The Jesuit Bend BLH-Wet site is located in Plaquemines Parish which is currently in attainment of NAAQS.

3.2.3.8.2 The Tank BLH-Wet Project

The Tank BLH-Wet site is located in Plaquemines Parish which is currently in attainment of NAAQS.

3.2.3.9 Noise

3.2.3.9.1 Jesuit Bend BLH-Wet Project

There are commercial and residential housing units located along LA Hwy 23, which is located east of the project area. Noise is produced by consistent and sporadically heavy traffic on this road. The nearest major navigable waterway to the Jesuit Bend BLH-Wet project is the Mississippi River. Sporadic boat traffic along the river may produce noise levels that exceed 55 dBA.

3.2.3.9.2 The Tank BLH-Wet Project

This project is located in a remote portion of the Salvador/Timken WMA in St. Charles Parish, Louisiana. The nearest major navigable waterway to The Tank project is Lake Cataouatche, LA. Sporadic boat traffic may produce noise levels that exceed 55 dBA.

3.2.3.10 Hazardous, Toxic, and Radioactive Waste

3.2.3.10.1 Jesuit Bend BLH-Wet Project

No RECs were identified and the probability of encountering HTRW during the course of this mitigation project is very low.

3.2.3.10.2 The Tank BLH-Wet Project

No RECs were identified and the probability of encountering HTRW during the course of this mitigation project is very low.

3.2.3.11 Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

3.2.3.11.1 Jesuit Bend BLH-Wet Project

This project is located on the west bank of Plaquemines Parish, Louisiana. There are no residents or housing units located within the boundaries of the Jesuit Bend BLH-Wet Restoration Project as it mainly consists of open water. There are about 1,300 residents living across a borrow canal on lands fronting LA Hwy 23. One quarter of the residents are minority while the larger block group data shows only 2% of households with incomes below the poverty level.

The nearest major thoroughfare is LA Hwy 23. The nearest major navigable waterway to the Jesuit Bend BLH-Wet Restoration Project is the Mississippi River. Commercial fishing does not take place within the boundaries of the Jesuit Bend site.

3.2.3.11.2 The Tank BLH-Wet Project

According to 2010 U.S. Census data, there are no residents located within or around the boundaries of The Tank BLH-Wet site, which is located in St. Charles Parish. There are no EJ communities near the proposed restoration site.

Additionally, there are no commercial/industrial properties, public facilities, or transportation infrastructure within the project boundaries. The nearest major navigable waterway to The Tank is Lake Cataouatche.

St. Charles Parish saw an increase in population between the years of 2000 and 2015. The Parish has grown by an estimated 4,500 residents in the fifteen-year span. Along with an increase in residents, the Parish also experienced an increase in unemployment, from 3.4% in 2000 to 7.7% in 2015. Similar to the other Parish's in the affected area, the per capita income in St. Charles Parish has increased. The Parish's per capita income increased by an estimated \$8,193, from \$19,054 in 2000 to \$27,247 (US Census Bureau).

St. Charles Parish has the one of the highest estimated average home value within the affected area. Homes in this Parish average between \$181,000 and \$184,300 (Data USA, 2017). Similar to other Parishes in the affected area, the majority of residents own their home. In 2015, an estimated 81% of the population owned their home.

St. Charles Parish residents are largely employed in the manufacturing, healthcare and social assistance and retail trade industries. Compared to other states and regions, St. Charles Parish has a relatively high number of residents employed in the utilities industry (Data USA, 2017). Nineteen percent of land in St. Charles Parish is designated as farmland (USDA, Census of Agriculture).

According to data compiled by the LDWF, commercial fishing takes place in the Upper Barataria Basin. The Upper Barataria Basin consists of Lakes Salvador and Cataouatche and surrounding marshes. The Tank is located on the western edge of Lake Cataouatche. In 2014, commercial fisherman landed nearly 1.5 million pounds of brown shrimp, freshwater finfish, saltwater fish or white shrimp during 2,278 trips to the Upper Barataria Basin. See Table 12. The dollar value of commercial fish landings in the Upper Barataria Basin in 2014 was nearly \$1.5 million.

Table 10. Commercial Fish Landings, Upper Barataria Basin, 2014

Fish Species	Landings (lbs)	Value	Trips
Brown Shrimp	187,466	\$ 335,075	218
Freshwater Finfish	909,749	\$ 531,623	1,739
Saltwater Fish	4,674	\$ 3,269	9
White Shrimp	354,139	\$ 584,100	312
Total	1,456,028	\$ 1,454,067	2,278

* Upper Barataria Basin consists of Lakes Salvador and Cataouatche and surrounding marshes.

Commercial fish landings in the State of Louisiana have increased since 1981, the first year for which the National Oceans Economic Program has data. Landings in the state have been subject to sharp rises and falls but, overall, have increased (Ocean Economics). Commercial fishing operations suffered damage from Hurricanes Katrina and Rita in 2005 and 2008, respectively. In addition, the 2010 Deep Water Horizon oil spill also had damaging impacts on the industry. Louisiana commercial fishing operations are still recovering from these disasters (Alexander-Bloch, 2014). Studies done on the impacts of overfishing on coastal commercial fishing industries are inconclusive and projections vary widely. It is difficult to predict if desirable ocean species will decline and, if so, by how much (De Mutsert et al., 2007). Chart 1 illustrates landings of species caught in the Basin between the years 2000 and 2014 (Louisiana Fish and Wildlife, 2017).

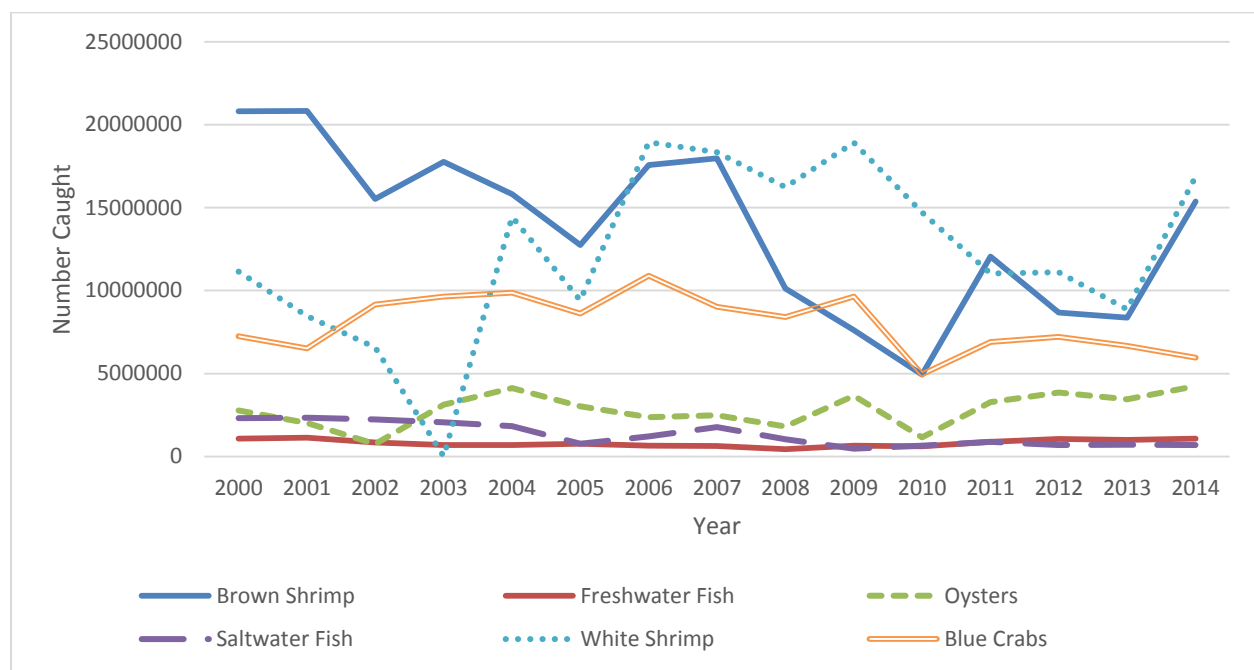


Chart 1. Commercial fishing catch in the Barataria Basin from 2000 to 2014.

3.2.4 MITIGATION FOR SWAMP IMPACTS

3.2.4.1 Wetlands and Other Surface Waters

3.2.4.1.1 Jesuit Bend Swamp Project

This area is primarily shallow (less than 3 ft deep) open water which depending on time of year could have mostly floating aquatic salvinia and some submerged aquatic vegetation could be present. The proposed 95 acre project site is surrounded by developed and bare land, swamp, wet BLH and intermediate marsh. Salinities in the open water area range from 0 to 2 ppt. The 258 acre borrow site is within the regularly dredged and maintained Mississippi River downstream of the project site near mile markers 65 and 64. Existing water depths in the borrow area are -44 to -62 ft NAVD88.

3.2.4.1.2 Lake Salvador Project

This 95 acre project site is primarily shallow open water ranging from 0 to 6 ft along Lake Salvador, the shoreline of Lake Salvador is surrounded by fresh marsh, swamp, and BLH wet. Lake Salvador is tidally influenced by its connection through various waterways including the GIWW to the Gulf of Mexico, it is also influence by the Mississippi River via the Davis Pond Diversion. Salinity in the project area is fresh 0-1 ppt. Because of the high wave energy in this area there is not much if any submerged aquatic vegetation or floating aquatic vegetation. The approximate 7,500 ft X 1,400 ft or 241 acre borrow site is within Lake Salvador adjacent to the project area. Existing water depths in the borrow area are -6 to -8 ft NAVD88.

3.2.4.2 Wildlife

3.2.4.2.1 Jesuit Bend Swamp Project

A variety of mammals, birds, reptiles, and amphibians are found in the project vicinity. Brown pelicans, seabirds, dabbling and diving ducks, coots, and gallinules; nutria, muskrat, mink, river otter, and raccoon; rabbit; white-tailed deer; and American alligator as well as other open water residents and migrants can be found utilizing the habitat within and around the area. Amphibians include tree frogs, toads, and salamanders. See Appendix B Table B-14 for a full species list.

3.2.4.2.2 Lake Salvador Swamp Project

A variety of bird species inhabit this project area. Brown pelicans, seabirds, dabbling and diving ducks, coots, and gallinules as well as other open water residents and migrants can be found utilizing the habitat within and around Lake Salvador. The American alligator as well as other open water residents and migrants can be found utilizing the habitat within and around the area. Amphibians include tree frogs, toads, and salamanders. See Appendix B Table B-14 for a full species list.

3.2.4.3 Threatened and Endangered Species

3.2.4.3.1 Jesuit Bend Swamp Project

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee and pallid sturgeon are expected to potentially occur within the project area. See section 3.2.3.3.1 for full species descriptions.

3.2.4.3.2 Lake Salvador Swamp Project

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee are expected to potentially occur within the project area. See section 3.2.3.3.1 for full species descriptions.

3.2.4.4 Fisheries, Aquatic Resources, and Water Quality

3.2.4.4.1 Jesuit Bend Swamp Project

The placement area is primarily shallow open water. Most of the fisheries species listed in Section 3.1 could be found during part of the year or part of their life cycle in the

placement area, but the area is limited in aquatic access and tidal exchange by an almost continuous dike. SAV (10% coverage) is not prevalent throughout the project area. The species present include coontail, Eurasian watermilfoil, and sago pondweed. The average salinity during the growing season in the placement area is 0.44 ppt. The borrow area in the Mississippi River could have the following species: grass and silver carp, buffalo, yellow, largemouth, and striped bass, sunfish, catfish, alligator, spotted, longnose and shortnose gar, freshwater drum, bowfin and American eel. The water quality of the hydrologic units encompassing this project fully supports its designated uses.

3.2.4.4.2 Lake Salvador Swamp Project

The placement area is primarily shallow open water and adequate fisheries and tidal access. Most of the fisheries species listed in Section 3.1 could be found during part of the year or part of their life cycle in the placement and borrow areas. The water quality of the hydrologic unit encompassing this project footprint and Lake Salvador, from which borrow would be excavated for this project, does not fully support one of its designated uses: Fish and Wildlife Propagation. The suspected sources of this impairment includes introduction of non-native organisms (accidental or intentional), sediment re-suspension (clean sediment), and natural sources.

3.2.4.5 Essential Fish Habitat

3.2.4.5.1 Jesuit Bend Swamp Project

EFH has not been designated in this project area or its borrow area.

3.2.4.5.2 Lake Salvador Swamp Project

The project and borrow areas are located within an area identified as EFH for coastal migratory pelagic, red drum, reef fish, and shrimp. See Table 7 for the specific EFH per life stage.

3.2.4.6 Cultural Resources

3.2.4.6.1 Jesuit Bend Swamp Project

The proposed project is within a sunken agricultural field and has a low probability for cultural resources. There is also the possibility that the proposed project area was used as a source of borrow in the past, making the likelihood of encountering cultural resources very low.

There is the possibility of cultural resources being located in features associated with the proposed project such as retention dikes, borrow pits, access corridors and staging areas. Depending on the locations of such project features, a cultural resources survey could be necessary. The decision to conduct a cultural resources survey and the results would be coordinated with the SHPO and Federally-recognized Indian tribes as required by Section 106 of the NHPA. Cultural resources eligible for inclusion in the NRHP and those that are unevaluated for the National Register would be avoided by project activities.

3.2.4.6.2 Lake Salvador Swamp Project

This proposed project has not been closely investigated for cultural resources. Prehistoric sites are known to exist within close proximity, including farther west (in the water) than the proposed project area. Most of the proposed project area is within the Barataria Unit of the Jean Lafitte Historical Park Historic District and contains several sites along the Lake Salvador Shoreline that are listed to the NRHP as contributing elements to the Historic District. If selected, this area would likely require additional cultural resources survey and consultation with the SHPO, Federally-recognized Indian tribes, and the National Park Service to develop strategies to avoid significant historic properties that are listed to the NRHP.

Cultural resources surveys may be required for associated project features such as borrow pits, access corridors, retention dikes and staging areas. The results of any surveys would be coordinated with the SHPO and Federally-recognized Indian tribes as required by Section 106 of the NHPA. Cultural resources eligible for inclusion in the NRHP and those that are unevaluated for National Register eligibility would be avoided.

3.2.4.7 Recreational Resources

3.2.4.7.1 Jesuit Bend Swamp Project

The site provides potential recreation uses such as boating and fishing. Currently, public recreation is not available since it is privately-owned.

3.2.4.7.2 Lake Salvador Swamp Project

The project area is located within JLNHPP. The mitigation site is located along the shoreline of Lake Salvador. Boating, fishing, and waterfowl hunting occur within the open water. Borrow material would be dredged from Lake Salvador and pumped via pipeline to the mitigation feature. Recreational fishing takes place in Lake Salvador.

3.2.4.8 Air Quality

3.2.4.8.1 Jesuit Bend Swamp Project

The Jesuit Bend Swamp site is located in Plaquemines Parish which is currently in attainment of NAAQS.

3.2.4.8.2 Lake Salvador Swamp Project

The Lake Salvador Swamp site is located in Jefferson Parish which is currently in attainment of NAAQS.

3.2.4.9 Noise

3.2.4.9.1 Jesuit Bend Swamp Project

There are commercial and residential housing units located along LA Hwy 23, which is located east of the project area. Noise is produced by consistent and sporadically heavy traffic on this road. The nearest major navigable waterway to the Jesuit Bend

Swamp project is the Mississippi River. Sporadic boat traffic along the river may produce noise levels that exceed 55 dBA.

3.2.4.9.2 Lake Salvador Swamp Project

This project is located in a remote portion of the JLNHPP in Jefferson Parish, Louisiana. However, there are two fishing camps on the pipeline canal running north to south west of the site. The nearest major navigable waterway to Lake Salvador Swamp project is Lake Salvador and the GIWW. Sporadic boat traffic on these waterways may produce noise levels that exceed 55 dBA.

3.2.4.10 Hazardous, Toxic, and Radioactive Waste

3.2.4.10.1 Jesuit Bend Swamp Project

There is one dry and plugged well within the proposed mitigation area. No other RECs were identified. The probability of encountering HTRW during the course of this mitigation project is very low.

3.2.4.10.2 Lake Salvador Swamp Project

No RECs were identified and the probability of encountering HTRW during the course of this mitigation project is very low.

3.2.4.11 Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

3.2.4.11.1 Jesuit Bend Swamp Project

Existing conditions of the Jesuit Bend Swamp Project are similar to those described in section 3.2.3.11.1, Jesuit Bend BLH-Wet Project.

3.2.4.11.2 Lake Salvador Swamp Project

The Lake Salvador Swamp Restoration site is open water and located in the JLNHPP; there are no residents living in the vicinity, according to the 2010 U.S. Census.

Additionally, there are no commercial/industrial properties, public facilities, or transportation infrastructure within the project boundaries. The nearest major navigable waterway to the Lake Salvador Project is Lake Salvador and the GIWW. For information concerning commercial fishing in the Lake Salvador area, see section 3.2.3.11.2.

3.2.5 MITIGATION FOR FRESH MARSH IMPACTS

3.2.5.1 Wetlands and Other Surface Waters

3.2.5.1.1 Cataouatche Ponds Fresh Marsh Project

This area is within JLNHPP and is primarily 110 acres of open freshwater and ranges in elevation from 0 to -4 ft NAVD88 with tidally fluctuating water depths ranging from 2 to 4 ft. The salinity in the area from field investigations ranged from 0 to 1 ppt. Shallower

areas near the marsh edge have emergent alligator weed, submerged aquatic vegetation mainly coontail and floating aquatic vegetation such as water hyacinth, beggar-tick, salvinia, water lilies and American lotus (*Nelumbo lutea*) can cover the open water area however acreage varies from year to year. The proposed project site is surrounded by freshwater marsh. Nearby waterways include the Lake Cataouatche Outfall Canal to the north, Whiskey Bayou and Lake Cataouatche to the west and south, and Yankee Pond to the east. Lake Cataouatche is a tidally connected and also influenced by fresh Mississippi River water from the Davis Pond Diversion structure. The borrow site for this Cataouatche Ponds project is approximately 2,000 ft by 2,600 ft or approximately 119 acres in Lake Cataouatche at an elevation of -6 ft to -8 ft NAVD88.

3.2.5.1.2 GIWW/Salvador Fresh Marsh Project

This 160 acre project site is primarily shallow open water ranging from 0 to 6 ft along Lake Salvador, the shoreline in this area of Lake Salvador is eroded fresh marsh and has eroded so much in this area that it now connects with the GIWW. At higher elevations along the edges of the site there is some scrub shrub habitat but mostly Eastern baccharis and *Iva frutescens* (bigleaf marsh-elder). Lake Salvador is tidally influenced by its connection through various waterways including the GIWW to the Gulf of Mexico, it is also influence by the Mississippi River via the Davis Pond Diversion. Salinity in the project area is fresh 0-1 ppt. Because of the high wave energy in this area there is not much if any submerged aquatic vegetation or floating aquatic vegetation. The approximate 4,000 ft X 1,800 ft or 165 acre borrow site is within Lake Salvador adjacent to the project area at an elevation of -6 ft to -8 ft NAVD88.

3.2.5.2 Wildlife

3.2.5.2.1 Cataouatche Ponds Fresh Marsh Project

A variety of bird species are present in this project area. Brown pelicans, seabirds, dabbling and diving ducks, coots, and gallinules as well as other open water residents and migrants can be found utilizing the habitat within and around the area. The American alligator as well as other open water residents and migrants can be found utilizing the habitat within and around the area. Amphibians include tree frogs, toads, and salamanders. See Appendix B Table B-14 for a full species list.

3.2.5.2.2 GIWW/Salvador Fresh Marsh Project

A variety of bird species utilize this project area. Brown pelicans, seabirds, dabbling and diving ducks, coots, and gallinules as well as other open water residents and migrants can be found utilizing the habitat within and around the area. The American alligator as well as other open water residents and migrants can be found utilizing the habitat within and around the area. Amphibians include tree frogs, toads, and salamanders.

3.2.5.3 Threatened and Endangered Species

3.2.5.3.1 Cataouatche Ponds Fresh Marsh Project

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee is expected to potentially occur within the project area. See section 3.2.3.3.1 for full species descriptions.

3.2.5.3.2 GIWW/Salvador Fresh Marsh Project

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee is expected to potentially occur within the project area. See section 3.2.3.3.1 for full species descriptions.

3.2.5.4 Fisheries, Aquatic Resources, and Water Quality

3.2.5.4.1 Cataouatche Ponds Fresh Marsh Project

The placement site Cataouatche Pond is open water with approximately 5% SAV coverage (coontail and Eurasian watermilfoil) and has sufficient fisheries access. The average mean salinity during the growing season is estimated at 0.45 ppt in Lake Cataouatche. The water quality of the hydrologic units encompassing this project footprint and Lake Cataouatche, from which borrow would be excavated for this project, fully supports its designated uses.

3.2.5.4.2 GIWW/Salvador Fresh Marsh Project

The placement site on Lake Salvador is primarily open water with approximately 5% SAV coverage (coontail and Eurasian watermilfoil) and has sufficient fisheries access. Most of the fisheries species listed in Section 3.1 could be found during part of the year or part of their life cycle in the placement and borrow area. The water quality of the hydrologic units encompassing this project footprint and Lake Salvador, from which borrow would be excavated for this project, fully supports its designated uses.

3.2.5.5 Essential Fish Habitat

3.2.5.5.1 Cataouatche Ponds Fresh Marsh Project

The project area is located within an area identified as EFH for coastal migratory pelagic, red drum, reef fish, and shrimp. See Table 7 for the specific EFH per life stage.

3.2.5.5.2 GIWW/Salvador Fresh Marsh Project

The project area is located within an area identified as EFH for coastal migratory pelagic, red drum, reef fish, and shrimp. See Table 7 for the specific EFH per life stage.

3.2.5.6 Cultural Resources

3.2.5.6.1 Cataouatche Ponds Fresh Marsh Project

No cultural resources surveys have been conducted around Cataouatche Pond and there are no recorded sites in the vicinity. Cataouatche Pond appears to be a sunken agricultural field which has very little potential for cultural resources.

Cultural resources surveys may be required for ancillary project features such as retention dikes, borrow pits, access corridors and staging areas. The decision to conduct cultural resources survey and the results would be coordinated with the SHPO and Federally-recognized Indian tribes as required by Section 106 of the NHPA. Cultural resources that are eligible for inclusion in the NRHP and those that are unevaluated for National Register eligibility would be avoided.

3.2.5.6.2 GIWW/Salvador Fresh Marsh Project

No cultural resources surveys have been conducted in the vicinity of this proposed project. Cultural resources do exist within as little as a quarter-mile of this proposed project, where they were exposed by the construction of the Gulf Inter-coastal Waterway. This indicates a high potential that cultural resources may exist or have existed before this land was submerged and damaged by erosion and other activities. This project area could require a cultural resources survey to document any cultural resources and to determine the NRHP status of identified cultural resources.

A cultural resources survey may be required for ancillary project features such as retention dikes, borrow pits, access corridors and staging areas. The decision to conduct a cultural resources survey and the results would be coordinated with the SHPO and Federally-recognized Indian tribes as required by Section 106 of the NRHP. Cultural resources that are eligible for inclusion in the NRHP and those that are unevaluated for National Register eligibility would be avoided.

3.2.5.7 Recreational Resources

3.2.5.7.1 Cataouatche Ponds Fresh Marsh Project

The 110-acre site is located within the JLNHPP Baratavia Preserve. Boating, fishing, and waterfowl hunting occur at and in the vicinity of the proposed fresh marsh restoration area. Borrow material would be dredged from Lake Cataouatche and piped via Whiskey Bayou and the Lake Cataouatche Outfall canal to the mitigation feature. Similar recreational resources are evident at the proposed borrow site and include boating, fishing and water fowl hunting.

3.2.5.7.2 GIWW/Salvador Fresh Marsh Project

The 160-acre site is located along the GIWW and fronts onto Lake Salvador. Boating, fishing, and waterfowl hunting occur within the open water. Borrow material would be dredged from Lake Salvador and piped to the mitigation feature. Boating, fishing and water fowl hunting are recreational uses of the lake.

3.2.5.8 Air Quality

3.2.5.8.1 Cataouatche Ponds Fresh Marsh Project

The Cataouatche Ponds Fresh Marsh site is located in Jefferson Parish which is currently in attainment of NAAQS.

3.2.5.8.2 GIWW/Salvador Fresh Marsh Project

The GIWW/Salvador Fresh Marsh site is located in Lafourche Parish which is currently in attainment of NAAQS.

3.2.5.9 Noise

3.2.5.9.1 Cataouatche Ponds Fresh Marsh Project

This project is remote located within the JLNHPP in Jefferson Parish, Louisiana. The major nearest navigable waterways to the Cataouatche Ponds project are the Lake Cataouatche Outfall Canal, Lake Cataouatche, and Yankee Pond. Sporadic boat traffic may produce noise levels that exceed 55 dBA within the project area.

3.2.5.9.2 GIWW/Salvador Fresh Marsh Project

This project is located in a remote portion of Lafourche Parish, Louisiana. The nearest major navigable waterways to GIWW/Salvador project is Lake Salvador and the GIWW. Sporadic boat traffic on these waterways may produce noise levels that exceed 55 dBA.

3.2.5.10 Hazardous, Toxic, and Radioactive Waste

3.2.5.10.1 Cataouatche Ponds Fresh Marsh Project

No RECs were identified and the probability of encountering HTRW during the course of this mitigation project is very low.

3.2.5.10. GIWW/Salvador Fresh Marsh Project

One plugged and abandoned oil/gas well, 1 oil/gas well with an expired permit, 1 crude-oil pipeline, and 1 natural-gas pipeline are within the boundaries of the mitigation site. Although the wells and pipelines exist within the mitigation site boundaries, the probability of encountering HTRW during the course of this mitigation project is low.

3.2.5.11 Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

3.2.5.11.1 Cataouatche Ponds Fresh Marsh Project

The fresh marsh restoration site is currently open water and located in the JLNHPP; there are no residents living in the vicinity, according to the 2010 U.S. Census.

The nearest major thoroughfare is Lapalco Blvd. The major nearest navigable waterways to the Cataouatche Project are Bayou Segnette and Lake Cataouatche. Little to no commercial fishing takes place in the Ponds.

The population of Jefferson Parish showed a downward trend between 2000 and 2015. The Parish's population decreased by an estimated 20,000 residents over 15 year span. Between 2000 and 2016 the unemployment rate in the Parish increased from 3.6% to 6%. Although unemployment has risen since 2000, the Parish's per capita income has increased from \$15,937 to \$24,837.

As is typical in the affected area, the Educational Services, Healthcare, and Social Assistance industry employs the largest percent of the population. Twenty-percent of the Jefferson Parish's population is employed in this industry. Other industries employing 10% - 20% of the population are: Construction, Retail Trade, Professional, and Arts, Entertainment, and Recreation.

About 4% of land in Jefferson County is utilized as farmland, according to the 2012 USDA Census of Agriculture. There is very little to no commercial fishing in the Ponds.

3.2.5.11.2 GIWW/Salvador Fresh Marsh Project

The GIWW/Salvador fresh marsh restoration site is open water and located along the shoreline of Lake Salvador. There are no residents living within or in the vicinity of the project area, according to the 2010 U.S. Census.

The nearest major thoroughfare is Barataria Blvd. The nearest, major navigable waterways to the project are Lake Salvador and the GIWW. For a description of commercial fishing in the Lake Salvador area, see section 3.2.3.11.2.

3.2.6 MITIGATION FOR BRACKISH MARSH IMPACTS

3.2.6.1 Wetlands and Other Surface Waters

3.2.6.1.1 Coleman Brackish Marsh Project

This area is primarily shallow (less than 3 ft deep) open water and eroded brackish marsh, and depending on time of year floating aquatic salvinia and submerged aquatic vegetation could be present. The proposed 230 acre project site is surrounded by open water, eroded brackish marsh, pipeline canals and to the north east is brackish marsh and scrub shrub along LA Hwy 23. Marsh species present include smooth cordgrass, saltmeadow cordgrass, saltgrass, yellow cowpea, and Olney's three square bulrush (*Schoenoplectus americanus*). Salinities in the area range from 5 to 18 ppt, with an average of 9 ppt. The 340 acre borrow site is within the regularly dredged and maintained Mississippi River upstream of the project site near mile markers 50 and 51. Existing water depths in the borrow area are -44 to -62 ft NAVD88.

