Coastal Restoration Division
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STATE OF LOUISIANA
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A report of:

Louisiana Department of Natural Resources
Coastal Restoration Division
Database Analysis Section

Acknowledgments:

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The purpose of this document is to provide the public with easily accessible information about projects constructed to date and the current efforts to address Louisiana's coastal land loss problem. The information contained in this report is current through December 1998. For more detailed information on these projects, or other relevant efforts, please refer to:

Coast 2050: Toward a Sustainable Coastal Louisiana
Louisiana Coastal Wetlands Conservation Plan
1998 Status Report for Coastal Wetlands Conservation and Restoration Program
The 1997 Evaluation Report to the U.S. Congress on the Effectiveness of Louisiana Coastal Wetland Restoration Projects

For more information on project monitoring:
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On the cover...flock of white pelicans in a Cameron Parish, Louisiana wetland

COASTAL RESTORATION IN LOUISIANA

Louisiana currently experiences 80% of the nation's coastal wetland loss, at an average rate of 25 to 35 square miles per year (Figures 1 and 2). Areas that were once healthy and viable wetlands are becoming open water at an alarming rate. It is estimated that it could cost the nation $36.6 billion from lost public use value over the next 50 years if this trend of wetland loss continues (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority, 1998).

The state of Louisiana has initiated a series of programs to offset this dramatic wetland loss. The Louisiana State and Local Coastal Resources Management Act was passed in 1978 and established a state coastal management program which oversees the regulation of developmental activities which effect wetland loss. The resulting Louisiana Coastal Resources Program became a federally approved coastal zone management program in 1980. In 1989, the Louisiana Legislature passed Act 6 of the second extraordinary session (R.S. 49:213-214) and a subsequent constitutional amendment which created the Coastal Restoration Division (CRD) within the Louisiana Department of Natural Resources. Act 6 also established the Wetland Trust Fund, which provides revenues derived from oil and gas activities to wetland restoration in Louisiana. This legislation also resulted in the first Wetland Restoration Plan for the state of Louisiana.

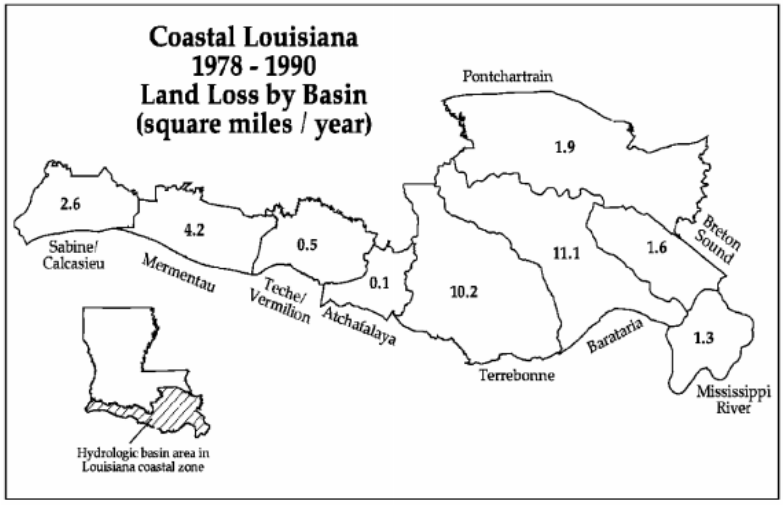


Figure 1. Coastal Louisiana land loss (square miles / year) by basin from 1978 to 1990 (Barras et al., 1994 [1]).

In 1990, the U.S. Congress recognized the national significance of wetland loss in Louisiana and passed the Coastal Wetlands Planning, Protection, and Restoration Act (Breaux Act)(Public Law 101-646, Title III) to contribute federal monies to state restoration activities. The Breaux Act dedicates approximately $40 million per year to wetland restoration projects in Louisiana. The Breaux Act also created a partnership between Louisiana and five federal agencies: U.S. Departments of Army, Agriculture, Commerce, and Interior, and the U.S. Environmental Protection Agency. The state of Louisiana and these federal partners worked together to create a comprehensive restoration plan which has recently been replaced by "Coast 2050," to be discussed later.

The Breaux Act program includes project monitoring to determine the effects of the restoration projects. CRD's Biological Monitoring and Database Analysis Sections cooperate with federal, state, and local agencies to monitor and evaluate all restoration projects. The type of monitoring activity varies depending on the type of project and its specific goals and objectives. Breaux Act projects are typically monitored over the 20-year project life.

[1]Barras, J.A., P.E. Bourgeois, and L.R. Handley. 1994. Land loss in coastal Louisiana 1956-1990. National Biological Survey, National Wetlands Research Center Open File Report 94-01.

The Breaux Act also mandated that Louisiana develop a Coastal Wetlands Conservation Plan with the goal of no net loss of coastal wetlands from developmental activities. The Coastal Management Division (CMD) is responsible for permitting, monitoring and enforcement of regulated activities within the coastal zone to ensure that wetlands are created or enhanced in compensation for those lost from these activities. The plan also provides a supplement to the federal Wetland Reserve Program, encouraging farmers to convert farmland back into wetlands.

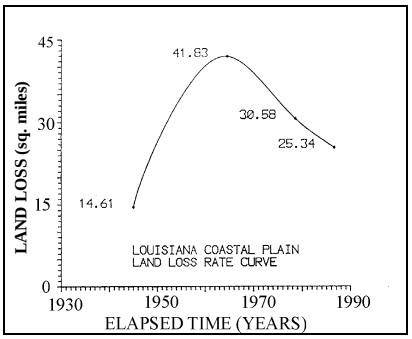


Figure 2. Wetland loss rates of the entire Louisiana coastal area expressed in square miles per year (after Dunbar et al. 1992[2]).

Through the Water Resources Development Act (WRDA), the U.S. Congress authorized the U.S. Army Corps of Engineers to construct large-scale diversion projects along the Mississippi River, such as the Caernarvon and Davis Pond Freshwater Diversion projects located near New Orleans.

In addition to the state-funded and Breaux Act-funded programs, several other wetland restoration programs have been created, each focusing on a specific component of Louisiana's wetland loss problem. These programs include: the Parish Coastal Wetlands Restoration Program (Christmas Tree Program); the Department of Natural Resources (DNR)/Natural Resources Conservation Service (NWRC)/Louisiana Department of Agriculture and Forestry, Office of Soil and Water (SWCC) Vegetation Planting Program; and the WRDA Sections 204 and 1135 beneficial use of dredged material programs.

In 1997, a significant planning effort was initiated to combine elements of these previous coastal restoration initiatives in Louisiana, called "Coast 2050." Coast 2050 incorporated initiatives from private citizens, local governments, state and federal agencies, and the scientific community to modify the 1993 Restoration Plan and align the efforts of these other programs to restore and protect coastal wetlands in Louisiana towards a common goal of sustainability.

The Coast 2050 effort has been affirmed by the adoption of the plan by the Louisiana Coastal Wetlands Conservation and Restoration Task Force (Breaux Act Task Force) and the Wetlands Conservation and Restoration Authority (State Wetlands Authority) as their official restoration plan. It also has the support of the 20 coastal parish councils and police juries within the coastal zone.

The Louisiana Department of Natural Resources and its partners on the Breaux Act Task Force and the State Wetlands Authority have implemented projects throughout coastal Louisiana that are already making a difference. These projects are reducing coastal erosion, providing improved habitat conditions for coastal fisheries and wildlife species, and in some cases are actually building new wetlands.

This report describes the coastal restoration projects completed or nearing completion in the four Coast 2050 regions from 1987 - 1999. It includes results from monitoring data collected through the CRD monitoring program. *Together with our federal and local partners, we are making a difference in the war against coastal land loss.*

Coast 2050 Strategic Goals

Goal 1: *Assure vertical accumulation to achieve sustainability*

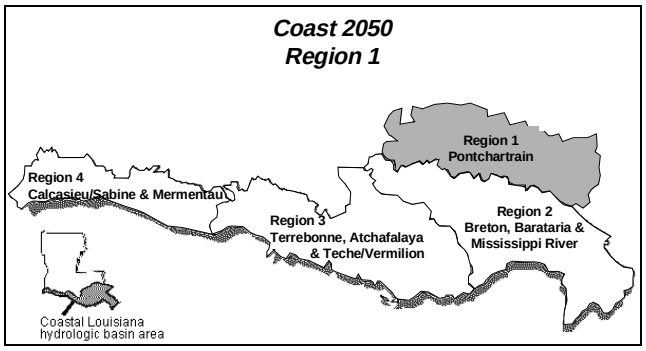
Goal 2: *Maintain estuarine gradient to achieve diversity*

Goal 3: *Maintain exchange and interface to achieve system linkages*

[2]Dunbar, J.B., L.D. Britch, and E.B. Kemp, III. 1992. Land loss rates: report 3, Louisiana coastal plain. Technical Report GL-90-2, U.S. Army Corps of Engineers District, New Orleans, La. 28 pp.

