COLE'S BAYOU MARSH RESTORATION
ENVIRONMENTAL ASSESSMENT
Fed No. TV-63
Vermilion Parish, Louisiana

Prepared by National Marine Fisheries Service

DRAFT
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UNITS OF MEASURE

ft	feet

ACRONYMS

CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CPRA	Louisiana Coastal Protection and Restoration Authority
CWA	Clean Water Act
CWPPRA	Coastal Wetlands Planning, Protection, and Restoration Act
CZMA	Coastal Zone Management Act
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FIRM	Flood Insurance Rate Maps
FONSI	Finding of No Significant Impact
GMFMC	Gulf of Mexico Fisheries Management Council
HTRW	Hazardous, Toxic, and Radioactive Waste
HMS	Highly Migratory Species
LCWCRTF	Louisiana Coastal Wetlands Conservation and Restoration Task Force
LDEQ	Louisiana Department of Environmental Quality
LDWF	Louisiana Department of Wildlife and Fisheries
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NAVD	North American Vertical Datum
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration, U.S. Department of Commerce
NRHP	National Register of Historic Places
SAV	Submerged aquatic vegetation
SHPO	State Historic Preservation Office
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service, U.S. Department of Interior
WCRA	Wetlands Conservation and Restoration Authority
WVA	Wetland Value Assessment

EXECUTIVE SUMMARY

Project: Cole's Bayou Marsh Restoration (TV-63)

Sponsor: National Marine Fisheries Service and Louisiana Coastal Protection and Restoration Authority

Contact: Cecelia Linder; 1315 East-West Hwy, Silver Spring MD 20910; ph 301-427-8675

Project Size: 3,840 acres

Location: In Vermilion Parish, Louisiana west of Intracoastal City, Louisiana.

Need: Land losses resulting primarily from subsidence, altered hydrology, sediment deficit, interior ponding, and storm impacts have resulted in rapid episodic losses

Purpose: Support the objectives of the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) by creating marsh in shallow open water areas, and nourishing existing marsh.

Proposal: Create 365 acres of marsh, nourish 53 acres of marsh using bay sediments, and reestablishing the historic freshwater and sediment patterns into the interior wetlands through installation of 48-inch culverts in an existing system of earthen canal spoil banks.

Public Participation: State resource agencies, federal resource agencies, and local government coordinated throughout project development as described in section 1.2. The draft Environmental Assessment (EA) will be available for public review at the Vermilion Parish Public Library in Abbeville, Louisiana, and online (http://www.habitat.noaa.gov/pdf/coles_TV_63_draft_environmental_assessment.pdf). We will publish a notice of the draft EA in the Advocate (State newspaper) and the Vermilion Today (local newspaper). The notice and any comments received on the draft will be included in the final EA.

Summary of statement and conclusions: Long-term beneficial impacts on the coastal resources of south Louisiana without substantial long-term adverse environmental impacts are anticipated with the proposed action. Adverse impacts are considered minor, as they are temporary or reversible, and beneficial impacts would be minor to moderate and sustained. This effects analysis is based on a review of relevant literature, site-specific data, and project-specific engineering reports related to biological, physical, and cultural resources, as well as on the cumulative experience gained through many similar coastal restoration projects in south Louisiana over the past two decades. The increase of fisheries habitat is anticipated to have long-term beneficial impacts on the local economy and culture as it relates to recreational and commercial fishing. In addition, the preferred alternative would result in increased protection of adjacent marsh in the area to be restored.

Potential adverse impacts: None

Issues to be resolved: None

1 INTRODUCTION

The proposed project (**Cole's Bayou Marsh Restoration, TV-63)** is authorized under the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) of 1990 (16 United States Code [U.S.C.] §777c, 3951-3956), which stipulates that five federal agencies and the State of Louisiana jointly develop and implement a plan to reduce the loss of coastal wetlands in Louisiana (16 U.S.C. §3952 (b) (2)). The National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (Fisheries Service), Department of Commerce is the federal sponsor responsible for project oversight, including National Environmental Policy Act (NEPA) compliance. The Louisiana Coastal Protection and Restoration Authority (CPRA) is the non-federal local project sponsor. Other federal agencies that make up the CWPPRA Task Force selected this project through a publicly vetted process for engineering and design (Louisiana Coastal Wetlands Conservation and Restoration Task Force [LCWCRTF] 2011).

For NOAA and CPRA to request funds and authorization for construction of this project, the CWPPRA standard operating procedures require an Environmental Assessment (EA). The EA provides information for the decision of whether to fund and authorize this project and analyzes the environmental impacts of the proposed action and provides evidence to determine the level of significance of impacts to the human environment. Specifically, this EA analyzes the direct, indirect, and cumulative impacts on the human environment likely to result from the Cole's Bayou Marsh Restoration Project. It was prepared in compliance with the NEPA of 1969 and Council on Environmental Quality (CEQ) regulations for implementation of NEPA (Title 40 *Code of Federal Regulations* [CFR] Parts 1500 through 1508 [CEQ 1992]). The following are some sources used to analyze the environmental impacts of the proposed action:

- Environmental Impact Statement (EIS) for the CWPPRA program (LCWCRTF 1993).
- Louisiana Coastal Area Ecosystem Restoration Study (LCA) EIS (U.S. Army Corps of Engineers (USACE) 2004).
- Wetland Value Assessment (WVA; NOAA Fisheries Service 2011)
- Engineering design analyses and associated data and surveys (Dynamic Solutions, LLC 2015)
- Hydrological Model (Dynamic Solutions, LLC and CPRA 2015)
- Coast 2050 Plan (LCWCRTF and Wetlands Conservation and Restoration Authority (WCRA) 1998)
- and other restoration efforts in coastal (LCWCRTF 2011 and OCPR 2012)

The CWPPRA EIS and LCA EIS provide general information on the need for action, the affected environment, and the environmental consequences.

The CWPPRA WVA evaluates wetland impacts through a quantitative, habitat-based assessment model developed to estimate anticipated environmental benefits. The WVA compares conditions over a 20-year period to determine the net difference in "future without project" and "future with project" scenarios. Initial and future conditions are set based on historical land loss, aerial imagery, and on-site visits to the proposed project area. Expected benefits are based on a combination of experience with previous projects, construction plans, models, and biological and engineering experience of the assessment team.

The engineering design analyses evaluate the cost efficiency and feasibility of components to achieve project goals. The design process includes surveying the proposed project area, testing soils for type and strength, determining options for access and staging of work, and proposed feature longevity. The CWPPRA program operating principles stipulate that, during engineering and design, reports are required at 30% and 95% completion. The reports are circulated, and meetings are held at which the CWPPRA participating agencies, landowners, and other interested parties are presented with the design process to

date, and provided opportunity to comment at that time. The 30% and 95% design meetings are expected to occur spring and summer of 2015.

1.1 Purpose and Need

1.1.1 Purpose

The purpose of the proposed project is to support the coastal restoration objectives of CWPPRA by re-establishing marsh in the project area. After construction, native marsh would be planted to help stabilize sediments of the newly created marsh area. Specific objectives are below, and proposed alternatives meet or exceed these goals.

- Create 365 acres of brackish marsh in recently formed shallow open water
- Nourish approximately 53 acres of existing brackish marsh
- Re-establish the historic freshwater and sediment patterns through the interior wetlands, specifically increase freshwater and sediment inflow through interior wetlands and decrease inundation

1.1.2 Need

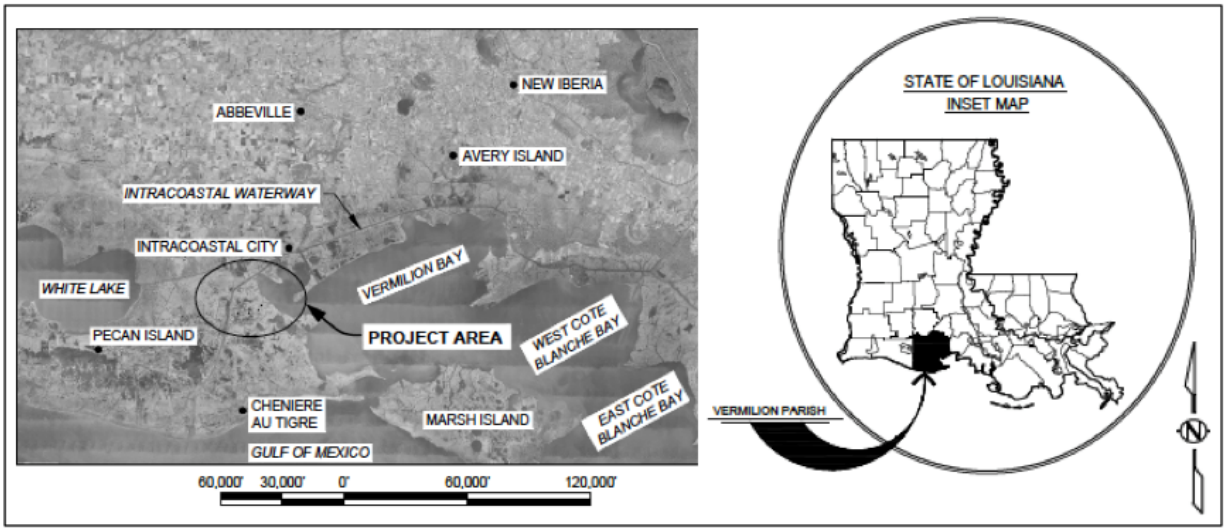
The proposed project is needed to reduce hydrologic stress and habitat shifts that impede marsh productivity, a critical component of a marsh's ability to maintain elevation. The project area is surrounded on the north by a series of earthen levees that have several hydrologic breaches (5 to 30 ft wide; CPRA 2015). There are no breaches in the southern end of the project, thus the levees act as a water trap reducing marsh quantity and quality. A healthy coastal marsh has value as rearing habitat for shellfish and finfish; habitat for waterfowl, wading birds, and small mammals; reducing storm surge to interior land; and helping maintain water quality. Louisiana's coastal wetlands, such as the proposed project area, are essential to sustain renewable fishery resources integral to the local, state, and national economies. Of the 1.4 billion pounds of fisheries landings reported for the Gulf Coast in 2013, more than 74% were caught in Louisiana (NOAA 2015). Marshes provide nursery, foraging, and spawning habitat for numerous marine and estuarine species of commercial and recreational importance.

1.2 Project Location

The proposed project is located in Vermilion Parish, Louisiana east of Freshwater Bayou Canal approximately 5 miles southwest of Intracoastal City, Louisiana and 16 miles southwest of Abbeville, Louisiana (Figure 1). The proposed project area encompasses 3,840 acres that is primarily marsh and open water with a sediment borrow area proposed Vermilion Bay. Two miles southeast of the proposed project area is a 15,000-acre Louisiana Wildlife Management Area and Game Preserve. The Paul J Rainey Wildlife Refuge and Game preserve is 8 miles southwest of the proposed area.

The proposed project area encompasses 3,840 acres within the Region 3 Rainy Marsh mapping unit Teche/Vermilion of Basin of the Coast 2050 Restoration Plan (LCWCRTF and Wetlands Conservation and Restoration Authority [WCRA] 1998, 1999; USACE 2004 SubProvince 3 of the Louisiana Coastal Area Restoration Plan East Freshwater Bayou/Chenier au Tigre Subunit). The Rainey Marsh mapping unit is 68,254 acres bordered by Vermilion Bay to the east and north, the Gulf of Mexico to the south, and Freshwater Bayou Canal to the south.

FIGURE 1. PROPOSED PROJECT LOCATION



Source: Draft Plans Dynamic Solutions LLC 2015

1.3 CWPPRA Process

The CWPPRA project selection process takes several months to complete, involves extensive public involvement and review by federal and state agencies, and narrows the field of potential projects down to approximately four a year that are approved to enter the formal engineering and design process. As a result of this process, the field of available alternatives under consideration for a project generally includes those alternatives that would meet project goals developed during the engineering and design process and that take place within the general proposed project area.

During the engineering and design process, a CWPPRA project is subjected to layers of public, academic, and interagency review to ensure that effective projects move forward for design and ultimate construction. The project selection process begins around February of each year when Regional Planning Teams across the coast convene to solicit project nominations from the public, State, and federal agencies, as well as members of industry and academia. The meetings are publicized via public notices, and all members of the public are invited to attend. Every nominated project contains conceptual project features, approximate construction costs, and anticipated benefits to wetland resources. The nominated projects are screened and pared down to 21 nominees at a public voting meeting. Each federal agency represented in the CWPPRA program, the State, and each coastal parish participates in voting.

Interagency and academic working groups then evaluate the conceptual project features for cost and project-associated wetland benefits for feasibility and appropriateness to addressing the local land loss. The 21 nominee projects are then voted on by the program's federal agencies and the State to obtain a list of the 10 top-ranking projects to continue through the process. These candidate projects undergo several months of further design and interagency evaluation to determine whether the proposed project features are feasible, the anticipated benefits are likely, and the project costs are within the funding constraints of the program. Certain project features are typically discounted during this preliminary design phase based on concerns about inferior performance, adverse impacts, technical infeasibility, or unreasonable costs. In the first months of each calendar year, the candidate projects are publicly presented and voted on by the program agencies to be funded for Phase 1 analysis, which includes the activities necessary to complete engineering and design, permitting, land rights, and environmental compliance before the project moves to construction.

1.4 Environmental Setting

The proposed area is a wetland undergoing losses at recent rates of about -0.3 percent per year (NOAA Fisheries Service 2011). Generally, altered hydrology has increased saltwater intrusion. Subsidence/sediment deficit, interior ponding, and storm impacts have resulted in rapid episodic losses. Drought, shearing, and other hurricane stresses, within recent decades have deteriorated the marshes. Saltwater intrusion and changes in hydrology are associated with increasing tidal influence. As hydrology in this area has been modified, habitats have shifted to more of a floatant marsh type, resulting in increased susceptibility to tidal energy storm damages. These habitat shifts and hydrologic stresses reduce marsh productivity, a critical component of vertical accretion in wetlands. These changes increased the susceptibility of damage from storms as evident in aerial photographs (Figure 2).

In preparation of this assessment, previous studies of the area were consulted, which contain information on the environmental setting of the proposed project and are referenced elsewhere in this analysis.

- The WVA is an analysis of future-with vs. future-without project-specific conditions for several ecological features (NOAA Fisheries Service 2011).
- Engineering design reports provide data and surveys collected in association with alternative development including some exiting conditions and alternative specific plans (Dynamic Solutions LCC 2015)
- A hydrological model was constructed to evaluate tidal inundation at the area and assist in proposed project design (Dynamic Solutions, LLC and CPRA 2015)
- A nutrient model, Boustany NSED2, evaluated benefits to marsh from the change in water flow (NOAA Fisheries Service project files).

