Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA)

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The 2009 Evaluation Report to the U.S. Congress on the Effectiveness of Coastal Wetlands Planning, Protection and Restoration Act Projects

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Suggested Citation

Louisiana Coastal Wetlands Conservation and Restoration Task Force. 2010. The 2009 Evaluation Report to the U.S. Congress on the Effectiveness of Coastal Wetlands Planning, Protection and Restoration Act Projects.

Map images provided by the USGS National Wetlands Research Center. Document direction and review provided by the 2009 CWPPRA Report to Congress Workgroup.

Documentation

This report is submitted by the Louisiana Coastal Wetlands Conservation and Restoration Task Force in accordance with the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), Title III of Public Law 101–646, commonly referred to as the "Breaux Act." This report fulfills the Breaux Act mandate, which requires a report to the U.S. Congress every 3 years on the effectiveness of Louisiana's coastal wetland restoration projects.

CWPPRA Task Force Member Agencies

- U.S. Army Corps of Engineers (represented by the New Orleans District): contact 504–862–2204 or at http://www.mvn.usace.army.mil/pd/cwppra_mission.htm
- U.S. Department of the Interior (represented by the U.S. Fish and Wildlife Service): contact 337–291–3100 or at http://www.fws.gov/coastal/CoastalGrants/
- U.S. Department of Agriculture (represented by the Natural Resources Conservation Service): contact 318–473–7751 or at http://www.la.nrcs.usda.gov/programs/cwppra/index.html
- U.S. Department of Commerce (represented by the National Oceanic and Atmospheric Administration National Marine Fisheries Service): contact 225–389–0508 or at http://habitat.noaa.gov/restoration/index.html
- U.S. Environmental Protection Agency (represented by the Water Quality Protection Division of EPA Region 6): contact 214–665–7275 or at http://www.epa.gov/region06/6wq/at/cwppra.htm
- Louisiana's Governor's Office (represented by the Governor's Office of Coastal Activities): contact 225–342–3968 or at http://www.goca.state.la.us/

Web sites

LaCoast, the official CWPPRA Web site, has a complete project listing and technical documents at http://www.lacoast.gov.

The CWPPRA program is administered through the U.S. Army Corps of Engineers. A CWPPRA organizational chart, standard operating procedures, annual Priority Project List (PPL) reports, and administrative proceedings documentation are publicly available on the New Orleans District Web site at http://www.mvn.usace.army.mil/pd/cwppra_mission.htm.

Acknowledgments

The CWPPRA Task Force wishes to thank Governor of Louisiana Bobby Jindal and the State and Federal Louisiana Delegations for their support of this crucial program.

Contents

Executive Summary:

The 2009 Evaluation Report to the U.S. Congress on the Effectiveness of Coastal Wetlands Planning, Protection and Restoration Act Projects

Louisiana's coastal zone contains 45 percent of all intertidal coastal marshes in the lower 48 States; however, it is suffering 80 percent of the entire Nation's coastal wetland loss. Prior to the 1900s, Louisiana's coastal area had an overall net gain of wetlands. Since then, Louisiana has lost about one million acres of coastal wetlands, an area greater than 25 times the size of Washington, D.C. This loss is due to a complex combination of natural and human-induced factors, including fresh water and sediment deprivation, subsidence, salt water intrusion, shoreline erosion, navigation channels, oil and gas production, herbivory, invasive species, and other pressures from human-related land uses.

Recognizing the severe coastal land loss crisis, as well as the significant economic dependency of the State and the Nation on the Louisiana coastal zone, Congress established the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA)[1] in 1990 to provide for the long-term conservation of Louisiana's coastal wetlands. At the direction of the CWPPRA Louisiana Coastal Wetlands Conservation and Restoration Task Force (hereafter referred to as the Task Force), each year a list of coastal wetland restoration projects is developed and funded for the design and construction of projects that benefit Louisiana's rapidly disappearing wetlands and dependent fish and wildlife populations. In accordance with CWPPRA,[2] this report fulfills the requirement defined by Congress to provide a scientific evaluation every 3 years on the effectiveness of these coastal wetland restoration projects.

Since its inception, CWPPRA has been the primary mechanism for implementing coastal wetland protection and restoration projects in Louisiana because of the consistent long-term funding stream authorized by Congress. The CWPPRA program has proven to be very effective and efficient in designing and implementing small- to medium-scale projects by using a bottom-up and collaborative multiagency approach that closely

[1] Coastal Wetlands Planning, Protection and Restoration Act, Public Law 101–646, Title III.

[2] Coastal Wetlands Planning, Protection, and Restoration Act, Section 303 (b) (7).

engages the public, local governments, academics, and other important stakeholders. After nearly 20 years of project implementation, the Task Force has led the way in protecting Louisiana's shorelines, restoring marshes and barrier islands, reintroducing freshwater and sediment, and reducing saltwater intrusion, as well as testing and proving new restoration technologies and monitoring coastwide land loss and gain. Currently, there are 144 ongoing coastal wetland protection and restoration projects on 19 Priority Project Lists (PPLs) that are projected to yield a total net benefit of 107,861 acres of coastal wetlands and related habitats. This estimate is conservative in that this figure does not capture the significant acreages of wetlands and associated open water habitats that are also enhanced by these projects.

As evidenced by these projects, CWPPRA is a program of action that is restoring areas of critical need. On average, a CWPPRA project can go from concept to construction in 3–5 years. This is largely a result of the congressional authority that has been delegated to the Task Force to both authorize and fund restoration projects. Furthermore, the project selection process quickly identifies projects that have the most cost effectiveness, construction feasibility, and public support, which ultimately streamlines project implementation. Given the significant need for coastal wetland restoration in Louisiana, the project selection process often generates more construction-ready projects than the program has funding in hand to build. Although Congress in 2004 reauthorized CWPPRA through 2019, the program is expected to reach its capacity to authorize new projects within the next few years. This is due to the current commitment of projected future funding that will be needed to construct existing authorized projects and for future operations and maintenance of constructed projects. Even though CWPPRA has received nearly $80 million each year over the last few years, there continues to be a backlog of construction-ready projects. While this has created a very efficient opportunity for other programs with readily available funds to step in and quickly build some of these projects, there are still coastal restoration needs that are not being addressed because of limited funding streams. To offset part of this deficiency, the program is streamlining administrative costs to put as much funding on the ground as possible and to leverage Federal resources when possible for the efficient implementation of coastal restoration.

The primary objective of the CWPPRA program is to build restoration projects by using techniques that stem from decades of sophisticated wetland science. The types of techniques used in various CWPPRA projects depend on the problems being addressed and other site-specific factors. These factors are typically evaluated during a robust period of interagency biological and engineering review prior to committing construction funds. Because of this, the project selection process is divided into two phases: Phase 1 includes engineering and design, and Phase 2 includes construction and long-term monitoring, operation, and maintenance.

The Task Force ***authorized*** 16 new projects between 2006 and 2009 for **Phase 1—Engineering and Design**, which if constructed would result in an estimated net benefit of 7,875 acres of wetlands. In this same period, the Task Force also ***authorized*** **Phase 2—Construction** of 12 projects that are expected to result in an estimated net benefit of 3,055 acres of wetlands. These 12 proposed construction projects include two barrier island projects, six marsh creation projects, three shoreline protection projects, and one freshwater diversion project.

The Louisiana coast is separated into four ecologic regions for the purpose of project planning. Below is the list of the projects that were authorized to begin **Phase 2—Construction** during this reporting period.

- Region 1: Lake Borgne Shoreline Protection Project (PO-30) and Goose Point/Point Platte Marsh Creation Project (PO-33), which will have a combined net benefit of 601 acres of wetlands.
- Region 2: Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration Project (BA-35), Dedicated Dredging on the Barataria Basin Landbridge Project (BA-36), Mississippi River Sediment

Delivery System – Bayou Dupont (BA-39), and South Shore of the Pen Shoreline Protection and Marsh Creation (BA-41), which will have a combined net benefit of 1,489 acres of wetlands.

- Region 3: West Lake Boudreaux Shoreline Protection and Marsh Creation Project (TE-46), South Lake De Cade Freshwater Introduction (TE-39), Whiskey Island Back Barrier Marsh Creation Project (TE-50), and the East Marsh Island Marsh Creation (TV-21), which will have a combined net benefit of 920 acres of wetlands.
- Region 4: Grand Lake Shoreline Protection –Tebo Point (ME-21a), which will have a net benefit of 45 acres of wetlands.

Although projects are authorized and constructed individually, they often work synergistically with one another. For example, the barrier island projects are collectively rebuilding Louisiana's first line of defense that can extend ecosystem benefits beyond just the sum of their individual projects. This type of synergy is also seen within the Barataria Basin, where constructed projects are working together to restore the structural integrity of a critical landform that is undergoing high land loss rates. These projects are demonstrating how small- to mid-scale projects are working collectively to generate large-scale results.

Although most of the CWPPRA projects are located within one of the four specific regions, the Task Force also authorized four coastwide demonstration projects between 2006 and 2009. Demonstration projects use technologies or methods that have not been fully developed for coastal restoration in Louisiana. These coastwide demonstration projects include Enhancement of Barrier Island Vegetation Demonstration (TE-53), Non-Rock Alternatives to Shoreline Protection Demonstration (LA-16), Sediment Containment System for Marsh Creation Demonstration (LA-09), and Bio-Engineered Oyster Reef Demonstration (LA-08).

Introduction

The traditional image of Louisiana's wetlands makes for a striking visual. Photographs often depict a grassy expanse of vegetation with trawling shrimp boats and sea birds dotting the horizon. The image is accurate, but its serenity can be misleading. Louisiana's coastal zone contains 45 percent of all intertidal coastal marshes in the lower forty-eight States, but it is suffering 80 percent of the entire Nation's annual coastal wetland loss. Since the 1930s, coastal Louisiana has lost over 1,875 square miles, an area more than 25 times larger than Washington, D.C. As recently as the year 2000, the annual loss rate was quantified as 24 square miles per year (Barras and others, 2003). Although the causes are a combination of complex human-induced and natural factors, this rate of loss is largely attributable to channelization of the Mississippi River for flood protection, natural subsidence, petroleum exploration and navigation channels, storms, and pressures from human-related land uses. As a result, the wetlands are rapidly converting to open water.

Congress recognized the ongoing severe coastal wetland losses in Louisiana and the increasing impacts on locally, regionally, and nationally important resources when it established the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) in 1990 (Public Law 101–646, Title III). Over these last two decades, it has been clearly established and well documented that there is an imminent need to restore and protect Louisiana's coastal wetlands in order to sustain the ecological and economic health of the Louisiana coastal zone.

The Louisiana wetlands provide a variety of benefits that serve the Nation across an array of economic sectors. Because of this, as detailed on the following pages, the land loss crisis in Louisiana is considered a matter of national concern.

Storm Protection

Louisiana is one of the most hurricane-prone regions in the United States. The U.S. Geological Survey estimated that Hurricanes Katrina and Rita (2005) alone accounted for converting 217 square miles (138,880 acres) of coastal marsh to open water along the Louisiana coast (Barras, 2006). Wetlands provide a natural buffer during storms by absorbing and reducing surging water. Resio and Westerink (2008) created a storm-surge simulation by using data from Hurricane Rita in southwestern Louisiana and estimated that healthy wetlands could reduce storm surge by 1 foot per 2.1–3.6 miles of inland penetration. In Louisiana's flat, low-lying coastal areas, even small reductions in storm surge could mean the difference between an area that survives a storm and one that suffers damage.

Coastal wetlands also serve as a buffer to protect levees that would otherwise be subjected to bay and gulf wave energy that would continually wash up on those levees. Wetlands provide a buffer that can absorb wave energy before it is at the levee system and within closer proximity to the communities the levees are intended to protect.

Energy Infrastructure

More than 80% of the Nation's offshore oil and gas is produced off the Louisiana coast, and 25% of the Nation's foreign and domestic oil comes ashore via coastal waterways of the State.[1] The Louisiana coastal zone also contains the Louisiana Offshore Oil Port; more than 43,000 oil and gas wells; two U.S. Strategic Petroleum Reserve stockpile sites; and the Henry Hub, one of the Nation's major natural gas distribution centers. This infrastructure and the pipelines that network through the coastal zone depend on the wetlands that surround them for physical support and buffering from storms. As wetlands wash away, pipelines and energy facilities become increasingly exposed to harsh open water environments.

Navigation Infrastructure

The coast of Louisiana is a national hub for navigation. Nearly 3,000 miles of deep-draft and shallow-draft channels are located in the State's wetlands (Waldemar S. Nelson and Company, Inc., 2002). In 2005, Louisiana's coastal wetlands provided storm protection for ports that carried 457 million tons of waterborne commerce, accounting for 18% of all waterborne commerce in the United States[2] (U.S. Army Corps of Engineers, 2007). As well, 5 of the top 15 largest ports in the United States are located in Louisiana. This infrastructure calls the Louisiana wetlands home, and vessels are offered safe navigation by the coastal wetlands that surround the extensive ports and channels necessary to provide goods and services throughout the Nation.

Commercial Fishing and Recreational Activities

Louisiana contributes about 28% of the total volume of U.S. fisheries, with a value of nearly $1 billion annually. The catch is comparable to that of the entire Atlantic seaboard and is triple that of the other Gulf Coast States. The annual shrimp and oyster harvest in Louisiana supplies 35%–40% of the Nation's needs. These economically important species depend on Louisiana's wetlands for all or part of their life history, which is a factor in their relative abundance in the State. As wetlands deteriorate, critical nursery habitat is lost; over time, these losses will affect fish populations.

Habitats

Louisiana's wetlands provide habitats for thousands of plant and animal species. Louisiana coastal marshes are of great importance to migratory waterfowl and provide winter habitat for more than two-thirds of the entire Mississippi Flyway waterfowl population (Bellrose and Trudeau, 1988). Coastal Louisiana also has a very diverse and productive invertebrate population, as well as numerous species of

[1] http://dnr.louisiana.gov/crm/background.

[2] http://dnr.louisiana.gov/crm/coastalfacts.asp.

Five of the top ports in the United States are located in Louisiana, including Port Fourchon.

mammals, fish, reptiles, and amphibians. Louisiana's wetlands also provide nursery and foraging grounds for numerous recreational and commercially important species that are significant economic drivers for the State.

Coastal Communities

Over 2 million residents—more than 47% of the State's population according to the 2007 U.S. Census estimate—live in Louisiana's coastal parishes (U.S. Census Bureau, 2007). Many of these people depend on coastal wetlands, waterways, and other natural resources to support their traditional ways of life and economic livelihood. The loss of wetlands results in a reduction in the capacity to generate a living from these natural resources. In addition, numerous indigenous cultures and tribal populations are at risk of being permanently dispersed or relocated as their communities are lost to coastal land loss. The permanent loss to the human fabric that makes up south Louisiana and is enjoyed by thousands of visitors each year is beyond enumeration. As part of CWPPRA, Congress established and directed the Louisiana Coastal Wetlands Conservation and Restoration Task Force (hereafter referred to as the "Task Force") to prepare, annually update, and implement a list of coastal wetland restoration projects in Louisiana to provide for the long-term conservation of such wetlands and dependent fish and wildlife populations. In addition, Congress directed the Task Force to provide a scientific evaluation every 3 years on the effectiveness of the projects as required by Section 303 (b) (7) of CWPPRA. The purpose of this report is to meet this requirement. The following sections provide an overview of the program and organizational structure, briefing on projects selected since 2006, effectiveness of the program to date, and the relevancy of CWPPRA to address land loss in Louisiana's coastal wetlands.

Hopedale Hydrologic Restoration Project.

CWPPRA Impact in Louisiana

Since its inception, CWPPRA has been the primary mechanism for implementing coastal wetland protection and restoration projects in Louisiana as a result of the consistent long-term funding stream authorized by Congress. The CWPPRA program has proven to be very effective and efficient in designing and implementing small- to medium-scale projects by using a bottom-up and collaborative multiagency approach that closely engages the public, local governments, academics, and other important stakeholders. After nearly 20 years of putting projects on the ground, the CWPPRA program continues to be the most effective coastal restoration program in Louisiana and leads the way in protecting shorelines, restoring marshes and barrier islands, reintroducing freshwater and sediment, and reducing saltwater intrusion, as well as testing and proving new restoration technologies, monitoring coastwide land loss and gain, and combating invasive species (see CWPPRA project types in appendix 1).

Through the CWPPRA program, Louisiana has received Federal funding each year for coastal restoration projects since the creation of the program. In recent years, the program has received nearly $80 million annually, which has been matched with a 15% State contribution. Currently, there are 144 active coastal protection and restoration projects that are projected to yield a total net benefit of 107,861 acres of coastal wetlands and related habitats. In addition to the projected net acres of wetlands, significant acreages of wetlands and associated open water habitats are enhanced by these CWPPRA projects. There are also four coastwide programmatic projects that are funded through CWPPRA that support broad-scale efforts such as comprehensive coastwide monitoring, conservation planning, nutria control, and storm recovery assessments.

On average, a CWPPRA project can go from concept to construction in 3–5 years. This ability is largely a result of the congressional authority that has been delegated to the Task Force to both authorize and fund restoration projects without having to seek additional authorization, which otherwise could delay projects for many years. Furthermore, the project selection process quickly culls projects that have the most cost effectiveness, construction feasibility, and public support, which ultimately streamlines project implementation. Additionally, the interagency model of CWPPRA provides for multiple agencies to have a divide and conquer approach, which

distributes the project load and can also lead to faster construction.

Given the limited funding for CWPPRA, the project selection process also generates more construction-ready projects than the program can afford to build. This is compounded by the fact that, although Congress in 2004 reauthorized CWPPRA through 2019, the program is expected to reach its capacity to authorize new projects within the next few years. This is due to the current obligation of future funding needed to construct existing authorized projects and to fund operations and maintenance of all constructed projects. The backlog of construction-ready projects developed through the CWPPRA program has provided opportunities to transfer some projects to other funding authorities for rapid implementation. This synergy created between authorities stretches restoration dollars, reduces redundancy, and implements projects faster since CWPPRA has already designed, prioritized, and publicly vetted all of its projects.

Notwithstanding the significant ecologic, economic, and political changes that have occurred in south Louisiana since Hurricane Katrina, CWPPRA has continued to stay the course and effectively serve as the largest coastal wetlands restoration program in the State's history in terms of total projects constructed. The present-day relevance of CWPPRA lies in its unique ability to construct near-term, small- to mid-scale projects that meet local immediate restoration needs and its ability to work seamlessly with other authorities to implement ecosystem-level restoration. Projects constructed through CWPPRA are either complementary to projects being planned through other authorities or are addressing land loss in critical areas that have no other resources for restoration.

Pecan Island Terracing Project.

Louisiana Coastal Wetlands Conservation and Restoration Task Force

The main governance of the CWPPRA program is the congressionally created Task Force. Chaired by the U.S. Army Corps of Engineers, the Task Force is composed of members from four other Federal agencies: the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the Natural Resources Conservation Service, and the National Marine Fisheries Service. In addition, the State of Louisiana, Governor's Office of Coastal Activities sits on the Task Force and represents the local sponsor to the program.