REGION 1

Region 1 encompasses the Lake Pontchartrain basin, extending from the Mississippi River on the west, to the Prairie Terrace on the north, to the Chandeleur Islands on the east, and the Mississippi River Gulf Outlet (MRGO) on the south. It covers all or part of the following parishes: Livingston, Tangipahoa, St. Tammany, St. Bernard, Orleans, Jefferson, St. Charles, St. John the Baptist, St. James, and Ascension.



Region 1 contains 576,570 acres of coastal wetlands which consist of: approximately 110,000 acres bottomland hardwood; 213,570 acres swamp; 34,700 acres fresh marsh; 27,700 acres intermediate marsh; 110,900 acres brackish marsh; and 79,700 acres saline marsh.

Lakes Pontchartrain, Maurepas and Borgne are the dominant hydrologic features within the region. The Amite and Tickfaw rivers, as well as Bayou Manchac, drain into Lake Maurepas. These contribute to significant water movement within the area. Lake Pontchartrain is affected by freshwater inflows from Pass Manchac, North Pass, and the Tangipahoa, Tchefuncte, and Bogue Falaya rivers, and the Bonnet Carrè Spillway. Major navigation channels include the MRGO and the Gulf Intracoastal Waterway (GIWW).

The construction of the MRGO in the early 1960s caused wetland loss in Region 1 both in the immediate vicinity (from the actual dredging to create the channel) and in more remote areas such as the Pontchartrain/ Maurepas Land Bridge (from the saline water it conveyed into the region). Marshes east of New Orleans have lost significant amounts of marsh due to levee-induced ponding of water. Other major causes of land loss have been shoreline erosion, subsidence, and altered hydrology.

The most critical concerns from parish governments and the public are preserving the present habitats and current levels of productivity. Near the Manchac and North Shore areas, and around the Pearl River mouth, conversion of some intermediate and brackish marsh to fresh marsh is needed. Open water in the interior of the forested wetlands near Lake Maurepas is also recommended for reconversion back to forested wetland. Forested wetlands in the Central Wetlands are also denoted for expansion. Some of the saline Biloxi marshes are recommended for conversion to brackish marsh.

Specific regional ecosystem strategies, identified in the Coast 2050 process, to attain these goals include: (1) restoring swamps by utilizing small Mississippi River diversions and related flood protection, where needed; (2) restoring and sustaining marshes utilizing several small river diversions, and dedicated delivery of sediment; (3) protecting the integrity of the shorelines of Lakes Pontchartrain and Borgne and the Biloxi marshes; (4) restoring and maintaining the Chandeleur Islands; and (5) maintaining the Eastern Orleans Land Bridge by marsh creation and shoreline protection. These and other ecosystem strategies are shown in Figure 3.

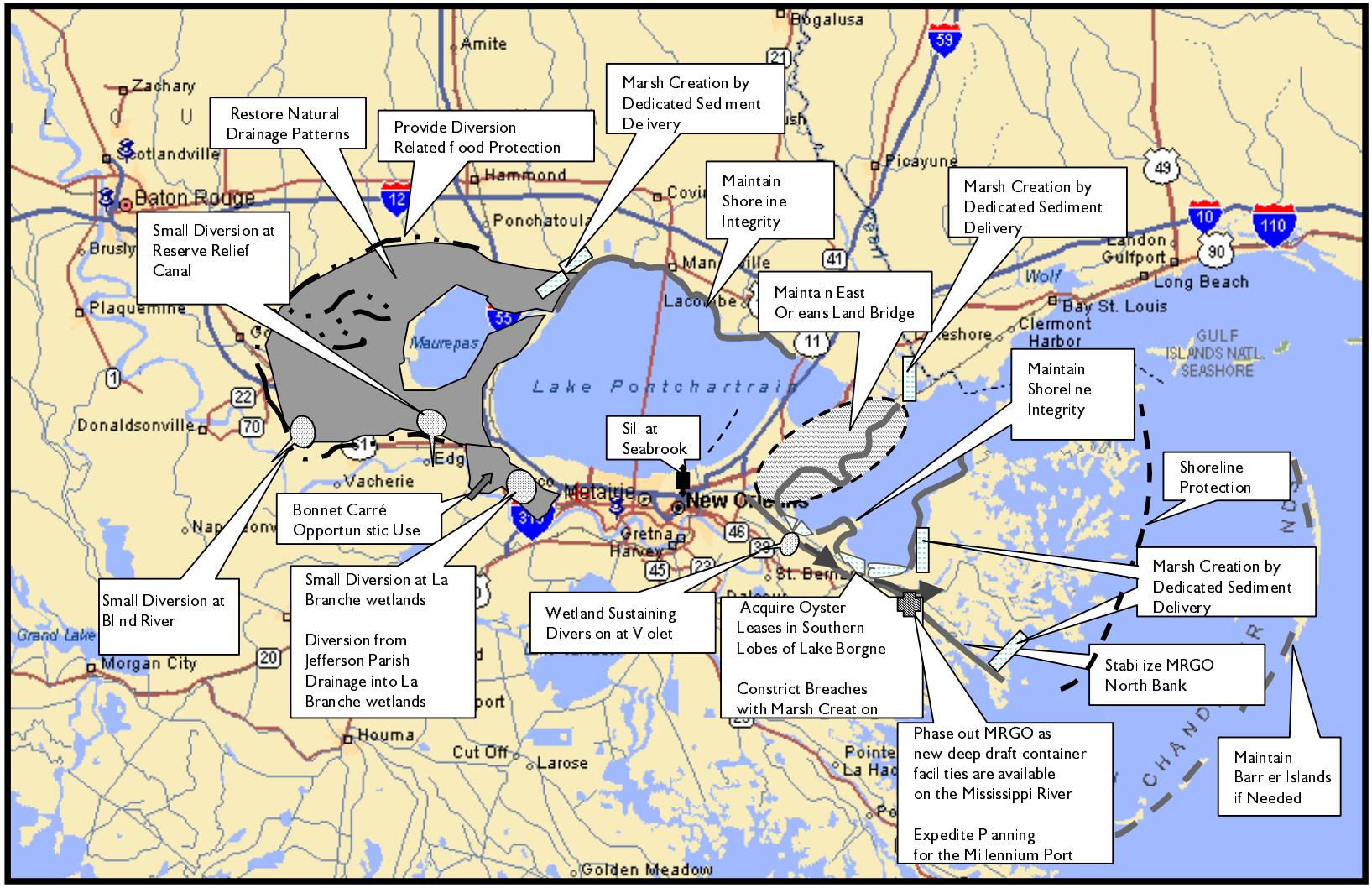


Figure 3. Coast 2050 Region 1 ecosystem strategies (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority, 1998).

REGION 1 MONITORING RESULTS

Restoration projects that have already been implemented or are under construction have contributed to the stability and sustainability of this area. Region 1 lost approximately 14,592 acres between 1978 and 1990, an average of 1,216 acres of wetlands per year (Barras et al., 1994). By the end of 1999, projects will have been implemented at 27 locations in Region 1.

BREAUX ACT (CWPPRA)

Six projects have been implemented under the direction of the Breaux Act (figure 4 and table on page 10).

Three projects which will address imminent marsh loss due to changes in natural hydrology include Fritchie Marsh (PO-06), and Bayou Sauvage Hydrologic Restoration projects, Phases 1 (PO-16) and 2 (PO-18). These projects will improve hydrology and contribute to the protection of the land bridges between Lakes Pontchartrain and Borgne.

The dedicated dredging project, Bayou La Branche Wetland (PO-17), involved filling an open-water area with material dredged from Lake Pontchartrain. Approximately 284 acres of emergent marsh were created based on aerial photography analysis from 1993 and 1997 conducted through the Breaux Act monitoring program. Monitoring data also indicate that the area was converted from 18.5% land/ 81.5% open water in 1993 to 81.7% land/18.3% open water in 1997. Approximately 51% of the area is now emergent marsh and 31% is scrub/shrub.