FIGURE 2. AERIAL PHOTOGRAPHY FROM BEFORE (2004) AND AFTER (2007) HURRICANES KATRINA AND RITA SHOWING LAND LOSS

Source: Dynamic Solutions, LLC and CPRA presentation

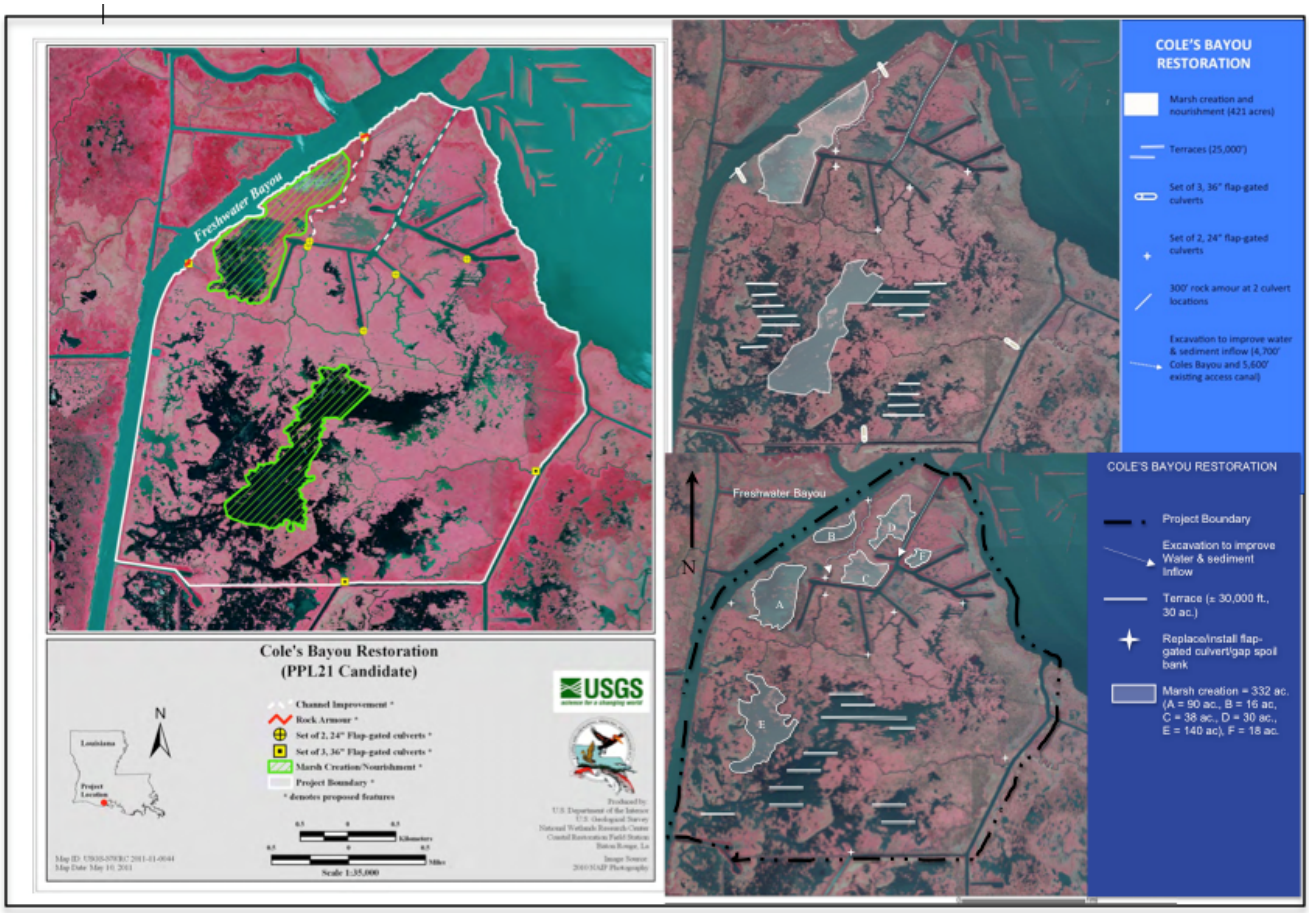
2 PROPOSED ACTION AND ALTERNATIVES

2.1 Alternatives Considered

Through the CWPPRA process, it was determined that re-establishment of the marsh and hydrology was the appropriate approach to restoration. Alternatives available to achieve this goal focus on adding sediment for elevation and nutrient enrichment of existing marsh using borrow sediments of the adjacent bay area, and changing hydrology to increase freshwater and decrease tidal / saltwater. Shoreline protection was also considered as a need and goal early in planning, and information collected toward installation of rock along Freshwater Bayou. This component was eliminated as a lower priority need of unclear benefit. When a proposed project is approved to proceed to formal engineering and design (Phase 1) by the CWPPRA Task Force, evaluation of project performance often includes the use of modeling to determine what project features are likely to be the most cost effective. Project features are refined based on results of field investigations and quantitative modeling, where applicable. Comprehensive engineering and design efforts focus on project alternatives that are considered technically feasible and cost effective while still meeting the project purpose and need. Project features are typically vetted to landowners and the public before the project moves into Phase 1, so that untenable features are eliminated from the evaluation process prior to investment of significant resources in data collection and detailed design.

For the Cole's Bayou Project area, several project concepts were considered for the area that lead to development of the alternatives considered in detail. Changes to project concepts incorporated opinions of agency representatives and public, feasibility, and benefits analysis. A variety of features and feature locations that were considered can be seen on Figure 3 aided in the proposal of alternative 2, the preferred alternative.

FIGURE 3. ORIGINAL RESTORATION CONCEPTS



Source: NOAA Fisheries Service Project files

2.2 Alternatives Considered in Detail

To meet the immediate need of the area, alternatives considered both marsh creation and hydrology. The successes of marsh creation/ terracing projects are apparent in scientific studies and monitoring of similarly constructed projects, as the method has been adopted by numerous restoration projects being constructed by the state, CWPPRA, Ducks Unlimited/NAWCA, Coastal Impact Assistance Program, NOAA Community-based Restoration Program, and as compensatory mitigation. Therefore, marsh creation and terracing options were pursued to meet the goals of the project.

Dynamic Solutions was tasked to model the hydrodynamics within the project area and help to determine the best course of action to meet the project goals. They evaluated hydrologic impact for constructing a marsh-only alternative, and one with culverts added as hydrologic management features. A culvert is a structure that allows water to flow under or through an obstruction, in this case, earthen spoil banks.

Aerial photography and bathymetric data for Vermilion Bay were collected along with topographic and bathymetric data for consideration of marsh creation. Geotechnical reports include soil type and stability information relevant to determining best placement and expected gains from the alternatives. Magnetometer surveys were conducted to determine the location of hazards.

Development began with data collection in spring of 2013. Field reconnaissance included water flow measurements at hydraulic connections between the Oil Field Canals and the marsh area, and major channels connected to open-water areas, elevation surveys of marsh, measurements of channel cross-

sections, and water depths. Tidal and salinity data from Vermilion Bay and surrounding coastal waters were analyzed to determine the extent needed for a hydrodynamic model.

A summary of alternative differences in relation to project goals is provided in Table 1 and 2. Following sections provide more information on the alternatives.

TABLE 1. COMPARISON OF MARSH ACRE CHANGES FOR ALL ALTERNATIVES

Alternative	No action (acres)	Alternative 1 (acres)	Alternative 2- Preferred (acres)
	No features created	Create 365 acres, nourish 53 existing acres marsh	Create 365 acres, nourish 53 existing acres marsh, install culverts
Marsh area after construction	2,550	2,915	2,915
marsh creation area	53	418	418
remainder of area	2,497	2,497	2,497
Marsh after 20 years	2,345	2,648	2,694
marsh creation area	49	352	352
reminder of area	2,296	2,296	2,342 (due to 24% land loss reduction)
Net change over time	-205	-267	-221
Net compared to existing	**-205**	**+98**	**+144**

Source: All numbers are approximations from the WVA (NOAA Fisheries Service 2011), and project design documents (Dynamic Solutions LLC 2015).

TABLE 2. HYDROLOGIC CHANGE ESTIMATES FOR ALL ALTERNATIVES

Alternative	No action / Existing (cubic feet / second)	Alternative 1 (cubic feet / second)	Alternative 2- Preferred (cubic feet / second)
Flow In	19.8	15.9	40.5
Flow Out	23.9	19.6	43.8
Net Flow from Marsh	4.1	3.7	3.3

Source: CPRA 2015

2.2.1 The No-Action Alternative

NEPA refers to the no-action alternative as the continuation of baseline conditions without implementation of the proposed project. Evaluation of the no-action alternative is required by CEQ regulations.

2.2.2 Alternative 1 –Marsh Creation

Marsh Earthen containment dikes would be constructed around three shallow open water areas to retain dredge fill sediments. The areas of marsh creation that would require containment dikes are shown in Figure 4. Soil stability determines the necessary configuration for the dikes, which differs among the proposed marsh creation locations, though all include a 20 ft minimum distance from the toe of the dike. Dike borrow pits would be dug within the marsh creation area for areas 1 and 2 (and thus be back filled with bay sediments). The containment borrow pit for marsh creation site 1 has a maximum bottom

elevation of -4.0 ft, and the borrow pit for marsh creation site 2 has a maximum bottom elevation of -3.0 ft. The earthen containment dikes for marsh creation area 3 would be outside the marsh creation area to -5 ft. The remaining channel would retain the water flow that would otherwise be altered by the marsh creation features. Dikes would be constructed to +3 ft in the northern sections of the project and to + 3.5 ft elevation in southern areas where inundation is greater and requires higher initial elevations for the dikes. Typical sections of the marsh creation containment dikes include a 5 ft crown width and 4:1 side slope.

Fill material from the bay borrow location would then be pumped in and placed to an elevation of +2 ft in fill areas 1 and 2 and to a +2.5 ft elevation in area 3. As the fill material settles, a final elevation of +1.3 ft is expected, which is the elevation of healthy marsh in the area. A total of 418 marsh acres would be constructed among the three fill areas. Half of the newly created marsh would be planted with native vegetation to assist in formation and soil stability.

2.2.3 Preferred - Alternative 2 –Marsh Creation and Culverts

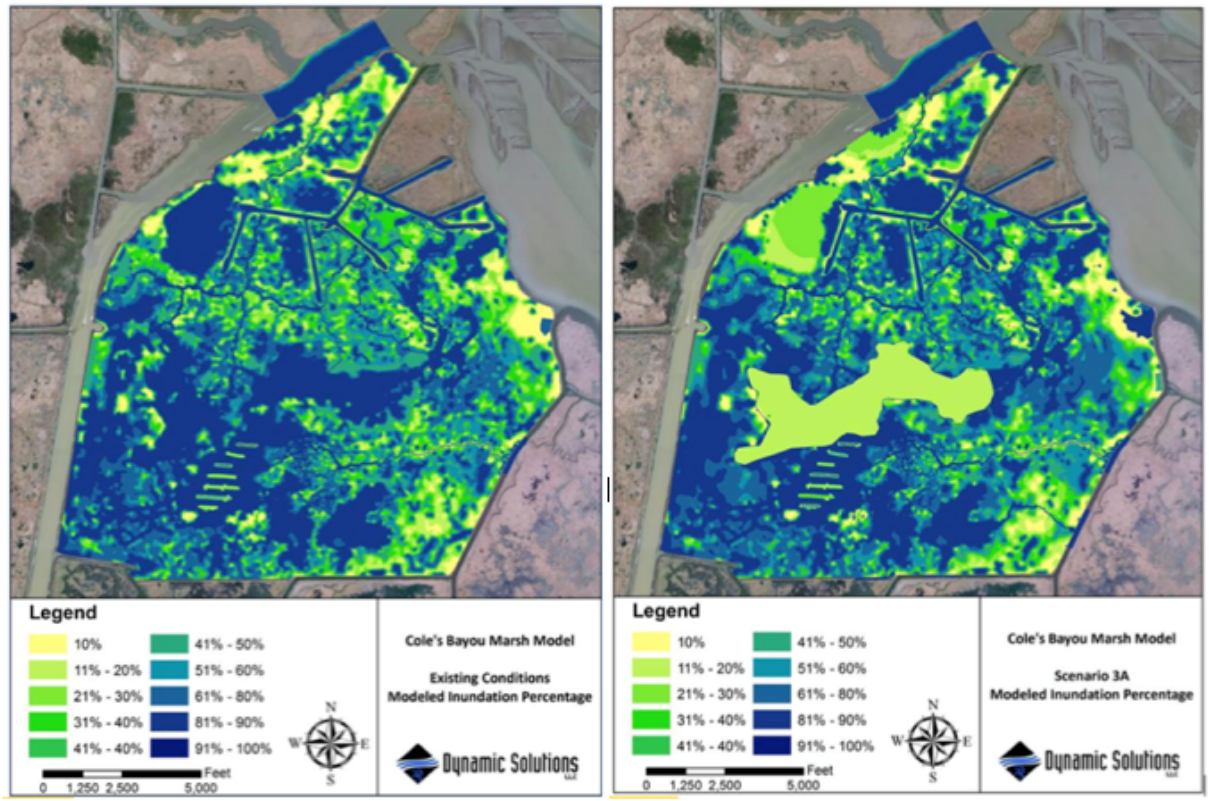
Culverts This alternative differs from alternative 1 through the addition of 16 hydrologic culverts on the northern (8 inflow) and southern (8 outflow) boundaries. The primary goal of the culvert feature is to control the volume of suspended sediment and associated nutrients getting into the project area and to facilitate the egress of the water. These goals governed the placement and configuration of the culverts. Culverts would consist of 48” diameter openings, placed at -2 ft depth.

The culverts would tie-in to the existing levee system using onsite sediments. The culverts would have flap gates that allow water flow into the marsh from the north and out through culverts in the south, thus influencing water level, salinity, and increasing drainage in the southern inundated areas. The locations of the breaches that allow water in along the northern boundary, existing channels, and larger ponding areas were the basis for the locations of the water control structures. Modeling the hydrology of the area assisted in structure number and location, as shown by the existing condition and reduced flooding in Figure 4. Different gate options were considered for control, including hinged top and one-way flap gate, the later was selected, as they require less maintenance than others considered and provide the directional flow to meet project goals.

Marsh Configuration of the borrow channels, containment dikes, and marsh fill are the same as in alternative 1. Earthen containment dikes would be constructed around three shallow open water areas to retain dredge fill sediments to create 418 acres of marsh (Figure 5). Soil stability determines the necessary configuration for the dikes, which differs among the proposed marsh creation locations, though all include a 20 ft minimum distance from the toe of the dike. Dike borrow pits of 3–4 ft in depth would be dug within the marsh creation area (and thus be back filled with bay sediments) for areas 1 and 2. The earthen containment dikes for marsh creation area 3 would be outside the marsh creation area to a depth of 5 ft. The remaining channel would retain the water flow that would otherwise be altered by the marsh creation features. Marsh creation fill would be the same as alternative 1, including the plantings of native vegetation to assist in formation and soil stability.

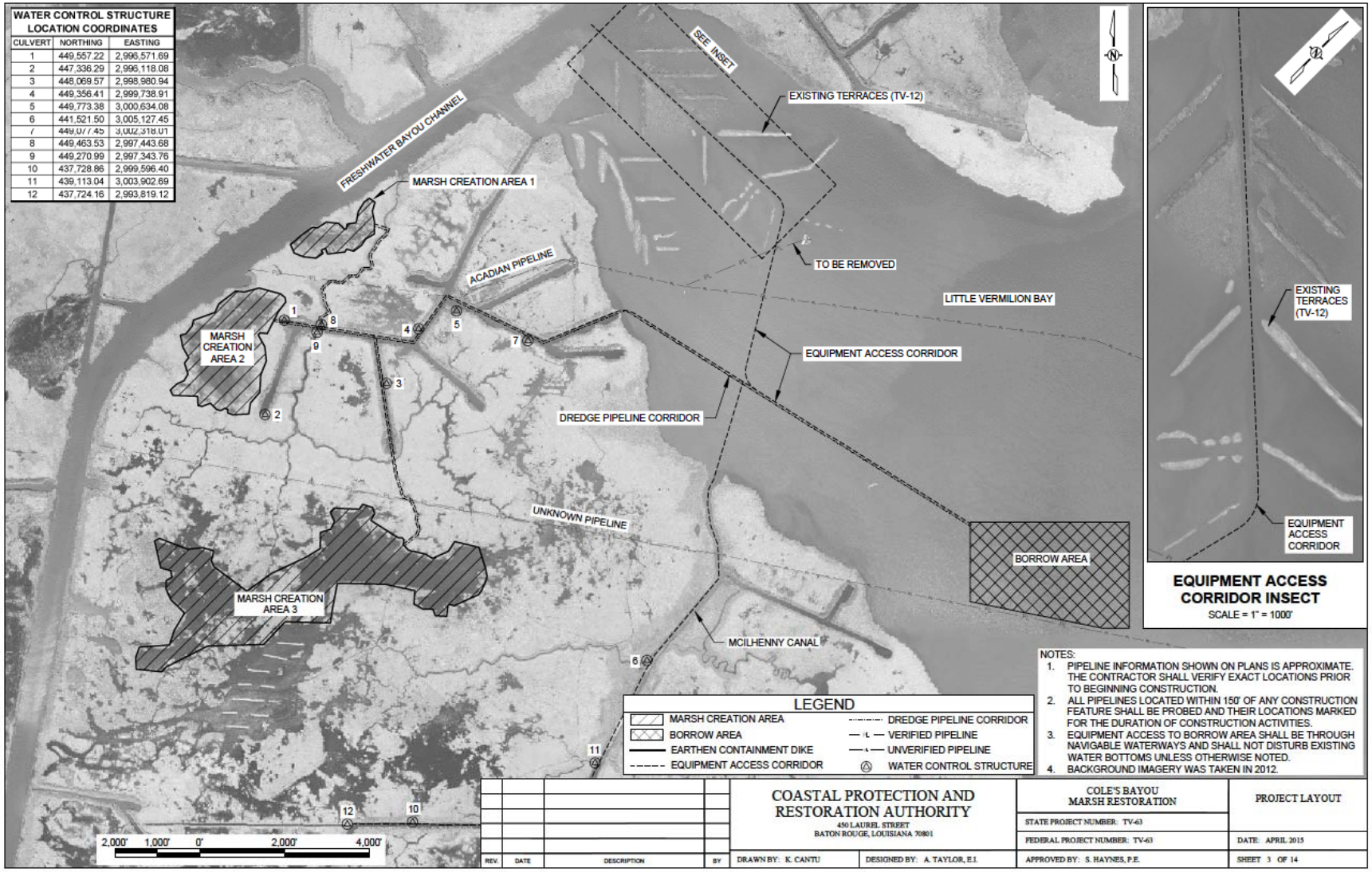
FIGURE 4. MODEL OF WATER LEVEL IN THE PROPOSED PROJECT AREA FOR EXISTING CONDITIONS, AND THE PREFERRED ALTERNATIVE (MARSH CREATIONS AND CULVERT INSTALLATION).