The Task Force effectively implements the CWPPRA program with the assistance of subordinate committees and workgroups (see figure 1) and by closely engaging the public. The Technical Committee reports and makes recommendations directly to the Task Force on issues, policies, and procedures related to executing the CWPPRA program and its projects. The Task Force conducts general planning activities and makes program and project funding decisions in at least three public meetings held throughout the year.

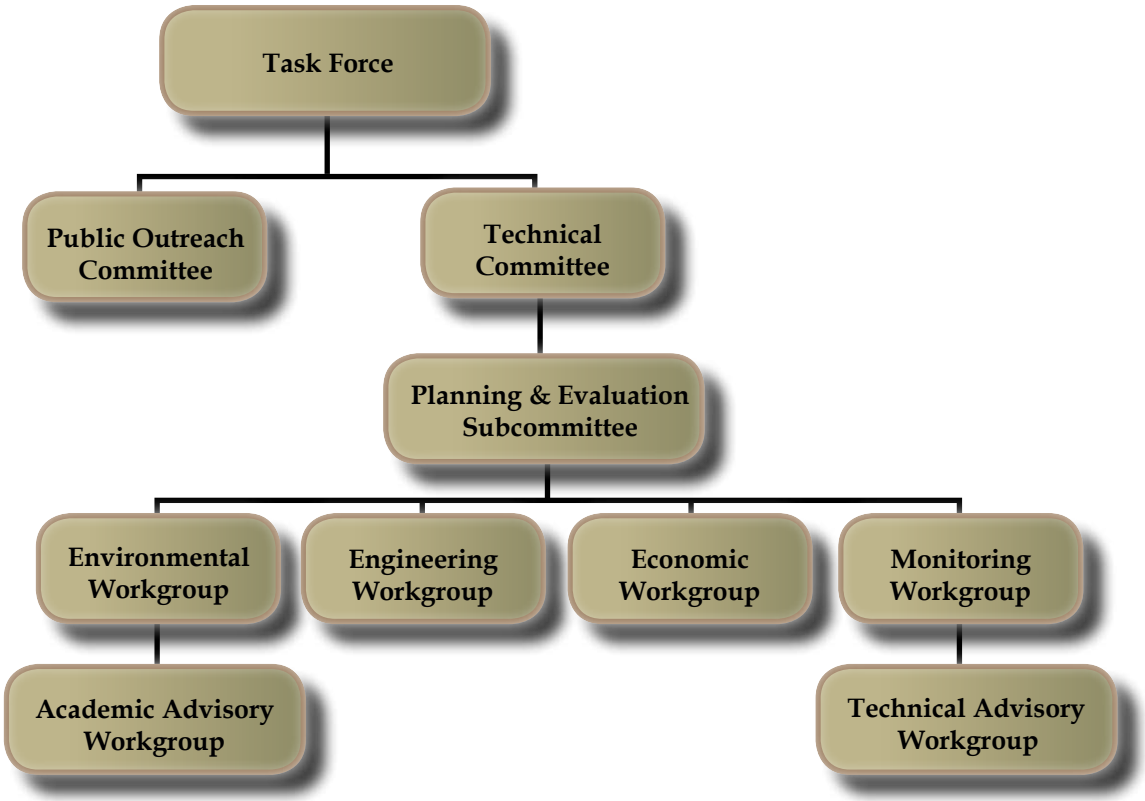


Figure 1. Organization chart for the Louisiana Coastal Wetlands Conservation and Restoration Task Force.

Terns visit a newly constructed terrace.

CWPPRA Project Planning and Implementation

The Task Force authorizes projects to be implemented under the CWPPRA program by using a systematic approach that starts with an annual planning cycle to select new projects. All projects undergo detailed engineering and design before they get final approval to proceed to construction and long-term operations, maintenance, and monitoring.

Planning and Selection of Annual Priority Project Lists

In January of each year, a new Priority Project List (PPL) selection process begins with solicitation to the CWPPRA agencies, the public, parish governments, and other stakeholders to propose new projects to be implemented through the CWPPRA program (figure 2). Often, local governments and citizens coordinate with the CWPPRA agencies to develop project concepts. Proposed project ideas are presented during four public meetings that are held across the coast. The CWPPRA Planning and Evaluation Subcommittee and local parishes select a list of restoration project nominees and demonstration project nominees from all of the proposed projects. The CWPPRA Environmental and Engineering Workgroups screen the list of nominees to ensure that they are consistent with established regional strategies. The Technical Committee selects candidate projects from the nominee list to be further developed and evaluated for cost effectiveness.

The candidate project evaluations include site visits by CWPPRA workgroups and agency staff and sometimes landowners, land managers, and project proponents. Following site visits, the CWPPRA workgroups coordinate with the USGS to determine land loss rates and define a project area for each project. The CWPPRA Environmental Workgroup and Academic Advisory Group use Wetland Value Assessment (WVA) models to predict the net wetland benefits and habitat value that would result in the future with and without the project over a 20-year period of analysis. Economic analyses are conducted to determine the total cost to implement, operate, maintain, and monitor each project for 20 years.

The Task Force uses cost effectiveness as the primary metric to determine which projects will be selected for engineering, design, and ultimately construction. Cost effectiveness is the total cost to implement, operate, maintain, and monitor a project over 20 years compared to the net wetland acres attributed to the project. Wetland benefits are also captured by using Habitat Suitability Indices, which look at both habitat quantity (expressed in acres) and habitat quality. The indices yield a metric of habitat units. Cost effectiveness can then be measured by comparing the average annual habitat units (AAHUs) projected for a project related to project cost.

After the candidate project evaluations are summarized and completed, the results are presented at public meetings later in the year. The Task Force accepts and fully considers public comments on the candidate projects before making a final decision on which projects to select. Lead Federal agencies are subsequently assigned to sponsor the projects through construction. An annual report is generated for each PPL, detailing the nominated projects, the evaluation of candidate projects, and the final list of selected projects.

CWPPRA Project Implementation

Projects on PPLs 1 through 8 were fully funded up front for implementation and 20 years of operations, maintenance, and monitoring; however, this funding method unnecessarily tied up available funds and began to limit the CWPPRA program's ability to implement new projects each year. Beginning with PPL 9, the Task Force has implemented cash flow management procedures to fund projects in two phases. The Task Force initially funds all Phase 1 activities, which include engineering and design. Once a project completes Phase 1, Phase 2 (construction, operation, maintenance, and monitoring) funding must be requested from the Task Force. Long-term operations, maintenance, and monitoring funds are approved annually so that all projects carry 3 years of incremental funding through the 20-year project life.

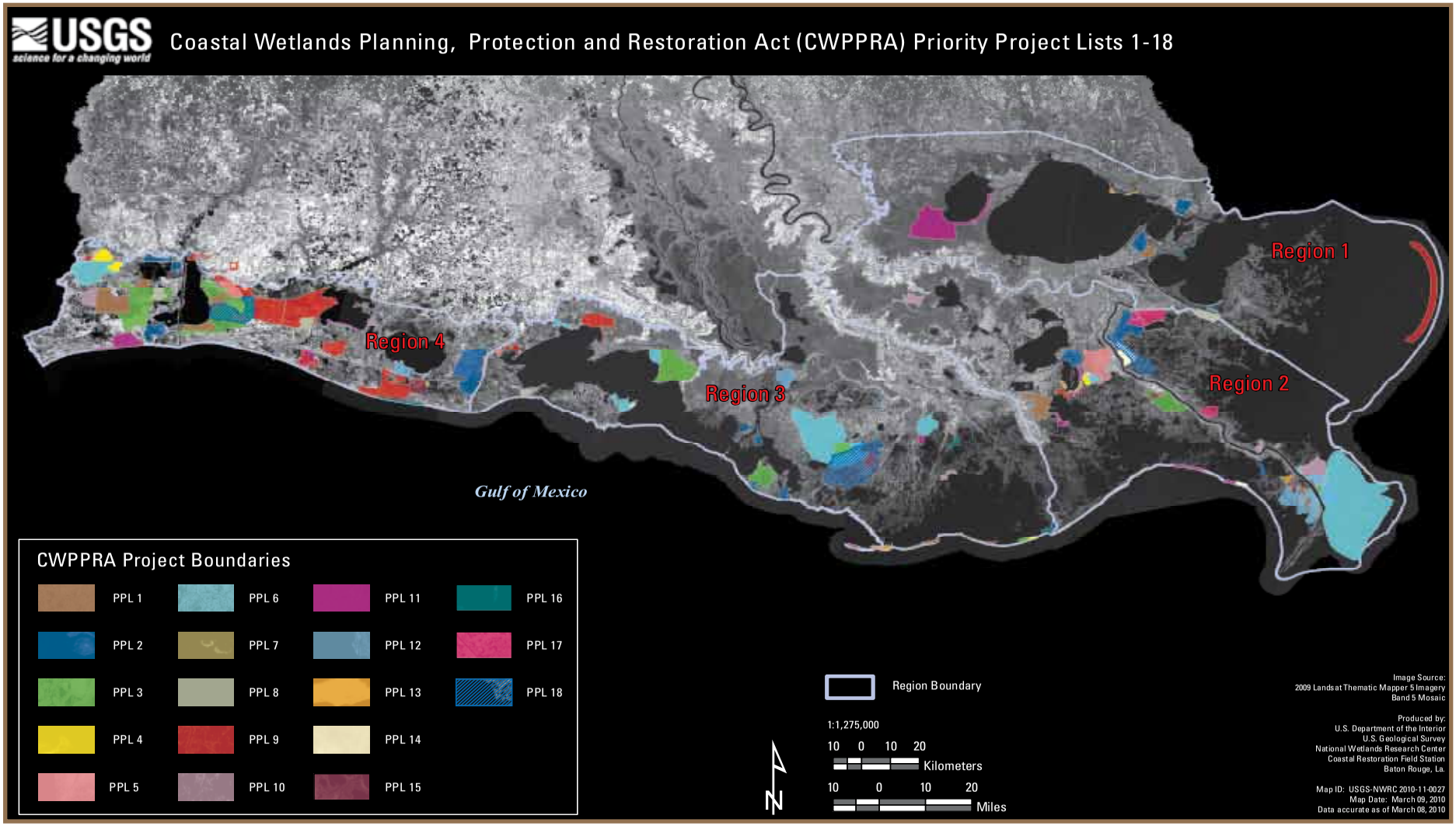


Figure 2. Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Priority Project Lists 1-18 and Coast 2050 Regions.

CWPPRA Projects Approved Since the 2006 Report to Congress

The Task Force ***authorized*** a total of 16 new projects between 2006 and 2009 for **Phase 1—Engineering and Design**, which if constructed would result in an estimated net benefit of 7,875 acres of wetlands (table 1).

Table 1. CWPPRA projects authorized between 2006 and 2009 for Phase 1.

[PPL, Priority Project List; Phase 1—Engineering and Design]

Project Number	PPL	Project Name	Date Authorized	Total Net Acres (Acres Reestablished and Protected)	Region
PROJECTS APPROVED FOR PHASE 1—Engineering and Design Feb. 2006 through Jan. 2009 (PPL 15 through PPL 18)					
BS-13	15	Bayou Lamoque FW Divr [TRANSFER - Oct 2007]	8-Feb-06	620	2
BA-42	15	Lake Hermitage Marsh Creation	8-Feb-06	447	2
MR-15	15	Venice Ponds Marsh Creation and Crevasses	8-Feb-06	511	2
ME-23	15	South Pecan Island Freshwater Introduction	8-Feb-06	98	4
PO-34	16	Alligator Bend Marsh Restoration and Shoreline Protection	18-Oct-06	127	1
ME-24	16	Southwest Louisiana Gulf Shoreline Nourishment and Protection	18-Oct-06	888	4
TE-51	16	Madison Bay Marsh Creation and Terracing	18-Oct-06	372	3
TE-52	16	West Belle Pass Barrier Headland Restoration	18-Oct-06	305	3
BS-15	17	Bohemia Mississippi River Reintroduction	25-Oct-07	637	2
BS-16	17	Caernarvon Outfall Management/Lake Lery Shoreline Restoration	25-Oct-07	652	2
BA-47	17	West Pointe a la Hache Marsh Creation	25-Oct-07	203	2
BA-48	17	Bayou Dupont Marsh and Ridge Creation	25-Oct-07	187	2
BS-18	18	Bertrandville Siphon	21-Jan-09	1,613	2
TE-66	18	Central Terrebonne Freshwater Enhancement	21-Jan-09	456	3
CS-49	18	Cameron-Creole Freshwater Introduction	21-Jan-09	473	4
BA-68	18	Grand Liard Marsh and Ridge Restoration	21-Jan-09	286	2
Total = 16 Projects			**Total Net Acres =**	**7,875**	

In this same period, the Task Force also ***authorized*** **Phase 2—Construction** of 12 projects that are expected to result in an estimated net benefit of 3,055 acres of wetlands (table 2). These12 projects include two barrier island projects, six marsh creation projects, three shoreline protection projects, and one freshwater diversion. In addition, a list of each project funded by the program to date is provided in appendix 2.

Table 2. CWPPRA projects authorized between 2006 and 2009 for Phase 2.

[PPL, Priority Project List; Phase 2—Construction]

Project Number	PPL	Project Name	Date Authorized	Total Net Acres (Acres Reestablished and Protected)	Region
PROJECTS APPROVED FOR PHASE 2—Construction Feb. 2006 through Jan. 2009					
PO-30	10	Lake Borgne Shoreline Protection	8-Feb-06	165	1
BA-35	11	Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration	8-Feb-06	263	2
TE-46	11	West Lake Boudreaux Shoreline Protection and Marsh Creation	8-Feb-06	277	3
PO-33	13	Goose Point/Pointe Platte Marsh Creation	15-Feb-07	436	1
BA-36	11	Dedicated Dredging on the Barataria Basin Landbridge	15-Feb-07	242	2
ME-21a	11	Grand Lake Shoreline Protection - Tebo Point	15-Feb-07	45	4
BA-39	12	Mississippi River Sediment Delivery System - Bayou Dupont	13-Feb-08	326	2
BA-41	14	South Shore of the Pen Shoreline Protection and Marsh Creation	13-Feb-08	211	2
TE-39	9	South Lake De Cade Freshwater Introduction	13-Feb-08	202	3
TE-50	13	Whiskey Island Backbarrier Marsh Creation	13-Feb-08	272	3
BA-42	15	Lake Hermitage Marsh Creation	21-Jan-09	447	2
TV-21	14	East Marsh Island Marsh Creation	21-Jan-09	169	3
Total = 12 Projects		**Total Net Acres =**		**3,055**	

Little Lake Shoreline Protection/ Dedicated Dredging near Round Lake

CWPPRA Effectiveness and Progress

Effectiveness within the CWPPRA program can be measured in the volume of projects that have expeditiously been constructed, the number of wetland acres restored and/or protected, and the successful collaboration between government and the public to accomplish ecosystem-level benefits with limited annual funding, one project at a time. Since 1990, 144 projects that are projected to restore and/or protect more than 107,861 acres have been implemented under CWPPRA. Although a project viewed in isolation can appear to have a limited footprint, several projects built in strategic proximity to each other can have a much larger and synergistic benefit than the sum of individual projects. This is being demonstrated with the Barataria Basin Landbridge and the Louisiana barrier island system.

Over the last several years, projects were constructed that are collectively stabilizing the Barataria Basin Landbridge. This area, just south of New Orleans, provides a critical hydrologic barrier against encroachment from the Gulf of Mexico. Recognized as an acute area of need, the CWPPRA agencies prioritized these projects to be built expeditiously in order to restore these wetlands. Working together, these projects provide synergy with one another in the form of shoreline protection and marsh creation (over 1,000 acres each) needed to reclaim this ecosystem.

The Louisiana barrier island system is rightfully referred to as the "first line of defense" for the coastal communities and infrastructure that lie behind them. Also a rich and diverse ecosystem, the islands are home to many threatened or endangered fish, bird, and wildlife species. The CWPPRA program has markedly led the charge in restoring the barrier islands and thus contributing to Louisiana's resiliency to storms and sea level rise. In the last 3 years alone, CWPPRA has initiated construction on several barrier island projects. A complex and expensive undertaking, these projects are needed to serve collectively as a perimeter defense to wetlands against storms and as a necessary component of Louisiana's highly productive estuaries.

The quantitative measure of success within the CWPPRA program is captured by its programmatic, and in some cases project-specific, monitoring program. Implemented through a partnership between the State of Louisiana and the U.S. Geological Survey, CWPPRA's Coastwide Reference Monitoring System (CRMS) installed monitoring stations throughout the Louisiana coastal zone to gather data on both project sites and reference areas to look at ecosystem response to projects. This information is critical, as it will help direct the design of future projects and the adaptive management of existing ones.

The following sections discuss several of the CWPPRA projects that were funded and/or constructed from 2006 to 2009 divided by hydrologic region, with a brief review of the geography and challenges unique to each region.



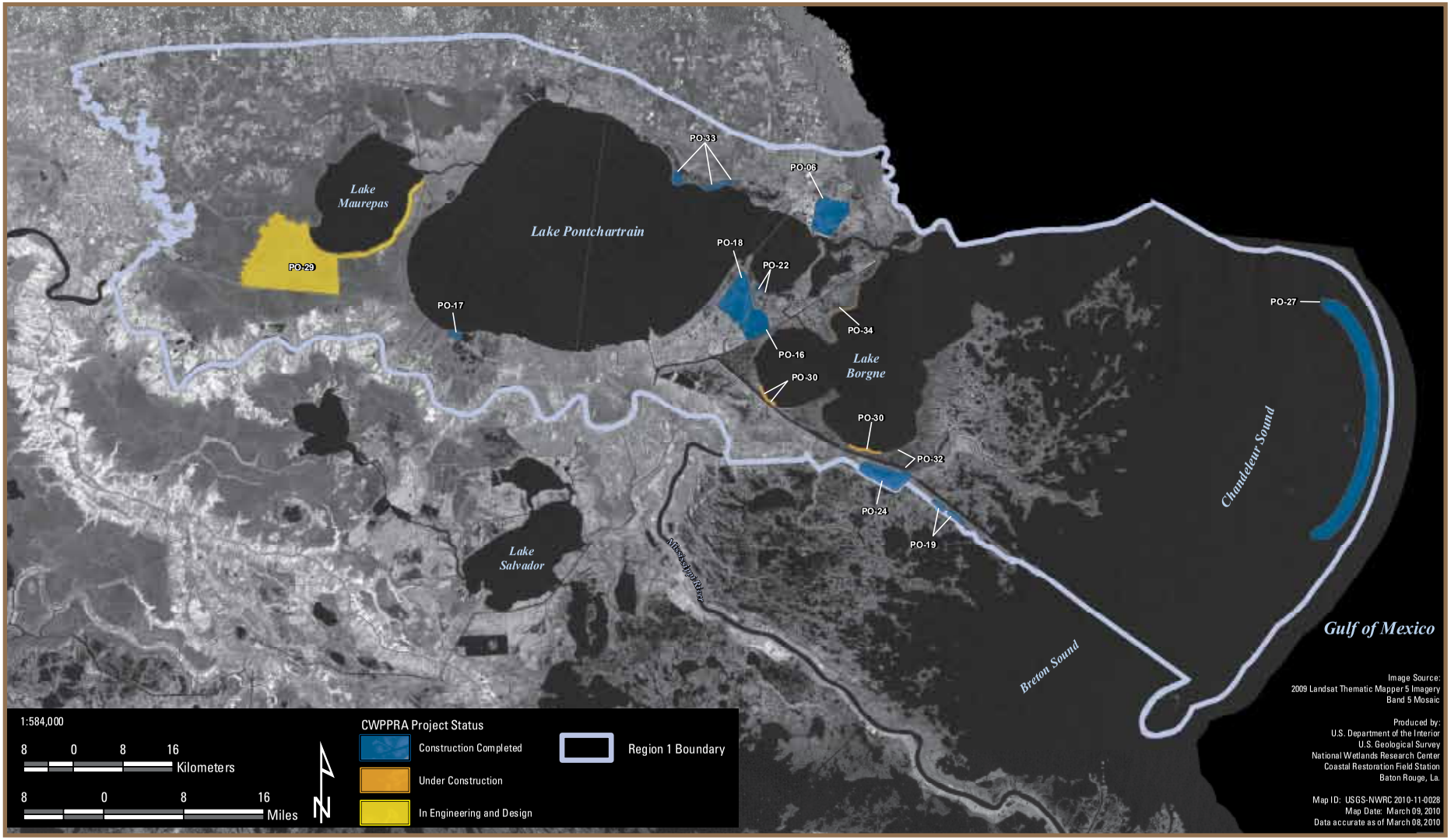



Figure 3. Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Priority Project Lists 1-18, Coast 2050 Region 1.