The marsh management project, MRGO Back Dike Marsh Protection (PO-19), involves hydrologic modifications that result in conditions conducive to a productive fresh marsh. This project will aid in the prevention of continued bank erosion along the Mississippi River Gulf Outlet, and preserve critical areas where wetland loss is imminent.

Aerial photography of LaBranche wetlands in 1993 (top) and 1997 (bottom) showing wetland area created by the Bayou LaBranche Wetland Breaux Act project.

The Bayou Chevee project (PO-22) is designed to prevent erosion on the shoreline of Lake Pontchartrain. This project involves building rock dikes to create favorable conditions for submerged aquatic vegetation growth. The recently approved Breaux Act component of this project will increase overall benefits to the area.

NON-BREAUX ACT

State

Six projects have been implemented by the Coastal Restoration Division and funded by the Wetlands Trust Fund (figure 5 and table on page 10). The two freshwater diversion projects [Violet Siphon (PO-01) and Central Wetlands(PO-08)] have addressed the problems of increased salinity and reduced sediment and nutrient input by restoring input of fresh water, nutrients and sediment into selected areas.

Four shoreline protection projects [Bayou Chevee (PO-02c), La Branche Shoreline (PO-03 and PO-03b), and Turtle Cove (PO-10)] have addressed the issue of erosion along critical areas of the Lake Pontchartrain shoreline. CRD monitoring information indicated that during the 12 month period between December 1995 and 1996, the shoreline position in the Turtle Cove project area prograded an average of 6.0 feet, while during the same 12 month period, erosion averaging -33.4 feet occurred in the adjacent reference area. Monitoring data collected also indicate that during the 26 month period from October 1994 to December 1996, the shoreline in the project area prograded an average of 23.4 feet, creating more than 5 acres of new wetlands and contributing to the accretion of 0.25 feet of sediment.

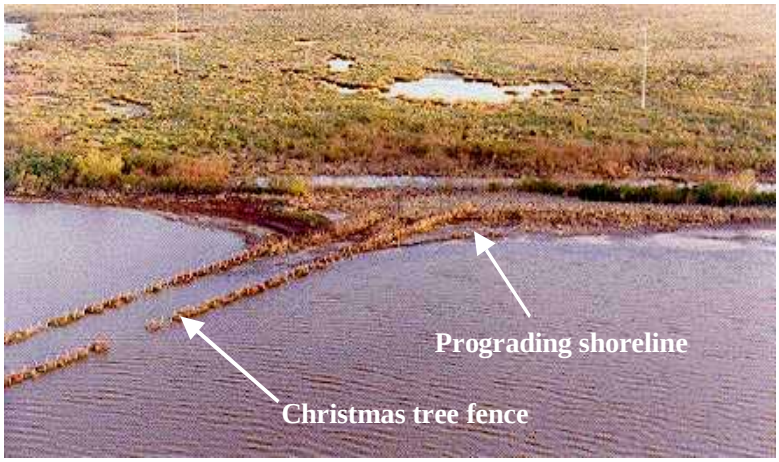
Turtle Cove shoreline protection project along Lake Pontchartrain in October 1994 (top) and June 1995 (bottom).

Parish Coastal Wetlands Restoration Program

Wooden enclosures built in close proximity to the shoreline are filled with recycled Christmas trees. By absorbing wave energy, the fences protect existing marsh vegetation and create conditions favorable for sediment deposition and subsequent colonization and growth of new marsh vegetation. Projects include Crab Pond, Goose Point, La Branche, and The Prairie.

Elevation surveys at the La Branche Christmas tree project indicate an accumulation of up to 0.35 feet of sediment during the first two years, and the creation of approximately three acres of new wetlands.

Through volunteering and donating trees, people of all ages become more aware of our coastal issues. Since 1990, approximately 5,894 linear feet of fences have been built. Christmas tree fences are relatively inexpensive, with an average cost of $50 per linear foot in Pontchartrain Basin.



Christmas tree fence at LaBranche.

DNR/NRCS/SWCC Vegetation Planting Program

DNR/NRCS/SWCC Vegetation Planting projects have been implemented at ten sites (see table on page 10). Some sites have been planted in phases covering several project years. These projects include Bayou Bienvenue, Goose Point, La Branche, Madisonville Lighthouse, The Prairie, Turtle Cove, MRGO-North Shore, Hog Island, Amite River, and West Lake Pontchartrain.

Since 1988, more than 49,317 plants have been installed (72% have been smooth cordgrass, *Spartina alterniflora*) along more than 158,000 linear feet of shoreline. Projects such as the 1998 plantings at Goose Point have shown an increase in lateral spread of the vegetation by as much as 19 inches during the first growing season.

Section 204/1135

One Section 204 beneficial use of dredge material project is currently planned along the Mississippi River Gulf Outlet (MRGO) from Mile 11 to Mile 14. This project will utilize dredged material from routine maintenance of the MRGO to create approximately 50 acres of new wetlands. Construction on this project began in 1998 and will be completed before the end of 1999. Several other similar projects are also planned for the MRGO; however, their benefitted areas are within Region 2 and will be discussed later.


Vegetation planted in St. Tammany parish.

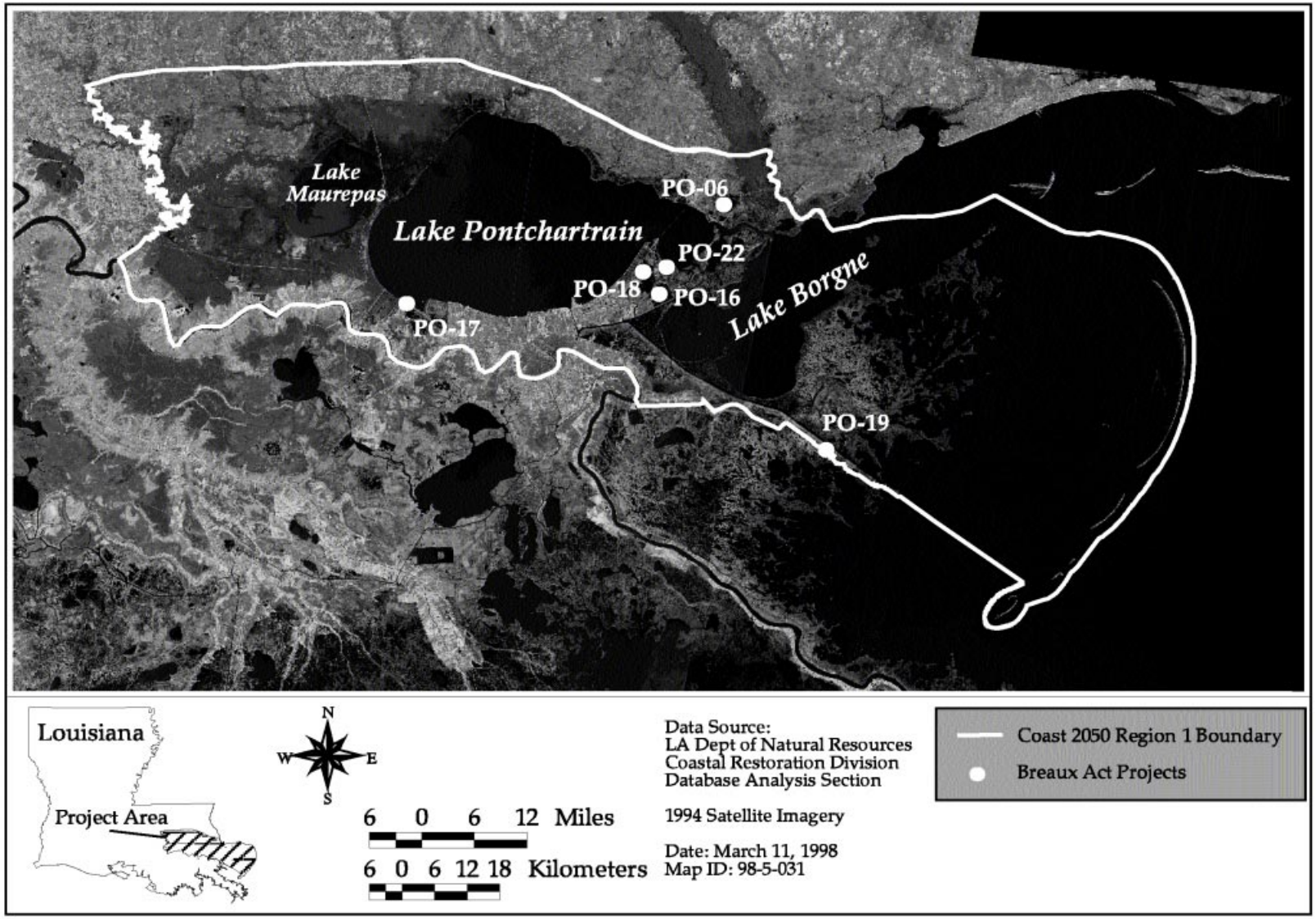


Figure 4. Location of completed or pending Breaux Act projects in Coast 2050 Region 1.