EXISTING **PREFERRED-ALTERNATIVE 2**



Source: CPRA 2015

FIGURE 5. GENERAL AREA OF MARSH CREATION AND BORROW FEATURES FOR BUILD ALTERNATIVE 2 -PREFERRED



Source: CPRA 2015 (Preliminary report)

3 AFFECTED ENVIRONMENT AND CONSEQUENCES

Effects of alternatives were designated as having *no impact*, *no significant impact (minor* or *moderate*), or *significant impact*. Consideration was given to both length of time and severity of the impact. *Minor impacts* are those that may be measurable but not result in adverse or beneficial effects to the human environment; these are short-term and reversible. *Moderate* impacts may have longer-term adverse or beneficial effects that have a measurable change to the identified environment, and thus warrant consideration of revision of the project component causing the adverse impact. *Significant* impacts can be either harmful or beneficial to the natural and physical environment, and/or the relationship of people with those environments, and would require preparation of an EIS. The qualitative assessment is based on reference material and professional judgment. A quantitative assessment is included when sufficient data are available to do so. Table 3 presents a summary of environmental impacts associated with the no-action and build alternatives. Table 4 presents avoidance and minimization measures of the preferred alternative.

TABLE 3. SUMMARY OF ENVIRONMENTAL IMPACTS OF ALTERNATIVES

Resource	No Action	Alternative 1	Preferred-Alternative 2
Geology, Soils & Topography	long-term, direct, minor to moderate adverse from loss of soils	short-term, direct, minor adverse effects nourishing existing 53 marsh through temporary burial, and long-term, indirect, moderate benefits from elevation increase	adverse impacts same as alternative 1, and long-term, indirect, moderate benefits area greater due to reduced hydrologic stress on soils
Climate & Air Quality	long-term, indirect, minor adverse for carbon dioxide cycle due to marsh loss	short-term, direct, minor adverse impacts from construction emissions, and long-term, indirect, minor benefit from carbon sequestration	similar to alternative 1, with greater lasting benefits of carbon sequestration and reduced flood time after storm surges.
Water	long-term, indirect, moderate adverse from turbidity during conversion and salt water intrusion to the aquifer	short-term, direct, minor adverse with dredging, and long-term, indirect, minor benefit from marsh filtering	same as alternative 1
Vegetation	long-term, direct, moderate adverse from conversion of 205 acres to open water over 20 years	short-term, direct, minor adverse with temporary burial of 53 acres marsh, and long-term, direct, moderate by retention of 98 acres over 20 years	short-term, direct, minor adverse with temporary burial of 53 acres marsh, and long-term, direct, moderate by retention of 144 acres over 20 years
Aquatic & Benthic Habitats	Long-term, direct, minor adverse impact from storm distribution, and long-term, direct, minor benefit from conversion to open water	short-term, direct, minor, adverse from sediment disturbance during construction, and long-term, indirect, minor benefits from improved water quality and increased detritus	similar to alternative 1 with greater benefit to water quality and more detritus from plant productivity and marsh longevity.
Essential Fish Habitat & Fisheries	long-term, direct, moderate adverse from conversion of marsh to open water	short-term, unavoidable, local, direct and indirect, adverse from construction, and long-term, direct and indirect, minor benefit from increased elevation, moderate benefit from forage species nursery habitat, and increases marsh acres and detritus	short-term, unavoidable, direct and indirect, adverse from construction greater than alternative 1 due to culvert installations, and longer-term, indirect, moderate benefit from marsh (46 acres more than alternative 1 and 349 acres more than no action), and increased water quality
Marine Mammals	none	none	none
Migratory Birds	long-term, indirect, minor adverse from reduced habitat quality and quantity	short-term, direct, minor adverse from displacement during construction, and long-term, direct and indirect, moderate from increased habitat quality and quantity	similar to alternative 1
Wildlife	long-term, indirect, moderate adverse from reduced habitat quality and quantity	short-term, indirect, adverse from construction, and long-term, indirect, moderate benefit from habitat recovery	short-term, indirect, adverse from displacement , and long-term, indirect, moderate benefits of increased habitat diversity and stability

Resource	No Action	Alternative 1	Preferred-Alternative 2
Threatened & Endangered Species	long-term, indirect, minor adverse impacts from prey habitat declines	unlikely to have adverse impacts, and long-term, indirect, moderate benefit to increased forage species habitat	same as alternative 1
Historic, Prehistoric & Native American	none	unlikely to have adverse impacts; no beneficial impacts	same as alternative 1
Socioeconomics	long-term, direct, minor adverse from habitat decline	short-term, direct, minor adverse from reduced recreational use during construction; short-term, direct, moderate benefits from local job creation; and long-term, indirect, moderate benefit of increased recreational value	similar to alternative 1 with greater sustained long-term benefits
Land Use & Infrastructure	long-term, indirect, minor adverse from increased exposure to storms and erosion	no adverse, and long-term, indirect, minor benefits from protection, and moderate benefit to recreation	similar to alternative 1 with greater sustained long-term benefits
Hazardous, Toxic, & Radioactive Waste	long-term, indirect, minor adverse impacts due to increased exposure to oil and gas infrastructure to exposure	unlikely to have adverse impacts; no beneficial impacts	same as alternative 1

TABLE 4. AVOIDANCE AND MINIMIZATION MEASURES OF THE PREFERRED ALTERNATIVE

Resource	Potential Avoidance and Minimization Measures
Geology, Soil & Topography	None
Climate & Air Quality	Contract provisions to reduce emissions
Water	Sediment retention dikes to reduce turbidity.
Vegetation	None
Aquatic & Benthic Habitats	None
Essential Fish Habitat & Fisheries	None
Marine Mammals	Sea turtle provisions if necessary as provided in Appendix B.
Migratory Birds	Coordination with US Fish and Wildlife Service (USFWS) to avoid construction during nesting season.
Wildlife	None
Threatened & Endangered Species	Measures will be included in construction contracts detailing avoidance of takings of threatened and endangered species.
Historic, Prehistoric & Native American	None
Socioeconomics	None
Land Use & Infrastructure	None
Hazardous, Toxic & Radioactive Waste	Contract provisions will require pre-construction magnetometer surveys to avoid potential oil and gas pipeline interactions and construction plans include offsets from identified pipeline areas.

3.1 Physical Environment

3.1.1 Geology, Soils, and Topography

The proposed project area was formed by the Mississippi River 6,000 years ago, one of the oldest delta complexes within the Mississippi River Deltaic Plain of coastal Louisiana. Soils in the project area include Allemands Series in the interior marsh with a fringe of Larose Series along the Freshwater Bayou Canal (NOAA Fisheries Service 2011). Allemands are very poorly drained organic soils that formed in moderately thick accumulations of decomposed herbaceous material. They are found in freshwater coastal marshes that are ponded and flooded most of the time and have an organic surface layer that is more than 16 inches thick. Soil information from twenty soil borings in the marsh creation and culvert areas, and six soil borings at the proposed borrow site, were collected in 2013 (Dynamic Solutions LLC 2015). Conditions do not vary widely across the project area. Underlying the top very soft to soft clay is silty clay with organics from depths ranging from about 10-15 ft below the soil surface. Below 15 ft are medium to stiff clay or silty clay soil.

Subsidence is a process of sinking that has natural and anthropogenic causes. The Cole's Bayou area subsidence rates range from (1–15 millimeters/year). Coastal Louisiana has a high rate of sea level rise. Combined these factors contribute to a relative sea level rise estimated at approximately 5 to 10 inches over the 20 year design life of this project (Dynamic Solutions LLC and CPRA 2015).

Impacts of No Action Long-term, direct, minor to moderate adverse impacts could be expected. With no action, the existing marsh would continue to be lost in storm conditions, subside, and convert to open water. Without action an estimated 205 acres of marsh would convert to shallow open water or bay.

Impacts of Alternative 1 Long-term, indirect, moderate benefits to this resource would result as vegetation colonizes the recreated emergent areas. The created habitat would help offset subsidence and sea level rise. The proposed elevation increase would reduce vegetation stress and placed sediments would increase nutrient availability to plants. An increase in plant productivity and subsequent increases

in organic material in the plant soils would be expected. Subsidence and land loss processes would continue, and result in an increase of 98 acres of productive marsh soil after 20 years compared to existing conditions with this alternative (Table 1).

Short-term, direct, minor adverse effects may result during nourishment of the existing 53 acres of marsh habitat. Temporary burial of marsh vegetation with a thin layer of sediment would occur while the vegetation recolonizes, or grows through, the sediment layer. This impact is unavoidable to provide the long-term, direct benefits of increasing marsh elevation. Native vegetative plantings would be used to stabilize soil, reduce resuspension of recently deposited sediment, and encourage sedimentation and colonization.

Impacts of Preferred - Alternative 2 The long-term, indirect, moderate beneficial impacts are similar to the build alternative 1. Additional beneficial impacts to the soil would result from hydrologic changes expected to further reduce plant stress, make nutrients more available to increase primary productivity and therefore allow greater organic soils to form than with alternative 1. A projected decrease in land loss of 24% was estimated for areas outside the marsh creation areas as a result of improved hydrology (NOAA Fisheries Service 2011). Subsidence and land loss processes would continue, and result in an increase of 144 acres of productive marsh soil after 20 years compared to existing conditions with this alternative (Table 1).

Short-term, direct, minor adverse effects the same as alternative 1 would include potential impacts to 53 acres of existing marsh that would temporarily reduce organic soil formation. Although soils would be moved to tie-in the culvert to the existing levee, no additional adverse effects are expected to result from culvert installation.

3.1.2 Climate and Air Quality

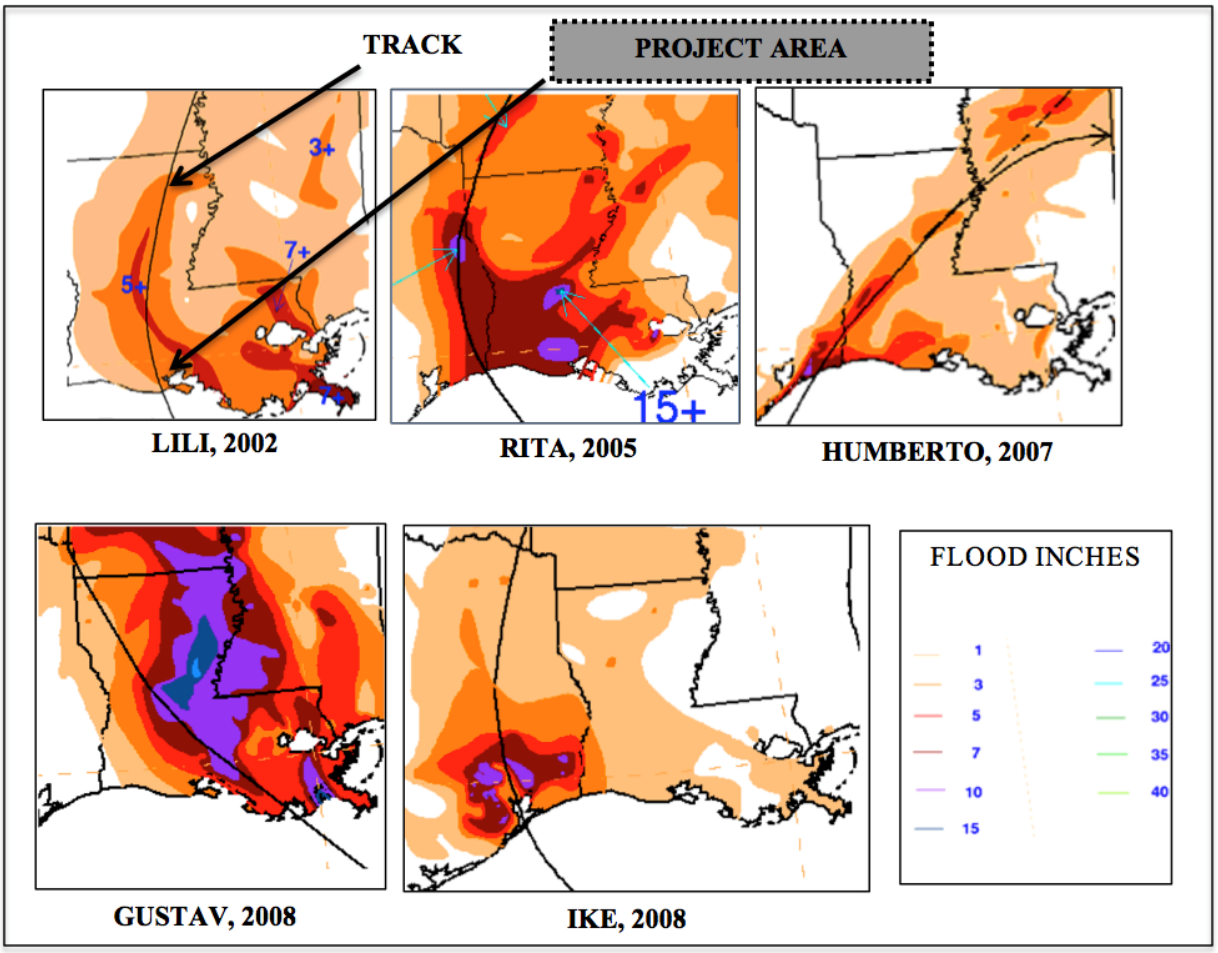
The subtropical climate of coastal Louisiana is characterized by long, hot summers and, mild winters with high humidity year round. Hurricanes and tropical storms typically occur over the study area between June and November. On average, since 1851, a tropical storm or hurricane is expected somewhere within the state of Louisiana every 0.7 years; hurricanes make landfall about every 2.8 years (Roth 2015). Recent hurricanes have resulted in rapid episodic loss of marsh as seen in Figure 2. These hurricanes are directly and significantly related to the need for the proposed project. Coastal storms physically removed vegetation in the area, a natural event made possible by the weaker marsh health and inadequate water evacuation. The track of hurricanes (from landfall to inland areas), and the related flooding (inundation) illustrate the energy associated with these events (Figure 6). The physical and lasting vegetation losses do not occur throughout all areas under a hurricane's influence, but occur at isolated areas. The proposed project area was identified as a specific area of high loss with the Teche/Vermilion Bay post-hurricane Katrina (Barras 2006). With adequate elevation and hydrology, such marsh areas can have full recovery after such storms.

Louisiana air quality is good, as offshore breezes mix and freshen the air. Vermilion parish is classified as attainment status according to the National Ambient Air Quality Standards and the Louisiana Department of Environmental Quality (LDEQ) consultation (Appendix C, LDEQ). Sources of air emissions in the 10-mile radius of the proposed area are mainly associated with industry of the Freshwater Bayou Oil Field Facility (LDEQ 2015).

Wetlands, such as those of the proposed project area, are more valuable as carbon sinks than other ecosystem types due to high carbon sequestration and negligible methane emissions (Choi and Wang 2004). Average soil carbon accumulation in estuarine emergent wetlands is 6.4 metric tons of carbon per acre per year, and has been reported as high as 42.7 metric tons per acre per year at Sabine National Wildlife Refuge, Louisiana (Bryant and Chabreck 1998; Engle 2011). For comparison, the latter is over

twice the annual carbon emissions per person in the US (Worldbank 2015; total greenhouse gas emissions, 17.6 metric tons per year). A review of the process and amounts of carbon sequestration in Gulf of Mexico wetlands was considered in this analysis (Engle 2011).

FIGURE 6. RECENT HURRICANE TRACKS, YEAR OF OCCURRENCE, AND THE ASSOCIATED STORM SURGE FLOODING IN INCHES



Source: modified from Roth, 2015

Impacts of No Action The no-action alternative would not substantially affect the climate or weather, and would not result in any changes to existing air quality in the area. The ability of the project area to recover from storm-associated direct (physical) and indirect (stress) adverse impacts would decline. The ability of the project area to extract carbon from the air during photosynthetic processes of the marsh plants will decline with projected land losses.

Impacts of Alternative 1 This build alternative would not substantially affect the climate or weather. The alternatives compared to no-action would increase the areas ability to withstand and recover from storm impacts by improving the productivity of the marsh, which can increase strength and vegetative recovery. Compared to the preferred alternative, this alternative would not improve the areas ability to recover from storm surge inundation. While the areas created would have less inundation due to increased elevation, the area as a whole would not significantly influence water flow compared to no action or existing conditions, as shown in modeling results in Table 2.

Differences between the air emissions of the alternatives are unquantifiable. Short-term, direct, minor adverse impacts to air quality from construction would be associated with emissions from diesel engines that would power the dredging machinery, and material placement operations. Emissions would occur over a period of a few months, with most emissions occurring at the dredge and creation sites. The emissions would consist predominantly of nitrogen oxides, with smaller amounts of carbon monoxide, sulfur dioxide, particulate matter, and volatile organic compounds. Prevailing winds would dissipate airborne pollutants and limit them to the proposed project's construction phase. The impact to human health would be negligible because the proposed project area is remote from any residential area. In the long term, air quality in the area is expected to be unchanged.

Long-term, indirect, minor benefits to air quality would result from the larger amount and productivity of marsh area increasing the ability of the area to hold carbon, a significant contributor to global climate change. Dredging is required to attain the necessary amounts of sediment for marsh creation. Because there is some suggestion that increases in marsh acreage can contribute to the overall carbon sink and mitigate the effects of atmospheric carbon on global warming, any short-term, direct, minor adverse impacts from dredge material and machine operation would be negated by the long-term, direct, minor beneficial impacts.

