

# **Pontchartrain Basin**

R1-PO-01-Fritchie Marsh-Northshore Marsh  
Creation and Terracing Project

## PPL-19 PROJECT NOMINEE FACT SHEET

January 2009

**Project Name:** Fritchie Marsh-Northshore Marsh Creation and Terracing Project

**Coastwide 2050 Strategy:**

- Coastwide Strategy: Dedicated dredging to create, restore, or protect wetlands
- Regional Strategy 9: Marsh creation via dedicated sediment delivery

**State Master Plan:**

- **Planning Unit 1: East of the Mississippi River**
  - D 1-12. St. Tammany Marsh Restoration and Shoreline Protection: This measure will utilize dedicated dredging and vegetative plantings to provide shoreline protection and marsh creation along the north shoreline of Lake Pontchartrain. Approximately 11.7 miles of shoreline will be protected and approximately 326 acres of marsh will be created.

**Project Location:** Region 1 - Pontchartrain Basin, Pearl River Mouth mapping unit, Fritchie Marsh System, St. Tammany Parish. The Fritchie Marsh Project Area contains 6,246 acres of intermediate and brackish marsh and is located approximately 3 miles southeast of Slidell, Louisiana, near the north shore of Lake Pontchartrain in St. Tammany Parish. The marsh is bounded by U.S. Highway 90 to the south and east, Louisiana Highway 433 to the west, and U.S. Highway 190 and additional marshland to the north.

**Problem:**

Although the CWPPRA PO-06 project was completed in 2001 and resulted in improved hydrology and marsh restoration throughout the area, a significant portion of the Fritchie Marsh was lost due to Hurricane Katrina. Now shallow open water areas dominate the landscape which reduces the effectiveness of the PO-06 project. Over 3,600 acres of this unit were lost in the past 50 years, and another 15% is expected to be lost over the next 50 years. The long-term loss rate is approximately 0.5%/yr; however, the loss rate jumped to 13% after the 2005 storms, as evidenced by satellite and aerial imagery collected by the USGS. This once stable land mass was severely damaged by the passing of Hurricane Katrina, to the effect that in some locations marsh was stacked over nine feet high along the tree line. These marshes cannot recover without replacement of lost sediment, which is critical if the northshore marshes are to be sustained.

**Goals:**

The goal of this project is to help restore the vital Fritchie Marsh ecosystem through marsh creation, marsh nourishment, and terrace construction. Dredged material will immediately create

marsh to help this fragile ecosystem, and terracing will reduce wave fetch and have the potential to create marsh over the project life.

Specific goals of the project are:

- Create approximately 273 acres of intermediate marsh
- Vegetative plantings for marsh creation area
- Nourish approximately 60 acres of marsh
- Create approximately 100,000 linear feet of terraces
- Reduce wave fetch and erosion of adjacent interior marshes
- Restore natural hydrology by dredging Salt Bayou to historic depth
- Increase hydrologic connection with Pearl System

**Proposed Project Features:**

Proposed project features include approximately 273 acres of marsh creation via hydraulic dredging and placement of 2.1 million cubic yards of material. Borrow areas will be determined during the planning phase of this project, but a possible borrow location would be Lake Pontchartrain. Water depths in this area are approximately 1 ft and containment would be semi-confined. Intermediate vegetation will be planted upon material compaction and settlement.

Dredging Salt Bayou, which is nearly silted in, would restore a hydrologic connection within the project area. Dredged to its historic depth, Salt Bayou could provide approximately 100,000 yd<sup>3</sup> of material to beneficially use for marsh nourishment. The proposed project would suggest the CWPPRA Working Groups investigate the hydrologic benefit of installing an additional culvert under Highway 190. During high water periods in the Pearl System water flows across Highway 190, and an additional culvert and small outfall channel could route this resource into the project area.

Approximately 100,000 linear feet of earthen terraces will be built to create a 1,300 acre terrace field. The water depths in this area are approximately 1 ft and materials are conducive for terrace construction. Terraces will be constructed with a 10 foot crown and 1 on 5 slopes. Two rows of intermediate marsh plugs will be planted on the crown and one row on each side of the terraces upon construction completion.

**Preliminary Project Benefits:**

1.) *What is the total acreage benefitted both directly and indirectly?*

Approximately 273 acres of created marsh, 66 acres of marsh nourishment and 150 acres (6,500,000 ft<sup>2</sup>) of created terraces would be directly benefitted by construction of this project. Indirect benefits would occur over approximately 1700 acres of marsh and open water habitat.

2.) *How many acres of wetlands will be protected/created over the project life?*

Approximately 381 acres. At the end of twenty years, 246 acres of created marsh and 135 acres of emergent terraces will remain [emergent acres x (0.5%/yr loss rate x 20 yrs)].

3.) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life?*

It is anticipated that the loss rate of the adjacent interior marsh would be reduced by 25-49%.

4.) *Do any project features maintain or restore structural components of the coastal ecosystem such as barrier islands, natural or artificial levee ridges, beach and lake rims, cheniers, etc.?*

This project will help protect the integrity of the Lake Pontchartrain lake rim and shoreline from eroding from the north. Without dedicated delivery of sediment to this area, large expanses of former marsh adjacent to the lake shoreline will continue to erode and threaten the Lake's northern rim.

5.) *What is the net impact of the project on critical and non-critical infrastructure?*

It is expected that this project will have a net positive impact on non-critical infrastructure. Both the marsh creation and terrace field would help provide protection to U.S. Highways 90 and 190, key hurricane evacuation routes for New Orleans East and the areas surrounding the Fritchie Marsh Unit.

6.) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*

This project will function synergistically with the CWPPRA PO-06 Fritchie Marsh project that was completed in 2001. The PO-06 project restored hydrology to what was once a stable marsh system; however, the marshes that once benefitted from this project were decimated by Hurricane Katrina. The proposed project will re-establish the marsh, which will be sustained by improved hydrology constructed under PO-06.

Under St Tammany Parish's Wastewater Master Plan, the Parish is beginning preliminary engineering and design on a new Regional Treatment Plant to be located to the north west of the project area. The Parish has completed a Preliminary Feasibility Analysis and is currently conducting a Baseline Ecological Characterization to provide a preliminary characterization of the Fritchie Marsh's suitability for wastewater assimilation, an analysis of loading and assimilation capabilities of the wetland, landowner constraints, and other appropriate information. Introduction of secondarily treated wastewater and associated nutrients to the project area would provide a great source of freshwater and nutrients to the project area, and create synergy between the Parish's Coastal Restoration Vision and Wastewater Master Plan.

**Identification of Potential Issues:**

The Parish has already been in contact with the land owner for the marsh creation area, and has his full support for the project. There are a few pipelines in the area that will require project coordination with the pipeline owners. There are no known state-issued oyster leases in the project vicinity. The Project is the top CWPPRA priority for the Parish.

**Preliminary Construction Costs:**

Preliminary construction cost estimate is \$16,046,300. This includes construction, containment, mobilization, vegetative plantings, and a 25% contingency.

**Preparer of Fact Sheet:**

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19-1-PO-#1



**Fritchie Marsh-Northshore Marsh  
Creation and Terracing Project  
CWPPRA PPL19 Nominee  
(January 2009)**

**CDM**



-  Culvert \ Pilot Channel
-  Marsh Creation
-  Marsh Nourishment
-  Terracing

Project Area



0 3,400 6,800 10,200



## Fritchie Marsh Restoration

Terracing  
Marsh Creation  
Hydrologic Restoration

## Project Elements

- 1300 acre terrace field/plantings
- Hydrologic restoration of Salt Bayou
- 273 acres of marsh creation/plantings
- 60 acres of marsh nourishment
- Improved connection to Pearl River
- \$ 16 million total project cost

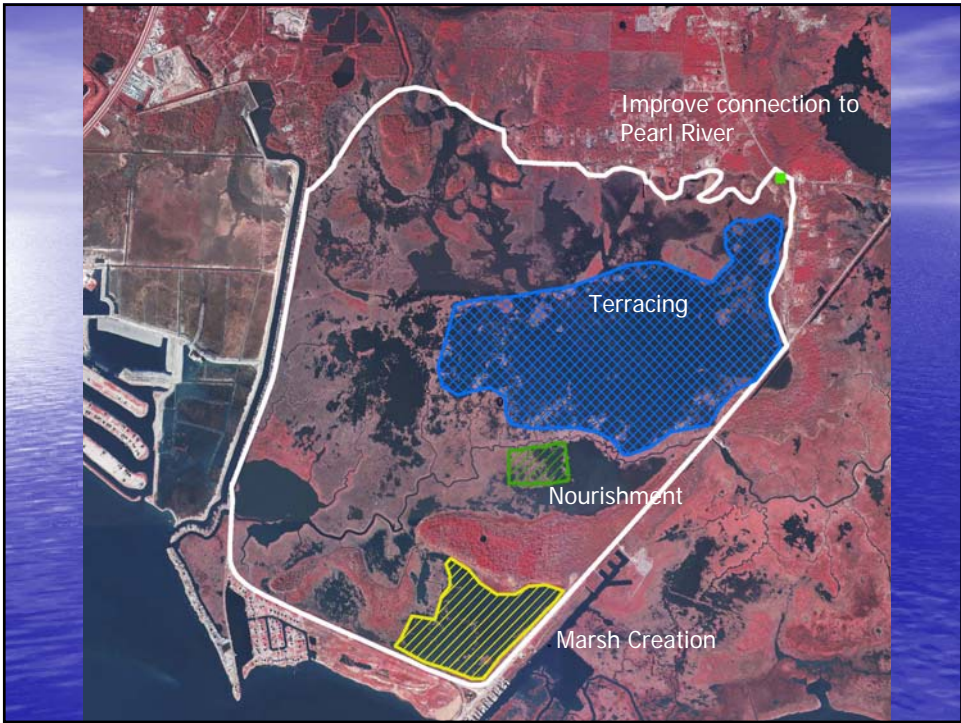


Fritchie Marsh 2004



Fritchie Marsh 2006





R1-PO-02-Seven Lagoons/ GIWW Marsh  
Creation, Shoreline Protection and Terracing

**PPL19 Nominee**  
**Seven Lagoons/GIWW Marsh Creation, Shoreline Protection and Terracing**  
**30 January 2009**

**Coast 2050 Strategy:**

Regional Ecosystem Strategies 11 (maintain shoreline integrity of Lake Borgne) and 15 (maintain East Orleans landbridge).

**Project Location:**

Region 1, Orleans Parish, shoreline of Lake Borgne between Unknown Pass and Rabbit Island.

**Problem:**

Shoreline erosion and interior marsh loss resulting in breaching of Lake Borgne into ponds in the Seven Lagoon area.

**Goals:**

The project goal is to maintain a continuous shoreline between the Gulf Intracoastal Waterway and Lake Borgne.

**Proposed Solutions:**

Dedicated dredging from Lake Borgne to create and restore about 175 acres of marsh along the shoreline of Lake Borgne, construction of about 17,000 feet of “soft” shoreline protection (i.e., earthen berm), and creation of about 15,000 feet of terraces to reduce pond margin erosion. Vegetative plantings will be used.

**Preliminary Project Benefits:**

The project will benefit about 200 acres of saline marsh.

**Identification of Potential Issues:**

The proposed project has the following potential issues: sediment source and shoreline protection design.

**Preliminary Construction Costs:**

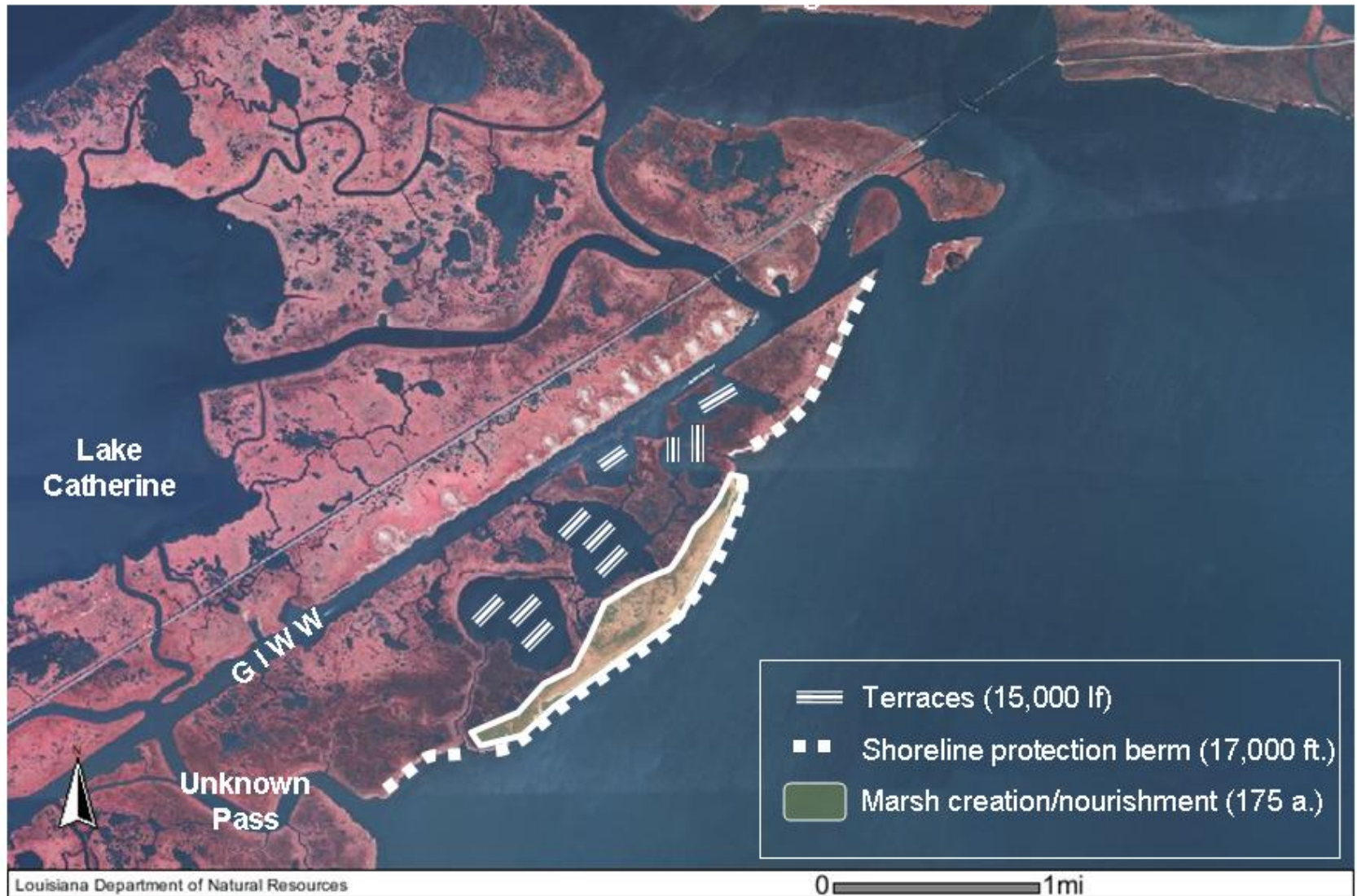
Construction costs are estimated at \$16,000,000 with 25% contingency.

