Photo by Jessica Wallace

*For centuries, the people of south Louisiana have lived and worked along the coastal bayous. Today, many people still maintain homes and fishing camps in the marsh.*

# V–Breaux Act Restoration Status

## Introduction

From the enactment of the Breaux Act in 1990 through the authorization of the eighth annual priority project list in 1999, there have been 91 coastal restoration projects selected for implementation in Louisiana's coastal zone to address wetland loss in each of the four coastal regions (table 5.1). As of April 2000, 14 of these projects (10 full-scale and four demonstration) have been formally deauthorized, 11 after initial selection (prior to construction), and three after construction (based on results from project monitoring). Of the remaining 77 projects, 12 are demonstration projects that will potentially provide information for the design of future restoration projects, and 65 are full-scale restoration projects anticipated to directly create, protect, or restore approximately 70,000 acres of coastal wetlands during their 20-year lives (see figure 4.2 for project locations). The size of projects ranges from a 3-acre demonstration project to a 140,380-acre full-scale project. The current estimated cost of all Breaux Act projects approved through 1999 is $319,411,042. The status of these projects is summarized in the subsequent region-specific sections.

Projects selected for implementation through the Breaux Act address critical problems identified in the original 1993 Louisiana Coastal Wetlands Restoration Plan (LCWCRTF 1993). Projects are proposed and supported by one of the federal cosponsoring agencies and are evaluated by using the Wetland Value Assessment (WVA) process (CWPPRA-EWG 1998). The selection process for the first eight priority project lists focused on critical problems and areas within a hydrologic basin. With the forward-looking ecosystem-level focus of the initial Coast 2050 Initiative and the development of the Coast 2050 Plan, projects selected on the ninth and subsequent lists must address one or more of the strategies outlined in this plan. Although the projects selected on the first eight lists were designed to address specific problems identified in the original restoration plan, these early projects fit within the larger framework of ecosystem-level restoration and promote the long-term goal of obtaining sustainable wetlands. Additional information that will be gained through monitoring and further research demands that the Coast 2050 Plan be dynamic and flexible enough to change as knowledge increases.

The project selection process for the ninth priority project list was revised from the process used for the first eight lists. This revision takes advantage of the growing institutional knowledge provided by the first eight project lists, as well as a more flexible cash flow management plan, and it divides the project selection process into two distinct phases. Projects selected for Phase I implementation undergo design and engineering development and are funded for 1 year of pre-construction baseline monitoring. After completion of Phase I, these projects must be reevaluated, again using the WVA process, and reselected for Phase II funding, which includes project construction, post-construction monitoring, and operation and maintenance. Although this two-phase process will encompass additional time and effort of agency personnel and academics for project reevaluation, it should minimize the construction of marginal projects (some projects will likely be modified or not be selected for Phase II funding) and will maximize the effectiveness of each dollar invested in wetland restoration in coastal Louisiana. This process may also result in fewer deauthorized projects by identifying problems early in the process. Nineteen projects (17 full-scale projects and two demonstration projects) were approved for Phase I funding on the ninth project list by the Breaux Act Task Force on January 11, 2000 (table 5.2 and figure 5.1). Because project feasibilities and preliminary design of the ninth list projects had just begun at the writing of this report, only those Breaux Act projects authorized on the first eight project lists are included in the region-specific summaries section.

The following sections contain project information and activity status for the coastal restoration projects funded by the Breaux Act in each of the four coastal regions. Although some causes of wetland loss are

**Table 5.1.** Summary of projects authorized by the Breaux Act on priority project lists 1-8. Hydrologic basins (in italics) are matched with their respective regions under the Coast 2050 Plan.

| | Number of Breaux Act Projects (nondemonstration) | | Number of Breaux Act Demonstration Projects | | Anticipated Acres Created/ Restored and Protected[a] | Current Estimated Cost (20 yr)[b] as of April 2000 |
|---|---|---|---|---|---|---|
| | Authorized | Deauthorized | Authorized | Deauthorized | | |
| **Region 1** | **10** | **2** | **1** | **1** | **5,479** | **$ 21,310,786** |
| *Pontchartrain* | 10 | 2 | 1 | 1 | 5,479 | $ 21,310,786 |
| **Region 2** | **23** | **5** | **3** | **0** | **23,745** | **$ 103,870,503** |
| *Breton Sound* | 4 | 2 | 0 | 0 | 1,141 | $ 3,006,342 |
| *Mississippi River Delta* | 4 | 1 | 2 | 0 | 13,153 | $ 24,121,138 |
| *Barataria* | 15 | 2 | 1 | 0 | 9,451 | $ 76,743,023 |
| **Region 3** | **25[c]** | **3[c]** | **6** | **1** | **18,212** | **$ 138,108,004[c]** |
| *Terrebonne* | 14 | 2 | 5 | 1 | 8,722 | $ 104,908,890 |
| *Atchafalaya* | 2 | 0 | 0 | 0 | 3,792 | $ 10,109,926 |
| *Teche/Vermilion* | 8 | 0 | 1 | 0 | 5,698 | $ 23,023,029 |
| **Region 4** | **17** | **0** | **5** | **2** | **22,189** | **$ 53,981,749** |
| *Mermentau* | 5 | 0 | 2 | 2 | 3,171 | $ 10,808,186 |
| *Calcasieu/Sabine* | 12 | 0 | 3 | 0 | 19,018 | $ 43,173,563 |
| **Grand Total** | **75[c]** | **10[c]** | **16[d]** | **4** | **69,625** | **$ 319,411,042[d]** |

