

**PROSPECTUS
JESUIT BEND MITIGATION BANK
PLAQUEMINES PARISH, LOUISIANA**



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1.0 INTRODUCTION

Restoration Systems (Sponsor) proposes establishing a freshwater wetland mitigation bank in Plaquemines Parish approximately 8 miles south of Belle Chase, Louisiana. The proposed Jesuit Bend Mitigation Bank (JBMB) will provide mitigation credits for wetland and aquatic resource impacts within the mitigation service area.

JBMB encompasses approximately 338.94 acres of open water, wooded berm, emergent marsh, and cypress swamp. Nearly the entire proposed Bank has compensatory mitigation potential in the form of re-establishment and enhancement of freshwater marsh and cypress-tupelo gum swamp. JBMB will be preserved and protected by a Conservation Servitude. Implementation of re-establishment and enhancement Mitigation Types as defined in the Corps of Engineers, New Orleans District (CEMNVN) Modified Charleston Method (MCM), *Guidebook for the Use of the Excel Workbook* (March 2013), will result in 44.52 acres of tupelo-cypress swamp and 272.66 acres of freshwater marsh at the Bank. In addition, a fish channel consisting of 3.84 acres will be constructed within the Bank.

1.1 Location

JBMB is located in Plaquemines Parish (Appendix A, Figure 1) and lies approximately one-half mile west of the Mississippi River at Jesuit Bend (Bank photographs are provided as Appendix B). JBMB's coordinates are 29.74197° N latitude and -90.03363° W longitude in Township 15 South, Range 24 East, Sections 14,15,16, and 17 and occurs in the East Central Louisiana Coastal Water Basin in the United States Geological Survey eight-digit cataloguing unit 08090301 and Louisiana Department of Environmental Quality's (DEQ) Barataria basin (Appendix A, Figure 2).

At 338.94 acres, JBMB is bounded on the east by the Plaquemines Parish Flood Protection Levee (also known as the Plaquemines 2 non-federal levee-PL2, IPET 2009); to the south by another inundated parcel; to the west by pipeline canals and their associated low berms; and on the north by over 20 inundated parcels of land. JBMB may be accessed from the Plaquemines Levee by way of the Ollie Pump Station Site that is located at the west end of Ollie Road in unincorporated Jesuit Bend, LA (Appendix A, Figure 3).

The Plaquemines Levee is bound on its east by the Parish Canal and to its east by a Jesuit Bend neighborhood of single-family residences. The land immediately north and south of the Bank is of the same character as the Bank, shallow open-water ponds. The Ollie Canal lies immediately south of the southern-adjointing parcel. The lands to the west are the large expanses of freshwater and transitional marsh of the Barataria land bridge, which are separated from the Bank by a pipeline canal.

2.0 PROJECT GOALS AND OBJECTIVES

The goals of JBMB are to restore and preserve the natural community functions of approximately 273 and 45 acres, respectively, of freshwater and cypress-tupelo gum swamp that have been degraded due to anthropogenic activities, natural land subsidence, sediment deprivation from the Mississippi River, wave fetch, and the wind, flood and saltwater damages associated with a series of recent hurricanes. Restoration will be achieved by importing river sediments to JBMB, thereby returning it to natural wetland grade and replanted (Appendix A, Figure 4). The post-mitigation bank will be freshwater marsh and cypress-tupelo gum swamps.

JBMB is strategically located and capable of restoring a variety of biotic and physical functions to the watershed. Therefore, the objectives of the Bank are multiple.

- Wetland – Long-term loss of wetland functions at this Bank will be restored by reversing the causes of the Bank’s degradation.
- Physical – New sediment will be brought into the system. This will provide greater flood protection and flood storage, as well as extend the Barataria land bridge.
- Biotic – Marsh and swamp habitat functions will be restored and enhanced; sensitive fishery functions (red drum, white and brown shrimp, as well as gulf menhaden, Atlantic croaker and blue crab habitat) will be substantially enhanced; as will avian and wetland mammal species habitats.
- Biogeochemistry – Re-building marsh and swamp habitats will restore biogeochemical processes as substantially more plant and invertebrate detritus will enter system.
- Soils – Restoration of the Bank’s topography and vegetative habitats will ensure restoration of the organic material to the system that is critical for rebuilding an organic soil profile at the Bank.
- Hydrologic – Restoration of the Bank topography, incorporation of the fishery channel, while maintaining a connection to offsite waters will restore the Site’s hydrologic processes.

The overall mitigation plan is depicted in Figure 4 (Appendix A). The Sponsor will use re-establishment, rehabilitation, and preservation to implement JBMB. Table 1 below illustrates the breakdown of the acreage of the existing plant communities (Figure 5) compared to the acreage of the proposed plant communities (Figure 6). Figure 4, shows the breakdown of mitigation types over the existing habitats. The entire site will be preserved and protected by a Conservation Servitude.

Table 1. Mitigation Plan Summary: Habitats; Methods; and Area Affected.

EXISTING HABITATS			PROPOSED HABITATS			MITIGATION TYPE
ABBREV.	NAME	ACRES	ABBREV.	NAME	ACRES	NAME
CS	CYPRESS SWAMP	31.60				ENHANCEMENT 1
CSD	CYPRESS SWAMP DEGRADED	11.79	CGS	CYPRESS-GUM SWAMP	44.52	RE-ESTABLISHMENT 2
MFW	MIXED FORSTED WETLAND	7.73				RE-ESTABLISHMENT 2
FWM	FRESHWATER MARSH	28.73				ENHANCEMENT 2
WBM	WOODED BERM	8.21	FWM	FRESHWATER MARSH	272.66	RE-ESTABLISHMENT 2
OW	OPEN WATER	236.25				RE-ESTABLISHMENT 1
OW	OPEN WATER	3.84	FC	FISH CHANNEL	3.84	RE-ESTABLISHMENT 1
LEV	PLAQUEMINES LEVEE	6.78	LEV	PLAQUEMINES LEVEE	6.78	BUFFER
LLOC	DRAINAGE CANAL	4.01	LLOC	LEVEE LIMITS OF CONSTRUCTION	11.14	BUFFER
		338.94			338.94	

The proposed plant community acreage outlined in Table 1 was derived by reviewing the historical boundaries of the cypress-tupelo swamp and the freshwater marsh. From a 1951 aerial image, as shown in Figure 5, the natural boundary of the cypress-tupelo swamp is clearly discernable. This boundary appears to be the same as the current cypress-tupelo boundary. Therefore, it was determined that the re-established and enhanced cypress-tupelo swamp should not extend past its current acreage (approximately 51.1 acres). When compared to the most current aerial photograph of the Site (2010), the 1951 image indicates that extensive areas within the 51.1 acres of cypress-tupelo swamp have degraded over time. The degradation of this habitat is symptomatic of a combination of man-made activities. Future degradation of the cypress-tupelo swamp will be halted with the establishment of the

JBMB, protecting and enhancing the healthy cypress-tupelo marsh and re-establishing (through borrowed soil deposits and vegetation planting) the degraded areas.

The existing Plaquemines parish levee and existing drainage canal will not be included as mitigation acreage credit. Since the CEMVK is planning to expand and restore the levee system in Plaquemines Parish, it is not appropriate to include this area (essentially a 100-foot buffer along the existing levee) in the Bank.

3.0 ECOLOGICAL SUITABILITY OF THE BANK

JBMB will restore the land to its prior conditions. As described below, the plan will reverse the processes that caused the severe degradation of the marsh system and restore wetland functions to the Bank.

3.1 Historical Ecological Characteristics of the Site

Historically the Bank site was at the edge of the forested floodplain of the Mississippi River and the upper freshwater reaches of the Barataria Bay system. Since construction of the Mississippi River levee system, the land’s hydrology has been altered such that hydrologic inflows may now only access the Bank from the Barataria system. Currently the land is subject to tidal fluctuations and seasonal variations of the tidal flows. The tidal inflows and outflows on the Bank are exclusively from an isolated narrow opening in an existing weir on the southern adjoining property border with Ollie Canal. The opening is approximately 30 feet wide. Anticipated tidal fluctuations of 1 to 1.5 feet maximum (typical variations between .5 to .8 feet) are expected which is typical for this area and ideal for marsh and forested growth sustainability. Most of the proposed Bank was a marsh with a cypress-tupelo gum swamp by the PL-2.

The communities that would have been present historically (Table 2), following the Cowardin classification system (Cowardin *et al.* 1979), were Palustrine Forested Broad & Needle-Leaved Deciduous and Palustrine Emergent Persistent. In lay terms, these habitats would be known as cypress-tupelo gum swamps and freshwater marshes. A current vegetation map is found in Appendix A as Figure 7. From an eco-region standpoint, the community types would be characterized as cypress-tupelo gum swamps in the Southern Holocene Meander Belts and freshwater marshes in the Deltaic Coastal marshes (Daigle *et al.* 2006). These community types are typical of long hydroperiod wetlands common in the region.

Table 2. Historic Habitats at the Bank

Habitat/Community Type	Community Common Name	Ecoregion Types	Species
Palustrine Forested Broad and Needle-Leaved Deciduous	Cypress-Gum Swamp	Southern Holocene Meander Belts (73K)	In wettest areas, cypress-gum swamps (bald cypress, water tupelo); on less flooded zones, overcup oak, Nuttall oak, willow oak, water hickory, elm, green ash, sweetgum; on point bars and natural levees, sweetgum, ash, cottonwood, some areas of live oak. Some forested canebrakes with open, mixed deciduous trees and giant cane
Palustrine Emergent Persistent	Freshwater Marsh	Deltaic Coastal Marshes (73O)	Freshwater marsh vegetation of grasses, sedges, and rushes with few to no trees. Alligator weed, spike rush, maidencane, cutgrass, and bulltongue

In terms of land uses, in the former swamp lands, bottomland forests and landward edges of the extensive marshes have been cleared and the region has been extensively modified for agriculture, flood control, and navigation. Levee and canal systems are extensive throughout the region. Soybeans, sugarcane, cotton, corn, and pasture are the major crops with crawfish aquaculture common. The wetland systems act as a buffer to help moderate flooding and tidal inundation during storm events.