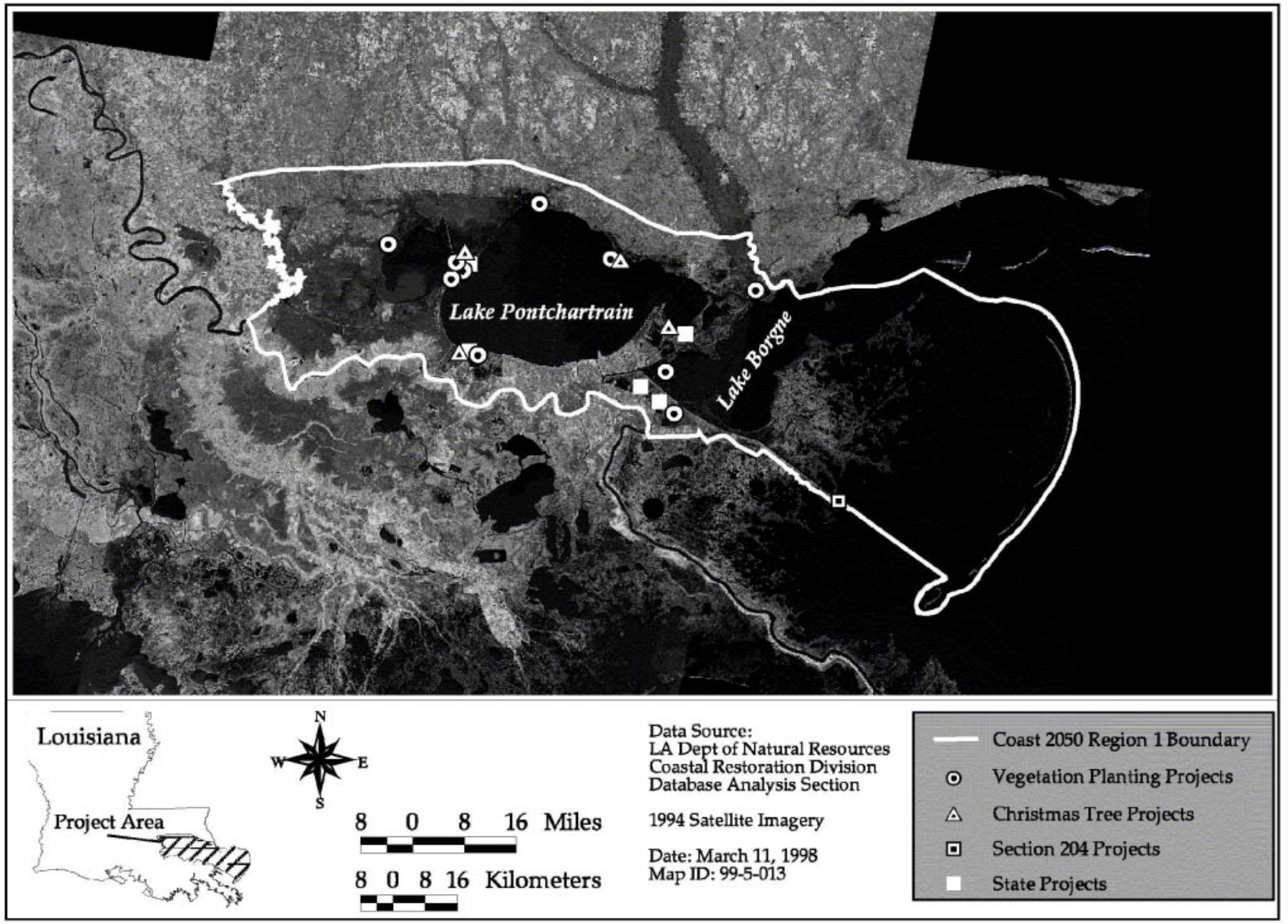


Figure 5. Location of completed or pending non-Breaux Act projects in Coast 2050 Region 1.

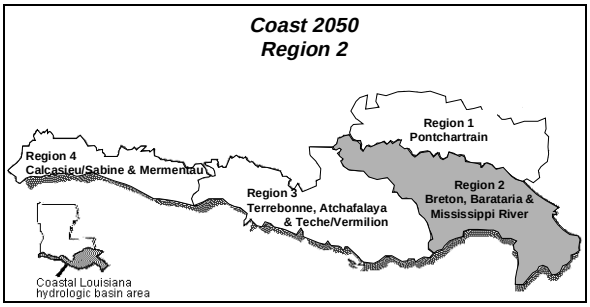
REGION 1 COMPLETED OR PENDING RESTORATION PROJECTS

Restoration Program	Project Name	Project Type	Year Completed	Parish
Breaux Act	Bayou Sauvage Hydrolic Restoration Phase 1, PO-16	Hydrologic Restoration	1996	Orleans
Breaux Act	Bayou Sauvage Phase 2, PO-18	Hydrologic Restoration	1997	Orleans
Breaux Act	Fritchie Marsh, PO-06	Hydrologic Restoration	1999*	St. Tammany
Breaux Act	Bayou La Branche Wetland, PO-17	Beneficial Use of Dredge Material	1994	St. Charles
Breaux Act	MRGO Back Dike Marsh Protection, PO-19	Marsh Management	1999*	St. Bernard
Breaux Act	Marsh Creation at Bayou Chevee, PO-22	Shoreline Protection	1999*	Orleans
State	Violet Siphon, PO-01	Freshwater Diversion	1992	St. Bernard
State	Central Wetlands, PO-08	Freshwater Diversion	1992	St. Bernard
State	Bayou Chevee, PO-02c	Shoreline Protection	1994	Orleans
State	La Branche Shoreline Stabilization and Canal Closure, PO-03	Shoreline Protection	1987	St. Charles
State	La Branche Shoreline, PO-03b	Shoreline Protection	1996	St. Charles
State	Turtle Cove, PO-10	Shoreline Protection	1994	St. John
PCWRP	Crab Pond	Christmas tree fence	1991,1997, 1998	Orleans
PCWRP	Goose Point	Christmas tree fence/ Gabion	1991, 1992, 1998	St. Tammany
PCWRP	La Branche	Christmas tree fence	1991, 1996, 1998	St. Charles
PCWRP	The Prairie	Christmas tree fence/ Vegetation	1991, 1996, 1997, 1998	Tangipahoa/ St. John
Vegetation	Amite River	Vegetation	1999*	Livingston
Vegetation	MRGO - North Shore	Vegetation	1995	St. Bernard
Vegetation	Bayou Bienvenue	Vegetation	1996	St. Bernard
Vegetation	La Branche	Vegetation/Sediment Fence	1991, 1992, 1994, 1996, 1998	St. Charles
Vegetation	Turtle Cove	Vegetation	1987, 1996	St. John
Vegetation	The Prairie	Vegetation	1997, 1998	St. John
Vegetation	West Lake Pontchartrain	Vegetation	1999*	St. John
Vegetation	Madisonville Lighthouse	Vegetation	1988	St. Tammany
Vegetation	Goose Point	Vegetation	1991, 1993, 1994, 1995, 1996, 1997, 1998	St. Tammany
Vegetation	Hog Island	Vegetation	1999*	St. Tammany
Section 204	MRGO, Mile 14 to 11	Beneficial Use of Dredge Material	1999*	St. Bernard

Breaux Act = Coastal Wetlands Planning, Protection and Restoration Act, also known as CWPPRA
State = Restoration projects funded entirely by the State of Louisiana through the Coastal Restoration Division
PCWRP = Parish Coastal Wetlands Restoration Program (Christmas Tree Program)
Vegetation = DNR/NRCS/SWCC Vegetation Planting Program
Section 204 = Section 204 beneficial use of dredged material projects
* = anticipated date

REGION 2

Region 2 includes the Breton Sound and Barataria Basins and the Mississippi River Birdsfoot Delta. It stretches from the Mississippi River Gulf Outlet (MRGO) on the east, to Bayou Lafourche on the west, and from the Mississippi River on the north to the Gulf of Mexico on the south. It covers all or part of the following parishes: St. Bernard, Plaquemines, Jefferson, Lafourche, St. Charles, St. James, St. John the Baptist, and Assumption.



