

PROJECT NO. P0-3A

LABRANCHE WETLANDS

DRAFT

FEASIBILITY REPORT

COMPLETED BY:

LA DNR - COASTAL RESTORATION DIVISION

IN COOPERATION WITH:

ST. CHARLES PARISH PLANNING DEPARTMENT

WETLANDS AND WILDLIFE MANAGEMENT COMPANY

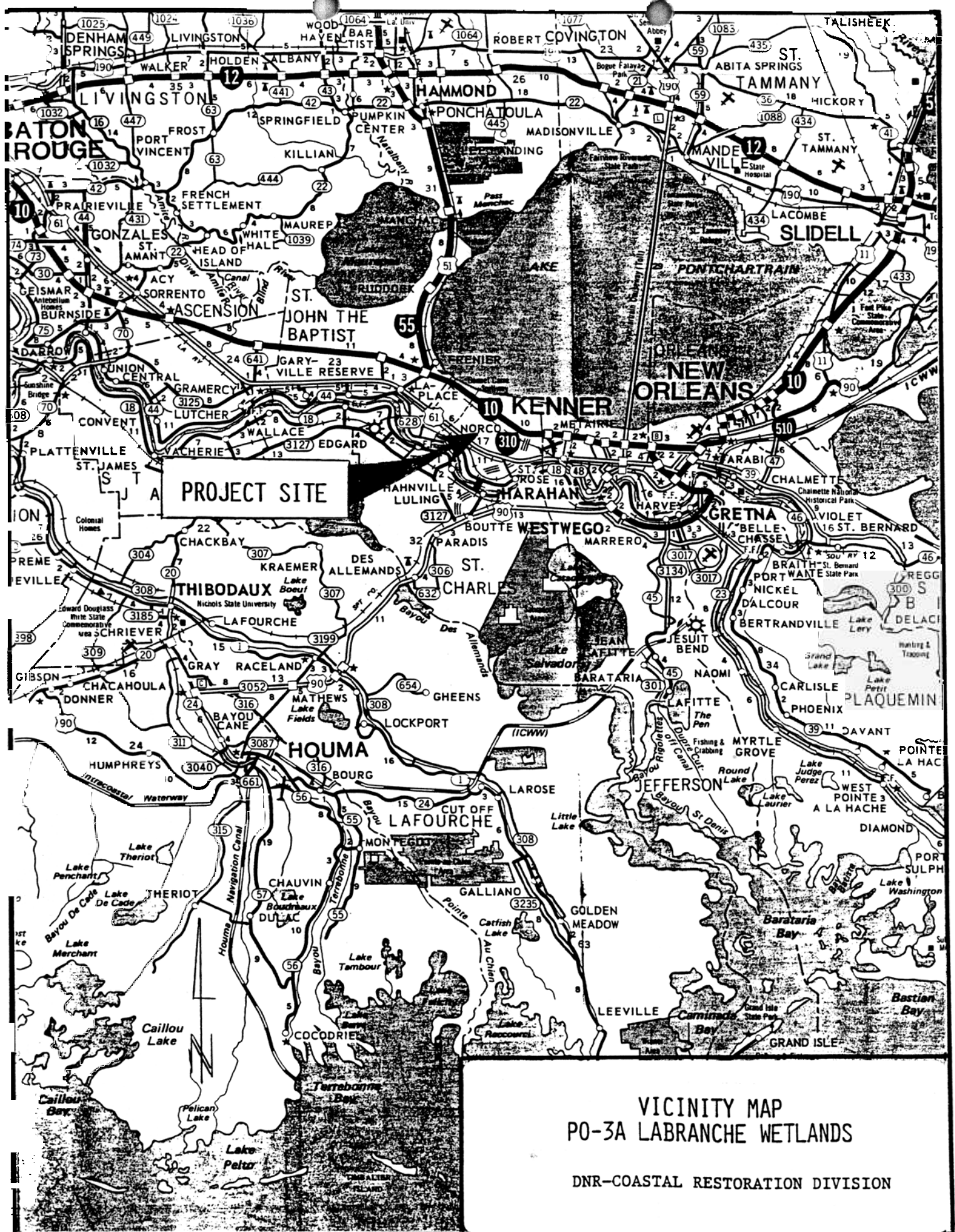
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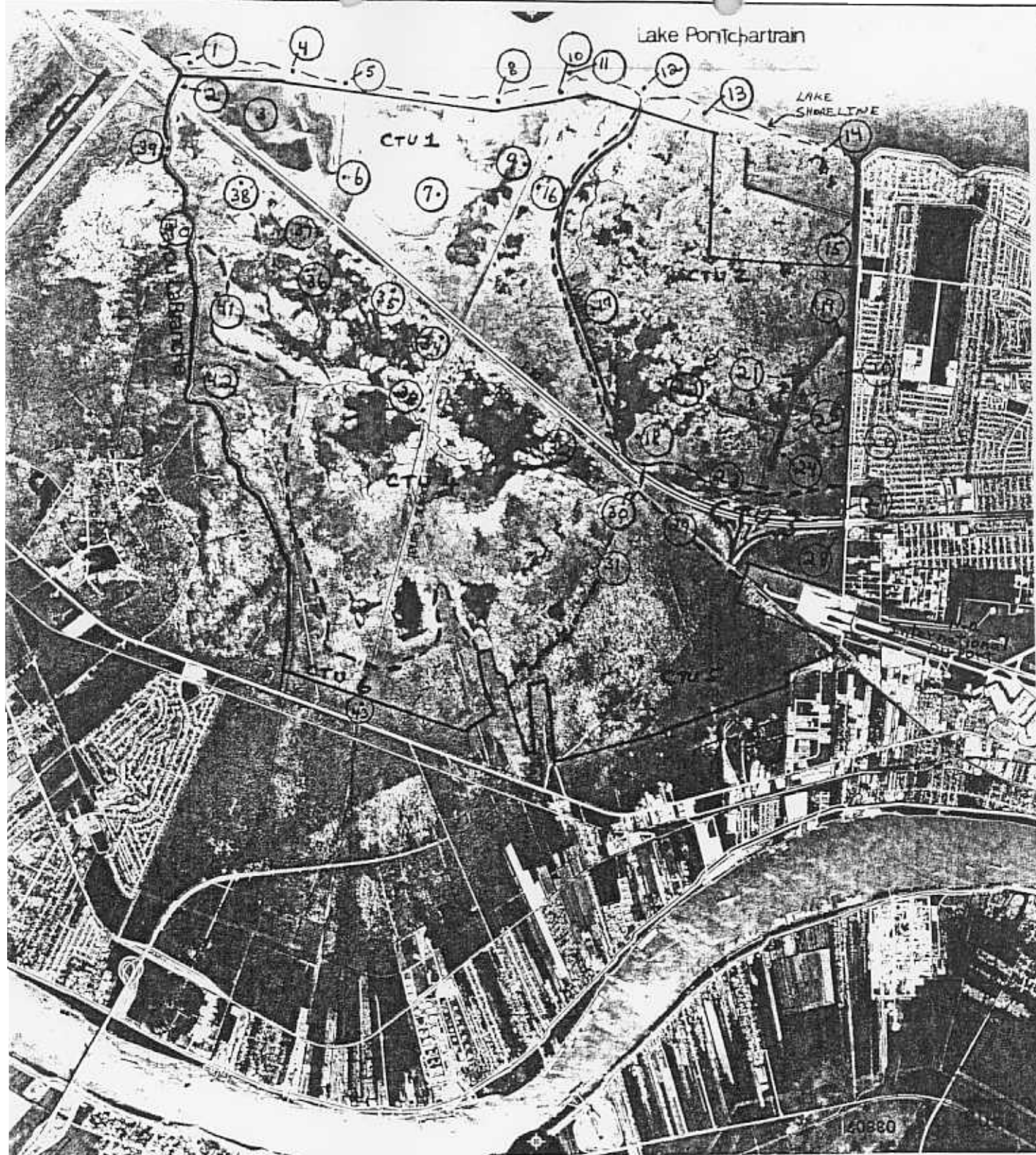
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TABLE OF CONTENTS