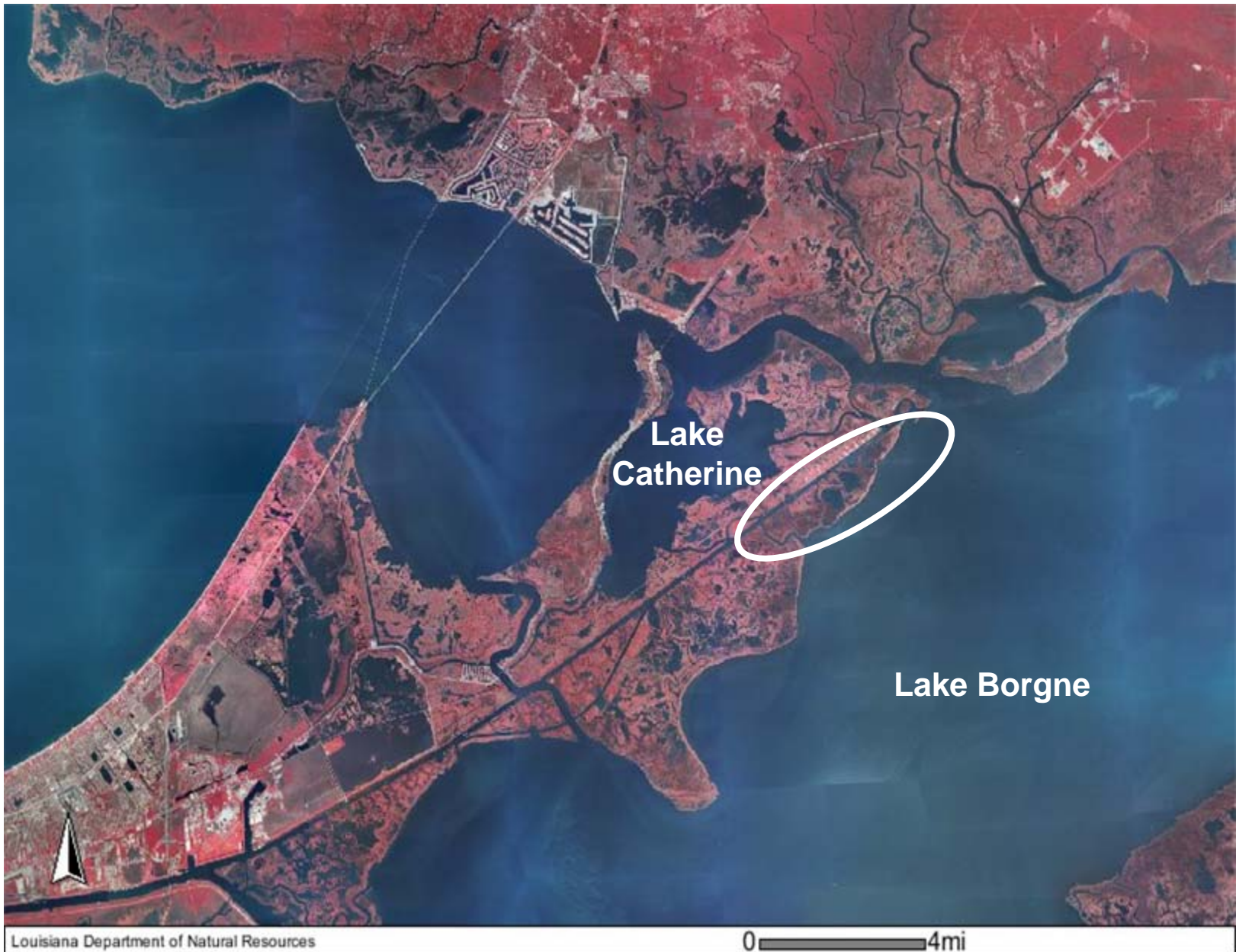
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## Seven Lagoons/GIWW Marsh Creation, Shoreline Protection and Terracing





Lake Catherine

Lake Borgne



1998

Louisiana Department of Natural Resources



2005

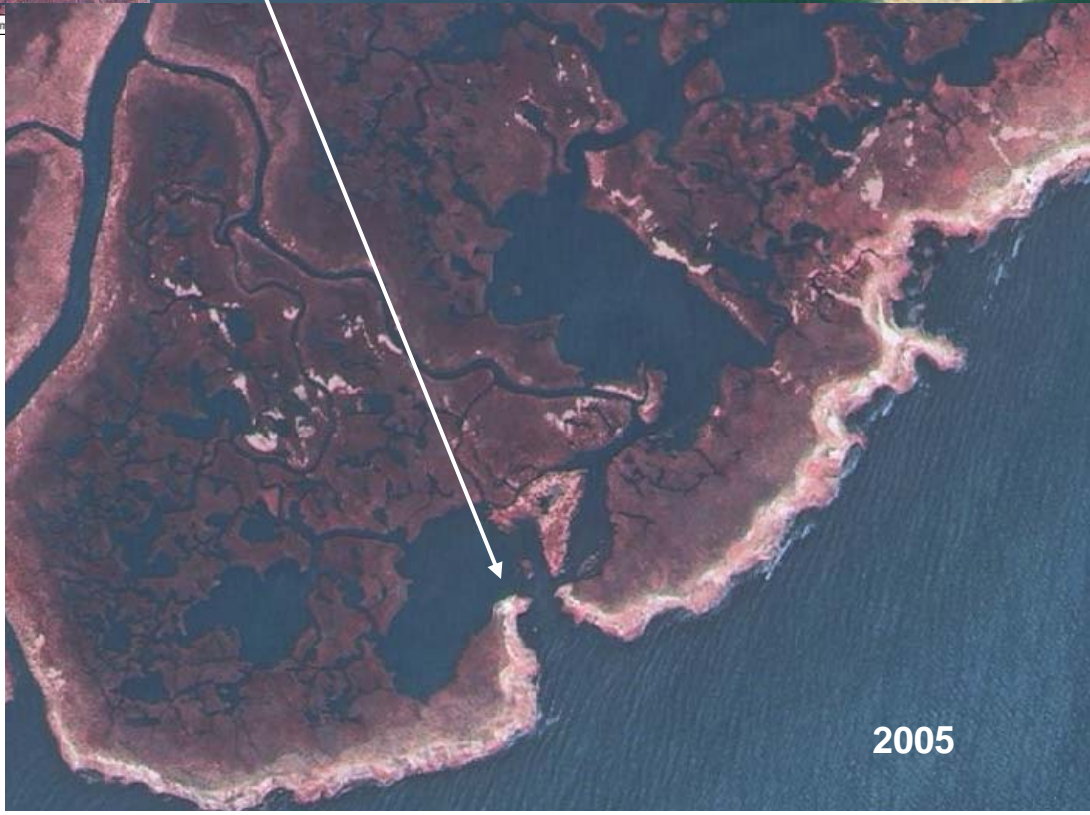
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1998

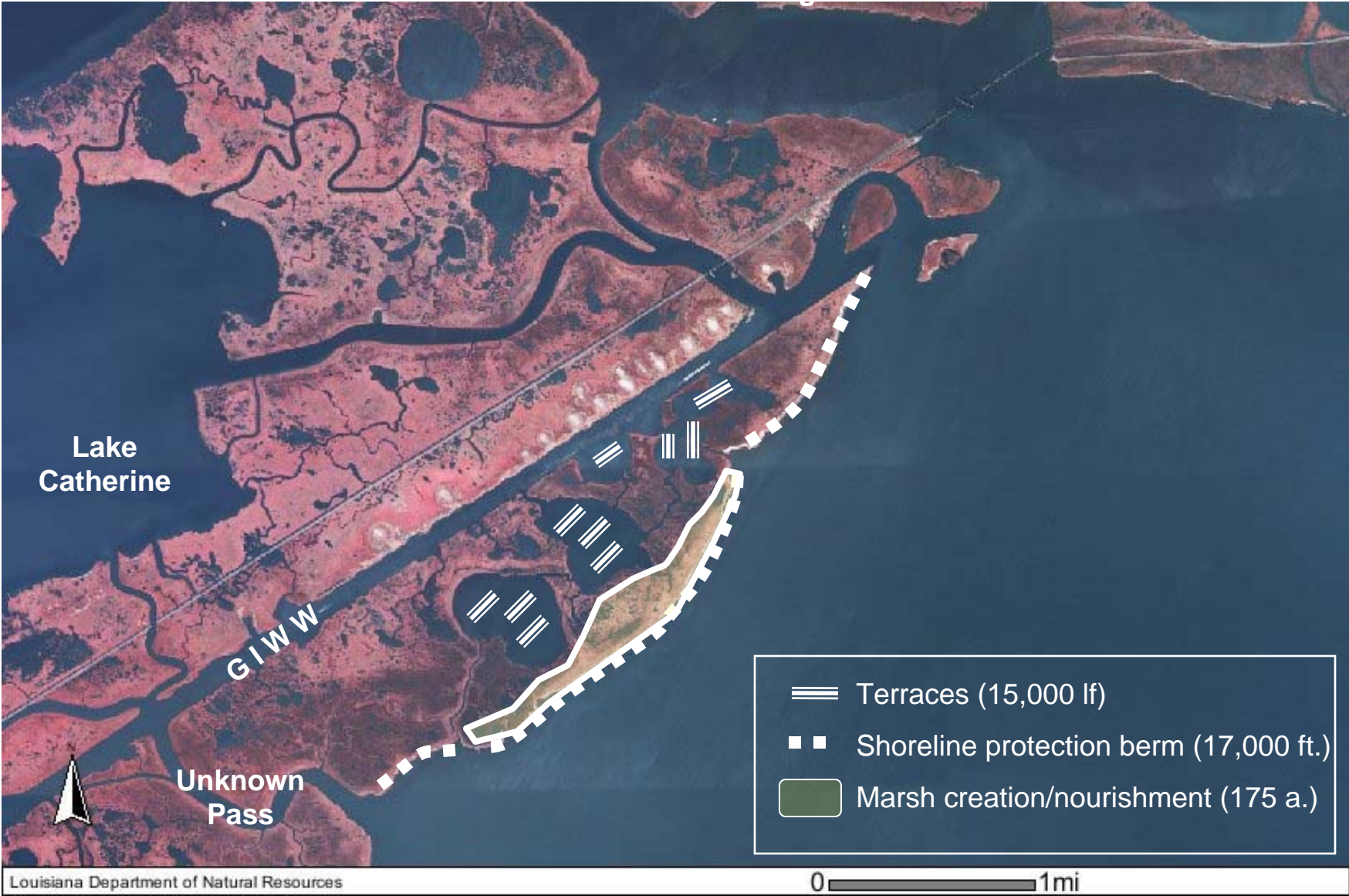
Louisiana Departm



2005



# Seven Lagoons/GIWW Marsh Creation, Shoreline Protection and Terracing



R1-PO-03-Bayou Bienvenue Restoration

**PPL 19**  
**Bayou Bienvenue Restoration**

**Coast 2050 Strategy:**

- Dedicated Dredging, to Create, Restore, or Protect Wetlands;
- Dedicated delivery of sediment for marsh building.

**Project Location:**

Region 1, Pontchartrain Basin, Orleans Parish, just east of the Industrial Canal. The Bayou Bienvenue project area is approximately 348 acres, of which 340 is open water. An 85 acre tract was removed from the proposed project as it will be restored through the mitigation for the IHNC Lock Replacement.

**Problem:**

Over the past years the wetlands in the area have been lost because of altered hydrology due to impoundment, subsidence, and saltwater intrusion. The majority of the area is very shallow open water littered with cypress logs and stumps.

**Goals:**

The goal of this project is to create wetlands and shallow water habitat in the triangular area adjacent to the headwaters of Bayou Bienvenue.

1. Restoration of 348 acres of wetlands and shallow water habitat via dedicated dredging from either the Mississippi River or Lake Borgne.
2. Restoring the historic bankline along Bayou Bienvenue.

**Proposed Solution:**

Dedicated dredging of sediments from the Mississippi River or Lake Borgne to create emergent marsh in the triangular area adjacent to the headwaters of Bayou Bienvenue. Shallow water habitats would be created along the existing openings to Bayou Bienvenue, to allow fishery access to the interior marsh.