The proposed Bank has been used for a variety of types of agriculture including cattle ranching, crops and aquaculture. Implementation and protection of Bank resources through a Conservation Servitude will promote the sustainability of aquatic resources in the mitigation service area.

3.2 Current Ecological Characteristics of the Site

JBMB is entirely flat and wet (Appendix A, Figures 5 and 8) with nearby spot elevations indicating the land surface varies from elevations of one foot in the marsh to seven feet at the Plaquemines Levee edge. The top of the Plaquemines Levee is approximately 8.5 feet in elevation (IPET 2009, pg. VIII-5-48).

The proposed Bank’s vegetation is typical for the unmanaged lands in this region (Figure 5, Table 3). The existing Site is bounded by the Plaquemines Levee on the east, which grades into a deeply inundated cypress swamp that has a ground cover of emergent marsh species (Appendix B, Photographs 7/9). There is a mixed hardwood and exotic species edge as the levee grades into the swamp (Appendix B, Photographs 9/10). A low wooded berm on the western side of the Bank (Appendix B, Photographs 11/13) separates the main body of open water (Appendix B, Photograph 12) from an emergent freshwater marsh community (Appendix B, Photograph 13).

Soils at the JBMB are Allemands and Barbary Mucks (Appendix A, Figure 9; NRCS 2010). Neither soil type is a prime farmland soil due to their hydric characteristics. Allemands Muck supports marsh vegetation and is typically characterized by 36 inches of muck, comprised of decomposed organic material, that overlays deeper clayey backswamp deposits. It is frequently flooded by non-saline to very slightly saline (0.0 to 4.0 mmhos/cm) water. Barbary Muck supports swamp vegetation and is typically comprised of 4 inches of muck over fluid clayey backswamp deposits. It is frequently flooded by non-saline (0.0 to 2.0 mmhos/cm) water. The levee is presumably made of spoils from canal construction. The internal berm would have been constructed with adjacent on-Site soils. Table 3 summarizes the current conditions at the proposed Bank.

Table 3. Current Site Conditions. Habitats, Soils and Acres by Type and Quality

Area	Acres	Condition	Soils
Plaquemines Levee and Canal	10.79	NA, maintained upland levee	Spoil from Canal
Cypress Swamp	43.39	Relatively open canopy, low to moderate quality with marshy ground cover, SWG II/III transitional status	Barbary Muck
Mixed Forested Wetland (eastern edge of Site)	7.73	Levee edge, moderate quality, includes popcorn trees	Barbary Muck
Wooded Berm	8.21	Low trees: native and popcorn tree	Allemands Muck
Open Water, Shallow	240.09	2.4' to 3.5' deep, occasional water hyacinth patches, no submergent vegetation	Allemands and Barbary Mucks
Freshwater Marsh	28.73	Moderate quality	Allemands Muck

As can be seen in seen on maps, aerials and photos, as well as deduced from the soils and vegetation mapping, the entire proposed Bank, with the exception of the Plaquemines Levee, is within the dredge and fill regulatory jurisdiction of the U. S. Army Corps of Engineers (COE).

In summary, JBMB is primarily an open water pond due to local and regional subsidence. The wetland habitats at the eastern and western edges vary from low to moderate levels of functioning caused by exotic invasions and the negative effects of the open water.

3.3 General Need for the Project in this Area

The East Central Louisiana Coastal Watershed is a large drainage area within the Deltaic Plain in Southern Coastal Louisiana. A combination of the population growth rate, ongoing implementation of the Greater New Orleans Hurricane and Storm Damage Risk Reduction System (HSDRRS), and impacts from the oil and gas industry has created a need for a compensatory mitigation bank to service the region. There is one other private bank in this geographic area which has a limited number of bottomland hardwood and cypress-tupelo mitigation credits for sale. JBMB would provide freshwater marsh and additional cypress-tupelo swamp credits to the watershed, expanding the availability of watershed-based mitigation options.

Historically the upper Barataria system was nourished with fresh water, sediments, and nutrients from the Mississippi River and its distributary channels. Construction of flood control levees have cut off fresh water and its sediments as has closure of Bayou Lafourche. Both sets of actions contributed to perhaps the highest rate of wetland loss along the Louisiana coast (Environmental Protection Agency; EPA 2007)As open water areas have expanded and fetch has increased, the remaining marsh has been exposed to erosion from wind-generated waves. The JBMB is consistent with the Louisiana Coastal Wetlands Conservation and Restoration Task Force, and the Wetlands Conservation and Restoration Authority Region 2 ecosystems strategy to help stabilize the Barataria Basin Landbridge and protect freshwater marsh of the upper basin from increased marine/tidal influence.

A central goal of JBMB is to become an active participant in implementation of the regional sediment management plan as further described. This will occur by the use of Mississippi River sediments as donor material in JBMB's implementation phase.

3.4 Technical Feasibility

Historically, the JBMB was seasonally flooded by the Mississippi River. Due to the construction of levees along the banks of the river over the past 100 years, the proposed Bank has lost its natural connectivity to the sediment deposits that these floods precipitate. The historic Mississippi River floodplain system cannot be restored; however, the local subsidence can be addressed. The proposed plan is to import beneficial use sediment from the Mississippi River to re-construct the marsh platform at JBMB. Approximately 1,830,000 cubic yards of sandy material will be dredged from the Mississippi River, pumped to JBMB, and distributed at elevations needed to sustain a healthy marsh environment, which is a target elevation of 1.3 feet. Similarly, sediment will be used to spot-fill areas located within existing degraded swamp areas to provide a platform for reestablishment of cypress-tupelo in areas inundated and unable to regenerate these species. A dredge permit, MVN 2010.02690MR, has been filed for this project showing primary sources in the Mississippi River which have been identified. The method of taking beneficial use dredge material from the Mississippi River and depositing it to re-establish marsh will avoid having to utilize borrow material from existing marshes and deepening areas within an already subsiding landscape.

A central goal of JBMB is to become an active participant in implementation of the regional sediment management plan. This will occur by the use of Mississippi River sediments as donor material in JBMB's implementation phase. The Bank will be able to maintain post-restoration conditions through the over-build of sediments placed from Mississippi River dredging, and the re-establishment of native vegetation. Temporary dikes along the exterior of the Site will keep re-introduced sediments on the Site while the vegetation is becoming established.

4.0 ESTABLISHMENT OF THE MITIGATION BANK

4.1 Restoration Plan

As described in Section 2.0, freshwater marsh and cypress-tupelo gum swamp will be restored and preserved using the techniques described here and as depicted in Figure 4 (Appendix A). The proposed Bank is a shallowly inundated pond which can be brought back to grade with imported excess river sediments, then graded with earth moving equipment to restore the Site's topographic features, and re-planting. Because the swamp is a transitional SWG Condition Class II/III (CFSWG 2005), it will be replanted in the shallower zones and the marsh will be planted "behind" the earthwork in a continuing fashion; this will ensure Site stabilization as quickly as possible and spread out the planting operation over time.

Marsh Platform Restoration

The average elevation of pre-restoration marsh in the Bank is +0.88 foot North American Vertical Datum (NAVD) 88. Healthy marsh elevation is estimated to be approximately +1.3 feet NAVD 88. A fill elevation of +2.0 feet NAVD 88 was chosen because it would yield desirable marsh elevations for most of the project life. Filling to this elevation, most of the foundation settlement and self-weight consolidation would occur within two years after construction. The created marsh platforms would settle to +1.3 feet NAVD 88 at year 10, and to +1.2 feet NAVD 88 at the end of the 20-year project life (Figure 10).

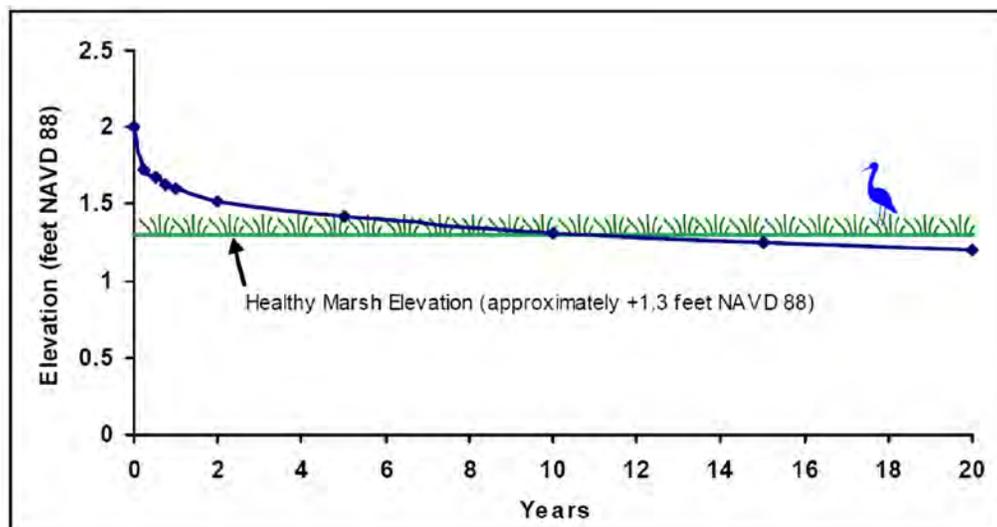


Figure 10. Fill Settlement vs. Time.