3.2.6.1.2 Defelice Brackish Marsh Project

The wetlands and habitat at the 345 acre Defelice site is very similar to the Coleman site. This area is primarily shallow (less than 3 ft deep) open water and eroded brackish marsh, and depending on time of year floating aquatic salvinia and submerged aquatic vegetation could be present. The project site is open water and eroded brackish marsh and to the north east is less eroded brackish marsh and scrub shrub along Lake Hermitage road. Marsh species present include smooth cordgrass, saltmeadow cordgrass, saltgrass, yellow cowpea, and Olney's three square bulrush. Salinities in the area range from 5 to 18 ppt, with an average of 9 ppt. The 348 acre borrow site is within the regularly dredged and maintained Mississippi River upstream of the project

site near mile markers 50 and 51. Existing water depths in the borrow area are -44 to -62 ft NAVD88.

3.2.6.2 Wildlife

3.2.6.2.1 Coleman Brackish Marsh Project

A variety of non-game wading birds, shore birds, and sea birds are found in the project vicinity. Common wading birds and shore birds include herons, egrets, *Eudocimus albus* (white ibis), *Himantopus mexicanus* (black-necked stilt), *Chadrius vociferous* (killdeer), and *Tringa semipalmata* (willet). American white and brown pelicans are also found in the project vicinity. Common waterfowl include *Anas discors* (blue-winged teal), *Anas fulvigula* (mottled duck), *Aix sponsa* (wood duck), *Podilymbus sp.* (grebes), *Anas platyrhynchos* (mallards), *Aythya collaris* (ring-necked duck), and *Mergus serrator* (red-breasted merganser). Mammals around the brackish marsh include nutria, raccoons, white-tailed deer, opossums, eastern cottontail, and coyotes. American alligators, and an assortment of frogs, turtles, and venomous and nonvenomous snake species are also present. See Appendix B Table B-14 for a full species list.

3.2.6.2.2 Defelice Brackish Marsh Project

A variety of non-game wading birds, shore birds, and sea birds are found in the project vicinity. Common wading birds and shore birds include herons, egrets, white ibis, black-necked stilt, killdeer, and willet. American white and brown pelicans are also found in the project vicinity. Common waterfowl include blue-winged teal, mottled duck, wood duck, grebes, mallards, ring-necked duck, red-breasted merganser. Mammals around the brackish marsh include nutria, raccoons, white-tailed deer, opossums, eastern cottontail, and coyotes. American alligators, and an assortment of frogs, turtles, and venomous and nonvenomous snake species are also present. See Appendix B Table B-14 for a full species list.

3.2.6.3 Threatened and Endangered Species

3.2.6.3.1 Coleman Brackish Marsh Project

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee and pallid sturgeon are expected to potentially occur within the project area. See section 3.2.3.3.1 for additional species information. Current information indicates that the pallid sturgeon is widely distributed throughout the lower Mississippi River, however for areas proposed to be dredged south of River Mile 51, entrainment during dredging is reduced because of the large channel size, depth and complexity. Additionally, there have been no reported captures of pallid sturgeon south of River Mile 95. A “Conservation Plan for the Interior Least Tern, Pallid Sturgeon, and Fat Pocketbook Mussel in the Lower Mississippi River (ESA, Section 7(a)(1)), dated July 23, 2013 (<https://www.fws.gov/mississippiES/pdf/LMR%20Conservation%20Plan%20Final%20USACE%20CIP%2023%20July%202013.pdf>) and the biological opinion titled “Biological Opinion Channel Improvement Program Mississippi River and Tributaries Project Lower

Mississippi River (https://www.fws.gov/mississippi/_pdf/LMRBiologicalOpinion.pdf) document the existing research and population assessment for pallid sturgeon.

3.2.6.3.2 Defelice Brackish Marsh Project

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee and pallid sturgeon are expected to potentially occur within the project area. See section 3.2.6.3.1 for full species descriptions.

3.2.6.4 Fisheries, Aquatic Resources, and Water Quality

3.2.6.4.1 Coleman Brackish Marsh Project

In the vicinity of the project area, brackish marsh is found on the flood side of the NOV. Brackish marsh has an average salinity of approximately 8 ppt. This community is tidally influenced. Brackish marsh is more productive than open water and provides habitat to a wide variety of economically important fish and invertebrates, such as those described in Section 3.1, which could be found during part of the year or part of their life cycle in the placement and borrow areas. The placement site in the Coleman Brackish Marsh is primarily shallow open water with limited fisheries and tidal access. The water quality of the hydrologic units encompassing this project footprint fully supports its designated uses.

3.2.6.4.2 Defelice Brackish Marsh Project

In the vicinity of the project area, brackish marsh is found on the flood side of the NFL. Brackish marsh has an average salinity of approximately 8 ppt. This community is tidally influenced. The placement site in the Defelice Brackish Marsh is primarily shallow open water with limited fisheries and tidal access. Most of the fisheries species listed in Section 3.1 could be found during part of the year or part of their life cycle in the placement area. The water quality of the hydrologic units encompassing this project footprint fully supports its designated uses.

3.2.6.5 Essential Fish Habitat

3.2.6.5.1 Coleman Brackish Marsh Project

The project and borrow areas are located within an area identified as EFH for coastal migratory pelagic, red drum, reef fish, and shrimp. Additionally, several tributaries are located within the project area and designated as EFH by GMFMC. See table 7 for the specific EFH per life stage.

3.2.6.5.2 Defelice Brackish Marsh Project

The project and borrow areas are located within an area identified as EFH for coastal migratory pelagic, red drum, reef fish, and shrimp. Additionally, several tributaries are located within the project area and designated as EFH by GMFMC. See Table 7 for the specific EFH per life stage.

3.2.6.6 Cultural Resources

3.2.6.6.1 Coleman Brackish Marsh Project

This project has not been surveyed for cultural resources. The project appears to be a sunken agricultural field, and there is a low potential for the presence of cultural resources.

A cultural resources survey may be required for ancillary project features such as retention dikes, borrow pits, access corridors and staging areas. The proposed borrow source in the Mississippi River is not likely to require cultural resources surveys because the river has been regularly dredged to maintain navigation. The decision to conduct a cultural resources survey and the results would be coordinated with the SHPO and Federally-recognized Indian tribes as required by Section 106 of the NHPA. Cultural resources that are eligible for inclusion in the NRHP and those that are unevaluated for National Register eligibility would be avoided.

3.2.6.6.2 Defelice Brackish Marsh Project

This project has not been surveyed for cultural resources. The area appears to be sunken and dissected marsh, and is not obviously related to natural waterways, although remnants of these can be seen in the vicinity. No cultural resources have been identified or recorded in the vicinity of this project, and it is considered to have a low potential for the presence of cultural resources.

A cultural resources survey may be required for ancillary project features such as retention dikes, borrow pits, access corridors and staging areas. The proposed borrow source in the Mississippi River is not likely to require cultural resources surveys because the river has been regularly dredged to maintain navigation. The decision to conduct a cultural resources survey and the results would be coordinated with the SHPO and Federally-recognized Indian tribes as required by Section 106 of the NHPA. Cultural resources that are eligible for inclusion in the NRHP and those that are unevaluated for National Register eligibility would be avoided.

3.2.6.7 Recreational Resources

3.2.6.7.1 Coleman Brackish Marsh Project

The 230-acre Coleman Brackish Marsh site is currently privately-owned. Recreational opportunities include mainly boat fishing and hunting. Dredge material needed for the restoration will come from the Mississippi River where there is little recreation taking place. Material will be delivered via unnamed waterways already identified and there is little recreation taking place in those areas. The waterways may be used by fisherman. A staging area will also be set up between LA Hwy 23 and the river and there is no recreation taking place in the vicinity.

3.2.6.7.2 Defelice Brackish Marsh Project

The 345-acre Defelice Brackish Marsh site is currently privately-owned. Recreational opportunities include mainly boat fishing and hunting. Dredge material needed for the

restoration will come from the Mississippi River where there is little recreation taking place. Material will be delivered via unnamed waterways already identified and there is little recreation taking place in those areas. The waterways may be used by fisherman, especially in the area of Lake Judge Perez. A staging area will also be set up between LA Hwy 23 and the river and there is no recreation taking place in the vicinity.

3.2.6.8 Air Quality

3.2.6.8.1 Coleman Brackish Marsh Project

The Coleman brackish marsh site is located in Plaquemines Parish which is currently in attainment of NAAQS.

3.2.6.8.2 Defelice Brackish Marsh Project

The Defelice brackish marsh site is located in Plaquemines Parish which is currently in attainment of NAAQS.

3.2.6.9 Noise

3.2.6.9.1 Coleman Brackish Marsh Project

There are commercial and residential housing units located along LA Hwy 23, which is located east of the project area. Noise is produced by consistent and sporadically heavy traffic on this road. The nearest major navigable waterway to the Coleman project is the Mississippi River and some unnamed pipeline canals. Sporadic boat traffic along the river or boats on the canals may produce noise levels that exceed 55 dBA.

3.2.6.9.2 Defelice Brackish Marsh Project

There are commercial and residential housing units located along Lake Hermitage Road and LA Hwy 23, which is located east of the project area. Noise is produced by consistent and sporadically heavy traffic on these roads. The nearest major navigable waterway to the Defelice project is the Mississippi River and some unnamed pipeline canals. Sporadic boat traffic along the river or boats on the canals may produce noise levels that exceed 55 dBA.

3.2.6.10 Hazardous, Toxic, and Radioactive Waste

3.2.6.10.1 Coleman Brackish Marsh Project

Three dry and plugged wells exist within the mitigation site boundaries; 1 dry and plugged well exists adjacent to the mitigation site. The probability of encountering HTRW during the course of this mitigation project is very low.

3.2.6.10.2 Defelice Brackish Marsh Project

No RECs were identified and the probability of encountering HTRW during the course of this mitigation project is very low.

3.2.6.11 Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

3.2.6.11.1 Coleman Brackish Marsh Project

There are no residents, and therefore no EJ communities, living within nor in the vicinity of the brackish marsh restoration site, according to the 2010 U.S. Census. Additionally, there are no commercial/industrial properties, public facilities, or transportation infrastructure within the project boundaries. The nearest major thoroughfare is LA Hwy 23. The nearest major navigable waterways to the project are the Mississippi River and Lake Judge Perez. There are many bayous and canals that intersect the vicinity of the project area. There is no commercial fishing taking place at the Coleman project site.

3.2.6.11.2 Defelice Brackish Marsh Project

No RECs were identified within the project area and the probability of encountering HTRW during the course of this mitigation project is very low. The dredge material pipeline would cross one crude-oil pipeline that would be considered a REC. Precautions must be taken to prevent damage to or breakage of the pipeline.

4.0 ENVIRONMENTAL CONSEQUENCES OF THE FINAL ARRAY

This section describes the direct, indirect and cumulative effects of mitigation projects based on their description at the time of the AEP. Appendix A Figure A-7 shows those significant resources found within the Basin. The period of impact analysis begins when project construction is completed and generally extends 50 years for USACE projects.

Direct impacts are those that are caused by the action taken and occur at the same time and place (40 CFR §1508.8(a)). Indirect impacts are those that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR §1508.8(b)). Cumulative impacts are the effects on the environment that results from the incremental impact of the proposed project when added to other past, present, and reasonably foreseeable future action, regardless of what agency or person undertakes such actions.

4.1 NEW ROW REQUIREMENTS

Implementation of the proposed new ROW for NOV 09 and NOV-NF-W-05a.1 does not incur any additional impacts, it actually reduces the impacts for these reaches as described in the NOV EIS, NFL EIS, and SEA #537 (“previous NEPA documents”).

4.1.1 Wetlands and Other Surface Waters

NOV 09 and NOV-NF-W-05a.1

Direct, Indirect, and Cumulative Impacts

As a result of the new ROW design, impacts to BLH-Wet habitat were reduced by 17.1 acres (-10.6 AAHUs) and wet pasture were reduced by 8.4 acres (-2.7 AAHUs) from what was described in previous NEPA documents for these reaches. As such, the total impact for constructing NOV 09 and NOV-NF-W-05a.1 would now impact 23.5 acres (14.3 AAHUs) of BLH-Wet and 34.9 acres (11.4 AAHUs) of wet pasture. Please see direct, indirect, and cumulative impacts discussion in chapter 5, No Action Alternative.

4.1.2 Wildlife

NOV 09 and NOV-NF-W-05a.1

Direct, Indirect, and Cumulative Impacts

As a result of new ROW design, impacts to BLH-Wet habitat were reduced by 17.1 acres and impacts to wet pasture were reduced by 8.4 acres which correlates to a reduction in the impacts described in previous NEPA documents to wildlife species utilizing the area. Please see direct, indirect, and cumulative impacts discussion in chapter 5, No Action Alternative.

4.1.3 Threatened and Endangered Species

NOV 09 and NOV-NF-W-05a.1

Direct, Indirect and Cumulative Impacts

None of the animals under USFWS and/or NMFS jurisdiction are expected to be found in the project area for of NOV 09 or NOV-NF-W-05a.1, therefore no impacts are anticipated.

4.1.4 Fisheries, Aquatic Resources, and Water Quality

1.

NOV 09 and NOV-NF-W-05a.1

Direct, Indirect and Cumulative Impacts

As a result of the new ROW design, impacts to BLH-Wet habitat were reduced by 17.1 acres and wet pasture were reduced by 8.4 acres. This reduces the impacts to water quality associated with construction of the NFL NOV levees in these reaches that were described in previous NEPA documents. Please see direct, indirect, and cumulative impacts discussion in chapter 5, No Action Alternative.

4.1.5 Essential Fish Habitat

NOV 09 and NOV-NF-W-05a.1

Direct Impacts, Indirect and Cumulative Impacts

There would be no direct, indirect or cumulative impacts to EFH since the area presently does not currently contain EFH.

4.1.6 Cultural Resources

NOV 09 and NOV-NF-W-05a.1

Direct and Indirect Impacts

New ROW for NOV 09 contains possible overlap with two potential historic properties that were identified during previous cultural resources surveys. Additional investigations are required to determine if the historic properties extend into the new ROW. If portions of the properties extend into the proposed new ROW and are determined to be significant and eligible for listing to the NRHP, further consultation will be conducted with the SHPO and Federally-recognized Indian tribes.

There are no recorded or suspected intact cultural resources within the additional ROW of NOV-NF-W-05a.1. New ROW for NOV-NF-W-05a.1 was coordinated for no historic properties affected in a letter dated January 15, 2016.

The erosion and land loss caused by natural forces and human activity would continue to impact cultural resources in the project area. The loss of land within the project area threatens the existence and integrity of existing cultural resources. The implementation of measures to prevent flooding into areas of cultural resources would work to reduce continued land loss and erosion in the Basin, and prevent exposure and impact to significant cultural resources, both existing and as yet undiscovered.

Cumulative Impacts

Implementation of this project would work synergistically with other storm damage and flood risk reduction, and ecosystem restoration projects in coastal Louisiana to reduce impacts to significant cultural resources. Cumulative impacts to cultural resources would be the additive combination of impacts by this and other Federal, state, local, and private restoration efforts, and would be further evaluated on a project-by-project basis.

4.1.7 Recreational Resources

NOV 09 and NOV-NF-W-05a.1

Direct, Indirect and Cumulative Impacts

There are no impacts to recreational resources with utilization of the new ROW for NOV 09 and NOV-NF-05a.1, because it decreases the impacts discussed in previous NEPA

documents. Please see direct, indirect, and cumulative impacts discussion in chapter 5, No Action Alternative.

4.1.8 Air Quality

NOV 09 and NOV-NF-W-05a.1

Direct, Indirect and Cumulative Impacts

The equipment used for construction of NOV 09, and NOV-NF-W-05a.1 will consist primarily of backhoes, excavators, bulldozers, and dump trucks. This is the same equipment that will be used to construct the No Action Alternative, which was already described in previous NEPA documents, and which does not reflect the reduction impacts caused by these realignments. No increase in emissions would occur with utilization of the new ROW.

4.1.9 Noise

NOV 09 and NOV-NF-W-05a.1

Direct, Indirect and Cumulative Impacts

Backhoes, excavator, bulldozers and dump trucks would be the primary pieces of equipment used for construction of NOV 09, and NOV-NF-W-05a.1. This is the same equipment that will be used to construct the No Action Alternative, as described in previous NEPA documents, and no increase in noise would occur with utilization of the new ROW given its reduction of impacts.

4.1.10 Hazardous, Toxic, and Radioactive Waste

NOV 09 and NOV-NF-W-05a.1

Direct, Indirect, and Cumulative Impacts

The new ROW for NOV 09 and NOV-NF-W-05a.1 were surveyed via aerial photographs and database searches in the Zone Improvement Plan (ZIP) areas where they would be located. Although there were numerous small incidents recorded in the database searches, none of the recorded incidents, either individually or cumulatively, would have any adverse effects on the new levee alignments and additional ROW. No RECs were identified in the new alignments and additional ROWs. As such, there would be no direct, indirect, and cumulative impacts to HTRW.

4.1.11 Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

NOV 09 and NOV-NF-W-05a.1

Direct and Indirect Impacts

Construction of the new ROW alignments would have minimal to no direct impacts on population and housing surrounding the project site. During the construction phase, residents residing near the ROW realignments may experience a temporary, minor, indirect impacts, such as noise and dust. The ROW alignments will have little to no impact on business and industry in the affected area, and would have little to no direct impact on the land use in the area.

Substantial indirect benefits could accrue to the population from the construction of the new ROW alignments which will provide flood risk reduction to homes and businesses.

Title VI of the Civil Rights Act (42 United States Code [USC] 2000) and EO 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* mandate that Federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. Socioeconomic and demographic data for the project vicinity were reviewed to determine whether the proposed action would have a disproportionately high and adverse impact on minority or low-income people.

Table 11. Population, Minority Population, and Low Income Population Data for Plaquemines Parish and the State of Louisiana

Location	2000			2010	
	Total Population	Percent Minority	Percent Low Income	Total Population	Percent Minority
Plaquemines Parish	26,757	30.2	18.0	25,106	31.4
Louisiana	4,468,976	36.1	19.6	4,507,335	36.5

U.S. Census Bureau 2000a, 2000b and ESRI 2010.

Table 12. Population, Minority Population and Low Income Population Data for Census Block Groups in the Project Area

Segment	Census Tract and Block Group	2000			2010	
		Total Population	Percent Minority	Percent Low Income*	Total Population	Percent Minority
NOV 09/ NOV-NF- W-05a.1	504.1	1,145	73.0	31.1	1,056	78.2

*Individuals below poverty level and Census Block Group level data are based on a Census 2000 sample. Data are estimates of the actual figures.
No data – data are not available at the census block group level.

NOV 09 and NOV-NF-W-05a.1 are located within Block Group 504.1 which stretches from LA Hwy 23 to the Levee Road. According to Census 2000 data, this area was a minority, low-income community in 2000, with 73 percent of the population a minority and approximately 31 percent of the population low-income. These percentages are substantially higher than state or parish figures (see Table 13). ESRI estimates for 2010 indicate a slightly higher percentage of minorities in the block group.

Implementation of the proposed action would enhance Federal hurricane risk reduction in an area with existing lower level risk reduction. Thus, implementation would benefit all residents of these areas alike. Direct adverse impacts from construction activities include temporary impacts to air quality, noise, and traffic. Indirect impacts from this action may include residential and commercial growth within the protected area due to increased flood protection provided by the levee. The direct and indirect impacts of noise and other associated construction activities are not anticipated to exert disproportionately high indirect, adverse human health, and environmental impacts on minority and/or low-income communities.

LA Hwy 23 will be used to transport materials for construction of both ROW alignments. Fosters Road will most likely be used to access the River levee which is on the edge of the Diamond subdivision and there is no housing along this stretch. West Ravenna Road will most likely be used to access NOV-NF-W-05a.1 which passes through agricultural lands, and no housing is located in the vicinity. Additionally, the number of trips expected for transport of borrow material for the levee construction is expected to have minimal direct and indirect impacts on traffic in the area. Navigation will not be experience any direct or indirect impacts.

Cumulative Impacts

The cumulative impacts of the new levee ROW projects, when added to other past, present, and reasonably foreseeable levee, ecosystem restoration, mitigation or other type projects in the Basin would minimally and temporarily affect socio-economic resources. Impacts from levee projects can temporarily disrupt transportation, navigation and commercial fishing in project areas during construction activities.

Due to the relatively small number and linear feet of new ROW alignments, the remote and generally unpopulated areas where the projects would be constructed, the temporary nature of the project construction activities and the duration of levee projects, the new ROW alignments would add very little and only temporary impacts to any other impacts resulting from past, present and reasonably foreseeable projects in the region and would not contribute significantly to socio-economic resources in the Basin.

4.2 MITIGATION PROJECTS BY HABITAT TYPES

Mitigation Bank and ILF Project TSPs

Direct, Indirect, and Cumulative Impacts

The TSPs mitigating the BLH-Dry, BLH-Wet, swamp, and fresh marsh features of the TSMP include the purchase sufficient BLH-Wet, swamp, and fresh marsh credits from a bank and the ILF program within the Basin to mitigate a total of 244.4 AAHUs. See Table 1 for a breakdown of AAHUs impacted by the NFL NOV construction. The particular bank to be utilized is unknown at this time. Since permitted banks and the ILF program exist as reasonably foreseeable projects in the FWOP conditions, no new direct, indirect or cumulative impacts to wetlands and other surface waters, wildlife, threatened and endangered species, fisheries, aquatic resources, water quality, EFH, cultural resources, recreational resources, air quality, noise, HTRW, socioeconomics/land use, environmental justice, transportation, navigation, and commercial fisheries would be incurred from the purchase of these credits for the NFL NOV mitigation.

4.2.1 MITIGATION FOR BLH-DRY IMPACTS

4.2.1.1 Wetlands and Other Surface Waters

4.2.1.1.2 Plaquemines Parish Government BLH-Dry Project

Direct, Indirect, and Cumulative Impacts

There would be no direct, indirect or cumulative impacts to Wetlands and Other Surface Waters resources due to the construction of this project since the area presently does not currently contain these resources. The enhancement of BLH-Dry forests has the potential to provide indirect benefits to downstream wetlands in the form of nutrients and detritus which would contribute to the overall health and persistence of these wetlands. See Section 3.2.2.1.1 for description of the habitat at this project site.

4.2.1.1.3 Bayou Segnette BLH Project

Direct and Indirect Impacts

There would be a beneficial impact to wetlands and other surface waters as approximately 200 acres of existing invasive species, largely Chinese tallow tree, would be replaced with high quality BLH-Wet species. Indirectly, these restored wetlands

would produce nutrients and detritus which are important for the health and persistence of other wetlands in the Barataria Bay estuary, thereby contributing to their overall productivity. See Section 3.2.2.1.1 for description of wetlands at this project site.

Cumulative Impacts

Implementation of this project would prevent an overall loss in the Basin of BLH habitat. This project, when added to other past, present, and reasonably foreseeable ecosystem restoration and mitigation projects in the Basin would help augment the health of downstream wetlands through the production of nutrients and detritus necessary wetland health and persistence.

4.2.1.2 Wildlife

4.2.1.2.1 PPG BLH-Dry Project

Direct and Indirect Impacts

Wildlife species present at the time of construction would be temporarily displaced to adjacent habitats due to noise, dust, movement and vibration of construction equipment. It is anticipated they would return once construction is complete. Beneficial direct impacts would include the restoration of approximately 105 acres of BLH-dry habitat which would offer better shelter, foraging, and mating grounds for wildlife species in the area. Nesting opportunities would also increase potentially. Wildlife species outside the project area may indirectly benefit from gaining additional territory for foraging and mating opportunities. See Section 3.2.2.2.1 for a specific description of the wildlife in the area.

Cumulative Impacts

This project would prevent an overall loss in the Basin of BLH habitat necessary for many wildlife species. This project, when added to other past, present, and reasonably foreseeable future ecosystem restoration and mitigation projects in the Basin, would help reduce the overall decline of wildlife species and their habitats within the Basin and would be beneficial to preserving species biodiversity.

4.2.1.2.2 Bayou Segnette BLH Project

Direct and Indirect Impacts

Wildlife species present at the time of construction would be temporarily displaced to adjacent habitat due to noise, dust, movement and vibration of construction equipment. It is anticipated they would return once construction is complete. Beneficial direct impacts would be the enhancement of approximately 200 acres of BLH habitat which would offer better shelter, nesting, mating, and foraging grounds for wildlife in the area. Other wildlife outside the project may indirectly benefit from having this area as an additional territory for foraging and mating opportunities. This habitat could also serve as a temporary stopover habitat for migratory birds. See Section 3.2.2.2.2 for a description of the specific wildlife in the area.

Cumulative Impacts

This project would prevent an overall loss in the Basin of BLH habitat necessary for many wildlife species. This project, when added to other past, present, and reasonably foreseeable future ecosystem restoration and mitigation projects in the Basin, would help reduce the loss of wetlands and overall decline of wildlife species within the Basin and would be beneficial to preserving species biodiversity.

4.2.1.3 Threatened and Endangered Species

4.2.1.3.1 PPG BLH-Dry Project

Direct Impacts, Indirect and Cumulative Impacts

None of the animals under USFWS and/or NMFS jurisdiction are expected to be found in the project area for PPG therefore no impacts are anticipated.

4.2.1.3.2 Bayou Segnette BLH-Dry Project

Direct, Indirect and Cumulative Impacts

None of the animals under USFWS and/or NMFS jurisdiction are expected to be found in the Bayou Segnette area, therefore no impacts are anticipated.

4.2.1.4 Fisheries, Aquatic Resources, and Water Quality

4.2.1.4.1 PPG BLH-Dry Project

Direct Impacts, Indirect, and Cumulative Impacts

There would be no direct, indirect or cumulative impacts to fisheries or aquatic resources due to the construction of this project since the area presently does not currently contain fisheries or aquatic resources. There would be minor temporary direct and indirect impacts to water quality during the clearing and grubbing; grading and tilling necessary to level the surface and prepare the area for planting and to achieve the required elevation. These impacts would be minimized via Best Management Practices (“BMPs”) that would reduce any potential runoff from the site, hence there should be no negative cumulative impacts on water quality. By taking this area out of agricultural production there could be a potential for a reduction in non-point source pollution which would have a positive long term indirect and cumulative impact on water quality.

4.2.1.4.2 Bayou Segnette BLH Project

Direct Impacts, Indirect, and Cumulative Impacts

There would be no direct, indirect or cumulative impacts to fisheries or aquatic resources due to the construction of this project since the area presently does not currently contain fisheries or aquatic resources. There would be minor temporary direct and indirect impacts to water quality during the clearing of the invasive species and filling, realignment and/or construction of new drainage ditches. Additional water quality impacts would occur due to potential runoff of herbicides used to eradicate invasive

species. These impacts would be minimized via BMPs that would reduce any potential runoff from the site hence there should be no cumulative impacts on water quality.

4.2.1.5 Essential Fish Habitat

4.2.1.5.1 PPG BLH-Dry Project

Direct, Indirect, and Cumulative Impacts

There would be no direct, indirect or cumulative impacts to EFH since the area presently does not currently contain EFH.

4.2.1.5.2 Bayou Segnette BLH Project

Direct, Indirect, and Cumulative Impacts

There would be no direct, indirect or cumulative impacts to EFH since the area presently does not currently contain EFH.

4.2.1.6 Cultural Resources

4.2.1.6.1 PPG BLH-Dry Project

Direct and Indirect Impacts

This project has not been previously surveyed for cultural resources. Historic maps indicate that numerous natural waterways have existed in this vicinity, and that past clearing and plowing has occurred on this land. Although the potential does exist, modern activities give this area a low probability to contain intact cultural resources. Identified cultural resources that are determined to be eligible for listing or are listed on the NRHP would be avoided. If avoidance is not possible, strategies would be developed in consultation with the SHPO and Federally-recognized Indian tribes to mitigate for adverse effects to significant cultural resources.

Cumulative Impacts

Without the project, erosion and land loss would continue and would impact any unknown cultural resources in the Basin. The loss of land within the Basin would continue and spread to adjacent areas, threatening the existence and integrity of existing cultural resources. The implementation of measures to restore ecosystems and habitat could work to reduce continued land loss and erosion, and prevent exposure and impact to significant cultural resources.

4.2.1.6.2 Bayou Segnette BLH Project

Direct and Indirect Impacts

A review of previous research in the project area identified cultural resources that could be directly impacted by the proposed project. Several surveys have been conducted in the proposed project area, but there is a potential that additional cultural resources could exist within portions of the project area not previously surveyed. See Section

3.2.2.6.2. Activities associated with this project have the potential to directly impact previously undocumented cultural resources. Identified cultural resources that are determined to be eligible for listing or are listed on the NRHP would be avoided. If avoidance is not possible, strategies would be developed in consultation with the SHPO and Federally-recognized Indian tribes to mitigate for adverse effects to significant cultural resources.

Cumulative Impacts

Cumulative impacts will be similar to those described in Section 4.2.1.6.1.