Following the placement of dredged sediments, the site could be freshened through the beneficial use of disinfected, secondarily treated sewage effluent. If the site is also suitable, based on optimal water levels and salinities, the area could be planted with bald cypress and water tupelo. The two options, beneficial use of treated municipal effluent and bald cypress and water tupelo plantings are not included in the project proposal at this time.

**Project Benefits:**

The project would benefit 348 acres of emergent marsh and shallow water.

**Project Costs:**

The construction cost including 25% contingency is approximately \$18,000,000.

**Preparer of Fact Sheet**

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# Project Map



## Bayou Bienvenue Restoration



Dike \*

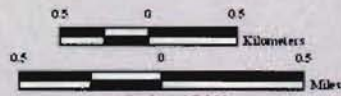


Project Boundary



Marsh Creation and Shallow Water Habitat

\* denotes proposed features



Map ID: USGS-NWRC 2009-11-0015  
Map Date: October 16, 2008



Produced by  
U.S. Department of the Interior  
U.S. Geological Survey  
National Wetlands Research Center  
Coastal Restoration Field Station  
Baton Rouge, LA  
Image Source  
2005 Digital Orthophoto Quarter Quadrangles

# Bayou Bienvenue Restoration

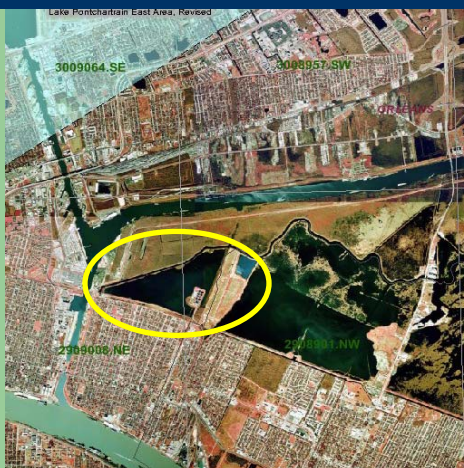
## Location



- Region 1
- Pontchartrain Basin
- Central Wetlands mapping unit
- East of the Industrial Canal

# Bayou Bienvenue Restoration

## History



- Over the past years the wetlands in the area have been lost because of altered hydrology:
- Impoundment
- Saltwater intrusion,
- Subsidence

## Bayou Bienvenue Restoration

History- Impoundment & Saltwater intrusion.



Freshwater and Salinity Inputs into the Central Wetlands

## Bayou Bienvenue Restoration

History- Subsidence



## Bayou Bienvenue Restoration

### Goals:



- Restoration of 315 acres of marsh swamp via dedicated dredging from either the Mississippi River or Lake Borgne.
- Restoring the historic bankline along Bayou Bienvenue.
- Creating shallow water habitat along the existing openings to Bayou Bienvenue.

## Bayou Bienvenue Restoration

### CWPPRA Coast 2050 Strategies:



- Dedicated Dredging, to Create, Restore, or Protect Wetlands;
- Dedicated delivery of sediment for marsh building.

## Bayou Bienvenue Restoration

### Proposed Solution:



- Dedicated dredging of sediments from Lake Borgne
- Area would be planted with bald cypress and water tupelo ( 1 year later)
- Area would be freshened through beneficial use of disinfected, secondarily treated sewage effluent
- Area monitored to optimize the correct water levels and salinities for bald cypress and water tupelo growth and regeneration.

## Bayou Bienvenue Restoration

### Project Benefits and Cost:



- Dedicated dredging of sediments from the Mississippi River or Lake Borgne to create emergent marsh
- A total of 348 net acres of emergent marsh and shallow water.
- Total construction cost including 25% contingency is approximately \$18,000,000



R1-PO-04-North Shore Marsh Restoration  
Project

PPL19 PROJECT NOMINEE FACT SHEET

January 29, 2009

19-1-PO-#4

**North Shore Marsh Restoration Project**

**Coast 2050 Strategy, Region 1**

- Coastwide – Dedicated Dredging to Create, Restore, or Protect Wetlands; Maintenance of Gulf, Bay and Lake Shoreline.
- Regional – (#9) Dedicated Delivery of Sediment for Marsh Building; (#10) Maintain Shoreline Integrity of Lake Pontchartrain to Protect Regional Ecosystem Values.
- Mapping Unit – (#27) Maintain Shoreline Integrity.

**Project Location**

Region 1, St. Tammany Parish, Lake Pontchartrain Basin, along the north shore of Lake Pontchartrain, within Big Branch Marsh National Wildlife Refuge and Fountainebleau State Park.

**Problem**

Interior ponding and, to a lesser extent shoreline erosion, are the major causes of wetland loss in the project area. From 1974 to 1990 marsh loss rates averaged approximately 35 acres/year. Those high loss rates are associated with hydrologic alterations which allowed saltwater to penetrate the fresher marshes. In addition, the passage of Hurricane Katrina also contributed to the loss of as much as 3.6 square miles of wetlands within the project area. During the transition to a more brackish plant community coupled with the storm events of 2005, large ponds have formed. A narrow strip of land separates those ponds from Lake Pontchartrain. Although the shoreline erosion rates are relatively low, the shoreline is already breached in several areas, and marsh loss in the interior ponds is expected to increase as the shoreline is breached.

**Proposed Project Features**

Sediment would be hydraulically dredged from Lake Pontchartrain and placed in designated areas within the ponds to create approximately 450 acres of emergent marsh and nourish approximately 300 acres of marsh. In all the ponds, marsh would be created to widen the shoreline so that the ponds would not be breached during the course of normal shoreline retreat. Sediment would be pumped within open water areas and allowed to over flow existing marsh. Containment dikes would be constructed along the backside of the open water areas to direct the sediment into existing marsh and to ensure marsh elevations are achieved. Initial elevations would depend on conditions of the dredged material, but would be pumped to approximately 2.5 ft above marsh level to achieve final target elevation of +0.5 ft above marsh elevation.

**Goals**

The primary goal is to re-create marsh habitat in the open water areas immediately behind the shoreline within Big Branch Marsh NWR. This will maintain the lake-rim function along this section of the north shore of Lake Pontchartrain.

**Identification of Potential Issues**

The borrow areas in Lake Pontchartrain are located within Gulf sturgeon critical habitat.

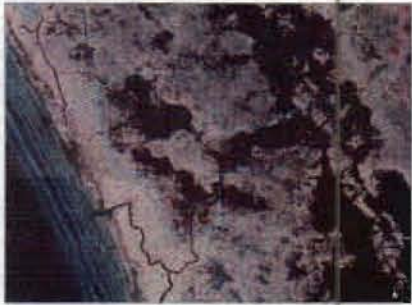
**Preliminary Construction Costs**

Preliminary construction costs are estimated at \$16 million which based on construction costs of the Goose Point/Point Platte Marsh Creation project (PO-33).

**Preparer of Fact Sheet**

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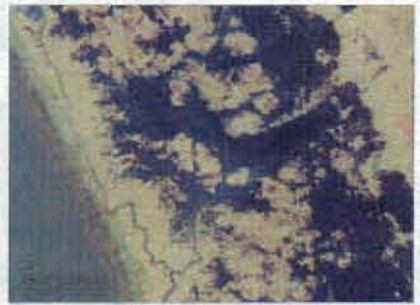
L-Pond (Big Branch Marsh NWR)



2004



2005



2007

North Pond (Big Branch Marsh NWR)



2004



2005

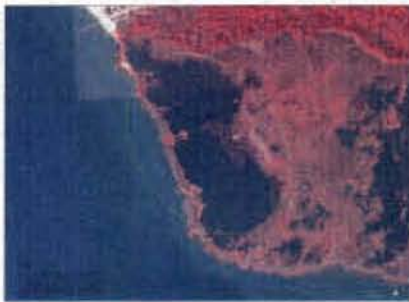


2007

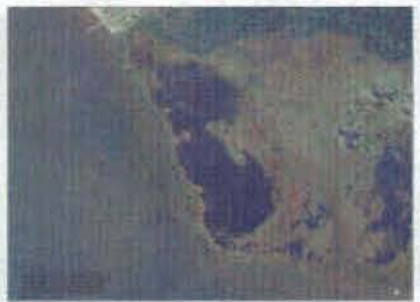
Fontainebleau State Park



2004



2005



2007



R1-PO-05-Bayou Bonfouca Marsh Creation

**PPL19 PROJECT NOMINEE FACT SHEET**  
**January 29, 2009**

**Project Name:**

Bayou Bonfouca Marsh Creation Project

**Coast 2050 Strategy:**

Coastwide- Dedicated Dredging to create, restore, or protect wetlands; Maintenance of Gulf, Bay and Lake Shoreline.

Regional- #9 Dedicated delivery of sediment for marsh building; #10 Maintain shoreline integrity of Lake Pontchartrain to protect regional ecosystem values.

Mapping Unit- #27 Maintain Shoreline Integrity.

**Project Location:**

Region 1, St. Tammany Parish, Lake Pontchartrain Basin, along the north shore of Lake Pontchartrain, parts of the project located within Big Branch National Wildlife Refuge adjacent to Bayou Bonfouca.

**Problem:**

The marsh in this area was fairly stable prior to Hurricane Katrina in August 2005. There was extensive damage to the emergent marsh along the north shore of Lake Pontchartrain and especially localized in the marshes near Bayou Bonfouca when the storm surge removed many acres of marsh. Marsh loss rates should increase in the marsh surrounding these newly created open water areas due to an increase in wind driven fetch. Shoreline erosion rates in this area seem to be very low, currently there is one fairly large breach and several areas that breaches are imminent. These breaches provide direct connection between the fresher interior marshes and higher saline waters of Lake Pontchartrain. This was a recent event and we should fix any breaches in the bankline before they grow to become a major exchange point causing interior loss rates to further increase.

**Goals :**

Primary goals of the project are to create and/or nourish 458 acres of low salinity brackish marsh in open water areas adjacent to Bayou Bonfouca that were damaged by Hurricane Katrina and repair any breaches along the lake rim.

**Proposed Solutions:**

This project would consist of placing sediment hydraulically dredged from Lake Pontchartrain and placed in open water sites to a height of +1.5 to +2.0 NAVD 88 to create approximately 416 acres of emergent marsh and nourish an additional 42 acres. Each site would have some containment dikes that would be sufficiently gaped or degraded to allow for fisheries access no later than three years post construction. Marsh adjacent to the marsh rim would be sufficient so as to not allow any breaches during the project life.

**Preliminary Project Benefits:**

1) *What is the total acreage benefited both directly and indirectly?* Direct benefits would be the 416 acres created and 42 acres nourished.

2) *How many acres of wetlands will be protected/created over the project life?*

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (<25%, 25-49%, 50-74% and >75%)?* Interior loss rates would be reduced by 50 to 74%.

4) *Do any project features maintain or restore structural components of the coastal ecosystem such as barrier islands, natural or artificial levee ridges, beach and lake rims, cheniers, etc?* This project would help maintain portions of the north shore of Lake Pontchartrain.

5) *What is the net impact of the project on critical and non-critical infrastructure?* This project would have no impact on critical or non-critical infrastructure.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?* This project would work synergistically with the newly constructed Goose Point (PO-33) to continue maintaining the Lake Pontchartrain shoreline.

**Identification of Potential Issues:**

The borrow sites in Lake Pontchartrain are located within Gulf sturgeon critical habitat.

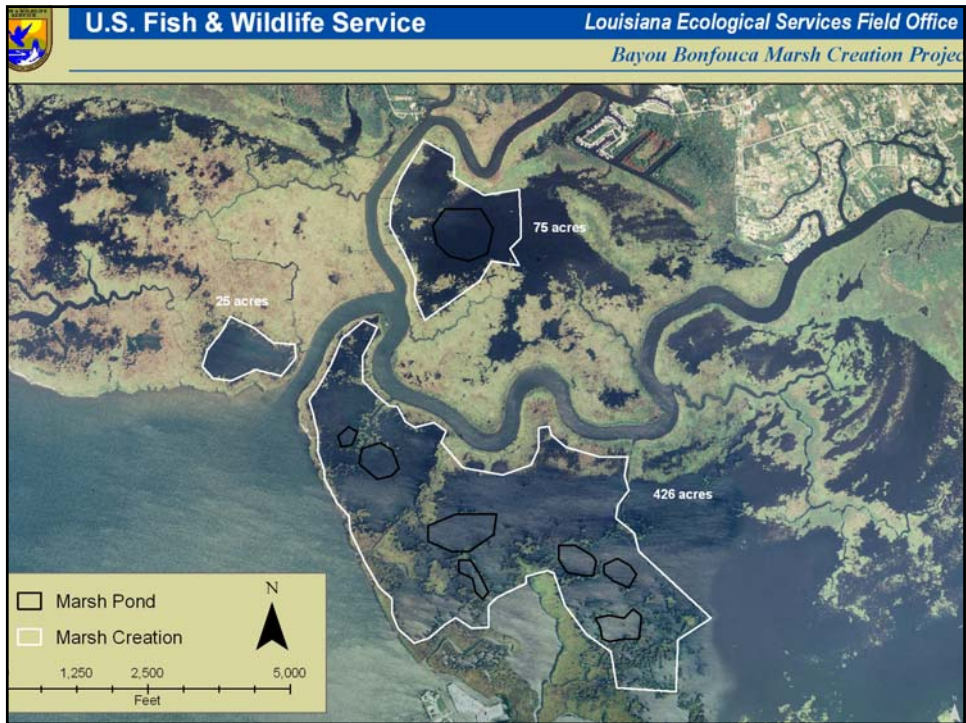
**Preliminary Construction Costs:**

Lump sum construction costs are estimated at \$14.1, \$17.7 with the 25% contingency added.

\*Goose Point /Point Platte Marsh Creation Project (PO-33) constructed in 2008 cost less than \$21 million and created 436 acres of marsh.