Region 1

Region 1 includes the Pontchartrain Basin, which is the coastal area north and east of the Mississippi River above Caernarvon and the Mississippi River-Gulf Outlet (MRGO) (see figure 3). Major infrastructure includes the New Orleans metropolitan area north and east of the Mississippi River with several major ports, communities on the north shore of Lake Pontchartrain, and the recently closed Mississippi River-Gulf Outlet (MRGO). The natural landscape is dominated by low-lying swamps and marshes that are nourished by periodic flooding of rivers and bayous such as the Amite and Pearl Rivers and Bayou Manchac. Region 1 has several large and significant lakes such as Lakes Pontchartrain, Maurepas, and Borgne that support vast wetland complexes. There are an estimated 576,570 acres of coastal wetlands in this urban estuary.

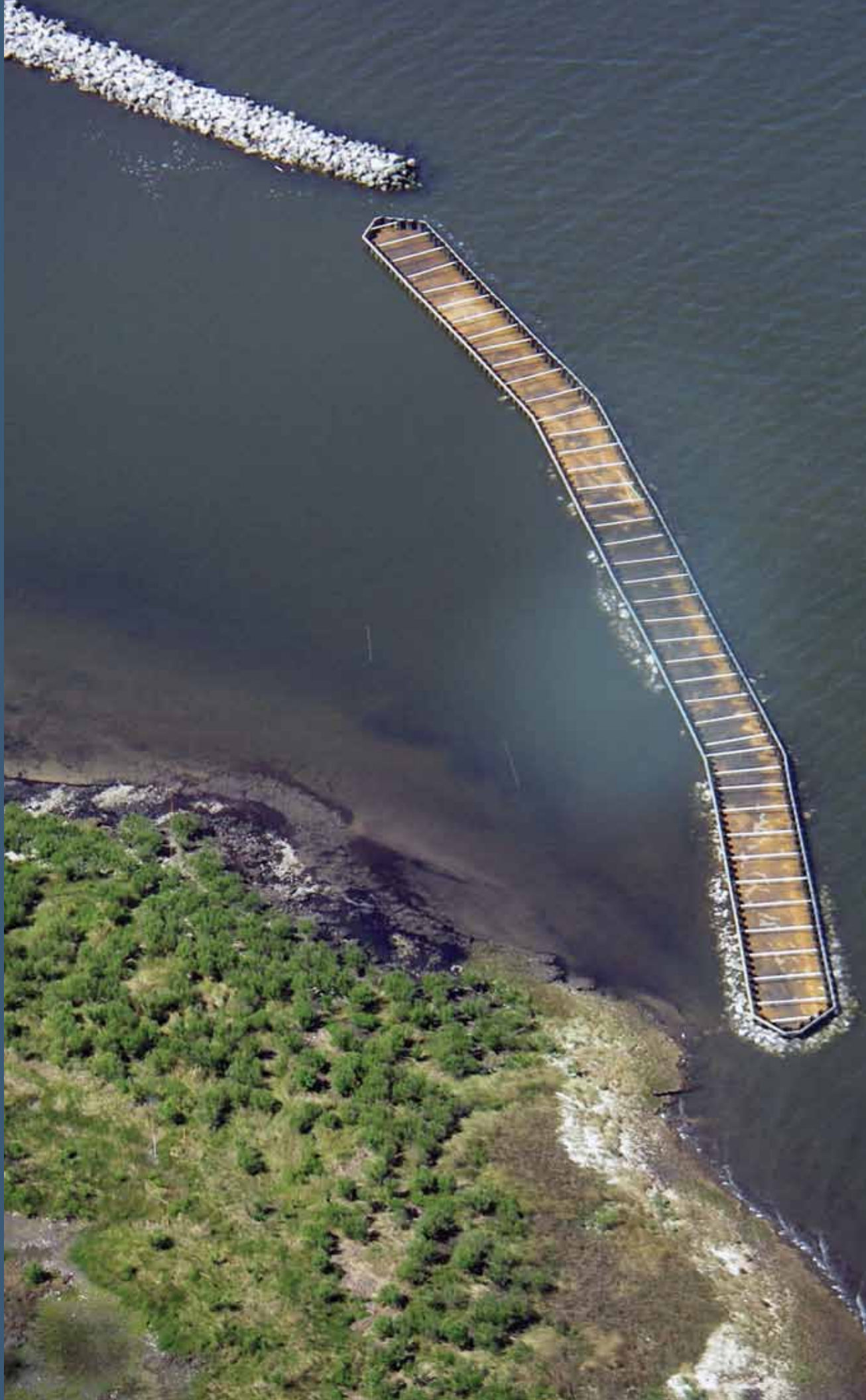
Critical problems in Region 1 are reduced riverine input, increased salinities, erosion along ship channels and lake shorelines, and potential loss of essential land bridges. Estimates of wetland loss from Region 1 indicate that 23,296 acres of wetlands were lost between 1990 and 2000 (Hill and Green, 2005). Hurricanes Katrina and Rita produced dramatic land changes within the region. The U.S. Geological Survey estimated that in this region 14,720 acres of wetlands converted to open water during the 2005 hurricane season (Barras, 2006). Whether these wetlands will recover or will persist as open water is unknown at this time.

The primary challenges in this region are preserving habitat and maintaining current levels of productivity. In 2006, the Task Force authorized Phase 1—Engineering and Design of the Alligator Bend Marsh Restoration and Shoreline Protection Project (PO-34) in Region 1. PO-34 is expected to benefit 575 acres of the project area. Projects authorized and constructed in Region 1 during 2006–2009 include Lake Borgne Shoreline Protection (PO-30) and Goose Point and Point Platte Marsh Creation (PO-33) (table 3).

Table 3. CWPPRA projects authorized for Phase 1 and Phase 2 during this reporting period (2006–2009) in Region 1.

[PPL, Priority Project List; Phase 1—Engineering and Design; Phase 2—Construction]

Project Number	PPL	Project Name	Date Authorized	Total Net Acres (Acres Reestablished and Protected)	Phase
PO-34	16	Alligator Bend Marsh Restoration and Shoreline Protection	18-Oct-06	127	1
PO-30	10	Lake Borgne Shoreline Protection	8-Feb-06	165	2
PO-33	13	Goose Point/Pointe Platte Marsh Creation	15-Feb-07	436	2
Total Projects: 3		**Total Acres =**		**728**	



Reestablishing a shoreline to protect interior marsh.

Alligator Bend Marsh Restoration and Shoreline Protection Project (PO-34)

Creative thinking to protect land just west of New Orleans.

Location

This project is located in the Lake Pontchartrain Basin, Orleans Parish, along the East Orleans Landbridge on the northwest shoreline of Lake Borgne. The project area is located between Chef Pass, the Gulf Intracoastal Waterway (GIWW), Unknown Pass, and Lake Borgne.

Problems

The landfall of Hurricane Katrina in southeast Louisiana destroyed thousands of acres of marsh and other coastal habitats in the Lake Pontchartrain Basin. Along the shorelines of Lake Borgne the storm created breaches between the lake and interior marshes and in some cases removed large expanses of wetlands. Loss of wetlands in the Alligator Bend area has created more than 1,000 acres of open water in a complex that formerly supported relatively stable brackish marshes. Post-storm aerial photographs show that the most significant losses occurred along the flanks of Bayou Platte. The current landscape configuration has left a large area of open water between eroding shorelines on Lake Borgne and along the GIWW. Continued shoreline erosion and future storms could create a direct path of open water connecting the GIWW and Lake Borgne and threaten the integrity of this important landbridge.

Restoration Strategy

The current objective of this project is to protect the shoreline integrity of Lake Borgne and prevent hydrologic coupling between the lake and the open water behind the shoreline. A foreshore rock dike will be constructed along approximately 26,702 linear feet of the shoreline. In the shoreline areas not protected by the rock dike, approximately 21,674 feet of vegetation will be planted. The rows will be staggered to facilitate the establishment of a "vegetative wall" to ensure a continuous line of protection against erosion.

Progress to Date

The project is currently in Phase 1—Engineering and Design. A 30% review meeting is anticipated for 2011. Phase 2—Construction funding is scheduled to be requested at the January 2012 Task Force meeting. Construction is anticipated to begin October 2012 with a completion date of September 2013.

Project Status

Approved: 2006

Project Area: 575 acres

Cost: $1.66 million

Net Benefit After 20 Years: 127 acres

Average Annual Habitat Units (AAHU): 56

Project Type: Marsh Restoration and Shoreline Protection

Status: Phase 1

This project is on Priority Project List 16.

Mending and Protecting Landmasses West of New Orleans: Lake Borgne Shoreline Protection (PO-30)

Rock breakwaters are constructed to protect shorelines.

Location

This project is located near New Orleans on the southwest shoreline of Lake Borgne at Old Shell Beach and Bayou Dupre in St. Bernard Parish. In general, the project area consists of two segments: the Bayou Dupre segment and the Shell Beach segment.

Problems

The narrow strip of marsh separating the MRGO and Lake Borgne in the vicinity of Old Shell Beach and Bayou Dupre is disappearing. This project addresses that loss by mitigating shoreline retreat and protecting the Lake Borgne shoreline.

Restoration Strategy

The project's objectives include preventing and reducing Lake Borgne shoreline retreat in the areas adjacent to Old Shell Beach and Bayou Dupre to mitigate further joining of the lake and the MRGO; reestablishing a sustainable lake rim; and preventing or reducing conversion of emergent marsh to open water. Continuous rock breakwaters were constructed onshore approximately 17,000 feet from Doulluts Canal to Fort Bayou (Shell Beach) to provide shoreline protection. The protection ties into the existing rock breakwater structure which surrounds the perimeter of Old Fort Beauregard (Fort Proctor). Additional onshore rock breakwaters were constructed approximately 6,643 feet west and 4,418 feet southeast of Bayou Dupre. Back-to-back steel sheet pile structures at Bayou Dupre tie the rock structures into the existing offshore U.S. Army Corps of Engineers rock breakwater along the MRGO.

Accomplishments

Phase 1—Engineering and Design was approved in January 2001 and January 2002 and was completed in March 2005. Approval/funding for Phase 2—Construction occurred in February 2006 and the notice to proceed (construction) in August 2007. Construction was completed in April 2010.

Protecting the Land, Plants, Animals, and People Along the North Shore of Lake Pontchartrain near New Orleans: Goose Point/ Point Platte Marsh Creation (PO-33)

The green plant area is the edge of Lake Pontchartrain; the black lines are the containment area of the project before it was built.

Location

The project is located north of New Orleans on the north shore of Lake Pontchartrain in St. Tammany Parish, between Fontainebleu State Park and Louisiana Highway 11 and within the Big Branch Marsh National Wildlife Refuge. The project area at Goose Point also includes a portion of the St. Tammany State Wildlife Refuge.

Problems

Interior ponding and, to a lesser extent, shoreline erosion are the major causes of wetland loss in the project area. High wetland loss rates were associated with hydrologic alterations that allowed salt water to penetrate the fresher marshes. During the transition to a more brackish plant community, large ponds were formed. A narrow strip of land separated these ponds from Lake Pontchartrain.

Restoration Strategy

The goal of this project was to re-create marsh habitat in the open water behind the shoreline. This new marsh will maintain the lake-rim function along this section of the north shore of Lake Pontchartrain by preventing the formation of breaches into interior ponds. Sediment was dredged from Lake Pontchartrain and contained in cells within the interior ponds to create approximately 417 acres of marsh in the 1,384-acre project area. In addition, 149 acres of degraded marsh were nourished with dredged material. Marsh was created to widen the shoreline so that the ponds will not be breached during the course of normal shoreline retreat.

Project implementation has resulted in approximately 566 acres of marsh created and nourished, with an estimated 436 acres protected and restored over the 20-year project life. The restored marshes will maintain the lake-rim function along this section of the north shore of Lake Pontchartrain and will continue to provide water quality benefits necessary to support the lake's aquatic resources, as well as support the fish and wildlife habitat of the national wildlife refuge.

Accomplishments

Construction began in April 2008 and was completed in January 2009. The current estimated cost of the project is $15,721,330, which includes $15,131,010 for construction first costs and then $590,320 for 20 years of operations and maintenance. This project was completed under budget, and it is anticipated that approximately $5 million will be returned to the CWPPRA program to be reinvested in other projects.

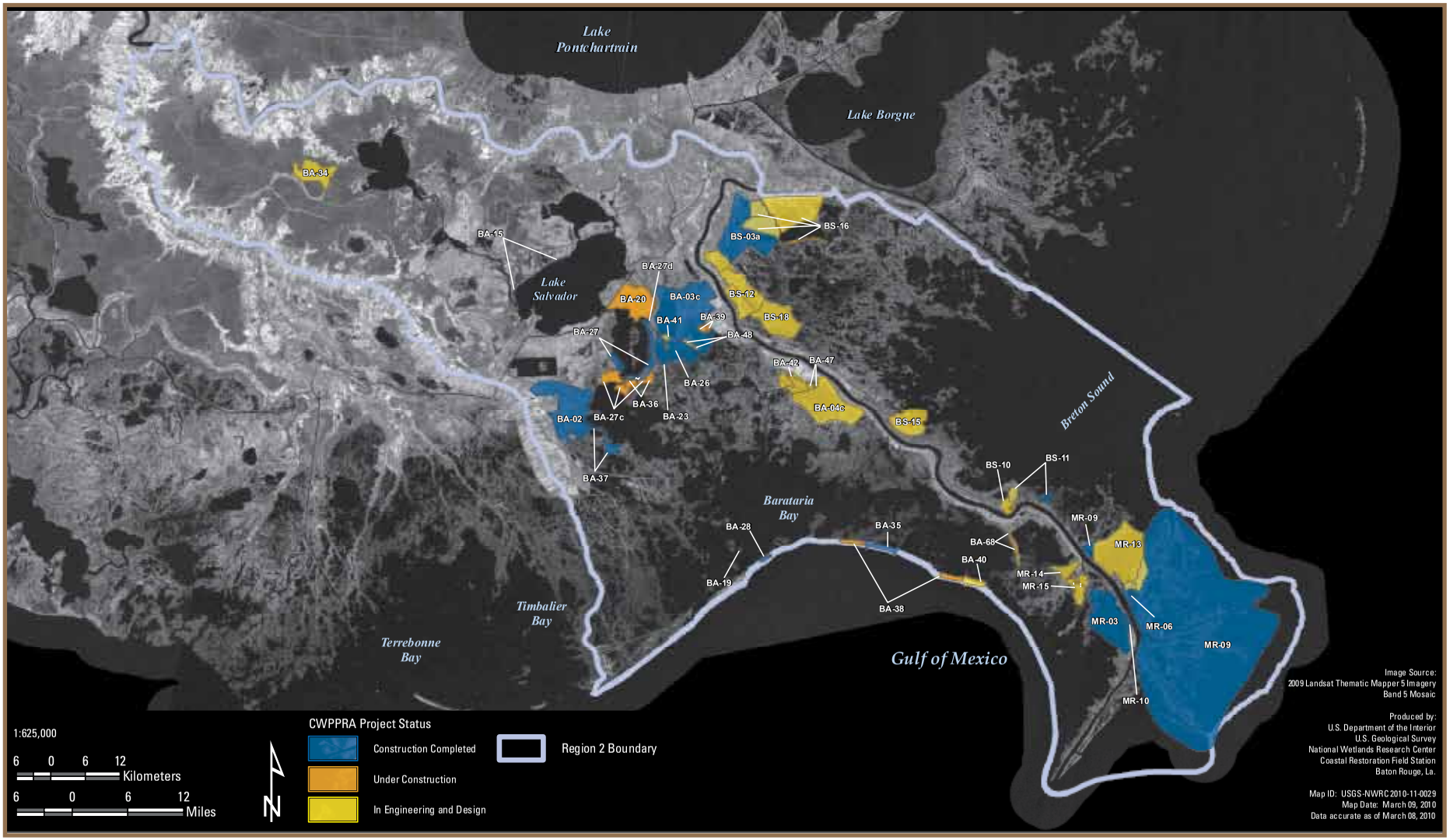


Figure 4. Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Priority Project Lists 1-18, Coast 2050 Region 2.

Region 2

Region 2 includes the Breton Sound, Barataria, and Mississippi River Delta hydrologic basins (see figure 4). This region comprises the coastal area east of the Mississippi River to the MRGO and the area west of the Mississippi River to Bayou Lafourche and includes 894,700 acres of wetlands. Important features include the Birdsfoot Delta of the Mississippi River, Little Lake, Lake Salvador, and Barataria Bay and extensive marshes varying from fresh to saline. This region's major infrastructure includes the "West Bank" area of New Orleans, the lower Mississippi River navigation channel, and important offshore support bases such as Port Fourchon and Venice. Numerous oil and gas pipelines pass through this region to inland refineries or interstate transmission networks, including the Louisiana Offshore Oil Port (LOOP) pipeline. The LOOP provides a deepwater port for some of the world's largest tankers. Towns such as Lafitte, Venice, Port Sulphur, and Grand Isle support robust commercial and recreational fishing industries.

Historically, annual flooding from the Mississippi River and Bayou Lafourche provided nutrients, sediment, and water to the wetlands; however, levee construction altered the natural hydrologic process and transport of sediment for marsh nourishment. Region 2 has undergone one of the highest rates of land loss in coastal Louisiana. This region lost approximately 52,160 acres of wetlands between 1990 and 2000 (Hill and Green, 2005). The U.S. Geological Survey estimated that in this region alone 49,280 acres of open water were formed during the 2005 hurricane season (Barras, 2006). Breton Sound Basin suffered the highest losses of any basin from Hurricane Katrina. Critical problems in Region 2 include subsidence combined with sediment and nutrient deprivation, compaction, saltwater intrusion, shoreline erosion, and barrier island erosion.