4.2.1.7 Recreational Resources

4.2.1.7.1 PPG BLH-Dry Project

Direct and Indirect Impacts

Construction of the proposed mitigation feature, BLH-Dry, would not directly impact recreational resources since the site is fenced and locked and currently unavailable for use. (See Section 3.2.2.7.1.) Enhancement as BLH-Dry could create a more recreational friendly environment if the site was available for public use in the future.

Temporary, indirect impacts will occur and include trucks delivering equipment and plant materials through the residential neighborhood surrounding the site, which may minimally affect recreational activities taking place in the subdivision. Increased traffic and truck noise may result from construction activities but will be temporary and would not permanently affect recreational activities.

Cumulative Impacts

The cumulative impacts of the PPG project, when added to other past, present, and reasonably foreseeable ecosystem restoration, mitigation or other type projects in the Basin would only minimally and temporarily impact recreational resources. In the case of mitigation projects, such as PPG site, the small increment of benefit could be considered cumulatively beneficial when added to the impacts of recreational opportunities provided at refuges, other existing recreational areas in the Basin and those provided by other on-going projects. However, since this is mitigation, which replaces impacted habitats, fish and wildlife resources dependent on these habitats would merely shift from the area of impact to the area of mitigation, preventing the loss of recreational resources in the Basin.

4.2.1.7.2 Bayou Segnette BLH Project

Direct and Indirect Impacts

There are no direct impacts to recreational resources from the construction of the Bayou Segnette BLH-Dry project. The restored site could improve public opportunities for hunting, wildlife viewing and bird watching with the planting of BLH and if there is a change of land status from private to public. (See Section 3.2.2.7.2.)

During construction of the Bayou Segnette BLH-Dry project, recreational resources such as fishing and hunting that occur are in the vicinity of the site or recreational activities of visitors to the nearby Bayou Segnette State park may be impacted by noise. Following completion of the proposed mitigation, recreation opportunities such as hiking, wildlife viewing, and bird watching in the surrounding areas of the proposed site will return to pre-construction conditions.

Cumulative Impacts

Cumulative Impacts would be similar to those stated in section 4.2.1.7.1.

4.2.1.8 Air Quality

4.2.1.8.1 PPG BLH-Dry Project

Direct and Indirect Impacts

During construction of this project, a slight increase in air emissions could be expected due exhaust emissions from additional vehicles transporting personnel and tree saplings to the site. Emission of fugitive dust near the construction area is not anticipated to be a problem as the majority of the work is anticipated to be completed by hand. Air quality would return to pre-construction conditions shortly after the completion of construction activities, and because the project area is in a parish in attainment of NAAQS, a conformity analysis is not required.

There would be no adverse indirect impacts to air quality in the parish with construction of this option.

Cumulative Impacts

Cumulative impacts to air quality in the project area due to construction of this project in addition to the other construction activities within the Basin that may be occurring concurrently would be temporary and would be very minimal. After the construction period, there would be no incremental contribution to cumulative air quality impacts due to the proposed action.

4.2.1.8.2 Bayou Segnette BLH Project

Direct and Indirect Impacts

During construction of this project, an increase in air emissions could be expected. These emissions could include 1) exhaust emissions from operations of various types of non-road construction equipment such as a hydro-ax, skidder, ATV etc. and 2) fugitive dust due to earth disturbance. Emission of fugitive dust near the construction area is not anticipated to be a problem as the site is fairly remote, and the majority of the work is anticipated to be completed by hand.

Any site-specific construction effects would be temporary, and dust emissions, if any, would be controlled using standard BMPs. Air quality would return to pre-construction

conditions shortly after the completion of construction activities. Because the project area is in a parish in attainment of NAAQS, a conformity analysis is not required.

There would be no long-term adverse indirect impacts to air quality in the parish with construction of the proposed action.

Cumulative Impacts

Cumulative impacts to air quality in the project area due to construction of this project in addition to the other construction activities within the Basin that may be occurring concurrently would be temporary and would be very minimal. After the construction period, there would be no incremental contribution to cumulative air quality impacts due to the proposed action.

4.2.1.9 Noise

4.2.1.9.1 PPG BLH-Dry Project

Direct and Indirect Impacts

Backhoes, hydro-axes, gyro-tracks, mulchers, and dump trucks would be the primary pieces of equipment used for construction of this project. These pieces of equipment exceed noise levels above 55 dBA at 50 feet. Noise levels may result in wildlife avoiding the project area during construction; however, movement of equipment during construction would result in the same avoidance behaviors from wildlife species. In addition, noise levels quickly drop off once a buffer is established between the noise source and the receptor (e.g. vegetation). There would be temporary impacts to human populations in the surrounding neighborhoods, but they would cease with construction completion and the added trees could buffer noise of the nearby NAS.

Cumulative Impacts

Construction of this project is not anticipated to add significantly to the cumulative effect of noise in the Basin as the construction activities would be temporary and ending in 2022, by then the area would be buffered by vegetation and the new BLH growth. Cumulatively noise impacts would consist of aircraft noise from the nearby Belle Chasse NAS, traffic noise from LA Hwy 23, and other redevelopment projects in the immediate vicinity.

4.2.1.9.2 Bayou Segnette BLH Project

Direct and Indirect Impacts

Backhoes, hydro-axes, gyro-tracks, mulchers, and dump trucks would be the primary pieces of equipment used for construction of this project. These pieces of equipment exceed noise levels above 55 dBA at 50 feet. Noise levels may result in wildlife avoiding the project area during construction; however, movement of equipment during construction would result in the same avoidance behaviors from wildlife species. In addition, noise levels quickly drop off once a buffer is established between the noise source and the receptor (e.g. vegetation). Only one house is near the site and it is

anticipated that noise levels would quickly drop off due to the vegetative buffer surrounding the project area.

Cumulative Impacts

Construction of this project is not anticipated to add significantly to the cumulative effect of noise in the Basin as the construction activities would be temporary and ending in 2022, by then the area would be buffered by vegetation and the new BLH growth. Cumulatively noise impacts would be produced by other redevelopment, diversion and coastal restoration, and transportation projects, but they would not all be under construction at the same time.

4.2.1.10 Hazardous, Toxic, and Radioactive Waste

4.2.1.10.1 PPG BLH-Dry Project

Direct, Indirect and Cumulative Impacts

No RECs were located within the potential mitigation area. The area is currently vacant land that is lightly treed. Mitigation would involve the planting of native BLH species. No direct, indirect, or cumulative impacts are expected at this project site.

4.2.1.10.2 Bayou Segnette BLH Project

Direct, Indirect and Cumulative Impacts

One REC and one potential REC are located in the Bayou Segnette project area. Mitigation will mainly involve eradicating Chinese tallow trees and replanting of native BLH species. As long as the construction traffic involved in the mitigation process follows proper precautions, there is a low probability of encountering HTRW or petroleum products in the proposed mitigation area. Additional oil and gas explorations and additional land development could occur that increase potential for HTRW in this area, but there are no known exploration or development projects scheduled for this area.

4.2.1.11 Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

4.2.1.11.1 PPG BLH-Dry Project

Direct and Indirect Impacts

This project would have minimal to no direct or indirect impacts on the population surrounding the project site. During the construction phase, residents residing nearby may experience an increase in noise during the construction phase but these effects will be minor and temporary in nature. The planting of additional trees may have positive impacts on the private property adjacent to the project site. Increased trees and reduced invasive species could improve the area's aesthetics and add value to adjacent properties.

This project would have little to no direct or indirect impacts on business and industry in the area. The project site is owned by Plaquemines Parish, so no business interests will be displaced. The potential opportunity for business development on the land used for the project would however be lost.

Use of the land would not change, as the project site is owned by PPG and is not currently in use. Any future opportunity for the land to be converted for agricultural use would be lost.

There are no direct impacts to EJ communities from construction of the PPG BLH-Dry project. The mitigation site is currently vacant land with trees interspersed and surrounded, across the street on three sides, by residential housing. According to 2010 U.S. Census data, 13 percent of the population surrounding the mitigation site is minority while 5 percent have incomes below the poverty level.

E.O. 12898 on EJ states that when minority populations exceed 50 percent or when 20 percent or more residents in the area are below the poverty threshold, EJ issues need to be taken into consideration. In this case, both are below the thresholds and therefore, there are no EJ concerns.

Currently, access to the site is not allowed as all entry points are locked.

Transporting the planting materials could cause temporary and minimal, minor adverse impacts to the roads and increased traffic and noise. It is likely that Barrier Road to Olson Dr. would be the access route to the PPG site since it is a paved two lane road suitable for heavier traffic. Dust would be minimal since there is minimum hauling of plant materials and no major earth work on site. The plants are delivered in refrigerated trucks with the roots wrapped in burlap type bags with insert to ensure they stay hydrated. Due to small size of plants, the truck can deliver many seedlings at one time. Additionally, the truck is limited to number of trees they can plant in a few days or a week. Approximately ten truck trips will be needed to deliver the materials necessary for the construction of the PPG project.

The direct and indirect impacts of noise and other associated construction activities are not anticipated to exert disproportionately high indirect, adverse human health, and environmental impacts on minority and/or low-income communities.

Cumulative Impacts

Combined with other reasonably foreseeable restoration projects occurring in the larger geographical area, the restoration project's aim of improving the amount and quality of coastal habitat will reduce the risk of storm surge flooding. Housing may remain stable and residents would be able to continue using their land in the manner in which they are accustomed. Additionally, increased habitat will most likely attract more wildlife diversity and recreational opportunities. Overall, the quality of life for residents in the region would be expected to remain stable or improve.

4.2.1.11.2 Bayou Segnette BLH Project

Direct and Indirect Impacts

The proposed project site lies about five miles from the nearest community, Avondale. (See Section 3.2.2.11.2.) During the construction phase, noise and increased traffic may impact population of nearby communities. During the life of the project, impacts of the project on the population would be nonexistent or minimal.

The proposed project would have no impact on housing nor business and industry in the affected area. The mitigation site is currently privately owned. Implementing the project would however require the owner to forgo future opportunities to utilize the land for profit.

According to 2010 U.S. Census data, there are no residents located within or around the boundaries of the Bayou Segnette BLH-Dry project site and therefore are no direct, indirect or cumulative impacts to the EJ resource.

Impacts from restoration projects can temporarily disrupt transportation and navigation in project areas during construction. Land use impacts, such as impacts to commercial/industrial properties and public facilities impacts are not anticipated.

There would be no direct and only minimal indirect impacts to transportation in nearby residential area on Highway 90 during construction due to heavy vehicle traffic in the vicinity of the restoration site. It is expected that once the necessary construction equipment is on site that no additional transportation impacts would occur until the project construction is complete.

There would be no direct or indirect impacts to navigation or commercial fishing on any of the nearby waterways from implementation of the project.

Cumulative Impacts

Cumulative Impacts would be similar to those stated in section 4.2.1.11.1.

4.2.2 MITIGATION FOR BLH-WET IMPACTS

4.2.2.1 Wetlands and Other Surface Waters

4.2.2.1.1 Jesuit Bend BLH-Wet Project

Direct and Indirect Impacts

See Section 3.2.3.1.1 for description of wetlands at this project site. There would be a beneficial impact to wetlands as approximately 225 acres of open water habitat would be converted to BLH-Wet habitat. Indirectly, these restored wetlands would produce nutrients and detritus which are important for the health and persistence of other wetlands in the Barataria Bay estuary thereby contributing to their overall productivity. Although there would be a loss of 225 acres of open water in the basin, large amounts

of wetlands are converting to open water in the basin every year and open water is prevalent in the basin. See the Fisheries, Aquatic Resources, and Water Quality sections for analysis of borrow pit impacts.

Cumulative Impacts

Implementation of this project would prevent an overall loss of BLH-Wet habitat in the Basin. This project, when added to other past, present, and reasonably foreseeable ecosystem restoration and mitigation projects in the Basin would help retard the loss of wetlands. There would be an overall loss of open water habitat in the Basin, but no permanent adverse impacts are anticipated because this habitat is prevalent throughout the Basin.

4.2.2.1.2 The Tank BLH-Wet Project

Direct and Indirect Impacts

See Section 3.2.3.1.2 for description of wetlands at this project site. There would be a beneficial impact to wetlands as approximately 310 acres of open water habitat would be converted to BLH-Wet habitat. Indirectly, these restored wetlands would produce nutrients and detritus which are important health and persistence of other wetlands in the Barataria Bay estuary thereby contributing to their overall productivity. Although there would be a loss of 310 acres of open water in the basin, large amounts of wetlands are converting to open water in the basin every year and open water is prevalent in the basin. See the Fisheries, Aquatic Resources, and Water Quality sections for analysis of borrow pit impacts.

Cumulative Impacts

Implementation of this project would prevent an overall loss of BLH-Wet habitat in the Basin. This project, when added to other past, present, and reasonably foreseeable ecosystem restoration and mitigation projects in the Basin would help retard the loss of wetlands. There would be an overall loss of open water habitat in the Basin, but no permanent adverse impacts are anticipated because this habitat is prevalent throughout the Basin.

4.2.2.2 Wildlife

4.2.2.2.1 Jesuit Bend BLH-Wet Project

Direct and Indirect Impacts

See Section 3.2.3.2.1 for description of wildlife at this project site. Wildlife species present at the time of construction would be temporarily displaced. The common inhabitants of this area are avian species which are fully equipped to relocate to nearby open water. A survey would be performed prior to construction to identify the presence of colonial nesting water birds or nesting bald eagles. If colonial nesting water birds are present, best management practices (BMPs) developed in coordination with USFWS would be implemented to avoid potential direct impacts. See Section 5.4.1 and Section 8.2. If nesting bald eagles are present, the National Bald Eagle Management Guidelines

would be followed. Other wildlife outside the project may indirectly benefit from having this area as an additional territory for nesting (e.g. rookeries), foraging, and mating opportunities. This habitat could also serve as a temporary stopover habitat for migratory birds.

Approximately 225 acres of shallow open water would be converted to BLH-wet habitat. This conversion would eliminate wintering habitat for brown pelican, and increase habitat for white-tailed deer, skunks, rabbits, squirrels, and armadillos; various raptors such as barred owls, red-shouldered hawks, northern harriers (marsh hawks), American kestrel, and red-tailed hawks; passerine birds such as sparrows, vireos, warblers, Northern mockingbirds, grackles, red-winged blackbirds, wrens, blue jays, northern cardinals, and crows. The BLH habitat would offer new shelter, nesting, mating, and foraging grounds for these species. Other wildlife outside the project may indirectly benefit from having this area as an additional territory for foraging and mating opportunities. This habitat could also serve as a temporary stopover habitat for migratory birds.

Cumulative Impacts

This project would prevent an overall loss in the Basin of BLH habitat necessary for many wildlife species. This project, when added to other past, present, and reasonably foreseeable future ecosystem restoration and mitigation projects in the Basin, would help reduce the loss of wetlands and overall decline of wildlife species within the Basin and would be beneficial to preserving species biodiversity.

4.2.2.2.2 The Tank BLH-Wet Project

Direct and Indirect Impacts

See Section 3.2.3.2.2 for description of wildlife at this project site. Wildlife species (e.g. birds, small mammals, reptiles) present at the time of construction would be temporarily displaced. The common inhabitants of this area are avian species which are fully equipped to relocate to nearby open water. A survey would be performed prior to construction to identify the presence of colonial nesting water birds or nesting bald eagles. If colonial nesting water birds are present, BMPs, developed in coordination with USFWS, would be implemented to avoid potential impacts. See Section 5.4.1 and Section 8.2. If nesting bald eagles are present, the National Bald Eagle Management Guidelines would be followed. Other wildlife outside the project may indirectly benefit from having this area as an additional territory for foraging and mating opportunities.

Approximately 310 acres of shallow open water would be converted to BLH-wet habitat. This conversion would eliminate wintering habitat for brown pelican, and increase habitat for white-tailed deer, skunks, rabbits, squirrels and armadillos; various raptors such as barred owls, red-shouldered hawks, northern harriers (marsh hawks), American kestrel, and red-tailed hawks; passerine birds such as sparrows, vireos, warblers, Northern mockingbirds, grackles, red-winged blackbirds, wrens, blue jays, northern cardinals, and crows. The BLH habitat would offer new shelter, nesting, mating, and foraging grounds for these species. Other wildlife outside the project may indirectly

benefit from having this area as an additional territory for foraging and mating opportunities. This habitat could also serve as a temporary stopover habitat for migratory birds.

Cumulative Impacts

This project would prevent an overall loss in the Basin of BLH habitat necessary for many wildlife species. This project, when added to other past, present, and reasonably foreseeable future ecosystem restoration and mitigation projects in the Basin, would help reduce the loss of wetlands and overall decline of wildlife species within the Basin and would be beneficial to preserving species biodiversity.

4.2.2.3 Threatened and Endangered Species

4.2.2.3.1 Jesuit Bend BLH-Wet Project

Direct and Indirect Impacts

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee and pallid sturgeon are expected to potentially occur within the project area. The presence of construction-related activities, machinery, and noise would be expected to cause this species to avoid the project area during the construction period. However, in order to minimize the potential for construction activities to cause adverse impacts to manatees or pallid sturgeon during the construction period, the standard manatee protection measures and pallid sturgeon protection measures found in section 5.5.2 would be implemented.

Potential indirect impacts from the proposed action would primarily consist of effects from dredging operations, increased turbidity, and benthic species removal. However, although the rise in turbidity could immediately reduce water quality in the project area, those effects would be temporary and would be reduced by movement of the tides. Any manatees or pallid sturgeon in the area would be free to relocate during construction since the project area encompasses only a small section of a large estuarine/brackish lake. Additional foraging areas are available for manatees to utilize throughout the Basin in the interim. As such, this project is not likely to adversely affect any manatees or pallid sturgeon that may be present in the area.

Cumulative Impacts

Due to the size of the Mississippi River, the relatively small size of the borrow area, the temporary nature of the borrow activities, the use of a cutterhead dredge for borrow procurement, the duration of dredging, and the ability of these species to avoid the project area during the construction period, the Jesuit Bend project would add very little and only temporary impacts to any other impacts resulting from past, present and reasonably foreseeable projects in the Basin and would not contribute significantly to cumulative impacts to threatened and endangered species in the Basin.

4.2.2.3.2 The Tank BLH-Wet Project

Direct and Indirect Impacts

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee is expected to potentially occur within the project area. The presence of construction-related activities, machinery, and noise would be expected to cause these species to avoid the project area during the construction period. However, in order to minimize the potential for construction activities to cause adverse impacts to manatees during the construction period, the standard manatee protection measures found in section 5.5.2 would be implemented.

Potential indirect impacts from the proposed action would primarily consist of effects from dredging operations, increased turbidity and benthic species removal. However, although the rise in turbidity could immediately reduce water quality in the project area, those effects would be temporary and would be reduced by movement of the tides. Any manatees in the area would be free to relocate during construction since the project area encompasses only a small section of a large estuarine/brackish lake. Additional foraging areas are available for manatees to utilize throughout Basin in the interim. As such, this project is not likely to adversely affect the West Indian Manatee.

Cumulative Impacts

Due to the size of Lake Cataouatche, the relatively small size of the borrow area, the temporary nature of the borrow activities, the use of a cutterhead dredge for borrow procurement, the duration of dredging, and the ability of these species to avoid the project area during the construction period, the Tank project would add very little and only temporary impacts to any other impacts resulting from past, present and reasonably foreseeable projects in the Basin and would not contribute significantly to cumulative impacts to threatened and endangered species in the Basin.

4.2.2.4 Fisheries, Aquatic Resources, and Water Quality

4.2.2.4.1 Jesuit Bend BLH-Wet Project

Direct and Indirect Impacts

See Section 3.2.3.4.1 for description of this resource at the project site. With implementation of this project, there would be some direct and indirect impacts to fisheries in the form of physically altered open water bottom habitat and temporary increases in turbidity during construction activities. Approximately 225 acres of shallow open water would be converted to BLH-Wet habitat and no longer be available for fishery and aquatic species. Approximately 258 acres of Mississippi River bottom would be deepened to approximately -90 feet NAVD88. Due to flow of the river it is anticipated that the pits would re-fill overtime and no anoxic conditions would develop. Sediment particles suspended due to construction activities may impact filter feeding benthic invertebrates by fouling feeding apparatus if the concentration of such particles is excessively high at the dredge site and adjacent to the placement site. Due to the lack of escape routes, most fish species in the placement area would be experience

demise during borrow material placement. There would be a short term direct impact to the benthic community at the borrow site. The animals that are living on or in the dredged material would most likely be killed in either the transportation of the dredge material or the placement. The new bottom of the borrow pit would be quickly recolonized and species make up would be similar. There would be no long term impacts. There would also be direct impacts to the benthic community due to burial and conversion from open water to BLH habitat. These species are commonly found throughout the Basin in similar shallow water environments that exist in abundance. As such, impacts to the overall population of these species in the Basin from the borrow placement is expected to be negligible. Direct impacts caused by increases in suspended sediments during placement of stabilization materials would be minimal, localized, and short-lived.

Cumulative Impacts

Though construction of this project would result in the loss of some fisheries habitat, some fish, and temporary impacts to water quality and benthic habitat; this habitat is abundant throughout the Basin, impacts to existing fisheries are minimal, and water quality and benthic species would rebound once project construction is complete. As such, construction of this project would result in minimal cumulative loss to fisheries, aquatic resources, and water quality in the Basin in light of past, present and reasonably foreseeable projects in the Basin.

The reinstatement of BLH in areas that are currently open water could provide indirect benefits to fisheries in the future by providing nutrients to the system in the form of detritus. As a result of borrow placement and the type of containment utilized for this project, land adjacent to the mitigation project may receive material suspended in the dredge effluent. This would nourish adjacent marsh habitat and may cause adjacent shallow open water to become shallower or be filled; encouraging the existing habitat to move through early successional phases faster.

These temporary impacts to water quality would add incrementally to similar cumulative impacts throughout the Basin as other projects listed in the FWOP conditions are constructed, causing temporary decreases in water quality throughout the Basin. The temporary impacts to the Mississippi River from borrow excavation are not anticipated to be substantial enough to cause water quality impairment under the standards of Louisiana Administrative Code, Title 33, Part IX, Chapter 11. Impacts in the fill area would temporarily add to the water quality impairment of this sub-segment through increased turbidity, but these impacts would be minimized through BMPs and would cease after construction. Although there would be a loss of open water from construction of this project, open water is found in abundance throughout the Basin.

4.2.2.4.2 The Tank BLH-Wet Project

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts that would be similar to those described in Section 4.2.2.4.1 except approximately 310 acres of shallow open water would be

replaced with BLH-Wet habitat and no longer be available to fish or aquatic habitat. Approximately 7,000 ft by 4,000 ft of Lake Cataouatche bottom would be deepened to approximately -20 feet NAVD88. It is anticipated that the pits would re-fill overtime and no anoxic conditions would develop. The temporary impacts to Lake Cataouatche from borrow excavation are not anticipated to be substantial enough to cause water quality impairment under the standards of Louisiana Administrative Code, Title 33, Part IX, Chapter 11. Although there would be a loss of open water from construction of this project, open water is found in abundance throughout the Basin.

An indirect negative impact would result from dredging Lake Cataouatche. Lake Cataouatche is a shallow lake that host a variety of SAV. The borrow pit would be situated far enough from shoreline that it would not cause increased shoreline erosion.

4.2.2.5 Essential Fish Habitat

4.2.2.5.1 Jesuit Bend BLH-Wet Project

Direct, Indirect, and Cumulative Impacts

There would be no impacts to EFH with implementation of this project. Neither the placement area nor the borrow area contain EFH.

4.2.2.5.2 The Tank BLH-Wet Project

Direct and Indirect Impacts

There would be long term direct and indirect impacts to EFH in the form of physically altered open water bottom habitat as 310 acres of EFH is converted to BLH-Wet. Mitigation of EFH impacts can be satisfied with a different class of EFH. As such, mitigation for these impacts would be completed with the expansion of the fresh marsh TSP (currently the purchase of mitigation bank/ILF credits) if this project is selected as the BLH-Wet TSP in the future. Approximately 334 acres of Lake Cataouatche water bottom would be deepened to an elevation of -20 feet NAVD88 but would continue to provide EFH for multiple managed species. There could be a short term indirect impact to EFH due to temporary increases in turbidity and increased sedimentation rates in and adjacent to the placement area as well as the borrow area. These areas would return to preconstruction conditions once the construction ends.

Temporary increases in turbidity and increased sedimentation rates adjacent to the placement area would elicit a minor temporal loss of EFH in the Basin.

Cumulative Impacts

Although there would be impacts to EFH with the implementation of this project, these impacts would be mitigated such that an increase in the cumulative EFH impacts in the Basin would not occur.

4.2.2.6 Cultural Resources

4.2.2.6.1 Jesuit Bend BLH-Wet Project

Direct and Indirect Impacts

It is not likely that activities associated with the proposed restoration project would have a direct impact on cultural resources site 16PL186, 16PL187, or other cultural resources that may be located within the vicinity of the project area. Removal of borrow material from the Mississippi River is not likely to directly impact any known or previously unrecorded cultural resources or shipwrecks, because the river is regularly dredged to maintain navigation. Identified cultural resources that are determined to be eligible for listing or are listed on the NRHP would be avoided. If avoidance is not possible, strategies would be developed in consultation with the SHPO and Federally-recognized Indian tribes to mitigate for adverse effects to significant cultural resources.

Cumulative Impacts

Cumulative impacts will be similar to those described in Section 4.2.1.6.1.

4.2.2.6.2 The Tank BLH-Wet Project

Direct and Indirect Impacts

It is not likely that activities associated with the proposed restoration project would have a direct impact on NRHP eligible cultural resources site 16SC27, 16SC28, 16SC29, or any of the other cultural resources previously identified within one mile of the proposed project area. Submerged cultural resources could exist in the proposed borrow source located in Lake Cataouatche, and the removal of borrow could have a direct impact on those cultural resources. Identified cultural resources that are determined to be eligible for listing or are listed on the NRHP would be avoided. If avoidance is not possible, strategies would be developed in consultation with the SHPO and Federally-recognized Indian tribes to mitigate for adverse effects to significant cultural resources.

Cumulative Impacts

Cumulative impacts would be similar to those described in Section 4.2.1.6.1.

4.2.2.7 Recreational Resources

4.2.2.7.1 Jesuit Bend BLH-Wet Project

Direct and Indirect Impacts

With the proposed action, 225 acres of open water habitat would be converted to BLH-Wet habitat, eliminating the fisheries resource habitat and the possibility of recreational fishing. Recreational species which could be impacted include red and black drum, spotted seatrout, gulf menhaden, southern flounder, white and brown shrimp, blue crab, largemouth bass and channel catfish (LCWCRTF and WCRA, 1999). After the creation of BLH-Wet habitat, there could be the potential for public recreation opportunities such as hunting, hiking, and wildlife viewing if there is a change of land status from private to

public. Borrow material necessary for construction of this project would be obtained from the Mississippi River. Dredging of the river could cause an increase in turbidity and localized impacts to river bank fishing in the immediate vicinity, but overall there would be minimal direct recreational resource impacts.

Conversion to BLH-Wet may cause temporary turbidity changes in waters adjacent waters to the immediate mitigation site. Recreational fish species in the areas around the mitigation site may reap benefits of the new Wet habitat which will offer foraging for juveniles and spawning for adults. Construction noise may temporarily limit recreational fishing and hunting in areas close to construction work. Once the area has matured, recreational opportunities could be enhanced in surrounding areas because of the new habitat created.

Cumulative Impacts

Restoration/enhancement of fish and wildlife habitat would increase use of the project sites by desirable species which would consequently provide a better recreational experience. Recreational impacts could be considered cumulatively beneficial when added to the recreational opportunities provided at adjacent refuges and other existing recreational areas in the Basin. However, since this is mitigation, which replaces impacted habitats, recreational resources dependent on these habitats would merely shift from the area of impact to the area of mitigation, preventing the loss of recreational resources in the Basin. The impacts associated with utilization of the borrow sites for construction of the mitigation projects would be short term and not result in a significant increase in cumulative impacts to recreational resources in the Basin.

4.2.2.7.2 The Tank BLH-Wet Project

Direct and Indirect Impacts

The project area is located within the Salvador Timken Wildlife Management Area managed by Louisiana Department of Wildlife and Fisheries. Approximately 334 acres of open water habitat would be converted to BLH-wet habitat. Currently the recreation use is high and includes fishing and duck hunting when access is not restricted by thick submerged aquatic vegetation. Recreational fish using the habitat at the project site include red and black drum, spotted seatrout, gulf menhaden, white and brown shrimp, blue crab, largemouth bass, and channel catfish (LCWCRTF and WCRA, 1999). After restoration to a BLH-W habitat, these fishes could continue to use the site, but to a much more limited degree. Opportunities for fishing and duck hunting would be substantially reduced. There may be the potential for small, shallow draft boats during times of peak inundation to utilize portions of the swamp.