Borrowed Material

A primary borrow source has been located at latitude 29.7898204 longitude -90.0154122 (Figure 12). After project layout and staking, a dredging contractor will be mobilized adjacent to the primary

area. Work will begin by fusing 28,000 linear feet of 24" to 30" discharge HDPE pipeline. Discharge piping will be oriented along the batture from the borrow source. Material will be transported using existing or installed casings underneath railroad and Highway 23. Booster pumps will be installed along discharge pipeline as needed to maintain flow rate of 1,000 cubic yards (CY) per hour. The dredge will consist of a 24" to 32" suction dredge in Mississippi River at the primary borrow area. Fused discharge pipe will be connected to stern tube. River discharge pipe from stern tube will be sunk and marked with approved US Coast Guard markings to allow Mississippi boat traffic to pass. Close coordination with MNSA will dictate procedures while dredging in the river.

Containment Berms

Containment Berms (dikes) are planned at the proposed project location. The containment dike design will result in construction of a dike that has a crown elevation of +3.0 feet NAVD 88 (allowing one foot of freeboard above the marsh fill), a crown width of 6 feet, and side slopes of 1(V):3(H) producing a slope stability factor of 1.64 (Figure 11). The dikes will be constructed using material mechanically-dredged from within the marsh creation areas. The dikes will be leveled after completion of the marsh platform. Figure 11 represents a generalized containment cross section of the containment dikes proposed for the Bank:

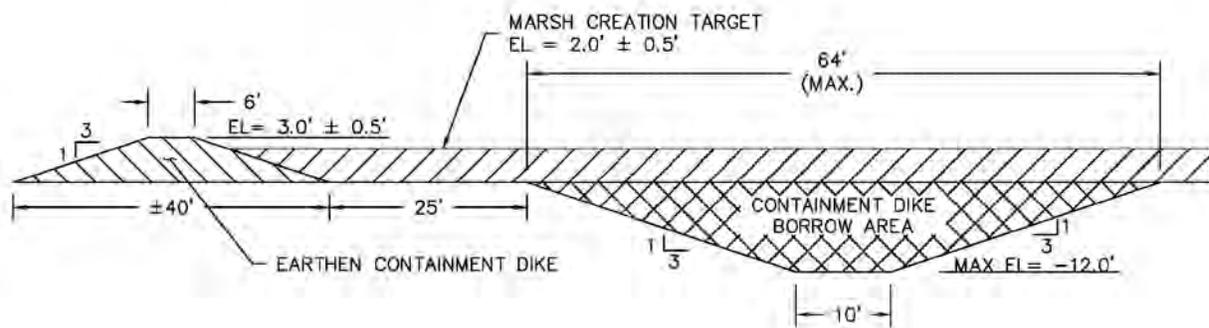


Figure 11. Containment Dike (detail).

Based on available geotechnical data, it is reasonable to assume that a similar design may be employed at the proposed Bank site. The borrow material for the containment berm will be taken from the interior of the proposed mitigation site. The borrow pit will then be replaced with dredged material and no adverse impacts outside the project footprint will impact the neighboring environment.

Construction of Freshwater Marsh and Fish Channel

A 15' wide fish channel will be dredged in the approximate center of the open water environment (Figure 4). This fish channel will run from north to south and will be between 5 and 10 feet deep depending on site conditions. The slope of the channel sides will be gradual to accommodate the depth and to minimize the risk of channel collapse. The dredged sediments (Allemands and Barbary Muck soils) from inside the Site boundary will be used to fill and re-establish portions of the degraded cypress-swamp. An overflow weir box on the western containment dike will be installed to allow natural tidal flow to continue within the Bank.

During the creation of freshwater marsh, the wooded berm that separates the existing freshwater marsh from the open water environment will be removed. The removal of this area will

create a seamless transition between the freshwater marsh and the cypress-tupelo swamp. A natural transitional area between the two habitats may be established via natural regeneration. Any invasive species encountered during construction will be eliminated.

Planting Plan

Settlement of the restored marsh platform is anticipated to occur within the first two years after the final grading of the deposited sediments. During this time, the site will be left to regenerate naturally through rhizome proliferation or through seed dispersal from adjacent marsh areas. Once the marsh platform has settled to the desired elevations, the following planting plan will be implemented. Note that the principal community types identified for planting are (1) Cypress-Tupelo Swamp; and (2) Freshwater Emergent Marsh. Habitats will be demarcated based upon the location and extent of the existing cypress-gum swamp habitat and elevation differences in post-fill construction grades. Based upon the well-documented occurrence of natural recruitment and seed bank regeneration of marsh species at similar restoration sites (namely Bayou DuPont Restoration Site), it is anticipated that if correct marsh elevation is achieved, much of the site will revegetate naturally. Planting will occur within those areas that have not naturally revegetated during the 1- to 2-year period of the settlement of the marsh platform.

Species selected for planting will be well suited for both the edaphic and hydrologic conditions of the restored site. Therefore, it is recommended that the vegetation species list be created after the placed sediments settle. Waiting until the sediments have settled will give the on-site biologists a better understanding of the on-site conditions and will help dictate the most appropriate vegetation for the newly created marsh. An updated planting plan will be produced by the on-site biologist and circulated through the IRT for approval before planting commences. All species chosen for supplemental planting will be native to the area and will be obtained from a local source. All invasive species that may have taken root during the natural regeneration phase will be removed.

Invasive Species

At the time of the completion of dredge placement and final grading, an assessment of the extent of the presence of invasive species such as Phragmites will be conducted. The subsequent herbicide treatment will be implemented based upon the location and the extent of occurrence of invasive species. It is anticipated that invasive species control can be readily accomplished via broadcast ground treatment (either mounted spray tank on ground vehicle or backpack sprayers). Habitat® Herbicide is a recommended treatment for control of Phragmites (particularly within or adjacent to emergent marsh).

It is anticipated that the spread of invasive species will be restricted by daily tidal inundation of the marsh platform. Other areas not subject to regular tidal inundation may continue to be at risk for the spread of invasive species. As a result, areas will continue to be monitored over a five-year period post-construction, and additional herbicide treatment will be conducted as necessary for exotic/noxious species control. Treatment will likely consist of broadcast ground application (via vehicle-mounted spray tank or backpack sprayers).

JBMB will be implemented in the following general sequence:

- a. Site surveying and benchmarks established.
- b. Begin mobilization of equipment (marsh buggies, dozers, pumps, barges, etc)
- c. Begin fusing and installation of discharge pipe from river inlet to Site.
- d. Build containment dikes at the north and south edges of the Site using on-Site material.

- e. Install turbidity curtains along the edges of the cypress swamp not being re-established.
- f. Mobilize dredge to borrow source(s) on the Mississippi River.
- g. Hydraulically dredge renewable bed-load sediment from the Mississippi River, pump the sediment along the Mississippi River batture, over the Mississippi River levee, and under Highway 23, along the Plaquemines Parish Flood Protection Levee, and then onto the Site via pipeline (Figure 12). The proposed dredging is under review for USACE Permit No. MVN2010.02690MR
- h. Begin spreading the pumped sediment with grading equipment to establish the appropriate elevations for marsh re-establishment
- i. Excavate the fishery channel 5-10 feet below final grade.
- j. Place material to slough into the pre-excavated fishery channel for a finished width of 15 feet +/-.
- k. Spread the sediment in pre-determined areas around existing cypress trees to re-establish appropriate grade to facilitate planting of new swamp species and foster natural re-seeding.
- l. Level existing low berm in western side of JBMB to foster surface water exchange throughout the proposed Bank.
- m. Establish the appropriate marsh and swamp vegetation. Planting in the swamp areas will begin when appropriate compaction of the substrate will sustain seedlings.

4.2 Current Site Risks

JBMB is in a zone within the Barataria system that exhibits a high subsidence rate (Gagliano 1998) of 2.1 to 3.5 feet per century. Without the addition of new sediments to the system, subsidence will continue. Related effects of this continued subsidence is an increase in saltwater intrusion, which will affect the community composition.

Due to damages and breaches in the current non-federal levee system (NFL) from recent hurricanes, Congress directed that COE should “replace or modify” the existing PL-2, an NFL. COE is currently preparing a Supplemental Environmental Impact Statement (SEIS) for incorporation of the PL-2 Project into the Federal system. When completed in 2014, the upgraded PL-2 levee will be part of the New Orleans to Venice Federal Levee System. The overall project is currently in design and is going through the environmental compliance process in accordance with National Environmental Policy Act (NEPA; Van Antwerp 2010). The upgraded levee will be adjacent to the eastern edge of JBMB and coordination meetings have been held with the Vicksburg District planners.

Due to JBMB’s location, adjacent development and proposed development from surrounding areas are not an issue. JBMB’s adjoining neighbors to the north, south and west are all located in water 2-3 deep, and the Plaquemines Parish levee borders the project to the east. There are no known zoning conflicts or planned developments on or adjacent to the property.