[a]Acres Protected/Created is the net gain in emergent marsh as a result of project implementation as estimated by the Environmental Work Group during the Wetland Value Assessment. This figure includes acres of emergent marsh protected, created, and restored as a result of project implementation and indicates acreage which is anticipated to offset land loss. Anticipated acres are exclusive of deauthorized projects.
[b]Includes costs incurred to date on deauthorized projects.
[c]Includes numbers, acres, or cost from CW-5i Marsh Creation east of Atchafalaya River-Avoca Island Project.
[d]Includes numbers, acres, or cost from CW-7 Coastwide Nutria Harvest Demonstration Project.

common in all four regions (such as the altered hydrology from dredging of canals and navigation channels, and shoreline erosion), each region has specific problems which are discussed at the regional level. These sections also include summaries of wetland composition, proposed solutions to the wetland loss problems (projects), and monitoring summaries for completed projects where sufficient data have been collected to allow preliminary evaluation of project performance.

Photo by Jessica Wallace

*A great egret (*Ardea albus*) hunts for small fish in the grasses of a brackish marsh.*

**Table 5.2.** Projects approved for Phase I funding by the Breaux Act Task Force on the ninth priority project list on January 11, 2000.

| Project Name | Agency[a] | Project Type[b] | Anticipated Acres Created/ Restored and Protected[c] | Current Phase I Cost Estimate as of April 2000[d] |
|---|---|---|---|---|
| Opportunistic Use of Bonnet Carre Spillway (XPO-55a) | USACE | FD | 177 | $ 150,706 |
| Chandeleur Islands Restoration (XPO-95) | NMFS | VP | 220 | $ 1,608,400 |
| Freshwater Introduction South of Highway 82 (PME-07a) | USFWS | HR/MC | 296 | $ 607,138 |
| South Lake DeCade/Atchafalaya Freshwater Introduction (PTE-28) | NRCS | HR | 201 | $ 396,489 |
| Four-Mile Cut/Little Vermilion Bay Hydrologic Restoration (XTV-30) | NMFS | SNT | 327 | $ 574,133 |
| Castille Pass Sediment Delivery (XAT-11) | NMFS | MC/SNT | 589 | $ 1,855,792 |
| Black Bayou Bypass Culverts (CS-16) | NRCS | HR | 540 | $ 799,823 |
| Perry Ridge West Bank Stabilization/Terracing (PCS-26ii) | NRCS | SP/MC | 83 | $ 317,399 |
| Freshwater Bayou Canal HR/SP - Belle Isle to Lock (REVISED COST) (XTV-27) | USACE | HR/SP | 529 | $ 1,498,967 |
| Little Pecan Bayou (XME-42a) | NRCS | HR | 144 | $ 1,245,278 |
| Barataria Basin Landbridge Shore Protection Phase III (XBA-63iii) | NRCS | SP | 264 | $ 1,040,595 |
| LaBranche Terracing/Plantings (PPO-07a) | NMFS | SNT/SP/VP | 489 | $ 1,027,190 |
| Marsh Creation South of Leeville (BA-32a) | USEPA | MC | 146 | $ 1,151,484 |
| East/West Grand Terre Islands Restoration (XBA-01a) | NMFS | BI/MC | 472 | $ 2,320,255 |
| Timbalier Island Dune/Marsh Restoration (XTE-45a) | USEPA | BI/MC | 273 | $ 1,360,198 |
| New Cut Dune/Marsh Restoration (TE-11a) | USEPA | BI/MC | 102 | $ 746,274 |
| Weeks Bay/Commercial Canal Shoreline Protection (PTV-13) | USACE | SP/VP/HR | 138 | $ 1,229,337 |
| **Demonstration Projects** | | | | |
| Mandalay Bank Protection Demonstration (XTE-DEMO) | USFWS | SP | NA[e] | $ 298,939[f] |
| Periodic Introduction of Sediment and Nutrients at Selected Diversion Sites (MR-DEMO) | USACE | FD | NA[e] | $ 1,500,000[f] |

[a]Agency: U.S. Environmental Protection Agency (USEPA); National Marine Fisheries Service (NMFS); Natural Resources Conservation Service (NRCS); U.S. Army Corps of Engineers (USACE); and U.S. Fish and Wildlife Service (USFWS).