Borrow material needed to construct the BLH-Wet habitat at The Tank will come from Lake Cataouatche, which is a shallow water lake. Dredging would directly impact recreational fishing opportunities in the short-term near the site. The new bottom of the borrow pit would be quickly recolonized and species make up would be similar. There would be no long term impacts to recreational fishing in the lake.

Construction of the restored BLH-Wet habitat at the Tank and dredging of the borrow site may cause noise and affect turbidity in the surrounding areas. Recreational opportunities in areas adjacent to The Tank and to the borrow site may be temporarily impacted during construction.

Cumulative Impacts

Cumulative Impacts would be similar to those stated in section 4.2.2.7.1.

4.2.2.8 Air Quality

4.2.2.8.1 Jesuit Bend BLH-Wet Project

Direct and Indirect Impacts

During construction of this project, an increase in air emissions could be expected. These emissions could include exhaust emissions from operations of various types of non-road construction equipment such as a cutterhead dredge, backhoes, tractors, etc. and from vehicles used to access the project area. Fugitive dust emissions are not anticipated during construction.

Any site-specific construction effects to air quality would be temporary, and air quality would return to pre-construction conditions shortly after the completion of construction activities. Because the project area is in a parish in attainment of NAAQS, a conformity analysis is not required.

There would be no adverse indirect impacts to air quality in the parish with construction of the proposed action.

Cumulative Impacts

Cumulative impacts to air quality in the project area due to construction of this project in addition to the other construction activities within the Basin that may be occurring concurrently would be temporary and would be very minimal, especially considering that placement of dredged material would not create fugitive dust. After the construction period, there would be no incremental contribution to cumulative air quality impacts due to the proposed action.

4.2.2.8.2 The Tank BLH-Wet Project

Direct and Indirect Impacts

During construction of this project, an increase in air emissions could be expected during construction. These emissions could include exhaust emissions from operations of various types of non-road construction equipment such as a cutterhead dredge, backhoes, tractors, etc. and from vehicles used to access the project area. Fugitive dust emissions are not anticipated during construction.

Any site-specific construction effects to air quality would be temporary, and air quality would return to pre-construction conditions shortly after the completion of construction

activities. Because the project area is in a parish in attainment of NAAQS, a conformity analysis is not required.

There would be no adverse indirect impacts to air quality in the parish with construction of the proposed action.

Cumulative Impacts

Cumulative Impacts would be similar to those stated in Section 4.2.2.8.1

4.2.2.9 Noise

4.2.2.9.1 Jesuit Bend BLH-Wet Project

Direct and Indirect Impacts

Cutterhead dredges, backhoes, slurry pumps, marsh tracked vehicles and barge mounted equipment would be the primary pieces of equipment used for construction of this project. These pieces of equipment exceed noise levels above 55 dBA. Noise levels may result in wildlife avoiding the project area during construction; however, movement of equipment during construction would result in the same avoidance behaviors from wildlife species. Residences within close proximity to the project area could experience higher than ambient noise levels during construction, however these levels would be temporary during the period of construction and would be limited to daylight hours. There are no residences located at the project area that would be impacted by noise associated with the proposed project.

Cumulative Impacts

Construction of this project is not anticipated to add significantly to the cumulative effect of noise in the Basin as the construction activities would be restricted to daylight hours, temporary, and all NFL NOV construction is anticipated to end in 2022. Cumulatively noise impacts would be produced by traffic noise on LA Hwy 23, boat traffic on the Mississippi River, and other redevelopment projects that may be under construction in the immediate vicinity.

4.2.2.9.2 The Tank BLH-Wet Project

Direct and Indirect Impacts

Cutterhead dredges, backhoes, slurry pumps, marsh tracked vehicles and barge mounted equipment would be the primary pieces of equipment used for construction of this project. These pieces of equipment exceed noise levels above 55 dBA. Noise levels may result in wildlife avoiding the project area during construction; however, movement of equipment during construction would result in the same avoidance behaviors from wildlife species. Noise levels quickly drop off once a buffer is established between the noise source and the receptor (e.g. vegetation). As such, any wildlife in the adjacent habitats should be largely undisturbed by the additional noise from this project's construction. No impact to human populations is anticipated as this project area is remote and uninhabited.

Cumulative Impacts

Construction of this project is not anticipated to add significantly to the cumulative effect of noise in the Basin as the construction activities would be temporary and the area is remote. Cumulatively noise impacts would be produced by other redevelopment, diversion and coastal restoration, and transportation projects, but they would not all be under construction at the same time.

4.2.2.10 Hazardous, Toxic, and Radioactive Waste

4.2.2.10.1 Jesuit Bend BLH-Wet Project

Direct, Indirect and Cumulative Impacts

No RECs were found within the potential Jesuit Bend BLH-Wet project area. The area proposed for mitigation is currently open water. It would be filled with dredged material from a borrow site in the Mississippi River to establish a platform, then planted with native BLH species. USACE Engineer Regulation, ER 1165-2-132, HTRW for Civil Works Projects, states that dredged material and sediments beneath navigable waters proposed for dredging qualify as HTRW only if they are within the boundaries of a site designated by the EPA or a state for a response action (either a removal or a remedial action) under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), or if they are a part of an National Priority List (NPL) site under CERCLA. None of the area proposed for dredging is included in the NPL or within the boundaries of a CERCLA site.

There is a low probability of encountering HTRW or petroleum products in this feature. No direct, indirect, or cumulative impacts are expected at this project site.

4.2.2.10.2 The Tank BLH-Wet Project

Direct, Indirect and Cumulative Impacts

No RECs were found within The Tank BLH-Wet potential mitigation project area. The area is currently open water. It would be filled with dredged material from a borrow site in Lake Cataouatche to establish a platform and then planted with native BLH species. USACE Engineer Regulation, ER 1165-2-132, HTRW for Civil Works Projects, states that dredged material and sediments beneath navigable waters proposed for dredging qualify as HTRW only if they are within the boundaries of a site designated by the EPA or a state for a response action (either a removal or a remedial action) under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), or if they are a part of an National Priority List (NPL) site under CERCLA. None of the area proposed for dredging is included in the NPL or within the boundaries of a CERCLA site.

There is a low probability of encountering HTRW or petroleum products. No direct, indirect, or cumulative impacts are expected at this project site.

4.2.2.11 Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

4.2.2.11.1 Jesuit Bend BLH-Wet Project

Direct and Indirect Impacts

According to 2010 U.S. Census data, there are no residents or housing units located within the boundaries of the Jesuit Bend project and therefore no direct impacts to population and housing are expected to occur. Additionally, there are no commercial/industrial properties, public facilities, or transportation infrastructure within the project boundaries and therefore no direct or indirect impacts to employment, businesses, industry, public facilities and services, transportation, community and regional growth, community cohesion, or tax revenues and property values are anticipated to occur under this project. The site of the proposed project was previously drained for agricultural use. Implementing the project would however require the current landowner to forgo the potential opportunity to use the land for agricultural production in the future.

Temporarily, residents of nearby communities may experience indirect impacts such as dust and noise from the construction, but these factors would be minimal and temporary in nature.

There would be no direct or indirect impacts to navigation or commercial fishing on any of the nearby waterways from implementation of the project. With the proposed action, 225 acres of open water habitat would be converted to BLH-Wet habitat, eliminating the fisheries resource habitat and the possibility of recreational fishing..

There are no direct impacts to EJ communities from construction of this project, located on the west bank of Plaquemines Parish, Louisiana. There are no residents or housing units located within the boundaries of the Jesuit Bend BLH-Wet Restoration Project as it mainly consists of open water. There are about 1,300 residents living well outside of the project boundary, across a borrow canal on lands fronting LA Hwy 23. One quarter of the residents are minority while the larger block group data shows only 2% of households with incomes below the poverty level. EO 12898 on EJ states that when minority populations exceed 50 percent or when 20 percent or more residents in the area are below the poverty threshold, EJ issues need to be taken into consideration. In this case, both are below the thresholds and therefore, there are no EJ concerns.

All of the BLH-Wet dredge material will be delivered via an over-ground pipeline coming from the Mississippi River. There will be no trucks passing through the community for the delivery of sediment and minimal disruption during the laying of the pipeline. Any trucks needed will use the levee top directly adjacent to the site for access via Ollie Drive. Delivery of plant materials, including seedlings, will be trucked to the site on LA Hwy 23, a four lane road, via Ollie Drive. Approximately ten truck trips, total, will deliver the plant materials for the construction of the project site. . The direct and indirect impacts of noise and other associated construction activities are not anticipated

to exert disproportionately high indirect, adverse human health, and environmental impacts on minority and/or low-income communities.

Cumulative Impacts

Cumulative Impacts would be similar to those stated in section 4.2.1.11.1.

4.2.2.11.2 The Tank BLH-Wet Project

Direct, Indirect and Cumulative Impacts

There are no direct, indirect or cumulative impacts on the EJ resource from the construction of this project. The proposed project is located on lands owned by LDWF. According to 2010 U.S. Census data, there are no residents located within the boundaries or in the vicinity of The Tank Restoration project and therefore no minority or low-income populations would be adversely impacted.

The mitigation project will have little to no impact on the area's population, given no communities or homes are established near the project site. The population in the region will continue to grow as projected. The proposed project would have no foreseeable impact on housing or business and industry in the affected area. The land's protected nature will not be altered under the current project plan. It will continue to be used for recreation and provide wildlife habitat.

There would be no direct and indirect impacts to transportation during construction of the restoration site. There would be direct impacts to navigation of larger commercial and recreational fishing vessels as the site will be inaccessible during and after construction of the restoration project. However, there may be the potential for small, shallow draft boats during times of peak inundation to utilize portions of the swamp.

Indirect impacts to commercial fishing in Lake Cataouatche could occur in the vicinity of dredging for sediment that will be used for the BLH-Wet project. The impacts, due to increase in turbidity and dredging activities, would be temporary. It is anticipated that the borrow pit would refill overtime and no anoxic conditions would develop. The temporary impacts to Lake Cataouatche from borrow excavation are not anticipated to be substantial enough to cause water quality impairment.

Cumulative Impacts would be similar to those stated in section 4.2.1.11.1.

4.2.3 MITIGATION FOR SWAMP IMPACTS

4.2.3.1 Wetlands and Other Surface Waters

4.2.3.1.1 Jesuit Bend Swamp Project

Direct and Indirect Impacts

See Section 3.2.4.1.1 for description of the wetlands at the project site. Impacts would be similar to, but smaller than, those described in 4.2.2.1.1, as the sites have

substantially similar physical attributes and habitat present (they are adjacent to one another). Approximately 95 acres of open water habitat would be converted to swamp habitat.

4.2.3.1.2 Lake Salvador Swamp Project

Direct and Indirect Impacts

See Section 3.2.4.1.2 for description of wetlands at the project site. There would be a beneficial impact to wetlands as approximately 95 acres of open water habitat would be converted to swamp habitat. Indirectly, these restored wetlands would produce nutrients and detritus which are important health and persistence of other wetlands in the Barataria Bay estuary thereby contributing to their overall productivity. Although there would be a loss of 95 acres of open water in the basin, large amounts of wetlands are converting to open water in the basin every year and open water is prevalent in the basin. See the Fisheries, Aquatic Resources, and Water Quality sections for analysis of borrow pit impacts.

Cumulative Impacts

Implementation of this project would prevent an overall loss of swamp habitat in the Basin. This project, when added to other past, present, and reasonably foreseeable ecosystem restoration and mitigation projects in the Basin would help retard the loss of wetlands. There would be an overall loss of open water habitat in the Basin, but no permanent adverse impacts are anticipated because this habitat is prevalent throughout the Basin.

4.2.3.2 Wildlife

4.2.3.2.1 Jesuit Bend Swamp Project

Direct, Indirect, and Cumulative Impacts

Impacts would be similar to but smaller than those described in 4.2.2.2.1, as the sites have substantially similar physical attributes and wildlife present. (They are adjacent to one another). Approximately 95 acres of shallow open water would be converted to swamp habitat.

4.2.3.2.2 Lake Salvador Swamp Project

Direct and Indirect Impacts

Approximately 95 acres of shallow open water would be converted to swamp habitat. This conversion would eliminate wintering habitat for brown pelican, and increase habitat for wading birds, shorebirds, and raptors (LCWCRTF and WCRA, 1999) as well nutria, muskrat, mink, river otter, raccoon, reptiles and amphibians. The fresh marsh habitat would offer new shelter, nesting, mating, and foraging grounds for these species. Other wildlife outside the project may indirectly benefit from having this area as an additional territory for foraging and mating opportunities. This habitat could also serve as a temporary stopover habitat for migratory birds. Wildlife species present at the time of construction would be temporarily displaced to adjacent habitat due to noise,

dust, movement and vibration of construction equipment. Brown pelicans and other avian species would have sufficient adjacent habitat for relocating during the time of construction.

Species that utilize shallow open water habitats would be displaced due to the habitat conversion. However, these impacts would be temporary. Many species directly utilizing the current habitat type would thrive with the additional foraging, cover and resting habitat the project would create. Other wildlife outside the project may indirectly benefit from having this area as an additional territory for foraging and mating opportunities. A rise in turbidity at the borrow site could immediately reduce water quality in the area however those effects would be temporary and would be reduced by movement of the tides.

Cumulative Impacts

This project would prevent an overall loss in the Basin of fresh marsh habitat necessary for many wildlife species. This project, when added to other past, present, and reasonably foreseeable future ecosystem restoration and mitigation projects in the Basin, would help reduce the loss of wetlands and overall decline of wildlife species within the Basin and would be beneficial both to preserve species bio-diversity and combat the current trend of conversion of marsh to open water.

4.2.3.3 Threatened and Endangered Species

4.2.3.3.1 Jesuit Bend Swamp Project

Direct, Indirect and Cumulative Impacts

Impacts would be similar to but smaller than those described in 4.2.2.3.1, as the sites have substantially similar physical attributes and T&E present (they are adjacent to one another).

4.2.3.3.2 Lake Salvador Swamp Project

Direct and Indirect Impacts

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee are expected to potentially occur within the project area. The presence of construction-related activities, machinery, and noise would be expected to cause these species to avoid the project area during the construction period. However, in order to minimize the potential for construction activities to cause adverse impacts to manatees during the construction period, the standard manatee protection measures found in section 5.5.2 would be implemented.

Potential indirect impacts from the proposed action would primarily consist of effects from dredging operations, increased turbidity and benthic species removal. However, although the rise in turbidity could immediately reduce water quality in the project area, those effects would be temporary and would be reduced by movement of the tides. Any manatees in the area would be free to relocate during construction since the project

area encompasses only a small section of a large estuarine/brackish lake. Additional foraging areas are available for manatees to utilize throughout Basin in the interim. As such, this project is not likely to adversely affect the West Indian manatee.

Cumulative Impacts

Potential cumulative impacts to threatened or endangered species (manatee) from construction of the Lake Salvador project would involve the combined adverse effects on the species from the other projects within the Basin. Due to the size of Lake Salvador, the relatively small size of the borrow area, the temporary nature of the borrow activities, the use of a cutterhead dredge for borrow procurement, the duration of dredging, and the ability of these species to avoid the project area during the construction period, the Lake Salvador project would add very little and only temporary impacts to any other impacts resulting from past, present and reasonably foreseeable projects in the Basin and would not contribute significantly to cumulative impacts to threatened and endangered species in the Basin.

4.2.3.4 Fisheries, Aquatic Resources, and Water Quality

4.2.3.4.1 Jesuit Bend Swamp Project

Direct, Indirect and Cumulative Impacts

See Section 3.2.4.4.1 for a description of the resources at the project site. Impacts would be similar to, but smaller than, those described in 4.2.2.4.1, as the sites have substantially similar physical attributes and fisheries and aquatic resources present (they are adjacent to one another).

4.2.3.4.2 Lake Salvador Swamp Project

Direct, Indirect, and Cumulative Impacts

Impacts would be similar to, but smaller than, those described in Section 4.2.2.4.1. Approximately 95 acres of open water would be converted to swamp habitat in Lake Salvador and an approximately 7,500 foot by 1,400 foot section of Lake Salvador water bottom would be deepened to approximately -20 feet NAVD88. The temporary impacts to Lake Salvador water quality from borrow excavation are not anticipated to be substantial enough to cause water quality impairment under the standards of Louisiana Administrative Code, Title 33, Part IX, Chapter 11.

There would be some negative cumulative impact because fish access to the swamp once restored would be limited. However, there would be a positive indirect and cumulative impact on aquatic species due to the long term stability of the new swamp.

4.2.3.5 Essential Fish Habitat

4.2.3.5.1 Jesuit Bend Swamp Project

Direct, Indirect, and Cumulative Impacts

There would be no impacts to EFH with implementation of this project. Neither the placement area nor the borrow area contain EFH.

4.2.3.5.2 Lake Salvador Swamp Project

Direct and Indirect Impacts

There would be long term direct and indirect impacts to EFH in the form of physically altered open water bottom habitat as 95 acres of EFH is converted to BLH-Wet.

Mitigation of EFH impacts can be satisfied with a different class of EFH. As such, mitigation for these impacts would be completed with the expansion of the fresh marsh TSP (currently the purchase of mitigation bank/ILF credits) if this project is selected as the Swamp TSP in the future. Approximately 241 acres of Lake Salvador water bottom would be deepened to an elevation of -20 feet NAVD88 but would continue to provide EFH for multiple managed species. There could be a short term indirect impact to EFH due to temporary increases in turbidity and increased sedimentation rates in and adjacent to the placement area as well as the borrow area. These areas would return to preconstruction conditions once the construction ends.

Temporary increases in turbidity and increased sedimentation rates adjacent to the placement area would elicit a minor temporal loss of EFH in the Basin.

Cumulative Impacts

Although there would be impacts to EFH with the implementation of this project, these impacts would be mitigated such that an increase in the cumulative EFH impacts in the Basin would not occur.

4.2.3.6 Cultural Resources

4.2.3.6.1 Jesuit Bend Swamp Project

Direct and Indirect Impacts

It is not likely that activities associated with the proposed restoration project would have a direct impact on sites 16PL186, 16PL187, or other cultural resources that may be located within the vicinity of the project area. Removal of borrow material from the Mississippi River is not likely to directly impact any known or previously unrecorded cultural resources or shipwrecks, because the river is regularly dredged to maintain navigation. Identified cultural resources that are determined to be eligible for listing or are listed on the NRHP would be avoided. If avoidance is not possible, strategies would be developed in consultation with the SHPO and Federally-recognized Indian tribes to mitigate for adverse effects to significant cultural resources.

Cumulative Impacts

Cumulative impacts would be similar to those described in Section 4.2.1.6.1.

4.2.3.6.2 Lake Salvador Swamp Project

Direct and Indirect Impacts

The proposed project is mostly located within the Barataria Unit of the Jean Lafitte Historical Park Historic District and historic properties listed to the NRHP as contributing elements to the Historic District are present along the existing shoreline of Lake Salvador and within one-mile of the proposed project area. The proposed project has the potential to directly impact significant historic properties and additional cultural resources surveys and consultation with the SHPO, Federally-recognized Indian tribes, and the National Park Service would be required prior to construction of this project. Submerged cultural resources could exist in the proposed borrow source located in Lake Salvador, and the removal of borrow could have a direct impact on those cultural resources. Identified cultural resources that are determined to be eligible for listing or are listed on the NRHP would be avoided. If avoidance is not possible, strategies would be developed in consultation with the SHPO and Federally-recognized Indian tribes to mitigate for adverse effects to significant cultural resources.

Cumulative Impacts

Cumulative impacts will be similar to those described in Section 4.2.1.6.1.

4.2.3.7 Recreational Resources

4.2.3.7.1 Jesuit Bend Swamp Project

Direct and Indirect Impacts

With the proposed action, approximately 95 acres of water would be converted into swamp. Recreational fish species currently in the project site, include red drum, gulf menhaden, southern flounder, white and brown shrimp, blue crab, largemouth bass and channel catfish (LCWCRTF and WCRA, 1999). The design of the restored swamp would likely preclude access to the swamp habitat by most of these species. Limited access could be feasible during peak flood stages therefore fishing for the common recreational species at this site would likely be diminished once the project is mature. There would be the potential for other recreation opportunities such as hunting, hiking, wildlife viewing, and bird watching with the planting of canopy and midstory swamp species seedlings. There are no direct impacts to recreational resources associated with dredging the Mississippi River.

Recreational opportunities in areas surrounding the Jesuit Bend site may be affected from the noise of constructing the swamp project. Additionally, turbidity caused by site construction could temporarily affect fishing in areas near the site. Borrow material necessary for construction of this project would be obtained from the Mississippi River. Minimal indirect recreation impacts will occur from dredging since very little recreation takes place in the river.

Cumulative Impacts

Cumulative impacts will be similar to those described in Section 4.2.2.7.1.

4.2.3.7.2 Lake Salvador Swamp Project

Direct and Indirect Impacts

The project area is located within JLNHPP. Approximately 95 acres of open water would be converted to forested swamp habitat. The proposed action would eliminate boating along this part of the Lake Salvador shoreline, approximately 10,000 LF. The conversion would reduce recreational fisheries resources in the affected project area. Swamp habitat, once mature though, could provide shelter for juveniles and potentially increase fishing opportunities in the open waters of the Lake.

Construction of the swamp mitigation feature would not directly impact other navigable waters. However, borrow material necessary for construction of this feature would be obtained from Lake Salvador. Dredging activities would increase the turbidity in the area of work and in the vicinity of the discharge pipes. This turbidity may disrupt water-oriented recreational activity occurring within the vicinity; however, these adverse impacts would be temporary and of short duration. Recreational boating navigation in the immediate area of the borrow site could be adversely affected during the period of dredging operations. A floating pipeline delivering sediment to the project site from the Lake Salvador borrow site, will be placed where possible, out of the way of boating traffic and often along the edge of any shoreline. Any impact would be minimized through appropriate coordination with the US Coast Guard. Fish and wildlife in the area would likely relocate while dredge material is being excavated. Water quality will be monitored and remediation will take place to alleviate this problem; recreational opportunities are expected to be affected until conditions return to normal after re-settling of water bottoms.

Cumulative Impacts

Cumulative impacts would be similar to those described in Section 4.2.2.7.1.

4.2.3.8 Air Quality

4.2.3.8.1 Jesuit Bend Swamp Project

Direct and Indirect Impacts

During construction of this project, an increase in air emissions could be expected during construction. These emissions could include exhaust emissions from operations of various types of non-road construction equipment such as a cutterhead dredge, crewboats, backhoes, tractors, etc. and from vehicles used to access the project area. Fugitive dust emissions are not anticipated during construction.

Any site-specific construction effects to air quality would be temporary, and air quality would return to pre-construction conditions shortly after the completion of construction

activities. Because the project area is in a parish in attainment of NAAQS, a conformity analysis is not required.

There would be no adverse indirect impacts to air quality in the parish with construction of the proposed action.

Cumulative Impacts

Cumulative impacts would be similar to those identified in Section 4.2.2.8.1.

4.2.3.8.2 Lake Salvador Swamp Project

Direct and Indirect Impacts

During construction of this project, an increase in air emissions could be expected during construction. These emissions could include exhaust emissions from operations of various types of non-road construction equipment such as a cutterhead dredge, backhoes, tractors, etc. and from vehicles used to access the project area. Fugitive dust emissions are not anticipated during construction.

Any site-specific construction effects to air quality would be temporary, and air quality would return to pre-construction conditions shortly after the completion of construction activities. Because the project area is in a parish in attainment of NAAQS, a conformity analysis is not required.

There would be no adverse indirect impacts to air quality in the parish with construction of the proposed action.

Cumulative Impacts

Cumulative impacts would be similar to those identified in Section 4.2.2.8.1.

4.2.3.9 Noise

4.2.3.9.1 Jesuit Bend Swamp Project

Direct and Indirect Impacts

Direct and Indirect impacts would be similar to those described in Section 4.2.2.9.1.

Cumulative Impacts

Cumulative impacts would be similar to those described in Section 4.2.2.9.1.

4.2.3.9.2 Lake Salvador Swamp Project

Direct and Indirect Impacts

Cutterhead dredges, backhoes, slurry pumps, marsh tracked vehicles and barge mounted equipment would be the primary pieces of equipment used for construction of this project. These pieces of equipment exceed noise levels above 55 dBA. Noise levels may result in wildlife avoiding the project area during construction; however,

movement of equipment during construction would result in the same avoidance behaviors from wildlife species. Noise levels quickly drop off once a buffer is established between the noise source and the receptor (e.g. vegetation). As such, any wildlife in the adjacent habitats should be largely undisturbed by the additional noise from this project's construction. The two fishing camps east of the project along the pipeline canal could experience higher than ambient noise levels during construction, however these levels would be temporary during the period of construction and would be limited to daylight hours.

Cumulative Impacts

Construction of this project is not anticipated to add significantly to the cumulative effect of noise in the Basin as the construction activities would be temporary and the area is remote. Cumulatively noise impacts would be produced by other redevelopment, diversion and coastal restoration, and transportation projects, but they would not all be under construction at the same time.

4.2.3.10 Hazardous, Toxic, and Radioactive Waste

4.2.3.10.1 Jesuit Bend Swamp Project

Direct, Indirect and Cumulative Impacts

One REC, a dry and plugged well, was found within the Jesuit Bend project area. The area proposed for mitigation is currently open water. It would be filled with dredged material from a borrow site in the Mississippi River to establish a platform, which would allow planting of swamp species. USACE Engineer Regulation, ER 1165-2-132, HTRW for Civil Works Projects, states that dredged material and sediments beneath navigable waters proposed for dredging qualify as HTRW only if they are within the boundaries of a site designated by the EPA or a state for a response action (either a removal or a remedial action) under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), or if they are a part of an National Priority List (NPL) site under CERCLA. None of the area proposed for dredging is included in the NPL or within the boundaries of a CERCLA site.

There is a low probability of encountering HTRW or petroleum products in this project area. No direct, indirect, or cumulative impacts are expected at this project site.

4.2.3.10.2 Lake Salvador Swamp Project

Direct, Indirect and Cumulative Impacts

No RECs were found within the Lake Salvador project area. The area proposed for potential mitigation is currently open water. It would be filled with dredged material from a borrow site in Lake Salvador to establish a platform, which would allow planting of swamp species. USACE Engineer Regulation, ER 1165-2-132, HTRW for Civil Works Projects, states that dredged material and sediments beneath navigable waters proposed for dredging qualify as HTRW only if they are within the boundaries of a site designated by the EPA or a state for a response action (either a removal or a remedial

action) under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), or if they are a part of an National Priority List (NPL) site under CERCLA. None of the area proposed for dredging is included in the NPL or within the boundaries of a CERCLA site.

There is a low probability of encountering HTRW or petroleum products in this project area. No direct, indirect, or cumulative impacts are expected at this project site.

4.2.3.11 Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

4.2.3.11.1 Jesuit Bend Swamp Project

Direct, Indirect, and Cumulative Impacts

The proposed project will have no anticipated long term direct impacts on the population in the area. During the construction phase residents of Jesuit Bend near the project site may experience indirect impacts such as noise and dust from construction activities.

The noise will be temporary in nature and end once construction has been completed.

The proposed project will have minimal direct impact on housing in the area.

Homeowners near the proposed pipeline alignment route may experience some disturbance while the pipeline is being laid. The proposed project will have little to no impact on the region's business and industry.

The site of the proposed project had previously been used as agricultural land. Due to subsidence, the land eventually became submerged and is no longer used for agricultural purposes. Although the land is no longer being used for agriculture, the landowner will forfeit future potential opportunities to use the land for financial gain.

There are no residents or housing units located within the boundaries of the Jesuit Bend Swamp Restoration Project as it mainly consists of open water. There are about 1,300 residents living across a borrow canal on lands fronting LA Hwy 23. See Section 4.2.2.12.1 for a discussion of impacts that may be felt by these residents. The impacts associated with construction of the swamp are not high, adverse nor disproportionate and therefore, there are no EJ impacts.

There would be no direct or indirect impacts to navigation or commercial fishing on any of the nearby waterways from implementation of the project.

4.2.3.11.2 Lake Salvador Swamp Project

Direct, Indirect, and Cumulative Impacts

No communities or houses are established in the vicinity of the project area. The proposed project should have no direct or indirect impact on the population and housing in the affected region. The proposed project should have no impacts on business and industry. The land on which the proposed project will be located is owned by the Louisiana Department of Wildlife and Fisheries. Currently, it is part of a wildlife reserve.

The nature of the site's utilization is not expected to change after implementation of the proposed project.