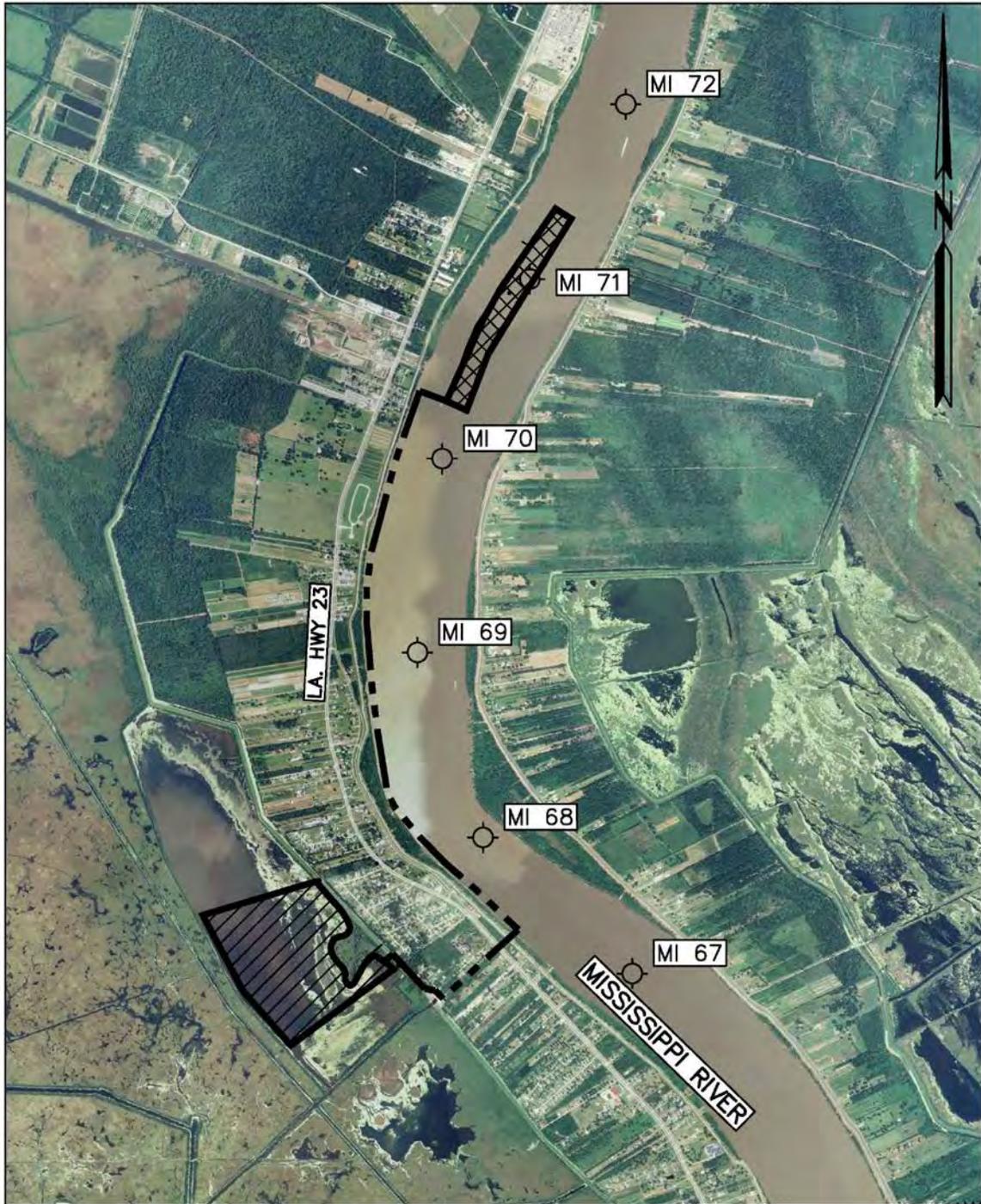


Figure 12. Proposed Jesuit Bend Mitigation Bank General Dredging Plan Layout.

JBMB exhibits these advantages:

1. Fee-simple title to the land has been acquired by the sponsor. There are no known servitudes, easements, or encumbrances to the proposed Bank;
2. Open water to be converted to fresh water marsh to provide a buffer between Plaquemines Parish residents and the Gulf of Mexico;
3. JBMB's close proximity to renewable Mississippi River beneficial use borrow sites provides easy access to imported dredge material;
4. JBMB has water depth elevations averaging 2-3 feet depth, which provides an opportunity for a low amount of sediment needed to provide a sustainable marsh.
5. River sediment can be transported via pipeline to the proposed Bank pursuant to USACE Permit No. MVN-2010.02690MR using infrastructure which will be installed under Highway 23, under the railroad tracks, and over the Mississippi River Federal levee;
6. Containment dikes are minimized due to existing site conditions and existing containment dikes surrounding the project area;
7. JBMB is relatively insulated from erosion and tidal inundation;
8. JBMB is close to the Naomi Siphon, which provides approximately 2100 cfs with the potential to deliver 150,000 yards³ of river sediment annually in the vicinity of the proposed project;
9. The entire land contained within JBMB's footprint has the potential for ecological uplift;
10. The proposed Bank complements the CPRA Master Plan.

4.3 Long-Term Sustainability of the Site

Due to its location and project design, the proposed Bank has a very high likelihood of success. JBMB will be restored to the types of communities that were historically present on the property. The hydrologic and landscape processes that have caused JBMB to have lost sediment, resulting in a largely open water environment, will be reversed. JBMB's hydrology will be connected to the surrounding marsh network to the west and south, tying it into the region's natural hydrologic processes. No weirs or structures will be required to maintain the Banks's post-restoration hydrologic regime, so structural maintenance will not be an issue. Similarly, the reliance on the systems natural vs. engineered hydrology will ensure that the restored habitats are subject to a regionally-appropriate, natural hydroperiod.

5.0 PROPOSED SERVICE AREA

The Primary Geographic Service Area (PGSA) is the 8-digit Cataloging Unit 08090301 (Figure 2); however, the JBMB's potential to benefit to adjacent service areas may warrant credits to be purchased from outside this PGSA, including the Deltaic Plain, may be done so on a case-by-case basis.

6.0 OPERATION OF THE MITIGATION BANK

JBMB will be managed by the Sponsor throughout pre-construction, construction, and monitoring. The Sponsor will be responsible for the Bank's success, for the sale of credits in accordance with an approved credit release schedule, and for transferring the Bank's Conservation Servitude to an appropriate entity such as a land conservancy or local government.

6.1 Project Representatives

Sponsor and Landowner:

Mr. George Howard
Restoration Systems, LLC
1101 Haynes Street, Suite 211
Raleigh, NC 27604
george@restorationsystems.com
919-334-9105

Agent:

Cardno ENTRIX
7800 Mopac Expressway, Suite 350
Austin, TX 78728

6.2 Qualifications of the Sponsor

Restoration Systems, LLC (Sponsor) has been a leader in the development of successful aquatic mitigation Sites in North Carolina and the Southeast for over 10 years. Sponsor’s qualifications are best illustrated by its track record in selecting high quality Sites and using highly skilled technical designers and experts in implementation is well-demonstrated. Sponsor has forty regional off-Site mitigation or mitigation bank projects in some stage of design, implementation, or completion. These projects encompass wetland, stream, and riparian buffer mitigation projects in North Carolina, Tennessee, Maryland, Virginia, Texas, and Georgia encompassing more than 22,000 acres of wetlands and 50 miles of streams. Most of Sponsor’s non-mitigation bank projects provide regionally significant in-lieu-fee mitigation for departments of transportation impacts, primarily for the North Carolina Environmental Enhancement Program (NCEEP). The remainder of Sponsor’s projects provides third party, off-Site, regionally significant mitigation for project-specific impacts. Sponsor also has seven mitigation banks being permitted in five southeastern states. Furthermore, Sponsor provides financial surety for every project through every phase of work and each Site is inspected by staff no less than quarterly in addition to requisite technical monitoring.

Included among the mitigation projects completed, or in advanced planning, by Sponsor are:

Table 5. Sponsor’s Projects.

Approved Mitigation Banks							
	Project	State	Client	Year Initiated	Status	Mitigation Type	Credits
1	Barra Farms	NC	Bank Representative	2012	Monitoring Year 2	Non-Riparian Wetland	80.5
2	Bass Mountain	NC	Bank	2005	Construction	Stream	5,748
3	Bear Creek	NC	NCDOT	2000	Close Out in process	Wetland	165.6
4	Cripple Creek	NC	Bank	2008	Monitoring Year 3	Stream	4,518
						Wetland	7.85
8	Katy Prairie (Phase I)	TX	Bank	2009	Construction	Stream	17,500
6	Pancho	NC	Bank	2009	Construction	Stream	8,113
						Wetland	30
						Nutrients	22,000

Mitigation Banks in Development							
	Project	State	Client	Year Initiated	Status	Mitigation Type	Credits
1	Birmingham, AL Beltway	AL	Bank	2012	Proposed	Stream	~20,000
						Wetland	~59
2	Front Range	CO	Bank	2012	Proposed	Stream	~25,000
						Wetland	~250
3	Hebert II	TX	Bank	2012	In-Development	Wetland	360
4	Jesuit Bend	LA	Bank	2010	In-Development	Marsh (fresh)	273
						BLH	51
5	Milburnie Dam	NC	Bank	2009	In-Development	Stream	32,590
6	Towanda Creek (Phase 1)	PA	Bank	2012	Under IRT Review	Wetland	22
						Stream	7,000

Existing Projects							
	Project	State	Client	Year Initiated	Status	Mitigation Type	Credits
7	Anderson Swamp	NC	EEP	2006	Closed Out	Non-Riparian Wetland	15.5
8	Angola Bay	NC	Martin Marietta Materials	2004	Design	Wetland	750
9	Basin Creek	NC	EEP	2012	Construction	Stream	2119
10	Big Bull Creek	NC	EEP	2005	Closed Out	Buffer	35
11	Brogden Road	NC	EEP	2005	Closed Out	Buffer	15
12	Brown Marsh	NC	EEP	2006	Monitoring Year 5	Stream	5,000
						Non-Riparian Wetland	5
13	Burrows Cove	TN	TN DOT	2009	Monitoring Year 3	Wetland	27
14	Butlers Branch	NC	City of Raleigh	2009	Monitoring Year 3	Nutrients	122,742
15	Cane Creek	NC	EEP	2006	Monitoring Year 5	Stream	6,748
						Riparian Wetland	4.4
						Non-Riparian Wetland	5
16	Carbonton Dam	NC	EEP	2004	Close Out in Process	Stream	90,494
17	Casey Dairy	NC	EEP	2003	Closed Out	Buffer	72
18	Causey Farm	NC	Fed-Ex	2003	Closed Out	Stream	7,000
						Riparian Wetland	10
						Wetland	0.5
19	Columbus Swamp	NC	EEP	2007	Monitoring Year 4	Wetland	32
20	Conetoe Creek	NC	EEP	2005	Closed Out	Buffer	10
21	Cranston's Mill Pond	VA	Bank	2009	Monitoring Year 3	Nutrients	752
22	Cutawhiskie	NC	EEP	2006	Monitoring Year 5	Stream	3,375