Impacts of Preferred - Alternative 2 This alternative would have similar short-term, direct, minor adverse impacts to air quality from construction equipment as described with alternative 1.

Alternative 2 creates more marsh than the other alternatives (Table 1) and increases water flow with a reduction in water elevation (Table 2). Reducing water elevation reduces inundation, while increasing water exchange (or flow) provides greater nutrient and oxygen flow. The increased longevity of marsh area and productivity that is expected to occur from increasing plant elevation, increasing nutrients, and reducing inundation stress, would improve both the areas recovery from previous storm damage, and increase the likelihood of recovery from future storms. The added hydrological changes would allow for faster evacuation of storm surge waters, reducing the post-hurricane flooding and salt-water stressors. With more marsh and more productive marsh, a greater amount of carbon would be sequestered in the global carbon cycle providing the greatest beneficial impact of the alternatives.

3.1.3 Water Resources

The U.S. Environmental Protection Agency (EPA) has authority through Section 1424(e) of the Safe Drinking Water Act of 1974 to review federally financed projects to determine their potential for contaminating sole source aquifers. The project is located on the Chicot Aquifer, a designated sole source aquifer (Appendix B, Louisiana Aquifer System).

The proposed project is within the LDEQ subsegment 061103. The project area is "fully supporting the designated use" of boating, but not fully supporting primary contact or fish and wildlife propagation (LDEQ 2013). The suspected causes of impairment for these uses are total suspended solids, turbidity, and fecal coliform (LDEQ 2013).

Impacts of No Action The no-action alternative would not directly affect local water quality. Long-term, indirect, moderate adverse impacts would result from increased turbidity of the water from land erosion, and increased salt water to the Chico aquifer system.

Impacts of Alternative 1 Impacts on water quality would not be measurably different with this alternative. Short-term, direct, minor adverse impacts associated with the dredging required for implementation of the preferred alternative include: (1) increased turbidity and decreased dissolved

oxygen in the water column at the dredge sites (dredge plume) and fill sites; (2) potential decreased dissolved oxygen in the water column at the borrow area due to increased water depth (>16 ft); (3) possible exhumation of buried debris; and (4) discharges from the dredge vessel. During dredging, silt or clay may become suspended in the water column near the dredge site. The suspended sediment would settle in a matter of hours to days (depending on current). If the disturbed sediments were anoxic, the dissolved oxygen levels in the water column would decrease. Turbidity and suspended particulate levels in the water column above the borrow area are normally high as a result of coastal processes. Long-term, indirect, minor benefits to water quality would result from the ability of created marsh to remove nitrates and phosphate.

Impacts of Preferred - Alternative 2 With this alternative, adverse impacts would not be quantifiably different those described in alternative 1. However, long-term, direct, moderate benefits to water quality would result from the ability of created marsh to remove nitrates and phosphate, and the improved freshwater flow allowing sediment settlement, thus reducing turbidity and providing more marsh for natural water filtering benefits.

3.2 Biological Environment

3.2.1 Vegetation Resources

Coastal Louisiana contains an estimated 40 percent of the vegetated estuarine wetlands in the contiguous United States (USACE 2004). The 3,840-acre project area is brackish marsh and intermediate open water (Sasser and others 2013). The marsh was all intermediate in 2001 and prior according to USGS surveys, and has been increasingly becoming saline. The project area is currently all brackish marsh. Marshhay cordgrass is the dominant vegetation occurring with Roseau cane three corner grass, marsh mallow, and marsh morning-glory (NOAA Fisheries Service 2011).

Approximately 150 acres of submerged aquatic vegetation (SAV) are believed to occur in the project area. Stands of SAV were observed to be dense in northern ponds of the project area and sporadic in southern ponds in the spring and summer of 2011. Species known to occur in the area are widgeon grass, water celery, tape grass, and southern naiad (NOAA Fisheries Service 2011). No or minimal SAV are known or believed to occur in the borrow area. Although, the borrow area is in shallow open water where SAV could occur, the high turbidity and wave energies prevent a sustainable population.

The Louisiana Department of Wildlife and Fisheries (LDWF) Natural Heritage Program lists rare plant species and their associated habitat, threats, and recommended practices. None are reported to occur in the project area (Appendix C). LDWF was consulted in conjunction with this analysis.

Impacts of No Action With no action, continued subsidence and land loss are expected to occur, resulting in losses of 53 acres of marsh; the marsh would convert to shallow open water. SAV would remain in the area and colonize new shallow open water. However, increased water turbidity and wind-generated wave energy would prevent the quantity of SAV to increase.

Impacts of Alternative 1 Short-term, direct, minor adverse effects may result during nourishment of the existing 53 acres of marsh habitat. Temporary burial of marsh vegetation and SAV with a thin layer of sediment would occur while the marsh vegetation recolonizes, or grows through, the sediment layer. The adverse impacts are unavoidable to provide the long-term, direct benefits of increasing marsh elevation. Native vegetative plantings would be used to stabilize soil, reduce resuspension of recently deposited sediment, and encourage sedimentation and colonization.

The alternative would exert long-term, direct, moderate benefits on vegetative communities of the area by adding elevation to marshes. This would offset some subsidence, increase vegetative productivity, and

decrease conversion of marsh to open water. The increase in elevation would be beneficial to vegetative communities by reducing flooding stress on the plants and allow time for vegetation to colonize and contribute to the elevation. Accumulation of organic material is a primary factor influencing the vertical accretion of marshes. SAV outside the fill area is projected to increase, thus offsetting buried by marsh fill (NOAA Fisheries Service 2011).

Impacts of Preferred - Alternative 2 Short-term, direct, minor adverse effects to the existing 53 acres of marsh habitat are the same as with alternative 1. Minor additional adverse effects to vegetation would results during installation of culverts that are not located in an existing breach.

The long-term benefits would be greater than with either the no action or alternative 1 by approximately 50 acres more gained in 20 years compared to the existing conditions (Table 1). This alternative is expected to result in more flood stress reduction for the vegetation, thus reducing the conversion to open water. After 20 years, the area is expected to have 144 acres more than the existing conditions, whereas the no action alternative during that time would result in a loss of 205 acres. Overall acres of SAV for the project area are projected to increase within 5 years post-construction and be greater than or equal to current conditions (NOAA Fisheries Service 2011). Areas in the southern project area where SAV are sparse would increase in density with reduction in inundation and the decreased water turbidity that limits the amount of light accessible to SAV for growth.

3.2.2 Aquatic and Benthic Habitats

The project area is primarily shallow (<1 ft) open-water surrounded by marsh at the marsh creation area, and a shallow (<4 ft) bay at the borrow area (NOAA Fisheries Service 2011). The borrow area is benthic habitat under estuarine water column. Benthic habitats near marsh support bacteria, fungi, microalgae, meiofauna, and microfauna, such as mollusks, polychaetes, decapods, and nematodes (Day and others 1989). The benthic community supports higher levels of the food chain, such as shrimp and demersal fish. Substrate quality strongly influences the distribution of benthic fauna. Other variables affecting the distribution of benthic organisms include water depth, salinity, illumination, food availability, currents, and tides. The whole of the Vermilion Bay complex, including Little Vermilion Bay where the borrow area is located, is public oyster seed ground designated by the Louisiana Department of Wildlife and Fisheries, whom describe the conditions as, “highly influenced by freshwater discharge for the Atchafalaya River. Typically, oyster reproduction occurs in the fall after the river stage abates, with oysters growing to seed size (1 inch to < 3 inches) by the following spring. However, spring and early summer floodwaters depress salinities, placing extreme physiological stress on the organisms. These low salinities, coupled with high water temperatures through the summer months typically results in extensive oyster mortalities on the public grounds. Occasionally, however, reduced freshwater inflow from the Atchafalaya River leads to higher-than-normal salinities and the normal annual cycle of extensive oyster mortalities is broken, leading to a harvestable population of see oysters during the following oyster seasons (September through April) (LDWF 2011).”

CPRA will be conducting a biological survey in 2015 of the seed grounds for the proposed project, and information updated on impacts at that time.

Impacts of No Action The benthic area would continue to increase as marsh converts to open water, increasing the quantity of habitat and thus a long-term, direct, minor benefit to the aquatic and benthic habitat. However, the area would become more exposed to marine processes and disruption from storm events either by resuspension or movement of sediments and the associated infauna that would have a long-term, direct, minor adverse impact on the quality of the habitat.

Impacts of Alternative 1 Long-term, indirect, minor benefits would be expected in surrounding areas from improved water quality and increased primary productivity. The created marsh would contribute to

detritus that supports benthic species. Short-term, local, direct, minor to moderate adverse impacts to aquatic and benthic resources would occur from the direct disturbance or burial of sediment and associated organisms during dredging. Other direct, adverse impacts could include entrapment and likely death of slow-moving organisms and polychaetes during dredging, and smothering of benthic organisms in the deposition sites. Mobile invertebrates would be expected to vacate the proposed project area during construction and return after construction is complete. Organisms that do not move out of the area would likely be injured by suffocation from suspended sediments. Dredging would change substrate topography, causing a temporary redistribution of organisms in the immediate vicinity. The borrow area is expected to fill in over the 20 year project life, because sediment laden waters that flow into the bay have created mud flats among the created terraces where Freshwater Bayou enters Little Vermilion Bay.

Benthic organisms would likely re-colonize borrow areas. Early-stage recruitment of defaunated sediments occurs rapidly in coastal systems (Grassle and Grassle 1974, McCall, 1977, Simon and Dauer 1977, Ruth and others 1994, all as cited in EPA 2003). Later stages of colonization would be more gradual and would depend on environmental conditions after cessation of dredging. Fish and invertebrates are expected to benefit from turbidity reduction post-construction, and increased organic input over the project life.

Impacts of Preferred - Alternative 2 Minor adverse impacts to aquatic and benthic resources would be similar to alternative 1. Areas of deposition are the same and the same amount of borrow area would be affected. Minor differences from alternative 1, due to the hydrologic component of this alternative, would result from construction and benthic quality changes at culvert locations. Sediments would be disturbed with short-term, direct, minor adverse impacts resulting from culvert installation. However, long-term, indirect, moderate benefits to those benthic areas are likely to result from the increased water flow and water quality that would result from such installations.

3.2.3 Essential Fish Habitat (EFH)

The proposed project area contains EFH as designated by the Gulf of Mexico Fishery Management Council (GMFMC) for species that are federally managed under the Magnuson-Stevens Fishery Conservation and Management Act, P.L. 104-297; 16 U.S.C. 1801 et seq. (Magnuson-Stevens Act). Categories of EFH in the project area include marsh, estuarine soft bottom, SAV, and nearshore waters (GMFMC 2005). Table 5 lists the EFH by life stage for federally managed and highly migratory species at the proposed project and borrow areas.

Wetlands and water bottoms in the project area provide nursery and foraging habitat supportive of a variety of economically important marine fishery species such as Atlantic croaker, black drum, blue crab, Gulf menhaden, spotted seatrout, sand seatrout, southern flounder, and striped mullet. Some of these species serve as prey for these, other fish species managed under the Magnuson-Stevens Act by the GMFMC (for example, snappers), and highly migratory species managed by NOAA Fisheries Service (for example, sharks).

TABLE 5. ESSENTIAL FISH HABITAT IN THE PROJECT AREA FOR FISHERY SPECIES MANAGED BY THE GULF OF MEXICO FISHERY MANAGEMENT COUNCIL AND HIGHLY MIGRATORY SPECIES (HMS) MANAGED BY THE NATIONAL MARINE FISHERY SERVICE ECOREGION 4.

Common Name	Life Stage System	Essential Fish Habitat at Proposed Area
Brown shrimp	larvae/early juvenile	all nearshore waters
	juvenile	estuarine marsh, SAV, and soft bottom
	adults	nearshore and estuarine soft bottom
White shrimp	eggs/larval	nearshore soft bottom
	juvenile	estuarine marsh and soft bottom
	adult	nearshore soft bottom
Red drum	larvae/postlarvae	estuarine marsh, SAV, and soft bottom
	juvenile	estuarine marsh, all nearshore waters, SAV, and soft bottom
	adults	estuarine marsh and SAV
Gray snapper	adult	estuarine marsh and nearshore waters
Lane snapper	post larvae/juvenile	nearshore and estuarine, SAV soft bottom
Scalloped Hammerhead shark, HMS	neonate	all nearshore waters
Spinner shark, HMS	juvenile	all nearshore waters
Blacktip shark, HMS	adult	all nearshore waters and estuarine waters

Source: National Marine Fisheries Service, EFH consultation (Appendix C).

Impacts of No Action The variety and quality of EFH associated with estuarine areas are expected to decrease as the remaining marsh converts to open-water. Open-water EFH that is already plentiful in the area would increase.

Impacts of Alternative 1 Long-term, direct and indirect, moderate benefits of the build alternatives would result from marsh creation, improving estuarine-related EFH. Marsh aided by vegetative plantings, would increase post-construction vegetation. Detrital material, formed by the breakdown of emergent vegetation, would contribute to the aquatic food web of the surrounding ecosystem. Decreases in wind erosion would protect estuarine soft bottoms around the proposed project area. Thus, the alternative would restore productive habitats supportive of brown shrimp, white shrimp, gray snapper, and red drum.

Short-term, unavoidable, direct and indirect, adverse impacts to habitats supportive of various life stages of the listed species (Table 5) would occur during the construction phase of the proposed project as 418 acres if marsh is created or nourished, and 198 acres of near shore borrow areas are excavated. Potential impacts to EFH include movement of prey species away from the construction areas, smothering of benthos, interruption of feeding or spawning by some species, and other effects on behavioral patterns. However, no significant adverse impacts on EFH are expected. Post-construction long-term benefits of increased quality and quantity of marsh EFH would be greater than the short-term adverse impacts to the open-water EFH that is plentiful.

Impacts of Preferred - Alternative 2 Long-term, direct and indirect, moderate benefits and short-term, unavoidable, direct and indirect, moderate adverse impacts are similar to alternative 1. More productive marsh is expected to be sustained over 20 years after construction than with the other alternatives, as a result of decreased land loss from improved hydrology. The net benefit after 20 years is

expected to result in 46 acres more marsh than with alternative 1, and 349 acres more than with the no action alternative (Table 1).

3.2.4 Marine Fishery Resources

A wide variety of estuarine-dependent fishery species found in the Teche/Vermilion Basin (LCWCRTF and WCRA 1999) are of national economic importance. Most species vary in abundance from season to season due to their migratory life cycle, habitat preferences according to life stage, and the variation in salinity (Herke 1978, Rogers and others 1993, LCWCRTF and WCRA 1999). Most spawn offshore in the open Gulf of Mexico and enter the marsh area as postlarvae or young juveniles to use the marshes as a nursery, and return to the open gulf as subadults or adults.

This area supports stable populations of red drum, black drum, Gulf menhaden, southern flounder, white shrimp, blue crab, largemouth bass, and channel catfish. Whereas populations of largemouth bass and channel catfish are expected to increase and the southern flounder and population is expected to decline, all others are projected to remain stable. Brown shrimp and American oyster populations are declining and are projected to continue to do so (LCWCRTF and WCRA 1998).

Impacts of No Action Abundant open-water fisheries habitat is available in coastal Louisiana and increasing. The increase in open-water fisheries habitat comes at the expense of submerged vegetation and emergent fisheries habitats, which are less common and more vulnerable to disturbance than open-water habitat. The quality of fish habitat is expected to decrease as remaining marsh converts to open water reducing the nursery function of the area for estuarine-dependent species.

Impacts of Alternative 1 Short-term, local, direct, minor adverse impacts to fishery resources would occur during construction from dredging and placement of sediments. Dredging would directly move benthic organisms and indirectly entrap slow-moving organisms of the borrow areas. In the placement area, smothering of benthic organisms, and sessile fish and invertebrate species would occur. Mobile aquatic animals would move during construction and return after construction completes. Early-stage recruitment of defaunated sediments occur rapidly in coastal systems (Grassle and Grassle 1974, McCall, 1977, Simon and Dauer 1977, Ruth and others 1994, all as cited in EPA 2003). Dredged sites would be rapidly colonized by opportunistic infauna (EPA 2003).

Long-term, direct and indirect, moderate beneficial impacts would result from the increase in marsh habitat providing nursery for estuarine-dependent fisheries.

Impacts of Preferred - Alternative 2 Adverse impacts would be the same as alterative 1. Changes in hydrology would change fish access, but would not adversely impact access. The installation of culverts at open water (breach) areas that currently provide fisheries access to the marsh would be reduced in size through installation of culverts, and flap gates would prevent egress from northern areas of the project area. However, greater access and egress points would be provided by installing culverts in existing earthen spoil banks. The flap gates that regulate which way water flows through the culvert, re-establish the historic water flow, and thus the historic fisheries access routes. The long-term, direct and indirect, moderate beneficial impacts would include those of alternative 1, with added benefit of providing more marsh habitat, and increasing water.

3.2.5 Marine Mammal Resources

Marine mammals that could occur in shallow coastal waters of Louisiana include dolphin, and the West Indian manatee, as discussed in the Threatened and Endangered Species section (3.2.8). Dolphins are common along the shore and should be expected to occur in surface waters in the borrow area. Dolphin follow schooling fishes, such as menhaden that are prey, and seek food and refuge in interior bay waters.