Between 2006 and 2009, the Task Force authorized nine projects for Phase 1—Engineering and Design in Region 2. These include Lake Hermitage Marsh Creation (BA-42), Venice Ponds Marsh Creation and Crevassess (MR-15), Bohemia Mississippi River Reintroduction (BS-15), Caernarvon Outfall Management/Lake Lery Shoreline Restoration (BS-16), West Pointe a la Hache Marsh Creation (BA-47), Bayou Dupont Ridge Creation and Marsh Restoration (BA-48), Bertrandville Siphon (BS-18), and Grand Liard Marsh and Ridge Restoration (BA-68), and Bayou Lamoque Freshwater Diversion (which was later transferred to another program). Projects authorized for Phase 2—Construction in Region 2 during 2006–2009 include Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration (BA-35); Dedicated Dredging on the Barataria Basin Landbridge (BA-36), Mississippi River Sediment Delivery System – Bayou Dupont (BA-39), South Shore of the Pen Shoreline Protection and Marsh Creation (BA-41), and the Lake Hermitage Marsh Creation project (BA-42) (table 4).

Additionally, CWPPRA constructed projects during this time period include Delta Management at Fort St. Phillip (BS-11), the Barataria Basin Landbridge Shoreline Protection Phases 1 and 2 (BA-27), Pass Chaland to Grand Bayou Pass Barrier Island Shoreline Restoration (BA-35), and the Barataria Barrier Island and Pass La Mer to Chaland Headland (BA-28-2).

Table 4. CWPPRA projects authorized for Phase 1 and Phase 2 during this reporting period (2006–2009) in Region 2.

[PPL, Priority Project List; Phase 1—Engineering and Design; Phase 2—Construction]

Project Number	PPL	Project Name	Date Authorized	Total Net Acres (Acres Reestablished and Protected)	Phase
BS-13	15	Bayou Lamoque FW Divr [Transfer - Oct 2007]	8-Feb-06	620	1
BA-42	15	Lake Hermitage Marsh Creation	8-Feb-06	447	1
MR-15	15	Venice Ponds Marsh Creation and Crevasses	8-Feb-06	511	1
BS-15	17	Bohemia Mississippi River Reintroduction	25-Oct-07	637	1
BS-16	17	Caernarvon Outfall Management/Lake Lery Shoreline Restoration	25-Oct-07	652	1
BA-47	17	West Pointe a la Hache Marsh Creation	25-Oct-07	203	1
BA-48	17	Bayou Dupont Marsh and Ridge Creation	25-Oct-07	187	1
BS-18	18	Bertrandville Siphon	21-Jan-09	1,613	1
BA-68	18	Grand Liard Marsh and Ridge Restoration	21-Jan-09	286	1
BA-35	11	Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration	8-Feb-06	263	2
BA-36	11	Dedicated Dredging on the Barataria Basin Landbridge	15-Feb-07	242	2
BA-39	12	Mississippi River Sediment Delivery System - Bayou Dupont	13-Feb-08	326	2
BA-41	14	South Shore of the Pen Shoreline Protection and Marsh Creation	13-Feb-08	211	2
BA-42	15	Lake Hermitage Marsh Creation	21-Jan-09	447	2
	Total Projects: 14		**Total Acres =**	**6,645**	

Sand fences and grasses help to improve resiliency.

Bohemia Mississippi River Reintroduction (BS-15)

Location

The project is located in the Breton Sound Basin in Plaquemines Parish along the east bank of the Mississippi River approximately 8–9 miles southeast of Pointe a la Hache, just north of and across the river from Port Sulfur.

Problems

Wetland loss rates in this area are very low, probably because of the beneficial effect of the small Bohemia diversion nearby; regular, seasonal overbank flow during flood stage on the Mississippi River; some influence from the nearby mouth of the Mississippi River; and possibly a stabilizing effect of these wetlands occurring on the flanks of the natural levee of the Mississippi River. This project is best viewed as an opportunity to create new land by diverting Mississippi River water, which could offset a small portion of losses elsewhere.

Restoration Strategy

An uncontrolled diversion with a capacity of approximately 10,000 cubic feet per second will be constructed to reintroduce Mississippi River water to promote natural deltaic growth and nourish 5,000 acres of saline and brackish marsh and open water. Approximately 637 net acres of marsh will be created over the 20-year life of the project. The diversion will also result in a shift in marsh types towards fresher marsh. In addition, to partially compensate for habitat losses from proposed channel improvements, dredged material will be used beneficially to fill in existing oil and gas canals to create marsh, and trees will be planted on new guide levees of the improved diversion channel. Aquatic vegetation in interior marsh ponds and channels is expected to increase. The project also aims to improve habitat interspersion in the area by creating new marsh in open water areas as a result of diverting Mississippi River water, sediment, and nutrients. An increase in the amount of shallow open water habitat in the project area, as a percentage of existing open water habitat, is also anticipated.

Progress to Date

The Louisiana Coastal Wetlands Conservation and Restoration Task Force approved funding for Phase 1—Engineering and Design of this project at its October 2007 meeting. The U.S. Environmental Protection Agency, the lead Federal project sponsor, is currently working with Louisiana's Office of Coastal Protection and Restoration as they negotiate a scope of services with their prospective engineering and design firm.

Project Status

Approved Date: 2007

Project Area: 5,210 acres

Approved Funds: $1,359,699

Total Estimated Cost: $6,923,792

Net Benefit After 20 Years: 637 acres

Project Type: Freshwater Diversion

Average Annual Habitat Units (AAHU): 989

Status: Phase 1—Engineering and Design

This project is on Priority Project List 17.

West Pointe a la Hache Marsh Creation (BA-47)

Location

The project area is located in Barataria Basin. The site is located near Highway 23 at West Pointe a la Hache.

Problems

As a result of leveeing the Mississippi River for navigation and flood control, the West Pointe a la Hache wetlands were cut off from the historical overbank flooding of the river. Without continued sediment input, marshes could not sustain viable elevations because of ongoing subsidence. In addition, oil and gas canals disrupted hydrology and facilitated saltwater intrusion, further degrading the marsh. Beginning in 1993, the siphons at West Pointe a la Hache were operated to reintroduce Mississippi River water, fine sediments, and nutrients into this area; however, land loss rates have continued to be high. An opportunity exists to create marshes directly in the influence area of the siphons by using sediment from the nearby Mississippi River. The created marshes should benefit from the effects of the reintroduced Mississippi River water from the siphons.

Restoration Strategy

This project will re-create marsh habitat in the area just west of the Jefferson Lake Canal by harvesting sediment from the Mississippi River and pumping it via pipeline to the proposed site. The goals of this project include converting approximately 250 acres of open water habitat to intermediate marsh, nourishing approximately 102 acres of existing intermediate marsh with dredged material, and maintaining 203 acres of created/nourished marsh over the 20-year project life.

Progress to Date

The project is currently in Phase 1—Engineering and Design. A 30% review meeting is anticipated for 2011. Phase 2—Construction funding is scheduled to be requested at the January 2012 Task Force meeting. Construction is anticipated to begin September 2012, with a completion date of September 2013.

Project Status

Approved Date: 2007

Project Area: 352 acres

Approved Funds: $1.6 million

Total Estimated Cost: $16 million

Net Benefit After 20 Years: 203 acres

Average Annual Habitat Units (AAHU): 126

Project Type: Marsh Creation

Status: Engineering and Design

This project is on Priority Project List 17.

Crevasses, Terraces, and Plants Work Together To Revive Fresh Marsh Habitats: Delta Management at Fort St. Philip (BS-11)

An artificial crevasse (gap) in the containment system allows for the diversion of fresh water and sediments.

Location

The project is located about 50 miles southeast of New Orleans in Plaquemines Parish on the east bank of the Mississippi River across from Fort Jackson.

Problems

This area has undergone tremendous loss of emergent wetlands since 1974. The causes of marsh loss appear to be from subsidence, wind and wave erosion, and possibly scouring of highly organic marshes when river water was introduced in the early 1970s (possibly during the 1973 flood). The fringing marsh in this area borders Breton Sound, which can undergo intense wave energy that causes extensive loss of shoreline marsh. During the 1973 flood, a locally constructed levee was breached in several locations near Fort St. Philip and has continued to deteriorate from wave energy and the flow of fresh water during high river stages. In 1991, the U.S. Army Corps of Engineers constructed a revetment (retaining wall) and rock dike approximately 2 miles long on the east side of the Mississippi River near Fort St. Philip. That dike, originally constructed to an elevation of 5 feet, has been degraded to 0.5 feet for 2,000 feet and to -3 feet for 700 feet immediately downstream from Fort St. Philip to allow for continued overbank flow of fresh water.

Restoration Strategy

Even though this area is undergoing a net gain in emergent marsh, this project will enhance the natural marsh-building processes and increase the growth rate of emergent wetlands. The objective of the project is to enhance the delta-building process occurring as a result of the crevasse at Fort St. Philip. Six artificial crevasses were constructed to divert fresh water and sediments into two shallow, open water receiving areas currently restricted by spoil banks or natural ridges. The crevasses will be maintained during the project life. In addition, 98 linear terraces, each 200 feet in length (19,600 linear feet total), were constructed to enhance sediment retention and reduce wave energy in one of the large receiving bays. Terraces were also planted with seashore paspalum and smooth cordgrass.

Accomplishments

Through the construction of earthen terraces and vegetative plantings and the enhancement of the natural processes of delta growth, approximately 267 net acres of emergent marsh are expected to be benefited through the 20-year project life. Construction was initiated on June 19, 2006, and was completed on December 14, 2006. The project cost was $2,098,036, which included $1,974,007 for construction first costs and the remainder to be used for 20 years of monitoring, operations, and maintenance.

Panel structures being used for a field test.

A Synergistic Approach to Restoration Improves Constructability and Stability: Barataria Basin Landbridge Shoreline Protection, Phases 1 and 2 (BA-27)

Location

The project is located approximately 20 miles due south of New Orleans and 3 miles south of Lafitte, in western Jefferson Parish and eastern Lafourche Parish, on the western shoreline of Bayou Perot and the east/southeastern shoreline of Bayou Rigolettes.

Problems

Erosion rates of up to 114 feet per year along the western shoreline of Bayou Perot and the eastern shoreline of Bayou Rigolettes are causing severe marsh loss in the area. The Barataria Basin Landbridge is a key feature in the Barataria Bay Estuary and was likely to be lost if the erosion in the area was not reduced.

Restoration Strategy

Approximately 35,000 feet of shoreline protection has been constructed. Of that, approximately 6,200 feet is a traditional foreshore rock dike; the remainder consists of concrete panel structures. This project is one of several projects in the area that works synergistically to protect and restore the wetlands within the entire Barataria Basin Landbridge. This first Barataria Basin Landbridge project has been constructed in four CWPPRA phases. The project restoration area has grown through funds provided by the Coastal Impact Assistance Program (CIAP) and by Louisiana State surplus fund. In partnership with other programs, it now extends well beyond its original footprint and plan.

Accomplishments

At the April 14, 1999, meeting, the Louisiana CWPPRA Task Force approved combining the Barataria Basin Landbridge Phase 1 (PPL 7) and Phase 2 (PPL 8) projects. The project was recorded on Priority Project List 7. It was then separated into four construction units (a–d).

Responding to Damage Promptly Helps Prevent Total Collapse of the System: Pass Chaland to Grand Bayou Pass Barrier Island Shoreline Restoration (BA-35)

The construction rebuilds the island complex and helps to protect the marsh directly behind the newly created barrier island areas. Wave action on the south side of the beach is apparent in the photograph.

Location

This project is located about 60 miles south of New Orleans in the Barataria Basin in Plaquemines Parish.

Problems

The Plaquemines Parish shoreline, which forms the southern boundary of the Barataria Bay Estuary, is one of the fastest eroding coasts in the Nation. Historically, Shell Island, a 5-mile-long barrier shoreline, extended eastward; however, Shell Island has largely been eroded, and this project serves to stabilize the remaining island chain. The specific project area was an intact shoreline in 2001. The shoreline was initially breached in 2002, after which increased erosion was evident because of the formation of tidal passes. Erosional losses increased dramatically as shoreline degradation resulting from continued storm impacts occurred.

Restoration Strategy

The project was designed to maintain shoreline integrity through the restoration of a sandy beach and dune feature. Additionally, construction activities restored back barrier marshes to provide a foundational platform to support anticipated shoreline migration. More than 2,950,000 cubic yards of material was used for island restoration.

Accomplishments

The project reestablished a continuous 2.7-mile shoreline by restoring a fragmented beach. At the time of project construction, an 8-foot-deep inlet had formed. The project created and restored more than 425 acres of beach, dune, and marsh. Based on coastal engineering analyses, it is predicted that the shoreline should remain intact for 15–20 years. It is estimated that about 260 more acres will exist in 20 years.

Engineering was completed at a cost of about $1.4 million. Engineering challenges included project redesign following Hurricanes Katrina and Rita in 2005. Site-specific design issues included ensuring continued circulation in Bay Joe Wise to maintain oyster production.

Drawing a "Line in the Sand" To Enhance Coastal Resiliency: Barataria Barrier Island Complex Project – Pelican Island and Pass La Mer to Chaland Headland (BA-38-2)

Pipes deliver new sediment to the island.

Location

Chaland Headland is located on the Gulf of Mexico about 60 miles south of New Orleans in Plaquemines Parish.

Problems

The Plaquemines Parish shoreline, which forms the southern boundary of the Barataria Bay Estuary, is one of the fastest eroding coasts in the Nation. The specific project area was an intact, continuous 2.6-mile shoreline in 2001. Ongoing coastal erosion, coupled with tropical storms and hurricanes, resulted in the fragmentation of the shoreline into three parts.

Restoration Strategy

The major project purpose was to restore a continuous shoreline to enhance coastal resiliency. Using state-of-the-art coastal engineering science, the project was designed to maintain shoreline integrity through the restoration of a sandy beach and dune feature. Additionally, construction activities restored back barrier marshes to provide a foundational platform to support anticipated shoreline migration. More than 3,370,000 cubic yards of material was dredged from offshore relic deposits and used for island restoration.

Accomplishments

Full design and engineering was completed in less than 3 years. Despite delays associated with the 2005 hurricane season, heavy construction began in March 2006 and was completed in January 2007.

The project reestablished a continuous 2.6-mile shoreline by reconnecting three segments of fragmented beach. The project created and restored over 414 acres of beach, dune and marsh. On the basis of coastal engineering analyses, it is predicted that the shoreline should remain intact for 15–20 years. It is estimated that about 280 more acres will exist in 20 years and that the shoreline retreat will have been reduced by over 200 feet.

Engineering was completed at a cost of about $1.2 million by a consortium of several private firms and involved extensive surveying and soil investigations. Construction activities included dredging and other marine construction functions, as well as sand fencing and vegetative plantings. Total construction costs were about $18 million.

Harvesting the Rich Resources of the River: Mississippi River Sediment Delivery System – Bayou Dupont (BA-39)

Hydrologic cutterhead dredge head. This dredge brings sediment from the river bed.

Location

Located approximately 20 miles south of New Orleans on the west bank of the Mississippi River, adjacent to Bayou Dupont and southeast of Cheniere Traverse Bayou, this project is located within the Barataria Basin in the vicinity of Ironton in Plaquemines Parish and Lafitte in Jefferson Parish.

Problems

Project area marshes are badly degraded and have converted to mostly open water, likely due to a combination of causes including a lack of natural freshwater and sediment input, subsidence, and the dredging of oil and gas canals.

Restoration Strategy

The project harvests sediment from the Mississippi River to create marsh in a rapidly eroding and subsiding section of the Barataria Basin Landbridge. The project utilizes a hydraulic cutterhead dredge to mine renewable sediment from the Mississippi River between river miles 63 and 65. Approximately 2,300,000 cubic yards of sediment would be pumped approximately 5 miles through pipeline to the receiving marsh area. The pipe that carries the sediment from the river to the marsh was jacked and bored under Louisiana Highway 23 and the Missouri Pacific railroad line. Results from this project should serve to demonstrate the value and efficacy of greater use of pipeline-conveyed river sediments for coastal restoration.

Accomplishments

This project created or restored 471 acres of intertidal marsh by delivering sediments dredged from the Mississippi River via pipeline and by planting marsh vegetation. An additional 84 acres of marsh were created through use of NOAA American Recovery and Reinvestment Act funds and surplus CWPPRA construction funds.

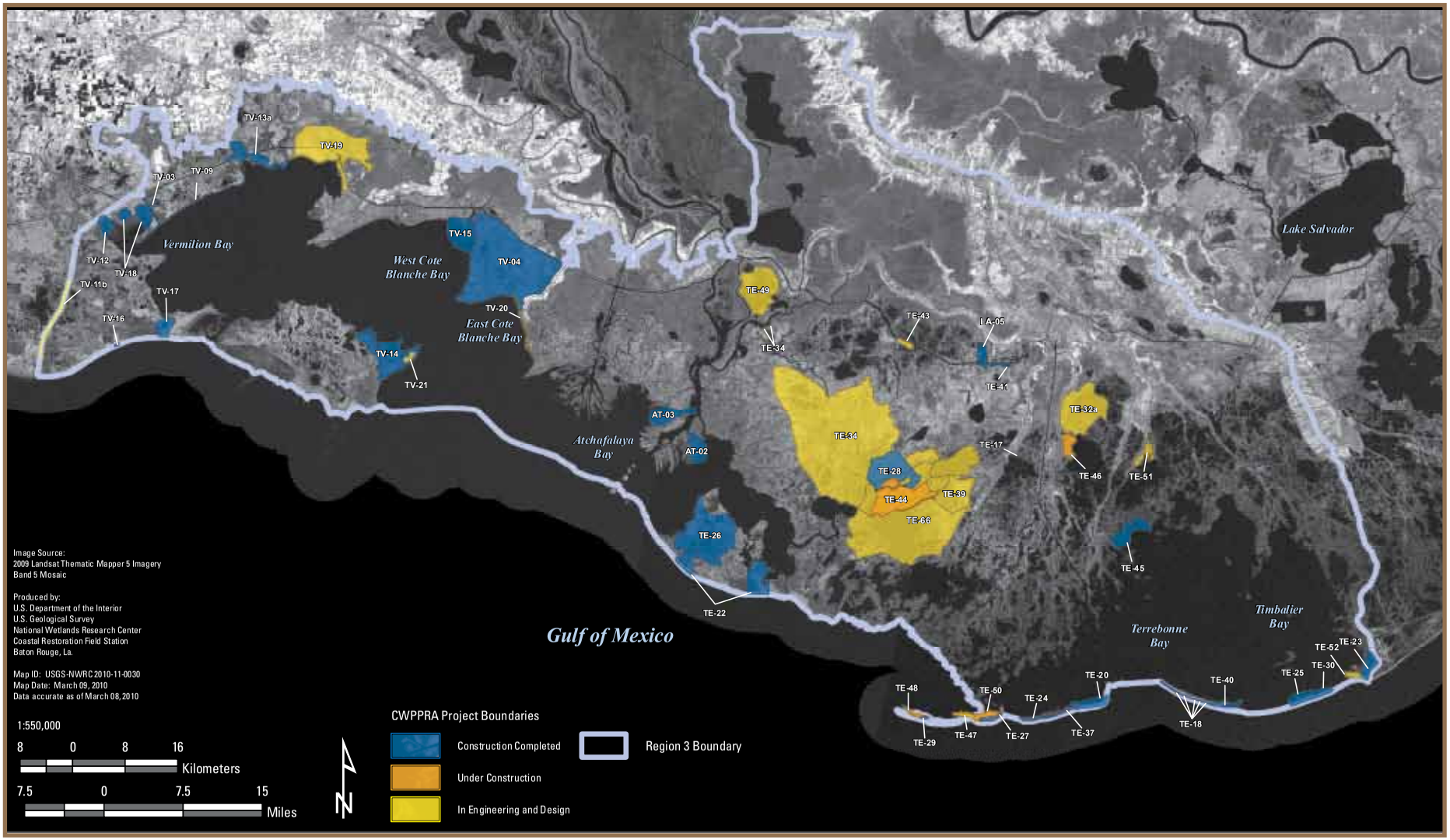


Figure 5. Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Priority Project Lists 1-18, Coast 2050 Region 3.