**Preparer(s) of Fact Sheet:**

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R1-PO-06-Eloi Bay Oyster Reefs

# **ELOI BAY OYSTER REEFS**

## **PPL-19 Candidate Project**

### **Project Name**

Eloi Bay Oyster Reefs

### **Coast 2050 Strategy**

Coastwide Common Strategies

- Maintenance of Bay and Shoreline Integrity

Region 1 Regional Ecosystem Strategies

- Protect Bay and Lake Shorelines

Region 1 Mapping Unit Strategies

- Shoreline Protection

### **Project Location**

Region 1, Pontchartrain Basin, St. Bernard Parish: The project area is a highly productive estuarine area lying between Bayou La Loutre and the MRGO and connected with Breton Sound through Eloi Bay. The area includes Lakes Eloi and Athanasio.

### **Problem**

Historically, loss of saline marsh in the area resulted from edge erosion along muddy shorelines and opening of interior marsh ponds. Accelerated erosion has resulted from recent hurricanes. Peninsulas and islands that separate the estuarine area from the open waters of Breton Sound are eroding from all sides and becoming segmented. If this continues, the shore of Breton Sound will move inland about 4 miles. This in turn will cause massive loss of marsh, increase in salinity and tidal energy, and greater exposure to storm surge and waves. The marsh islands and peninsulas at the seaward end of the area are essential valves for controlling the hydrology and water chemistry of the system and for preventing loss of marsh and other components of the estuarine system.

### **Proposed Project Features**

The proposed solution to enlargement of Breton Sound consists of construction of vertical oyster reefs, using bio-engineered Reefblk<sub>sm</sub> technology. Induced oyster reefs will be strategically located to provide optimal protection as breakwaters and marine ecosystems. There are 35.4 miles of shoreline in the lower Eloi Bay estuary (Area A). The proposed project would deploy 15 miles of Reefblk<sub>sm</sub> units in critical areas. A combination of two sizes and configurations of the units would be used as follows:

7 miles of 3 ft x 5 ft units arranged in Layout 1, and

8 miles of 3 ft x 10 ft units arranged in Layout 2.

The larger 3 ft x 10 ft units would be used in higher wave energy areas.

Each reef segment will consist of two interlocked rows of individual reef units. Each reef unit is comprised of a bent rebar frame, made of three panels (each approximately 3 ft high and 5 ft long), that are triangular in shape with a hollow center. Once the frames are at the project area, oyster shells, obtained from local fishermen or shucking houses, are loaded into

plastic-mesh bags that are secured to three sides of the frame. The individual units are fastened together to form the genesis of a reef with the length and configuration of the reef adjusted to site conditions. The geometry of the reef unit provides high strength and large reef-face surface area with a stable base. The units can be emplaced in a myriad of alignments and configurations, based on specific site conditions.

### **Goals**

The primary goal is to provide long-term protection and stability to the existing marsh and the marsh and pond habitat leeward of the bioengineered reefs.

Emergent oyster reefs, indigenous and common to coastal Louisiana, were mined through the last few centuries, resulting in the demise of sustainable reefs and an increase in the susceptibility of marshes to shoreline erosion. This missing landscape feature has long been recognized for its importance in the state's fight against the loss of coastal resources. Riprap has become the accepted alternative to the historic oyster reefs, but it requires the dredging of flotation/access channels and requires additional lifts because of the heavy weight of the rock. These factors, combined with availability and costs for the product, make riprap extremely expensive. The emplacement of Reefblks<sub>sm</sub> in settings with favorable salinity conditions represents an alternative to riprap. Furthermore, bio-engineered reefs grow upward as the reef sinks, are self-sustaining, enlarge in width and thickness, provide habitat for estuarine organisms, and can provide shore protection and wave dampening functions for hundreds of years.

Three previously implemented Reefblk<sub>sm</sub> projects with ongoing successful results demonstrate the viability of the system. These projects are located in Bay Rambo (Lafourche Parish), Terrebonne Bay (Terrebonne Bay Shoreline Protection TE-45, Terrebonne Parish), and Mad Island – GIWW, (The Nature Conservancy property, Texas).

Because water containing microscopic food that the oyster feed upon flows through the vertical reefs, the oysters grow faster than bottom reefs and therefore produce shell at a high rate. Under favorable growth conditions, a single reef unit loaded with only 300 pounds of cultch will produce about one ton of new shell in 18 months. After that, the production rate is exponential, as each oyster shell valve is potentially available for new spat set. The growing oysters in the reef units become cemented together to form a solid shell mass. Shell dislodged from the units during storms form oyster clusters between the reef and the shore and shell gradually washes up along the shore to form a beach.

### **Preliminary Project Benefits**

Benefits of the project would be as follows:

- Prevent loss of approximately 5100 acres of saline marsh in the lower end (Area A) of the Eloi Bay estuary,

- Prevent loss or deterioration of 5000 acres of saline marsh in the upper end (Area B) of the Eloi Bay estuary,

Prevent salinity and tidal energy increase in 4800 acres of water bodies in Area B of the estuary,

Provide 15 miles of new reefs that would release larvae in the Eloi Bay estuary and adjacent waters of Breton Sound.

Provide more favorable biotic conditions for approximately 1100 acres of shallow sub-tidal water bodies located between the reefs and the shore, and

Enhance oyster bottom conditions in approximately 1000 acres of shallow water bodies on the open water sides of the reefs.

The bio-engineered oyster reefs would attract fish populations and also provide secondary increases in production by providing forage for those fish populations. Predation of oysters on the reefs would create crushed oyster shell and sediments at the base of the reef blocks that would serve as armor for marsh shorelines behind the reefs as well as future cultch.

#### **Identification of Potential Issues**

Coordinate with landowners. Provide access for exploration and development of oil and gas resources.

Coordination with private oyster lease holders and the Louisiana Department of Wildlife and Fisheries would be required. Implementation of a similar reef project in Bay Rambo in Lafourche Parish was facilitated by the adjacent oyster lease holders. The oystermen not only supported the project because of the increased spat production, but provided oyster shells for the reef units and assisted with logistical support during construction.

Identify and avoid damage to pipelines in the project footprint areas.

Concern for initial manufactured structures being a hazard to navigation would be prevented by marking structures in accordance with U. S. Coast Guard regulations.

#### **Preliminary Construction Costs**

The total fully funded cost for this project is \$ 20,064,000 exclusive of monitoring. The basic cost breakdown is as follows:

7 mi of 3ft x 5ft units -	\$ 7,392,000
8 mi of 3 ft x 10 ft units -	\$12,672,000

#### **Nominated by:**

St. Bernard Parish Government

#### **Preparers of Fact Sheet:**

Coastal Environments, Inc.,

Mark Gagliano 225-383-7455x 111, [mgagliano@coastalenv.com](mailto:mgagliano@coastalenv.com)

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Sherwood Gagliano, 225-892-3252, [sgagliano@coastalenv.com](mailto:sgagliano@coastalenv.com)



## ELOI BAY OYSTER REEFS PPL-19 Candidate Project

**Presented to:**  
The CWPPRA Technical  
Committee  
New Orleans District,  
Corps of Engineers  
New Orleans, La  
January 29, 2009

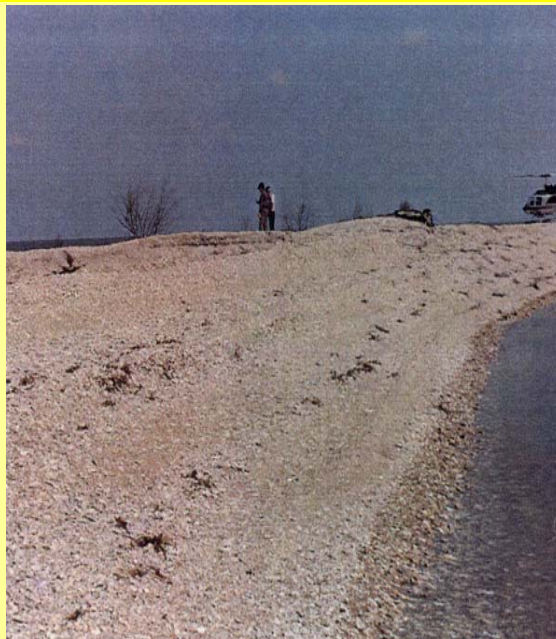
**Proposed by:**  
The St. Bernard Parish Government

**Presented by:**  
Coastal Environments Inc.



## NATURAL OYSTER REEFS

- Provide fish & wildlife habitat
- Build shell islands & beaches
- Buffer storm surge
- Reduce edge erosion
- Enhance commercial & recreational fishing



## INDUCED OYSTER REEFS

Bio-engineered containers for oyster cultch can be used to initiate fast growing vertical oyster reefs in selected locations and along preferred alignments.



## NATURE CONSERVANCY MAD ISLAND PRESERVE OYSTER REEF PROJECT

Along the eroding bank  
of the Gulf Intracoastal  
Waterway

Near  
College Point, Texas.  
2005 – 2006

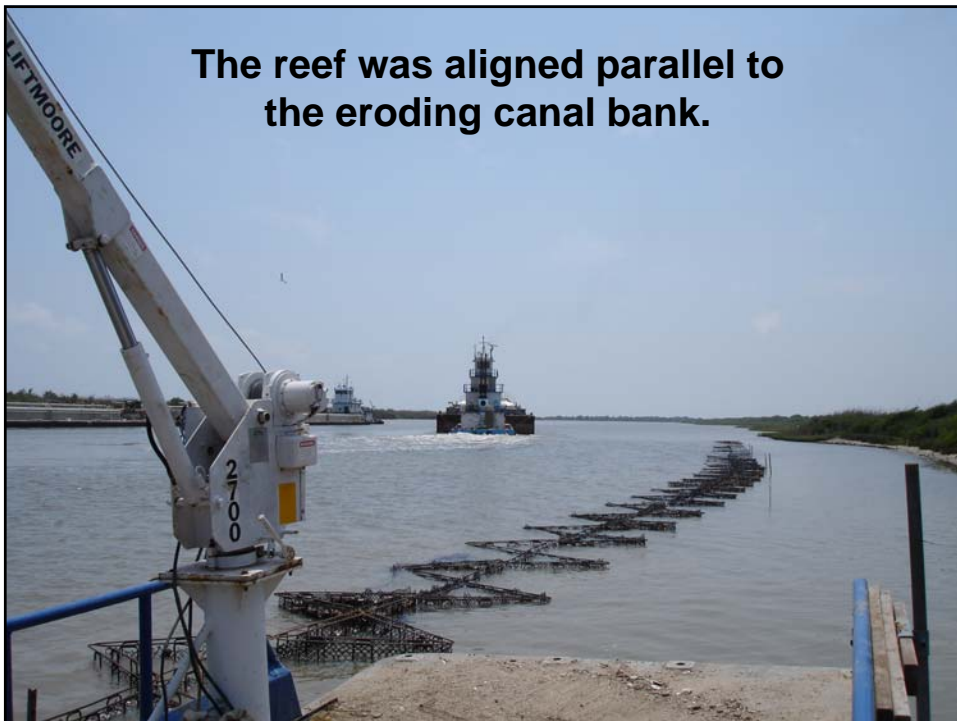
1800 ft of bank  
stabilization



**Reef units were deployed from a shallow draft, self-propelled barge.**



**The reef was aligned parallel to the eroding canal bank.**







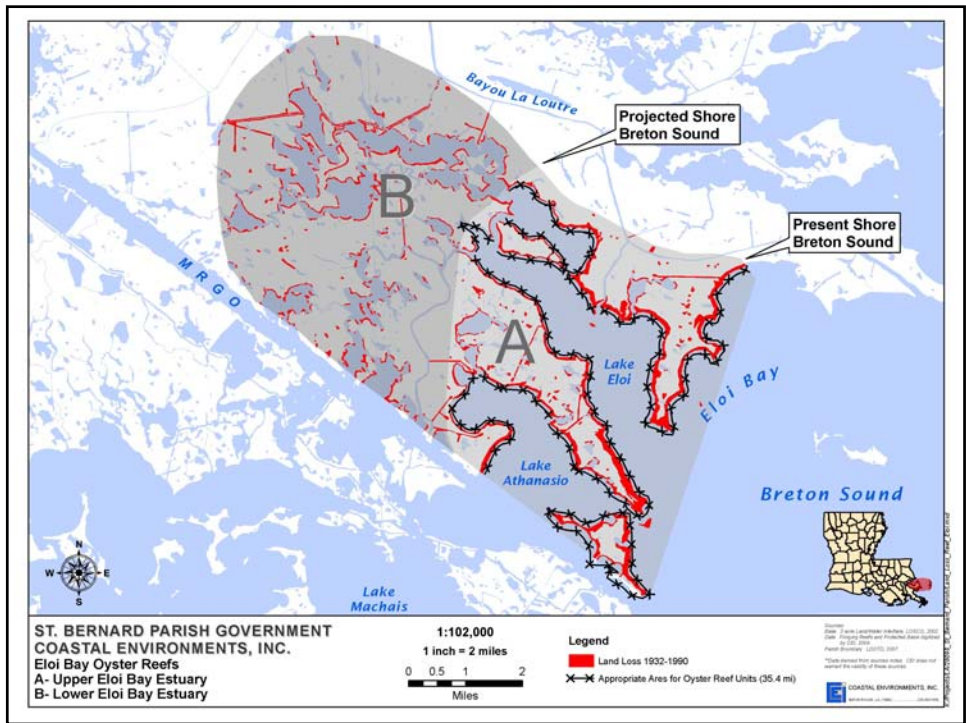
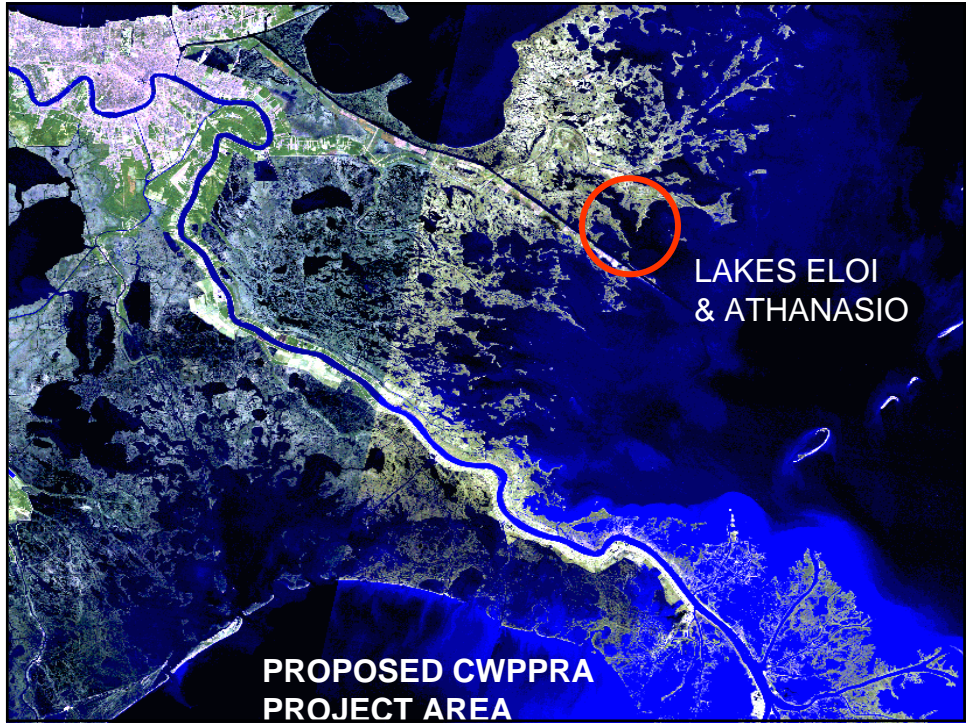