According to 2010 U.S. Census data, there are no residents located within the boundaries or in the vicinity of the Lake Salvador Swamp Restoration project and therefore no minority or low-income populations would be adversely impacted.

Indirect, temporary impacts to commercial fishing in Lake Salvador could occur in the vicinity of dredging activities. It is anticipated that the borrow pit would refill overtime and no anoxic conditions would develop. The temporary impacts to Lake Salvador from borrow excavation are not anticipated to be substantial enough to cause water quality impairment.

There are no direct, indirect or cumulative impacts on transportation from the proposed project. However, navigation of commercial or recreational boats along the shoreline of Lake Salvador will be not be possible once the open water is converted to swamp; but boats would be able to easily navigate around the project area in the Lake.

4.2.4 MITIGATION FOR FRESH MARSH IMPACTS

4.2.4.1 Wetlands and Other Surface Waters

4.2.4.1.1 Cataouatche Ponds Fresh Marsh Project

Direct and Indirect Impacts

See Section 3.2.5.1.1. for a description of wetlands at project site. Approximately 110 acres of open water, emergent and submerged aquatic vegetation habitat would be converted to fresh marsh. There would be a beneficial impact to wetlands as approximately 110 acres of open water habitat would be converted to fresh marsh habitat. Indirectly, these restored wetlands would produce nutrients and detritus which are important health and persistence of other wetlands in the Barataria Bay estuary thereby contributing to their overall productivity. Although there would be a loss of 110 acres of open water in the basin, large amounts of wetlands are converting to open water in the basin every year and open water is prevalent in the basin.

See the Fisheries, Aquatic Resources, and Water Quality sections for analysis of borrow pit impacts.

Cumulative Impacts

Implementation of this project would prevent an overall loss of fresh marsh habitat in the Basin. This project, when added to other past, present, and reasonably foreseeable ecosystem restoration and mitigation projects in the Basin would help retard the loss of wetlands. There would be an overall loss of open water habitat in the Basin, but no permanent adverse impacts are anticipated because this habitat is prevalent throughout the Basin.

4.2.4.1.2 GIWW/Salvador Fresh Marsh Project

Direct and Indirect Impacts

See Section 3.2.5.1.2 for a description of the wetland resources at the project site. Impacts would be similar to, but larger than those described in 4.2.3.1.2, as the sites have substantially similar physical attributes and habitat present. Approximately 160 acres of open water habitat would be converted to fresh marsh.

4.2.4.2 Wildlife

4.2.4.2.1 Cataouatche Ponds Fresh Marsh Project

Direct and Indirect Impacts

Approximately 110 acres of shallow open water would be converted to fresh marsh habitat. This conversion would eliminate wintering habitat for brown pelican, and increase habitat for wading birds, shorebirds, and raptors (LCWCRTF and WCRA, 1999) as well nutria, muskrat, mink, river otter, raccoon, reptiles and amphibians. The fresh marsh habitat would offer new shelter, nesting, mating, and foraging grounds for these species. Other wildlife outside the project may indirectly benefit from having this area as an additional territory for foraging and mating opportunities. This habitat could also serve as a temporary stopover habitat for migratory birds. Wildlife species present at the time of construction would be temporarily displaced to adjacent habitat due to noise, dust, movement and vibration of construction equipment. Brown pelicans and other avian species would have sufficient adjacent habitat for relocating during the time of construction.

Species that utilize shallow open water habitats may be displaced due to the habitat conversion. However, these impacts would be temporary. Many species directly utilizing the current habitat type would thrive with the additional foraging, cover and resting habitat the project would create. Other wildlife species outside the project may indirectly benefit from having this area as an additional territory for foraging and mating opportunities.

Cumulative Impacts

This project would prevent an overall loss in the Basin of fresh marsh habitat necessary for many wildlife species. This project, when added to other past, present, and reasonably foreseeable future ecosystem restoration and mitigation projects in the Basin, would help reduce the loss of wetlands and overall decline of wildlife species within the Basin and would be beneficial both to preserve species bio-diversity and combat the current trend of conversion of marsh to open water.

4.2.4.2.2 GIWW/Salvador Fresh Marsh Project

Direct, Indirect and Cumulative Impacts

Impacts would be similar to but larger than those described in 4.2.3.2.2, as the sites have substantially similar physical attributes and wildlife present. Approximately 160 acres of shallow open water would be converted to fresh marsh habitat.

4.2.4.3 Threatened and Endangered Species

4.2.4.3.1 Cataouatche Ponds Fresh Marsh Project

Direct and Indirect Impacts

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee are expected to potentially occur within the project area. The presence of construction-related activities, machinery, and noise would be expected to cause these species to avoid the project area during the construction period. However, in order to minimize the potential for construction activities to cause adverse impacts to manatees during the construction period, the standard manatee protection measures found in section 5.5.2 would be implemented.

Potential indirect impacts from the proposed action would primarily consist of effects from dredging operations, increased turbidity and benthic species removal. However, although the rise in turbidity could immediately reduce water quality in the project area, those effects would be temporary and would be reduced by movement of the tides. Any manatees in the area would be free to relocate during construction since the project area encompasses only a small section of a large estuarine/brackish lake. Additional foraging areas are available for manatees to utilize throughout Basin in the interim. As such, this project is not likely to adversely affect the West Indian manatee.

Cumulative Impacts

Potential cumulative impacts to threatened or endangered species (manatee) from construction of the Cataouatche Ponds project would involve the combined adverse effects on the species from the other projects within the Barataria Basin. Due to the size of Lake Cataouatche, the relatively small size of the borrow area, the temporary nature of the borrow activities, the use of a cutterhead dredge for borrow procurement, the duration of dredging, and the ability of these species to avoid the project area during the construction period, the Cataouatche Ponds project would add very little and only temporary impacts to any other impacts resulting from past, present and reasonably foreseeable projects in the Basin and would not contribute significantly to cumulative impacts to threatened and endangered species in the Basin.

4.2.4.3.2 GIWW/Salvador Fresh Marsh Project

Direct, Indirect and Cumulative Impacts

Impacts would be similar to but larger than those described in 4.2.3.3.2, as the sites have substantially similar physical attributes and T&E species present.

4.2.4.4 Fisheries, Aquatic Resources, and Water Quality

4.2.4.4.1 Cataouatche Ponds Fresh Marsh Project

Direct and Indirect Impacts

With implementation of this project, there would be some direct and indirect impacts to fisheries in the form of physically altered open water bottom habitat, and temporary increases in turbidity during construction activities. Approximately 110 acres of open water would be converted to fresh marsh habitat and no longer be available for open water fishery and aquatic species. Approximately 2,600 foot by 2,000 foot area of Lake Cataouatche would be deepened to approximately -20 feet NAVD88. It is anticipated that anoxic conditions would be avoided with this depth of dredging and that mobile fishery species would avoid the proposed borrow site during construction, thereby minimizing direct and indirect impacts to those species. Sediment particles suspended due to construction activities may impact filter feeding benthic invertebrates by fouling feeding apparatus if the concentration of such particles is excessively high at the dredge site and adjacent to the placement site. Due to the lack of escape routes, most fish species in the placement area would experience demise during borrow material placement. There would be a short term direct impact to the benthic community at the borrow site. The animals that are living on or in the dredged material would most likely be killed in either the transportation of the dredge material or the placement. The new bottom of the borrow pit would be quickly recolonized and species make up would be similar. There would be no long term impact. There would also be direct impact to the benthic community due to burial and conversion from open water to fresh marsh. These species are commonly found throughout the Basin in similar shallow water environments that exist in abundance. As such, impacts to the overall population of these species in the Basin from the borrow placement is expected to be negligible. Direct impacts caused by increases in suspended sediments during placement of stabilization materials would be minimal, localized, and short-lived.

Cumulative Impacts

Though construction of this project would result in the loss of fisheries habitat, some fish, and temporary impacts to water quality and benthic habitat; this habitat is abundant throughout the Basin, impacts to existing fisheries are minimal, and water quality and benthic species would rebound once project construction is complete. As such, construction of this project would result in minimal cumulative loss to fisheries, aquatic resources, and water quality experienced in the Basin from the past, present and reasonably foreseeable projects in the Basin.

The reinstatement of fresh marsh in areas that are currently open water could provide indirect benefits to fisheries in the future by providing nutrients to the system in the form of detritus. As a result of borrow placement and the type of containment utilized for this project, land adjacent to the mitigation project may receive material suspended in the dredge effluent. This would nourish adjacent marsh habitat and may cause adjacent

shallow open water to become shallower or be filled; encouraging the existing habitat to move through early successional phases faster.

These temporary impacts to water quality would add incrementally to similar cumulative impacts throughout the Basin as other projects listed in the FWOP conditions are constructed, causing temporary decreases in water quality throughout the Basin. However, those projects in the FWOP conditions which include marsh restoration as well as the HSDRRS Mitigation could have the long-term beneficial impact of increased dissolved oxygen and increased filtration which helps control local turbidity. The temporary impacts to Lake Cataouatche from borrow excavation are not anticipated to be substantial enough to cause water quality impairment under the standards of Louisiana Administrative Code, Title 33, Part IX, Chapter 11. Impacts in the fill area would temporarily add to the water quality impairment of this sub-segment through increased turbidity, but these impacts would be minimized through BMPs and would cease after construction. Although there would be a loss of open water from construction of this project, open water is found in abundance throughout the Barataria Basin. There would be a positive indirect and cumulative impact on fisheries and aquatic species due to the long term stability of the new fresh marsh.

4.2.4.4.2 GIWW/Salvador Fresh Marsh Project

Direct, Indirect and Cumulative Impacts

Impacts would be similar to but smaller than those described in Section 4.2.4.4.1. The impacted area would be approximately 160 acres of new fresh marsh and approximately 4,000 foot by 1,800 foot of borrow in Lake Salvador which would deepen to approximately -20 feet NAVD88. This design will create a more productive habitat, however with the rock construction design, access would be limited, even with fish dips. The temporary water impacts to Lake Salvador from borrow excavation are not anticipated to be substantial enough to cause water quality impairment under the standards of Louisiana Administrative Code, Title 33, Part IX, Chapter 11. There would be a positive indirect and cumulative impact on fisheries and aquatic species due to the long term stability of the new fresh marsh.

4.2.4.5 Essential Fish Habitat

4.2.4.5.1 Cataouatche Ponds Fresh Marsh Project

Direct and Indirect Impacts

See Section 3.2.5.5.1 for a description of the EFH at the project site. Several types of EFH associated with open water would be permanently replaced with fresh marsh and other associated EFH. Negative impacts to the existing EFH would be more than offset by the creation of fresh marsh since the support functions of the created marsh is greater than the support functions of the existing open water. Compensatory mitigation for the conversion of EFH would not be required. Excavation of borrow from Lake Cataouatche would deepen estuarine water column and may expose a different bottom

substrate, which could impact managed species by reducing available cover and foraging habitat.

Cumulative Impacts

This project would cause one type of EFH in the Basin to be replaced by another type of EFH. The switching of EFH types from construction of the proposed project is not anticipated to have a significant impact to the overall EFH in the Basin. Impacts to cover and foraging for managed species are not anticipated to contribute significant increases in cumulative impacts to managed species as the borrow area is small in size compared to the available EFH habitat in the Basin providing similar habitat.

4.2.4.5.2 GIWW/Salvador Fresh Marsh Project

Direct and Indirect Impacts

See Section 3.2.5.5.2 for a description of the EFH present at the project site. Several types of EFH associated with open water would be permanently replaced with estuarine emergent marsh and other associated EFH. Negative impacts to the existing EFH would be more than offset by the creation of fresh marsh since the support functions of the created marsh is greater than the support functions of the existing open water. Compensatory mitigation for the conversion of EFH would not be required. Excavation of borrow from Lake Salvador would deepen estuarine water column and may expose a different bottom substrate, which could impact managed species by reducing available cover and foraging habitat.

Cumulative Impacts

This project would cause one type of EFH in the Basin to be replaced by another type of EFH. The switching of EFH types from construction of the proposed project is not anticipated to have a significant impact to the overall EFH in the Basin. Impacts to cover and foraging for managed species are not anticipated to contribute significant increases in cumulative impacts to managed species as the borrow area is small in size compared to the available EFH habitat in the Basin providing similar habitat.

4.2.4.6 Cultural Resources

4.2.4.6.1 Cataouatche Ponds Fresh Marsh Project

Direct and Indirect Impacts

It is not likely that activities associated with the proposed restoration project would have a direct impact on cultural resources within the project area. Submerged cultural resources could exist in the proposed borrow source located in Lake Cataouatche, and the removal of borrow could have a direct impact on those cultural resources. Identified cultural resources that are determined to be eligible for listing or are listed on the NRHP would be avoided. If avoidance is not possible, strategies would be developed in consultation with the SHPO and Federally-recognized Indian tribes to mitigate for adverse effects to significant cultural resources.

Cumulative Impacts

Cumulative impacts would be similar to those described in Section 4.2.1.6.1.

4.2.4.6.2 GIWW/Salvador Fresh Marsh Project

Direct and Indirect Impacts

It is not likely that activities associated with the proposed restoration project would have a direct impact on cultural resources within the project area. Submerged cultural resources could exist in the proposed borrow source located in Lake Salvador, and the removal of borrow could have a direct impact on those cultural resources. Identified cultural resources that are determined to be eligible for listing or are listed on the NRHP would be avoided. If avoidance is not possible, strategies would be developed in consultation with the SHPO and Federally-recognized Indian tribes to mitigate for adverse effects to significant cultural resources.

Cumulative Impacts

Cumulative impacts would be similar to those described in Section 4.2.1.6.1.

4.2.4.7 Recreational Resources

4.2.4.7.1 Cataouatche Ponds Fresh Marsh Project

Direct and Indirect Impacts

Approximately 110 acres of water would be converted to marsh in Cataouatche Pond within Jean Lafitte National Historical Park and Preserve. Boating would be eliminated within the project area. Water fowl hunting is allowed within JLNHPP and the marsh creation project may increase duck hunting opportunities. A mature marsh creation project may also increase opportunities for bird watching as the marsh project should provide habitat for wading birds, shorebirds, raptors, rabbits, and deer (LCWCRTF and WCRA, 1999). However, there may be less fishing opportunities. Once established, portions of the marsh may be accessible by air boats and vessels with very shallow draft. During construction of the mitigation feature, duck hunting in the immediate vicinity of the features could also be adversely affected as a result of construction noise scaring ducks away from the area.

Borrow material necessary for construction of the proposed marsh project would be obtained from Lake Cataouatche using a floating pipeline. Dredging activities would increase the turbidity in the area of work and in the vicinity of the discharge pipes. This turbidity may disrupt water-oriented recreational activity occurring within the vicinity; however, these adverse impacts would be temporary and of short duration. Recreational boating in the immediate area of the borrow site could be adversely affected during the period of dredging operations. Any impact would be minimized through appropriate coordination with the US Coast Guard. The proposed marsh feature may, however, benefit recreational fish species in the long-term through the assimilation of nutrients and capture of suspended sediments in area waters.

Cumulative Impacts

Cumulative impacts would be similar to those described in Section 4.2.2.7.1.

4.2.4.7.2 GIWW/Salvador Fresh Marsh Project

Direct and Indirect Impacts

Approximately 160 acres of water would be converted to marsh at the GIWW/Salvador project site. Boating would be eliminated within the project area. Water fowl hunting may be affected by the marsh creation initially, but overtime as the marsh matures, duck hunting opportunities may increase. There would be the potential for recreation opportunities such as canoeing/kayaking and minimal fishing after marsh creation.

Borrow material necessary for construction of the marsh feature would be obtained from Lake Salvador. Dredging activities would increase the turbidity in the area of work and in the vicinity of the discharge pipes. This turbidity may disrupt water-oriented recreational activity occurring within the vicinity; however, these adverse impacts would be temporary and of short duration. Recreational boating navigation in the immediate area of the borrow site could be adversely affected during the period of two dredging operations which include hydraulically dredging of fill material from a borrow site within Lake Salvador. Additionally, a floating pipeline will be used to convey dredge material to the mitigation site. Any recreational boating impact would be minimized through appropriate coordination with the US Coast Guard. The proposed marsh feature may, however, benefit recreational fish species in the long-term through the assimilation of nutrients and capture of suspended sediments in area waters.

Fishing in the general area may improve because of the fresh marsh habitat increasing spawning, nursery, forage and cover habitat for recreational fisheries resources including red drum, gulf menhaden, southern flounder, white and brown shrimp, blue crab, largemouth bass, and channel catfish (LCWCRTF and WCRA, 1999).

Cumulative Impacts

Cumulative impacts would be similar to those described in Section 4.2.2.7.1.

4.2.4.8 Air Quality

4.2.4.8.1 Cataouatche Ponds Fresh Marsh Project

Direct and Indirect Impacts

During construction of this project, an increase in air emissions could be expected. These emissions could include exhaust emissions from operations of various types of non-road construction equipment such as a cutterhead dredge, backhoes, tractors, etc. and from vehicles used to access the project area. Fugitive dust emissions are not anticipated during construction.

Any site-specific construction effects to air quality would be temporary, and air quality would return to pre-construction conditions shortly after the completion of construction

activities. Because the project area is in a parish in attainment of NAAQS, a conformity analysis is not required.

There would be no adverse indirect impacts to air quality in the parish with construction of the proposed action.

Cumulative Impacts

Cumulative impacts would be similar to those described in Section 4.2.2.8.1.

4.2.4.8.2 GIWW/Salvador Fresh Marsh Project

Direct, Indirect and Cumulative Impacts

Construction activities and emissions from equipment and fugitive dust for this project would be similar to those resulting from the Cataouatche Ponds Fresh Marsh Project, and the parish is in attainment of NAAQS. Therefore, direct, indirect, and cumulative impacts would be similar to those described in Sections 4.2.2.8.1 and 4.2.4.8.1

4.2.4.9 Noise

4.2.4.9.1 Cataouatche Ponds Fresh Marsh Project

Direct and Indirect Impacts

Cutterhead dredges, backhoes, slurry pumps, marsh tracked vehicles and barge mounted equipment would be the primary pieces of equipment used for construction of this project. These pieces of equipment exceed noise levels above 55 dBA. Noise levels may result in wildlife avoiding the project area during construction; however, movement of equipment during construction would result in the same avoidance behaviors from wildlife species. Noise levels quickly drop off once a buffer is established between the noise source and the receptor (e.g. vegetation). As such, any wildlife in the adjacent habitats should be largely undisturbed by the additional noise from this project's construction. No impact to human populations is anticipated as this project area is remote and uninhabited.

Cumulative Impacts

Cumulative impacts would be similar to those described in Section 4.2.2.9.1.

4.2.4.9.2 GIWW/Salvador Fresh Marsh Project

Direct and Indirect Impacts

Cutterhead dredges, backhoes, slurry pumps, marsh tracked vehicles and barge mounted equipment would be the primary pieces of equipment used for construction of this project. These pieces of equipment exceed noise levels above 55 dBA. Noise levels may result in wildlife avoiding the project area during construction; however, movement of equipment during construction would result in the same avoidance behaviors from wildlife species. Noise levels quickly drop off once a buffer is established between the noise source and the receptor (e.g. vegetation). As such, any

wildlife in the adjacent habitats should be largely undisturbed by the additional noise from this project's construction. No impact to human populations is anticipated as this project area is remote and uninhabited.

Cumulative Impacts

Construction of this project is not anticipated to add significantly to the cumulative effect of noise in the Basin as the construction activities would be temporary and the area is remote. Cumulatively noise impacts would be produced by other redevelopment, diversion and coastal restoration, and transportation projects, but they would not all be under construction at the same time.

4.2.4.10 Hazardous, Toxic, and Radioactive Waste

4.2.4.10.1 Cataouatche Ponds Fresh Marsh Project

Direct, Indirect and Cumulative Impacts

No RECs were found within Cataouatche Ponds Fresh Marsh project. The area is currently open water. It would be filled with dredged material from a borrow site in Lake Cataouatche to establish a platform, which would allow native marsh plants to colonize. USACE Engineer Regulation, ER 1165-2-132, HTRW for Civil Works Projects, states that dredged material and sediments beneath navigable waters proposed for dredging qualify as HTRW only if they are within the boundaries of a site designated by the EPA or a state for a response action (either a removal or a remedial action) under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), or if they are a part of an National Priority List (NPL) site under CERCLA. None of the area proposed for dredging is included in the NPL or within the boundaries of a CERCLA site.

There is a low probability of encountering HTRW or petroleum products in the Cataouatche Ponds project area. No direct, indirect, or cumulative impacts are expected at this project site.

4.2.4.10.2 GIWW/Salvador Fresh Marsh Project

Direct, Indirect, and Cumulative Impacts

Four RECs — one dry and plugged well, one oil/gas well with an expired permit, and two petroleum product pipelines — were found within the potential GIWW/Lake Salvador project area. The area is currently open water. It will be filled with dredged material from a borrow site in Lake Salvador to establish a platform that would allow native marsh plants to colonize. USACE Engineer Regulation, ER 1165-2-132, HTRW for Civil Works Projects, states that dredged material and sediments beneath navigable waters proposed for dredging qualify as HTRW only if they are within the boundaries of a site designated by the EPA or a state for a response action (either a removal or a remedial action) under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), or if they are a part of an National Priority List

(NPL) site under CERCLA. None of the area proposed for dredging is included in the NPL or within the boundaries of a CERCLA site.

There is a low probability of encountering HTRW or petroleum products in the GIWW/Lake Salvador project area. No direct, indirect, or cumulative impacts are expected at this project site provided the proper precautions are taken to avoid the pipelines and oil/gas wells.

4.2.4.11 Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

4.2.4.11.1 Cataouatche Ponds Fresh Marsh Project

Direct, Indirect and Cumulative Impacts

The proposed project would have minimal to no direct and indirect impacts on population and housing in the affected area, given the proposed project site's remote nature. The proposed project would have no discernable impact on the business and industry of the affected area.

The proposed project site's use would not change after the project's implementation. The proposed access channel and pipeline route would cross privately owned land. Park staff have indicated the land owner would be willing to allow access to the construction team, but land use would not be affected.

Dredging of material for placement in the fresh marsh project will come from Lake Cataouatche where commercial fishing takes place. There could be short-term, temporary direct and indirect impacts at the borrow site and in waters surrounding the site as dredging activities will increase turbidity. Commercial fisherman will relocate to other waters during dredging periods.

According to 2010 U.S. Census data, there are no residents located within the boundaries of the Cataouatche Marsh Restoration project and therefore no minority or low-income populations would be adversely impacted.

There are no direct, indirect or cumulative impacts on transportation from the proposed project. Navigation of commercial or recreational boats within the Cataouatche Ponds will not be allowed during project construction. However, once the marsh matures, small boats will be able to easily navigate in the project area.

4.2.4.11.2 GIWW/Salvador Fresh Marsh Project

Direct, Indirect and Cumulative Impacts

The proposed project will have minimal or no direct and indirect impacts on population or housing in the affected area, due to the project's remote location. The proposed project may have nominal, positive impacts on Lafourche Parish's tourism industry, as the project proposes increasing wetland area. The site is located in a designated wildlife preserve and the land will continue to be used as such after project implementation

According to 2010 U.S. Census data, there are no residents located within the boundaries of the GIWW/Salvador project project and therefore no minority or low-income populations would be adversely impacted.

Indirect impacts to commercial fishing in Lake Salvador from dredging activities would be similar to those described for the Lake Salvador swamp project, section 4.2.3.11.2.

There are no direct, indirect or cumulative impacts on transportation from the proposed project. Navigation of commercial boats along the shoreline of Lake Salvador will be not be possible once the open water is converted to marsh. However, recreational boats will be able to easily navigate within and around the project area in the lake. There would be no direct or indirect impacts to navigation on the GIWW.

4.2.5 MITIGATION FOR BRACKISH MARSH IMPACTS

4.2.5.1 Wetlands and Other Surface Waters

4.2.5.1.1 Coleman Brackish Marsh Project

Direct and Indirect Impacts

See Section 3.2.6.1.1 for a description of wetland resources at this project site. There would be a beneficial impact to wetlands as approximately 230 acres of open water habitat would be converted to brackish marsh habitat. Indirectly, these restored wetlands would produce nutrients and detritus which are important health and persistence of other wetlands in the Barataria Bay estuary thereby contributing to their overall productivity. Although there would be a loss of 230 acres of open water in the basin, large amounts of wetlands are converting to open water in the basin every year and open water is prevalent in the basin. See the Fisheries, Aquatic Resources, and Water Quality sections for analysis of borrow pit impacts.

Cumulative Impacts

Implementation of this project would prevent an overall loss in the Basin of brackish marsh habitat. This project, when added to other past, present, and reasonably foreseeable ecosystem restoration and mitigation projects in the Basin would help retard the loss of wetlands. There would be an overall loss of open water habitat in the Basin, but no permanent adverse impacts are anticipated because this habitat is prevalent throughout the Basin.

4.2.5.1.2 Defelice Brackish Marsh Project

Direct, Indirect and Cumulative Impacts

See Section 3.2.6.1.2 for a description of the wetland resources at this project site. Impacts would be similar to, but larger than, those described in 4.2.5.1.1, as the sites

have substantially similar physical attributes and habitat present. Approximately 345 acres of open water habitat would be converted to brackish marsh habitat.

4.2.5.2 Wildlife

4.2.5.2.1 Coleman Brackish Marsh Project

Direct and Indirect Impacts

Approximately 230 acres of shallow open water would be converted to brackish marsh habitat. This conversion would eliminate wintering habitat for brown pelican, and increase habitat for white-tailed deer, skunks, rabbits, squirrels and armadillos; various raptors such as barred owls, red-shouldered hawks, northern harriers (marsh hawks), American kestrel, and red-tailed hawks; passerine birds such as sparrows, vireos, warblers, Northern mockingbirds, grackles, red-winged blackbirds, wrens, blue jays, northern cardinals, and crows. The brackish marsh habitat would offer new shelter, nesting, mating, and foraging grounds for these species. Other wildlife outside the project may indirectly benefit from having this area as an additional territory for foraging and mating opportunities.

Any wildlife present at the time of construction would be temporarily displaced. The common inhabitants of this area are avian species which are fully equipped to relocate to nearby open water. A survey would be performed prior to construction to identify the presence of colonial nesting water birds or nesting bald eagles. If colonial nesting water birds are present, BMPs, developed in coordination with USFWS, would be implemented to avoid potential impacts. See Sections 5.4.1 and 8.2. If nesting bald eagles are present, the National Bald Eagle Management Guidelines would be followed.

Cumulative Impacts

This project would prevent an overall loss in the Basin of brackish marsh habitat necessary for many wildlife species. This project, when added to other past, present, and reasonably foreseeable future ecosystem restoration and mitigation projects in the Basin, would help reduce the loss of wetlands and overall decline of wildlife species within the Basin and would be beneficial to preserving species biodiversity.

4.2.5.2.2 Defelice Brackish Marsh Project

Direct, Indirect and Cumulative Impacts

Impacts would be similar to but larger than those described in 4.2.5.2.1, as the sites have substantially similar physical attributes and wildlife present. Approximately 345 acres of shallow open water would be converted to brackish marsh habitat.

4.2.5.3 Threatened and Endangered Species

4.2.5.3.1 Coleman Brackish Marsh Project

Direct and Indirect Impacts

Of the animals and plants under USFWS and/or NMFS jurisdiction, only the West Indian manatee and pallid sturgeon are expected to potentially occur within the project area. The presence of construction-related activities, machinery, and noise would be expected to cause this species to avoid the project area during the construction period. However, in order to minimize the potential for construction activities to cause adverse impacts to manatees or pallid sturgeon during the construction period, the standard manatee protection measures and pallid sturgeon protection measures found in section 5.5.2 would be implemented.

Potential indirect impacts from the proposed action would primarily consist of effects from dredging operations, increased turbidity and benthic species removal. However, although the rise in turbidity could immediately reduce water quality in the project area, those effects would be temporary and would be reduced by movement of the tides. Any manatees or pallid sturgeon in the area would be free to relocate during construction since the project area encompasses only a small section of a large estuarine/brackish lake. Additional foraging areas are available for manatees to utilize throughout the Basin in the interim. As such, this project is not likely to adversely affect the West Indian manatee.

Cumulative Impacts

Potential cumulative impacts to threatened or endangered species (manatee or pallid sturgeon) from construction of the Coleman project would involve the combined adverse effects on the species from the other projects within the Basin. Due to the size of the Mississippi River, the relatively small size of the borrow area, the temporary nature of the borrow activities, the use of a cutterhead dredge for borrow procurement, the duration of dredging, and the ability of these species to avoid the project area during the construction period, the Coleman project would add very little and only temporary impacts to any other impacts resulting from past, present and reasonably foreseeable projects in the Basin and would not contribute significantly to cumulative impacts to threatened and endangered species in the Basin.