Region 3

Region 3 includes the Atchafalaya, Terrebonne, and Teche/Vermilion hydrologic basins and extends from Bayou Lafourche to Freshwater Bayou Canal (see figure 5). This region covers the municipalities of Houma and Thibodaux and the major port of Morgan City. Region 3 also has numerous oil and gas pipelines connecting to inland refineries or interstate natural gas transmission networks, such as the Henry Hub in the Teche/Vermilion Basin. A major landscape element is Bayou Lafourche, which has many miles of fishing communities along its banks. Terrebonne and Timbalier Bays are actually one large bay system with several large barrier islands separating it from the Gulf of Mexico. The Atchafalaya River is building the only two actively growing deltas on the Louisiana coast. This region includes 1,078,800 acres of wetlands.

Estimates of wetland loss from Region 3 indicate that 46,976 acres of wetlands were lost between 1990 and 2000 (Hill and Green, 2005). The U.S. Geological Survey estimated that in this region alone 21,120 acres of wetlands converted to open water during the 2005 hurricane season (Barras, 2006). Principal causes of land loss in this region include subsidence, shoreline erosion, altered hydrology, and barrier island deterioration. Although the active deltas of the Atchafalaya River are growing slowly, they have not offset the land loss in Region 3.

Since 2006, the Task Force has authorized three projects for Phase 1—Engineering and Design in Region 3: Madison Bay Marsh Creation and Terracing (TE-51), West Belle Pass Barrier Headland Restoration (TE-52), and Central Terrebonne Freshwater Enhancement (TE-66) (see table 5). Combined, these projects are expected to benefit 1,133 acres of wetlands in Region 3.

Projects authorized for Phase 2—Construction in Region 3 during 2006–2009 include West Lake Boudreaux Shoreline Protection and Marsh Creation (TE-46), South Lake De Cade Freshwater Introduction (TE-39), Whiskey Island Back Barrier Marsh Creation (TE-50), and East Marsh Island Marsh Creation (TV-21) (table 5).

Additionally, CWPPRA constructed projects in Region 3 during this reporting period include Timbalier Island Dune and Marsh Creation (TE-40) and Raccoon Island Shoreline Protection/Marsh Creation (TE-48).

Table 5. CWPPRA projects authorized for Phase 1 and Phase 2 during this reporting period (2006–2009) in Region 3.

[PPL, Priority Project List; Phase 1—Engineering and Design; Phase 2—Construction]

Project Number	PPL	Project Name	Date Authorized	Total Net Acres (Acres Reestablished and Protected)	Phase
TE-51	16	Madison Bay Marsh Creation and Terracing	18-Oct-06	372	1
TE-52	16	West Belle Pass Barrier Headland Restoration	18-Oct-06	305	1
TE-66	18	Central Terrebonne Freshwater Enhancement	21-Jan-09	456	1
TE-46	11	West Lake Boudreaux Shoreline Protection and Marsh Creation	8-Feb-06	277	2
TE-39	9	South Lake De Cade Freshwater Introduction	13-Feb-08	202	2
TE-50	13	Whiskey Island Backbarrier Marsh Creation	13-Feb-08	272	2
TV-21	14	East Marsh Island Marsh Creation	21-Jan-09	169	2
		Total Projects: 7	**Total Acres =**	**2,053**	

Central Terrebonne Freshwater Enhancement (TE-66)

Location

The project area is located in Terrebonne Parish in the Terrebonne Basin.

Problems

The Bayou Dularge Ridge historically restricted the marine influence of the Gulf of Mexico into Central Terrebonne marshes, forming a diagonal restriction extending from northeast to southwest, where the Atchafalaya River influence is prominent. The Grand Pass is currently a 900-foot-wide artificial cut through the Bayou Dularge Ridge south of Lake Mechant. The pass is used mainly by commercial and recreational fishermen as a shortcut to the gulf; it has greatly eroded to a point of approximately 36 feet deep that well exceeds optimal utility. The expansion of the pass to its current size has allowed for a substantial alteration of historical salinity and hydrology; consequently, a broad area of the Central Terrebonne marshes is suffering some of the highest loss rates in the State.

Restoration Strategy

The project will reestablish historical hydrologic and salinity conditions by reducing the artificial intrusion of gulf marine waters via the Grand Pass into the Central Terrebonne marshes while enhancing the influence of the Atchafalaya River waters into the area. A structure consisting of rock barge bay would be constructed to reduce the size of the opening by up to 90% to 150 feet wide and 15 feet deep. The project would reestablish the historical ridge function of Bayou Dularge that separated Lake Mechant from the gulf and moderate salinities that have greatly impacted the marshes to the north of Lake Mechant. The project will also increase the Atchafalaya River influence in the area by modifying the current structure located in Liners Canal north of Lake Decade to increase freshwater introduction to Lake Decade by an estimated 500 cubic feet per second and provide maintenance dredging at Minors Canal to maintain optimal freshwater conveyance from the Gulf Intracoastal Waterway into Lake Decade.

Progress to Date

The project is currently in Phase 1—Engineering and Design. The project team is developing surveying, geotechnical investigations, and modeling requirements necessary to proceed to 30% design review. The project is scheduled to request Phase 2—Construction funding at the January 2012 Task Force meeting.

Project Status

Approved Date: 2009

Project Area: 48,446 acres

Net Benefit After 20 Years: 456 acres

Average Annual Habitat Units (AAHU): 470

Project Type: Hydrologic Restoration

Status: Phase 1—Engineering and Design

This project is on Priority Project List 18.

West Belle Pass Barrier Headland Restoration (TE-52)

Location

The project is located along the Chenier Caminada headland to the west of West Belle Pass, at the southeastern edge of Timbalier Bay in Lafourche Parish.

Problems

This headland undergoes some of the highest shoreline retreat rates in the Nation, measuring over 100 feet per year in some locations. As the Gulf of Mexico encroaches upon the shoreline, sand is removed, and the headland erodes. What was once a continuous shoreline spanning several miles has been reduced to less than half its original length. Furthermore, Hurricanes Katrina and Rita removed most of the emergent headland and dunes west of the pass. This headland helps provide protection to interior marshes and the Port Fourchon area; however, its continued degradation threatens the fragile bay habitat and infrastructure it once protected.

Restoration Strategy

This project will reestablish the West Belle headland by rebuilding a large portion of the beach, dune, and back barrier marsh that once existed. Approximately 9,300 feet of beach and dune will be rebuilt by using nearly 2 million cubic yards of dredged sand, and 150 acres of marsh habitat will be rebuilt by using nearly 1 million cubic yards of dredged material. Native vegetation will be planted upon construction to help stabilize the rebuilt marsh and dune habitat.

Progress to Date

This project was approved for Phase 1—Engineering and Design in October 2006 and is anticipated to be completed in 2009.

Project Status

Approved Date: 2006

Project Area: 542 acres

Cost: $32.5 million

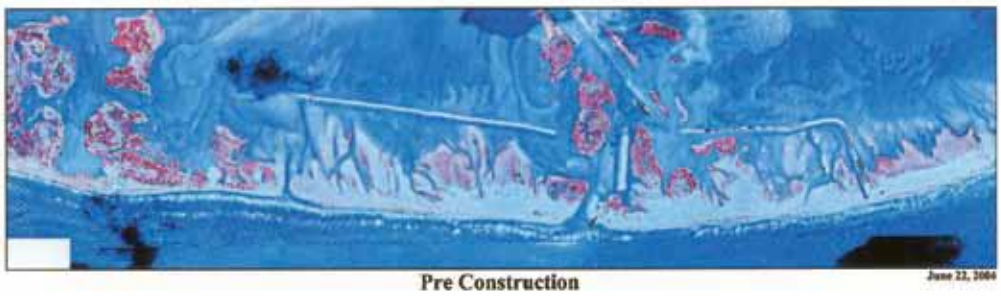
Net Benefit After 20 Years: 299 acres

Average Annual Habitat Units (AAHU): 180

Project Type: Barrier Headland and Marsh Creation

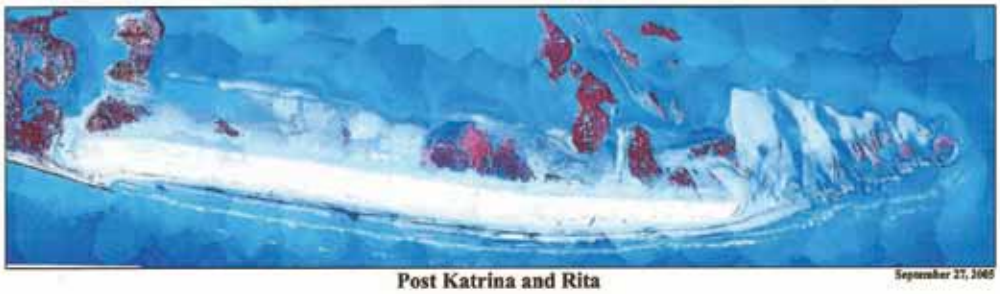
Status: Phase 1—Engineering and Design

This project is on Priority Project List 16.

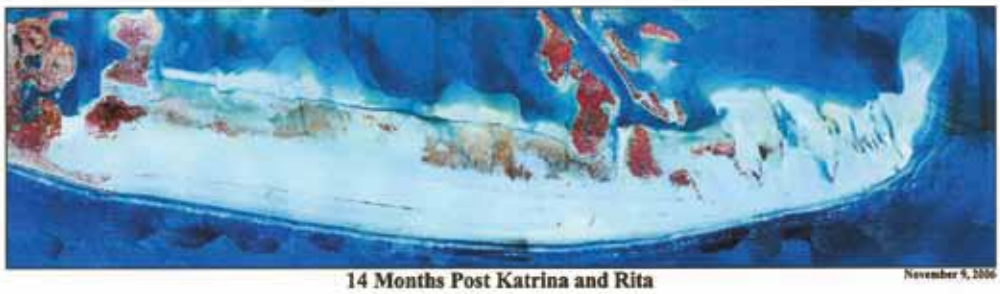


Pre Construction

Post Construction



Post Katrina and Rita



14 Months Post Katrina and Rita

Caption

A Picture Is Worth a Thousand Words: Timbalier Island Dune and Marsh Creation (TE-40)

Location

Timbalier Island is a barrier island located south of Houma and south of Terrebonne Bay in Terrebonne Parish.

Problems

Timbalier Island was migrating rapidly to the west/northwest as beach material was being carried by waves and currents. Additionally, land was being lost because of inadequate sediment supply, relative sea level rise or subsidence, and the passage of storms. Without mitigation efforts, the island was projected to disappear by 2050.

Restoration Strategy

The project pumped sediment from the Gulf of Mexico to restore 2.2 miles of beach and dune and created a marsh platform on the bay side of the island. More than 110,000 grown plants consisting of eight different species were planted, while sand fencing was built to help the plants capture and retain wind-blown sand.

Accomplishments

This project was constructed in summer 2005 prior to the devastating impacts of Hurricanes Katrina and Rita. While the impacts to Timbalier Island appeared to be initially significant, the photograph taken 14 months after the hurricanes clearly shows the resilience of the project after tidal forces reworked the sediment.

Working with 300 Landowners Is Truly Public Involvement: West Lake Boudreaux Shoreline Protection and Marsh Creation (TE-46)

Marsh creation required the extraction of material from the bottom of Lake Boudreaux via hydraulic dredge and placement of that material in previously constructed earthen containment cells.

Location

The West Lake Boudreaux Shoreline Protection and Marsh Creation (TE-46) project area is located south of Houma in Terrebonne Parish, along the western side of Lake Boudreaux, south of Bayou Butler and east of Highway 57 and Bayou Grand Caillou.

Problems

Where this project is located, the western shoreline of Lake Boudreaux is very close to a forced drainage levee that directly protects the community of Boudreaux and indirectly protects the community of Dulac, La. The shoreline erosion rates along the western shore of Lake Boudreaux were determined to be approximately 45 feet per year (northwestern shore), 20–30 feet per year (central western shore), and 7 feet per year (southwestern shore) (U.S. Fish and Wildlife Service, 2001). A Professional Engineering and Surveying Company, Inc. (PENSCO) survey, taken in the spring of 2004, indicated that there had been as much as 600 feet of shoreline erosion in the 6-year period since the baseline aerial photograph utilized for the project plan had been taken on February 4, 1998 (PENSCO, 2004).

Restoration Strategy

Two restoration strategies were used in the construction of this project: marsh creation and shoreline protection. Marsh creation required the extraction of material from the bottom of Lake Boudreaux via hydraulic dredge and placement of that material in previously constructed earthen containment cells. Those cells of material would be protected by the second restoration strategy, in which rock was placed along the shoreline in front of those marsh creation cells.

Accomplishments

The project restored/nourished 226 acres of emergent marsh and protected 80 acres of submerged aquatic vegetation and emergent marsh. This project also protected nearly 12,000 linear feet of shoreline.

The cost to complete the engineering and design work (including the land rights) was approximately $1.3 million, and construction costs will be nearly $14 million. Construction start date was July 24, 2007, and in January 2009 all construction work had been completed. In this project, nearly 300 landowners were involved in the restoration activities.

Saving Louisiana's Westernmost Barrier Island and the Brown Pelican: Raccoon Island Shoreline Protection/Marsh Creation (TE-48)

Construction crews build breakwaters on Raccoon Island.

Location

Raccoon Island is located in the Terrebonne Basin. It is the westernmost island of the Isles Dernieres ("last islands") barrier island chain in Terrebonne Parish, south of Houma.

Problems

The Isles Dernieres barrier island chain is undergoing some of the highest erosion rates of any coastal region of the world. Raccoon Island is undergoing shoreline retreat both gulfward and bayward, which is threatening one of the most productive colonial waterbird nesting areas and shorebird habitats along the Gulf Coast. This island is now home to Louisiana's largest nesting colony of brown pelicans, whose native population was reduced to near zero during the 1960s.

Restoration Strategy

This project has been separated into two construction phases, Phase A and Phase B. Phase A involved the construction of eight segmented breakwaters, complementing the eight breakwaters that were originally constructed on the gulf front in 1997 (as part of the CWPPRA Raccoon Island Breakwater Demonstration project [TE-29] to prevent shoreline erosion). Phase A also included the installation of an eastern groin that connects existing Breakwater Number 0 to the island.

Phase B consists of creating additional intertidal and supratidal marsh, both of which are excellent foraging and nesting avian habitat, on the northeast portion of the island. This will be done by backfilling an open water area with suitable sediment dredged from the outer continental shelf, approximately 4 miles south of Raccoon Island. Vegetative plantings will be the last part of the project design.

Accomplishments

The project was selected for Phase 1 funding at the January 2002 CWPPRA Task Force meeting. Construction funding for Phase A was approved in October 2004, and construction on Phase A began in December 2005. After delays caused by emergency work associated with Hurricane Katrina and access stipulations set forth by the Louisiana Department of Wildlife and Fisheries to protect the nesting brown pelicans on the island, Phase A was completed in September 2007. In just a few short months, sand began depositing behind the new breakwaters, thus creating valuable avian habitat. Phase B construction approval was given by the Task Force in February 2008, and construction is scheduled to begin in summer 2011. This project will prevent the loss of 62 acres of beach and saline marsh and create 54 acres of intertidal and supratidal marsh.

Saving the "Last Islands": Whiskey Island Back Barrier Marsh Creation (TE-50)

Whiskey Island and marsh project footprint.

Location

Whiskey Island is located on the southern tip of central Louisiana and provides a partial "barrier" between the adjacent coastal marsh and the Gulf of Mexico. It is south of Houma, La., and is part of a chain locally known as Isles Dernieres or "last islands."

Problems

The Isles Dernieres are one of the most rapidly deteriorating barrier shorelines in the United States. Since 1887, the Isles Dernieres, once a continuous deltaic headland, have fragmented into five islands: Raccoon, Whiskey, Trinity, East, and Wine. Area change rates for Whiskey Island between 1978 and 1988 have been documented at -31.1 acres per year. Gulfside and bayside erosion has resulted in the narrowing of Whiskey Island and the entire Isles Dernieres chain as the two shorelines migrate toward each other, resulting in a 68 percent decrease in average width for the Isles Dernieres. It is estimated that within 100 years the entire above-water portion of the Isles Dernieres is expected to disappear except for small land fragments associated with the western end of Whiskey Island and the eastern end of East Island.

Restoration Strategy

The goal of the project is to increase the longevity of the previously restored and natural portions of the island by increasing the island's width via dedicated dredging from the Gulf of Mexico. Increasing the island's width will help to retain sand volume and elevation. The area will be planted with native marsh vegetation to colonize and protect the newly placed marsh soil.

Accomplishments

Approximately 316 acres of back barrier intertidal marsh habitat; 5,800 linear feet of tidal creeks; three 1-acre tidal ponds; and 13,000 linear feet of protective sand dune were created by semiconfined disposal and placement of approximately 2.4 million cubic yards of dredged material. It is estimated that the project will result in 272 more acres after 20 years as compared to the without-project conditions. Because the newly created marsh needs time to settle to optimal elevation, vegetative plantings are not scheduled to occur until the spring or summer of 2010.