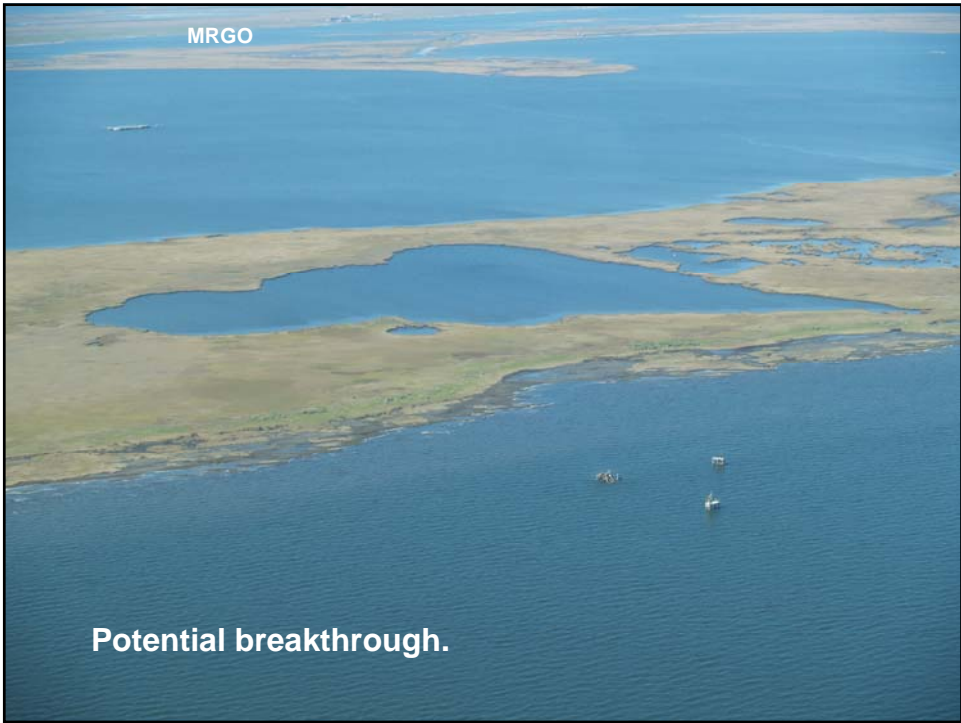
**Prior to reef installation there was severe erosion along the bank of the Gulf Intracoastal Waterway.**

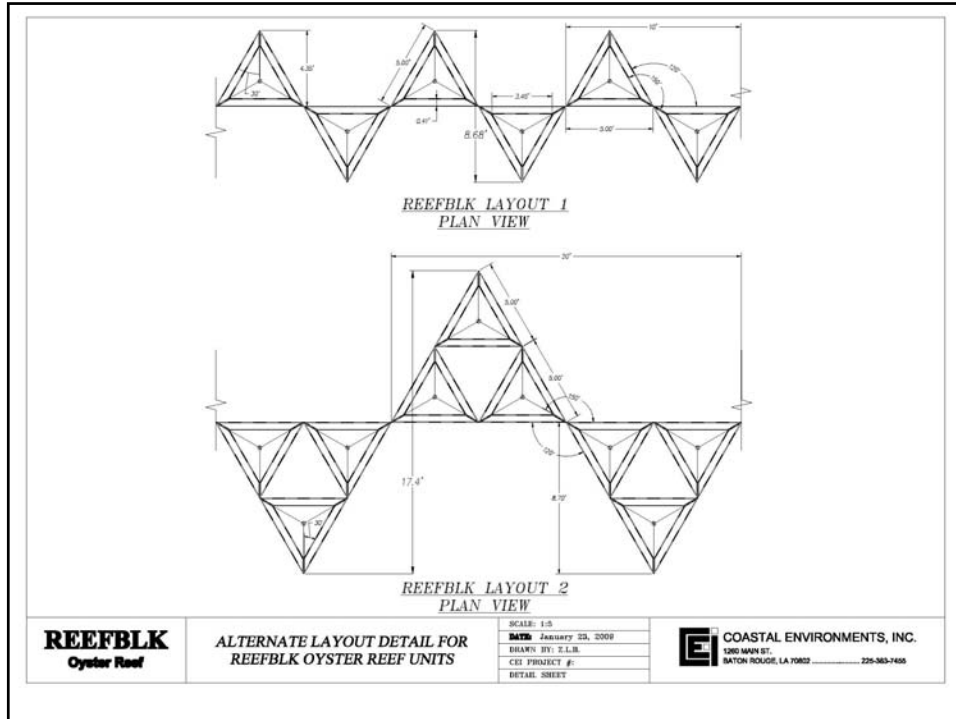
**Within one year after installation erosion was arrested and sediment had accumulated between the reef and the bank.**



**Bank erosion was stopped and the eroded area restored with trapped sediment. Smooth cord grass planted in spring of 2007.**





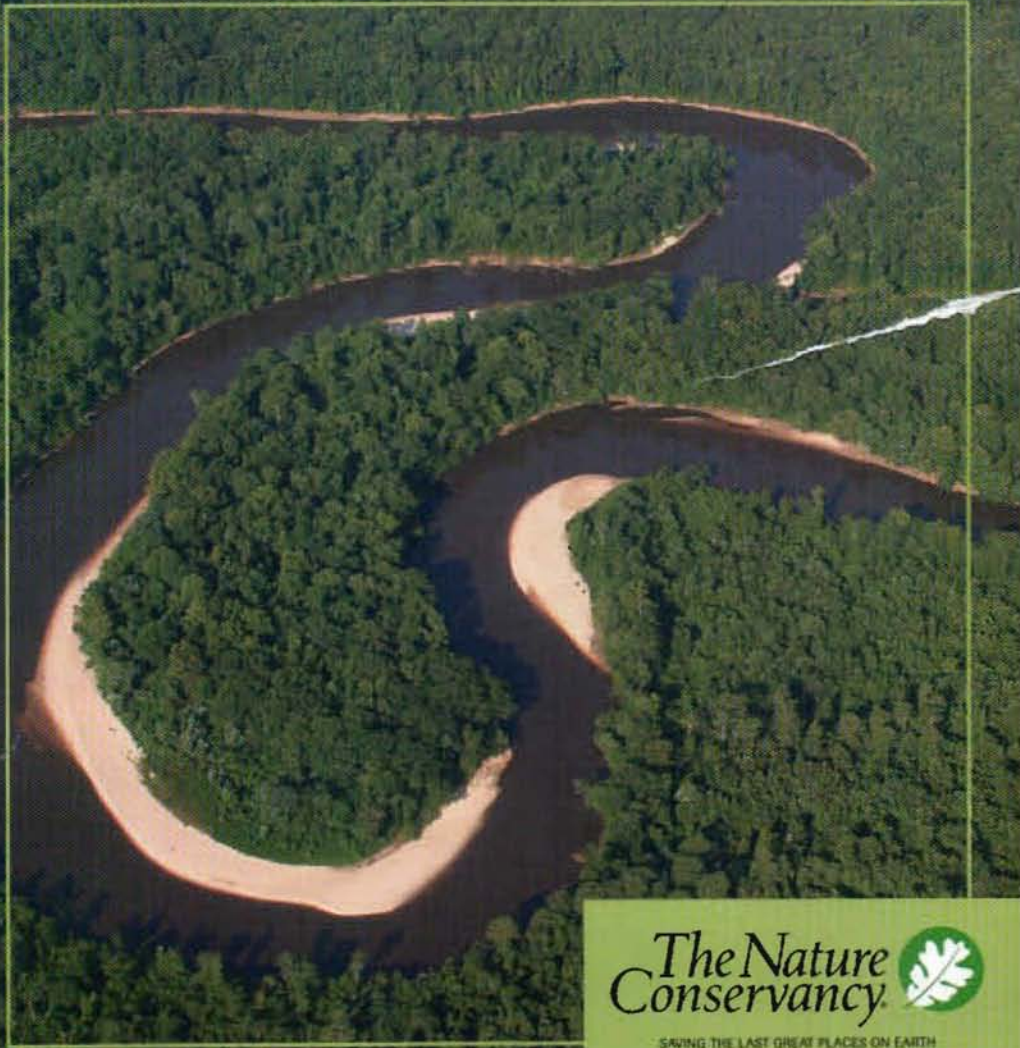


R1-PO-07-Big Branch Cypress Plantings



19-1-PO-#8

THE *Pearl*  
RIVER



The Nature  
Conservancy 

SAVING THE LAST GREAT PLACES ON EARTH

# Special Habitats

## IN THE BASIN

With its slow meandering rivers and creeks, expansive bottomland hardwood forests, healthy marsh complex (from freshwater to brackish), slope forests and dense cypress-tupelo swamps, the Pearl River watershed consists of many diverse habitats. At least twelve natural communities of conservation importance occur within the Pearl River Basin.

Backwater habitats such as oxbows, sloughs and side channels connected to the main river channel in high water provide additional habitat for aquatic wildlife. Deepwater swamps, characterized in the Pearl Basin by bald cypress and water tupelo, can develop in oxbows and permanently flooded sloughs. These non-flowing waters provide protected habitat for juvenile fish, and plankton for fish species such as the cypress minnow (*Hybognathus hayi*), iron color shiner (*Cyprinella whipplei*), flagfin shiner (*Pteronotropis signipinnis*), and blue-nose shiner (*Pteronotropis welaka*).



TUPELO IN HONEY ISLAND SWAMP

# Stresses TO THE Pearl River

Some of the primary stresses to the Pearl River system include:

- excess sedimentation
- altered hydrology
- substrate destabilization
- toxic substances and contaminants
- altered stream structure
- barriers to fish movement and dispersal
- habitat disturbance and fragmentation
- changes in water levels and flows
- invasive species

The Pearl River watershed took a direct hit from Hurricane Katrina in August 2005. Although the hurricane caused significant damage to



© CC LICHTWOOD



© JOHN JAMES CLARK

CYPRESS IN BENNETT'S SLOUGH

## BALANCING THE Economy AND THE

Our land use practices impact the water quality of the Pearl River. Some strategies that The Nature Conservancy and partners use to abate threats and promote a healthier river system include:

- Collaborating with landowners, the aggregate and forestry industries, and residential and commercial developers to encourage the use of Best Management Practices that reduce water quality degradation.





*Although the Pearl River Basin still supports a great diversity of wildlife and plants, there are many stresses that threaten the biological integrity of the Pearl.*

© AMY SMITH KYLE



© LATIMORE SMITH

the bottomland hardwood forests and emergent marsh systems, these systems should recover with time and careful management.

## Environment IN THE BASIN

- Conducting a watershed monitoring project that includes a geomorphic and sediment assessment to better understand the current health of the river.
- Organizing a symposium of experts and stakeholders to share information about the Pearl River watershed and facilitate an appreciation for its ecological significance.

## BEST MANAGEMENT PRACTICES

(provided by the Louisiana Department of Environmental Quality and the Mississippi Department of Environmental Quality)

### **Sand and Gravel Mining:**

Prevent sediment from leaving mining sites through use of berms, terraces, filter strips, sediment basins, etc. When mining activities are completed, restore the site by grading and revegetating.

### **Development:**

Install and maintain vegetative buffers or protect existing riparian buffers along water bodies to slow and filter storm water runoff. Follow state and local regulations regarding erosion and sediment control for construction sites.

### **Forestry:**

Plan harvesting to minimize soil compaction, rutting, erosion, and sedimentation. Carefully plan all permanent roads to minimize stream crossings and avoid sensitive areas. As soon as possible after harvest, replant harvested areas with minimal land preparation that favors a native balance of species. Protect and maintain streamside management zones.

### **Agriculture:**

Disturb the soil as little as possible during cultivation. Add as few amendments as possible to achieve a successful crop. Plant and maintain filter strips around all drainage ways. Fence livestock out of streams.