[b]Project Type: Freshwater Diversion (FD); Sediment and Nutrient Trapping (SNT); Hydrologic Restoration (HR); Barrier Island Restoration (BI); Marsh Creation (MC); Marsh Management (MM); Shoreline Protection (SP); and Vegetation Planting (VP).

[c]Acres Protected/ Created: The net gain in emergent marsh as a result of project implementation as projected by the Environmental Work Group during the Wetland Value Assessment. This figure includes acres of emergent marsh to be protected, created, and restored as a result of project implementation estimated at the time the project was approved by the Breaux Act Task Force.

[d]Current Cost of Phase I Funding Only: Phase I funding will include project planning, design, and 1-year pre-construction monitoring.

[e]NA: Not applicable.

[f]Cost: Fully funded baseline cost.

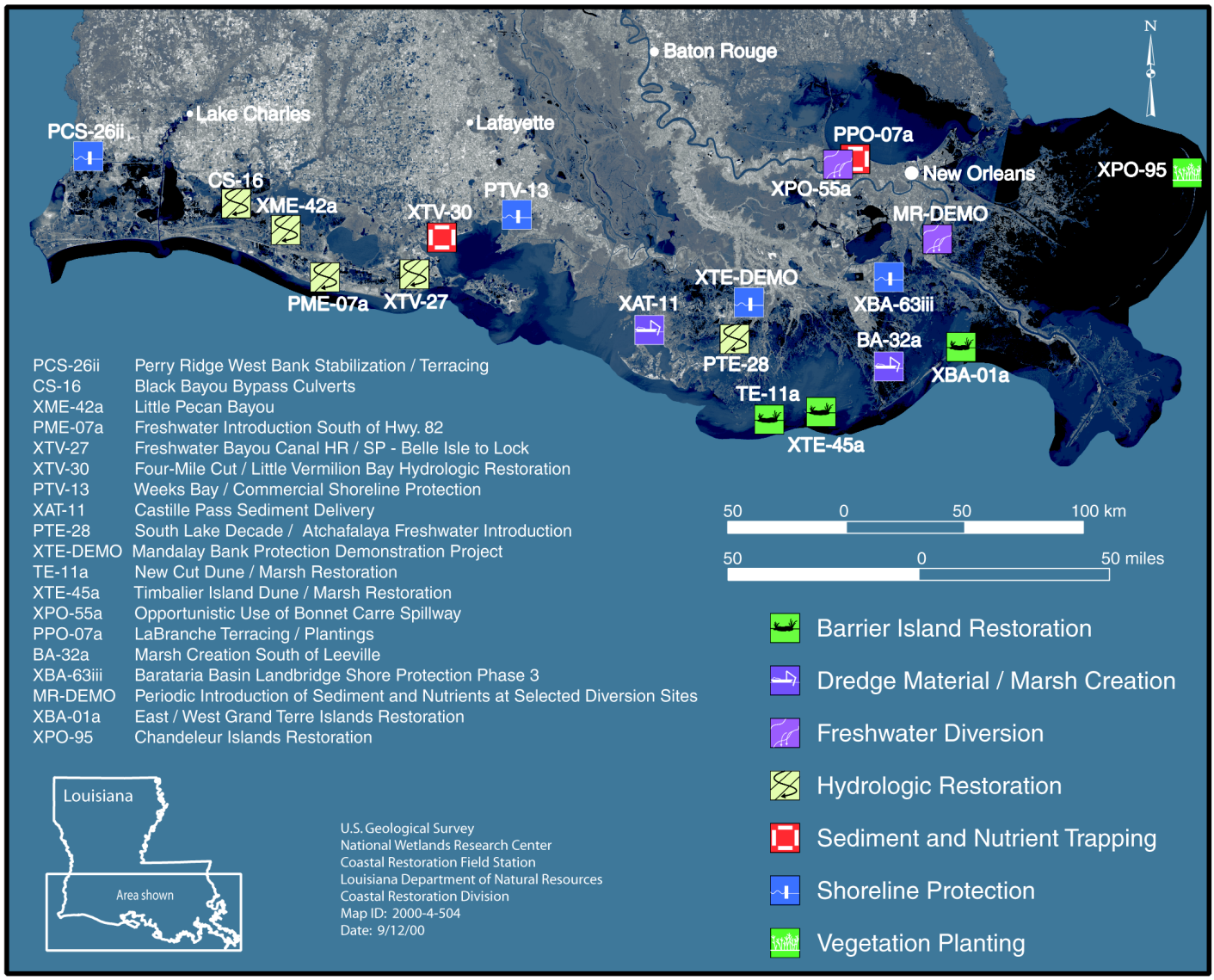



***Figure 5.1*** *Location of Breaux Act projects authorized for Phase I funding on the ninth priority project list on January 11, 2000.*