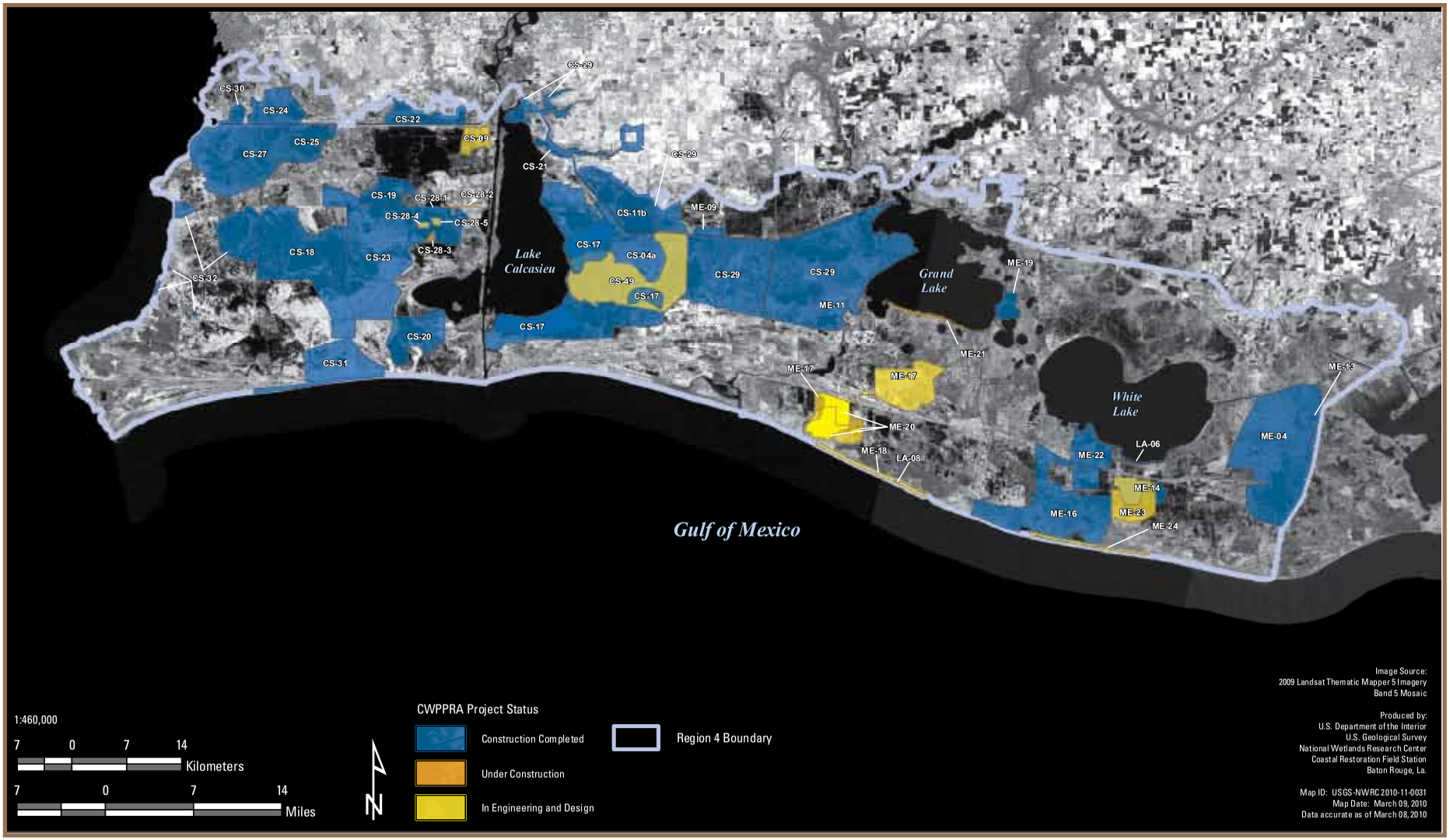


Figure 6. Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Priority Project Lists 1-18, Coast 2050 Region 4.

Region 4

Region 4 includes the Calcasieu/Sabine and Mermentau hydrologic basins from Freshwater Bayou canal to the Sabine River (see figure 6). There are no hurricane-protection levees to protect inland cities such as Lake Charles, so the wetland buffer from storm surge is essential for the protection of local municipalities and highways. Even Interstate 10, located 30 miles inland, is vulnerable to hurricane surge from the Gulf of Mexico. This region also includes several coastal communities, often used for recreational or commercial fishing bases. These communities were severely damaged, with some completely destroyed, by Hurricane Rita in 2005. Region 4 also has numerous oil and gas pipelines connecting to inland refineries or interstate natural gas transmission networks.

This region includes several large lakes such as Grand Lake, White Lake, Sabine Lake, and Calcasieu Lake, all surrounded by marshes. It also includes the Rockefeller Wildlife Refuge, Paul J. Rainey Wildlife Sanctuary, Cameron Prairie National Wildlife Refuge, and Sabine National Wildlife Refuge. The natural landscape is dominated by cheniers (forested ridges) and intervening wetlands. The region covers 768,210 acres of wetlands.

Principal causes of land loss in this region include gulf shoreline erosion and altered hydrology. Estimates of wetland loss from Region 4 indicated that 34,688 acres of wetlands were lost between 1990 and 2000 (Hill and Green, 2005). In the 2005 hurricane season alone, 53,760 acres of wetlands converted to open water in this region (Barras, 2006). Loss of cheniers from erosion and development has greatly impacted resting and refueling areas vital to migrating neotropical birds that cross the Gulf of Mexico twice yearly.

Between 2006 and 2009, the Task Force authorized three projects for Phase 1—Engineering and Design in Region 4: South Pecan Island Freshwater Introduction (ME-23), Southwest Louisiana Gulf Shoreline Nourishment and Protection (ME-24), and Cameron-Creole Freshwater Introduction (CS-49) (table 6). In this region, one project was approved for Phase 2—Construction during 2006–2009: the Grand Lake Shoreline Protection – Tebo Point (ME-21) (table 6).

Additionally, CWPPRA constructed projects during this reporting period included the Sabine Refuge Marsh Creation Cycles 2 and 3 (CS-28-2 and CS-28-3), Black Bayou Culverts Hydrologic Restoration (CS-29), East Sabine Lake Hydrologic Restoration (CS-32), and Freshwater Introduction South of Highway 82 (ME-16).

Table 6. CWPPRA projects authorized for Phase 1 and Phase 2 during this reporting period (2006–2009) in Region 4.

[PPL, Priority Project List; Phase 1—Engineering and Design; Phase 2—Construction]

Project Number	PPL	Project Name	Date Authorized	Total Net Acres (Acres Reestablished and Protected)	Phase
ME-23	15	South Pecan Island Freshwater Introduction	8-Feb-06	98	1
ME-24	16	Southwest Louisiana Gulf Shoreline Nourishment and Protection	18-Oct-06	888	1
CS-49	18	Cameron-Creole Freshwater Introduction	21-Jan-09	473	1
ME-21a	11	Grand Lake Shoreline Protection - Tebo Point	15-Feb-07	45	2
		Total Projects: 4	**Total Acres =**	**1,504**	

Cameron-Creole Freshwater Introduction (CS-49)

Location

The project area is located on the east side of Calcasieu Lake and west of Gibbstown Bridge and Highway 27.

Problems

Virtually all of the project area marshes have undergone increased tidal exchange, saltwater intrusion, and reduced freshwater retention resulting from hydrologic changes associated with the Calcasieu Ship Channel and the Gulf Intracoastal Waterway. In addition, thousands of acres of marsh were damaged by Hurricane Rita and again, more recently, by Hurricane Ike. Because of human alterations to the hydrology, it is unlikely that those marshes will recover without comprehensive restoration efforts. The Cameron-Creole Watershed Project has successfully reduced salinities and increased marsh productivity; however, the area remains disconnected from freshwater, sediments, and nutrients available from the Gulf Intracoastal Waterway.

Restoration Strategy

The freshwater introduction project would restore the function, value, and sustainability to approximately 22,247 acres of marsh and open water by improving hydrologic conditions via freshwater input and increasing organic productivity.

Progress to Date

The project is in Phase 1—Engineering and Design. The project team is developing surveying, geotechnical investigations, and modeling requirements necessary to proceed to 30% design review. The project is scheduled to request Phase 2—Construction funding at the January 2012 Task Force meeting.

Project Status

Approved Date: 2009

Project Area: 22,247 acres

Total Est. Cost: $1.5 million

Net Benefit After 20 Years: 473 acres

Average Annual Habitat Units (AAHU): 524

Project Type: Freshwater Diversion

Status: Phase 1—Engineering and Design

This project is on Priority Project List 17.

Southwest Louisiana Gulf Shoreline Nourishment and Protection (ME-24)

Location

The project is located along the Mermentau Basin in Cameron and Vermilion Parishes.

Problems

The Gulf of Mexico's shoreline in the vicinity of Rockefeller Refuge is reportedly eroding at an estimated rate of 35–39 feet per year.

Restoration Strategy

Approximately 4.9 million cubic yards of sediment will be deposited along 47,900 linear feet of gulf shoreline between Dewitt Canal and Constance Lake. The result will be to create approximately 421 acres of marsh platform, mud flat, and shallow water that extend into the gulf.

Progress to Date

The Louisiana Coastal Wetlands Conservation and Restoration Task Force approved Phase 1—Engineering and Design funding in January 2006. The project delivery team has been assembled, and pending development and acceptance of a cost share agreement, a kickoff meeting and site visit will be planned.

Project Status

Approved Date: 2006

Project Area: 1,244 acres

Total Estimated Cost: $36.9 million

Net Benefit After 20 Years: 888 acres

Average Annual Habitat Units (AAHU): 311

Project Type: Shoreline Protection

Status: Phase 1—Engineering and Design

This project is on Priority Project List 16.

Dredged material from the Calcasieu River Ship Channel is placed in the Cycle 3 marsh creation site via a temporary pipeline.

Restoration Married to Maintenance Dredging for Coastal Sustainability: Sabine Refuge Marsh Creation Cycles 2 and 3 (CS-28-2 and CS-28-3)

CS-28-2

CS-28-3

Location

This project is located about 20 miles south of Lake Charles in the Sabine National Wildlife Refuge, west of State Highway 27 in open water areas west of Browns Lake in Cameron Parish.

Problems

The project area is undergoing marsh degradation because of saltwater intrusion and freshwater loss. This has resulted in the conversion of vegetated intermediate marsh to large, shallow open water areas. Salinity migrates into the region from the Calcasieu River. Southeast winds push saline waters into the project area through canals and bayous. Wind-driven waves cause further loss of the remaining marsh fringe.

Restoration Strategy

A permanent dredged-material disposal pipeline 3.57 miles in length was constructed in Cycle 2. The pipeline commenced near mile 13.2 of the Calcasieu River Ship Channel and terminated at the northeastern corner of the Sabine National Wildlife Refuge. Much of the right of way required for the pipeline was previously impacted by the construction of a temporary pipeline used during the construction of Cycle 1. The pipeline is to be used for future marsh creation projects in conjunction with the U.S. Army Corps of Engineers maintenance dredging of the Calcasieu River Ship Channel.

Accomplishments

This project was originally approved as part of the PPL 8 in 1999. The project was later broken into five cycles. In 2004, additional funds for Phase 1—Engineering and Design and Phase 2—Construction were approved for Cycle 3, which consisted of the creation of 232 acres of marsh platform by using material dredged from the Calcasieu River Ship Channel. Between February 12 and March 31, 2007, 828,767 cubic yards of dredged sediment material was placed into the Sabine Refuge Cycle 3 marsh creation area. The dredged material is contained by earthen dikes. Lower level earthen overflow weirs were constructed to assist in the dewatering of the marsh creation disposal area and to create fringe marsh with the overflow. The placement of the dredged material has now been completed for Cycles 2 and 3. Cycles 4 and 5 will be started in the near future.

Working with Louisiana Highway Department To Create Healthy Marsh Habitats: Black Bayou Culverts Hydrologic Restoration (CS-29)

Aerial view of the project area.

Location

The project area is located near Lake Charles, east of Calcasieu Lake, and includes areas north of the Gulf Intracoastal Waterway and west of Grand Lake in Cameron Parish; however, the project features are located in southern Calcasieu Parish.

Problems

The marsh within this area had been suffering from excessive water levels within the lake's subbasin. This high water killed marsh vegetation and prevented the growth of desirable annual plant species; additionally, it contributes to interior wetland loss and shoreline erosion. Prior to the construction of the Gulf Intracoastal Waterway and the Calcasieu Lock structures, Black Bayou served as the natural drainage route for the western edge of the Mermentau Basin. With the construction of Louisiana Highway 384, the Black Bayou drainage path to the Calcasieu River was blocked. In conjunction with the poor flood water relief offered by the Calcasieu Lock, the dam created in Black Bayou hindered the escape of flood waters from the Mermentau Basin.

Restoration Strategy

Project components include ten 10-foot by 10-foot concrete box culverts in Black Bayou at its intersection with Louisiana Highway 384. These culverts offer relief from the extreme water levels. By reopening Black Bayou at its intersection with the highway, floodwater is now allowed to escape the basin. Saltwater is also prevented from entering the basin from the Calcasieu River.

Accomplishments

Black Bayou offers a unique location in the basin where the water in the lake's subbasin and the outer tidal waters are separated by only a narrow highway corridor. This project was put to the test during the 2008 hurricane season. The storm surge from Hurricane Ike pushed water nearly all the way to Lake Charles from the coastline. Two days before Ike made landfall in Galveston, Tex., the pins were pulled on the structure, opening the gates once water levels dropped in Calcasieu Lake allowing for the drainage of flood waters from the storm.

This project was approved for Phase 1—Engineering and Design funding on January 11, 2000, and Phase 2—Construction funding on August 14, 2003. Construction began on May 25, 2005. As part of the construction, Highway 384 had to be removed and a temporary road installed to properly install the culverts, which took a great deal of coordination with the Louisiana Department of Transportation and Development. After significant delays due to structural damages that happened during construction and two active hurricane seasons, construction was completed on December 1, 2009.

Newly created earthen terraces are visited by project staff.

Protecting One of the Largest National Refuges in the Louisiana Coastal Zone: East Sabine Lake Hydrologic Restoration (CS-32)

Location

The project is located southwest of Lake Charles near the border of Texas and Louisiana. It is in the western portion of the Sabine National Wildlife Refuge from refuge impoundment Pool 3 westward to the eastern shoreline of Sabine Lake in Cameron Parish.

Problems

The fresh and intermediate lower salinity project-area marshes are converting to shallow, open water because of elevated salinity and subsidence. The larger Sabine-Neches Waterway and Gulf Intracoastal Waterway and the smaller navigation channels provide a direct route for salt water to infiltrate the marsh, disrupt the natural water circulation, and allow rapid runoff of fresh water. Elevated tidal fluctuations in these channels have led to increased water flow, which has increased the conversion of marsh to open water. Area marsh loss is also caused by wave action along Sabine Lake and interior marsh shorelines and by other natural causes (for example, subsidence).

Restoration Strategy

The project features included installing (1) a rock weir in Pines Ridge Bayou to improve hydrology by mitigating the effects of Pines Ridge Canal; (2) three 24-inch-diameter culverts with stop logs and flap gates at Bridge Bayou to improve hydrology and allow fisheries access; (3) a 3,000-foot-long segmented rock breakwater with 50 wide gaps along the Sabine Lake shoreline at Willow Bayou to prevent the bayou from eroding into the lake; (4) a weir at the opening at Starks South Canal Section 16 levee; and (5) 221,000 linear feet (42 miles) of vegetated earthen terraces in the eroded marshes adjacent to Greens Lake.

Accomplishments

Phase 1—Engineering and Design began in July 2001 and was completed in August 2004; Phase 2—Construction began in December 2004 and was completed in August 2009. The project will protect and restore brackish and intermediate marshes over a 6,589-acre area, including marshes on Sabine National Wildlife Refuge, one of the largest refuges in the Louisiana coastal zone. The 221,000 linear feet of vegetated earthen terraces, one of the largest terrace restoration projects in the world, will restore 127–150 acres of marsh; the 3,000 linear feet of rock breakwater will protect 14 acres and restore 3.4 acres of shoreline over 20 years; and the water control structures will protect 26 acres from being lost for the project life for a total of 156–193 acres protected and restored.

Multiple Techniques Are Used To Flow Fresh Water and Reduce Salinities: Freshwater Introduction South of Highway 82 (ME-16)

Spray dredging is used to rebuild marshes.

Location

The project is located on the Louisiana coast halfway between Lake Charles and Lafayette. It is in the central and eastern portions of Rockefeller Wildlife Refuge in Cameron and Vermilion Parishes. It is bounded by Highway 82 to the north, the eastern boundary of Rockefeller Wildlife Refuge Unit 6 to the west, the Gulf of Mexico to the south, and a north-south line south of the eastern boundary of Unit 15 on the east.

Problems

The Chenier Sub-basin of the Mermentau Basin has undergone saltwater intrusion because of a lack of freshwater and sediment input from the Lakes Sub-basin, resulting in the conversion of healthy marshes to shallow open water. Major hydrologic changes in the Mermentau Basin occurred with the construction of State Highway 82, the impoundment of Grand and White Lakes in the Lakes Sub-basin via locks and gates, and the construction of the Mermentau River-Gulf of Mexico Navigation Channel, oil and gas navigation channels, and levees. Historically, excess freshwater from Grand and White Lakes and the Mermentau River flowed southward into the Chenier Sub-basin through natural bayous. Today, much of the north-to-south flow across Highway 82 is restricted by the highway, canals, and levees. Within the 24,874-acre project area, marsh losses were 12.6, 1.2, and 0.9 percent for the periods 1956–1974, 1974–1983, and 1983–1990, respectively, for a total of 22 percent wetland loss within that area from 1932 to 1990.

Restoration Strategy

The project helps direct excess fresh water from the Lakes Sub-basin to the Chenier Sub-basin of the Mermentau Basin to reduce saltwater impacts to the brackish marshes in the southeastern portion of the refuge and adjacent lands. The project includes features to move fresh water from White Lake south of Highway 82 to marshes in the southeastern portion of Rockefeller Wildlife Refuge and marsh restoration through the construction of earthen terraces.

Accomplishments

The project will protect and restore brackish and intermediate marshes over a 20,000-acre area, including marshes on Rockefeller Wildlife Refuge and adjacent landowner property. The 26,000 linear feet of vegetated earthen terraces will restore 15–18 acres of marsh, and the fresh water introduction component will protect 243 acres of marsh over the project life. The project will return part of the Chenier Sub-basin to its natural function as an estuary by moving fresh water southward to marshes that have become artificially starved of fresh water. It supports a major Region 4 Coast 2050 Regional Strategy to introduce fresh water across Highway 82. Phase 1—Engineering and Design began in September 2000 and was completed in August 2004; Phase 2—Construction began in September 2005 and was completed in December 2006. Over the 20-year project life, the project is predicted to enhance 15,159 acres, restore 53 acres, and protect 243 acres of brackish and intermediate marsh, thereby benefitting 296 net acres over the 20,000-acre project area.

Demonstration Projects

Although most of the CWPPRA projects are located within specific regions, four coastwide demonstration projects have been authorized in PPLs 16 through 18. Demonstration projects use technologies or methods that have not been fully developed for coastal restoration in Louisiana. The coastwide demonstration projects authorized between 2006 and 2009 include Enhancement of Barrier Island Vegetation Demonstration (TE-53), Non-Rock Alternatives to Shoreline Protection Demonstration (LA-16), Sediment Containment System for Marsh Creation Demonstration (LA-09), and Bio-Engineered Oyster Reef Demonstration (LA-08).