4.2.5.3.2 Defelice Brackish Marsh Project

Direct, Indirect and Cumulative Impacts

Impacts would be similar to but larger than those described in 4.2.5.3.1, as the sites have substantially similar physical attributes and T&E present.

4.2.5.4 Fisheries, Aquatic Resources, and Water Quality

4.2.5.4.1 Coleman Brackish Marsh Project

Direct and Indirect Impacts

See Section 3.2.6.4.1 for a description of the resources at this project site. With implementation of this project, there would be some direct and indirect impacts to fisheries in the form of physically altered open water bottom habitat, and temporary increases in turbidity during construction activities. Approximately 230 acres of open water would be converted to brackish marsh habitat and no longer be available for open water fishery and aquatic species. Approximately 348 acres of the Mississippi River would be deepened to approximately -90 feet NAVD88. It is anticipated that anoxic conditions would be avoided with this depth of dredging and that mobile fishery species would avoid the proposed borrow site during construction, thereby minimizing direct and indirect impacts to those species. Sediment particles suspended due to construction activities may impact filter feeding benthic invertebrates by fouling feeding apparatus if the concentration of such particles is excessively high at the dredge site and adjacent to the placement site. Due to the lack of escape routes, most fish species in the placement area would experience demise during borrow material placement. There would be a short term direct impact to the benthic community at the borrow site. The animals that are living on or in the dredged material would most likely be killed in either the transportation of the dredge material or the placement. The new bottom of the borrow pit would be quickly recolonized and species make up would be similar. There would be no long term impact. There would also be direct impact to the benthic community due to burial and conversion from open water to brackish marsh. These species are commonly found throughout the Basin in similar shallow water environments that exist in abundance. As such, impacts to the overall population of these species in the Basin from the borrow placement is expected to be negligible. Direct impacts caused by increases in suspended sediments during placement of stabilization materials would be minimal, localized, and short-lived.

Cumulative Impacts

Though construction of this project would result in the loss of fisheries habitat, some fish, and temporary impacts to water quality and benthic habitat; this habitat is abundant throughout the Basin, impacts to existing fisheries are minimal, and water quality and benthic species would rebound once project construction is complete. As such, construction of this project would result in minimal loss to fisheries, aquatic resources, and water quality experienced in the Basin from the past, present and reasonably foreseeable projects in the Basin. The reinstatement of brackish marsh in areas that are currently open water could provide indirect benefits to fisheries in the future by providing nutrients to the system in the form of detritus. As a result of borrow placement and the type of containment utilized for this project, land adjacent to the mitigation project may receive material suspended in the dredge effluent. This would nourish adjacent marsh habitat and may cause adjacent shallow open water to become shallower or be filled; encouraging the existing habitat to move through early successional phases faster.

These temporary impacts to water quality would add incrementally to similar cumulative impacts throughout the Basin as other projects listed in the FWOP conditions are constructed, causing temporary decreases in water quality throughout the Basin. However, those projects in the FWOP conditions which include marsh restoration as well as the HSDRRS Mitigation could have the long-term beneficial impact of increased dissolved oxygen and increased filtration which helps control local turbidity. The temporary impacts to the Mississippi River from borrow excavation are not anticipated to be substantial enough to cause water quality impairment under the standards of Louisiana Administrative Code, Title 33, Part IX, Chapter 11. Impacts in the fill area would temporarily add to the water quality impairment of this sub-segment through increased turbidity, but these impacts would be minimized through BMPs and would cease after construction. Although there would be a loss of open water from construction of this project, open water is found in abundance throughout the Barataria Basin. There would be a positive indirect and cumulative impact on fisheries and aquatic species due to the long term stability of the new brackish marsh.

The project site would be located close to the proposed Mid Barataria sediment diversion site. The sediment diversion could potentially create a habitat shift from brackish to more fresh marsh, however, this would be in line with the State of Louisiana's master plan which supports marsh creation.

4.2.5.4.2 Defelice Brackish Marsh Project

Direct, Indirect and Cumulative Impacts

See Section 3.2.6.4.2 for a description of the resources at the project site. Impacts would be similar to but greater than those described in Section 4.2.5.4.1 for the approximately 345 acres of new brackish marsh in north of Lake Hermitage and approximately 348 acre of borrow in the Mississippi River which would deepen to approximately -90 feet NAVD88. The temporary water impacts to the Mississippi River from borrow excavation are not anticipated to be substantial enough to cause water quality impairment under the standards of Louisiana Administrative Code, Title 33, Part IX, Chapter 11. Since marsh is more productive than open water, there would be a positive indirect and cumulative impact on fisheries and aquatic species due to the long term stability of the new fresh marsh habitat.

4.2.5.5 Essential Fish Habitat

4.2.5.5.1 Coleman Brackish Marsh Project

Direct and Indirect Impacts

See Section 3.2.6.5.1 for a description of the EFH at this project site. Several types of EFH associated with open water would be permanently replaced with brackish marsh and other associated EFH. Negative impacts to the existing EFH would be more than offset by the creation of brackish marsh since the support functions of the created marsh is greater than the support functions of the existing open water. Compensatory mitigation for the conversion of EFH would not be required. Excavation of borrow from the Mississippi River would deepen the water column and may expose a different

bottom substrate, which could impact managed species by reducing available cover and foraging habitat.

Cumulative Impacts

This project would cause one type of EFH in the Basin to be replaced by another type of EFH. The switching of EFH types from construction of the proposed project is not anticipated to have a significant impact to the overall EFH in the Basin. Impacts to cover and foraging for managed species are not anticipated to contribute significant increases in cumulative impacts to managed species as the borrow area is small in size compared to the available EFH habitat in the Basin providing similar habitat.

4.2.5.5.2 Defelice Brackish Marsh Project

Direct and Indirect Impacts

See Section 3.2.6.5.2 for a description of the EFH at this project site. Several types of EFH associated with open water would be permanently replaced with brackish marsh and other associated EFH. Negative impacts to the existing EFH would be more than offset by the creation of brackish marsh since the support functions of the created marsh is greater than the support functions of the existing open water. Compensatory mitigation for the conversion of EFH would not be required. Excavation of borrow from the Mississippi River would deepen the water column and may expose a different bottom substrate, which could impact managed species by reducing available cover and foraging habitat.

Cumulative Impacts

This project would cause one type of EFH in the Basin to be replaced by another type of EFH. The switching of EFH types from construction of the proposed project is not anticipated to have a significant impact to the overall EFH in the Basin. Impacts to cover and foraging for managed species are not anticipated to contribute significant increases in cumulative impacts to managed species as the borrow area is small in size compared to the available EFH habitat in the Basin providing similar habitat.

4.2.5.6 Cultural Resources

4.2.5.6.1 Coleman Brackish Marsh Project

Direct and Indirect Impacts

This project has not been previously surveyed for cultural resources. Although the potential does exist, modern activities and conditions give this area a low probability to contain intact cultural resources. Removal of borrow material from the Mississippi River is not likely to directly impact any known or previously unrecorded cultural resources or shipwrecks, because the river is regularly dredged to maintain navigation. Identified cultural resources that are determined to be eligible for listing or are listed on the NRHP would be avoided. If avoidance is not possible, strategies would be developed in

consultation with the SHPO and Federally-recognized Indian tribes to mitigate for adverse effects to significant cultural resources.

Cumulative Impacts

Cumulative impacts will be similar to those described in Section 4.2.1.6.1.

4.2.5.6.2 Defelice Brackish Marsh Project

Direct and Indirect Impacts

Due to similarities in project activities, project locations, and the low probability for the presence of intact cultural resources, direct and indirect impacts would be similar to those described in the immediately preceding Section, 4.2.5.6.1.

Cumulative Impacts

Cumulative impacts would be similar to those described in Section 4.2.1.6.1.

4.2.5.7 Recreational Resources

4.2.5.7.1 Coleman Brackish Marsh Project

Direct and Indirect Impacts

Approximately 230 acres of shallow, open water and mud bottom would be replaced with brackish marsh, increasing recreational opportunities in the area as the new habitat will provide spawning, nursery, forage and cover habitat for fish species including red drum, gulf menhaden, southern flounder, white and brown shrimp, and blue crab (LCWCRTF and WCRA, 1999). The recreational environment in and around the project area would experience limited short-term disruption imposed by the physical size and working activities of the construction phase of the project. With marsh creation, there would also be the potential for recreation opportunities such as duck hunting. Positive long-term benefits would be the creation of the marsh and the added benefits of providing shelter and habitat for wildlife.

Borrow material necessary for construction of the marsh feature would be obtained from the Mississippi river. Because minimal recreation takes place in the Mississippi River, there will be no impacts to recreation resources from excavation of dredge material or placement of the overland/water pipeline.

Fishing in the general area may improve because of the brackish marsh habitat increasing spawning, nursery, forage and cover habitat for recreational fisheries resources including red drum, gulf menhaden, southern flounder, white and brown shrimp, blue crab, largemouth bass, and channel catfish (LCWCRTF and WCRA, 1999).

Cumulative Impacts

Cumulative impacts will be similar to those described in Section 4.2.2.7.1.

4.2.5.7.2 Defelice Brackish Marsh Project

Direct and Indirect Impacts

The project would eliminate approximately 345 acres of open water that is currently available for boating and fishing in the privately-owned water body. Species would relocate during project construction. The recreational environment in and around the project area would experience limited short-term disruption imposed by the physical size and working activities of the construction phase of the project. Positive long-term benefits would be the creation of the marsh and the added benefits of providing shelter and habitat for wildlife. With brackish marsh creation, there would be the potential for public recreation opportunities such as duck hunting and canoeing/kayaking if access is available. Following construction of the proposed brackish marsh, portions of the marsh may still be navigable by recreation air boats or very shallow draft vessels (kayaks, skiffs, etc.), but not by watercraft with deeper draft.

Borrow material necessary for construction of this project would be obtained from the Mississippi River. Minimal direct impacts to recreational resources are expected to occur from dredging the borrow source in the River.

Brackish marsh would also improve the habitat for recreational species in the area around the site by increasing spawning, nursery, forage and cover habitat for fisheries resources including red drum, gulf menhaden, southern flounder, white and brown shrimp, and blue crab (LCWCRTF and WCRA, 1999). Turbidity from construction of the brackish marsh project could impede on surrounding waters. However, any indirect impact on recreational resources will be short lived and water conditions should return to pre-construction conditions.

Cumulative Impacts

Cumulative impacts will be similar to those described in Section 4.2.2.7.1.

4.2.5.8 Air Quality

4.2.5.8.1 Coleman Brackish Marsh Project

Direct and Indirect Impacts

During construction of this project, an increase in air emissions could be expected. These emissions could include exhaust emissions from operations of various types of non-road construction equipment such as a cutterhead dredge, backhoes, tractors, crew boats, and from vehicles used to access the project area. Fugitive dust emissions are not anticipated during construction.

Any site-specific construction effects to air quality would be temporary, and air quality would return to pre-construction conditions shortly after the completion of construction activities. Because the project area is in a parish in attainment of NAAQS, a conformity analysis is not required.

There would be no adverse indirect impacts to air quality with construction of the proposed action.

Cumulative Impacts

Cumulative Impacts would be similar to those identified in Section 4.2.2.8.1.

4.2.5.8.2 Defelice Brackish Marsh Project

Direct, Indirect and Cumulative Impacts

Construction activities and emissions from equipment and fugitive dust for this project would be similar to those resulting from the Cataouatche Ponds Fresh Marsh Project, and the parish is in attainment of NAAQS. Therefore, direct, indirect, and cumulative impacts would be similar to those described in Sections 4.2.2.8.1 and 4.2.5.8.1.

4.2.5.9 Noise

4.2.5.9.1 Coleman Brackish Marsh Project

Direct, Indirect, and Cumulative Impacts

Due to similarities in construction activities and equipment, and the lack of residences located within the project area, direct and indirect, and cumulative impacts would be similar to those described in Section 4.2.2.9.1.

4.2.5.9.2 Defelice Brackish Marsh Project

Direct and Indirect Impacts

Cutterhead dredges, backhoes, slurry pumps, marsh tracked vehicles and barge mounted equipment would be the primary pieces of equipment used for construction of this project. These pieces of equipment exceed noise levels above 55 dBA. Noise levels may result in wildlife avoiding the project area during construction; however, movement of equipment during construction would result in the same avoidance behaviors from wildlife species. Residences east of the project along Lake Hermitage Road and LA Hwy 23 could experience higher than ambient noise levels during construction, however these levels would be temporary during the period of construction and would be limited to daylight hours.

Cumulative Impacts

Construction of this project is not anticipated to add significantly to the cumulative effect of noise in the Basin as the construction activities would be restricted to daylight hours, temporary, and all NFL NOV construction is anticipated to end in 2022. Cumulatively noise impacts would be produced by other redevelopment, diversion and coastal restoration, and transportation projects, but they would not all be under construction at the same time.

4.2.5.10 Hazardous, Toxic, and Radioactive Waste

4.2.5.10.1 Coleman Brackish Marsh Project

Direct, Indirect and Cumulative Impacts

No RECs were found within the Coleman project area. The area is currently open water. It would be filled with dredged material from a borrow site in in the Mississippi River to establish a platform, which would allow native marsh plants to colonize. USACE Engineer Regulation, ER 1165-2-132, HTRW for Civil Works Projects, states that dredged material and sediments beneath navigable waters proposed for dredging qualify as HTRW only if they are within the boundaries of a site designated by the EPA or a state for a response action (either a removal or a remedial action) under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), or if they are a part of an National Priority List (NPL) site under CERCLA. None of the area proposed for dredging is included in the NPL or within the boundaries of a CERCLA site.

The dredge material pipeline would cross two natural gas pipelines that would be considered RECs. Precautions must be taken to prevent damage to or breakage of the pipelines.

There is a low probability of encountering HTRW or petroleum products in the Coleman project area. No direct, indirect, or cumulative impacts are expected at this project site provided the proper precautions are taken to avoid breaking or damaging the natural gas pipelines.

4.2.5.10.2 Defelice Brackish Marsh Project

Direct, Indirect and Cumulative Impacts

No RECs were found within the potential Defelice project area. The area is currently open water. It would be filled with dredged material from a borrow site in in the Mississippi River to establish a platform, which would allow native marsh plants to colonize. USACE Engineer Regulation, ER 1165-2-132, HTRW for Civil Works Projects, states that dredged material and sediments beneath navigable waters proposed for dredging qualify as HTRW only if they are within the boundaries of a site designated by the EPA or a state for a response action (either a removal or a remedial action) under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), or if they are a part of an National Priority List (NPL) site under CERCLA. None of the area proposed for dredging is included in the NPL or within the boundaries of a CERCLA site.

The dredge material pipeline would cross one crude-oil pipeline that would be considered a REC. Precautions must be taken to prevent damage to or breakage of the pipeline.

There is a low probability of encountering HTRW or petroleum products in the Coleman project area. No direct, indirect, or cumulative impacts are expected at this project site provided the proper precautions are taken to avoid breaking or damaging the crude-oil pipeline.

4.2.5.11 Socioeconomics/Land Use, Environmental Justice, Transportation, Navigation, and Commercial Fisheries

4.2.5.11.1 Coleman Brackish Marsh Project

Direct, Indirect and Cumulative Impacts

The proposed project is likely to have minimal to no direct or indirect impacts on population, as the project site is located well west of housing located between LA Hwy 23 and the Mississippi River. The proposed project site will have little to no impact on business and industry in the affected area.

The proposed project will convert private land into brackish marsh. Although the land is not currently used for profit, the landowner will forfeit any future potential opportunities to use the land for gaining profit.

According to 2010 U.S. Census data, there are no residents located within the boundaries nor in the vicinity of the Coleman Brackish Marsh Restoration project and therefore no minority or low-income populations would be adversely impacted.

There are no long-term direct, indirect or cumulative impacts on transportation or commercial fishing from the proposed project. Fisherman in boats will not be able to access the project site during construction. However, boats will be able to easily navigate around the project area during and after construction.

4.2.5.11.2 Defelice Brackish Marsh Project

Direct, Indirect and Cumulative Impacts

Due to the similarities in project activities and socioeconomic/land use resources in the project area, direct, indirect and cumulative impacts from construction of the Defelice Brackish Marsh project are expected to be similar to those described for the Coleman site, section 4.2.5.11.1.

5.0 ENVIRONMENTAL CONSEQUENCES OF PLAN ALTERNATIVES

5.1 INTRODUCTION

This section describes the direct, indirect and cumulative effects of the No Action Alternative and the TSA. The TSA is comprised of the New ROW for NOV 09 and NOV-NF-W-05a.1, as well as the TSMP. The TSMP is in turn comprised of five projects

designed to mitigate all impacts that have already occurred, and that are projected to occur, as a result of the construction of NFL sections 1-5 and NOV reaches 02, 05A, 05B, 06B, 07A, 07B, 08B, 09, 10, 11, 13, 14, P-14a, and P-17a.

Total impacts for which compensatory mitigation is required was originally calculated using the actions as proposed in the NFL EIS, SEA #537, and NOV SEIS. It has since been adjusted to reflect the reduction in impacts that utilization of the proposed new ROW for NOV 09 and NOV NF-W-05a.1 would result in. It has been further adjusted to reflect the additional impacts that were incurred to saline marsh and scrub shrub habitats during construction of NOV 05A utilizing additional ROW, as described in Section 2.1.

5.1.1 No Action – Overview

Direct Impacts

Under the No Action alternative, the ROW for NOV 09 and NOV-NF-W-05a.1 would not change from that which was described in the NOV SEIS, NFL EIS and SEA #537, and no compensatory mitigation for impacts already incurred or impacts projected to occur would take place. However, impacts incurred from utilizing additional ROW during the construction of NOV 05A would be part of the No Action since construction in this reach is now complete.

Wetlands and other surface waters, wildlife, threatened and endangered species, fisheries, aquatic resources, water quality, EFH, cultural resources, recreational resources, air quality, noise, HTRW, socioeconomics/land use, environmental justice, transportation, navigation, and commercial fisheries within the Basin would be impacted from construction of the approved actions for NOV 09 and NOV-NF-W-05a.1 described in the NFL EIS, SEA #537, NOV SEIS, as well as from the construction that has already occurred at NOV 05A.

More specifically, NOV-NF-W-05a.1, which is part of Section 2 as described in the NFL EIS and SEA #537, would directly impact approximately 43.3 acres of wet pasture. Reaches NOV 09 and NOV 05A, as described in the NOV SEIS, would directly impact approximately 40.6 acres of BLH-Wet, 21.9 acres of saline marsh, and 3 acres of scrub shrub habitat. In addition to the impacts described for NOV 05A in the NOV SEIS and identified in the preceding sentence, an additional 24.4 acres of saline marsh habitat and 2.6 acres of scrub shrub habitat have been impacted by construction in this reach utilizing the additional ROW (See Table 5.1).

Under the No Action Alternative, the reduction in BLH-Wet and wet pasture impacts that would result from the utilization of new ROW for NOV 09 and NOV-NF-W-05a.1, as described in this EA, would not be realized.

Therefore, with implementation of the No Action Alternative, there would be an overall loss of marsh, BLH, and swamp habitat within the Basin of approximately 619.1 acres,

and 363.2 AAHUs. Moreover, CEMVN’s legal obligation to compensate for habitat losses caused by construction of the NFL NOV project would not be satisfied.

Table 5.1 ROW impacts for the No Action Alternative

No Action	Acres impacted	AAHUs impacted
NOV-NF-W-05a.1 in NFL EIS + SEA #537	43.3	14.1
NOV 05A and NOV 09 in NOV SEIS	65.5	40.7
NOV 05A New ROW already impacted	27.1	2.7
Total No Action ROW Impacts	135.9	57.5

Indirect Impacts

There would be an overall loss of marsh; BLH; and swamp habitat within the system that once provided cover, resting, nesting and foraging habitat for wildlife, fisheries, and aquatic species, which would indirectly impact these resources. The loss of these habitats, and the effect such losses would have on wildlife and fish species, and would cause recreational opportunities in the Basin to also suffer loss. The loss of wetlands and the detritus and filtering function they provide would indirectly impact fisheries productivity and water quality.

Cumulative Impacts

The overall loss of marsh; BLH; and swamp habitat within the system combined with other habitat loss incurred from implementation of projects in the FWOP conditions could have cumulative adverse impacts to wildlife, fisheries, aquatic resources, water quality, EFH and recreational resources.

The indirect and cumulative impacts of the No Action Alternative on relevant resources is discussed in greater length in Sections 5.4 through 5.13.

5.1.2 Tentatively Selected Alternative (TSA) – Overview

The Tentatively Selected Alternative (Table 13) is a combination of the tentatively selected projects (TSPs) that were identified in Section 4. Thus, the Tentatively Selected Alternative includes:

1. New ROW Project for NOV 09 and NOV-NF-W-05a.1
2. Tentatively Selected Mitigation Plan (TSMP)
 - a. For scrub shrub and BLH-Dry impacts - the purchase of BLH-Wet mitigation bank credits
 - b. For BLH-Wet impacts - the purchase of BLH-Wet mitigation bank credits
 - c. For swamp impacts – the purchase of swamp mitigation bank credits
 - d. For fresh marsh and wet pasture impacts - the purchase of mitigation bank and ILF credits

- e. For intermediate marsh, brackish marsh, and saline marsh impacts – construction of the Coleman FS Brackish Marsh Project

The TSMP would mitigate for all habitat impacts that have already occurred, or are expected to occur, as a result of the construction of the NFL NOV project.

Table 13. Results of the TSA

New ROW	Acres impacted	AAHUs impacted	Estimated Mitigation
Additional ROW (NOV09 and NOV-NF-W-05a.1)	-25.5 (BLH-Wet & wet pasture)	-13.3	None needed, reduced original impacts
Mitigation Projects of the TSMP	Acres Mitigated	AAHUs Mitigated	Mitigation Project Acres
Mitigation Bank PS BLH-Dry (includes scrub shrub)	59.8	37.5	TBD*
Mitigation Bank FS BLH-Wet	179.2	120.2	TBD*
Mitigation Bank FS Swamp	39.4	33.8	TBD*
ILF and Mitigation Bank FS Fresh Marsh (includes wet pasture)	147.5	53	TBD*
Coleman FS Brackish Marsh (includes intermediate and saline marsh)	152.5	105.6	230 acres includes 10% buffer
Total	593.7	350	

*Since the mitigation bank that will ultimately be selected for use is unknown at this time, the mitigation potential at that bank and the number of acres necessary to satisfy the mitigation requirement is similarly unknown.

In an effort to draft a clear and concise NEPA document, the direct, indirect and cumulative impacts incurred as a result of purchasing mitigation bank and ILF credits for the BLH-Dry, BLH-Wet, swamp and fresh marsh features of the TSMP are condensed into a single response and addressed in the following subsection.

5.2 IMPACTS TO RELEVANT RESOURCES - TSP MITIGATION BANKS AND ILF

Direct, Indirect and Cumulative Impacts

Credits purchased as the BLH-Dry, BLH-Wet, swamp, and fresh marsh features of the TSMP would be from approved mitigation banks in the watershed and/or from the Louisiana ILF program. Because permitted banks and the ILF program exist as reasonably foreseeable projects in the FWOP conditions, no new direct or indirect impacts to any relevant resource would be incurred from the purchase of these credits to satisfy the NFL NOV mitigation requirement.

No new cumulative impacts to any resource would be incurred from the purchase of credits from approved mitigation banks in the watershed or from the ILF program for the NFL NOV mitigation under the TSMP. The purchase of mitigation bank / ILF credits, considering the impacts of all other past, present, and reasonably foreseeable projects have on the relevant resources in the Basin, would be cumulatively neutral, as it would offset the loss of 244.4 AAHUs of BLH, swamp and fresh marsh habitat within the Basin.

In the event sufficient credits are not available for these habitat types to offset impacts associated with a proposed permit, the district engineer would determine appropriate compensatory mitigation based on the factors described in 33 CFR Part 332.3(b). See section 2.4.2 and 2.8 for additional information.

5.3 IMPACTS TO RELEVANT RESOURCES – NO ACTION, REMAINING COMPONENTS OF THE TSA

The following sections describe the impacts of the No Action Alternative and the remaining components of the TSA on the relevant resources in the Basin. Since impacts to relevant resources from implementation of the BLH-Dry, BLH-Wet, swamp, and fresh marsh features of the TSMP are discussed in section 5.2, the following sections will only look at the new ROW and brackish marsh feature of the TSMP (Coleman FS Brackish Marsh Project).

5.3.1 WETLANDS AND OTHER SURFACE WATERS

5.3.1.1 No Action

Direct and Indirect Impacts

Under the No Action Alternative, approximately 43.3 acres (14.1 AAHUs) of wet pasture, 40.6 acres (24.9 AAHUs) of BLH-Wet, 46.3 acres (30.6 AAHUs) of saline marsh, and 5.6 acres (2.5 AAHUs) of scrub shrub habitat would be impacted. Mitigation for these impacts would not occur and CEMVN's legal obligation to compensate for habitat losses caused by construction of the NFL NOV would not be satisfied.

There would be an overall loss of BLH and marsh within the system that once provided cover, resting, nesting and foraging habitat for wildlife, fisheries, and aquatic species, which would indirectly impact these resources. The loss of these habitats, and the effect such losses would have on wildlife and fish species, could cause recreational opportunities in the Basin to also suffer loss. The loss of wetlands and the detritus and filtering function they provide would indirectly impact fisheries productivity and water quality.

Cumulative Impacts

Appendix L and Section 2.9.1 identify other projects in and around coastal Louisiana for redevelopment, coastal and wetland restoration, flood risk reduction, and transportation. Completing construction of the NFL NOV and HSDRRS flood risk reduction projects would reduce saltwater intrusion from smaller storms and indirectly benefit protected side habitats. Transportation projects utilizing best management practices and following Stormwater Pollution Prevention Permits (SWPPP), including installation of drainage features and culverts, could negatively impact wetlands and other surface waters during construction; but benefit them by improving hydrologic connection and flow upon construction completion. Future diversions planned for the Mississippi River, and other wetland creation projects planned and constructed under the CWPPRA could reduce wetland loss in the Basin and throughout coastal Louisiana. The overall loss of BLH and marsh within the system combined with other habitat loss incurred from implementation of projects in the FWOP conditions would result in cumulative adverse impacts to Wetlands and the wildlife and fish species that utilize these areas.

5.3.1.2 TSA – New ROW and Coleman FS Brackish Marsh Projects

Direct and Indirect Impacts

Construction utilizing the new ROW for NOV 09 and NOV-NF-W-05a.1 would reduce the BLH and wet pasture impacts stated under the No Action Alternative to 23.5 acres (14.3 AAHUs) of BLH-Wet and 34.9 acres (11.4 AAHUs) of wet pasture.

The TSMP of the TSA mitigates for all NFL NOV reaches moving forward to construction, including the new ROW, that impacted BLH-Dry, scrub shrub, BLH-Wet, swamp, fresh marsh, wet pasture, intermediate marsh, brackish marsh, saline marsh, and open water in the Basin. Constructing the Coleman Brackish Marsh project would restore approximately 230 acres of brackish marsh in the project area that had converted to open water habitat. There would be a loss of 230 acres of open water habitat from construction of the project, but this habitat is prevalent in the Basin. There would be temporary impacts to the 340 acre borrow site in the Mississippi River as the borrow material is dredged, however, over time this borrow source is anticipated to refill with sediment from the river.

Cumulative Impacts

Appendix L and Section 2.9.1 identify other projects in and around coastal Louisiana for Orleans Parish, redevelopment, coastal and wetland restoration, flood risk reduction, and transportation. Increasing the height of the levee and completing construction of the NFL NOV and HSDRRS flood risk reduction projects would reduce saltwater intrusion from smaller storms and indirectly benefit the habitat. Transportation projects utilizing best management practices and following Stormwater Pollution Prevention Permits (SWPPP) including installation of drainage and culverts could impact wetlands and other surface waters during construction and benefit them by improving drainage and flow upon construction completion. Future diversions planned for the Mississippi River, and other wetland creation projects planned and constructed under the CWPPRA (Appendix L and Section 2.9.1) could reduce wetland loss in the Basin as well as

throughout coastal Louisiana.

Implementation of the Coleman Brackish Marsh Project would prevent an overall loss in the Basin of brackish marsh habitat. Completing the Coleman mitigation project when added to other past, present, and reasonably foreseeable ecosystem restoration and mitigation projects in the Basin would help retard the loss of wetlands. There would be an overall loss of open water habitat in the Basin, but no permanent adverse impacts are anticipated because this habitat is prevalent throughout the Basin.