# *Region 1 Background*

The historical ecology of Region 1 (see figure 3.1, page 9), the Pontchartrain Basin, has been predominantly governed by lake and river processes. Freshwater swamps and marshes were fed and maintained by periodic flooding of rivers like the Amite, Tchefuncte, Bogue Falaya, Pearl, and Mississippi, as well as distributary bayous such as Bayou Manchac. Except for the Mississippi, the rivers of Region 1 discharge into some of Louisiana's largest and most well known lakes: Maurepas, Pontchartrain, and Borgne. Each lake has a particular ecology and hydrology, characterized by its salinity regime and surrounding wetlands. Many of these wetlands, particularly marshes along Lake Pontchartrain, benefit from seasonal lake overflows, but they depend on stable shorelines to protect them from damaging waves and occasional high salinity.

Currently, Region 1 contains approximately 576,500 acres of wetlands (figure 5.2). Between 1932 and 1990, Region 1 lost 74,800 acres of wetlands, an average of 1,290 acres per year (LCWCRTF and WCRA 1998). Lakes Pontchartrain, Borgne, and Maurepas have collectively been referred to as "Louisiana's urban estuary" due to the proximity of these interconnected lakes to metropolitan New Orleans and other increasingly populated areas (Coalition to Restore Coastal Louisiana web site, www.crcl.org). This proximity has made Region 1 particularly vulnerable to human impacts on the landscape. Though designed to bring prosperity while protecting lives and property, the building of levees, navigation canals, and channels has led to alterations in the hydrology of Region 1 and to the breakdown of crucial ecosystem dynamics—the same dynamics of vertical accumulation, estuarine gradients, and system linkages described in the three goals of the Coast 2050 Plan. Salinity pulses and prolonged innundation, the primary stressors of marsh vegetation in coastal Louisiana (Penland et al. 1996), have been exacerbated by human activities.

Levees along river banks protect residents from flood damage, but they isolate marshes and swamps from sediment-rich fluvial and lake water input, increasing the challenge for wetland vegetation to keep up with subsidence. Subsidence is a natural and continual geologic process where poorly consolidated sediment compacts. For Louisiana marshes to be healthy and sustainable and counteract subsidence, they must be supplied with new inorganic sediment and/or must produce organic material to elevate the marsh surface as the soils beneath them compact. Without sufficient inflow of nutrients and sediments, marshes have not been able to keep up with subsidence and have degraded to open water or have been reduced to highly fragmented areas. Breaux Act projects such as Bayou Sauvage Refuge Restoration Phase I (XPO-52a) and Phase II (XPO-52b), Fritchie Marsh Restoration (PO-06), and Bayou Bienvenue Pump Station Diversion and Terracing (XPO-74a) have been authorized to facilitate freshwater input and improve drainage in wetland areas which are in imminent danger of being lost due to stresses associated with changes in hydrologic conditions.

Construction of navigation canals, particularly the Mississippi River Gulf Outlet (MRGO), disrupted the natural estuarine gradient in Region 1 by creating direct access for salt water to move into fresher inland marshes, stressing vegetation and resulting in open water ponds (LDNR, OCRM 1995). In addition to bringing in salt water, the MRGO is responsible for immediate loss along its banks, as large boat wakes eroded the canal from its original width of 700 ft in 1968 to an average of 1,500 ft in 1990—a loss of almost 2,300 acres of wetlands from post-construction bank erosion (USACE 1999).

Many of the lakes in Region 1 are sufficiently large enough that wind-generated waves cause erosion of marsh shorelines. While this is a natural process, such losses are not balanced by marsh creation. When shoreline erosion results in breaches of critical parts of the landscape, such as ridges or natural berms, action must be taken to restore the physical integrity of the wetland system. Breaux Act projects such as the Bayou LaBranche Marsh Creation (PPO-10) project have resulted in the creation of wetlands in an open water area by utilizing dredged material to directly increase the sediment elevation. Additionally, the Bayou Chevee Shoreline Protection (Revised) (XPO-69) project will protect exposed wetlands from wave-induced erosion to prevent the loss of interior wetlands.