No impacts are expected to occur from any of the alternatives. The NOAA office of protected resources is being consulted in this determination (Appendix C).

3.2.6 Migratory Bird Resources

Migratory birds are a trust resource of the USFWS. Waterbirds were specifically considered pursuant to the Migratory Bird Treaty Act. There are 34 migratory bird species of concern that may use the project area. The resource was evaluated following the USFWS database online suggestion to review onsite evidence of nesting within the following parameters:

- Colonial Wading Birds (herons, egrets, etc.) nesting within 1,000 ft
- Brown pelican nesting within 2,000 ft
- Colonial and isolated shorebird nesting (plovers, gulls, terns, black skimmer, etc.) 650 ft

Black skimmer, gull-billed tern, and least tern were most likely to utilize the area when the marshes were intermediate, less-saline, marsh (Appendix B). These may utilize the area for nesting or foraging, though nesting in the marsh fill areas is unlikely due to their being shallow open water.

Impacts of No Action With no action, the marsh used by migratory birds and their forage species would decline. The marsh fill areas are primarily open water, which is not conducive to nesting. Long-term, indirect, minor adverse impacts would be related to further loss of marsh habitat quality and quantity reduction.

Impacts of Alternative 1 Short-term, direct, minor adverse impact would result from the displacement of foraging birds during construction to nearby foraging habitats, such as the wildlife refuges near the project area. Long-term, indirect, minor benefits after construction would result from increased habitat diversity and longevity of the foraging marsh.

The disturbance of construction activities would likely prevent colonies from selecting the area for nesting once activities have commenced. Long-term, direct and indirect, moderate benefits would occur by creating nesting areas for colonial waterbirds once vegetation becomes established, and increasing the quantity and quality of foraging area.

Impacts of Preferred - Alternative 2 The proposed project has been developed with coordination and input from the USFWS, whom determined that their trust resources would not be adversely affected by the proposed project (Appendix C). Foragers would be temporarily displaced to an abundance of nearby foraging habitat the same as with alternative 1. Therefore, short-term, direct, minor adverse impacts would be the same as for alternative 1. Long-term, indirect, minor benefits would be expected for foraging related to sustaining habitat quality and increasing the quantity for 20 years post-construction.

Although no nesting colonies are known to occur within the project area at this time, if colonies containing nesting wading birds (such as, herons, egrets, night-herons, ibis, and roseate spoonbills), anhinga, and/or cormorants are observed, all activities within 1,000 ft of the nesting colony anhinga restricted to the non-nesting period (September 1 through February 15, exact dates may vary within this window depending on species present). Because the anticipated construction duration is in excess of eight months and some construction activities may occur during the nesting season, time-of-year restrictions may not be practicable. Accordingly an abatement plan to ensure that birds do no nest at the time of project construction would be developed in consultation with the USFWS, if required to address potential nesting.

3.2.7 Wildlife Resources

Louisiana's coastal zone supports 19 percent of the United States' winter population for 14 species of ducks and geese. The North American Waterfowl Management Plan identified coastal Louisiana as one of

the most important regions for the maintenance of continental waterfowl populations in North America (USACE 2004).

Approximately 735 species of birds, finfish, shellfish, reptiles, amphibians, and mammals spend all or part of their life cycle in the estuaries of coastal Louisiana (USACE 2004). Table 6 lists the wildlife species and/or species groups prominent (LCWCRTF and WCRA 1998) within coastal Louisiana along with the habitat function, status, trend, and projection surrounding the project area. While species that frequent woody or freshwater habitats may be listed as occurring in the surrounding geographic area, the proposed project area does not contain habitat supportive of such species. The area is within the Mississippi Flyway, and birds from central and northern North America start to converge in the fall. Waterfowl populations in the area have declined as marsh converts to open water (LCWCRTF and WCRA 1999). The proposed project area is not known by the State Natural Heritage Program to have any rare, endangered, or otherwise significant animal species (Appendix C).

TABLE 6. AVIAN AND OTHER POPULATION FUNCTIONAL GROUPS STATUS AND TRENDS

1988 Habitat		Open Water	Brackish Marsh
Brown Pelican	Function	Wintering area	.
	Status	Low numbers	Not historically present (NH)
	Trend/Proj.	Increasing/Increasing	.
Bald Eagle	Status	NH	NH
Wading Birds	Function	.	Multiple functions
	Status	NH	High numbers
	Trend/Proj.	.	Increasing/Steady
Shorebirds	Function	.	Multiple functions
	Status	NH	High numbers
	Trend/Proj.	.	Steady/Decreasing
Dabbling Ducks and Diving Ducks	Function	Wintering area	Wintering area
	Status	Moderate numbers	Moderate numbers
	Trend/Proj.	Steady/Steady	Steady/Steady
Geese, Rails, Coots, and Gallinules	Function	Wintering area	Wintering area
	Status	Low numbers	Low numbers
	Trend/Proj.	Steady/Steady	Steady/Steady
Raptors	Function	.	Multiple functions
	Status	NH	Low numbers
	Trend/Proj.	.	Steady/ Steady
Other Marsh / OW Residents and Migrants	Function	Multiple functions	Multiple functions
	Status	Moderate numbers	High numbers
	Trend/Proj.	Steady/Steady	Steady/Decreasing
Furbearers (raccoon, nutria)	Function	Multiple functions	Multiple functions
	Status	Moderate numbers	Moderate numbers
	Trend/Proj.	Steady/Steady	Steady/Steady
Game animals (rabbit, deer)	Status	NH	NH
American Alligator	Function	Multiple functions	Multiple functions
	Status	High numbers	High numbers
	Trend/Proj.	Steady/Steady	Steady/Steady

*Projection (Proj.), Function, Status, and Trends for Rainey unit (LCWCRTF and WCRA 1998) NH indicates groups not historically present.

Impacts of No Action Without action the marsh that has remained while surrounding areas subsided and succumbed to storm related losses would continue to be converted to shallow open waters. Long-term, indirect, minor adverse impacts would result from the increased potential disruption of the habitat from storm surge and coastal storms.

Impacts of Alternative 1 The build alternatives are not substantially different as they pertain to impacts to this resource. Short-term, indirect, adverse impacts during construction related to area disturbance would displace wildlife to surrounding area wildlife refuges. Long-term, indirect, moderate benefits would be longevity of marsh and habitat diversity, and post-storm recovery of the areas habitat.

Impacts of Preferred-Alternative 2 With this alternative, greater recovery of the marsh stability, increased water flow would improve the areas habitat diversity and re-create the habitat that has supported a diversity of wildlife. Habitats lost in recent storms would recolonize with surrounding area wildlife and have improved likelihood to sustain future storm waters. Short-term, indirect, adverse impacts from displacement of species to surrounding areas would occur during construction, followed by long-term, indirect, moderate benefits of increased habitat diversity, and stability.

3.2.8 Threatened and Endangered Species

Coordination with USFWS under the Endangered Species Act (ESA) has been completed (Appendix C). Nine species have federal threatened or endangered species status in Vermilion Parish, Louisiana. The Sprague's Pipit is a candidate for ESA listing. Threatened and endangered birds are the Piping plover and Red Knot. Fish, marine mammal, and reptiles that are ESA listed are the Atlantic sturgeon, West Indian Manatee, and the seaturtles: Loggerhead, Kemp's ridley, hawksbill, leatherback, and green. No critical habitats are designated within the project area.

Sprague's pipits are unlikely to utilize the proposed project area, as grasslands and prairie are not likely to be affected. Piping plover are shorebirds that may utilize intertidal beaches and flats (between annual low tide and annual high tide), and associated dune systems and flats above annual high tide for foraging. While mud flats may be exposed during low tide at the project area, there are no mud flats that are above annual high tide. The species is unlikely to utilize the proposed project area. Red Knot is a migratory bird recently ESA-listed (January 2015). The species has been seen in western Louisiana, but are rare. They may utilize the coastline as resting areas during migration.

No sea turtle nesting is known to occur in the vicinity of the project. Hawksbill sea turtle are associated with coral reefs, and the leatherback are a deepwater, pelagic species, so neither are believed to be present at the proposed project area, and not further discussed. Other species of sea turtle are unlikely to be in the interior bay borrow or marsh areas. Green sea turtles may be nearshore while migrating between their nesting and foraging sites in Florida and Texas. Major threats to sea turtles in the U.S. include destruction and alteration of nesting and foraging habitats; incidental capture in commercial and recreational fisheries; marine debris; and vessel strikes. They feed on phytoplankton, zooplankton, SAV, and small fish or crab. Kemp's ridley nest in Mexico and immature individuals are believed to stay in shallow, warm, nearshore waters in the northern Gulf of Mexico. They forage for crabs, mollusks, shrimp, and small fish. Loggerhead sea turtles occur in coastal and marine areas along the margins of the Atlantic, Pacific, and Indian Oceans. Their major threats are direct take, incidental capture in fisheries, and loss of habitat. The loggerhead turtle is the most abundant species of U.S. sea turtles and have a complex life history that is highly migratory.

Gulf sturgeons utilize rivers in the summer and marine waters in the winter. They are not expected to occur west of the Mississippi, therefore they will not be affected, and are not further considered.

Threatened or endangered marine mammals are not known to occur near the project, but those that occur in Louisiana are the Blue, Sei, Sperm, and Fin whales and the West Indian manatee. West Indian manatees are not known to travel into interior marshes, such as the proposed marsh creation and borrow areas. Young males are known to migrate along nearshore waters of Louisiana, but sightings are rare and unlikely, so these are not further discussed. Shallow waters of the proposed project area (4 ft or less) will not support whales, so they are not further discussed.

Impacts of No Action Without action existing marsh that is habitat for species that support sea turtle and marine mammal, such as species of shrimp and fish, would continue to be lost. Long-term, indirect, minor adverse impacts would result from no action.

Impacts of Alternative 1 and Preferred-Alternative 2 The build alternatives are not substantially different as they pertain to impacts to this resource. Species unlikely to occur in the project area are also unlikely to be adversely affected. USFWS have concurred that the proposed project is not likely to adversely affect federally-listed threatened or endangered species, and there designated critical habitat (Appendix C). Long-term, indirect, moderate benefits to listed species may result from increasing the quality of forage species habitat and quantity of refuge area. NOAA Protected Resources has been contacted relative to marine species consultation. Sea turtles are unlikely to utilize the area and thus unlikely to be adversely affected. However, the NMFS-recommended avoidance measures of the "Sea Turtle and Smalltooth Sawfish Construction Conditions" would be utilized if deemed necessary (Appendix B).

3.3 Cultural Resources

3.3.1 Historic, Prehistoric and Native American

This section considers both terrestrial and submerged cultural resources. There are no known terrestrial or submerged cultural resources in this location. Early settlements occurred along natural waterways with navigation access to the Gulf of Mexico. Prehistoric sites occur south of the proposed project area but none occur in the project area. Waterways in the area are primarily man made, and area is not historically a known navigation route. Therefore, the area is unlikely to have been areas of settlement. Previous cultural resources reports along Freshwater Bayou, and the State Historic Preservation Office (SHPO) were consulted (Rawls and others 2010, Gibson 1979).

Impacts of No Action No other resources have been identified in the area. No impacts from the no-action alternative are expected.

Impacts of Alternative 1 and Preferred-Alternative 2 The build alternatives are not substantially different as they pertain to impacts to this resource. The marsh creation areas are previous interior marsh and unlikely to be disturbed, as any resources would be buried. The planned culverts that will be replaced/ constructed occur along man made waterways, and are therefore unlikely to have been areas of settlement. Adverse impacts to dredging in the natural water way are not expected, as it is not historically a known navigation route. The SHPO concur that no known historic properties would be affected by such actions.

3.3.2 Socioeconomics (Income and Environmental Justice)

The proposed project area is remote with recreational homes called "camps" being the nearest habitation. Intracoastal city is the area of activity, but is non-residential. Two homes are within five miles of the proposed project area (Appendix B, Environmental Justice). The nearest town is the small, historic town of Abbeville, Louisiana. Table 7 provides population/poverty data for Abbeville, Vermilion Parish, and Louisiana. This data is considered because population is one standard for the number of humans impacted, and population by race and poverty level are standards in considering environmental justice.

Industries providing the majority of employment are cattle farming, rice production, oil and natural gas-related activities, tourism, and commercial fishing (Impact Assessment, Inc. 2005).

TABLE 7. POPULATIONS OF LOUISIANA, VERMILION PARISH, AND ABBEVILLE

Topic	Louisiana	Vermilion Parish	Abbeville
Total Population	4,629284	59,253	12,440
White	62.6%	81.1%	50%
Black or African American	32%	14.8%	41%
American Indian and Alaska Native	0.7%	0.4%	0.3%
Asian	1.5%	2.3%	5.2%
Native Hawaiian and Other Pacific Islander	0%	0%	0%
Persons of Hispanic or Latin Origin	4.2%	3%	3.1%
2007-2011 percent persons below poverty level	19.1%	17.1%	24%

Source: U.S. Census 2015

Impacts of No Action As the remaining marsh is lost to open water and mud flats deepen, the benefit of the area as shrimp habitat declines. Loss of shrimp leads to loss of income in the region because marsh habitats provide essential nursery function to shrimp. Fisheries related activities would decline with a result of long-term, direct, moderate adverse impacts.

Impacts of Alternative 1 This alternative would have a short-term, direct, minor adverse impact through disruption of localized fishing during construction. Short-term, direct, moderate benefits through local job creation would result from construction activities. Long-term, indirect, moderate benefits would result from increasing shrimp habitat, and recreational and fishing value of the area.

Impacts of Preferred - Alternative 2 All impacts would be similar to the preferred alternative. More marsh habitat in the area that supports shrimp, a major component of the commercial and recreational fishing economy, would be created than with alternative 1.

3.3.3 Land Use and Infrastructure

The area is primarily used for recreation and oil and gas. Land owners are the McIlhenny estate and Exxon Corporation. The Freshwater Bayou Canal immediately west of the proposed project location and Gulf Intracoastal Waterway (to the north) are major shipping routes, and Intracoastal City is a hub of industrial activity, one of the U.S. highest producing fishing ports, and a base for offshore oil and gas industry. Offshore fishing vessels, barges, and small aircraft can been seen from the proposed project area throughout any given day. In contrast, recreational and wilderness areas surround the project area, with the Leland Bowland Lock two miles to the north, the Louisiana Wildlife Management Area and Game Preserve two miles to the south, and the Paul J Rainey Wildlife Refuge and Game preserve eight miles southwest of the proposed area.

One 10-inch diameter Acadian pipeline traverses the proposed project area that was identified in topographic, bathymetric, and magnetometer surveys of April 2013 to June 2013, and from October 2014 to November 2014. It intersects an equipment access route, and is buried at a depth of cover of approximately 10 ft (Dynamic Solutions LLC and CPRA 2015). No permanent structures or infrastructure exists within the proposed project area.

Impacts of No Action Future storm surges would continue to erode the area. Conversion of a land area to open water generally increases exposure of pipelines, thus posing threats to human safety, and decreases

the commercial and recreational value of an area. However, within the affected area, the only identified pipeline is at a sufficient depth to be exposed in the foreseeable future. Existing culverts would continue to be inefficient at evacuating excess waters, and the area would provide less of a buffer to surrounding navigation areas, such as the bay and Gulf Intracoastal Water Way, thus resulting in long-term, indirect, minor adverse impacts.

Impacts of Alternative 1 With this alternative land use/ recreation would be maintained and for a longer period of time than with no action. The area would continue to buffer navigation and industrial activity from storm surge. Adverse impacts to use are not expected. The borrow area, marsh creation areas, and sediment pipeline access route would not impeded navigational uses. Equipment would be made visible to localized shallow-draft boat traffic and therefore not pose a hazard or limit use. Long-term, indirect, minor benefits to navigation and pipelines are expected, with moderate benefits to recreation.

Impacts of Preferred - Alternative 2 Impacts to land use/ recreation would be similar to alternative 1. Greater long-term, indirect, benefits can be expected from the increased amount and longevity of land with this alternative than the others. Marsh fires can impede air traffic for local oil field based flight companies. Such events occur naturally from spontaneous combustion in the anoxic marsh soils. It is highly unlikely the proposed project would significantly increase the risk of marsh fire, as equipment would be on newly placed (noncombustible) sediments, and activities on the water.

3.3.4 Hazardous, Toxic, and Radioactive Wastes

No evidence of hazardous, toxic, or radioactive wastes (HTRW) at the marsh creation area, access route, or borrow area were observed in numerous site visits that occurred for project development since 2013 or during an HTRW site assessment July 8, 2015. An HTRW Phase I Environmental Site Assessment provides the history of the area oil and gas production activities, and reports no conditions of environmental or human hazard concern (TetraTech 2015).

Impacts of No Action Long-term, indirect, minor adverse impacts would be due to increased exposure of oil and gas infrastructure. No beneficial impacts would occur for the area.