### **Septic Systems:**

Ensure system is pumped out and checked every 3 - 5 years.

**PEARL RIVER BASIN**



© H. SCHLAUCH



**LOWER PEARL RIVER AREA**



# PEARL RIVER

# Wildlife

© STEVE HAASE

RUBY-THROATED HUMMINGBIRD



© WALTER CLIFTON



© WALTER CLIFTON

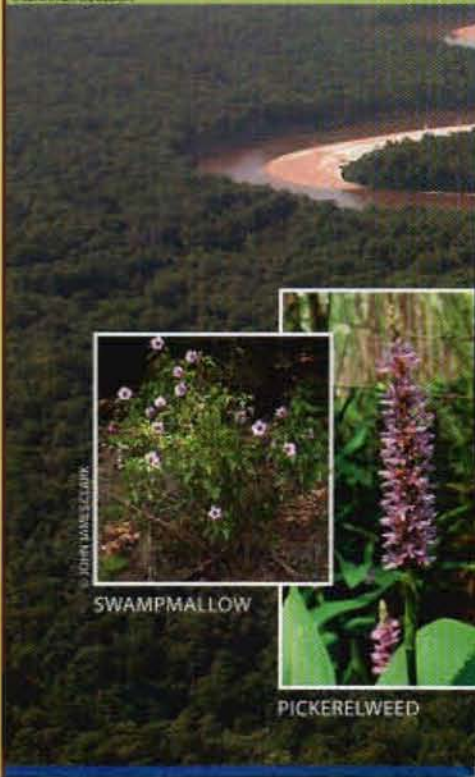
BARRED OWL



© WALTER CLIFTON

YELLOW-CROWNED NIGHT HERON

© JENNIFER COULSON



SWAMP MALLOW



PICKERELWEED





© MANKY WEBB

LOUISIANA BLACK BEAR

BLACK SWALLOWTAIL BUTTERFLY



© MANKY WEBB

WOOD THRUSH



© WALTER CLIFTON



© WWW.AMANA.BIRDS.COM

BLACK-CROWNED NIGHT HERON



© WALTER CLIFTON

NORTHERN PARULA

© WALTER CLIFTON

Named for the pearls found at the mouth of the river by French explorers in the late 1600s, the Pearl River is **one of the most intact river systems in the southeast U.S.**

Long cherished by local residents for its scenic quality, the Pearl River is a **significant source of water** for the public and **provides abundant recreational opportunities**. Many enjoy boating, fishing, bird watching and hunting in the Pearl River Basin.

The Pearl River Basin's large blocks of contiguous bottomland hardwood forest provide **critical stopover habitat for many Neotropical migratory birds** that make the long journey across the Gulf of Mexico.



GREAT

AM



## RINGED MAP TURTLE

# TURTLES

Primary aquatic turtle species of conservation concern found in the Pearl River watershed include the Ringed (Sawback) Map Turtle (*Graptemys oculifera*), Alligator Snapping Turtle (*Macrochelys temminckii*), Pascagoula Map Turtle (*Graptemys gibbonsi*) and the Mississippi Diamondback Terrapin (*Malaclemys terrapin pileata*). The Ringed Map Turtle, designated as a threatened species in 1986, is only found in the Pearl River Basin.



© WACKERLEUTZ/FOCA

WHY IS  
Pearl  
River  
Basin  
IMPORTANT

THE RINGED  
MAP TURTLE  
IS FOUND  
NOWHERE  
IN THE  
WORLD  
EXCEPT  
THE PEARL  
RIVER BASIN.

THE  
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## FISH



The Pearl River supports over 130 fish species, making it one of the most species-rich river systems in North America. With ancestry dating to prehistoric times, the federally threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) can grow longer than nine feet and weigh more than 300 pounds. Like Salmon in the northwest, these migratory fishes make a spring journey from salty marine waters in the Gulf to freshwater spawning areas like the Pearl River.



### GULF STURGEON

The Louisiana Department of Wildlife and Fisheries and the Mississippi Department of Wildlife, Fisheries and Parks are studying Gulf sturgeon populations in the Pearl River.

## MUSSELS

There are approximately 40 species of freshwater mussels found in the Pearl River, including the threatened inflated heelsplitter (*Potamilus inflatus*). While mussels can be found singly on a stream or river bottom, they often live closely together in communities or beds. A single bed may contain many species of

The Basin is **important nesting habitat for migratory birds** such as the Swallow-tailed Kite (*Elanoides forficatus*). Twenty-seven nesting pairs were observed in the lower Pearl River area in 2005.



SWALLOW-TAILED KITE

Swallow-tailed Kites, a species of conservation concern, are often seen soaring and

feeding over the river. The Pearl River Basin has one of only nine sub-populations of Swallow-tailed Kites in the southeastern U.S.

The lower Pearl River's healthy marsh complex **helps maintain a viable fisheries industry in Louisiana and Mississippi.**

Like tropical rain forests, wetlands are some of the most productive ecosystems in the world. The Pearl River **wetlands serve valuable functions**, such as absorbing excess nutrients, recharging aquifers, improving water quality and acting like natural sponges by storing stormwater to help reduce flooding.

The Pearl River Basin is **home to a large diversity of wildlife** including at least seven federally listed species that are protected under the Endangered Species Act: the Ringed Map Turtle (*Graptemys oculifera*) which is only found in this area, Gulf sturgeon (*Acipenser oxyrinchus desotoi*), inflated heelsplitter mussel (*Potamilus inflatus*), Bald Eagle (*Haliaeetus leucocephalus*), Dusky Gopher Frog (*Rana capito sevosa*), Gopher Tortoise (*Gopherus polyphemus*), and Louisiana black bear (*Ursus americanus luteolus*).

© HAROLD E. MAUDE

GREY

AFRICAN ALLIGATOR



© JOHN D. OWENS

OSPREY



RED FOX



© JOHN D. OWENS

CYPRESS

GREEN TREE



© JOHN D. OWENS



S TREE IN THE NATURE CONSERVANCY'S  
WHITE KITCHEN PRESERVE



FROG

© WALTER CLIFTON

mussels. Under the right conditions, some mussel species can live up to 100 years of age.



© STEVE SHIPLEY

INFLATED HEELSPLITTER

### IMPORTANT HABITAT NEEDS OF MANY AQUATIC WILDLIFE SPECIES

- Good water quality without excess sediment
- Natural flooding and water flow regimes
- Coarse, firm, and clean substrate suitable for spawning beds
- No barriers to movement for migratory fish
- Stable sand or silt bottom riverine habitats with slow to moderate currents for freshwater mussels
- Sunny areas with many basking logs for turtles
- Sandbars with clean, fine-grain sand, minimal vegetation, and a slight elevation above the river's water level for nesting turtles



R1-PO-08-Kenner Wetland Assimilation

## PPL19 PROJECT NOMINEE FACT SHEET

2/4/09

### **Project Name: Kenner Effluent Discharge To Restore/Sustain LaBranche Marsh and Wetlands**

**Coast 2050 Strategy:** Region Strategy – Restore/sustain marshes by diverting semi-treated sewerage in a controllable manor to feed the LaBranche Wetlands

**Project Location:** Region 1, Pontchartrain Basin, St. Charles/City of Kenner, Jefferson Parish, the LaBranche wetlands located between the Bonne Carre Spillway and the Parish line canal between St. Charles and Jefferson Parish. The project area is bounded on the west by the Bonne Carre Spillway, on the east by the City of Kenner/Jefferson Parish Line Canal, on the north by Lake Pontchartrain, and on the south by Louisiana Highway 61.

**Problem:** The City of Kenner, Louisiana is evaluating options related to the discharge of secondary-treated municipal effluent into the LaBranche wetlands located west of Kenner, Louisiana.

**Goals:** Substantially increase the sewerage treatment capacity of the Kenner wastewater treatment capacity, decrease the adverse affects of the sanitary sewer overflows during wet weather events, while enhancing hurricane protection and improving the severely degraded state of the LaBranche wetlands.

**Proposed Solution:** In 1983, the City built a third wastewater treatment plant (WWTP3) to consolidate the discharge from their existing two treatment facilities and re-route flow to WWTP3. Recently, consolidation was completed, but the City now must address how to dispose of sanitary sewer overflow during wet weather events and how to further reduce nutrients in treated effluent. Discharge into the LaBranche wetlands is one solution to this problem that is being considered. Wetland assimilation will provide the most economical approach for the City of Kenner to meet its water quality objectives while enhancing the restoration of coastal wetland marsh.

**Preliminary Project Benefits:** In addition to providing water quality improvement, the LaBranche wetlands will be greatly enhanced by the addition of treated municipal effluent. These wetlands are currently in a severely degraded state and the addition of nutrients and freshwater via treated effluent will lead to enhanced hurricane protection, in addition to the future potential for wetland mitigation banking and carbon sequestration banking.

**Identification of Potential Issues:** No issues identified at this time

**Preliminary Construction Costs:** \$ 4 million for 17 MGD wastewater treatment

**Preparers of Fact Sheet:** Prat P. Reddy, P.E , Deputy C.A.O., City of Kenner  
**Consultants:** Rick Meyer, Meyer Engineers Ltd. (504-885-9892)  
John Day, PhD, Comite Resources, Inc. (225-654-8847)  
Ray Davezac, Davezac Consulting Engineers, LLC (985)764-6490

Lake Pontchartrain

Project  
Boundary



WW Effluent  
Discharge

Kenner  
r  
WWTP



Louisiana Department of Natural Resources

0  0.7mi

Data Source: LA Department of Natural Resources  
Map Date: February 3, 2009  
Image Data: 2005 Coastal Photographs

**PPL 19 Nominee**  
**Effluent Discharge – LeBranche Wetlands**

# Improving Water Quality and Enhancing Wetlands

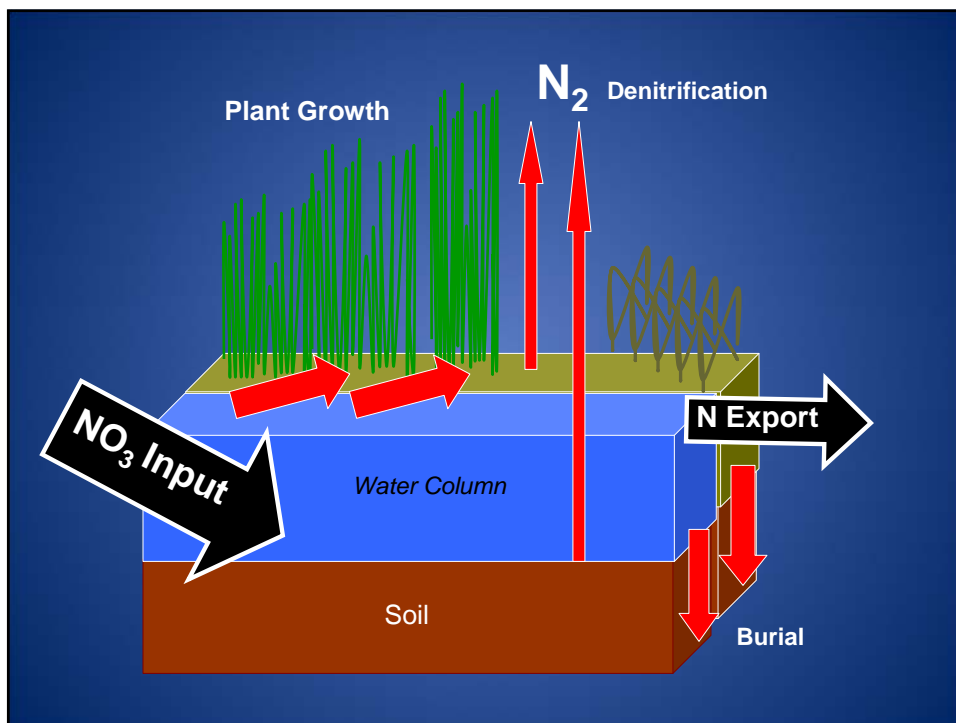
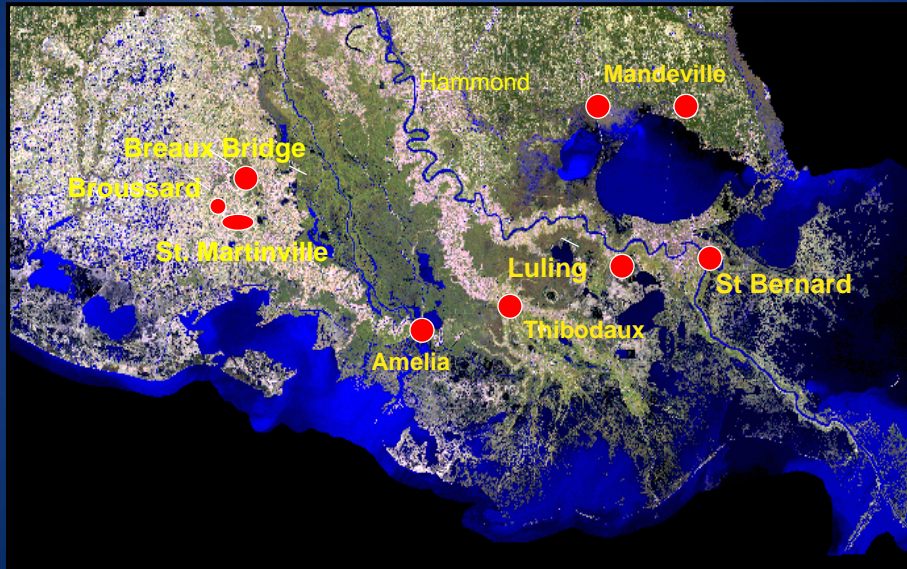
## City of Kenner's Wetland Assimilation Project