5.3.2 WILDLIFE

5.3.2.1 No Action

Direct and Indirect Impacts

Wildlife species that utilize the 43.3 acres of wet pasture, 40.6 acres of BLH-Wet, 46.3 acres of saline marsh, and 5.6 acres of scrub shrub habitat would be impacted by the loss of these habitats. Wildlife species present at the time of construction would be permanently displaced to adjacent habitats due to the loss of habitat which may impact the carrying capacity of adjacent habitats. Wetland species, such as nutria, muskrat, waterfowl, etc., could easily avoid disturbances associated with construction activities. Some wildlife species displaced at the time of the construction (e.g. brown pelican) would utilize adjacent open water habitat. Aquatic mammals, reptiles, and amphibians would find other sufficient adjacent habitat along the Mississippi River. Birds, including migratory birds that use adjacent marsh for resting, foraging, or loafing, would have ample alternative locations adjacent to the current habitat available for use. Upland species of mammals or reptiles that may inhabit the area are likely to react to disturbances by relocating to adjacent areas. It is anticipated that mobile species would relocate to similar adjacent habitat during construction. Less mobile species may experience demise.

There is potential for nesting of wading/water birds to utilize the habitats. There are existing bald eagle nests north of the NOV-NF-W-05a.1 reach and potential for more nests to occur closer to the project site. Through careful design of project features, timing of construction and the implementation of best management practices, adverse impacts to protected birds and their nests are currently being avoided. No known colonies exist within 1,000 feet of existing ROW for NOV 09 and NOV-NF-W-05a.1 reaches. However, a qualified biologist would inspect the proposed worksites for the presence of undocumented nests during the nesting seasons (i.e., February 15 through Sept 1 for colonial nesting birds and October through May for bald Eagles) and prior to construction. To minimize disturbance to nesting birds all activity occurring within 1,000 feet of a rookery or 660 feet of an eagle nest would be restricted to the non-nesting period. During nesting season the no-work distances would be implemented and coordinated with USFWS and LDWF.

Cumulative Impacts

Overall this project would slightly reduce the overall loss in the Basin of BLH-wet habitat necessary for many wildlife species. This project, when added to other past, present, and reasonably foreseeable future ecosystem restoration and mitigation projects in the Basin, would help reduce the loss of wetlands and overall decline of wildlife species and their habitats within the Basin and would be beneficial to preserving species biodiversity.

5.3.2.2 TSA – New ROW and Coleman FS Brackish Marsh Projects

Direct and Indirect Impacts

Construction utilizing the new ROW for NOV 09, and NOV-NF-W-05a.1 would reduce the BLH and wet pasture impacts stated under the No Action Alternative to 23.5 acres (14.3 AAHUs) of BLH-Wet and 34.9 acres (11.4 AAHUs) of wet pasture. The reduction in habitat impacts would result in less impacts to wildlife species. No additional impacts to wildlife from implementation of the TSA would be incurred.

At the Coleman site, approximately 230 acres of shallow open water would be converted to brackish marsh habitat. Wildlife species that utilize the open water in the project area would be indirectly impacted by the conversion of this habitat to brackish marsh. However, it is anticipated that these wildlife species would relocate to adjacent similar habitat as open water habitat is plentiful in the Basin. The conversion of open water to marsh would eliminate wintering habitat for brown pelican, and provide potential feeding area for white-tailed deer, skunks, rabbits, squirrels and armadillos; various raptors such as barred owls, red-shouldered hawks, northern harriers (marsh hawks), American kestrel, and red-tailed hawks; passerine birds such as sparrows, vireos, warblers, Northern mockingbirds, grackles, red-winged blackbirds, wrens, blue jays, northern cardinals, and crows. American alligators, turtle species, and amphibian species would relocate to adjacent habitat. Other wildlife outside the project may indirectly benefit from having this area as an additional territory for foraging and mating opportunities.

Wetland species, such as nutria, muskrat, waterfowl, etc., could easily avoid disturbances associated with all construction activities. Birds, including migratory birds that might use adjacent marsh for resting, foraging, or loafing, would have ample alternative locations available for use. Upland species of mammals or reptiles that may inhabit the area are likely to react to disturbances by relocating to adjacent areas. Construction activities will avoid adverse impacts to wading bird nesting colonies and bald eagle nesting locations through careful design of project features and timing of construction.

Cumulative Impacts

Accounting for other ongoing projects in Plaquemines Parish, this project would prevent an overall loss in the Basin of wetland habitat necessary for many wildlife species. This TSA, when added to other past, present, and reasonably foreseeable future ecosystem restoration and mitigation projects in the Basin, would help reduce the loss of wetlands

and overall decline of wildlife species within the Basin and would be beneficial to preserving species biodiversity.

5.3.3 THREATENED AND ENDANGERED SPECIES

5.3.3.1 No Action

Direct Impacts, Indirect and Cumulative Impacts

None of the animals under USFWS and/or NMFS jurisdiction are expected to be found in the project area for of the No Action alternative including the NOV 05A additional ROW, therefore no impacts are anticipated.

5.3.3.2 TSA – New ROW and Coleman FS Brackish Marsh Projects

Direct and Indirect Impacts

None of the animals under USFWS and/or NMFS jurisdiction are expected to be found in the project area for NOV 09, or NOV-NF-W-05a. Therefore no impacts are anticipated as result of the new ROW TSP.

The Green (*Chelonia mydas*), Kemp's Ridley (*Lepidochelys kempii*), Leatherback (*Dermochelys coriacea*), Hawksbill (*Eretmochelys imbricate*) and Loggerhead (*Caretta caretta*) sea turtles are known to utilize the offshore and inshore areas of the Gulf of Mexico. However, it is highly unlikely that they would enter the Coleman brackish marsh project area due to the location of the borrow site and limited access to the placement site. It is unlikely that the piping plover or the red knot would be found utilizing the proposed Coleman brackish marsh project area as the preferred habitat is limited or does not exist. Therefore, no impacts to any of the aforementioned species are expected.

The manatee and pallid sturgeon have the potential to forage or swim in aquatic habitats where borrow dredging and placement for the Coleman brackish marsh project. The presence of construction-related activity, machinery, and noise would be expected to cause these species to avoid the project area during the construction.

In order to minimize the potential for construction activities to cause adverse impacts to manatees and pallid sturgeon, the following standard protection measures would be implemented when activities are proposed that would impact habitat where manatees or pallid sturgeon could occur:

Manatees: All contract personnel associated with the project would be informed of the potential presence of manatees and the need to avoid collisions with manatees. All construction personnel would be responsible for observing water-related activities for the presence of manatees. Temporary signs would be posted prior to and during all construction/dredging activities to remind personnel to be observant for manatees during active construction/dredging operations or within vessel

movement zones (i.e., the work area), and at least one sign would be placed where it is visible to the vessel operator. Siltation barriers, if used, would be made of material in which manatees could not become entangled and would be properly secured and monitored. If a manatee is sighted within 100 yards of the active work zone, special operating conditions would be implemented, including: moving equipment would not operate within 50 ft of a manatee; all vessels would operate at no wake/idle speeds within 100 yards of the work area; and siltation barriers, if used, would be re-secured and monitored. Once the manatee has left the 100-yard buffer zone around the work area of its own accord, special operating conditions would no longer be necessary, but careful observations would be resumed. Any manatee sighting would be immediately reported to the U.S. Fish and Wildlife Service (337/291-3100) and the Louisiana Department of Wildlife and Fisheries (LDWF), Natural Heritage Program (225/765-2821).

Pallid sturgeon: All contract personnel associated with the project would be informed of the potential presence of pallid sturgeon. When lowering the ladder, the pumping rate should be reduced to the slowest speed feasible while the cutterhead is being lowered to the channel bottom. The cutterhead should remain completely buried in the channel bottom during dredging operations. If pumping water through the cutterhead is deemed necessary to dislodge material, or to clean the pumps, the pumping rate should be reduced to the lowest rate feasible while raising the ladder until the cutterhead is at least at mid-depth at which point the pumping rate can then be increased.

Indirect impacts to endangered or threatened species are effects that could occur later in time than direct impacts but still are reasonably certain to occur would primarily consist of effects from dredging operations, increased turbidity and benthic species removal. However, although the rise in turbidity could immediately reduce water quality in the project area, those effects would be localized, temporary, and would be reduced by movement of the tides. Any manatees or pallid sturgeon in the area would be free to relocate during construction. Indirect impacts would be minimal and temporary, the proposed action is not likely to adversely affect either species.

Cumulative Impacts

Potential cumulative impacts to the threatened or endangered species (manatee and pallid sturgeon) that could occur in the vicinity of the project area from construction of the TSA would involve the combined adverse effects on each species from the other projects within the Basin. Due to the large size of the lakes and the MS River, the relatively small size of the borrow areas, the temporary nature of the borrow activities, the sediments in the borrow area, the depth of excavation, the use of cutterhead dredges for borrow procurement, the duration of dredging, the ability of benthic species to quickly re-colonize the borrow areas, the ability of threatened and endangered species to avoid the project area during the construction period, and the use of protection measures, the TSA would add very little and only temporary impacts to any

other impacts resulting from past, present and reasonably foreseeable projects in the Basin and would not contribute significantly to cumulative impacts to threatened and endangered species or their habitat in the Basin.

5.3.4 FISHERIES, AQUATIC RESOURCES, AND WATER QUALITY

5.3.4.1 No Action

Direct and Indirect Impacts

Under the No Action alternative, approximately 43.3 acres (14.1 AAHUs) of wet pasture, 40.6 acres (24.9 AAHUs) of BLH-Wet, 46.3 acres (30.6 AAHUs) of saline marsh, and 5.6 acres (2.5 AAHUs) of scrub shrub habitat would be impacted. Actions associated with construction of NOV 05A, NOV 09 and NOV-NF-W-05a.1 as described in the NFL EIS, SEA #537, and NOV SEIS and as well as the additional ROW already used during construction of NOV 05A would have moderate, direct and indirect, short-term and long-term impacts on fisheries, aquatic resources, and water quality. Stormwater runoff from construction sites and staging areas for construction access to levees and floodgates are considered direct temporary impacts. Construction of the levees and associated features may have some localized short-term direct impacts on water quality. Construction activities may result in direct impacts to water quality of increased suspended solids in the vicinity of the construction due to site disturbance. The State of Louisiana allows a 10 percent increase to the 50 NTU criteria for turbidity in estuaries from discharges. It is not expected that the No Action Alternative would exceed this limit. The increased suspended solids may result in decreased primary productivity due to shading of phytoplankton. The decreased primary productivity may then indirectly lower dissolved oxygen levels. These impacts would be short term and localized to construction site and immediate area. Some sections of the levee would restore the base footprint and encroach upon adjacent surface water and permanently fill the shorelines of channels and wetlands. Impaired water quality could temporarily indirectly impact associated aquatic resources through surface runoff into nearby canals and channels. The impacts of wetland encroachment are discussed in the wetlands and other surface waters section of this EA 543.

Mitigation for these impacts would not occur and CEMVN's legal obligation to compensate for habitat losses caused by construction of the NFL NOV would not be satisfied. The loss of marsh, swamp, BLH-Wet, and open water habitat within the system would indirectly impact fisheries productivity and water quality as the loss of wetlands would limit the detritus and filtering function they provide.

Cumulative Impacts

The NFL NOV project and multiple flood control projects ongoing in the region (See Appendix L and Section 2.9.1) would have a potential for cumulative impacts on fisheries, aquatic resources, and water quality through increased turbidity, runoff, and siltation. BMPs would be used to minimize the impacts of dredging and levee expansion. Additional temporary impairment from construction stormwater runoff would occur on water resources if there is a major rain event during construction of levee and

floodwall reaches. The ecosystem restoration projects in the Basin would work to enhance and restore historic ecosystem processes within the Basin to offset these impacts.

5.3.4.2 TSA – New ROW and Coleman FS Brackish Marsh Projects

Direct and Indirect Impacts

There are no fisheries, aquatic, or water quality resources in NOV 09 or NOV-NF-W-05a.1 ROW areas therefore there will be no additional impacts to these resources over what would be incurred by implementation of the No Action Alternative.

At the Coleman site, approximately 230 acres of shallow open water would be positively impacted by conversion to brackish marsh habitat and would continue to be available for fishery and aquatic species.

Cumulative Impacts

Accounting for other ongoing projects in Plaquemines Parish, this project would prevent an overall loss in the Basin of wetlands habitat necessary for many fisheries and aquatic resources. The new ROW alignment and Coleman Brackish Marsh Project, when added to other past, present, and reasonably foreseeable ecosystem restoration and mitigation projects in the Basin, result in minimal loss to fisheries, aquatic resources, and water quality experienced in the Basin and would be beneficial to preserving species biodiversity. The reinstatement of brackish marsh in areas that are currently open water could provide indirect benefits to fisheries in the future by providing nutrients to the system in the form of detritus. As a result of borrow placement and the type of containment utilized for this project, land adjacent to the mitigation project may receive material suspended in the dredge effluent. This would nourish adjacent marsh habitat and may cause adjacent shallow open water to become shallower. There would also be a positive indirect and cumulative impact on fisheries and aquatic species due to the long term stability of the new brackish marsh.

5.3.5 ESSENTIAL FISH HABITAT

5.3.5.1 No Action

Direct and Indirect Impacts

Under the No Action alternative, the actions described in the NFL EIS, SEA #537, NOV SEIS for NOV 09 or NOV-NF-W-05a.1, and the additional ROW already used for the construction of NOV 05A ROW would have a direct effect on EFH. There are no EFH within the NOV 09 and NOV-NF-W-05a.1 reaches; however, construction of the NOV 05A reach (original ROW as described in NOV SEIS as well as additional ROW used during construction) impacted 46.3 acres of EFH.

Construction of the Coleman Brackish Marsh Project would not occur, and mitigation bank credits would not be purchased for impacts to EFH habitat. With implementation of the No Action Alternative, there would be an overall loss of marsh and open water

habitat within the Basin of approximately 46.3 acres. Intertidal marshes and some open water habitats are designated EFH, and loss of marsh and open water habitat in the Basin would equate to a loss of EFH in the Basin. CEMVN's legal obligation to compensate for habitat losses caused by construction of the NFL NOV would not be satisfied.

Cumulative Impacts

The NFL NOV project and multiple flood control projects ongoing in the region (Appendix L) would have a potential for cumulative impacts on EFH resources through loss of this habitat or by producing turbidity that could affect the survival of SAVs or cause siltation of bottom substrates. BMPs would be used to minimize the impacts of dredging and levee expansion. The ecosystem restoration projects in the Basin would work to enhance and restore historic ecosystem processes within the Basin to offset these impacts.

5.3.5.2 TSA – New ROW and Coleman FS Brackish Marsh Projects

Direct and Indirect Impacts

There is no EFH in the new ROW areas. Although, a potential for temporary indirect impacts to EFH from storm water runoff from construction access corridors or roads exists, thereby affecting the survival of SAVs and/or causing the siltation of bottom substrates, these impacts would be minimized via BMPs that would reduce any potential runoff from the site.

As part of the Coleman Brackish Marsh Project approximately 230 acres of new marsh would be created and in the process several types of EFH associated with open water would be permanently replaced with brackish marsh and other associated EFH. Negative impacts to the existing EFH would be more than offset by the creation of estuarine emergent wetlands since the support functions of the created marsh is greater than the support functions of the existing open water. As a result of these actions, adverse impacts on some types of EFH may occur, but marsh creation would compensate for these impacts, and the overall productivity of Federally-managed species would be benefitted.

Cumulative Impacts

Accounting for other ongoing projects in Plaquemines Parish, this project would prevent an overall loss in the Basin of wetlands habitat necessary for EFH. The Coleman Brackish Marsh project, when added to other past, present, and reasonably foreseeable ecosystem restoration and mitigation projects in the Basin, would help retard the loss of wetlands in the Basin and would be beneficial to preserving species biodiversity. There would also be a positive cumulative impact on EFH due to the long term stability of the new brackish marsh which would provide habitat for an abundance of species.

5.3.6 CULTURAL RESOURCES

5.3.6.1 No Action

Direct, Indirect, and Cumulative Impacts

Under the No Action alternative, the cultural resources within the Basin would not be directly impacted from the construction of any of the proposed projects. Section 106 consultation for cultural resources has already occurred for the construction of the NFL NOV project that includes NOV 05A, NOV 09, and NOV-NF-W-05a.1. There would be no additional potential for impacts to undiscovered cultural resources resulting from the No Action alternative that have not in previous NEPA documents and consultations required by Section 106 of the NHPA.

5.3.6.2 TSA – New ROW and Coleman FS Brackish Marsh Projects

Direct and Indirect Impacts

Activities associated with implementation of the TSA could have a direct impact on existing or as yet undiscovered cultural resources. Unidentified cultural resources could exist within new ROW for NOV-NF-W-05a.1 and NOV 09.

The purchase of mitigation bank credits for the TSA would occur at existing approved banks and State In-Lieu-Fee. Permitted banks exist as reasonably foreseeable projects in the FWOP conditions, and no new direct or indirect impacts to cultural resources would be incurred from the purchase of these credits for the NFL NOV mitigation needs. See Section 5.2 for additional information.

No cultural resources are known or expected within the Coleman brackish marsh project area. If previously unidentified cultural resources are discovered, those resources would be evaluated for significance and eligibility for listing to the NRHPA and additional consultation would be conducted with the SHPO and Federally-recognized Indian tribes. Identified cultural resources that are determined to be significant and eligible for listing or are listed on the NRHP would be avoided. If avoidance is not possible, strategies would be developed in consultation with the SHPO and Federally-recognized Indian tribes to mitigate for adverse effects to significant cultural resources.

The erosion and land loss caused by natural forces and human activity would continue to impact cultural resources in the Basin. The loss of land within the Basin threatens the existence and integrity of cultural resources located in the Basin. The implementation of measures to reduce storm damage and flood risk, and to restore ecosystems and habitat could work to reduce continued land loss and erosion, and prevent exposure and impact to significant cultural resources.

Cumulative Impacts

Implementation of this project would work synergistically with other ecosystem restoration projects in coastal Louisiana. Cumulative impacts to cultural resources

would be the additive combination of impacts by this and other Federal, state, local, and private restoration efforts, and would be further evaluated on a project-by-project basis.

5.3.7 RECREATIONAL RESOURCES

5.3.7.1 No Action

Direct and Indirect Impacts

Under the no action alternative, the new ROW for NOV 09 and NOV-NF-W-05a.1 would not be constructed. There are no direct impacts on recreational resources from this alternative. Indirect impacts include an increase in the risk of flooding from a levee breach, since existing orphaned and abandoned oil and gas wells would remain in the levee footprint and a 90 degree turn in the levee would focus wave energy into that section of levee. Such a breach would indirectly impact the recreational facilities in Plaquemines Parish.

Cumulative Impacts

Without construction of an action alternative, there would be an overall loss of marsh; BLH; and swamp habitat within the system. Loss of habitat in the Basin would equate to a loss in recreational fishing and hunting opportunities. The overall loss of fresh marsh, BLH, and swamp within the system combined with other habitat loss incurred from implementation of projects in the FWOP conditions could have cumulative adverse impacts to wildlife, fisheries, aquatic resources, as explained in the immediately preceding subsections, and therefore recreational resources.

5.3.7.2 TSA – New ROW and Coleman FS Brackish Marsh Projects

Direct and Indirect Impacts

There are no direct impacts to recreational resources within the new alignment areas for NOV 09 and NOV-NF-W-05a.1.

At the Coleman site, approximately 230 acres of shallow, open water and mud bottom would be replaced with brackish marsh, increasing recreational opportunities in the area as the new, mature habitat will provide spawning, nursery, forage and cover habitat for fish species including red drum, gulf menhaden, southern flounder, white and brown shrimp, and blue crab (LCWCRTF and WCRA, 1999). The recreational environment in and around the project area would experience limited short-term disruption imposed by the physical size and working activities of the construction phase of the project. Positive long-term benefits would be the creation of the marsh and the added benefits of providing shelter and habitat for wildlife. With marsh creation, there would also be the potential for recreation opportunities such as duck hunting.

Borrow material necessary for construction of the marsh feature would be obtained from the Mississippi River. Because minimal recreation takes place in the Mississippi River, there will be no impacts to recreation resources from excavation of dredge material or placement of the overland/water pipeline.

Since the purchase of mitigation bank credits for the TSA would occur at an existing approved bank and since permitted banks exist as reasonably foreseeable projects in the FWOP conditions, no new direct or indirect recreational impacts would be incurred from the purchase of these credits for the Plaquemines NFL/NOV mitigation. See Section 5.2 for additional information.

The NFL/NOV new ROW alignments are part of the ongoing Federal effort to reduce the threat to property posed by flooding. Implementation of the proposed action would have beneficial, indirect impacts on recreational resources throughout the Plaquemines Parish area and to lesser extent the greater New Orleans metropolitan area by reducing the risk of flooding. Indirect impacts include temporarily increasing noise levels near the new ROW levee and Coleman brackish marsh project which could impact recreational resources such as hunting, fishing, and bird watching and activities such as walking and jogging. Noise levels would return to pre-construction levels following the completion of the project. Recreational activities would return to pre-construction levels following the completion of the project.

Cumulative Impacts

The cumulative recreational resource impacts of the TSA, when added to other past, present, and reasonably foreseeable levee projects or other type projects in the Basin would minimally and temporarily affect recreational resources. Impacts from the TSA projects could temporarily disrupt transportation, navigation and recreational fishing in project areas during construction activities.

Due to the small number of linear feet of levee to be realigned, the remote and generally unpopulated areas where the projects would be constructed, and the temporary nature of the project construction activities, implementation of the TSA would add very little and only temporary recreational impacts to any other impacts resulting from past, present and reasonably foreseeable projects in the region and would not contribute significantly to cumulative impacts to recreational resources in the Basin.

The combined effects from construction of the multiple projects underway and planned for the Lake Pontchartrain and West Bank and Vicinity Hurricane Protection Systems reduce flood risk and storm damage to hundreds of recreation facilities and associated infrastructure and parks.

5.3.8 AIR QUALITY

5.3.8.1 No Action

Direct and Indirect Impacts

Under the No Action Alternative, the NFL NOV projects, including the previously assessed ROW for NOV 05A, NOV 09 and NOV-NF-W-05a.1 ROW, as well as the additional ROW used during construction of NOV 05A would continue to be utilized. Impacts to air quality from the No Action would be similar to those found in the NFL EIS,

SEA #537, and NOV SEIS, and would be minor and temporary. Temporary increases in air pollution from the levee construction would occur from three main sources: 1) emissions from transportation of construction materials such as clay fill, concrete and concrete piling, stone, and rocks to project sites; 2) combustible emissions from the engines of construction equipment, workers' automobiles commuting to work, and trucks shipping miscellaneous supplies to project sites; and 3) fugitive dust when soils are disturbed at the construction site. Because the project area is in a parish in attainment of NAAQS, a conformity analysis is not required.

Cumulative Impacts

The No Action is not anticipated to have a cumulative significant impact to air quality in the Basin as the levee construction activities associated with the NFL NOV project would be temporary along with other development, diversion and coastal restoration, and transportation projects (Appendix L). Cumulatively all of these projects would impact air quality but they would not all be under construction at the same time.

5.3.8.2 TSA – New ROW and Coleman FS Brackish Marsh Projects

Direct and Indirect Impacts

The equipment used for construction of NOV 09 and NOV-NF-W-05a.1 would consist primarily of backhoes, excavators, bulldozers, and dump trucks. This equipment would produce air emissions that could impact the local area air quality. During construction of the Coleman brackish marsh creation, an increase in air emissions could be expected that include exhaust emissions from operations of various types of non-road construction equipment such as a cutterhead dredge, backhoes, tractors, crew boats, and vehicles used to access the project area. The impacts, however, would be minor and temporary. As Plaquemines parish is classified as attainment for all NAAQS (EPA 2009), no Conformity Determination or other effort is required of the TSA.

Cumulative Impacts

Construction of the TSA project is not anticipated to have a cumulative significant impact to air quality in the Basin as the levee construction activities would be temporary along with other development, diversion and coastal restoration, and transportation projects (Appendix L). Cumulatively all of these projects would could temporarily impact air quality, but they would not all be under construction at the same time.

5.3.9 NOISE

5.3.9.1 No Action

Direct and Indirect Impacts

The impacts of the No Action Alternative have already been addressed in NOV SEIS, NFL FEIS, and SEA 537. To that end, backhoes, excavator, bulldozers and dump trucks would be the primary pieces of equipment used for construction of the NOV 05A, NOV 09 and NOV-NF-W-05a.1 reaches. These pieces of equipment exceed noise levels above 55 dBA at 50 feet. Noise levels may result in wildlife avoiding the project

area during construction; however, movement of equipment during construction would result in the same temporary avoidance behaviors from wildlife species. There would be minor temporary impacts to human populations in the vicinity of the NOV 05A, NOV 09 and NOV-NF-W-05a.1 reaches.

Cumulative Impacts

Construction of this project is not anticipated to add significantly to the cumulative effect of noise in the Basin as the levee construction activities would be temporary and ending in 2022, along with other redevelopment, diversion and coastal restoration, and transportation projects (Appendix L). Cumulatively all of these projects produce noise but they would not all be under construction at the same time.

5.3.9.2 TSA – New ROW and Coleman FS Brackish Marsh Projects

Direct and Indirect Impacts

Backhoes, excavator, bulldozers and dump trucks would be the primary pieces of equipment used for construction of NOV 09, and NOV-NF-W-05a.1. These pieces of equipment exceed noise levels above 55 dBA at 50 feet. Cutterhead dredges and backhoes would be the primary pieces of equipment used for construction of Coleman brackish marsh project. Additional construction equipment includes hydro-axes, gyro-tracks, mulchers, dump trucks, slurry pumps, marsh tracked vehicles and barge mounted equipment. These pieces of equipment exceed noise levels above 55 dBA. See Appendix B Table B-17 for list of equipment and associated dBA. Noise levels may result in wildlife avoiding the project area during construction; however, movement of equipment during construction would result in the same avoidance behaviors from wildlife species. Noise levels quickly drop off once a buffer is established between the noise source and the receptor (e.g. vegetation). As such, any wildlife in the adjacent habitats should be largely undisturbed by the additional noise from construction of these features. There would be minor temporary impacts to human populations along Diamond Road which runs parallel to NOV 09, and residences east of the Coleman brackish marsh project along LA Hwy 23 could experience higher than ambient noise levels during construction, however these levels would be temporary during the period of construction and would be limited to daylight hours.

Cumulative Impacts

Construction of this project is not anticipated to add significantly to the cumulative effect of noise in the Basin as the levee construction and the Coleman brackish marsh creation activities would be temporary and ending in 2022, along with other redevelopment, diversion and coastal restoration, and transportation projects (Appendix L). Cumulatively all of these projects produce noise but they would not all be under construction at the same time.

5.3.10 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

5.3.10.1 No Action

Direct, Indirect and Cumulative Impacts

No RECs were identified in NOV 05A, NOV 09 and NOV-NF-W-05a.1 ROW and the additional NOV 05A ROW. As such, there would be no direct, indirect, and cumulative impacts to HTRW.

If a recognized environmental condition is identified in relation to the project sites, the CEMVN would take the necessary measures to avoid the recognized environmental condition so that the probability of encountering or disturbing HTRW would continue to be low.

5.3.10.2 TSA – New ROW and Coleman FS Brackish Marsh Projects

Direct, Indirect and Cumulative Impacts

NOV 09 and NOV-NF-W-05a.1 would be constructed within the ROW and the Coleman brackish marsh project would be constructed. No RECs were identified in the new ROWs, or the Coleman brackish marsh project site.

If a recognized environmental condition is identified in relation to the project sites, the CEMVN would take the necessary measures to avoid the recognized environmental condition so that the probability of encountering or disturbing HTRW would continue to be low.

5.3.11 SOCIOECONOMICS/LAND USE, ENVIRONMENTAL JUSTICE, TRANSPORTATION, NAVIGATION, AND COMMERCIAL FISHERIES

5.3.11.1 No Action

Direct and Indirect Impacts

Under the no action alternative, NOV 05A, NOV 09 and NOV-NF-W-05a.1 would be constructed using the existing ROW described in NOV SEIS, NFL FEIS, and SEA #537, as well as the additional NOV 05A ROW. All relevant socio-economic resources would be expected to continue to change in pace with previous trends. Indirect impacts include an increase in the risk of flooding from a levee breach and the associated impacts to all of all socio-economic resources, including damage and destruction of facilities in Plaquemines Parish.