Bio-Engineered Oyster Reef Demonstration (LA-08)

Location

The project is located along the Rockefeller Wildlife Refuge Gulf of Mexico shoreline west of Joseph Harbor Canal in Cameron Parish, La.

Problems

At Rockefeller Refuge, the direct Gulf of Mexico frontage and extremely low soil load-bearing capacity (250–330 psf), as well as an average shoreline retreat of 30.9 feet per year, presents unique engineering challenges with a subsequent direct loss of emergent saline marsh.

Restoration Strategy

The goal of this demonstration project is to test a new bio-engineered product to address rapid shoreline retreat and wetland loss along the Gulf of Mexico shoreline in areas with soils of low load-bearing capacity and to evaluate the proposed technique as a cost effective technique for protecting those types of areas. The demonstration project would consist of an oysterbreak, approximately 1,000 feet long. The oysterbreak is a lightweight, modular shore protection device that uses accumulating biomass (an oyster reef) to dissipate wave energy. The bio-engineered structure is designed to grow rapidly into an open structured oyster reef by using specifically designed structural components with spat attractant (agricultural byproducts) and enhanced nutrient conditions conducive to rapid oyster growth. The oysterbreak is constructed by placing modular units into an open interlocked configuration. The units are sized to be stable under storm wave conditions. The height and width of the oysterbreak are designed to achieve a moderate initial wave energy reduction. As successive generations of encrusting organisms settle on the oysterbreak, the structure's ability to dissipate wave energy increases.

Progress to Date

The cooperative agreement between the National Marine Fisheries Service and the Louisiana Department of Natural Resources has been executed. The project design report is nearing completion.

Project Status

Approved Date: 2007

Project Area: 0 acres

Approved Funds: $1.8 million

Total Estimated Cost: $1.98 million

Net Benefit After 20 Years: 0 acres

Project Type: Shoreline Protection

Status: Phase 1—Engineering and Design

This project is on Priority Project List 17.

Building Floating Marsh: Floating Marsh Creation Demonstration (LA-05)

Site 1: June 1, 2006, beginning of the project. (Picture taken by Jenneke Visser, University of Louisiana at Lafayette.)

Location

This project was located in Terrebonne Parish, near the town of Houma, on the U.S. Fish and Wildlife Service Mandalay National Wildlife Refuge. The project location was chosen because it is representative of areas of fresh marsh that have converted to open water over the last 50 years.

Restoration Strategy

The purpose of the project was to develop methods for restoration of open water areas within existing deteriorated floating marsh habitats, common in southeastern Louisiana. The goal was to field test buoyant vegetated mats or artificial floating systems within deteriorated floating marsh and other freshwater habitats. The plant used to create this marsh is maidcane (*Panicum hemitomon*), the grass that forms natural floating marshes in southeastern Louisiana.

Accomplishments

This project, implemented by the Federal and State sponsors through the LSUAg Center scientists under the direction of Dr. Charles Sasser, successfully demonstrated that the creation of floating marshes in open water areas can be effectively accomplished. More specifically:

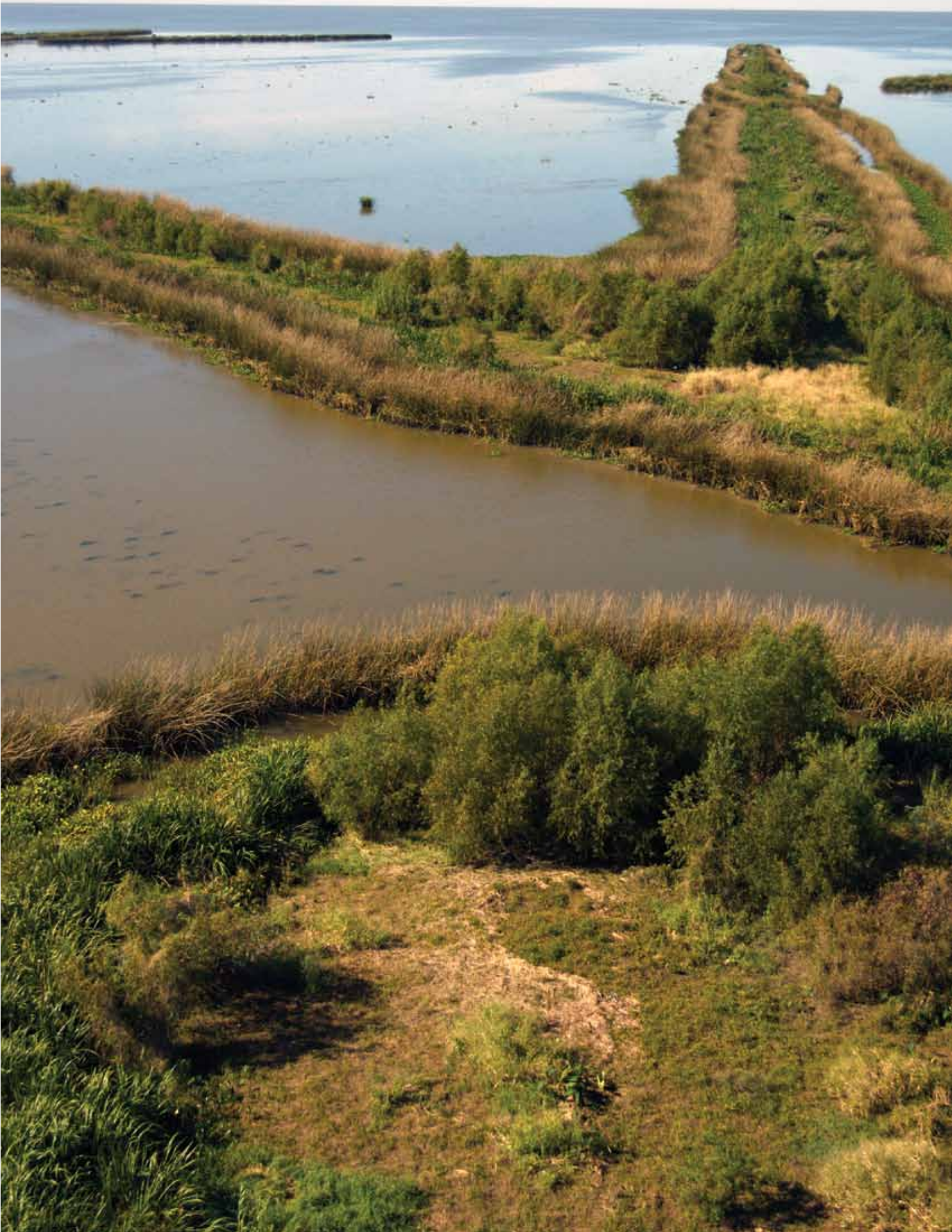
- Establishment with potted plants resulted in quicker cover increases than establishment from stems. By the end of the first growing season, however, differences in cover between establishment techniques were small, especially in the sites that were established early in the growing season.
- *P. hemitomon* cover decreased during the third growing season as the fences that protected it from grazing rusted; however, 37 other species colonized the created area, and total cover remained high. Decreased *P. hemitomon* and overall cover at the southern sites may be related to periodic salinity incursions related to tropical storms.
- All structures remained buoyant and structurally intact in the first two growing seasons. An apparent boat strike near the beginning of the third growing season affected the buoyancy and structural integrity of some of the bamboo structures at one site, ultimately leading to the sinking of three structures. One string of ten PVC structures vanished from a site after Hurricane Gustav, but 81% of the monitored structures and 100% of the unmonitored structures remained intact after four growing seasons.

Conclusion

The Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) has been actively reclaiming wetlands and helping to turn the tide on land loss for over 20 years. Projects that have rebuilt the barrier islands and interior marshes and have repaired hydrology have all left a lasting mark on the coastal landscape. Since the inception of the CWPPRA program, a foundation has been laid on which subsequent restoration initiatives have been built. Capitalizing on CWPPRA's public planning process, several comprehensive restoration plans have been generated and widely accepted because of the encouragement of public involvement. Government master planning documents and ongoing feasibility studies have often been born from CWPPRA-generated project concepts. As well, some projects that have been designed through CWPPRA but have been unfunded have been adopted and constructed through other authorities. This type of synergy between funding vehicles is not redundant but rather is efficient in pursuing project implementation.

In addition to authorizing 144 projects, the CWPPRA program remains uniquely committed to the understanding and championing of restoration science. Together with a rich brain trust of local academia, program scientists collect and analyze data from CWPPRA projects to evaluate the ecologic response from one blade of grass to an entire ecosystem. This helps guide managers to develop projects by using the most cutting edge science to support successful restoration.

The Coastal Wetlands Planning, Protection and Restoration Act is meeting an otherwise unfilled niche to build near-term projects in acute, and often highly strategic, areas of need. This continues to be the program's greatest asset and contribution to turning the tide on Louisiana land loss.





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Appendix 1. Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Project Types

The Task Force has implemented various restoration techniques to protect and restore coastal wetlands in Louisiana. The types of techniques used in various CWPPRA projects depend on the problems being addressed and other site-specific factors, including project area landscape, substrate, wave climate, habitat type, and proximity to sediment and fresh water resources, major waterways, and open waters. Most CWPPRA projects employ one or more of the following restoration techniques:

- ***Freshwater Reintroduction*** Fresh water is channeled from a nearby river or waterbody into surrounding wetlands. This infusion of water, sediment, and nutrients helps slow saltwater intrusion, slows the loss of marsh, and creates a limited amount of new marsh.
- ***Outfall Management*** A variety of techniques are used to regulate the flow of freshwater reintroduction to ensure that water and sediment reach needed areas. These techniques maximize the benefits of freshwater reintroduction.
- ***Sediment Diversion*** A controlled gap (called a crevasse) is cut into a river levee, allowing river water, nutrients, and sediment to flow into nearby wetlands and mimic natural land-building processes.
- ***Dredged Material/Marsh Creation*** Dredged sediment is placed at specified elevations in shallow open water and deteriorating marsh, high enough to encourage plant recolonization.
- ***Shoreline Protection*** Eroding shorelines are protected by buttressing the land with rock berms, concrete, plantings, or by diffusing wave energy in front of the shore by using breakwaters and/or fences.
- ***Sediment and Nutrient Trapping*** Brush fences or low land ridges (terraces) are built to slow water flow and promote sediment accumulation.
- ***Hydrologic Restoration*** Natural drainage patterns are restored as much as possible by blocking dredged canals and cutting gaps in artificial levees.
- ***Marsh Management*** The water level and salinity in a contained marsh area are controlled by levees and gates or weirs to promote the regrowth of desired vegetation and reestablish historical wildlife habitat.
- ***Barrier Island Restoration*** Several methods are used to stabilize and protect islands, including shoring up dunes with fences and vegetative plantings, rebuilding islands with dredged material, and using breakwaters to protect islands from waves.
- ***Vegetative Planting*** Site-appropriate marsh plants are established in project areas to reduce erosion, stabilize the soil, and accelerate wildlife habitat development.
- ***Terracing*** Terracing is construction of low ridges, usually in patterns, which enclose open water areas. The ridges slow water flow and help trap sediment to rebuild marsh.
- ***Long-Distance Conveyance of Dredged Material*** This technique is similar to other marsh creation techniques except different techniques are utilized to transport sediment greater distances, often by using booster pumps.
- ***Invasive Species Control Program*** A control program pays licensed trappers/hunters to harvest invasive species, such as nutria, that damage the marsh.
- ***Delta Management*** Wetland creation on active deltas can be enhanced by altering flow patterns promoting land accretion.

Appendix 2. Complete List of Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Projects Authorized Since 1990

[PPL, Priority Project List; NRCS, Natural Resources Conservation Service; CPRA, State of Louisiana, Coastal Protection and Restoration Authority; NMFS, National Marine Fisheries Service; COE, U.S. Army Corps of Engineers; EPA, U.S. Environmental Protection Agency; USFWS, U.S. Fish and Wildlife Service]

Name	Number	Type	Sponsors	Subprovince	PPL
Alligator Bend Marsh Restoration and Shoreline Protection	PO-34	Marsh Creation	NRCS, CPRA	1	16
Atchafalaya Sediment Delivery	AT-02	Hydrologic Restoration, Marsh Creation, Dredged Material	NMFS, CPRA	3	2
Avoca Island Diversion and Land Building	TE-49	Water Diversion	COE, CPRA	3	12
Barataria Barrier Island Complex Project: Pelican Island and Pass La Mer to Chaland Pass Restoration	BA-38	Barrier Island Restoration	NMFS, CPRA	2	11
Barataria Basin Landbridge Shoreline Protection, Phase 3	BA-27c	Shoreline Protection	NRCS, CPRA	2	9
Barataria Basin Landbridge Shoreline Protection, Phase 4	BA-27d	Shoreline Protection	NRCS, CPRA	2	11
Barataria Basin Landbridge Shoreline Protection, Phases 1 and 2	BA-27	Shoreline Protection	NRCS, CPRA	2	7
Barataria Bay Waterway East Side Shoreline Protection	BA-26	Shoreline Protection	NRCS, CPRA	2	6
Barataria Bay Waterway West Side Shoreline Protection	BA-23	Shoreline Protection	NRCS, CPRA	2	4
Barataria Bay Waterway Wetland Restoration	BA-19	Marsh Creation	COE, CPRA	2	1
Bayou Bienvenue Pump Station Diversion and Terracing (Deauthorized)	PO-25	Terracing	NMFS, CPRA	1	8
Bayou Boeuf Pump Station (Deauthorized)	TE-33	Hydrologic Restoration	EPA, CPRA	3	6
Bayou Chevee Shoreline Protection	PO-22	Shoreline Protection	COE, CPRA	1	5
Bayou Dupont Marsh and Ridge Creation	BA-48	Marsh Creation	NMFS, CPRA	2	17
Bayou LaBranche Wetland Creation	PO-17	Marsh Creation	COE, CPRA	1	1
Bayou Lafourche Siphon (Deauthorized)	BA-25	Freshwater Diversion	EPA, CPRA		5
Bayou Lamoque Freshwater Diversion	BS-13	Freshwater Diversion	COE, EPA, CPRA	2	15
Bayou L'Ours Ridge Hydrologic Restoration (Deauthorized)	BA-22	Hydrologic Restoration	NRCS, CPRA	2	4
Bayou Perot/Bayou Rigolettes Marsh Restoration (Deauthorized)	BA-21	Marsh Creation	NMFS, CPRA	2	3
Bayou Sale Shoreline Protection	TV-20	Shoreline Protection	NRCS, CPRA	3	13
Bayou Sauvage National Wildlife Refuge Hydrologic Restoration, Phase 1	PO-16	Hydrologic Restoration	USFWS, CPRA	1	1
Bayou Sauvage National Wildlife Refuge Hydrologic Restoration, Phase 2	PO-18	Hydrologic Restoration	USFWS, CPRA	1	2
Beneficial Use of Hopper Dredged Material Demonstration (Deauthorized)	MR-08	Demonstration	COE, CPRA	2	4
Benneys Bay Diversion	MR-13	Water Diversion	COE, CPRA	2	10

Name	Number	Type	Sponsors	Subprovince	PPL
Bertrandville Siphon	BS-18	Freshwater Diversion	EPA, CPRA	2	18
Big Island Mining	AT-03	Hydrologic Restoration, Marsh Creation, Dredged Material	NMFS, CPRA	3	2
Bio-Engineered Oyster Reef Demo	LA-08	Demonstration	NMFS, CPRA	4	17
Black Bayou Culverts Hydrologic Restoration	CS-29	Hydrologic Restoration	NRCS, CPRA	4	9
Black Bayou Hydrologic Restoration	CS-27	Hydrologic Restoration	NMFS, CPRA	4	6
Bohemia Mississippi River Reintroduction	BS-15	Freshwater Diversion	EPA, CPRA	2	17
Boston Canal/Vermilion Bay Bank Protection	TV-09	Shoreline Protection, Vegetative Planting	NRCS, CPRA	3	2
Brady Canal Hydrologic Restoration	TE-28	Hydrologic Restoration	NRCS, CPRA	3	3
Brown Lake Hydrologic Restoration	CS-09	Hydrologic Restoration	NRCS, CPRA	4	2
Caernarvon Diversion Outfall Management	BS-03a	Outfall Management	NRCS, CPRA	2	2
Caernarvon Outfall Management/Lake Lery Shoreline Restoration	BS-16	Outfall Management	USFWS, CPRA	2	17
Cameron Creole Plugs	CS-17	Hydrologic Restoration	USFWS, CPRA	4	1
Cameron Prairie National Wildlife Refuge Shoreline Protection	ME-09	Shoreline Protection	USFWS, CPRA	4	1
Cameron-Creole Freshwater Introduction	CS-49	Freshwater Diversion	NRCS, CPRA	4	18
Cameron-Creole Maintenance	CS-04a	Hydrologic Restoration	NRCS, CPRA	4	3
Castille Pass Channel Sediment Delivery	AT-04	Water Diversion	NMFS, CPRA	3	9
Central Terrebonne Freshwater Enhancement	TE-66	Hydrologic Restoration	NRCS, CPRA	3	18
Chandeleur Islands Marsh Restoration	PO-27	Barrier Island Restoration	NMFS, CPRA	1	9
Channel Armor Gap Crevasse	MR-06	Sediment Diversion	COE, CPRA	2	3
Cheniere Au Tigre Sediment Trapping Demonstration	TV-16	Demonstration, Sediment and Nutrient Trapping	NRCS, CPRA	3	6
Cheniere Ronquille Barrier Island Restoration	BA-76	Barrier Island Restoration	NMFS, CPRA	2	19
Clear Marais Bank Protection	CS-22	Shoreline Protection	COE, CPRA	4	2
Coastwide Nutria Control Program	LA-03b	Herbivory Control	NRCS, CPRA	2	11
Coastwide Reference Monitoring System	CRMS	Monitoring	CPRA, USGS		
Compost Demonstration (Deauthorized)	CS-26	Demonstration	EPA, CPRA	4	4
Cote Blanche Hydrologic Restoration	TV-04	Hydrologic Restoration	NRCS, CPRA	3	3
Dedicated Dredging on the Barataria Basin Landbridge	BA-36	Marsh Creation	USFWS, CPRA	2	11
Delta Building Diversion at Myrtle Grove	BA-33	Water Diversion	COE, CPRA	2	10
Delta Building Diversion North of Fort St. Philip	BS-10	Water Diversion	COE, CPRA	2	10
Delta Management at Fort St. Philip	BS-11	Sediment and Nutrient Trapping, Outfall Management	USFWS, CPRA	2	10
Delta Wide Crevasses	MR-09	Water Diversion	NMFS, CPRA	2	6