Impacts of Alternative 1 and Preferred - Alternative 2 The state of Louisiana, whom would contract out construction of the project, specifies contract conditions that minimize adverse impacts by avoiding any existing oil and gas infrastructure. These provisions include conducting magnetometer surveys to verify submerged oil and gas pipelines, and identifying any potential hazards. Other contract provisions include avoidance or remediation of on-site contaminant release from machinery and specification of no work zones near pipelines. The build alternatives do not differ in HTRW considerations. Long-term, indirect, minor benefits may result from reducing exposure of oil and gas infrastructure to erosion and storms.

3.4 Other Considerations

3.4.1 Cumulative Impacts

Direct and indirect impacts of past, present, and reasonably foreseeable future events were considered in the analysis of the proposed project consequences. These impacts include historical and predicted future land loss rates for the area and other restoration projects in the vicinity. The preferred alternative would have temporary reversible adverse impacts to some environmental resources but cumulative benefits to the environmental resources as described in this section .

Coastal Louisiana, including the project area, has been adversely impacted by natural subsidence (Reed and Yuill 2009), levees, hurricanes, and oil and gas infrastructure. Recent events, such as hurricanes, have contributed to the loss of already weakened or stressed habitat. Currently, land loss is at an average rate of

an acre every 38 minutes. If the current rate of loss is not slowed by the year 2040, an additional 800,000 acres of wetlands will convert to open water.

Though CWPPRA projects are nominated and implemented one at a time and must have an expectation of individual beneficial impacts, the cumulative value of all wetland restoration and protection projects in an area can exceed the summed values of the individual projects. Similar wetland restoration projects in the area would operate synergistically with the proposed alternative to enhance the structural and functional integrity of the ecosystem, improve primary productivity rates, and thereby improve the overall environmental resources. Other restoration and protection projects within approximately 5 miles of the proposed project that are listed by the state as either constructed within the last 25 years, or planned for construction involve shoreline stability and marsh management: Freshwater Bayou Bank Stabilization-one Natural Resource Conservation Service and two state funded projects; Freshwater Bayou Bank Protection; Little Vermilion Bay Sediment Trapping, Boston Canal/ Vermilion Bay Bank Protection; Vermilion River Cutoff Bank Protection; Four-Mile Canal Storm Surge Reduction Construction; Rainey Audubon Wildlife Sanctuary Earthen Terraces; and Freshwater Bayou Wetland Protection. Environmental benefits from these project types address the suite of environmental threats along this area of coast. In recognition that the environmental needs are varied in type and differ by location, the state of Louisiana developed a 2012 Coastal Master Plan for Southwest Louisiana as a way to prioritize restoration actions, and an updated 2017 plan is under development. The proposed project marsh restoration goal is consistent with prioritized similar restoration actions, although the area is not a marsh-restoration location listed as a priority by the state.

Physical cumulative impacts are related to mining borrow sediments. The effect of borrowing from inshore sources has been evaluated in the design documents so as to avoid any increased wave climate and determined to have no adverse cumulative impact (Dynamic Solutions LLC 2015). No significant cumulative impacts are expected to physical (soils, geology, or topography) resources.

The cumulative impact of the proposed project on air and water quality would not differ substantially from the effects of the alternatives considered individually. The cumulative beneficial impact to water quality would be a long-term increase in quality as a result of increased potential for the waters impaired from industrial and navigation activities at Freshwater Bayou Canal and Intracoastal City to access marsh. The proposed project's ability to increase freshwater access from north to south through the marsh area would increase potential for the impaired waters to access the marsh, thereby filtering pollutants, and result in water quality benefits from increases in quantity and productivity of marsh. No significant cumulative impacts are expected to air and water quality resources.

Biological cumulative impacts would be similar to the direct and indirect impacts of the alternatives described previously. The proposed marsh creation would work with existing projects to enhance habitat for fish, wildlife, vegetation, and EFH. Cumulatively, alternative 1 or the preferred-alternative 2 would increase benefits to the area by increasing marsh, whereas the preferred- alternative 2 would additionally increase water filtering of impaired waters, and reduce flooding stress to marsh leading to greater longevity. Cumulative benefits for the proposed project are not expected to be significant. Quantifying cumulative benefits of the CWPPRA program is the objective of the Coastwide Reference Monitoring System (CRMS). The CRMS, funded by CWPPRA, collects data on ecological conditions throughout coastal Louisiana and supports the large-scale evaluation of the cumulative effects of all CWPPRA projects. Trajectories of change are accessed for various ecological indices at CRMS sites. Results are publically available and included in reports to congress (LCWCRTF 2012). No cumulative adverse impacts are anticipated. No significant cumulative impacts are expected to biological resources.

Cultural cumulative impacts would result from synergy of the preferred alternative with nearby restoration projects. These projects would cumulatively decrease losses of habitat, thereby maintaining

more of the economy and storm protection than with no action. No adverse cumulative impacts would be expected as a result of the proposed project, as the adverse impacts are related to the temporary construction periods, which do not occur simultaneously. No significant cumulative impacts are expected to cultural resources.

3.4.2 Invasive Species

Executive Order 13112 requires federal agencies to use authorities to prevent introduction and control (in cost effective and environmentally sound manners) invasive species, and to provide for restoration of native species and habitats in ecosystems that have been invaded. As stated above, the purpose of the preferred alternative is to restore the native habitat. The proposed project would not introduce invasive species. The State of Louisiana, whom administers contracts for plantings, uses only plantings authorized for release. This ensures appropriate (noninvasive) species and cultivars are provided.

3.4.3 Coordination

Coordination in development of the proposed project, its alternatives and selection of the preferred alternative has been maintained with each CWPPRA Task Force agency. The project was vetted publicly through the CWPPRA process, which includes opportunities for the public and CWPPRA agencies to comment on the proposed project. The project was discussed in public meetings for CWPPRA where project details were made available on several occasions. Prior to initiating the draft EA, a solicitation of views was sent to those listed in the distribution section. Comments received are summarized in Appendix C. A draft EA will be circulated to participating restoration agencies and made available to the public. The preferred alternative is not expected to cause adverse environmental impacts that would require compensatory mitigation.

3.4.4 Compliance with Laws and Regulations

Many federal, state, and local laws and regulations were considered during development of the proposed restoration project, as well as several regulatory requirements that are typically evaluated during the permitting process. A brief review of potentially applicable laws and regulations that may pertain to this proposed project is available in Appendix A. Relevant correspondence is provided in Appendix C and the status in Table 8. The project manager would ensure that there is coordination among these programs where possible and that project implementation and monitoring comply with all applicable laws and regulations.

TABLE 8. STATUS OF LAW AND REGULATION COMPLIANCE

Law or Regulation	Status
Archeological & Historic Preservation Act of 1974	Completed as per SHPO letter 4-8-13
Clean Air Act of 1970	Coordinated with LDEQ 5-7-2013
Clean Water Act	Pending, Permit application to USACE for section 404 is being prepared concurrent with the completion of this EA
Coastal Zone Management Act of Louisiana Executive Order 11998, Floodplain Management	In Process
Endangered Species Act of 1973	Pending for NOAA request sent 3-19-15, Coordination complete with USFWS 3-20-2013 and 3-11-2015
Executive Order 11990, Protection of Wetlands	Coordinated with Floodplain Administration of Vermilion Parish and FEMA
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations & Low-Income Populations	In compliance, assessed with this EA
Fish & Wildlife Coordination Act	Coordination with USFWS for ESA 3-20-11, 3-11-2015, 3-16-2015 and as a CWPPRA participating agency
Magnuson-Stevens Fishery Conservation & Management Act	Coordination with NMFS on EFH to be done with EA draft review
Migratory Bird Treaty Act of 1918	Coordinated with USFWS 3-20-2013 and 3-11-2013
National Environmental Policy Act of 1969	In Process with this EA draft
National Historic Preservation Act of 1966	Completed as per coordination with SHPO 4-8-13
Rivers and Harbors Act of 1899	Coordination concurrent as part of the COE section 404 CWA, and state Coastal Use Permit review

4 CONCLUSIONS

The natural processes of subsidence, habitat switching, and erosion of wetlands have been exacerbated by widespread human alterations of sediment delivery and other processes, resulting in marked degradation of the Louisiana coastal area. Without intervention to slow or reverse the loss of marshes, Louisiana's healthy and highly productive coastal ecosystem would not be maintained.

This EA provides information on the direct, indirect, and cumulative impacts on the human environment likely to result from the Cole's Bayou Marsh Restoration Project. The analysis in this EA provides evidence that the preferred alternative would have long-term beneficial impacts on the coastal resources of south Louisiana and would not result in any substantial long-term adverse environmental impacts. Construction-related adverse impacts would be temporary or reversible and therefore qualified as minor in the EA. The analysis in this EA further provides evidence that beneficial impacts would be minor. This effects analysis is based on a review of relevant literature, site-specific data, and project-specific

engineering reports related to biological, physical, and cultural resources, as well as on the cumulative experience gained through many similar coastal restoration projects in south Louisiana over the past decade. The increase of fisheries habitat is anticipated to have long-term beneficial impacts on the local economy and culture as it relates to recreational and commercial fishing. In addition, the preferred alternative would result in increased protection of adjacent marsh in the area to be restored. NOAA Fisheries Service will review, evaluate, and consider the evidence in this EA to determine whether it supports a finding that the proposed action will have no significant impact on the quality of the human environment.

5 PREPARERS

This EA was prepared by biologists Joy Merino, Cecelia Linder, and John Foret Ph.D. of NOAA Fisheries Service.

6 PERSONS / AGENCIES CONSULTED

References in the literature cited and the following persons / agencies were consulted in the preparation of this EA.

- Amity Bass, National Heritage Program Coordinator, LDWF
- Amy Powell, USACE Solicitation of Views Manager
- Stan O. McGee, Acadiana Regional Clearinghouse
- Beth Altazan-Dixon, Louisiana Department of Environmental Quality
- James Welsh, Louisiana Commissioner of Conservation
- Jeff Weller, US Fish and Wildlife Service
- Michael Sealy, US Fish and Wildlife Service
- Michael Bechdol, EPA Sole Source Aquifer Program Coordinator
- Markel Farber, Louisiana Department of Environmental Quality
- Pam Breaux, Louisiana State Historic Preservation Officer
- Susan Veillon, Floodplain Management, Department of Transportation and Development

7 DISTRIBUTION LIST

This EA will be distributed for comment to agencies of the CWPPRA Task Force and resource agencies as listed below. A minimum 30-day comment period will be provided. A draft EA will be available for public review. A final EA will be made available to the public at http://www.lacoast.gov along with other public records for the project. The EA was distributed to:

Troy Constance, Chairman Deputy District Engineer, U.S. Army Engineer District, New Orleans Office of the Chief. 7400 Leake Ave. New Orleans, Louisiana 70160-0267
Darryl Clark Senior Field Biologist, U.S. Fish and Wildlife Service. 646 Cajundome Blvd, Suite 400 Lafayette, Louisiana 70506
Bren Haas Deputy Chief- Studies & Environmental Branch, Coastal Protection and Restoration Authority. 617 North 3rd Street Baton Rouge, Louisiana 70804-4027
Richard Hartman Fishery Biologist, National Marine Fisheries Service. Rm 266 Military Science Bldg South Stadium Drive, LSU Baton Rouge, Louisiana 70803-7535
Karen McCormick Section Chief Environmental Protection Agency, Region 6 Marine and Coastal Protection Division (6WQ-EC). 1445 Ross Avenue Dallas, Texas 75202-2733

Britt Paul, P.E. Assistant State Conservationist, Water Resources, Natural Resources Conservation Service. 3737 Government Street Alexandria, Louisiana 71302

A solicitation of comments on the proposed project was conducted by mailing letters to the following listed entities prior to this analysis. Comments received are summarized in Appendix C and considered in analysis and project design. Full letters of reply are available in the project files maintained by the NOAA Fisheries Service.

8th Coast Guard District Commander
Acadia-Vermilion Community Action Program
Acadiana Regional Development District
Chitimacha Tribe
Choctaw Nation of Oklahoma
Coalition to Restore Coastal Louisiana
Department of Health and Hospitals Chief Sanitarian and Division of Environmental Health
Department of Public Safety Highway Safety Commission
Department of the Army Technical Support
Department of Wildlife & Fisheries Louisiana Natural Heritage Program
Department of Agriculture and Forestry - Office of Soil & Water Conservation and Office of Forestry
Department of Culture Recreation & Tourism/Division of Archaeology and Office of State Parks
Department of Economic Development Office of Business Development
Division of Administration State Land Office and State Planning Office
Environmental Protection Agency Source Water Protection and Federal Activities
Federal Transit Administration Region 6
Federal Emergency Management Agency Region VI
Federal Program Review Coordinator, Acadiana Regional Clearinghouse
Floodplain Administrator Vermilion Parish Policy Jury
Floodplain Management Program District 64
Inter-Tribal Council of Louisiana, Inc.
Jena Band of Choctaw Indians
Louisiana Department of Environmental Quality Beth Altazan-Dixon, Office of the Secretary
Louisiana House of Representatives District 47 Bob Hensgens and District 49 Simone Champagne
Louisiana Senate District 26 Jonathan Perry
Louisiana Department of Natural Resources Office of Conservation, and Office of Mineral Resources
Louisiana Forestry Association
Louisiana Good Roads Association
Louisiana State Police, Troop I
Louisiana State University Sea Grant Legal Advisory Service
Mississippi Band of Choctaw Indians
Natural Resources Conservation Service
Office of Civil Defense Jefferson Davis Parish
Office of Indian Affairs
Seminole Nation of Oklahoma
Tunica - Biloxi Tribe of Louisiana
U.S. Geological Survey
U.S. House of Representatives; District 1 - Steve Scalise, District 2 - Cedric Richmond, District 3 - Charles Boustany, Jr. MD, District 4 - John Fleming, MD, District 5 - Rodney Alexander, District 6 - Bill Cassidy, MD
U.S. National Park Service
U.S. Senate - David Vitter and Mary Landrieu
Vermilion Parish Civil Defense

Vermilion Parish Police Jury
Vermilion Parish School Board
Vermilion Parish Sheriff
Vermilion Soil and Water Conservation District of Louisiana

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APPENDIX A- ENVIRONMENTAL LAWS AND REGULATIONS

The proposed action is compliant or in the process of compliance with the following laws and regulations. A current status of compliance is provided in the attached EA.

Archeological and Historic Preservation Act of 1974 The Archeological and Historic Preservation Act of 1974 states that, if an activity may cause irreparable loss or destruction of significant scientific, prehistoric, historic, or archeological data, the responsible agency is authorized to undertake data recovery and preservation activities, in accordance with implementing procedures promulgated by the Secretary of the Interior.

Clean Air Act of 1970 Under the Clean Air Act of 1970, Congress established procedures for developing National Ambient Air Quality Standards (NAAQS) for the protection of human health and public welfare. EPA published the NAAQS in 1971, and they became effective at that time. Standards are provided for the following criteria pollutants: carbon monoxide, sulfur dioxide, nitric oxide, ozone, lead, and fine particulate matter.

Clean Water Act (CWA) The CWA is the principal law governing pollution control and water quality of the nation's waterways. It requires the establishment of guidelines and standards to control the direct or indirect discharge of pollutants to waters of the United States. Discharges of material into navigable waters are regulated under Sections 401 and 404 of the CWA. The USACE has the primary responsibility for administering the Section 404 permit program. Under Section 401 of the CWA, projects that involve discharge or fill to wetlands or navigable waters must obtain certification of compliance with state water quality standards.

Coastal Zone Management Act The Coastal Zone Management Act (CZMA) provides for protection of resources found in the coastal zone, proactive land management practices, and preservation of unique coastal resources. Included in the CZMA is the requirement that all federal actions within the coastal zone of Louisiana must be consistent with the federally approved State of Louisiana Coastal Resource Management Plan.

Endangered Species Act of 1973 (ESA) The ESA directs all federal agencies to conserve endangered and threatened species and their habitats and encourages such agencies to utilize their authorities to further these purposes. Under the Act, NOAA Fisheries Service and USFWS publish lists of endangered and threatened species. Section 7 of the act requires that federal agencies consult with these agencies to minimize the effects of federal actions on endangered and threatened species.

Executive Order 11990, Protection of Wetlands The intent of Executive Order 11990, Protection of Wetlands, is to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support for new construction in wetlands whenever there is a practicable alternative.

Executive Order 11998, Floodplain Management Executive Order 11998, Floodplain Management, requires each agency (including military departments) to determine whether any action undertaken would occur in a floodplain. The Federal Emergency Management Agency provides Flood Insurance Rate Maps (FIRM) for more than 19,000 communities in the country as part of the Flood Insurance Studies the agency completes. In addition to the 100-year floodplain, which is the area of the community with a 1 percent chance of flooding in any given year, the FIRM also illustrates coastal high hazard areas, the floodway, and the 500-year floodplain, which is the area of the community with a 0.2 percent chance of flooding in any given year.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs that the programs of federal agencies identify and address disproportionately high and adverse effects on human health and the environment of minority or low-income populations.

Fish and Wildlife Coordination Act The Fish and Wildlife Coordination Act requires agencies to consult with the USFWS, NOAA Fisheries Service, and appropriate state agencies, prior to modification of any stream or other body of water, to ensure conservation of wildlife resources. Compliance with the FWCA is integrated into the USACE interagency review process under Section 404 of the CWA as well as through the NEPA review process.

Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) In 1996, the act was reauthorized and changed by amendments to require that fisheries be managed at maximum sustainable levels and that new approaches be taken in habitat conservation. EFH is defined broadly to include “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity” (62 Fed. Reg. 66551, § 600.10 Definitions). The act requires consultation for all federal agency actions that may adversely affect EFH. Under Section 305(b)(4) of the act, NOAA Fisheries Service is required to provide advisory EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. Where federal agency actions are subject to ESA Section 7 consultations, such consultations may be combined to accommodate the substantive requirements of both ESA and the Magnuson-Stevens Act.

Marine Mammal Protection Act of 1972 (MMPA) All marine mammals are protected under the MMPA. With its’ amendments, it prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters.

Migratory Bird Treaty Act of 1918 (MBTA) The MBTA requires the protection of all migratory bird species and protection of ecosystems of special importance to migratory birds against detrimental alteration, pollution, and other environmental degradation. Coordination under MBTA is generally incorporated into Section 404 of the CWA, NEPA, or other federal permit, license or review requirements.

National Environmental Policy Act of 1969 NEPA was enacted in 1969 to establish a national policy for the protection of the environment. The CEQ was established to advise the President and to carry out certain other responsibilities relating to implementation of NEPA by federal agencies. Pursuant to Presidential Executive Order, federal agencies are obligated to comply with NEPA regulations adopted by the CEQ (40 CFR Parts 1500-1508). These regulations outline the responsibilities of federal agencies under NEPA and provide specific procedures for preparing environmental documentation to comply with NEPA.

National Historic Preservation Act of 1966 The National Historic Preservation Act of 1966, as amended in 1992, requires that responsible agencies taking action that affects any property with historic, architectural, archeological, or cultural value that is listed on or eligible for listing on the National Register of Historic Places (NRHP) comply with the procedures for consultation and comment issued by the Advisory Council on Historic Preservation. The responsible agency also must identify properties affected by the action that are potentially eligible for listing on the NRHP, usually through consultation with the state historic preservation officer.

Rivers and Harbors Act of 1899 Section 10 of the River and Harbors Act prohibits the obstruction of navigable waters and prevents building of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead,

jetty, or other structures in any port, roadstead, haven, harbor, canal, navigable river, or other water of the US, and makes it unlawful to excavate or fill , or in any manner to alter or modify the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the US unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of War. Permits are authorized via a joint state and COE application process that applies to all for work within the Louisiana Coastal Zone.

APPENDIX B- SUPPORTING DOCUMENTATION

Sea Turtle and Smalltooth Sawfish Construction Conditions

The permittee shall comply with the following protected species construction conditions:
a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.
b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.
c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service' s Protected Resources Division, St. Petersburg, Florida.
d. All vessels associated with the construction project shall operate at" no wake/ idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (*e. g.*, marked channels) whenever possible.
e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 ft of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.
f. Any collision with and/ or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service' s Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.
g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the primary consultation.
Revised: March 23, 2006

EJView ACS Summary Report

Location:

Study Area:

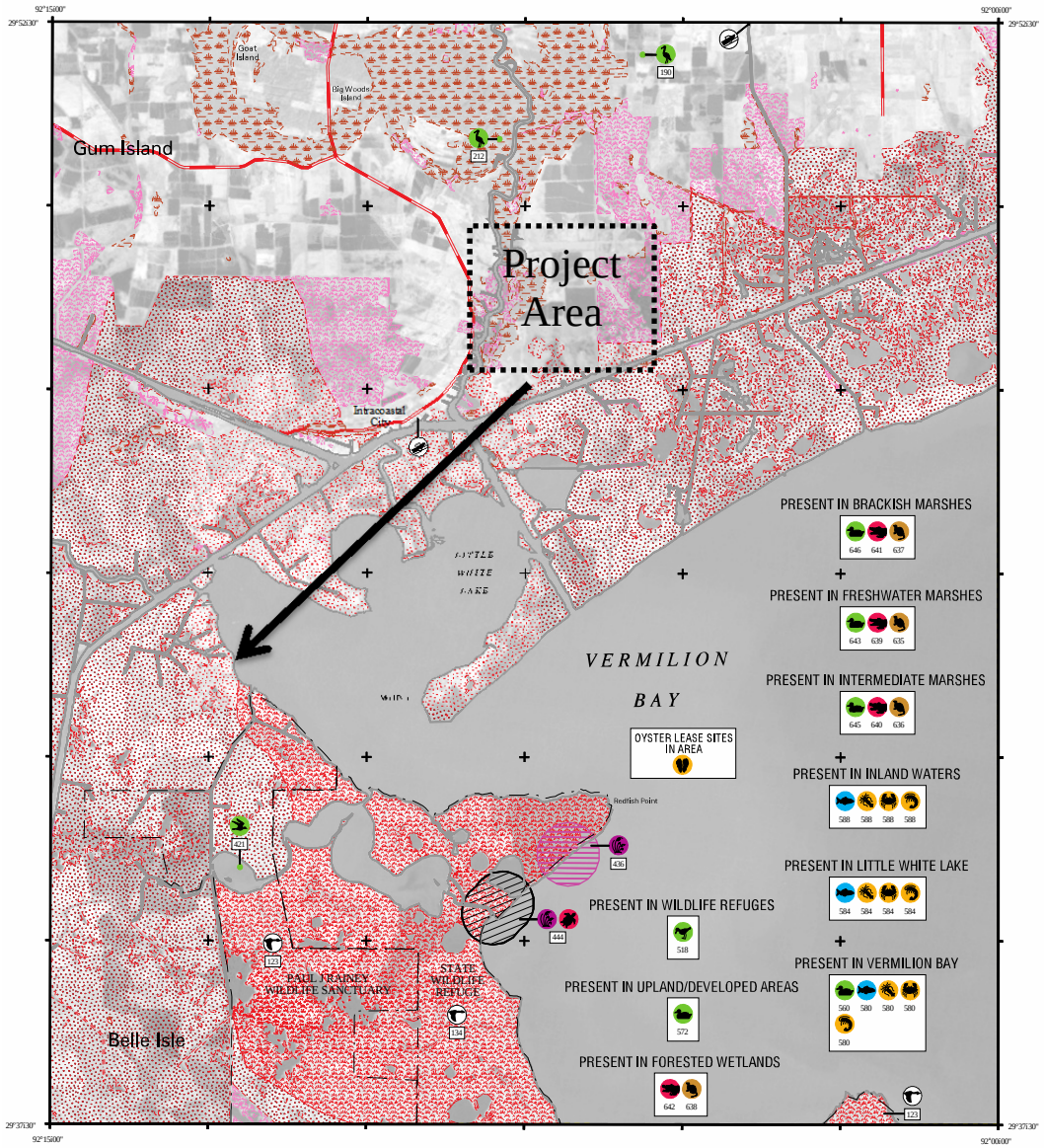
Summary of ACS Estimates	2006 - 2010
Population	
Population Density (per sq. mile)	
Minority Population	
% Minority	
Households	
Housing Units	
Housing Units Built Before 1950	
Per Capita Income	
Land Area (sq. miles) (Source: SF1)	
% Land Area	
Water Area (sq. miles) (Source: SF1)	
% Water Area	

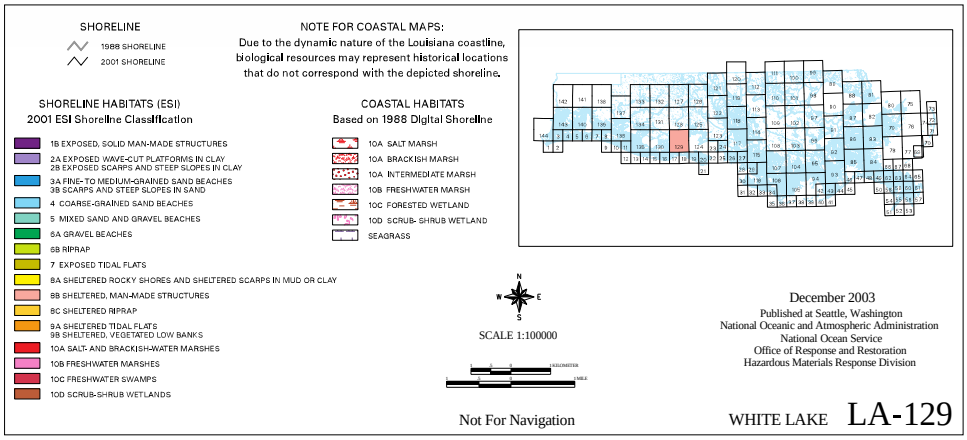
	2006 - 2010 ACS Estimates	Percent	MOE (±)
Population by Race			
Total			
Population Reporting One Race			
White			
Black			
American Indian			
Asian			
Pacific Islander			
Some Other Race			
Population Reporting Two or More Races			
Total Hispanic Population			
Total Non-Hispanic Population			
White Alone			
Black Alone			
American Indian Alone			
Non-Hispanic Asian Alone			
Pacific Islander Alone			
Other Race Alone			
Two or More Races Alone			
Population by Sex			
Male			
Female			
Population by Age			
Age 0-4			
Age 0-17			
Age 18+			
Age 65+			

Data Note: Detail may not sum to totals dues to rounding. Hispanic population can be of any race. N/A means not available.
Source: U.S. Census Bureau, American Community Survey (ACS) 2006 - 2010.

Environmental Sensitivity Map

ENVIRONMENTAL SENSITIVITY INDEX MAP





BIRD:

RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Migrating	Molting
190	Little blue heron			100 IND (94COUNT)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-
	Snowy egret			100 IND (94COUNT)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-
212	Great egret			100 IND (96COUNT)	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL	-	-
	Tricolored heron			100 IND (96COUNT)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-
421	Black skimmer			0 IND (97COUNT)	X	X	X	X	X	X	X	X	X	X	X	X	MAY-SEP	-	-
	Gull-billed tern			0 IND (97COUNT)	X	X	X	X	X	X	X	X	X	X	X	X	MAY-SEP	-	-
	Least tern			0 IND (97COUNT)			X	X	X	X	X	X	X				APR-SEP	-	-
518	Shorebirds						X	X	X		X	X	X	X			-	-	-
560	Lesser scaup			13 IND/SQ MI	X	X	X							X	X	X	-	-	-
572	American coot			2 IND/SQ MI	X	X	X							X	X	X	-	-	-
	American wigeon			2 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Blue-winged teal			16 IND/SQ MI	X	X	X	X	X				X	X	X	X	-	-	-
	Canvasback			PRESENT	X	X	X								X	X	-	-	-
	Gadwall			7 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Green-winged teal			23 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-
	Hooded merganser			PRESENT	X	X	X								X	X	-	-	-
	Lesser scaup			PRESENT	X	X	X							X	X	X	-	-	-
	Mallard			19 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mottled duck			4 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail			45 IND/SQ MI	X	X	X						X	X	X	X	-	-	-
	Northern shoveler			12 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-
	Ring-necked duck			1 IND/SQ MI	X	X	X							X	X	X	-	-	-
643	American coot			2 TO 215 IND/SQ MI	X	X	X							X	X	X	-	-	-
	American wigeon			1 TO 116 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Blue-winged teal			2 TO 30 IND/SQ MI	X	X	X	X	X				X	X	X	X	-	-	-
	Canvasback			UP TO 21 IND/SQ MI	X	X	X								X	X	-	-	-
	Gadwall			10 TO 243 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Green-winged teal			6 TO 86 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-
	Hooded merganser			PRESENT	X	X	X								X	X	-	-	-
	Lesser scaup			UP TO 41 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mallard			20 TO 99 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mottled duck			3 TO 18 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail			2 TO 70 IND/SQ MI	X	X	X						X	X	X	X	-	-	-
	Northern shoveler			UP TO 24 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-
	Ring-necked duck			UP TO 56 IND/SQ MI	X	X	X							X	X	X	-	-	-
645	American coot			33 TO 165 IND/SQ MI	X	X	X							X	X	X	-	-	-
	American wigeon			3 TO 73 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Blue-winged teal			9 TO 34 IND/SQ MI	X	X	X	X	X				X	X	X	X	-	-	-
	Canvasback			UP TO 6 IND/SQ MI	X	X	X								X	X	-	-	-
	Gadwall			36 TO 240 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Green-winged teal			9 TO 144 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-
	Hooded merganser			PRESENT	X	X	X								X	X	-	-	-
	Lesser scaup			2 TO 35 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mallard			4 TO 66 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mottled duck			8 TO 15 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail			UP TO 39 IND/SQ MI	X	X	X						X	X	X	X	-	-	-
	Northern shoveler			4 TO 34 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-
	Ring-necked duck			2 TO 36 IND/SQ MI	X	X	X							X	X	X	-	-	-
646	American coot			4 TO 42 IND/SQ MI	X	X	X							X	X	X	-	-	-
	American wigeon			5 TO 39 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Blue-winged teal			9 TO 21 IND/SQ MI	X	X	X	X	X				X	X	X	X	-	-	-
	Canvasback			UP TO 8 IND/SQ MI	X	X	X								X	X	-	-	-
	Gadwall			46 TO 167 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Green-winged teal			23 TO 70 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-
	Hooded merganser			UP TO 1 IND/SQ MI	X	X	X								X	X	-	-	-
	Lesser scaup			2 TO 10 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mallard			3 TO 19 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mottled duck			7 TO 17 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail			1 TO 56 IND/SQ MI	X	X	X						X	X	X	X	-	-	-
	Northern shoveler			6 TO 31 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-
	Ring-necked duck			UP TO 14 IND/SQ MI	X	X	X							X	X	X	-	-	-

FISH:

RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
580	Atlantic croaker			5	5	5	5	5	5	5	4	4	4	5	5		MAR-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy			5	5	5	5	5	5	5	5	5	5	5	5		JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum			3	3	3	3	3	3	3	3	3	3	3	3		JAN-MAY	JAN-MAY	JAN-MAY	JAN-DEC	-
	Crevalle jack			3	2	2	3	3	3	3	3	3	3	3	2		-	-	-	JAN-DEC	-
	Florida pompano			3	3	3	3	3	3	3	3	3	3	3	3		MAY-AUG	MAY-AUG	MAY-AUG	JAN-DEC	-
	Gizzard shad			4	3	3	3	4	4	4	3	3	3	3	3		MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gray snapper			3	2	2	2	2	2	3	3	3	3	3	2		-	-	-	JAN-DEC	-
	Gulf menhaden			5	5	5	5	5	5	5	5	5	5	5	5		-	AUG-APR	AUG-APR	JAN-DEC	-
	Red drum			4	3	3	3	3	4	4	4	3	3	3	3		AUG-MAR	AUG-MAR	AUG-MAR	JAN-DEC	-
	Sand seatrout			4	3	3	3	4	4	4	4	4	4	3	3		FEB-OCT	FEB-OCT	FEB-OCT	JAN-DEC	-
	Sheepshead			4	4	4	4	4	4	4	4	4	4	4	4		-	-	JAN-JUL	JAN-DEC	-
	Silver perch			4	3	3	3	3	4	3	3	3	3	3	3		MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Southern flounder			4	3	3	3	3	4	4	4	4	4	4	3		-	-	SEP-APR	JAN-DEC	-
	Spanish mackerel			3	2	2	3	3	3	3	3	3	3	3	2		-	-	-	JAN-DEC	-
	Spot			5	5	5	5	5	5	5	5	5	5	5	5		OCT-APR	OCT-APR	OCT-APR	JAN-DEC	-
	Spotted seatrout			4	3	3	3	3	4	4	4	4	3	4	3		MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Striped mullet			4	4	4	4	4	4	4	4	4	4	4	4		-	NOV-FEB	OCT-MAY	JAN-DEC	-
	Tarpon			3	2	2	2	2	2	3	3	3	3	3	2		-	-	MAY-NOV	JAN-DEC	-
584	Atlantic croaker			5	5	5	5	5	5	5	5	4	4	4	5	5	MAR-DEC	MAR-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy			5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum			3	3	3	3	3	3	3	3	3	3	3	3	3	FEB-APR	-	FEB-APR	JAN-DEC	-
	Crevalle jack			3	2	2	3	3	3	3	3	3	3	3	2		-	-	-	JAN-DEC	-
	Gizzard shad			4	3	3	3	4	4	4	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gray snapper			2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Gulf menhaden			5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Red drum			3	3	3	3	3	3	3	3	3	3	3	3	3	AUG-DEC	-	AUG-MAR	JAN-DEC	-
	Sand seatrout			4	3	3	3	4	4	4	4	4	4	3	3		-	-	-	JAN-DEC	-
	Sheepshead			4	3	3	3	4	4	4	4	4	4	4	3		-	-	-	JAN-DEC	-
	Silver perch			3	3	3	3	3	3	3	3	3	3	3	3	3	MAY-SEP	MAY-SEP	MAY-SEP	JAN-DEC	-
	Southern flounder			4	3	3	3	3	4	4	4	4	4	4	3		-	-	-	JAN-DEC	-
	Spanish mackerel			3	2	2	2	2	2	3	3	3	3	3	2		-	-	-	JAN-DEC	-
	Spot			5	5	5	5	5	5	5	5	5	5	5	5		-	-	-	JAN-DEC	-
	Spotted seatrout			3	3	3	3	3	3	3	3	3	3	3	3		MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Striped mullet			4	4	4	4	4	4	4	4	4	4	4	4		-	-	-	JAN-DEC	-
	Tarpon			2	2	2	2	2	2	2	2	2	2	2	2		-	-	-	JAN-DEC	-
588	Atlantic croaker			5	5	5	5	5	5	5	4	4	4	5	5		JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy			5	5	5	5	5	5	5	5	5	5	5	5		JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum			3	3	3	3	3	3	3	3	3	3	3	3		JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Crevalle jack			3	2	2	3	3	3	2	2	2	3	3	2		JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

Louisiana ESI: ESIMAP 129 (cont.)