FEASIBILITY REPORT

VICINITY MAP	. 1
PLAN VIEW MAP	. 2
PROJECT DESCRIPTION	. 3
PROJECT OBJECTIVES AND GOALS .	. 6
EVALUATION OF STRUCTURAL AND NON-STRUCTURAL MEASURES .	. 6
EVALUATION OF THE PROPOSED PLAN	10
SOCIO-ECONOMIC CONCERNS	11
COMMENTS AND RECOMMENDATIONS .	14





PLAN VIEW MAP PO-3A LABRANCHE WETLAND

- Project Boundary
- - Conservation Treatment Unit Boundary
- Evaluation Site Location & No.

Prepared by: DNR-Coastal Restoration Division

**PO-3A LABRANCHE WETLANDS
FEASIBILITY REPORT**

PROJECT DESCRIPTION

This 12,460 acre area, commonly referred to as the LaBranche Wetlands of St. Charles Parish, consist of 4,910 acres of intermediate and brackish marshes, 4,602 acres of open water, and 2,948 acres of forested wetlands, located in all or parts of sections 37, 39 of T11S and R8E, Sections 33, 39, 40, 54, 57, of T12S and R8E, Sections 41-52 of T11S and R9E, Sections 7, 9, 17, 18, 20, 29, 39, 40, 43, 47, 55, 62, 68, 70, 72, 73, 75, 76, 79, 80-84 of T12S and R9E. The approximate center of the project is at 30 degrees 01' 15" latitude and 90 degrees 20' 00" longitude. Bayou Labranche and Cross Bayou serve as the western boundary while the Pontchartrain Levee District property serves as the northern boundary. Jefferson Parish is the eastern boundary and a line parallel to and approximately 1,800 feet north of Airline Highway, US 61, serves as the southern boundary.

The 1990/91 Coastal Wetlands Conservation and Restoration Plan authorized construction of structures at ES-2, 42, 30, 32, and 35. See the Plan View Map on page 2 for locations of structure sites. The original plan for the LaBranche Wetlands was completed in 1986 and included 20 structures and recommended shoreline protection along Lake Pontchartrain. Most features of the original plan have been installed or all planned for installation under project initiatives other than this project. An update of the original project plan explaining past,

on-going, and future implementation of the original plan features was completed on October 15, 1991 by Coastal Restoration Division and is available for review upon request.

According to the USDA Soil Survey of St. Charles Parish, Lafitte muck, a highly erosive, deep organic soil with severe structural limitations, is the dominant soil found in the marsh area. Barbary muck, a very poorly drained, very fluid, mineral soil is the dominant soil occurring in the swamp area.

According to O'Neil, in "The Muskrat In The Louisiana Coastal Marshes, 1949", and personal communications with local landusers, prior to 1960, the dominant vegetation occurring south of the Illinois Central Gulf railroad was roseau cane (Phragmites communis), sawgrass (Cladium jamaicense), cattail (Typha sp.), and bulrush (Scirpus californicus). Prior to 1960, three-corned grass (Scirpus olneyi), and marsh-hay cordgrass (Spartina patens) dominated most of the area between the railroad and Lake Pontchartrain.

Personal communications with local landusers and interpretations of old aerial photographs indicate fresh water from Bayou LaBranche buffered brackish tidal surges in Conservation Treatment Unit #1. Apparently this resulted in vegetation characteristic of an intermediate marsh. This would explain why this marsh was so vulnerable to saltwater intrusion after dredging of the Interstate 10 Canal in the mid 1960's. Conversely, marsh vegetation in Conservation Treatment Unit #2 was predominately brackish plants and much less damage resulted from construction of Interstate 10.