This region is divided into three basins (Breton Sound, Barataria, and Mississippi River Birdsfoot Delta). Fresh marshes occur in the north, with a band of intermediate marshes to the south. The central portion contains brackish marshes, and saline marshes fringe the Gulf of Mexico and Breton Sound. The southern end of the Barataria Basin is bounded by a series of barrier headlands, islands and shoreline. Region 2 contains 894,700 acres of coastal wetlands which are classified as approximately: 90,000 acres of bottomland hardwood forests; 146,000 acres of cypress-tupelo swamps; and 220,100 acres of fresh; 73,000 acres of intermediate; 214,500 acres of brackish; and 151,100 acres of saline marshes.

This region is experiencing some of the highest rates of land loss across the Louisiana coast. Factors contributing to this deterioration include: altered hydrology; nutria herbivory; wind-induced shoreline erosion; high subsidence rates; excessive water on the marsh; saltwater intrusion via navigation and oil and gas access canals; and hurricane damage.

Habitat objectives for the year 2050 are the result of a cooperative effort between the public, parish governments, and Coast 2050 Regional Team members. Several large diversions into the Barataria Basin are proposed to extend the fresh marsh south of Little Lake and across the basin through the Myrtle Grove area. Another objective is to create a new strip of fresh marsh parallel to the Mississippi from West Point a la Hache to Venice and near the river in American Bay. A band of intermediate marsh gulfward of the fresh marsh is also desired with brackish marshes to its south. The only remaining saline marsh would be near Barataria Bay, and the barrier islands and shoreline would also be restored.

Specific ecosystem strategies for Region 2 (figure 6) center around sustaining existing wetlands and rebuilding lost wetlands by restoring more natural patterns of water movement and drainage, including: (1) restoring swamps by constructing small diversions with outfall management, and restoring natural drainage patterns; (2) restoring and sustaining existing marshes and building new marsh by increasing fluvial input through existing locks, diversions, dedicated dredging, sediment delivery, and outfall management; (3) protecting bay and lake shorelines from erosion by constructing wave absorbers and reef zones; (4) restoring and maintaining barrier islands and barrier shorelines; and (5) maintaining critical landforms (including land bridges in Perot/Rigolettes, Little Lake/Lake Salvador, and the Bayou L'Ours ridge) and possibly building the Bayou Lafourche Siphon/Pump project.

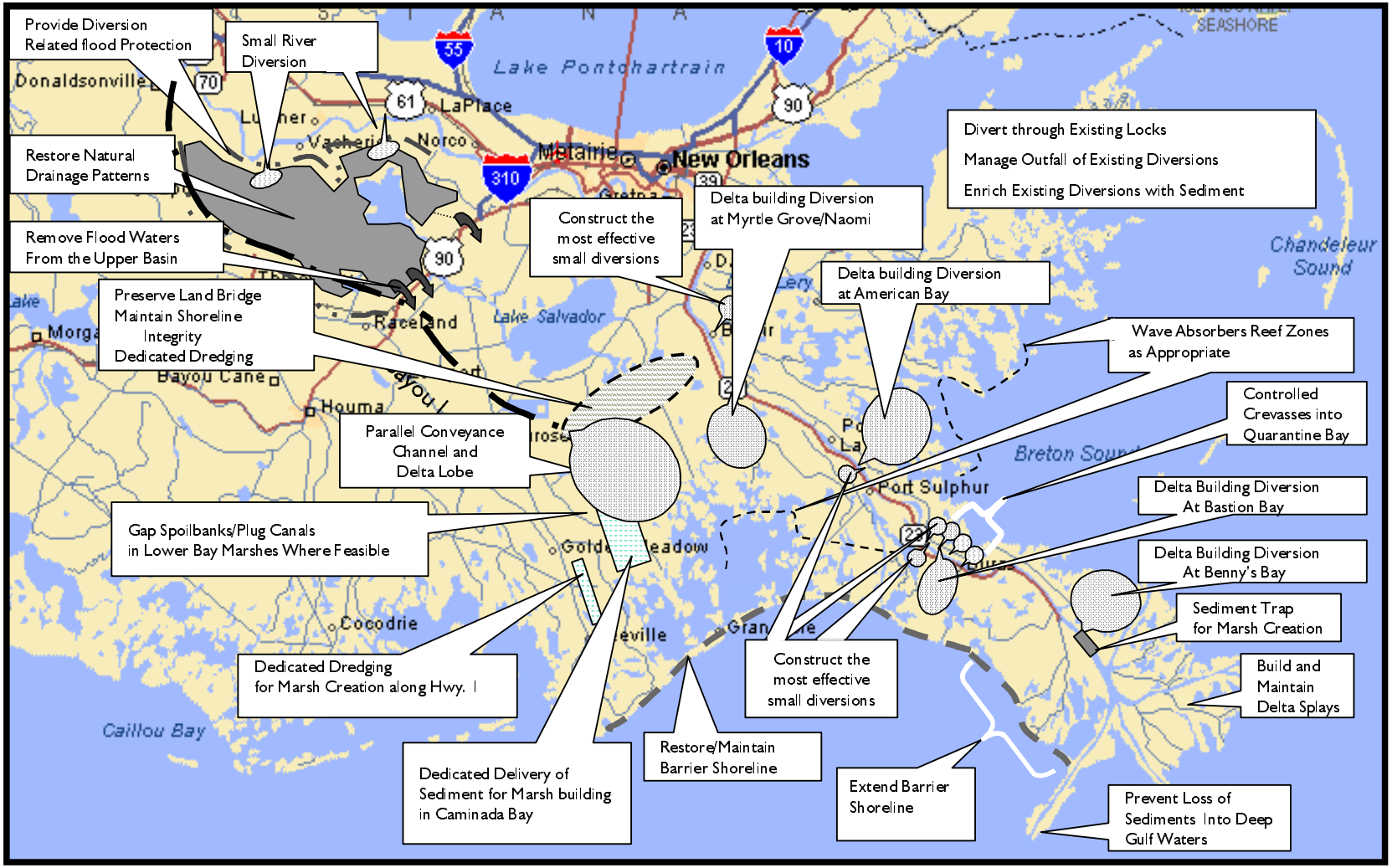


Figure 6. Coast 2050 Region 2 ecosystem strategies (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority, 1998).

REGION 2 MONITORING RESULTS

Because Region 2 has experienced such significant land loss, there is a high concentration of restoration projects in the area. This region lost approximately 107,520 acres of wetlands between 1978 and 1990, an average of 8,960 acres/year (Barras et al., 1994). By the end of 1999, projects will have been implemented at 69 locations.

BREAUX ACT (CWPPRA)

Eight projects authorized under the Breaux Act have either been constructed, or are planned for construction in 1999 (figure 7 and table on pages 19-20).

Hydrologic restoration projects at GIWW to Clovelly Wetlands (BA-02) and Jonathan Davis Wetland (BA-20) address marsh loss by restoring more natural patterns of water dispersion and drainage.

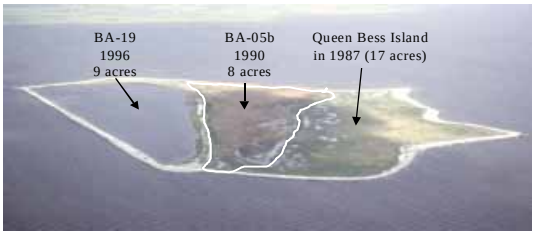
The freshwater diversion at Channel Armor Gap Crevasse (MR-06) is an uncontrolled diversion in the lower Mississippi delta, similar to the state-funded Small Sediment Diversions (MR-01) project. It is designed to distribute nutrients and sediments from the Mississippi River across the marsh surface and is expected to create approximately 936 acres of new wetlands.