Many marshes that once served as land bridges, separating bodies of water and linking gradients of salinity, have fragmented and eroded. As a result, this former mosaic of diverse wetlands is eroding into larger and larger expanses of open water. As habitat diversity declines, plants and animals dependent on historic conditions are jeopardized.

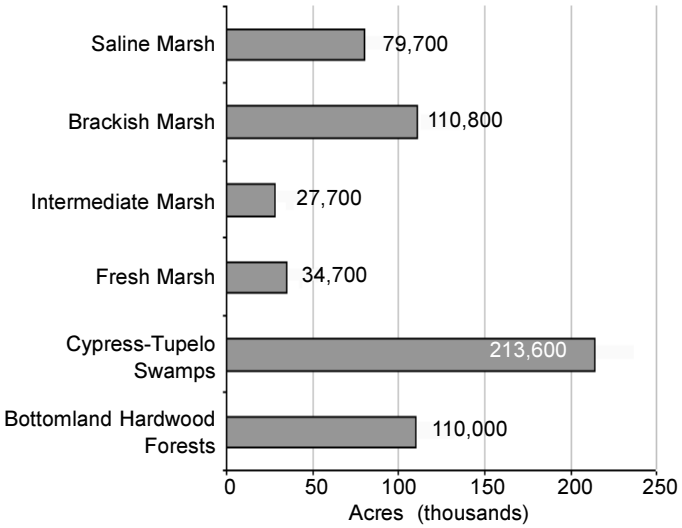



***Figure 5.2*** *Number of acres representing different wetland types in Region 1.*

The Breaux Act projects within Region 1 address some of these key wetland loss issues. Five of the eight projects still authorized on the first eight priority lists in Region 1 are hydrologic restoration projects. The three remaining projects (one each of beneficial use of dredged material, marsh management, and shoreline protection) were designed to address localized problems such as re-creating wetlands using dredge material in an eroded open-water area at Bayou LaBranche or armoring an eroding shoreline along Lake Pontchartrain at the Bayou Sauvage National Wildlife Refuge using rock dikes to protect and preserve the interior wetlands from high energy waves. These projects are itemized in figure 5.3 and table 5.3.

## *Breaux Act Projects in Region 1*

Eleven Breaux Act projects have been authorized from Priority Project Lists 1-8 in Region 1 (table 5.3.; figure 5.3.). These projects were authorized prior to the promulgation of the Regional Ecosystem Strategies of the Coast 2050 Plan and address critical problems identified in the 1993 Restoration Plan (LCWCRTF 1993).