Existing Projects							
	Project	State	Client	Year Initiated	Status	Mitigation Type	Credits
						Wetland	12.3
23	Elk Shoals	NC	EEP	2003	Closed Out	Stream	5,188
24	Fox Run	NC	EEP	2009	Monitoring Year 3	Buffer	45
25	Frog Hollow	NC	Global Transpark	2008	Closed Out	Preservation	1,114
26	Gatlin Swamp	NC	EEP	2005	Closed Out	Non-Riparian Wetland	125
27	Gray Farm	NC	EEP	2005	Closed Out	Stream	7,610
28	Haw River	NC	EEP	2003	Closed Out	Riparian Wetland	31.55
29	Heath	NC	EEP	2009	Monitoring Year 3	Buffer	60
30	Herman Dairy	NC	EEP	2010	Monitoring Year 1	Stream	4785
						Riparian Wetland	4
						Non-Riparian Wetland	0.91
31	Holly Grove	NC	EEP	2006	Monitoring Year 4	Stream	15,726
32	Jarmans Oak	NC	EEP	2006	Monitoring Year 5	Stream	6,640
						Wetland	12
33	Lane Island	NC	Bank	2008	Closed out	Nutrients	96,648
						Buffer	459,993
34	Lick Creek	NC	EEP	2004	Closed Out	Stream	9,500
35	Little Buffalo	NC	EEP	2005	Closed Out	Buffer	18.5
36	Lloyd	NC	EEP	2005	Closed Out	Stream	4,750
						Riparian Wetland	3.3
						Non-Riparian Wetland	3.1
37	Lowell Mill Dam	NC	EEP	2004	Closed Out	Dam Removal	34,990
38	Morgan Creek	NC	EEP	2006	Monitoring Year 4	Stream	4,083
						Wetland	0.83
39	Pepperwood Farm	NC	EEP	2012	Construction	Riparian Buffer	13.1
40	Salisbury Wicomico	MD	Private	2006	Monitoring Year 5	Wetland	40
41	Sleepy Creek	NC	NC DOT	2002	Close Out in Process	Riparian Wetland	192
42	Sliver Moon	NC	EEP	2011	Monitoring Year 1	Non-Riparian Wetland	14
43	Summit Seep	NC	EEP	2010	Monitoring Year 2	Riparian Wetland	4.1
44	Three Mile Creek	NC	EEP	2007	Monitoring Year 4	Stream	8,021
						Wetland	2.3
45	Vickis Thicket	NC	EEP	2009	Monitoring Year 3	Buffer	28
46	Wall	NC	EEP	2011	Post Construction	Buffer	9.2
47	Walnut Creek	NC	EEP	2004	Closed Out	Buffer	25
48	Wellons Farm	NC	Bank	2008	Closed Out	Nutrients	73804

Note: Credits are calculated differently for each Corps District. In general, the "Credits" column represents the total length of stream restoration (feet), acreage of wetland restoration, acreage of buffer or pounds of nutrient offset.

As illustrated in Table 5, Sponsor has extensive experience implementing wetland and stream mitigation, in addition to other forms of mitigation. Many of these projects involve wetland re-establishment and rehabilitation, and all include preservation. In addition, many of Sponsor's projects have been implemented in the coastal plain environment, in which this Site is also located.

6.3 Sponsor Approach to Project Establishment

JBMB will be established only after completion of a series of processes and tasks (see below) that are considered to be standard practices of the Sponsor and other professional providers in the mitigation banking industry:

1. GIS landscape-level Site evaluation;
2. Site (project area) reconnaissance including walking/boating exploration;
3. Real estate acquisition;
4. Analysis of the market;
5. cursory investigations of the project area with an emphasis on:
 - a. Site hydrology, drainage features, plant and animal communities, rare species, rare habitats, existing marsh communities, *etc.*; and
 - b. Site re-establishment/ rehabilitation/ enhancement potential
 - c. Jurisdictional Determination field work performed;
6. Intensive inventory of existing Site conditions and resources;
7. Detailed topographic mapping;
8. Site investigations to determine feasibility of the Site using planned dredging techniques;
9. Submit required permits for review
10. Begin Restoration Design Plans (see page 17, Implementation);
11. Confirm re-establishment/ rehabilitation/ enhancement potential credits on the Site;
12. Determine appropriate phases for implementation of project;
13. Establish Conservation Servitude holder and place Conservation Servitude over Bank;
14. Establish the Construction and Establishment (C&E) & Long Term Maintenance and Protection Fund escrow accounts;
15. Complete advanced design and submit Mitigation Banking Instrument (MBI) to Interagency Review Team (IRT) for approval;
16. Implement Restoration Design Plans following approval of MBI and issuance of all applicable permits and authorizations (see page 17, Implementation);
17. Perform post implementation walkthroughs monthly and photo document progress;
18. Perform monitoring reports as required.

6.4 Proposed Long-Term Ownership and Management Representatives

Restoration Systems LLC (the Sponsor) has purchased in fee-simple JBMB in its entirety. Restoration Systems, LLC is also owner of the Bank and will serve as the Management Representatives. Restoration Systems is the responsible party for all financial assurances for the development of the Bank. The Sponsor is responsible for the following: 1) the compensatory mitigation requirements for any Department of Army permits for which it sold Bank credits; and 2) the long-term management,

maintenance, monitoring and protection of the compensatory mitigation represented by those credits. All JBMB property is free of liens and encumbrances that would conflict with its use as a mitigation bank.

6.5 Site Protection

The holder of the conservation servitude has been identified as Jesuit Bend Marsh Inc. Jesuit Bend Marsh Watch Inc. is a local non-profit corporation whose purpose is to protect the wetlands surrounding the Jesuit Bend community in Plaquemines Parish, LA. The Sponsor shall burden the Property with a perpetual Conservation Servitude in accordance with Louisiana law, La. R.S. 9:1272. The Conservation Servitude shall be signed and filed in the Plaquemines Parish office with an executed copy of the MBI attached. After filing, a copy of the recorded Conservation Servitude, clearly showing the book, page and date of filing, will be provided to CEMVN prior to the release of credits. The portions of JBMB that will be preserved are those that are designated as cypress-tupelo gum swamp, freshwater marsh, and fishery channel on Figure 4.

6.6 Long-Term Strategy

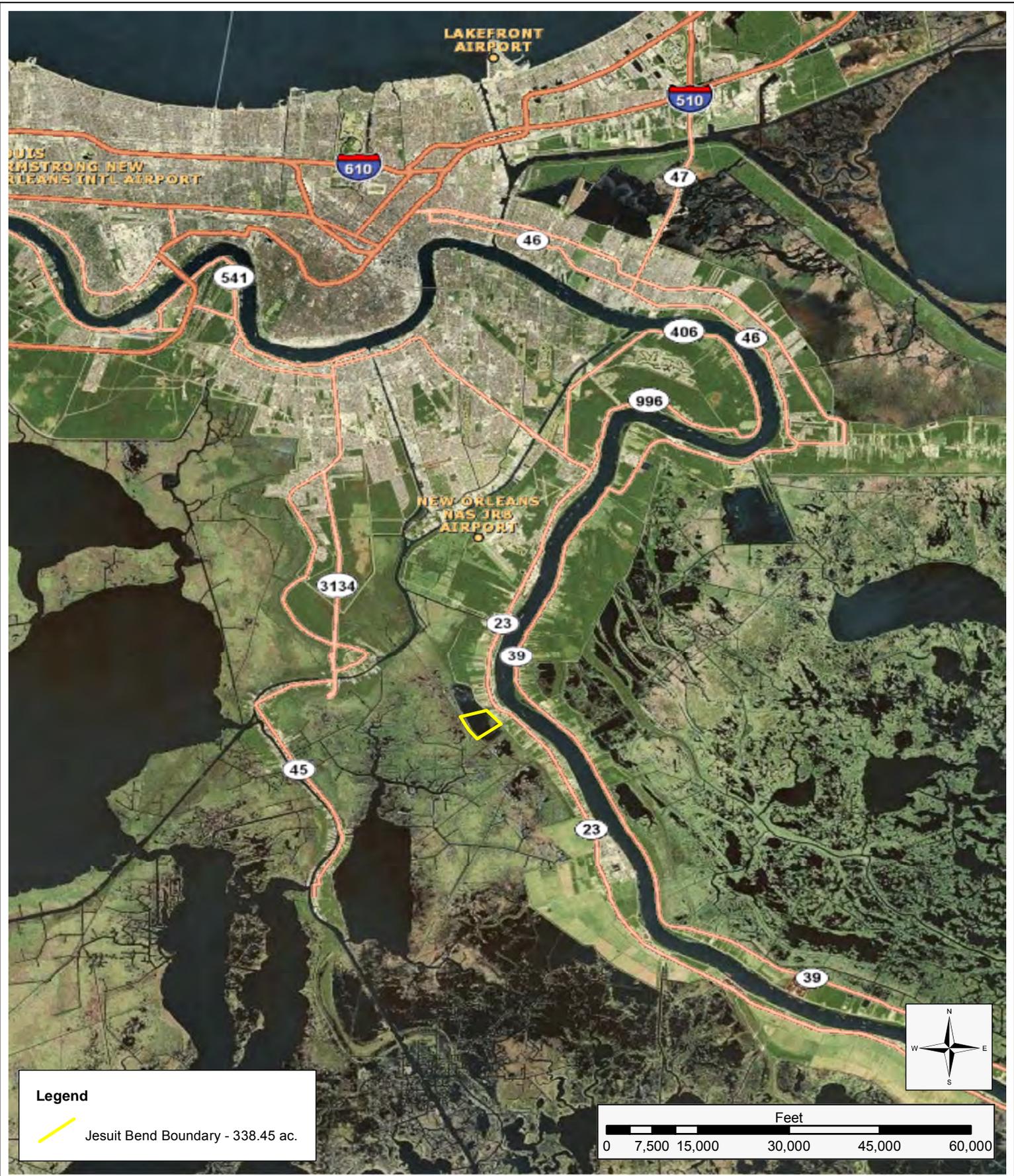
The Sponsor agrees to provide Financial Assurances sufficient to ensure satisfactory completion for the work described in the Mitigation Work Plan and the Adaptive Management Plan. The Sponsor will establish the Construction and Establishment (C&E) & Long Term Maintenance and Protection Fund escrow accounts to assure sufficient funds are available to perform work required to construct and maintain JBMB through successful attainment of long term success criteria following requirements provided by USACE-MVN. An assessment of the initial and capital costs and ongoing management funds required to manage and monitor JBMB will be included in the draft Mitigation Banking Instrument and will provide an estimate of work and cost requirements for construction and establishment of the Bank through achievement of long term success criteria. The Sponsor proposes to establish at the District Engineer's request an A+ Surety Performance Bond or Escrow Accounts.