Chabreck (1968) reported that the area north of the railroad (CTU 1, 2, & 3) supported vegetation representative of intermediate marsh and that the area south of the railroad (CTU 4, 5, & 6) was representative of fresh marsh. In 1978 Chabreck indicated that the vegetation had changed to brackish marsh north and intermediate marsh south of the railroad. In 1988 Chabreck reported no change in vegetation from 1978.

Other natural and man-made events compounded the problems in these wetlands. The Mississippi River Gulf Outlet Project, completed in 1963, increased salinity levels in Lake Pontchartrain by threefold (Montz, 1973). This project also increased daily tidal range, thereby, accelerating erosion. Hurricane Betsy (1965) and Camille (1969) flooded the marsh and swamp with 2 to 6 feet of saline water. Oil and gas activities introduced brackish water into the cypress trees, resulting in a reduction of stand density and quality. Photo interpretations have shown that 2,941 acres of the 4,615 acres of fresh marsh has converted to open water since 1953

Shoreline erosion along Lake Pontchartrain is jeopardizing the ponds and remaining marsh vegetation. A 3,000 foot section of shoreline extending from the Pipeline Canal westward, ranges in width from 5 feet to 100 feet. Shoreline retreat in this area has been over 25 feet per year since 1971. The shoreline protecting the area east of the Pipeline Canal has experienced slower erosion rate of 17 feet per year because the abandoned Hammond Highway, US 51, buffeted most of the wave energy for many years. However, most of the highway bed has now eroded away and shoreline retreat will likely accelerate.

PROJECT OBJECTIVES AND GOALS

primary objective of this conservation plan is to obtain water control to reduce saltwater intrusion, minimize the erosive action of fluctuating water levels, provide conditions for establishment of plants on exposed mud flats, improve plant species diversity, and improve the value of this wetland for many wildlife species. The water control structures will be operated to promote the growth of wetland vegetation, to enhance waterfowl and furbearer productivity, and to allow for migration of aquatic organisms. Specific goals of the project are:

1. Control erosion and reclaim eroded (open water) areas to emergent vegetation. (Areas that could be reclaimed are those with water depths from marsh level to 1.0' below marsh level
2. Control water fluctuations.
3. Encourage growth of submergent vegetation especially in the deeper (1.0' below marsh level and deeper open water areas
4. Allow ingress and egress of marine organisms to the extent possible without compromising the integrity of the management system.
5. Retain freshwater and stabilize salinity.

EVALUATION OF STRUCTURAL AND NON-STRUCTURAL MEASURES

existing and proposed structural measures are of the type commonly utilized throughout coastal Louisiana and will provide the management capabilities planned.

Structural measures associated with project PO-3a are listed and discussed below:

A plug was installed at this site by DOTD after construction of I-10. The plug breached and a variable crest, flapgated weir was subsequently planned and permitted for this site. This was the only actively managed structure planned north of the railroad. The intent was to utilize this structure for fresh water introduction whenever the Bonnet Carre Spillway was operated. This structure site is within the right-of-way for Interstate 10. The Louisiana Department of Transportation and Development (DOTD) would not approve construction of a water control structure at this site.

1991 permit modification approved changing the structure planned at this site to a 290' rock dam closure with a top elevation of +4.0' MSL. Funding for this structure will be provided by Louisiana Department of Transportation and Development (LA DOTD). No State funds will be utilized.

ES-30 A rock dam was installed at this site prior to completion of the Project Plan as mitigation by the New Orleans International Airport (NOIA). The plan calls for and permits authorize replacing the rock dam with a shell armored earthen plug. This structure is planned to be installed as permitted by the NOIA for mitigation of airport construction. No State funds will be utilized.

ES-32 A rock dam was installed at this site prior to completion of the project plan. The plan calls for and permits authorize replacing the rock dam with a shell armored earthen plug. This structure is planned to be installed as permitted.

ES-35 - A rock dam was installed at this site prior to completion of the project plan. The plan calls for and permits authorize replacing the rock dam with a shell armored earthen plug. This structure is planned to be installed as permitted.