Comite Resources, Inc. 225-654-8847

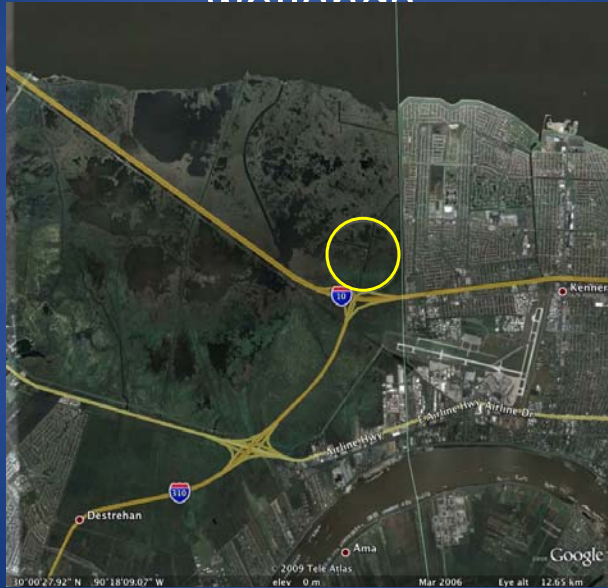
## Kenner is Evaluating

- how to dispose of sanitary sewer overflow during wet weather events and
- reduce nutrients in treated effluent

## Municipalities using Wetland Assimilation



## Discharge into the LaBranche Wetlands



## Benefits

- addition of nutrients and freshwater via treated effluent will lead to enhanced growth
- improvement of degraded habitat
- future potential for wetland mitigation banking and carbon sequestration banking
- also enhance hurricane protection by enhancing wetlands

*Nutrient loading rates and estimated removal efficiencies if 11 and 17.5 MGD were discharged*

	1140 ha (2817 ac)		2240 ha (5535 ac)	
	TN	TP	TN	TP
Discharge (MGD)	11	11	11	11
Nutrient Conc. (mg/L)	10	3	10	3
Loading Rate (g/m <sup>2</sup> /yr)	13.2	4.0	6.8	2.0
Predicted Reduction	50-70%	40-60%	70-90%	60-80%
Discharge (MGD)	17.5	17.5	17.5	17.5
Nutrient Conc. (mg/L)	10	3	10	3
Loading Rate (g/m <sup>2</sup> /yr)	21.2	6.4	10.8	3.2
Predicted Reduction	45-65%	38-58%	55-75%	45-65%

Wetland needed to achieve the nutrient reductions



# Conceptual Design





R1-PO-09-LaBranche East Marsh Creation  
Habitat Enhancement

19-1-PO-#9

## **LaBranche East Marsh Creation Habitat Enhancement PPL-19 Candidate Project**

### **Coast 2050 Strategy:**

- Coastwide Common Strategies
  - Dedicated Dredging for Wetlands Creation
  - Vegetative Planting
  - Maintain or Restore Ridge Functions
- Region 1 regional ecosystem strategies
  - Dedicated delivery of sediment for marsh creation
- Region 1 mapping unit strategies
  - Dedicated Dredging

### **Project Location:**

Region 1, Pontchartrain Basin, St. Charles Parish, between Lake Pontchartrain and I-10, bounded to the west by the Fall Canal and the initial Bayou LaBranche Wetland Creation Project (PO-17) and to the east by a pipeline canal.

### **Problem:**

Dredging of access and flotation canals for the construction of I-10 resulted in increased salinity and altered hydrology that exacerbated the conversion of wetland vegetation into shallow open water bodies.

### **Goals:**

The primary goal is to restore the marsh that has been converted to shallow open water. Project implementation would result in an increase of fisheries and wildlife habitat acreage and diversity and improvement of water quality. The proposed project would provide storm buffer protection to I-10, the region's primary westward hurricane evacuation route, and to a lesser degree, the Canadian National Illinois Central Railroad line. Additional wetland storm buffer would complement the U. S. Army Corps of Engineers ongoing and contemplated hurricane protection measures in the area that include raising/enlarging the existing earthen levee and placement of a breakwater structure on the north side of the intersection of I-10 and I-310.

### **Proposed Solution:**

The proposed solution consists of the creation of  $\pm$  365 acres of emergent wetlands,  $\pm$  165 acres of shrub scrub wetlands, and  $\pm$  240 acres of subtidal water bottoms using dedicated dredging from Lake Pontchartrain. The marsh creation area would have a target elevation the same as average healthy marsh. Shrub scrub areas would have a target elevation of average healthy marsh plus one foot. The subtidal area would have a target elevation of average healthy marsh minus 2 feet. Containment dikes would be built to separate the marsh creation from the subtidal water bottom area, and unconfined dredged material would be delivered within the marsh creation site without containment to build random shrub scrub wetlands resulting in a more cost effective project. Vegetative plantings would be utilized in the areas designated to be emergent marsh.

Elevated areas, resulting from the point discharge of dredged material, would vegetate naturally with shrub scrub vegetation. Successful wetland restoration in the immediate area (PO-17) clearly demonstrates the suitability and stability of soil and material availability from a sustainable borrow area (outlet end of Bonnet Carre Spillway).

**Project Benefits:**

This project would benefit 770 acres of intermediate marsh and open water. Approximately 365 acres of marsh and  $\pm 165$  acres of shrub scrub habitat would be created over the 20-year project life. In addition,  $\pm 240$  acres of subtidal water bottoms would be improved.

Constructed in April of 1994, PO-17 has provided more than 14 years of wetland benefits and will likely continue to provide benefits well beyond its 20-year prescribed life expectancy. As with the PO-17 project, the proposed project would not only provide wildlife and fisheries and water quality benefits, but the restored wetland vegetation would buffer/weaken storm surge, providing additional protection to existing infrastructure including the Lake Pontchartrain and Vicinity Hurricane Protection Levee, I-10, the Canadian National Illinois Central Railroad embankment, aerial electrical lines, and non-essential infrastructure. The rail embankment and the two camps that are located south of PO-17 escaped significant damage from Hurricane Katrina while most of the camps and several portions of the rail embankment to the east were either lost or heavily damaged.

The current project would utilize data and lessons learned from PO-17. For example, the borrow area in the lake, used for PO-17, would be evaluated for re-use in an effort to save time and CWPPRA funding.

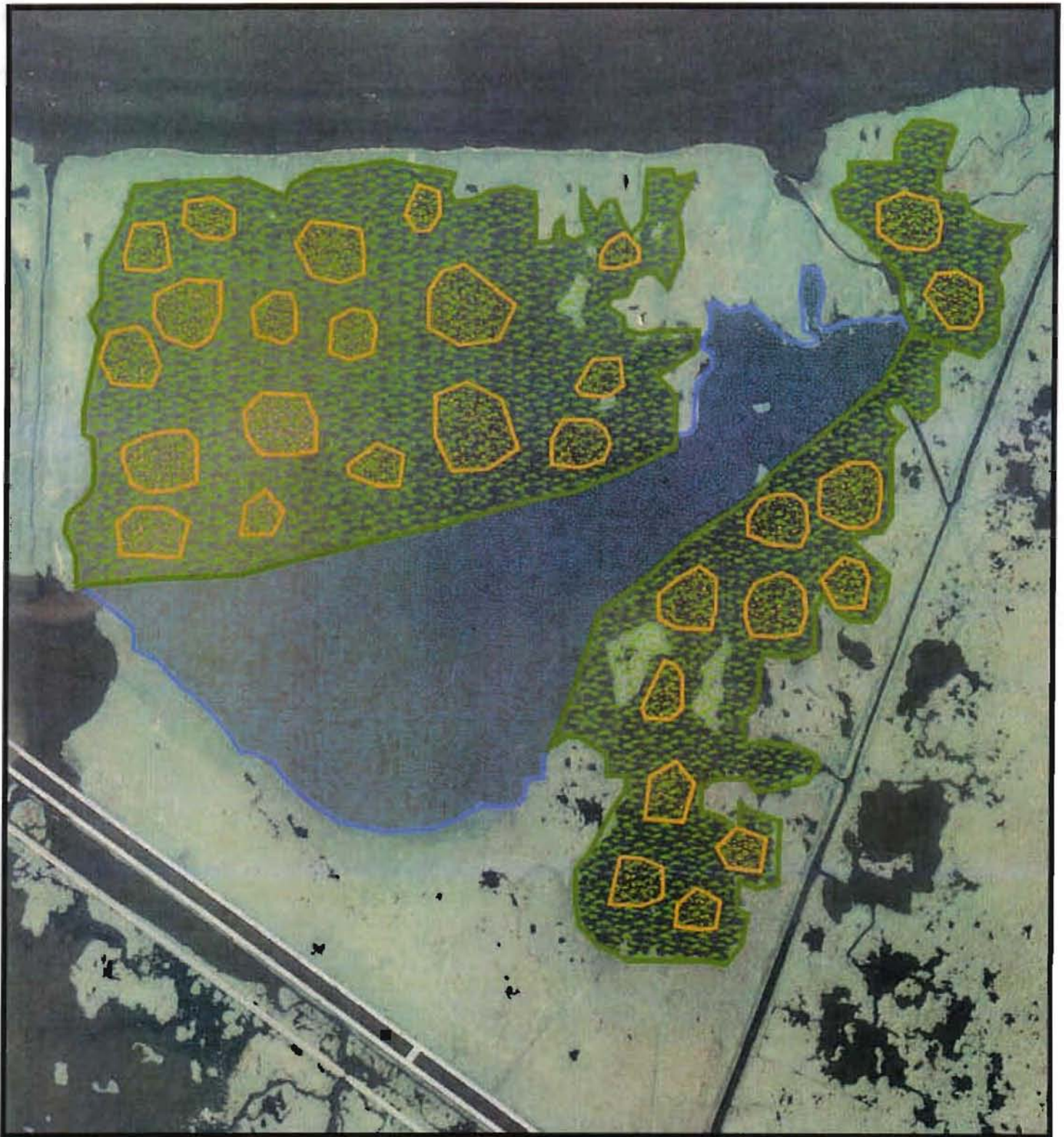
The project area's location north of I-10, makes it highly visible to motorists and would provide a readily discernible example of Louisiana's successful coastal restoration efforts. According to the Louisiana Department of Transportation and Development's Average Daily Traffic Count that was taken in 2005 for this segment of I-10, 54,687 vehicles a day pass this area. Because of its highly visible location near the New Orleans area, the project should be publicized as to its components and benefits.

**Project Cost:**

The estimated construction cost for this project is approximately \$19,000,000.

**Preparers of Fact Sheet:**


Jason Kroll, NRCS, 318-473-7816, [Jason.Kroll@la.usda.gov](mailto:Jason.Kroll@la.usda.gov)  
Ed Fike, agent for St. Charles Land Syndicate, 225-383-7455 x128,  
[efike@coastalenv.com](mailto:efike@coastalenv.com)



## LaBranche East Marsh Creation Habitat Enhancement

### Legend

- Subtidal - 240 ac.
- Shrub Scrub 165 ac.
- Marsh Creation 365 ac.

0 0.1 0.2 0.3 0.4  
 Miles

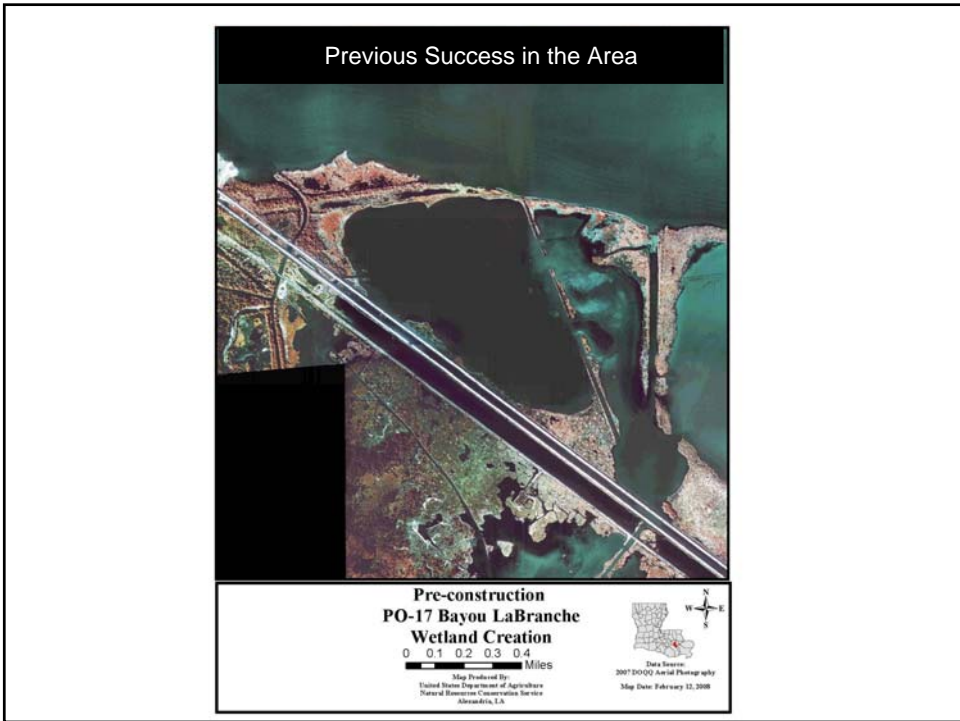
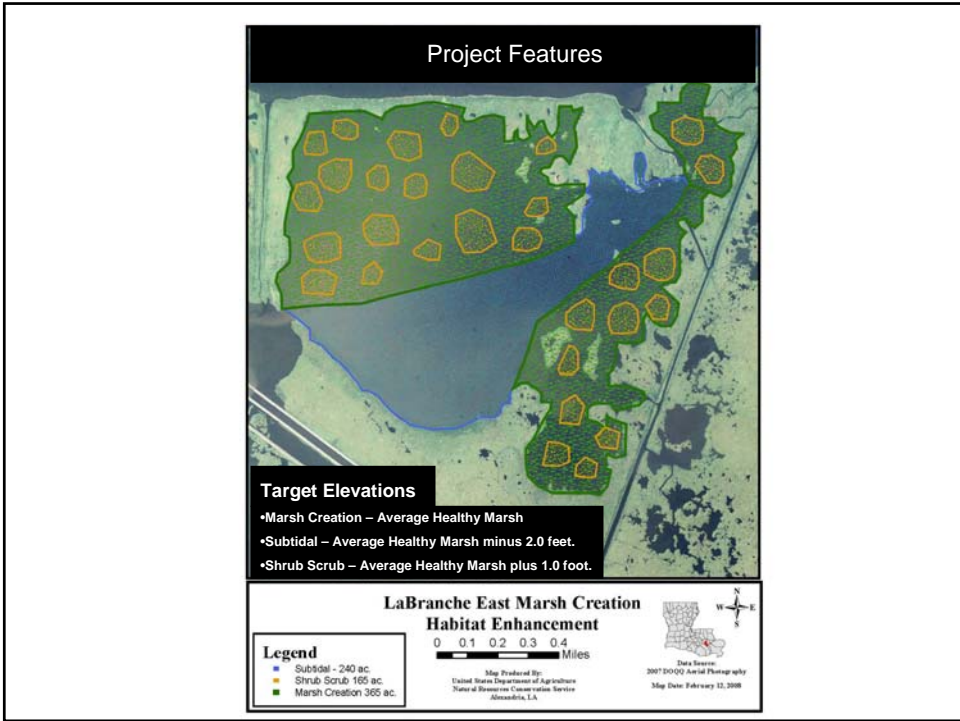
Map Produced By:  
 United States Department of Agriculture  
 Natural Resources Conservation Service  
 Alexandria, LA