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Appendix A: Figures



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 PHONE : 919.755.9490
 FAX : 919.755.9492

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SCALE: 1 inch = 20,833 feet
 DATE: DECEMBER-2011
 PROJECT: JB MBI

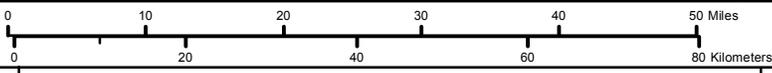
FIGURE 1: LOCATION MAP

OVERALL SITE CONTEXT MAP, SHOWING THE SITE'S PROXIMITY TO THE MISSISSIPPI RIVER AND THE GREATER NEW ORLEANS AREA.

AERIAL PHOTOGRAPHY
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 **SITE LOCATION**
 **USGS 8 DIGIT HYDROLOGIC UNIT CODES**



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Figure 2 - Watersheds Map

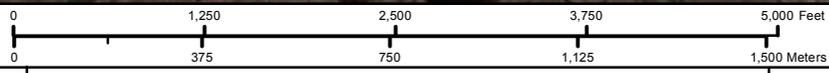
Jesuit Bend Mitigation Bank Plaquemines Parish, Louisiana




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 **PROJECT BOUNDARY - 338.94 AC. +/-**
 **PROJECT STAGING AREA**
 **SITE ACCESS**



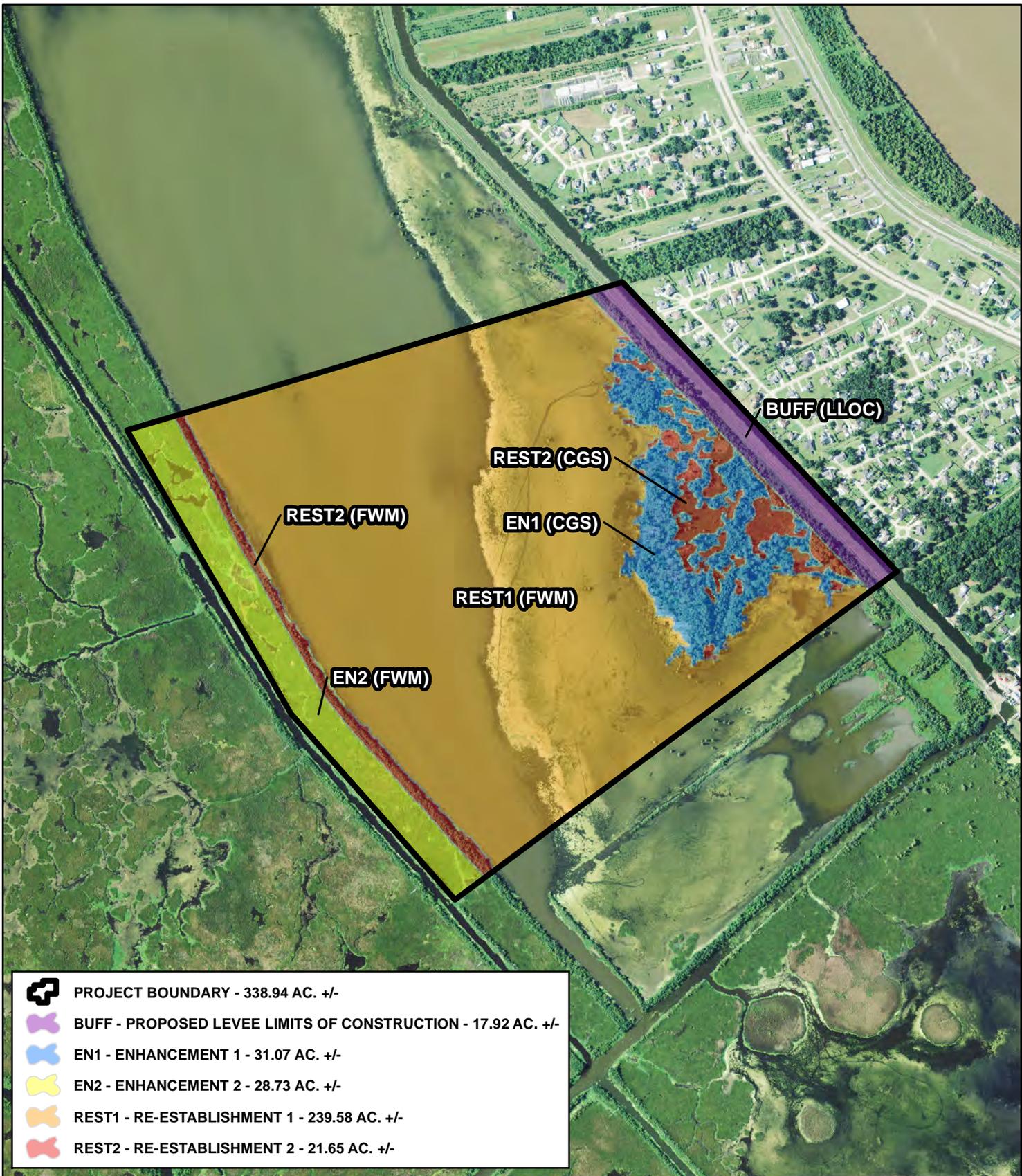
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Figure 3 - Site Access Map
Jesuit Bend Mitigation Bank
Plaquemines Parish, Louisiana

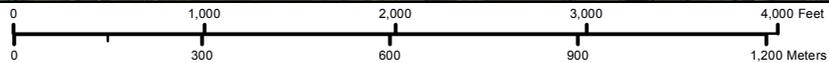


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-  **PROJECT BOUNDARY - 338.94 AC. +/-**
-  **BUFF - PROPOSED LEVEE LIMITS OF CONSTRUCTION - 17.92 AC. +/-**
-  **EN1 - ENHANCEMENT 1 - 31.07 AC. +/-**
-  **EN2 - ENHANCEMENT 2 - 28.73 AC. +/-**
-  **REST1 - RE-ESTABLISHMENT 1 - 239.58 AC. +/-**
-  **REST2 - RE-ESTABLISHMENT 2 - 21.65 AC. +/-**



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Figure 4 - Proposed Mitigation Type Map