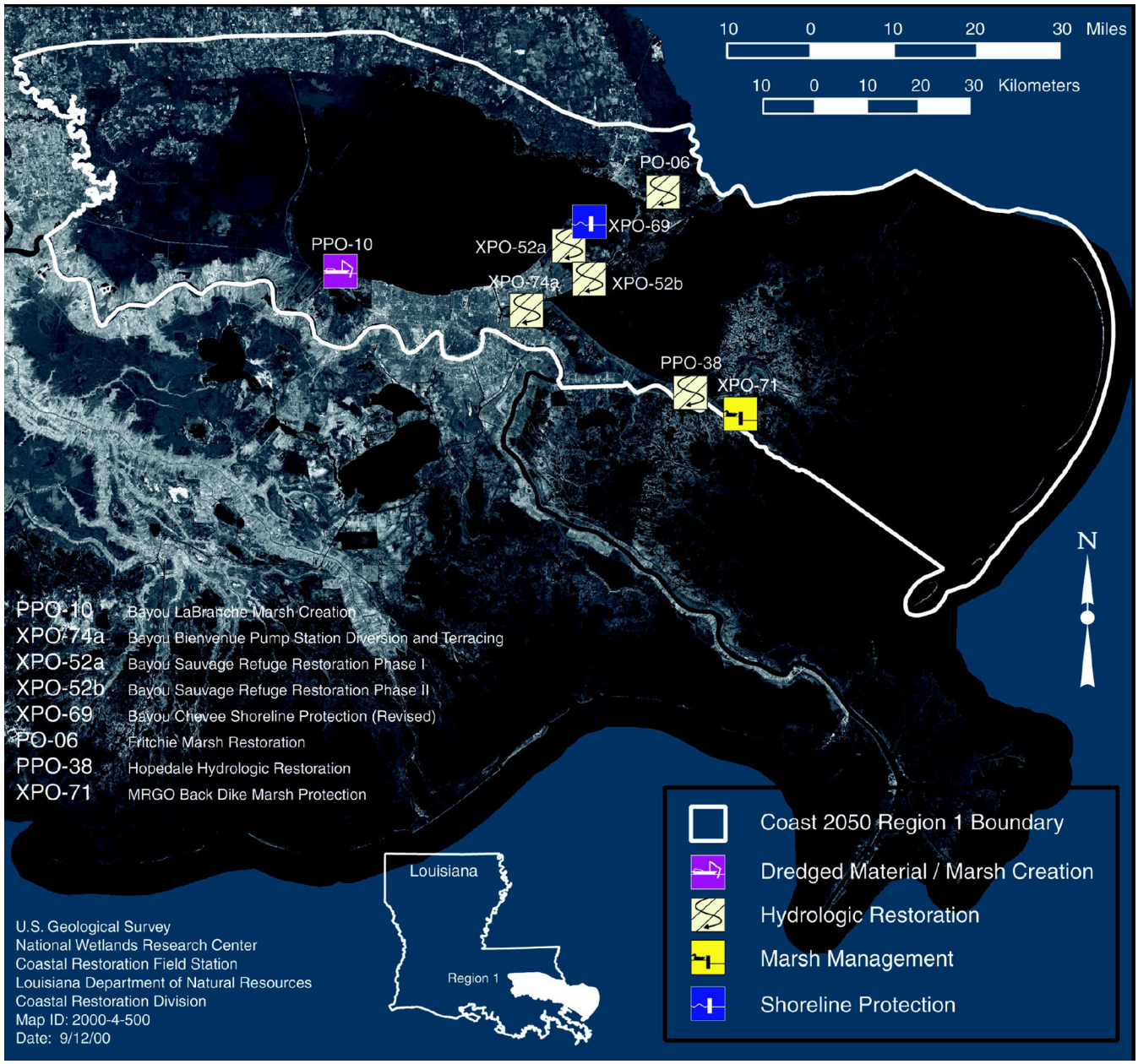


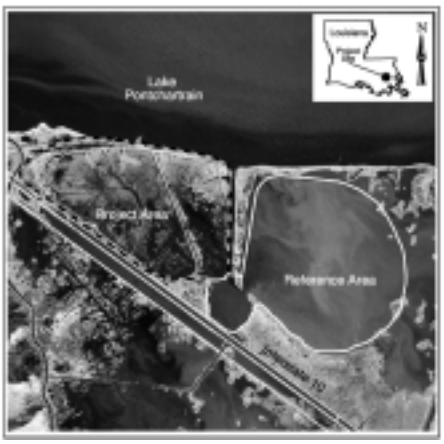

***Figure 5.3*** *Location of Breaux Act projects authorized on project priority lists 1 - 8 in Region 1.*

**Table 5.3.** Projects authorized on Breaux Act priority project lists 1-8 in Region 1.

| | Project Name | Activities[a] Engineering | Landrights | Construction | Monitoring | Operations & Maintenance | Priority List | Agency[b] | Project Type[c] | Year Completed | Anticipated Acres Created/ Restored and Protected[d] | Current Estimated Cost (20 yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Completed Projects** | Bayou LaBranch Marsh Creation (PPO-10) | C | C | C | I | I | 1 | USACE | DM | 1994 | 203 | $ 3,665,519 |
| | ■ Discussed on page 30. | | | | | | | | | | | |
| | Bayou Sauvage Refuge Restoration Phase I (XPO-52a) | C | C | C | I | I | 1 | USFWS | HR | 1996 | 1,550 | $ 1,615,390 |
| | ■ Discussed on page 31. | | | | | | | | | | | |
| | Bayou Sauvage Refuge Restoration Phase II (XPO-52b) | C | C | C | I | I | 2 | USFWS | HR | 1997 | 1,280 | $ 1,634,699 |
| | ■ Discussed on page 32. | | | | | | | | | | | |
| | MRGO Back Dike Marsh Protection (XPO-71) | C | NA | C | NA | NA | 3 | USACE | MM | 1999 | 755 | $ 342,611 |
| | ■ This project was authorized to address loss of fresh marsh on the MRGO disposal area. The project was reduced in scope from the original design (to repair breaches in earthen and rock dikes) to repair a shorter reach of earthen dikes and was completed by the USACE in January 1999. | | | | | | | | | | | |
| **Projects in Progress** | Fritchie Marsh Restoration (PO-06) | C | I | I | I | NI | 2 | NRCS | HR | 2000* | 1,040 | $ 2,933,808 |
| | ■ This project was authorized to address imminent marsh loss caused by alterations in the natural hydrology. The implementation of this project will restore a more natural hydrologic regime to a wetland area near Slidell by facilitating the input of fresh water into the wetlands from Salt Bayou and upland fresh water runoff from around the town of Slidell. | | | | | | | | | | | |
| | Bayou Chevee Shoreline Protection (Revised) (XPO-69) | C | C | NI | I | NI | 5 | USACE | SP | 2000* | 75 | $ 2,418,904 |
| | ■ The scope of this project has been revised from the original design as a Beneficial Use of Dredged Material project after consultation with personnel from Bayou Sauvage NWR. The revised project will protect this new exposed wetland area from erosive wave energy from Lake Pontchartrain utilizing two sections of rock dikes (totaling 5,700 linear ft) to protect marsh surrounding shallow open-water coves northwest and southeast of Bayou Chevee. | | | | | | | | | | | |
| | Hopedale Hydrologic Restoration (PPO-38) | I | I | NI | I | NI | 8 | NMFS | HR | 2001* | 134 | $ 2,432,958 |
| | ■ This project will abate site-specific wetland loss by replacing collapsed culverts installed in the 1950's near Yscloskey. These degraded water control structures are currently preventing the drainage of high tides and stormwater runoff, resulting in impounded water on the marsh. | | | | | | | | | | | |
| | Bayou Bienvenue Pump Station Diversion and Terracing (XPO-74a) | I | I | NI | NI | NI | 8 | NMFS | HR/ MC | 2001* | 442 | $ 3,894,916 |