ES-39 - A variable crest weir was planned and permitted for this site. This structure will be installed as planned. This structure was not identified as one of the PO-3a project features in the 1990/91 "Plan", however, the Parish & Landowner requested that it be added to the project. Installing this structure is essential to attain planned water control objectives south of the railroad.

ES-42 - Two 30" culverts with variable crest inlets were originally planned and permitted for this site. The 1991 permit modification authorized changing this structure to a variable crest weir with additional double flapgated openings (similar to ES-40). The purpose of this modification was to allow greater water management flexibility and to allow for sediment/fresh water introduction. This structure will be installed as planned. The structure site is not on St. Charles Land Syndicate Property. An easement from the adjacent landowner for construction, operation, and maintenance must be obtained before construction begins.

A hydrologic model of the area was completed for St. Charles Parish in October 1991 by Brown and Root. The model raised concern that the planned water management scheme could not be achieved because elevation of the west project boundary (east bank of Bayou LaBranche) was too low to act as a hydrologic barrier. Uncontrolled water exchange across the

east Bayou LaBranche natural levee would prevent achieving the water control necessary to realize the project objectives and goals. DNR/CRD completed elevation profile and cross-section surveys of the natural levee. The top elevation of critical (low) sections were found to be 1.6' NGVD. Historic water level data (1987-1990) for Lake Pontchartrain was also analyzed.

Comparison of the water level data and elevations on the natural levee indicate that uncontrolled water exchange could be expected to occur for short periods (21% or less of the time between March 15 and August 31 of each year) during the planned drawdown period. The comparison also indicates that water levels are normally below 1.6' NGVD for 79% of the time, or greater, during the normal growing period of each year.

A drawdown is normally considered to be effective if it can be achieved and maintained for a minimum of 2 weeks, once every three or four years. The data indicates that there is a very high potential for achieving and maintaining the planned drawdown even though there may be short periods of uncontrolled water exchange. Allowing uncontrolled water exchange across the natural levee may actually be beneficial for sediment and nutrient introduction, especially during the non-growing season. Short periods of exchange during the growing season is acceptable as long as duration of increased turbidity associated with high water is not detrimental to aquatic vegetation. Utilizing the natural levee elevation is similar to the developing concept of utilizing low "overflow" banks in lieu of the more traditional levee designs.

Managing the structures according to the operation schedule should result in creating water level and salinity conditions that are necessary to achieve the plan's objectives and goals. The structure operation schedule is the only non-structural measure included in the project plan. The permitted structure operation schedule is included in the Project Plan Update.

EVALUATION OF THE PROPOSED PLAN

Achieving the objectives and goals of this project will be dependent on the ability to reduce and stabilize salinity levels; and to control water levels to encourage growth of aquatic and emergent marsh plants. The proposed structural measures and water management scheme will provide the capability to control planned salinity and water levels.

This management scheme is directed toward recovery of the large marsh area between the railroad and Highway 61, but will allow ingress and egress of marine organisms into this area. Much of the unit has been converted to open water by salt water intrusion through the Interstate Canal and openings that were made through the lake shore for access to the construction site. The water management scheme will also reduce the amount of turbidity in the interior ponds by eliminating the rapid exchange of water during low tide stages in Lake Pontchartrain. The water control structures are planned so that flow can be directed into the marsh during periods when the Bonnet Carre Spillway is open.

Utilizing drawdowns to stimulate emergent vegetation has been successful in several areas of coastal Louisiana and should result in increasing emergent vegetation in this project, especially in the areas less than

1' deep. Several species of plants, both emergent and submergent, associated with an intermediate marsh do normally grow in areas where conditions are similar to that proposed for this area

Additional elevation loss (subsidence, erosion) on the existing hydrologic barrier forming the western project boundary would definitely jeopardize the future ability to maintain planned water control objectives. Maintenance of the east Bayou LaBranche streambank may be necessary to insure long-term functioning of the planned measures. Bayou LaBranche is designated as a scenic stream and any dredging of the bayou to obtain fill for streambank maintenance must be coordinated with regulations governing scenic streams. Bayou LaBranche is an important drainage outlet for residential areas south of the Hwy 61, so clean-out of the bayou would also provide the added benefit of timely removal of excess water.