The prevention of shoreline erosion on Lake Salvador and the Barataria Bay Waterway are the focus of three shoreline protection projects. Rock dikes absorb wave energy at the Barataria Bay Waterway West (BA-23; 9,400 linear feet) and Barataria Bay Waterway East (BA-26; 17,600 linear feet) projects. Besides 5,900 linear feet of rock dike, the Lake Salvador Shore Protection (BA-15) project is testing four different types of wave absorbers (10,000 linear feet total) to test the most effective means of preventing shoreline erosion.

Construction of Breaux Act shoreline protection project at Lake Salvador.

The sediment diversion project is the Delta Wide Crevasses (MR-09) project located in the lower Mississippi River delta. Crevasses will be built in 1999 to distribute river sediments and build new delta splays. They are expected to create literally thousands of acres of new marsh.

The remaining Breaux Act project utilized dredge material from the Barataria Bay Waterway to create wetlands on Queen Bess Island. This project, Barataria Bay Waterway (BA-19), expanded on an earlier state-funded project that created approximately 8 acres adjacent to Queen Bess Island by creating an additional 9-acre containment area that was filled with dredge material. The habitat on Queen Bess Island has been so improved that it is once again an important breeding area for Louisiana's state bird, the brown pelican, with more than 1,200 nests laid and more than 2,000 chicks fledged in 1998.

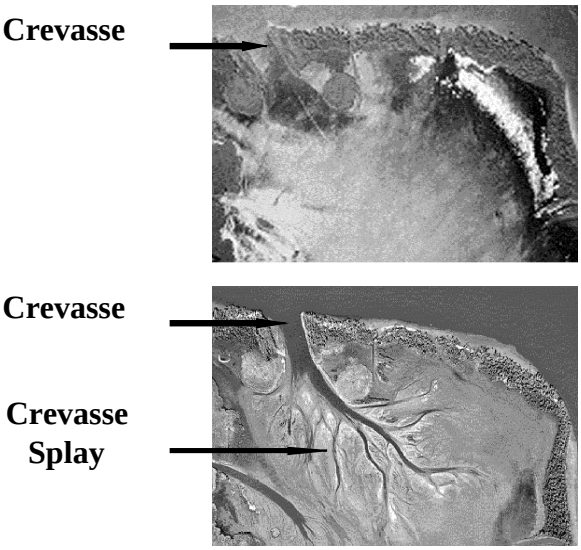


Queen Bess Island in Barataria Bay showing location of state (BA-05b) and Breaux Act (BA-19) projects.

NON-BREAUX ACT

State

Seventeen restoration projects have been implemented by the Coastal Restoration Division and funded through the Wetlands Trust Fund. Three freshwater diversion projects [Naomi Freshwater Diversion (BA-03), West Point a la Hache Diversion (BA-04), and Violet Freshwater Distribution (BS-06)] focus on restoring and creating marsh through the diversion of nutrients and sediment from the Mississippi River into adjacent marshes.



Aerial photos from 1987 (top) and 1996 (bottom) show the development of a new delta splay at Small Sediment Diversion Project.

Three shoreline protection projects [Baie de Chactas (BA-05c), Bayou Segnette (BA-16), and Grand Isle Bay Side Breakwaters] have used shell or rock to protect and rebuild shorelines by absorbing wave energy and preventing erosion. Queen Bess Island (BA-05b), a beneficial use of dredge material project, has helped to restore this important coastal island. This project also restored critical nesting habitat for Louisiana's state bird, the brown pelican.

The last state projects in Region 2 are sediment diversion projects (Small Sediment Diversions) in the active Mississippi River Delta. These crevasses cumulatively produced 313 ac of emergent marsh between 1986 and 1993; land growth rates ranged from 28 to 103 ac per crevasse for the older crevasses (4 to 10 years old) and 0.5 to 12 ac (0.2 to 4.9 ha) for the younger crevasses (0 to 2 years old).

Parish Coastal Wetlands Restoration Program

Christmas tree fences may be one of the most well-known restoration techniques. Every year, thousands of south Louisiana residents donate their old Christmas trees to help restore and build marsh. These projects are a low-cost means of protecting shorelines from erosion and trapping vital nutrients and sediment. Christmas tree projects have been completed at six sites including Goose Bayou, Whiskey Canal, Leeville, Fourchon, Eighty Arpent Canal, and Bayou Lafourche totaling 18,045 linear feet of protective fences.

Fourchon christmas tree fence promotes the growth of vegetation in the protected area behind the fence.

DNR/NRCS/SWCC Vegetation Planting Program

Through vegetation planting projects at 40 sites, approximately 76,657 stems of wetland grasses and mangroves have been planted. Combined, these projects cover 273,047 linear feet.

Biologists use stakes to support newly planted vegetation along Bayou LaTour.

Federal (WRDA)

The projects with the largest acreage of benefitted wetlands are the two freshwater diversion projects authorized under the federal Water Resources Development Act. The Davis Pond Freshwater Diversion project will be completed in 2001, and will preserve 33,000 acres of deteriorating wetlands in the Barataria basin.

The Caernarvon Freshwater Diversion was completed in 1991. The project area includes 55,440 acres of wetlands in the Breton Sound hydrologic basin. An aerial photography analysis in 1997 indicated an increase of 406 acres of wetlands in a 9,213 acre subsample within the outfall area of this project within a 3-year period. This represents a 5.9% increase per year in emergent wetlands.

Section 204/1135

There are four Section 204 projects and one Section 1135 project in Region 2. These projects will use dredged material to create at least 150 acres of new marsh along 6.5 miles of Barataria Bay Waterway, and 3.2 miles of the Mississippi River Gulf Outlet (MRGO). Dredged material also will be used to create new marsh for the Grand Terre Island Wetland Creation project. The Section 1135 project will create a new crevasse in South Pass in the Mississippi River delta.

Water from the Mississippi River flows through gated culverts at the Caernarvon Freshwater Diversion project.