| | ■ This project combines the use of existing pump stations with the construction of a 2,500-ft long diversion channel, water control structures, and earthen terraces planted with cordgrass to force the flow of fresh water and nutrients through a deteriorated marsh area adjacent to Paris Road and Bayou Bienvenue to abate site-specific marsh loss. | | | | | | | | | | | |
| **Deauthorized Projects** | Red Mud Coastal Restoration Demonstration (XTE-43) | C | C | C | I | NI | 3 | USEPA | MC | Deauthorized | NA | $ 470,500 |
| | ■ This collaborative effort with Kaiser Aluminum was to determine whether red mud, produced as a by-product of removing alumina from bauxite, could be utilized as marsh creation material in combination with compost and marsh sediment. Due to unexpected problems with the fill material, tears in the experimental unit liners, and contaminants in the water source, this project is currently pending deauthorization. | | | | | | | | | | | |
| | Eden Isles East Marsh Restoration (PPO-4) | I | NI | NI | NI | NI | 4 | NMFS | HR | Deauthorized | NA | $ 38,919 |
| | ■ There was a change in landowners of the project area during the planning phase of this project. The new landowner chose not to participate in the restoration program. | | | | | | | | | | | |
| | Violet Freshwater Distribution (PO-09a) | I | I | NI | NI | NI | 3 | NRCS | HR | Deauthorized | NA | $ 1,862,562 |
| | ■ This project was authorized to manage the distribution of fresh water from the existing state-funded Violet Siphon (PO-01) project. The implementation of this project will conserve and enhance vegetated wetlands by distributing available fresh water from the Mississippi River and municipal storm water pumping stations into adjacent wetlands. Based on findings from pre-construction geotechnical investigations, the required design revisions made this project economically unjustifiable. This project is currently pending deauthorization. | | | | | | | | | | | |

[a]Activities: Initiated (I); Completed (C); Not Initiated (NI); or Not Applicable (NA).
[b]Agency: U.S. Environmental Protection Agency (USEPA); National Marine Fisheries Service (NMFS); Natural Resources Conservation Service (NRCS); U.S. Army Corps of Engineers (USACE); and U.S. Fish and Wildlife Service (USFWS).
[c]Project Type: Beneficial Use of Dredged Material (DM); Hydrologic Restoration (HR); Marsh Creation (MC); Marsh Management (MM); and Shoreline Protection (SP).
[d]Acres Created/ Restored and Protected: The net gain in emergent marsh as a result of project implementation as projected by the Environmental Work Group during the Wetland Value Assessment. This figure includes acres of emergent marsh to be protected, created, and restored as a result of project implementation estimated at the time the project was approved by the Breaux Act Task Force.
*: Anticipated construction date.

# *Bayou LaBranche Marsh Creation (PPO-10)*




*PP0-10 project area location.*

## Problem:

- Construction of Interstate 10 (with its associated construction access canals) and the Illinois Central Railroad and an abandoned agricultural development resulted in altered hydrology and increased salinity.
- An unnamed hurricane in 1915 and Hurricane Betsy (1965) caused salt water to overflow the banks of Lake Pontchartrain and flow unchecked through canals, resulting in excessive salt water on the marsh and subsequent loss of intermediate marsh vegetation.