The loss of habitat due to the NOV NFL original project would reduce flood protection for the project area and potentially decrease wildlife populations. Increased flooding would most likely impact property values and community cohesion if residents chose to leave the area due to frequent flooding. The loss of wildlife habitat may also negatively impact the commercial fishing stock, reducing fishermen's profits. Decreased revenue from the commercial fishing industry could have a negative impact on local economies, affecting the quality of life for residents residing in the project area.

Cumulative Impacts

In the absence of the TSA, other habitat restoration projects would continue to be implemented and provide benefits. Without the added benefit of the TSA, other restoration projects in the area would have a somewhat reduced impact on preventing flooding and wildlife habitat restoration. Due to the TSP's relative small contribution to these efforts, residents would most likely not notice any socio-economic effects on the relevant resources should the TSP not be implemented.

5.3.11.2 TSA – New ROW and Coleman FS Brackish Marsh Projects

Direct and Indirect Impacts

The additional ROW is needed for construction of NOV 09 and NOV-NF-W-05a.1 to provide flood risk reduction to Plaquemines Parish residents and businesses.

NOV 09 and NOV-NF-W-05a.1 are located within Block Group 504.1 which stretches from LA 23 to the Levee Road. According to Census 2000 data, this area was a minority, low-income community in 2000, with 73 percent of the population a minority and approximately 31 percent of the population low-income. These percentages are substantially higher than state or parish figures (see Table 10 and 13). ESRI estimates for 2010 indicate a slightly higher percentage of minorities in the block group.

Implementation of the proposed action would enhance Federal hurricane risk reduction in an area with existing lower level risk reduction. Thus, implementation would benefit all residents of these areas alike. Direct adverse impacts from construction activities include impacts to air quality, noise, traffic, etc. Indirect impacts from this action may include residential and commercial growth within the protected area. The direct and indirect impacts of noise and other associated construction activities are not anticipated to exert disproportionately high indirect, adverse human health, and environmental impacts on minority and/or low-income communities.

The proposed Coleman mitigation project is likely to have minimal to no direct or indirect impacts on population, as the project site is located well west of housing located between LA 23 and the Mississippi River. The proposed project site will have little to no impact on business and industry in the affected area. The proposed project will convert private land into brackish marsh. Although the land is not currently used for profit, the landowner will forfeit any future opportunities to use the land for gaining profit.

There would be no direct and only minimal indirect impacts to transportation in nearby residential area during construction due to heavy vehicle traffic in the vicinity of the restoration site. It is expected that once the necessary construction equipment is on site that no additional transportation impacts would occur until the project construction is complete.

Since the purchase of mitigation credits for the TSA would occur at existing approved mitigation banks and the Louisiana ILF, and because permitted banks and the ILF

program exist as reasonably foreseeable projects in the FWOP conditions, no new direct or indirect impacts to socio-economic resource would be incurred from the purchase of these credits for the NFL NOV mitigation. See Section 5.2 for additional information.

There would be no direct or indirect impacts to navigation or commercial fishing on any of the nearby waterways from implementation of the Coleman project.

Cumulative Impacts

The cumulative impacts of the TSA projects, when added to other past, present, and reasonably foreseeable levee, ecosystem restoration, mitigation or other type projects in the Basin (Appendix L) would minimally and temporarily affect socio-economic resources. Impacts from levee projects can temporarily disrupt transportation, navigation and commercial fishing in project areas during construction activities including dredging and material placement in the restoration areas.

Due to the relatively small number and linear feet of new ROW alignments, the remote and generally unpopulated areas where the projects would be constructed, the temporary nature of the project construction activities and the duration of levee projects, the new ROW alignments would add very little and only temporary impacts to any other impacts resulting from past, present and reasonably foreseeable projects in the region and would not contribute significantly to cumulative impacts to socio-economic resources in the Basin.

The Coleman Brackish Marsh project restores habitat in Louisiana, offsetting the loss of existing habitats. The reduction in impacts provided by the TSA would augment other restoration projects in the area and residents would see reduced flooding and sustained benefits to human health, the environment, and economic resources. As a result, the negative impacts on the community would be reduced.

6.0 MITIGATION

During the plan formulation for any project, adverse impacts to the human and natural environment should first be avoided, then minimized, and lastly, compensated. During the plan formulation for the NFL NOV levee improvements, where possible, adverse impacts were avoided or minimized, however, unavoidable impacts to some habitat types would still occur. These impacts are shown in Table 1. Compensatory mitigation is required for the following habitat types: BLH-Wet, BLH-Dry, wet pasture (to be mitigated as fresh marsh), swamp, scrub shrub (to be mitigated as BLH-Dry), freshwater marsh, intermediate marsh, brackish marsh, and open water (included in marsh models). Temporary impacts to wet pasture associated with improving the lateral ditches and canals in NFL Sections 2 and 4 are considered temporary and self-mitigating and were not included in the total compensatory mitigation acreage. The planning and environmental compliance for the compensatory mitigation plan is being

coordinated with an interagency team comprised of representatives from the CPRA, LDNR, Plaquemines Parish Government, USACE, USEPA, USFWS, and NMFS.

7.0 MITIGATION SUCCESS CRITERIA, MITIGATION MONITORING AND REPORTING, AND ADAPTIVE MANAGEMENT

An effective monitoring program is required (WRDA 2007, Section 2036) to determine if the project outcomes are consistent with the identified success criteria. Since the brackish marsh feature is the only feature in the TSMP that consists of a Corps constructed project, a Monitoring Plan (Appendix C) has only been developed for the Coleman FS Brackish Marsh Project. The plan identifies success criteria and targets, a general schedule for the monitoring events, and the specific content for the monitoring reports that measure progress towards meeting the success criteria. Following completion of the design of the Coleman brackish marsh project and in coordination with the local Sponsor and the Interagency Mitigation Team, the monitoring plan would be adjusted to include actual transects, sampling plot and gage locations, and monitoring frequency. In the event that any of the other TSPs of the TSMP, which consist of the purchase of mitigation bank and/or ILF credits, are not implemented, a detailed monitoring plan for the next ranked project for that habitat type would be developed with the Interagency team.

The purpose of adaptive management activities in the life-cycle of the project is to address ecological and other uncertainties that could prevent successful implementation of a project. Adaptive management (AM) also establishes a framework for decision making that utilizes monitoring results and other information, as it becomes available, to update project knowledge and adjust management/mitigation actions. Hence, early implementation of AM and monitoring allows for a project that can succeed under a wide range of conditions and can be adjusted as necessary. Furthermore, careful monitoring of project outcomes both advances scientific understanding and helps adjust operations changes as part of an iterative learning process. See Appendix D for the AM Plan.

Each Corps constructed TSP would have a contingency plan for taking corrective actions in cases where monitoring demonstrates that the mitigation feature is not achieving ecological success in accordance with its success criteria. For the TSPs where credits would be purchased from a mitigation bank and/or ILF, the mitigation bank or ILF program must be in compliance with the requirements of the USACE Regulatory Program and its instrument/agreement, which specifies the management, monitoring, and reporting required to be performed by the mitigation site. Purchase of mitigation bank and ILF credits relieves the CEMVN and NFS of the responsibility for monitoring.

The TSA includes one Corps-constructed project, with the NFS responsible for operation and maintenance of functional portions of work as they are completed. On a cost shared basis, USACE will monitor completed mitigation to determine whether

additional construction, invasive species control and/or planting are necessary to achieve mitigation success. USACE will undertake additional actions necessary to achieve mitigation success in accordance with cost sharing applicable to the project and subject to the availability of funds. Once USACE determines that the mitigation has achieved initial success criteria, monitoring will be performed by the NFS as part of its OMRR&R obligations. If, after meeting initial success criteria, the mitigation fails to meet its intermediate and/or long-term ecological success criteria, USACE will consult with other agencies and the NFS to determine whether operational changes would be sufficient to achieve ecological success criteria. If, instead, structural changes are deemed necessary to achieve ecological success, USACE will implement appropriate adaptive management measures in accordance with the contingency plan and subject to cost sharing requirements, availability of funding, and current budgetary and other guidance.

8.0 COORDINATION AND PUBLIC INVOLVEMENT

8.1 PUBLIC INVOLVEMENT

Public involvement has been sought in planning the mitigation for NFL and NOV impacts. On October 28, 2014 letters were sent by Plaquemines Parish Government (PPG) to property owners in Plaquemines Parish, Louisiana to solicit interest and identify willing sellers of properties for use as mitigation for the NFL NOV project. Additionally, mitigation for NFL NOV impacts was discussed during public meetings held for the NFL EIS and NOV SEIS and mitigation measures were developed from input received during those meetings. This EA #543 will be mailed to the public for 45 day public review and comment starting June 27, 2017 and available for download on <http://www.mvn.usace.army.mil/About/Projects/>.

8.2 AGENCY COORDINATION

Preparation of this EA #543 has been coordinated with appropriate Congressional, Federal, state, and local interests, as well as environmental groups and other interested parties. An interagency environmental team was established for this project in which Federal and state agency staff played an integral part in the project planning and alternative project analysis phases of the project (members of this team are listed in Appendix K). This interagency environmental team was integrated with the CEMVN PDT to assist in the planning of this project and to complete a determination of the potential direct and indirect impacts of the tentatively selected plan. The PDT for this EA is made up of representatives from CPRA, Plaquemines Parish Government, USFWS, DNR, NMFS, and USACE has met regularly since 2011. Preparation of this draft EA and FONSI is being coordinated with appropriate congressional, Federal, state, and local interests, as well as environmental groups, Native American Indian tribes, and

other interested parties. The following agencies, as well as other interested parties, are receiving copies of this draft EA:

U.S. Department of the Interior, Fish and Wildlife Service
U.S. Department of the Interior, National Park Service
U.S. Environmental Protection Agency, Region VI
U.S. Department of Commerce, National Oceanic and Atmospheric Administration, NMFS
U.S. Natural Resources Conservation Service
Louisiana Advisory Council on Historic Preservation
Governor's Executive Assistant for Coastal Activities
Louisiana Department of Wildlife and Fisheries
Louisiana Department of Natural Resources, Coastal Management Division
Louisiana Department of Natural Resources, Coastal Restoration Division
Louisiana Department of Environmental Quality
Louisiana State Historic Preservation Officer
Coastal Protection and Restoration Authority Board

Since the purchase of mitigation bank BLH-Dry, BLH-Wet, swamp, and fresh marsh credits for those habitat impacts as part of the TSA's TSMP would occur at existing approved banks and the State of Louisiana ILF program (for fresh marsh), and since permitted banks and the ILF exist as reasonably foreseeable projects in the FWOP conditions; no new direct, indirect or cumulative impacts to threatened and endangered species or their critical habitat would occur that would require coordination with USFWS or NOAA, NMFS. In addition, a Water Quality Certificate from the State of Louisiana; public review of a Section 404(b)(1) Public Notice and signature of a Section 404(b)(1) Evaluation; receipt and acceptance or resolution of LDEQ comments on the air quality impact analysis; and receipt and acceptance or resolution of EFH recommendations would not be necessary for implementation of the mitigation bank and ILF TSPs of the TSMP. However, if acceptable bids for the sale of bank or ILF credits are not received and the USACE determines that next ranked project for that habitat type in the AEP would be implemented instead of the TSP, the aforementioned coordination with the resource agencies and evaluations, including consistency with the Louisiana Coastal Resources Program (LCRP) and completion of Section 106 consultation, would occur for those projects at that time.

Coordination with resource agencies will be ongoing as CEMVN further develops the Coleman brackish marsh project TSA.

The LDNR reviewed the proposed action for consistency with the LCRP, established under section 307 of the Coastal Zone Management Act of 1972 (16 USC 1451). The proposed action was found to be consistent with the LCRP, as per a letter dated **June XX, 2017 (Appendix G)**.

Section 106 of the NHPA, as amended, requires consultation with the LA SHPO and Federally-recognized Indian tribes. There are eleven Federally-recognized Indian tribes

that have an interest in the region. Section 106 consultation has not yet been completed for the TSA. Additional cultural resources investigations are needed in portions of the new ROW for NOV 09 to determine NRHP eligibility for portions of two previously recorded cultural resources that have not previously been evaluated. Section 106 consultation is on-going for the Coleman FS Brackish Marsh Project (TSMP), cultural resources investigations in the new ROW for NOV 09, and the areas outside of ROW for NOV 05A. The results of the additional cultural resources investigations for NOV 09 will be coordinated with the LA SHPO and Federally-recognized Indian tribes when available. A finding of no historic properties affected by the New ROW for NOV-NF-W-05a.1 was coordinated with the SHPO and Federally-recognized Indian tribes in a letter dated January 15, 2016, and the SHPO concurred with the finding.

Coordination with the USFWS on the NFL NOV mitigation has been ongoing since 2008. A draft Fish and Wildlife Coordination Act Report (FWCAR) for the EA #543 was provided by the USFWS on June 16, 2017. The final FWCAR will be provided by USFWS at the end of the EA #543 public review. The draft FWCAR concluded that the USFWS does not object to the TSA, provided that fish and wildlife conservation recommendations are implemented concurrently with project implementation. A copy of the draft report is provided in Appendix M. The USFWS project-specific recommendations for the EA #543 TSP are listed below:

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).

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.

Recommendation 1: The Corps shall fully compensate for any unavoidable losses 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) 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.

CEMVN Response 1: Concur. The USACE will mitigate as described in EA #543 for 120.2 AAHUs BLH-Wet, 37.5 AAHUs BLH-Dry, 33.8 AAHUs swamp, 53 AAHUs fresh marsh, and 105.6 AAHUs intermediate/brackish/saline marsh impacts.

Recommendation 2: The Service recommends that mitigation alternatives include locating the mitigation within the Basin where impacts occurred.

CEMVN Response 2: Concur. The USACE planning process and regulations followed included mitigation alternatives within the Basin where the habitat impacts occurred. The State of Louisiana ILF program credits cover mitigation in habitats within the deltaic plain, however, the deltaic plain includes projects within the Basin.

Recommendation 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 Corps reinstate 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.

CEMVN Response 3: Concur. The USACE would fulfill its consultation responsibilities as required under the ESA.

Recommendation 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.

CEMVN Response 4: Concur. USACE will carefully design project features, and time construction to implement best management practices to avoid adverse impacts to protected birds and their nests. These are described in EA #543 and include the following: a qualified biologist would inspect the proposed worksite for the presence of undocumented nests during the nesting seasons (i.e., February 15 through Sept 1 for colonial nesting birds and October through May for bald Eagles) and prior to construction. To minimize disturbance to nesting birds all activity occurring within 1,000 feet of a rookery or 660 feet of an eagle nest would be restricted to the non-nesting period. During nesting season the no-work distances would be implemented and coordinated with USFWS and LDWF.

Recommendation 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).

CEMVN Response 5: Concur.

Recommendation 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.

CEMVN Response 6: Concur.

Recommendation 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

CEMVN Response 7: Concur.

Recommendation 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.

CEMVN Response 8: Concur. The USACE would seek to avoid impacts to EFH and would coordinate with NMFS on any unavoidable impacts.

Recommendation 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.

CEMVN Response 9: USACE is attempting to mitigate for wetland and BLH impacts as quickly as possible. USACE formed a PDT of USACE members and other interested state and Federal agencies which have assisted the USACE in identifying potential mitigation sites, developing screening criteria to determine the sites that would undergo further engineering as part of the final array, and developing plans to implement and monitor the mitigation projects in the TSA.

Recommendation 10: We recommend that the Corps 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.

CEMVN Response 10: USACE considered future and presently available bank credits as well as ILF credits within the Basin as well as USACE constructed projects. These alternatives were evaluated in an alternatives evaluation process that considered impacts to risk and reliability, environmental, watershed and ecological site considerations, time, schedule, cost effectiveness and other cost considerations.

Recommendation 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 Corps shall provide them with an opportunity to review and submit recommendations on all work addressed in those reports.

CEMVN Response 11: The USFWS and other resource agencies would be provided an opportunity to review and comment on the proposed mitigation project plans and specifications.

Recommendation 12: Refinement of the mitigation potential as determined by the Wetland Value Assessment (WVA) for Corps 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).

CEMVN Response 12: The USFWS and other resource agencies would be provided an opportunity to review and comment on the proposed mitigation project plans and specifications for the 60 and 95 percent levels (30 percent was utilized for alternatives development of EA #543).

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

CEMVN Response 13: Concur.

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

CEMVN Response 14: Concur.

Recommendation 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.

CEMVN Response 15: Concur. Appendices C, D, and J include mitigation success criteria, monitoring and reporting requirements, and adaptive management all developed from HSDRRS projects.

Recommendation 16: The Service encourages the Corps 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.

CEMVN Response 16: Concur.

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

CEMVN Response 17: Concur. USACE will follow SWPPP and best management practices.

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

CEMVN Response 18: Concur, every attempt will be made for USACE and its contractors to stay within construction ROW.

Recommendation 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.

CEMVN Response 19: Concur. As part of the NFS's responsibility to provide the LERRDs for any of the NFL NOV project features, the NFS would be required to purchase the necessary property interest in fee title to "preserve the benefits of the proposed mitigation area in perpetuity.

9.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

There are many Federal and state laws pertaining to the enhancement, management and protection of the environment. Federal projects must comply with environmental laws, regulations, policies, rules and guidance. A 45 day public review and comment period for the draft EA began on June 27, 2017. Environmental compliance would be achieved upon conclusion of the 45-day public review and comment period and approval of the associated Finding of No Significant Impact signed on **September XX, 2017.**

Executive Order (E.O.) 11988 Floodplain Management

Executive Order 11988 directs Federal agencies to reduce flood loss risk; minimize flood impacts on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by flood plains. Agencies must consider alternatives to avoid adverse and incompatible development in the flood plain. If the only practical alternative requires action in the flood plain, agencies must design or modify their action to minimize adverse impacts. The proposed action represents the least environmentally damaging alternative to accomplish the needed risk reduction system modifications.

Clean Air Act of 1972

The Clean Air Act (CAA) sets goals and standards for the quality and purity of air. It requires the Environmental Protection Agency to set National Ambient Air Quality

Standards (NAAQS) for pollutants considered harmful to public health and the environment. The proposed action project area is located in Plaquemines Parish which is currently in attainment of NAAQS; therefore, a general conformity determination is not required. The Louisiana Department of Environmental Quality is not required by the CAA and Louisiana Administrative Code, Title 33 to grant a general conformity determination.

Clean Water Act of 1972 – Section 401 and Section 404

The Clean Water Act (CWA) sets and maintains goals and standards for water quality and purity. Section 401 requires a Water Quality Certification from the Louisiana Department of Environmental Quality (LDEQ). Coordination with the Louisiana Department of Environmental Quality determined that the three State Water Quality Certification (WQC) issued 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 for the NFL NOV NFL project remain valid for EA #543's TSA. (Appendix F).

As required by Section 404(b)(1) of the CWA, an evaluation to assess the short- and long-term impacts associated with the discharge of dredged and fill materials into waters of the United States resulting from this project has been completed (Appendix E). A Clean Water Act Section 404(b)(1) evaluation and public notice were mailed out for public and agency review and comment on June 27, 2017. The 404(b)(1) and public notice is included in Appendix E of this EA #543 and will be signed upon completion of public review and comment.

Coastal Zone Management Act of 1972

The Coastal Zone Management Act (CZMA) requires that "each Federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved state management programs." The CEMVN received a consistency determination C20100384 for the NFL FEIS on January 24, 2011 and C20110045 for the NOV SEIS and April 6, 2011. Coordination with LADNR for modification to CZD was initiated by letter dated May 24, 2017. In their letter dated **June XX, 2017**, the LADNR determined that the project as proposed is consistent with the Louisiana Coastal Resources Plan and issued Modification 8 to **CZD XXXX**.

Endangered Species Act of 1973

The Endangered Species Act (ESA) is designed to protect and recover threatened and endangered (T&E) species of fish, wildlife and plants. On May 26, 2017, the CEMVN submitted an updated Biological Assessment to USFWS with a determination of "no effect" on the piping plover, the red knot or any listed sea turtles and "not likely to adversely affect" the West Indian Manatee or the pallid sturgeon. USFWS concurred with this finding on June 9, 2017.

Fish and Wildlife Coordination Act of 1934

The FWCA provides authority for the USFWS involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It requires that fish and wildlife resources receive equal consideration to other project features. It requires Federal agencies that construct, license or permit water resource development projects to first consult with the USFWS, NMFS and state resource agencies regarding the impacts on fish and wildlife resources and measures to mitigate these impacts. Section 2(b) requires the USFWS to produce a Coordination Act Report (CAR) that details existing fish and wildlife resources in a project area, potential impacts due to a proposed project and recommendations for a project. The USFWS reviewed the TSA in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 USC 661 et seq.) and provided a draft Fish and Wildlife Consolidation Act Report (DCAR) dated June 16, 2017. This office has concurred with, or resolved, all recommendations contained in the DCAR, and project-specific recommendations have been addressed in section 8.2.

Hazardous, Toxic and Radioactive Waste (HTRW)

The USACE is obligated under Engineer Regulation (ER) 1165-2-132 to assume responsibility for the reasonable identification and evaluation of all hazardous, toxic, and radioactive waste (“HTRW”) contamination within the vicinity of proposed actions. ER 1165-2-132 identifies that HTRW policy is to avoid the use of project funds for HTRW removal and remediation activities.

An ASTM Phase I Environmental Site Assessment (ESA) was completed for the project area, no recognized environmental conditions (RECs) were identified in the new levee alignments, new ROWs, or the Coleman brackish marsh project site. A copy of the Phase 1 ESAs is on file at the CEMVN Headquarters. The probability of encountering HTRW for the recommended plan is low based on the initial site assessments. If a recognized environmental condition is identified in relation to the project site, the CEMVN would take the necessary measures to avoid the recognized environmental condition so that the probability of encountering or disturbing HTRW would continue to be low.

Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA)

The MSFCMA, as amended, Public Law 104-208, addresses the authorized responsibilities for the protection of Essential Fish Habitat (EFH) by NMFS in association with regional fishery management councils. The MSFCMA states that EFH is “those waters and substrate necessary for fish for spawning, breeding or growth to maturity” (16 United States Code [USC] 1802(10); 50 CFR 600.10). The 2005 amendments to the MSFCMA set forth a mandate for the NMFS of the National Oceanic and Atmospheric Administration, regional Fishery Management Councils (FMC), and other Federal agencies to identify and protect EFH of economically important marine and estuarine fisheries. A provision of the MSFCMA requires that FMCs identify and protect EFH for every species managed by a Fishery Management Plan (FMP) 16 USC 1853. NMFS has a “findings” with the CEMVN on the fulfillment of coordination requirements under provisions of the MSFCMA. In those findings, the CEMVN and NMFS have agreed to complete EFH coordination requirements for federal civil works

projects through the review and comment on National Environmental Policy Act documents prepared for those projects. EA #543 was provided to the NMFS for review and comment on June 27, 2017. Comments and EFH conservation recommendations if and when received from the NMFS and comment response would be included in Appendix G and incorporated into the FONSI.

Migratory Bird Treaty Act

The Project area is known to support colonial nesting wading/water birds (e.g., herons, egrets, ibis, night-herons and roseate spoonbills) and shorebirds (terns and gulls). Based on review of existing data, site visits, and with the use of USFWS guidelines, the CEMVN finds that implementation of the proposed actions would have no effect on colonial nesting water/wading birds or shorebirds. USFWS and USACE biologists will survey the proposed project area before construction to confirm no nesting activity as suitable habitat and the potential for nesting exist within the Project area. If active nesting exists within 1,000 feet (water birds) or 1,300 feet (shorebirds) of construction activities then USACE, in coordination with USFWS, would develop specific measures to avoid adverse impacts to those species. A detailed nesting prevention plan may be necessary in order to deter birds from nesting within the aforementioned buffer zones of the Project footprint in order to avoid adverse impacts to these species. If a nesting prevention plan is necessary, it would be prepared in coordination with USFWS.

Bald and Golden Eagle Act

The Project area is known to support bald eagles. Based on review of existing data, site visits, and with the use of USFWS guidelines, the CEMVN finds that implementation of the proposed actions would have no effect on bald eagles. USFWS and USACE biologists will survey the proposed project area before construction to confirm no nesting activity as suitable habitat and the potential for nesting exist within the Project area. If active nesting exists within 660 feet of construction activities CEMVN would coordinate with USFWS to develop avoidance measures. A permit under 50 CFR 22.26 or 22.27 will be required if the project cannot minimize or prevent disturbance of bald eagles.

E.O. 12898 Environmental Justice

The USACE is obligated under E.O. 12898 of 1994 and the Department of Defense's Strategy on Environmental Justice of 1995, which direct Federal agencies to identify and address any disproportionately high adverse human health or environmental effects of Federal actions to minority and/or low-income populations. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, Pacific Islander, or some other race or a combination of two or more races. A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population. Low-income populations are those whose income is the Census Bureau's statistical poverty threshold for a family of four. The Census Bureau defines a "poverty area" as a census tract or block numbering area with 20 percent or more of its residents below the poverty threshold level and an "extreme poverty area" as one with 40 percent or more below the poverty threshold level.

National Historic Preservation Act of 1966

Congress established the most comprehensive national policy on historic preservation with the passage of the National Historic Preservation Act of 1966. In this act historic preservation was defined to include "the protection, rehabilitation, restoration and reconstruction of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, or culture." The act led to the creation of the National Register of Historic Places, a file of cultural resources of national, regional, state, and local significance. The act also established the Advisory Council on Historic Preservation (the Council), an independent Federal agency responsible for administering the protective provisions of the act.

Section 106 of the National Historic Preservation Act requires consultation with the SHPO and Federally-recognized Indian tribes. Section 106 consultation has not yet been completed for the TSA, and Phase II archaeological investigations are being conducted in portions of the additional ROW for NOV 09 to determine NRHP eligibility for two previously recorded cultural resources. Consultation with the SHPO and Federally-recognized Indian tribes for the Coleman FS Brackish Marsh Project, new ROW for NOV 09, and additional ROW for NOV 05A for any potential effects to significant historic properties is on-going. A finding of no historic properties affected by the New ROW for NOV-NF-W-05a.1 was coordinated with the SHPO and Federally-recognized Indian tribes in a letter dated January 15, 2016, and the SHPO concurred with the finding.

Tribal Consultation

The NEPA, Section 106 of the National Historic Preservation Act, E.O. 13175 ("Consultation and Coordination with Indian Tribal Governments"), the American Indian Religious Freedom Act, and other related laws and regulations require consultation with Federally-recognized Indian tribes on actions that have the potential to significantly affect protected tribal resources, tribal rights, or Indian lands.. In accordance with CEMVN's responsibilities under NEPA, Section 106, and E.O. 13175, CEMVN will offer the following Federally-recognized Indian tribes the opportunity to review and comment on the proposed action: Alabama-Coushatta Tribe of Texas, Caddo Nation of Oklahoma, Chitimacha Tribe of Louisiana, Choctaw Nation of Oklahoma, Coushatta Tribe of Louisiana, Jena Band of Choctaw Indians, Mississippi Band of Choctaw Indians, Seminole Nation of Oklahoma, Seminole Tribe of Florida, and Tunica-Biloxi Tribe of Louisiana.

10.0 CONCLUSION

CEMVN has assessed the environmental impacts of the recommended TSA on relevant resources in EA #543. The TSA recommended plan would have only temporary short term impacts on air quality from heavy equipment operations during construction; short term temporary impacts to adjacent areas from construction noise; temporary transportation impacts from transporting of construction equipment and hauling materials to/from the construction site.

Constructing the TSA recommended plan, which includes new ROW for NOV 09 and NOV-NF-W-05a.1, would reduce impacts assessed in the NOV SEIS, SEA #537, and NFL EIS to BLH-Wet by 17.1 acres, and to wet pasture by 8.4 acres. See Table 2 for impacts being mitigated as changed by this new ROW design.

Constructing the TSA Coleman project would be a beneficial impact to wetlands as approximately 230 acres of open water habitat would be converted to brackish marsh habitat. The Coleman Brackish Marsh Project would offset loss of 105.6 AAHUs of intermediate, brackish and saline marsh habitat within the Basin. There would be temporary impacts to the 340 acre borrow site in the Mississippi River as the borrow material is dredged, however, over time this borrow source is anticipated to fill back in with sediment from the river. Implementing the TSA would also include purchasing mitigation bank and ILF credits that would offset the loss of 37.5 AAHUs of BLH-Dry, 120.2 AAHUs of BLH-Wet, 33.8 AAHUs of swamp and 53 AAHUs of fresh marsh impacts within the Basin. Since the purchase of mitigation credits for the TSA would occur at existing approved mitigation banks and the ILF, and because permitted banks and the ILF program exist as reasonably foreseeable projects in the FWOP conditions, no new direct or indirect impacts to any relevant resources would be incurred from the purchase of these credits for the NFL NOV mitigation.

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