BIOLOGICAL RESOURCES: (cont.)

FISH:

RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
588	Florida pompano			2	2	2	2	2	2	2	2	2	2	2	2	2	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gizzard shad			3	3	3	3	3	3	3	3	3	3	3	3	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gray snapper			3	2	2	2	2	2	3	3	3	3	3	3	2	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf menhaden			5	4	4	4	5	5	4	4	4	4	4	4	4	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf sturgeon		T	1	1	1	1	1	1	1	1	1	1	1	1	1	JAN-DEC	JAN-DEC	JAN-DEC	JUN-AUG	-
	Red drum			3	3	3	3	3	3	3	3	3	3	3	3	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Sand seatrout			4	3	3	3	3	4	3	3	3	4	4	3	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Sheepshead			3	3	3	3	3	3	3	3	3	3	3	3	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Silver perch			1	1	1	1	1	1	1	1	1	1	1	1	1	JAN-DEC	JAN-DEC	JAN-DEC	JUN-AUG	-
	Southern flounder			3	3	3	3	3	3	3	3	3	3	3	3	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spanish mackerel			2	1	2	2	2	2	2	2	2	2	2	2	1	JAN-DEC	JAN-DEC	JAN-DEC	MAR-NOV	-
	Spot			3	3	3	3	3	3	3	3	3	3	3	3	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted seatrout			3	3	3	3	3	3	3	3	3	3	3	3	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped mullet			3	3	3	3	3	3	3	3	3	3	3	3	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Tarpon			2	2	2	2	2	2	2	2	2	2	2	2	2	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-

HABITAT:

RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D
436	Rare plant				X	X	X	X	X	X	X	X	X	X	X	X
444	Rare plant				X	X	X	X	X	X	X	X	X	X	X	X

INVERTEBRATE:

RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
580	Bay squid			4	4	4	4	4	4	4	4	4	4	4	4	4	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Blue crab			5	4	4	5	5	5	5	5	5	5	5	5	4	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp			5	4	5	5	5	5	5	5	5	5	4	4	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf stone crab			3	3	3	3	3	3	3	3	3	3	3	3	3	-	MAR-NOV	MAR-DEC	JAN-DEC	-
	Pink shrimp			5	3	3	5	5	5	3	3	3	3	3	3	3	-	-	APR-OCT	JAN-DEC	-
	White shrimp			5	3	3	5	5	5	5	5	5	5	5	5	4	APR-NOV	APR-NOV	MAR-DEC	JAN-DEC	-
584	Bay squid			3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-DEC	MAR-DEC	MAR-DEC	JAN-DEC	-
	Blue crab			5	4	4	5	5	5	5	5	5	5	5	5	4	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp			5	3	4	5	5	5	5	5	5	5	4	4	3	-	-	JAN-DEC	JAN-DEC	-
	Gulf stone crab			3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp			3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	APR-SEP	JAN-DEC	-
	White shrimp			5	3	3	4	5	5	5	5	5	5	5	5	4	-	-	APR-DEC	JAN-DEC	-
588	Bay squid			3	3	3	3	3	3	3	3	3	3	3	3	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Blue crab			4	3	3	3	4	4	3	3	3	4	4	3	3	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp			2	2	2	2	2	2	2	2	2	2	2	2	2	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Florida stone crab			1	1	1	1	1	1	1	1	1	1	1	1	1	-	JAN-DEC	JAN-DEC	JUN-AUG	-
	Gulf stone crab			3	3	3	3	3	3	3	3	3	3	3	3	3	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Pink shrimp			2	2	2	2	2	2	2	2	2	2	2	2	2	JAN-DEC	JAN-DEC	JAN-DEC	JUN-AUG	-
	White shrimp			4	3	3	3	3	4	4	4	4	4	4	3	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-

REPTILE:

RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Internesting	Juveniles	Adults
444	Rare terrestrial/aquatic				X	X	X	X	X	X	X	X	X	X	X	X	-	-	JAN-DEC	-	-
639	American alligator			661 TO 9 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
640	American alligator			593 TO 38 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
641	American alligator			2257 TO 68 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
642	American alligator			1000 TO 250 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC

TERRESTRIAL MAMMAL:

RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D
635	Common raccoon			86 TO 42 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink			223 TO 179 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat			36 TO 17 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter			2036 TO 828 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria			3 TO 2 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
636	Common raccoon			77 TO 73 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink			329 TO 220 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat			99 TO 6 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter			1258 TO 423 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria			6 TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
637	Common raccoon			68 TO 43 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink			466 TO 215 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat			9 TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter			752 TO 373 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria			7 TO 5 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
638	Common raccoon			25 TO 23 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink			96 TO 56 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat			196 TO 53 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter			877 TO 728 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria			15 TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X

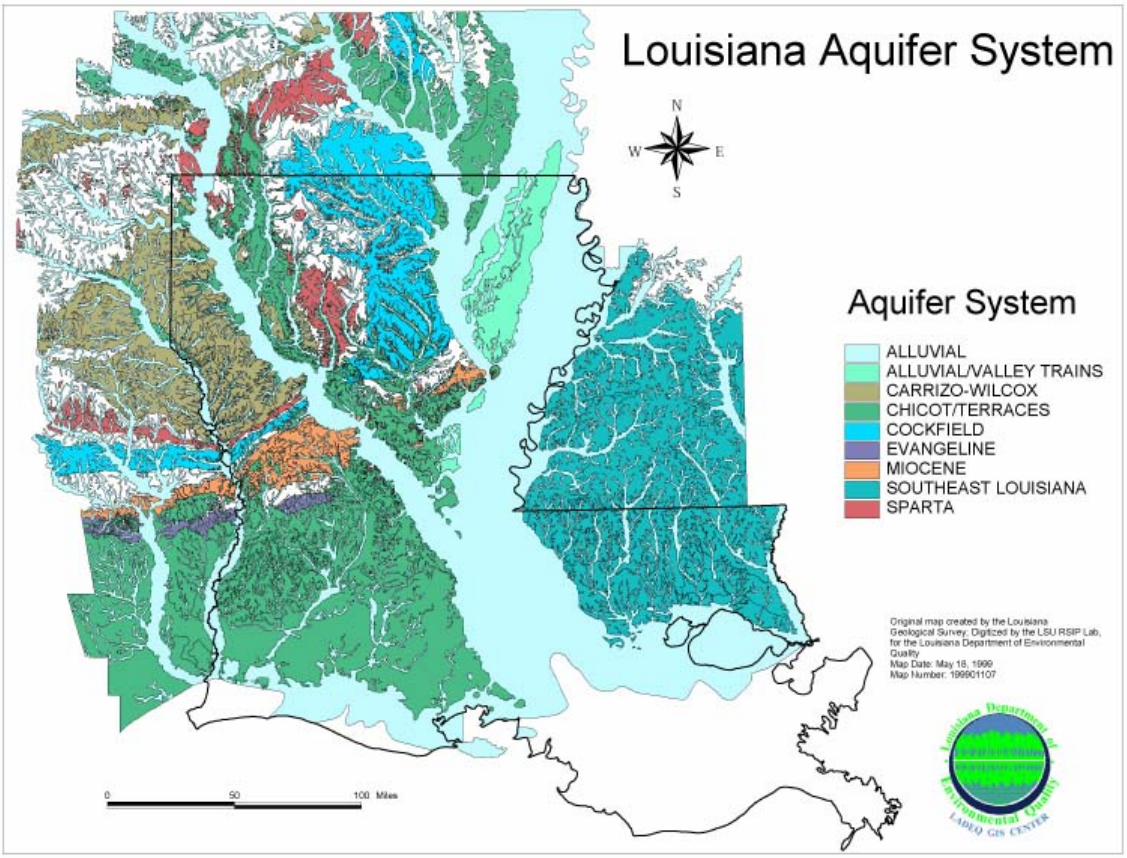
HUMAN USE RESOURCES:

WILDLIFE REFUGE:

HUN#	Name	Owner	Contact	Phone
123	PAUL J. RAINEY WILDLIFE SANCTUARY		NATIONAL AUDUBON SOCIETY	
134	STATE WMA		LDWF	

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

Louisiana Aquifer System



APPENDIX C- CORRESPONDENCE

USFWS ESA Consultation

3/11/2015

Louisiana Ecological Services Office

ESA Technical Assistance Form

General Information

Name: National Marine Fisheries Service

Point of Contact: Joy Merino

Address: 646 Cajundome Blvd

City: Lafayette **State:** Louisiana **Zip Code:** 70506

Phone Number 1: 337-291-2109 **Phone Number 2:** _____

Email Address: joy.merino@noaa.gov

Proposed Project Information

Project Reference ID: 4491

Project Latitude: 29.7 **Project Longitude:** -92.2

Project Parish(es): Vermilion

Project Description: Cole's Bayou Marsh Restoration CS-59 of the CWPPRA.

Goals are to:

- Create 365 acres of brackish marsh in recently formed shallow open water
- Nourish approximately 53 acres of existing brackish marsh
- reestablish the historic freshwater and sediment patterns through the interior wetlands, specifically increase freshwater and sediment inflow through interior wetlands and decrease inundation

Borrow area for sediments is Little Vermilion Bay.

Based on the information provided, the proposed project is not an activity that would affect a federally listed threatened or endangered species; nor is there proposed or designated critical habitat present within this Parish.

Therefore, a "no effect" conclusion is appropriate. No further ESA coordination with the Service is necessary for the proposed action, unless there are changes in the scope or location of the proposed project or the project has not been initiated one year from the date of this letter.

If the proposed project has not been initiated within one year, follow-up coordination via this website should be accomplished prior to making expenditures because our threatened and endangered species information is updated annually. If the scope or location of the proposed project is changed, coordination via this website should occur as soon as such changes are made.

This finding completes project review by the Service for effects to Federal trust resources under our jurisdiction and currently protected by the ESA.

Please keep a copy of this pre-development coordination for your records. Do not send it to the Lafayette ES

Office.

If you have additional questions, please contact Louisiana ES Office Biological Science Technician at 337/291-3100 for further assistance.

Project Type: Other

Does the project propose to obtain, remodel, refurbish, or rehabilitate existing structures in such a way that does not significantly alter the present capacity or use, and does not alter surrounding land areas that were previously undisturbed? **No**

Does the project propose to reconstruct, resurface, or enhance infrastructure and/or cityscape (e.g. streets, sewers, sidewalks, etc.) within the current footprint of the infrastructure and in a manner that does not disturb previously undisturbed ground? **No**

Is the construction project located entirely within the footprint of an established urban/suburban area (incorporated villages, towns, or cities)? **No**

Does the project propose to do general construction or clearing in an area that has been previously undisturbed or would it occur within or adjacent to the Amite River, Bayou Bartholomew, or a stream in Grant or Rapides Parishes? **No**

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
LSU Sea Grant Building- Room 124D
Baton Rouge, Louisiana 70803

March 13, 2013

RECEIVED
MAR 2 0 2013
FISH & WILDL. SERV
LAFAYETTE, LA.

U.S. Fish and Wildlife Service
646 Cajundome Blvd.
Lafayette, LA 70506

Dear Service,

The NOAA National Marine Fisheries Service is the federal sponsor of the *Cole's Bayou Restoration* (TV-63) in Teche/Vermilion Basin. As part of the preparation of the Environmental Assessment, in compliance with the National Environmental Policy Act, we ask the Service to provide a list of endangered, threatened, and proposed species and designated and proposed critical habitats that may occur in the project area, shown in the enclosed information.

This TV-63 project is being funded under the Coastal Wetland Planning, Protection, and Restoration Act (CWPPRA), of which your agency is a cooperating partner. The project location is in brackish marsh and shallow open water. Our proposed action includes creating and nourishing marsh via dedicated dredging from Vermilion Bay. To restore hydrology, culverts are proposed for freshwater and sediment inflow improvement, fisheries organisms ingress, and drainage of water.

Please respond to:
John Foret, PhD
National Marine Fisheries Service
646 Cajundome Blvd., Lafayette, LA
John.foret@noaa.gov

Sincerely,

Phillip L. Parker, P.E.
Environmental Engineer
NOAA Fisheries Service
225-578-8341

phillip.parker@noaa.gov

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

April 12 2013
Date

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

SITE MAY CONTAIN WETLANDS
Contact the U.S. Army Corps of Engineers for a jurisdictional determination.

District: New Orleans

Telephone No. 504-862-2274

SHPO Concurrence

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
LSU Sea Grant Building- Room 124D
Baton Rouge, Louisiana 70803

March ~~13~~ 20, 2013

No known historic properties will be affected by this undertaking. This effect determination could change should new information come to our attention.

Pam Breaux 4-8-13
Pam Breaux Date
State Historic Preservation Officer

Charles McGimsey
State Historic Preservation Office
1051 North 3rd Street Rm 405
Baton Rouge LA 70802

Dear Mr. McGimsey,

The NOAA, National Marine Fisheries Service is the federal sponsor of the *Cole's Bayou Restoration* (TV-63) in Teche/Vermilion Basin, Vermilion Parish. We request your assistance in identifying any potential cultural resources in this area, so we may coordinate areas of high probability or those to avoid.

The Cole's Bayou Restoration (TV-63) is funded under the Coastal Wetlands Planning, Protection and Restoration Act. The site is located in the Fearman Lake Quadrangle. The online database has no records of identified sites in the proposed project area, and 9 sites within the Fearman Lake Quadrangle.

Our proposed action, as shown on the attached figures, includes creating and nourishing marsh from offshore sediments. One natural bayou is proposed for dredging, and hydraulic dredging would done in Vermilion Bay, where the borrow site will be under further cultural review by our agency.

For the area known on the figure, we are aware that previous cultural resource surveys were completed for this stretch of Freshwater Bayou (Rawls et al. 2010, Gibson 1979). The marsh creation areas are previous interior marsh and unlikely to be disturbed, as any resources would be buried. The planned culverts that will be replaced/constructed occur along man made waterways and are therefore unlikely to have been areas of settlement.

Though no sites are in the proposed project area, to assist in your review we provide those site # and descriptions that occur south of the proposed location within the Fearman Lake Quadrangle. The nearest occurring historically used waterway is Belle Isle Bayou where several of these sites area located:

- 16VM11-shell midden
- 16VM12-prehistoric scatter (reference reports 22-1279 and 22-670)
- 16VM21-shell midden
- 16VM22-shell midden
- 16VM23-prehistoric scatter (beach deposit) and 2 shell middens
- 16VM25-shell midden reported as shell midden, Brown et al. says it is a dredge portion of bayou (report 22-1279)
- 16VM100-shell midden disturbed by dredging (report 22-806)

RECEIVED
MAR 25 -13
DIV. OF ARCHAEOLOGY

EFH Concurrence

Not yet requested; previous (Dec 2014) guidance consulted

Summary of Comments

- Acadiana Regional Clearinghouse replied that the State clearinghouse is no longer in operations, but they review the projects as that affect the sub-state planning District IV and "no negative aspects" had been found with the proposed project. 6-3-13
- Department of the Army replied that they "do not anticipate any adverse impacts to any Corps of Engineers projects" and advised for section 404 of the Clean Water Act, section 10 of the Rivers and Harbors Act, and a Louisiana Coastal Zone Coastal Use permit as are already planned. 6-18-13
- DOTD provided instruction on flood prevention and asked that the parish floodplain administer be contacted as was done. 5-13-13
- EPA "determined that the project, as proposed, should not have an adverse effect on the quality of the groundwater underlying the project site," located on the Chicot aquifer system. 5-6-13
- FEMA Region VI requested the parish floodplain administer be contacted, which was done 5-7-13
- LDEQ had "no objections" and provided information on water quality and stated Vermilion Parish is classified as attainment-status for national air quality standards. 5-7-13
- LDWF reviewed their Louisiana Natural Heritage Program database, and concluded "no impacts to rare, threatened or endangered species or critical habitats are anticipated for the proposed project. No state or federal parks, wildlife refuges, scenic streams, or wildlife management areas are known at the specified site." 5-2-13
- State office of Conservation replied the "the referenced project area indicates no oil, gas or injection wells located in the project area" were registered but unregistered wells could be in the area.5-16-13
- USFWS replied that the project was reviewed for their Federal trust resources and the action will have no effect on those resources 5-1-13