Data Source:  
 2007 DOQQ Aerial Photography

Map Date: February 12, 2008





Previous Success in the Area



2007  
PO-17 Bayou LaBranche  
Wetland Creation

0 0.1 0.2 0.3 0.4  
Miles

Map Produced By:  
United States Department of Agriculture  
Natural Resources Conservation Service  
Baton Rouge, LA



Data Source:  
2007 DNACC Aerial Photography  
Map Date: February 5, 2008

R1-PO-10-Barataria and Terrebonne Basins  
Stormwater Redirection



19-1-PO #10

**PPL-19 Project Nominee Fact Sheet**  
**January 29, 2000**

**Project Name:**

Barataria and Terrebonne Basins Stormwater Redirection Project

**Coast 2050 Strategy:**

Coastwide strategy: Management of pump outfall for wetland benefits

Regional Strategy: Construct small diversions with outfall management

**Project Location:**

Region 2 and 3. Barataria and Terrebonne Basins, Specifically: Grand Caillou, Bayou Sale, Parish Line Canal, Hayes Canal, south Port Sulphur, and Boothville area stormwater pumping stations located in Terrebonne, Jefferson/St.Charles, and Plaquemines Parishes, respectively.

**Problem:**

Wetlands and the bottomland hardwood swamps of Barataria and Terrebonne Basins are experiencing some of the most drastic land loss rates in the state. Suffering from a combination of subsidence, salt water intrusion, and lack of sediment, freshwater, and nutrient input, these areas are in a perpetual state of decline unless action is taken to reverse these conditions.

Numerous river diversions and siphons have been constructed to replenish failing wetlands; however, these projects are costly and not available to all areas of the coast. With much of south Louisiana under forced drainage, there are numerous opportunities to optimize both drainage and the beneficial discharge of collected stormwater by retrofitting existing pumping stations.

Stormwater discharge is mainly pumped either over levees and into unconfined, open water, or into canals dredged adjacent to pumping stations specifically to facilitate drainage. Stormwater, containing freshwater and to some extent nutrients, is then channelized and diffused into large open receiving bays. This freshwater could be redirected into adjacent wetlands which would serve as a dedicated source of freshwater into stressed marshes.

**Proposed Project Features:**

The project will re-route or manage the outfall of stormwater discharge at six sites within the Barataria and Terrebonne Basins. Depending upon location, construction would consist of rerouting and installing pipe to direct flow to adjacent wetlands, and/or installing water control structures to maximize distribution throughout the outfall area. Coordination with parish drainage personnel has been part of this preliminary process and initial site scoping, and will be closely continued throughout each phase of project selection.

**Preliminary Project Benefits:**

The intent of this project is to divert freshwater into marshes that are currently stressed. Limited marsh creation is anticipated; therefore, project benefits will be determined by the existing wetlands delineated within the proposed likely area of stormwater influence. A preliminary estimate of project benefits is 4,200 acres.

**Identification of Potential Issues:**

Beneficially redirecting stormwater drainage is a known technique and has been previously

applied and studied in south Louisiana. Since this is stormwater only, no water quality issues with the Dept. of Environmental Quality are expected. The parishes have been contacted and coordination has occurred with the Barataria-Terrebonne National Estuary Program who has considerable expertise with this technique. There may be some oyster leases within the proposed areas of influence.

**Preliminary Construction Costs:**

Preliminary construction cost estimate plus contingency is approximately \$2,100,000.

**Preparer of Fact Sheet:**

Cheryl Brodnax, NOAA NMFS, (225) 578-7923, [cheryl.brodnax@noaa.gov](mailto:cheryl.brodnax@noaa.gov)

# Bayou Sale Stormwater Pumping Site, Terrebonne Parish



Stormwater redirected area of influence

# Grand Caillou Stormwater Pumping Site, Terrebonne Parish



Stormwater redirected area of influence,

# Hayes Canal Stormwater Pumping Site near Port Sulpur, Plaquemines Parish

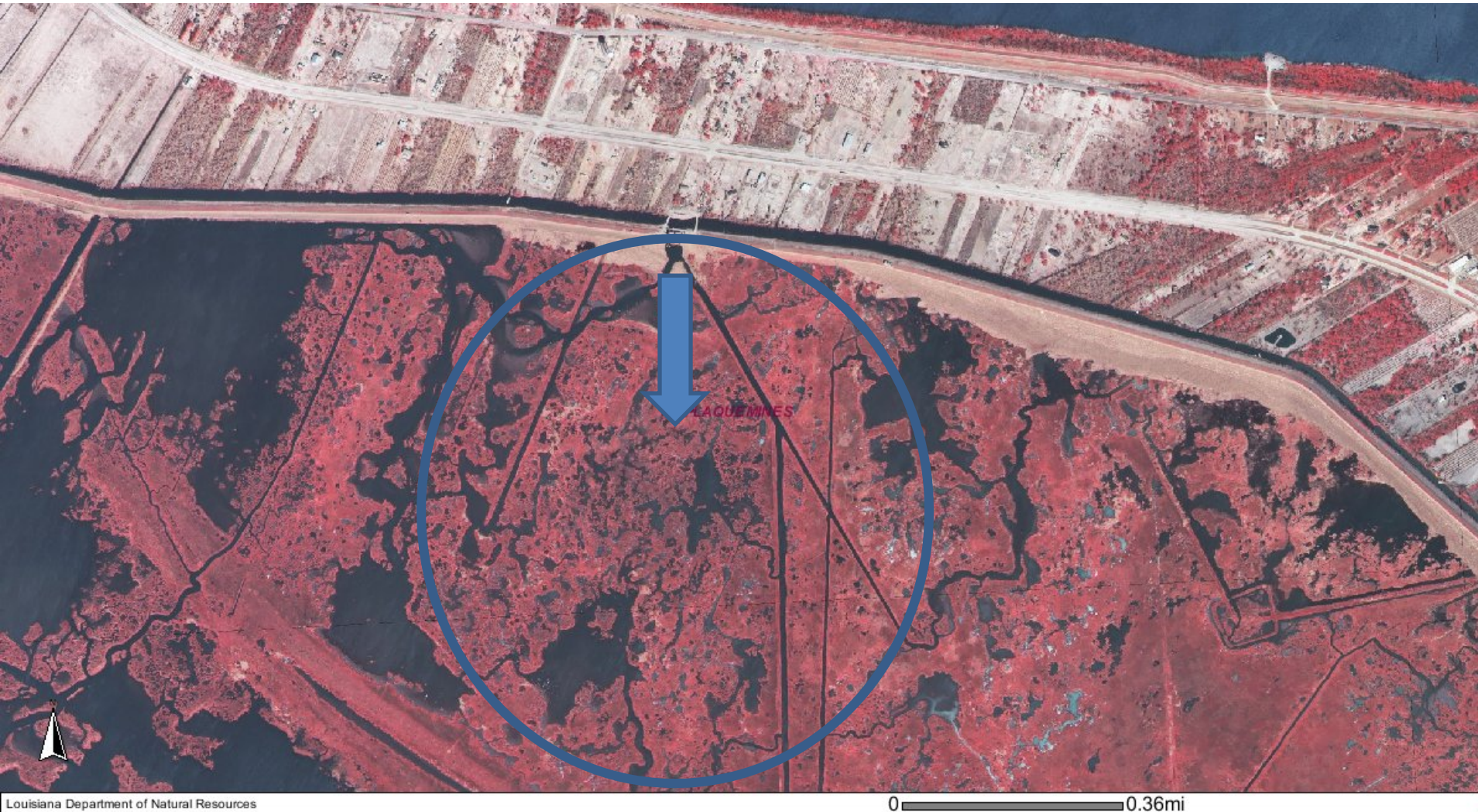


Stormwater redirect



Discharge area of influence,

# Stormwater Pumping Site south of Port Sulphur, Plaquemines Parish



Louisiana Department of Natural Resources

0 0.36mi



Stormwater redirected area of influence

# Stormwater Pumping Site south of Boothville, Plaquemines Parish

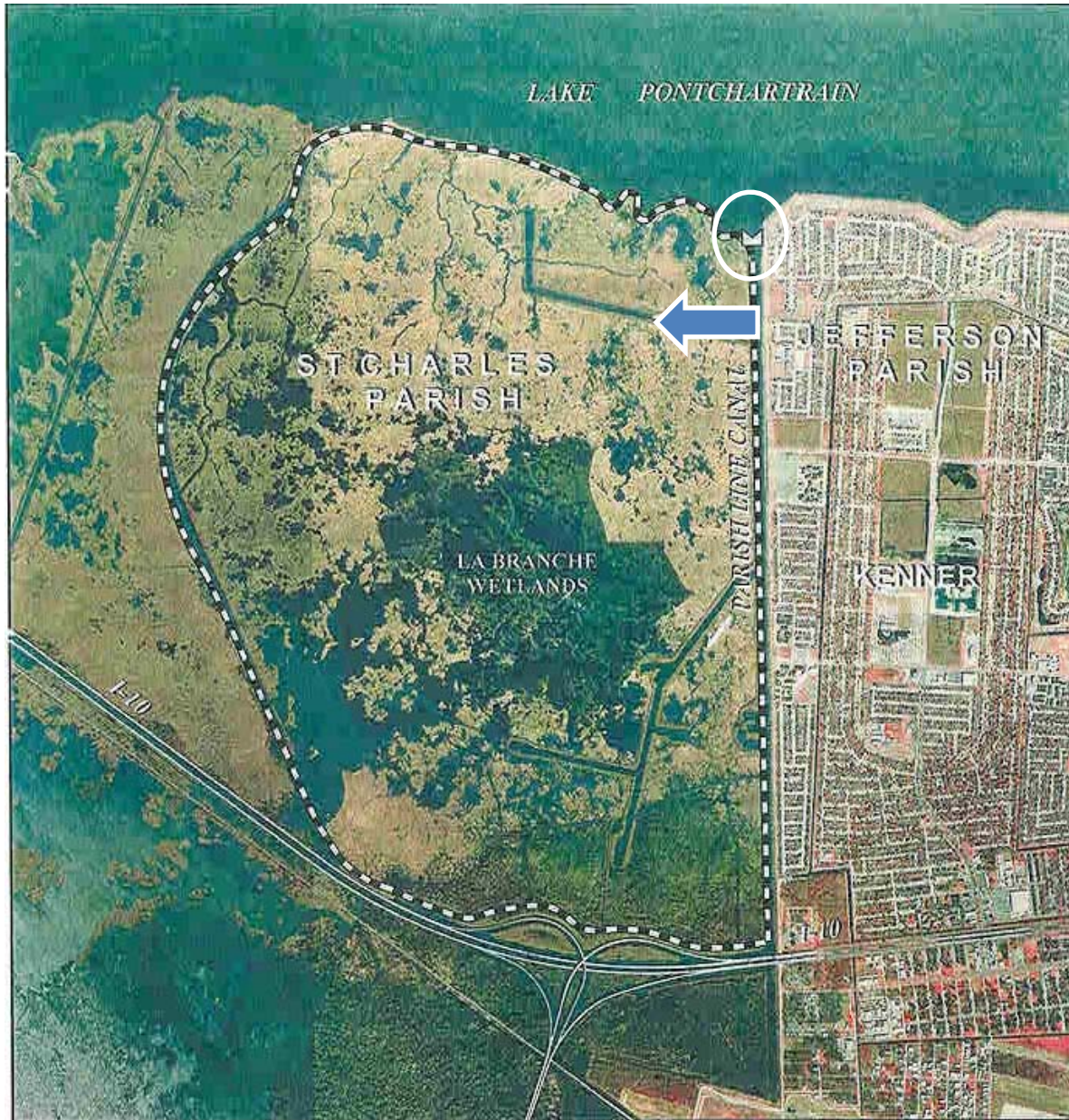


Stormwater redirected areas of influence



Proposed plug

# Parish Line Canal Stormwater Pumping Site, St. Charles and Jefferson Parishes



○ Proposed weir with boat bay

← Redirected flow and area of influence