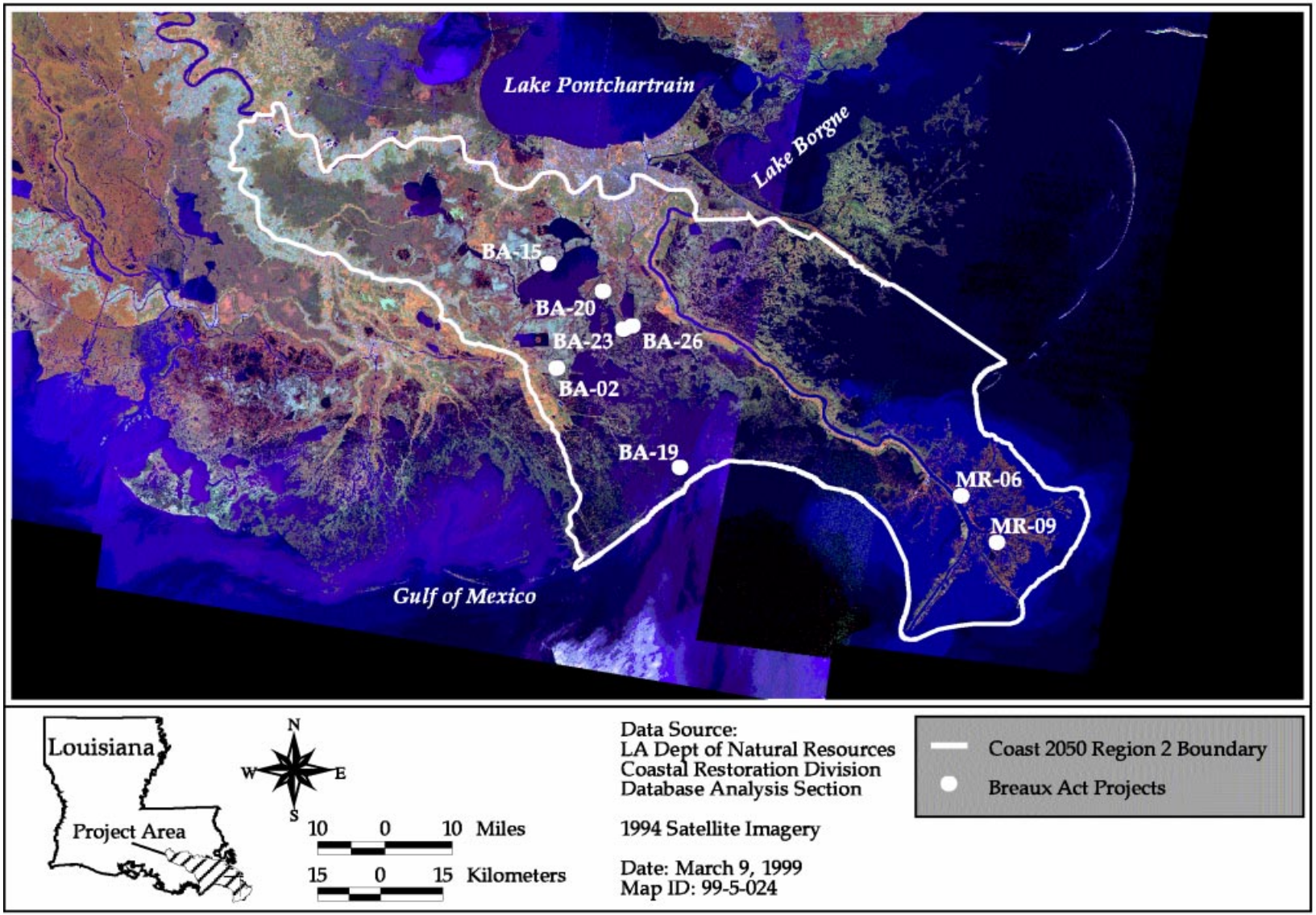


Figure 7. Location of completed or pending Breaux Act projects in Coast 2050 Region 2.

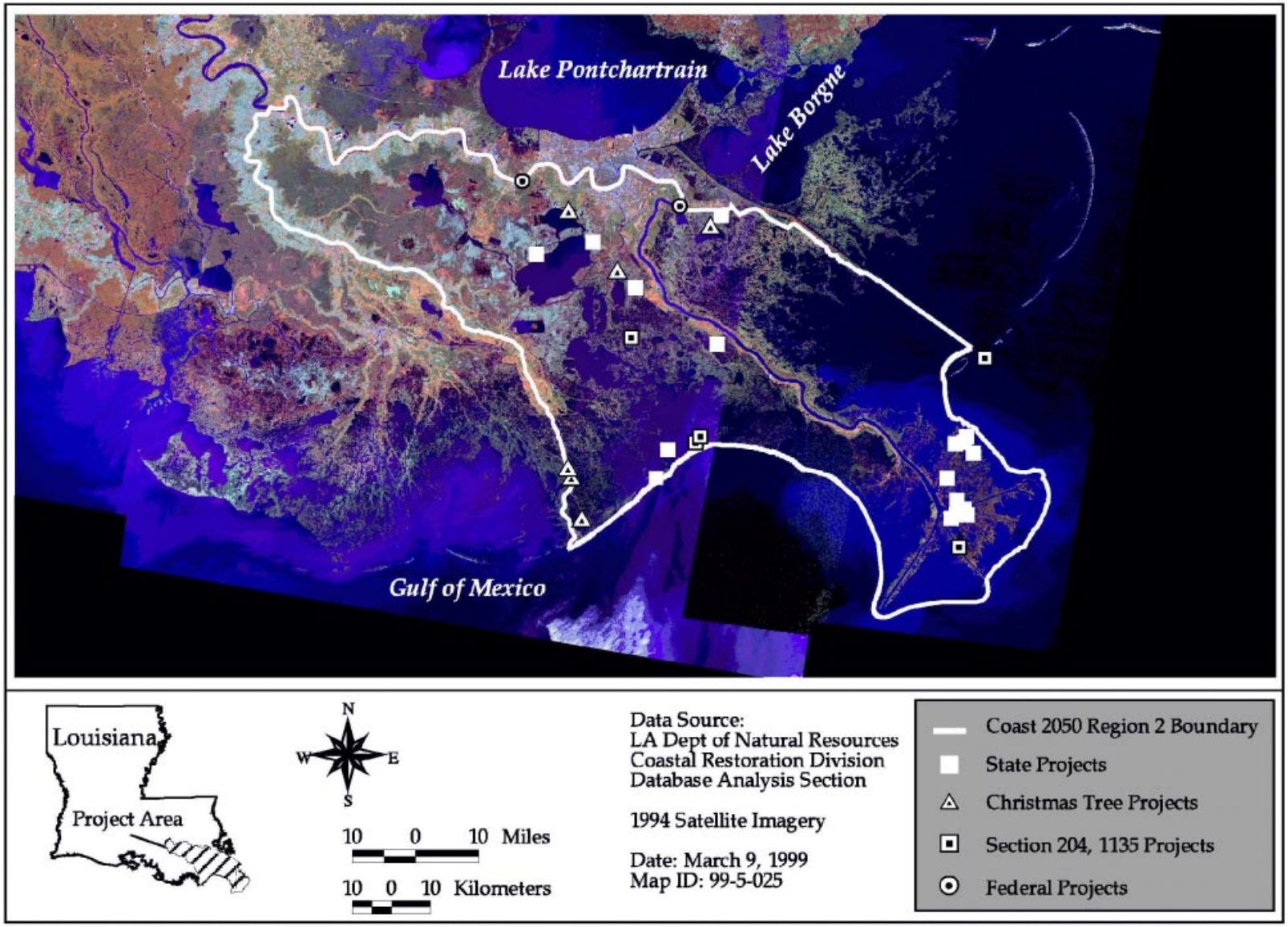


Figure 8. Location of completed or pending non-Breaux Act projects in Coast 2050 Region 2 (vegetation projects are shown in Figure 9).

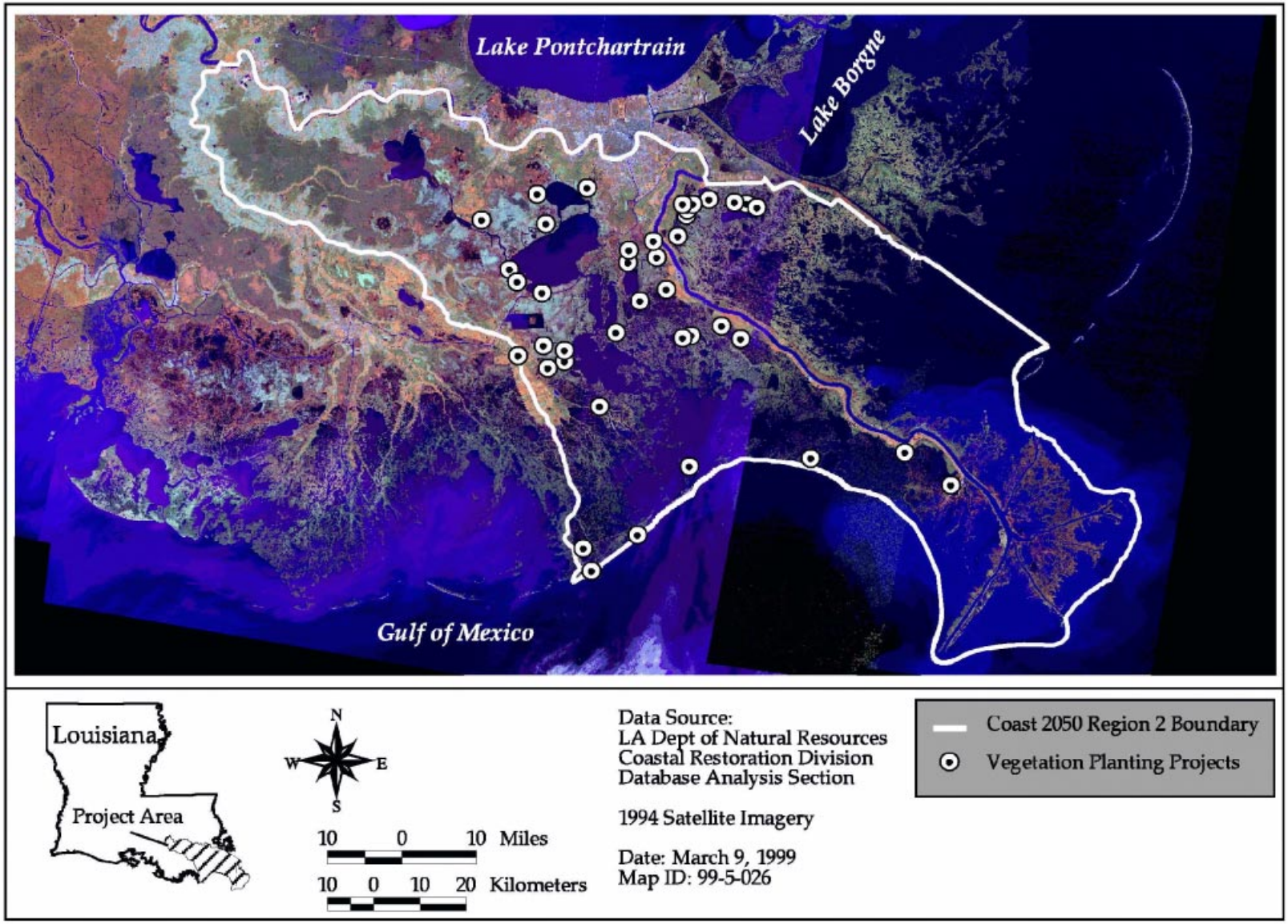


Figure 9. Location of completed or pending DNR/NRCS/SWCC Vegetation Planting program projects in Coast 2050 Region 2.