**Jesuit Bend Mitigation Bank
 Plaquemines Parish, Louisiana**



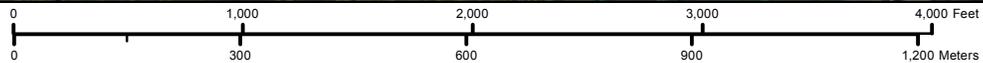
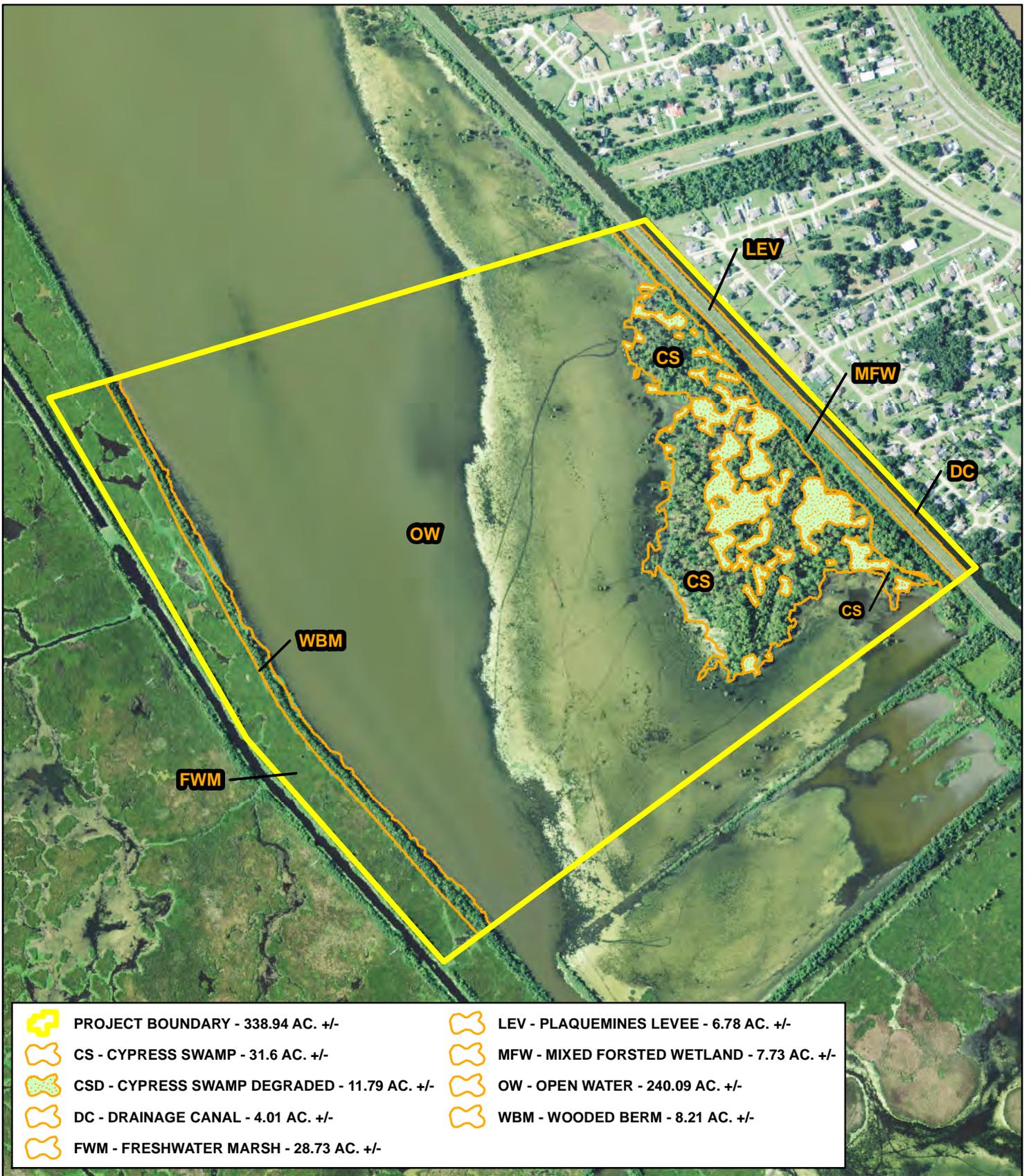
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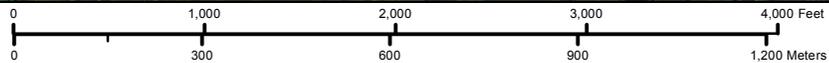
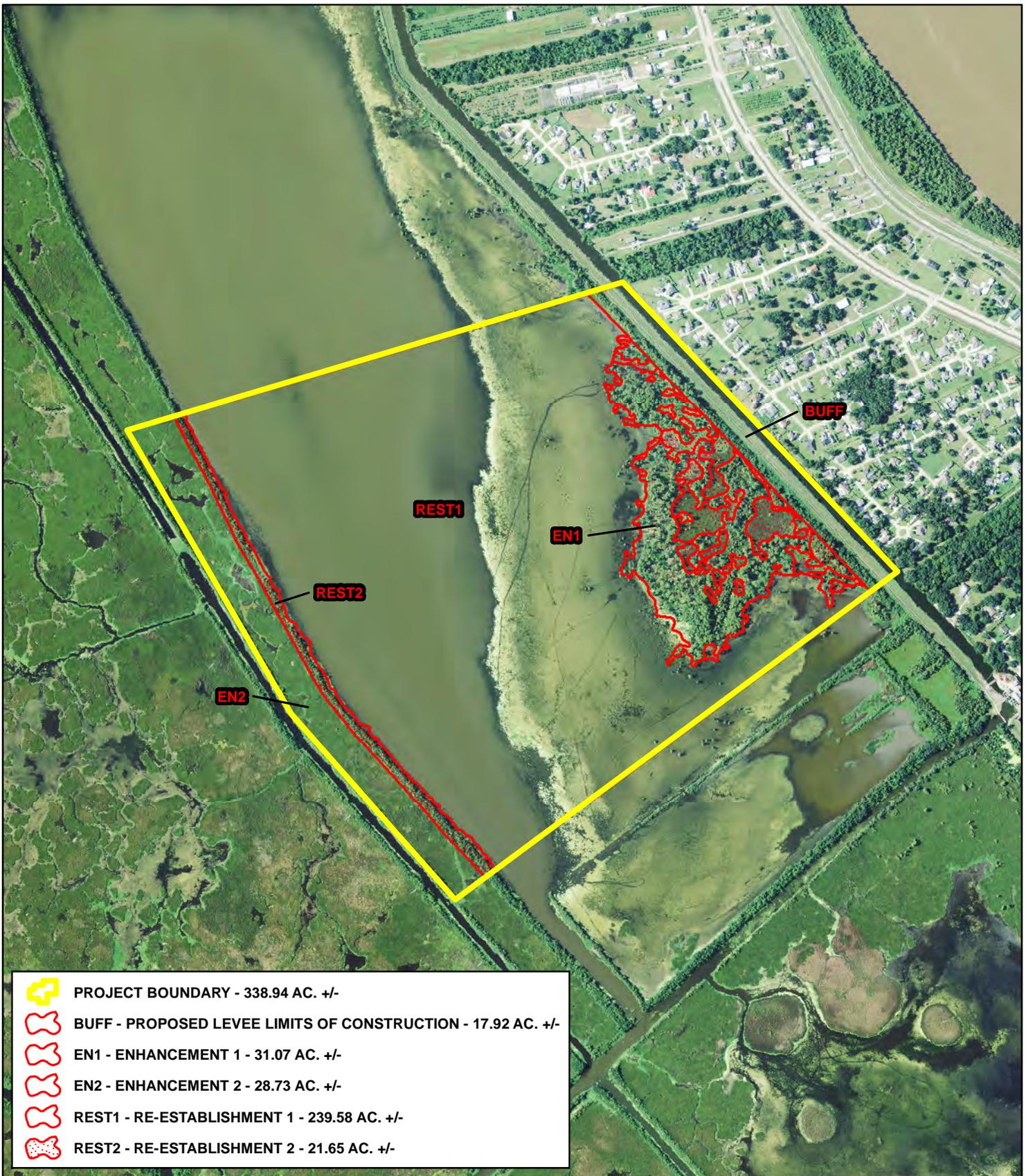


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Figure 5 - Existing Habitat Map
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Plaquemines Parish, Louisiana



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Figure 6 - Proposed Habitat Map

Jesuit Bend Mitigation Bank
Plaquemines Parish, Louisiana



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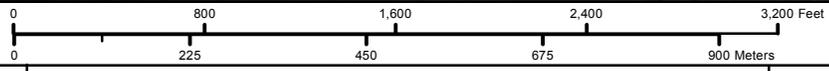
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-  **PROJECT BOUNDARY - 338.94 AC. +/-**
-  **CS - CYPRESS / GUM SWAMP - 51.12 AC. +/-**

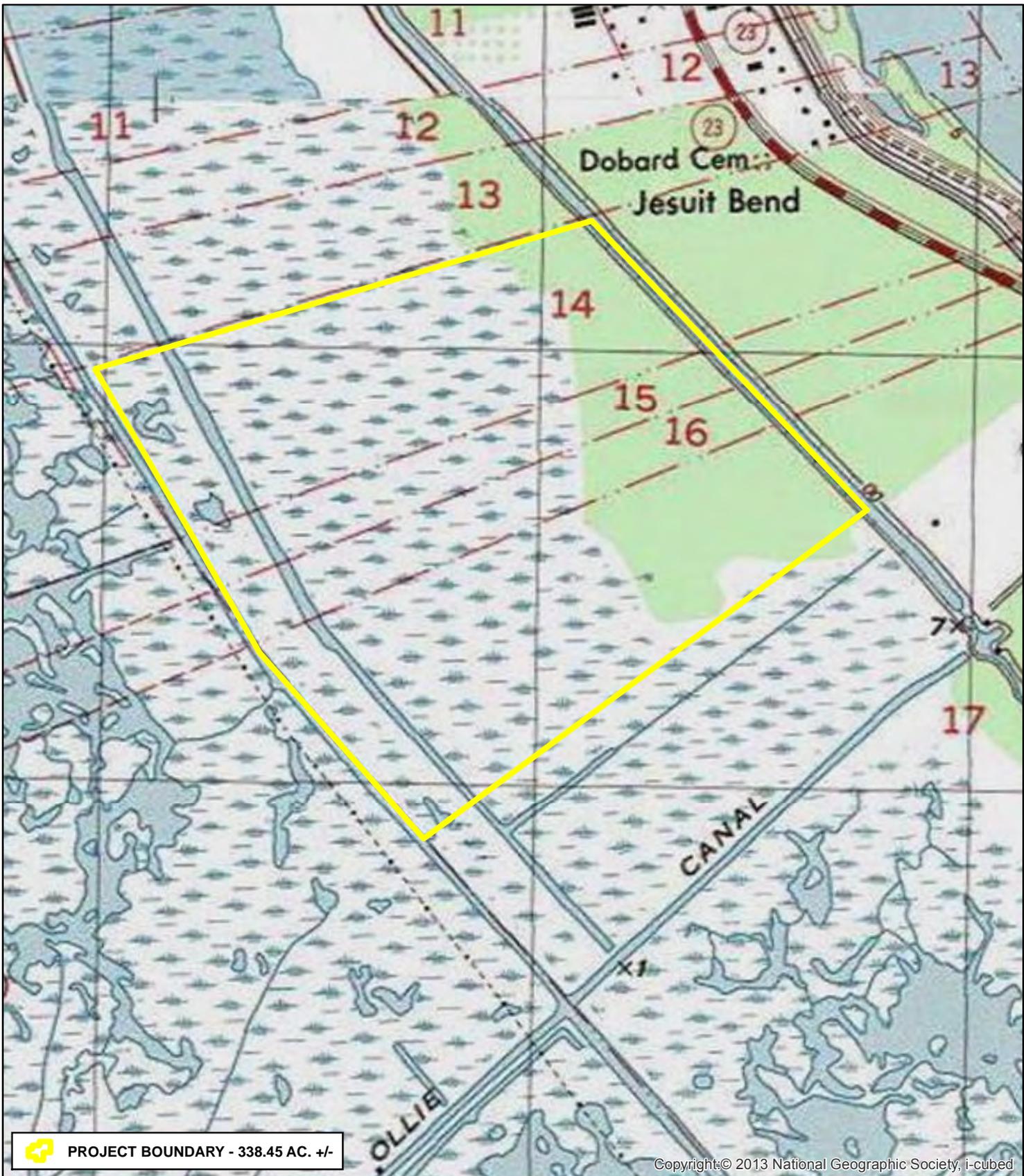


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Figure 7 - 1951 Historic Conditions Map
Jesuit Bend Mitigation Bank
Plaquemines Parish, Louisiana