## Proposed Solution:

- New emergent marsh was created by depositing 2.7 million $yd^3$ of sediments dredged from Lake Pontchartrain within an earthen containment berm. The project goal was to create an area of 70% land and 30% water within 5 years of construction.
- Water drainage and ingress/egress of aquatic organisms was facilitated by constructing culverts in the eastern side of the project area.
- Project effectiveness will be determined by monitoring sediment elevation and compaction rates, vegetation, and water quality.

Photo by LDNR

*Oblique aerial photograph showing vegetation colonizing area filled with dredged material.*

Photo by LDNR

*Dredged material being pumped into project area.*

## Progress to Date:

- As of January 1999, sediment elevation was within target range at all monitoring stations.
- Land/water analysis in 1997 showed 300 acres of open water had been converted to land 3 years after construction was completed in 1994.
- As of 1997, the project had created 80% land and 20% water, which is well within the target schedule.

## Challenges for the Future:

- Sediment elevations have declined at a slower than expected rate, yielding less marsh grasses and more trees and shrubs than planned. It is expected that sediments will continue to settle and yield more marsh vegetation, therefore achieving the target land to water ratio.
- Exchange between the constructed wetland and the outside estuary has been restricted in the past. It will be maintained in the future, which should increase sediment consolidation.

*This project summary was synthesized from the project's finalized Monitoring Plan (LDNR 1998a) and the project's most recent Monitoring Series Progress Report (Troutman and Gaudet 1999). More information about this project is available on the Internet at the CRD website, www.saveLAwetlands.org, and the Breaux Act website at www.lacoast.gov.*

# *Bayou Sauvage Refuge Restoration Phase I*
*(XPO-52a)*


*XPO-52a project area location.*

## Problem:

- Construction of U.S. Highway 90, canals, railroads, and hurricane protection levees hydrologically isolated historically brackish marsh from Lake Borgne.
- Inadequate water inflow and poor drainage subjected the area to periods of prolonged flooding and occasional drying, causing loss of wetland habitat.

## Proposed Solution:

- Pumps were installed in northern and southern units of project area to drain excess water from spring flooding, promoting the growth of fresh marsh vegetation and protecting black willow habitat.
- The effectiveness of this project will be determined by monitoring vegetation and water levels in both project units and in the reference area over spring-summer and fall-winter periods.

## Progress to Date:

- Water levels in the north unit were within target range approximately 57% of the time, and water levels in the south unit were within target range less than 10% of the time. Water levels were below the target range much of the time due to drought-induced low water conditions. Mechanical problems with the pumps in the south unit impeded management efforts.
- Emergent marsh vegetation increased between 1996 and 1997 based on monitoring surveys.
- Habitat analysis from aerial photography taken 7 months after project construction shows 297 acres were converted from open water to fresh marsh between 1993 and 1996. Forested wetlands, including black willow habitat, increased by 35 acres.

## Challenges for the Future:

- Isolate project effects from seasonal, meteorological effects.
- Incorporate adaptive management strategies in the operation plan to address seasonal weather extremes.

*Photo by LDNR*

*Pumps drain excessive water from the project area.*

*Photo by LDNR*

*Project area during low water conditions in February 2000.*

# *Bayou Sauvage Refuge Restoration Phase II*
## *(XPO-52b)*

*XPO-52b project area location.*

### Problem:
- Construction of Interstate 10, a railroad, and hurricane protection levees hydrologically isolated this historically brackish marsh from Lake Pontchartrain.
- Inadequate water flow and poor drainage subjected the area to periods of prolonged flooding and occasional drying causing loss of wetland habitat.

### Proposed Solution:
- Pumps were installed in the project area to lower water levels during the growing season to promote the growth of vegetation.
- Project effectiveness will be determined by monitoring water levels and vegetation in the project and reference areas over spring-summer and fall-winter periods.

### Progress to Date:
- A vegetation survey in 1997 indicated dry conditions conducive to marsh plant growth. Dry conditions are probably due more to low precipitation than project effects. Water levels were naturally low and pumps were only used once in the spring-summer.
- Target water levels were achieved approximately 32% of the time in spring-summer and 48% of the fall-winter period. Water levels were below the target range much of the time due to drought-related low water levels.

### Challenges for the Future:
- Isolate project effects from seasonal meteorological effects.
- Incorporate adaptive management strategies in the operation plan to address seasonal weather extremes.


*Photo by LDNR*

*Project area during low water conditions in April 1999.*


*Photo by LDNR*

*Water levels are monitored regularly at several locations within the project area.*

*This project summary was synthesized from the project's finalized Monitoring Plan (LDNR 1998c), the project's most recent Monitoring Series Progress Report (Troutman 1998), and unpublished data. More information about this project is available on the Internet at the CRD website, www.saveLAwetlands.org, and the Breaux Act website at www.lacoast.gov.*