REGION 2 COMPLETED OR PENDING RESTORATION PROJECTS

Restoration Program	Project Name	Project Type	Year Completed	Parish
Breaux Act	GIWW to Clovelly Wetlands, BA-02	Hydrologic Restoration	Unit 1 - 1997 Unit 2 - 1999*	Lafourche
Breaux Act	Jonathan Davis Wetland, BA-20	Hydrologic Restoration	Unit 1 - 1998 Unit 2 - 2000*	Jefferson
Breaux Act	Channel Armor Gap Crevasse, MR-06	Freshwater Diversion	1997	Plaquemines
Breaux Act	Barataria Waterway Shore Protection (West), BA-23	Shoreline Protection	1999*	Jefferson
Breaux Act	Barataria Bay Waterway Bank Protection (East), BA-26	Shoreline Protection	1999*	Orleans/ Jefferson
Breaux Act	Lake Salvador Shore Protection, BA-15	Shoreline Protection	Phase 1 - 1997 Phase 2 - 1998	St. Charles
Breaux Act	Delta Wide Crevasses, MR-9	Sediment Diversion	1999*	Plaquemines
Breaux Act	Barataria Bay Waterway, BA-19	Beneficial Use of Dredge Material	1996	Jefferson
State	Naomi Diversion, BA-03	Freshwater Diversion	1992	Jefferson and Plaquemines
State	West Point a la Hache, BA-04	Freshwater Diversion	1992	Plaquemines
State	Violet Freshwater Distribution, BS-06	Freshwater Diversion	1997	St. Bernard
State	Baie de Chactas, BA-05c	Shoreline Protection	1990	St. Charles
State	Bayou Segnette, BA-16	Shoreline Protection	1994, 1998	Jefferson
State	Grand Isle Bay Side Breakwater	Shoreline Protection	1995	Jefferson
State	Queen Bess, BA-05b	Beneficial Use of Dredge Material	1990	Jefferson
State	Small Sediment Diversions (10 projects)	Sediment Diversion	1986, 1991	Plaquemines
PCWRP	Goose Bayou (includes Bayou Cypress, Bayou Le Fleur, and Bayou La Tour)	Christmas tree fence/ Vegetation	1991, 1992, 1996, 1997	Jefferson
PCWRP	Whiskey Canal	Christmas tree fence	1998	Jefferson
PCWRP	Leeville #1	Christmas tree fence	1991, 1998	Lafourche
PCWRP	Fourchon	Christmas tree fence	1992, 1998	Lafourche
PCWRP	Eighty Arpent Canal	Christmas tree fence	1991, 1992	St. Bernard
PCWRP	Bayou Lafourche	Christmas tree fence/ Vegetation	1995, 1996, 1997	Lafourche
Vegetation	Trinity Island	Vegetation	1992	Terrebonne
Vegetation	Salvador WMA	Vegetation	1988	St. Charles
Vegetation	Clovelly	Vegetation	1988	Lafourche
Vegetation	Point au Chen	Vegetation	1989	Lafourche
Vegetation	Kings Ridge	Vegetation	1989, 1991, 1994	Lafourche
Vegetation	Queen Bess Island	Vegetation	1991, 1993, 1997	Jefferson
Vegetation	Myrtle Grove	Vegetation	1991, 1996	Plaquemines
Vegetation	Red Pass / Spanish Pass	Vegetation	1991, 1996	Plaquemines
Vegetation	Bay L'Ours	Vegetation	1991	Lafourche
Vegetation	Goose Bayou	Vegetation	1992	Jefferson
Vegetation	Lake Lery / 80 Arpent Canal	Vegetation	1993	St. Bernard
Vegetation	Lake Salvador	Vegetation	1992, 1999*	Lafourche
Vegetation	Temple Bay	Vegetation	1992	Lafourche
Vegetation	Bayou Dupont	Vegetation	1992, 1998, 1999*	Plaquemines

REGION 2 COMPLETED OR PENDING RESTORATION PROJECTS

(Cont'd)

Restoration Program	Project Name	Project Type	Year Completed	Parish
Vegetation	Lake Hermitage	Vegetation	1993	Plaquemines
Vegetation	Yellow Cotton Bay	Vegetation	1992	Plaquemines
Vegetation	Lake Laurier	Vegetation	1993	Plaquemines
Vegetation	Round Lake	Vegetation	1992	Plaquemines
Vegetation	Little Lake Hunting	Vegetation	1994, 1996	Jefferson
Vegetation	West Point a la Hache	Vegetation	1994	Plaquemines
Vegetation	LaReussite	Vegetation	1994	Plaquemines
Vegetation	Fourchon	Vegetation	1995	Lafourche
Vegetation	Bayou LaFourche Shore	Vegetation	1995	Lafourche
Vegetation	Big Mar	Vegetation	1995, 1998	Plaquemines
Vegetation	Scarsdale	Vegetation	1995, 1998	Plaquemines
Vegetation	Belair	Vegetation	1995	Plaquemines
Vegetation	Clovelly Farm	Vegetation	1996	Lafourche
Vegetation	Bayou Segnette	Vegetation	1997	Jefferson
Vegetation	Simoneaux Ponds	Vegetation	1997	St. Charles
Vegetation	Lake Lery Shoreline	Vegetation	1997, 1998	St. Bernard
Vegetation	Sebastopol Canal	Vegetation	1997	St. Bernard
Vegetation	Cane Ridge Slough	Vegetation	1997	Plaquemines
Vegetation	Delacroix Corp.	Vegetation	1997	Plaquemines
Vegetation	Bayou Des Allemands	Vegetation	1998	St. Charles
Vegetation	Elmers Island	Vegetation	1998	Jefferson
Vegetation	Port Fourchon '98	Vegetation	1998	Lafourche
Vegetation	Bay Joe Wise	Vegetation	1998	Plaquemines
Vegetation	Clovelly Levee	Vegetation	1999*	Lafourche
Vegetation	Delacroix '99	Vegetation	1999*	Plaquemines
Vegetation	Ollie Canal Pump-off	Vegetation	1999*	Plaquemines
Section 204	Grand Terre Island Wetland Creation	Beneficial Use of Dredge Material	1996	Jefferson
Section 204	Barataria Bay Waterway, mile 31 to 24.5	Beneficial Use of Dredge Material	1999*	Jefferson
Section 204	Barataria Waterway, Grand Terre Is, Ph. 2	Beneficial Use of Dredge Material	1999*	Jefferson
Section 204	MRGO, Berm, Mi. -2 to -3	Beneficial Use of Dredge Material	1999*	Plaquemines
Section 1135	South Pass Crevasse	Beneficial Use of Dredge Material	1999*	Plaquemines
Federal	Davis Pond, BA-01	Freshwater Diversion	2001	St. Charles
Federal	Caernarvon, BS-08	Freshwater Diversion	1991	Plaquemines

Breaux Act = Coastal Wetlands Planning, Protection and Restoration Act, also known as CWPPRA
State = Restoration projects funded entirely by the State of Louisiana through the Coastal Restoration Division
PCWRP = Parish Coastal Wetlands Restoration Program (Christmas Tree Program)
Vegetation = DNR/NRCS/SWCC Vegetation Planting Program
Section 204 = Section 204 beneficial use of dredged material projects
Section 1135 = Section 1135 beneficial use of dredged material projects
Federal = funded through the federal Water Resources Development Act
* = anticipated date