Name	Number	Type	Sponsors	Subprovince	PPL
Dewitt-Rollover Vegetative Plantings Demonstration (Deauthorized)	ME-08	Demonstration	NRCS, CPRA	4	1
Dustpan Maintenance Dredging Operation for Marsh Creation in the Mississippi River Delta Demonstration	MR-10	Demonstration, Marsh Creation	COE, CPRA	2	6
East Marsh Island Marsh Creation	TV-21	Marsh Creation	NRCS, EPA, CPRA	3	14
East Mud Lake Marsh Management	CS-20	Marsh Management	NRCS, CPRA	4	2
East Sabine Lake Hydrologic Restoration	CS-32	Hydrologic Restoration	NRCS, USFWS, CPRA	4	10
East Timbalier Island Sediment Restoration, Phase 1	TE-25	Barrier Island Restoration	NMFS, CPRA	3	3
East Timbalier Island Sediment Restoration, Phase 2	TE-30	Barrier Island Restoration	NMFS, CPRA	3	4
East/West Grand Terre Islands Restoration	BA-30	Barrier Island Restoration	NMFS, CPRA	2	9
Eden Isles East Marsh Restoration (Deauthorized)	PO-21	Hydrologic Restoration	NMFS, CPRA	1	4
Enhancement of Barrier Island Vegetation Demonstration	TE-53	Demonstration, Vegetative Planting	EPA, CPRA	3	16
Falgout Canal Planting Demonstration	TE-17	Demonstration, Shoreline Protection, Vegetative Planting	NRCS, CPRA	3	1
Floating Marsh Creation Demonstration	LA-05	Demonstration, Marsh Creation	NRCS, CPRA	2	12
Flotant Marsh Fencing Demonstration (Deauthorized)	TE-31	Demonstration	NRCS, CPRA	3	4
Four Mile Canal Terracing and Sediment Trapping	TV-18	Sediment and Nutrient Trapping	NMFS, CPRA	3	9
Fourchon Hydrologic Restoration (Deauthorized)	BA-18	Hydrologic Restoration	NMFS, CPRA	3	1
Freshwater Bayou Bank Stabilization	ME-13	Shoreline Protection	NRCS, CPRA	4	5
Freshwater Bayou Bank Stabilization - Belle Isle Canal to Lock	TV-11b	Shoreline Stabilization	COE, CPRA	3	9
Freshwater Bayou Marsh Creation	ME-31	Marsh Creation	NRCS, CPRA	4	19
Freshwater Bayou Wetland Protection	ME-04	Hydrologic Restoration, Shoreline Protection	NRCS, CPRA	4	2
Freshwater Introduction South of Highway 82	ME-16	Hydrologic Restoration	USFWS, CPRA	4	9
Fritchie Marsh Restoration	PO-06	Hydrologic Restoration	NRCS, CPRA	1	2
GIWW - Perry Ridge West Bank Stabilization	CS-30	Shoreline Protection	NRCS, CPRA	4	9
GIWW (Gulf Intracoastal Waterway) to Clovelly Hydrologic Restoration	BA-02	Hydrologic Restoration	NRCS, CPRA	2	1
GIWW Bank Restoration of Critical Areas in Terrebonne	TE-43	Shoreline Protection	NRCS, CPRA	3	10
Goose Point/Point Platte Marsh Creation	PO-33	Marsh Creation	USFWS, CPRA	1	13
Grand Bay Crevasse (Deauthorized)	BS-07	Sediment Diversion	COE, CPRA	2	4
Grand Bayou/GIWW Freshwater Diversion	TE-10	Hydrologic Restoration	USFWS, CPRA	3	5
Grand Lake Shoreline Protection, O&M Only [CIAP]	ME-21b	Shoreline Protection	COE, CPRA	4	11
Grand Lake Shoreline Protection, Tebo Point	ME-21a	Shoreline Protection	COE, CPRA	4	11
Grand Liard Marsh and Ridge Restoration	BA-68	Marsh Creation	NMFS, CPRA	2	18
Grand-White Lakes Landbridge Protection	ME-19	Shoreline Protection	USFWS, CPRA	4	10
Highway 384 Hydrologic Restoration	CS-21	Hydrologic Restoration	NRCS, CPRA	4	2

Name	Number	Type	Sponsors	Subprovince	PPL
Holly Beach Sand Management	CS-31	Shoreline Protection	NRCS, CPRA	4	11
Hopedale Hydrologic Restoration	PO-24	Hydrologic Restoration	NMFS, CPRA	1	8
Humble Canal Hydrologic Restoration	ME-11	Hydrologic Restoration	NRCS, CPRA	4	8
Isles Dernieres Restoration East Island	TE-20	Barrier Island Restoration	EPA, CPRA	3	1
Isles Dernieres Restoration Trinity Island	TE-24	Barrier Island Restoration	EPA, CPRA	3	2
Jonathan Davis Wetland Protection	BA-20	Hydrologic Restoration	NRCS, CPRA	2	2
LA Highway 1 Marsh Creation (Deauthorized)	BA-29	Marsh Creation	EPA, CPRA	2	9
LaBranche East Marsh Creation	PO-75	Marsh Creation	NRCS, CPRA	1	19
LaBranche Wetlands Terracing, Planting, and Shoreline Protection	PO-28	Terracing	NMFS, CPRA	1	9
Lake Borgne and MRGO Shoreline Protection	PO-32	Shoreline Protection	COE, CPRA	1	12
Lake Borgne Shoreline Protection	PO-30	Shoreline Protection	EPA, CPRA	1	10
Lake Chapeau Sediment Input and Hydrologic Restoration, Point Au Fer Island	TE-26	Hydrologic Restoration, Marsh Creation	NMFS, CPRA	3	3
Lake Hermitage Marsh Creation	BA-42	Marsh Creation	USFWS, CPRA	2	15
Lake Portage Land Bridge	TV-17	Shoreline Protection	NRCS, EPA, CPRA	3	8
Lake Salvador Shore Protection Demonstration	BA-15	Demonstration, Shoreline Protection	NMFS, CPRA	2	3
Little Lake Shoreline Protection/ Dedicated Dredging Near Round Lake	BA-37	Marsh Creation, Shoreline Protection	NMFS, CPRA	2	11
Little Pecan Bayou Hydrologic Restoration	ME-17	Hydrologic Restoration	NRCS, CPRA	4	9
Little Vermilion Bay Sediment Trapping	TV-12	Shoreline Protection, Sediment Trapping	NMFS, CPRA	3	5
Lost Lake Marsh Creation and Hydrologic Restoration	TE-72	Marsh Creation	USFWS, CPRA	3	19
Lower Bayou LaCache Hydrologic Restoration (Deauthorized)	TE-19	Hydrologic Restoration	NMFS, CPRA	3	1
Madison Bay Marsh Creation and Terracing	TE-51	Marsh Creation	NMFS, CPRA	3	16
Mandalay Bank Protection Demonstration	TE-41	Demonstration, Shoreline Protection	USFWS, CPRA	3	9
Marsh Creation East of the Atchafalaya River - Avoca Island (Deauthorized)	TE-35	Marsh Creation	COE, CPRA	3	6
Marsh Island Hydrologic Restoration	TV-14	Hydrologic Restoration	COE, CPRA	3	6
Mississippi River Gulf Outlet (MRGO) Disposal Area Marsh Protection	PO-19	Marsh Creation	COE, CPRA	1	3
Mississippi River Reintroduction Into Bayou Lafourche	BA-25b	Freshwater Diversion	EPA, CPRA	3	5
Mississippi River Reintroduction Into Northwest Barataria Basin	BA-34	Freshwater Diversion	EPA, CPRA	2	10
Mississippi River Sediment Delivery System - Bayou Dupont	BA-39	Marsh Creation, Dredged Material	EPA, CPRA	2	12
Mississippi River Sediment Trap	MR-12	Marsh Creation	COE, CPRA	2	12
Myrtle Grove Siphon	BA-24	Freshwater Diversion	NMFS, CPRA	2	5
Naomi Outfall Management	BA-03c	Outfall Management	NRCS, CPRA	2	5
New Cut Dune and Marsh Restoration	TE-37	Barrier Island Restoration	EPA, CPRA	3	9
Non-Rock Alternatives to Shoreline Protection Demonstration	LA-16	Demonstration	NRCS, CPRA		18
North Lake Boudreaux Basin Freshwater Introduction and Hydrologic Management	TE-32a	Water Diversion	USFWS, CPRA	3	6

Name	Number	Type	Sponsors	Subprovince	PPL
North Lake Mechant Landbridge Restoration	TE-44	Marsh Creation, Vegetative Planting, Dredged Material	USFWS, CPRA	3	10
Nutria Harvest for Wetland Restoration Demonstration	LA-03a	Demonstration, Herbivory Control	USFWS, CPRA	2	6
Oaks/Avery Canal Hydrologic Restoration, Increment 1	TV-13a	Hydrologic Restoration	NRCS, CPRA	3	6
Opportunistic Use of the Bonnet Carre Spillway	PO-26	Water Diversion	COE, CPRA	1	9
Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration	BA-35	Barrier Island Restoration	NMFS, CPRA	2	11
Pass-a-Loutre Crevasse (Deauthorized)	MR-07	Sediment Diversion	COE, CPRA	2	3
Pecan Island Terracing	ME-14	Sediment and Nutrient Trapping	NMFS, CPRA	4	7
Penchant Basin Natural Resources Plan, Increment 1	TE-34	Hydrologic Restoration	NRCS, CPRA	3	6
Periodic Introduction of Sediment and Nutrients at Selected Diversion Sites Demonstration (Deauthorized)	MR-11	Demonstration, Water Diversion	COE, CPRA	1	9
Perry Ridge Shore Protection	CS-24	Shoreline Protection	NRCS, CPRA	4	4
Plowed Terraces Demonstration	CS-25	Demonstration, Sediment and Nutrient Trapping	NRCS, CPRA	4	4
Point Au Fer Canal Plugs	TE-22	Hydrologic Restoration, Shoreline Stabilization	NMFS, CPRA	3	2
Raccoon Island Breakwaters Demonstration	TE-29	Barrier Island Restoration, Demonstration	NRCS, CPRA	3	5
Raccoon Island Shoreline Protection/Marsh Creation	TE-48	Marsh Creation, Shoreline Protection	NRCS, CPRA	3	11
Red Mud Demonstration (Deauthorized)	PO-20	Demonstration	EPA, CPRA	1	3
Replace Sabine Refuge Water Control Structures at Headquarters Canal, West Cove Canal, and Hog Island Gully	CS-23	Marsh Management	USFWS, CPRA	4	3
River Reintroduction into Maurepas Swamp	PO-29	Water Diversion	EPA, CPRA	1	11
Riverine Sand Mining/Scofield Island Restoration	BA-40	Barrier Island Restoration	NMFS, CPRA	2	14
Rockefeller Refuge Gulf Shoreline Stabilization	ME-18	Shoreline Protection	NMFS, CPRA	4	10
Sabine National Wildlife Refuge Erosion Protection	CS-18	Shoreline Protection	USFWS, CPRA	4	1
Sabine Refuge Marsh Creation Cycle 1	CS-28-1	Marsh Creation	COE, USFWS, CPRA	4	8
Sabine Refuge Marsh Creation Cycle 3	CS-28-3	Marsh Creation	COE, USFWS, CPRA	4	8
Sabine Refuge Marsh Creation, Cycle 2	CS-28-2	Marsh Creation	COE, CPRA	4	8
Sabine Refuge Marsh Creation, Cycle 4	CS-28-4	Marsh Creation	COE, CPRA	4	8
Sabine Refuge Marsh Creation, Cycle 5	CS-28-5	Marsh Creation	COE, CPRA	4	8
Sediment Containment System for Marsh Creation Demonstration	LA-09	Demonstration	NRCS, CPRA		17
Sediment Trapping at “The Jaws”	TV-15	Sediment and Nutrient Trapping	NMFS, CPRA	3	6
Ship Shoal: Whiskey West Flank Restoration	TE-47	Barrier Island Restoration	EPA, CPRA	3	11
Shoreline Protection Foundation Improvements Demonstration	LA-06	Demonstration, Shoreline Stabilization	COE, CPRA	2	13
South Grand Chenier Hydrologic Restoration Project	ME-20	Hydrologic Restoration	USFWS, CPRA	4	11
South Lake De Cade Freshwater Introduction	TE-39	Freshwater Diversion, Shoreline Protection	NRCS, CPRA	3	9

Name	Number	Type	Sponsors	Subprovince	PPL
South Pecan Island Freshwater Introduction	ME-23	Hydrologic Restoration	NMFS, CPRA	4	15
South Shore of the Pen Shoreline Protection and Marsh Creation	BA-41	Shoreline Protection	NRCS, CPRA	2	14
South White Lake Shoreline Protection	ME-22	Shoreline Protection	COE, CPRA	4	12
Southwest LA Gulf Shoreline Nourishment and Protection	ME-24	Shoreline Protection	COE, CPRA	4	16
Southwest Shore White Lake Demonstration (Deauthorized)	ME-12	Demonstration	NRCS, CPRA	4	3
Spanish Pass Diversion	MR-14	Water Diversion	COE, CPRA	2	13
Storm Recovery Assessment Fund	SRAF	Operation and Monitoring	USGS		
Sweet Lake/Willow Lake Hydrologic Restoration	CS-11b	Shoreline Protection	NRCS, CPRA	4	5
Terrebonne Bay Shore Protection Demonstration	TE-45	Demonstration, Shoreline Protection	USFWS, CPRA	3	10
Thin Mat Floating Marsh Enhancement Demonstration	TE-36	Demonstration, Marsh Enhancement	NRCS, CPRA	3	7
Timbalier Island Dune and Marsh Creation	TE-40	Barrier Island Restoration	EPA, CPRA	3	9
Timbalier Island Planting Demonstration	TE-18	Barrier Island Restoration, Demonstration, Vegetative Planting	NRCS, CPRA	3	1
Upper Oak River Freshwater Siphon, Phase 1 (Deauthorized)	BS-09	Terracing	NRCS, CPRA	2	8
Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island	BA-28	Vegetative Planting	NMFS, CPRA	2	7
Venice Ponds Marsh Creation and Crevasses	MR-15	Marsh Creation, Water Diversion	EPA, CPRA	2	15
Vermilion River Cutoff Bank Protection	TV-03	Shoreline Protection	COE, CPRA	3	1
Violet Freshwater Distribution (Deauthorized)	PO-09a	Outfall Management	NRCS, CPRA	1	3
Weeks Bay Marsh Creation and Shore Protection/Commercial Canal Freshwater Redirection	TV-19	Marsh Creation, Shoreline Protection	COE, CPRA	3	9
West Bay Sediment Diversion	MR-03	Water Diversion	COE, CPRA	2	1
West Belle Pass Barrier Headland Restoration	TE-52	Marsh Creation, Barrier Headland	COE, NMFS	3	16
West Belle Pass Headland Restoration	TE-23	Shoreline Protection, Dredged Material	COE, CPRA	3	2
West Hackberry Vegetative Planting Demonstration	CS-19	Demonstration, Sediment Trapping, Vegetative Planting	NRCS, CPRA	4	1
West Lake Boudreaux Shoreline Protection and Marsh Creation	TE-46	Marsh Creation, Shoreline Protection	USFWS, CPRA	3	11
West Pointe a la Hache Outfall Management	BA-04c	Hydrologic Restoration, Outfall Management	NRCS, CPRA	2	3
West Pointe a la Hache Outfall Management	BA-47	Marsh Creation	NRCS, CPRA	2	17
Whiskey Island Back Barrier Marsh Creation	TE-50	Barrier Island Restoration, Marsh Creation	EPA, CPRA	3	13
Whiskey Island Restoration	TE-27	Barrier Island Restoration	EPA, CPRA	3	3
White Ditch Diversion Restoration and Outfall Management	BS-12	Water Diversion, Outfall Management	NRCS, CPRA	2	14
White's Ditch Outfall Management (Deauthorized)	BS-04a	Outfall Management	NRCS, CPRA	2	3

Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA)

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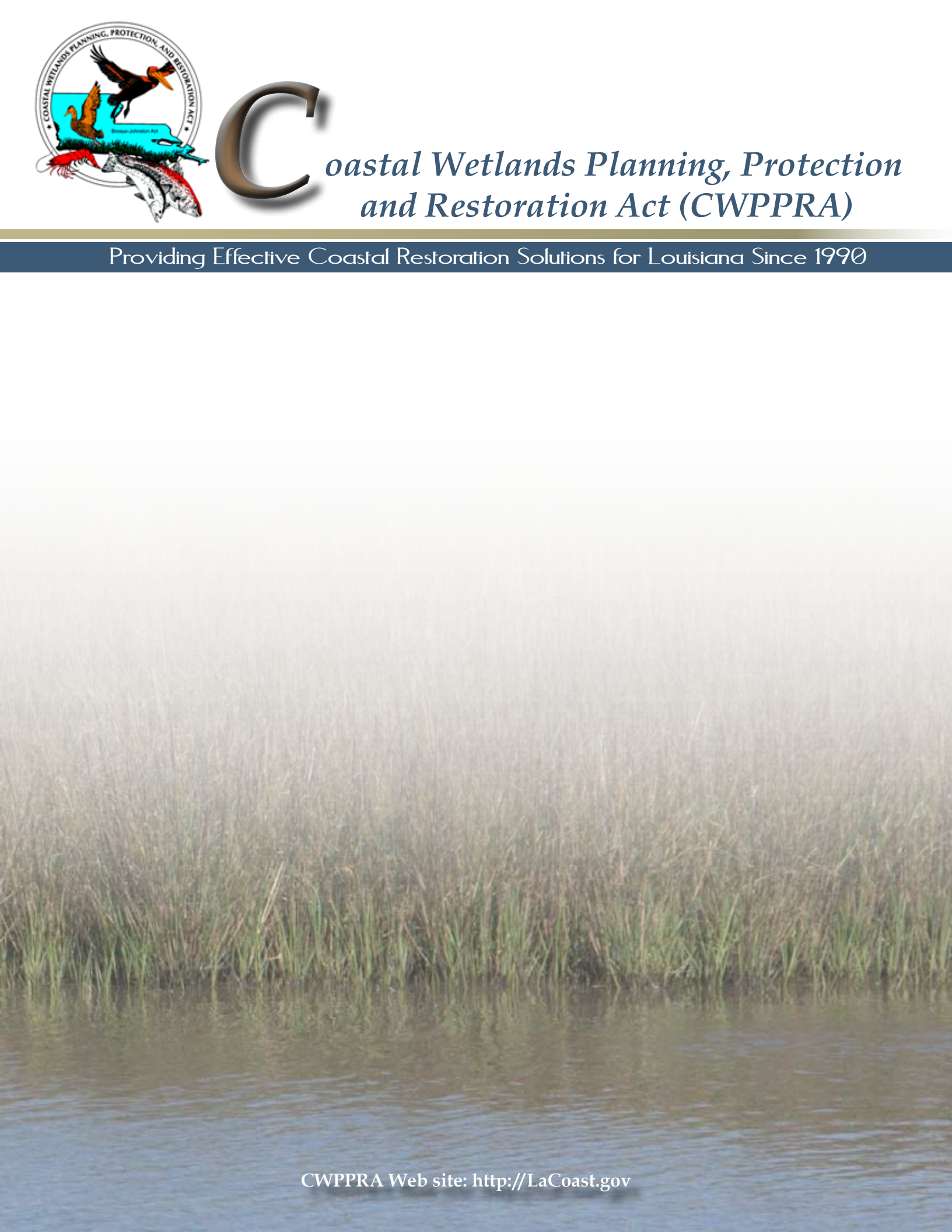

CWPPRA Web site: http://LaCoast.gov