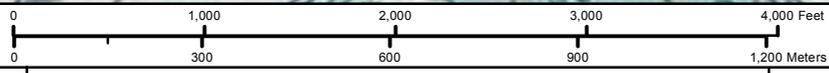


	
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Figure 8 - USGS Quadrangle Map

Jesuit Bend Mitigation Bank
Plaquemines Parish, Louisiana



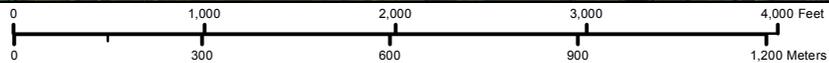
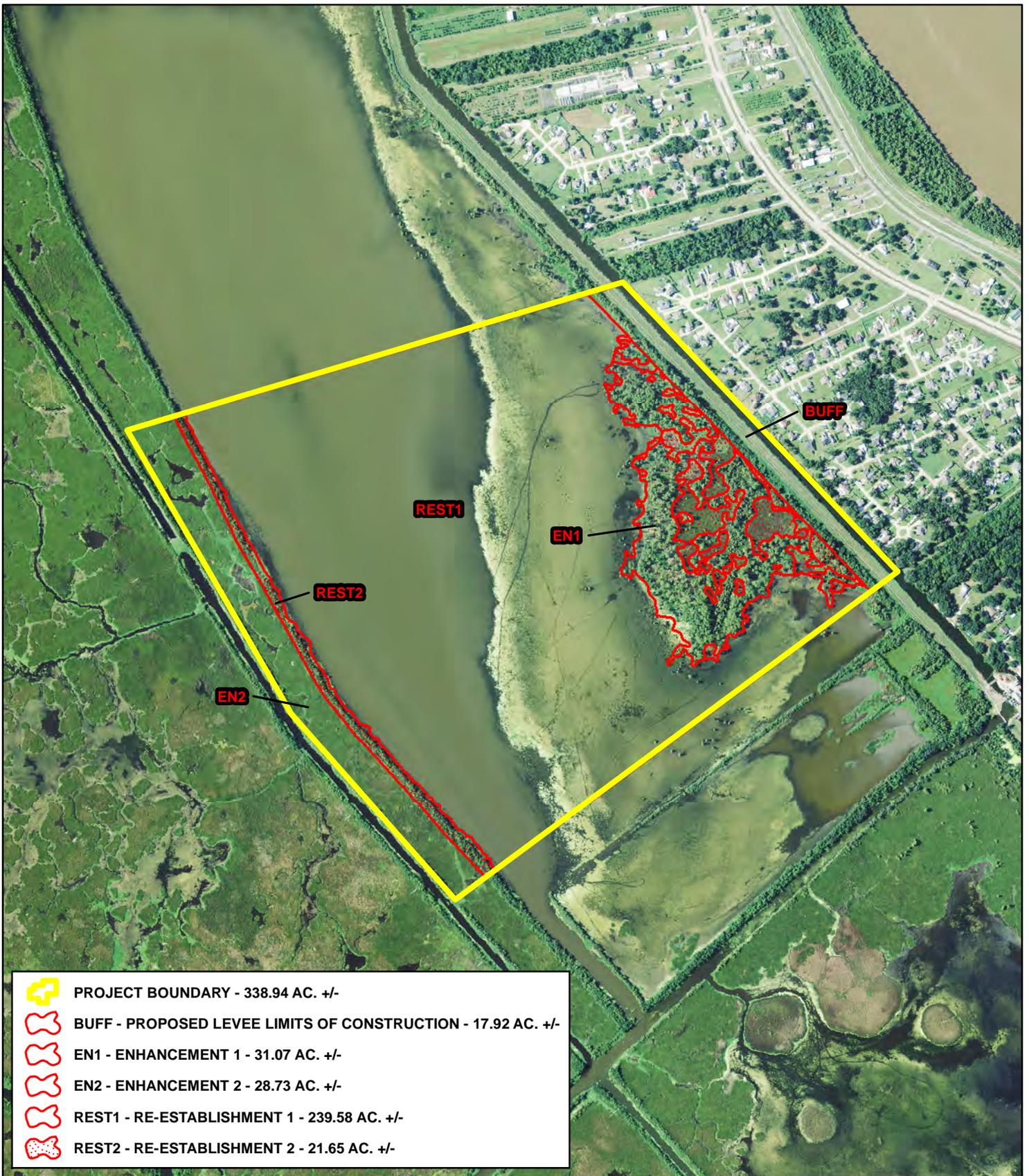
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Figure 9 - Proposed Habitat Map

Jesuit Bend Mitigation Bank
Plaquemines Parish, Louisiana



Image: 2010 NAIP



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Appendix B: Aerials and Site Photographs

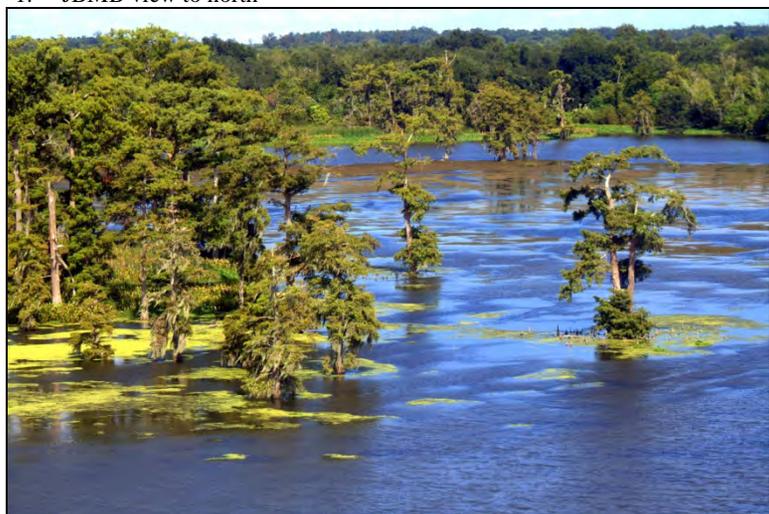
Current Condition Aerials



1. JBMB view to north



2. JBMB in mid-ground; illustrative of landscape setting



3. Southeast corner JBMB



4. Eastern side of JBMB

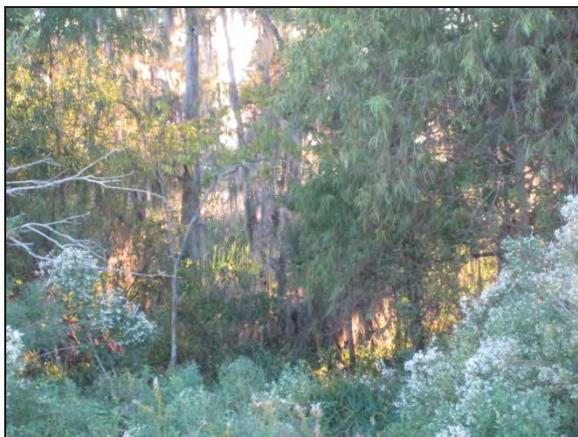


5. JBMB in right background with the Plaquemines Levee along its eastern edge; view to south



6. JBMB in right foreground with Mississippi River in background; view to northeast

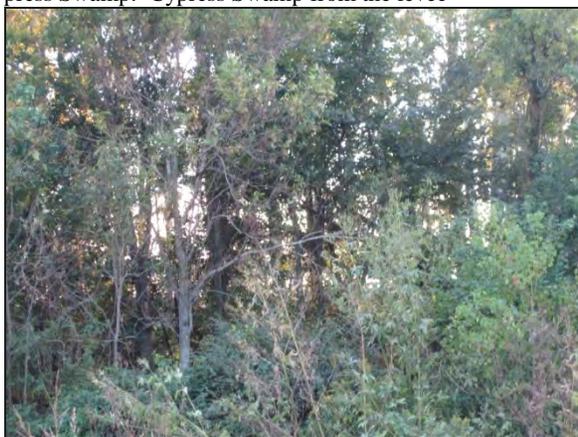
Current Conditions Site Photos



7. Cypress Swamp: Cypress Swamp from the levee



8. Cypress Swamp: Cypress Swamp from the water



9. Mixed forested wetland at levee edge: Open subcanopy zone



10. Mixed forested wetland at levee edge: Transitional edge and hackberry



11. Woody Berm: Southern Berm



12. Open Water: Open water, note floating water hyacinth clumps



13. Freshwater Marsh: Bull tongue, wooded berm in background