SOCIO-ECONOMIC CONCERNS

This project has been in the "implementation" phase for several years and has received widespread publicity through numerous newspaper and television reports. The project has received tremendous support from the private and public sector as evidenced by the ongoing support of the St. Charles Parish Council and participation by many private citizens in shoreline planting and christmas tree sediment trapping projects. The project was subject to public review through two public notice periods during the permitting process. No serious opposition has been raised concerning this project.

Many of the project features have been installed. Estimated cost of constructing Project PO-3a planned features is presented below along with other construction costs. Other construction costs include completed or planned features of the management plan not included in Project PO-3a

PROJECT PO-3A CONSTRUCTION COSTS

ES	<u>Installed Structures Cost of Construction</u>		<u>Planned Structures Estimated Cost of Construction</u>		<u>Total</u>
	Non-State Funds	State Funds	Non-State Funds	State Funds	All Funds
2	--	--	75,000	--	75,000
30			10,800	--	10,800
32				10,500	10,500
35	--	--	--	12,300	12,300
39				31,900	31,900
42				<u>87,500</u>	<u>87,500</u>
TOTAL PO-3a Costs			85,800	142,200	228,000

OTHER CONSTRUCTION COSTS

5	150,000				150,000
8	150,000	--			150,000
10	20,000				20,000
11	35,000				35,000
12	200,000	--			200,000
19	--	--	21,750	--	21,750
20			10,750	--	10,750
26			32,000		32,000
27	210,289	--			210,289
4-5	86,000	421,000	--	--	507,000
5-11			125,000	1,294,000	1,419,000
34	283,000	--	--		283,000
37	141,550				141,550
40	141,535	--			141,535
41		--	7,750		7,750
43	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	--

TOTALS

1,417,374	421,000	197,250	1,294,000	3,329,624
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Estimated Project Planning and Permitting cost associated with development of the original plan in 1986 to date is presented below:

Landowner	\$80,000
St. Charles Parish	\$12,000
SCS	<u>\$ 8,000</u>

TOTAL \$100,000

Estimated total Project cost for implementation of the original 1986 plan, including features of this project, (Planning, Permitting, Installation) is presented below:

State Funds	\$1,857,200
Non-State Funds	<u>\$1,800,424</u>

TOTAL \$3,657,624

The cost per acre for full implementation of the original 1986 plan based on estimated total project costs is \$293.54 per acre (\$3,657,624 /12,460 acres).

Estimated cost for construction of the feature of this project, PO-3a LaBranche Wetlands, below:

State funds	\$142,200
Non-State Funds	<u>\$ 85,800</u>

Total \$228,000

COMMENTS AND RECOMMENDATIONS

The 1990/91 "Plan" Project PO-3a authorized funding for structures at ES-2, 42, 30, 32, and 35. The structure at ES-2 will be installed by DOTD and the structure at ES-30 will be installed as mitigation by the New Orleans International Airport.

Additional features of the management plan that have not been installed or funded include the structures at ES-19, 20, 26, & 39. The landowner or parish has agreed to arrange funding for ES-19, 20, & 26 and has requested that the structure planned for ES-39 be included in this project. All other features of the management plan have been installed or approved for funding from various sources.

CRD recommends that the structure at ES-39 be included in Project PO-3a and that the structures planned at ES-42, 32, 35, and 39 be authorized for construction.

Elevation of the existing hydrologic barrier (natural levee of Bayou LaBranche) on the western project boundary must be monitored. Streambank maintenance will be necessary if engineering surveys or field observation after construction of the PO-3a features document that water control capabilities necessary to achieve Planned Objectives and Goals

are compromised by uncontrolled water exchange. CRD recommends initiating feasibility and planning for streambank maintenance in the near future to obtain necessary approvals so that maintenance can be performed in a timely manner if such action becomes necessary.