rev. September 2010
Cost figures as of: March 2013

East Mud Lake Marsh Management (CS-20)

Project Status

Approved Date: 1992 **Project Area:** 8,054 acres
Approved Funds: $5.21 M **Total Est. Cost:** $5.39 M
Net Benefit After 20 Years: 1,520 acres
Status: Completed October 1997
Project Type: Marsh Management
PPL #: 2

Location

This Priority Project List 2 project is located in Cameron Parish, approximately 3 miles north of Holly Beach, Louisiana, surrounding East Mud Lake immediately north of Louisiana Highway 82 and bordered to the west by Louisiana Highway 27. It encompasses 8,054 acres of open water and brackish marsh dominated by marshhay cordgrass (*Spartina patens*).

Problems

The Calcasieu Ship Channel, immediately east of the project area, provides an avenue for the rapid movement of high-salinity water into the Mud Lake project area. This movement increased salinity in the area, resulting in plant death and marsh loss.

Also, the input of fresh water from all directions was reduced by the construction of highways and levees around the project area. Because there are limited drainage avenues, there was prolonged flooding in the project area. Some of the existing water control structures had collapsed or otherwise were damaged in a cross-sectional area, thereby decreasing flow capacity.

Restoration Strategy

The project was designed to stabilize salinity and water levels while ensuring the movement of commercial fish species into and out of the project area. Earthen plugs, flapgated culverts, variable crest culverts, and gated culverts were constructed and can be used to manage the flow of water into and out of the project area. In treatment unit 1, the structures have slots allowing ingress and egress of commercial fish species. Treatment unit 2 structures have drawdown capabilities, encouraging shallow water areas to revert to emergent vegetation. In both treatment units, the structures are closed when salinities exceed 15 parts per thousand (ppt).

Smooth cordgrass (*Spartina alterniflora*) was planted to stabilize canal shorelines and encourage marsh regeneration. A reference area was chosen, and project area success will be determined by monitoring and comparing both before and after construction, land-to-water ratios, vegetation planting success, existing vegetation, soil bulk density, water quality, vertical accretion, surface elevation, and fisheries.

Progress to Date

Survival of planted vegetation after 1 year was above 90% in the canals, 46% on the step levee, and 15% along the lake (because of high wave energy). As a result of extreme drought, total vegetation cover in the project area decreased from 89% in 1995 to 65% in 1997, but stabilized at 62% in 2000. Reference area cover was 87% in both 1995 and 1997 and dropped to 77% by 2000. Marshhay cordgrass cover is decreasing, and saltgrass (*Distichlis spicata*) is increasing in both project and reference areas. Species richness increased in both areas but remains higher in the project area.

Water salinities remained under the 15 ppt threshold over 80% of the time from June 1996 to December 1998 and 60% of the time from January 1999 to January 2000. Water levels were low for most of the post-construction period because of two consecutive drawdown years and four consecutive dry years.

From 1995-2003 (preconstruction to pre Hurricane Rita), the project and reference areas had similar vertical accretion rates (VA; ~5 mm/yr) while the project area had a slightly higher rate of shallow subsidence (SS; -3 mm/yr) and a resultant lower rate of elevation change (EC; 2 mm/yr). From 2003-2006, the project and reference areas experienced dramatic increases in VA, SS, and EC caused by sedimentation via Hurricane Rita.

Fish and crustacean abundance patterns did not change from pre-construction to post-construction. Transient species were more abundant in the reference area, and resident species were more abundant in the project area both pre-construction and post-construction. The 2005 Monitoring Report concludes that a positive aspect of the drought experience is that it seems to show that lowering the water level did allow expansion of vegetation from the marsh edge. Another drawdown, conducted during more normal environmental conditions may be beneficial and should be considered. The new vegetation extending from the marsh edge can increase the amount of valuable emergent marsh.

During the 2000-2006 interval, which included Hurricane Rita, the project area lost less land (6%) than the reference area (13 %), overall.

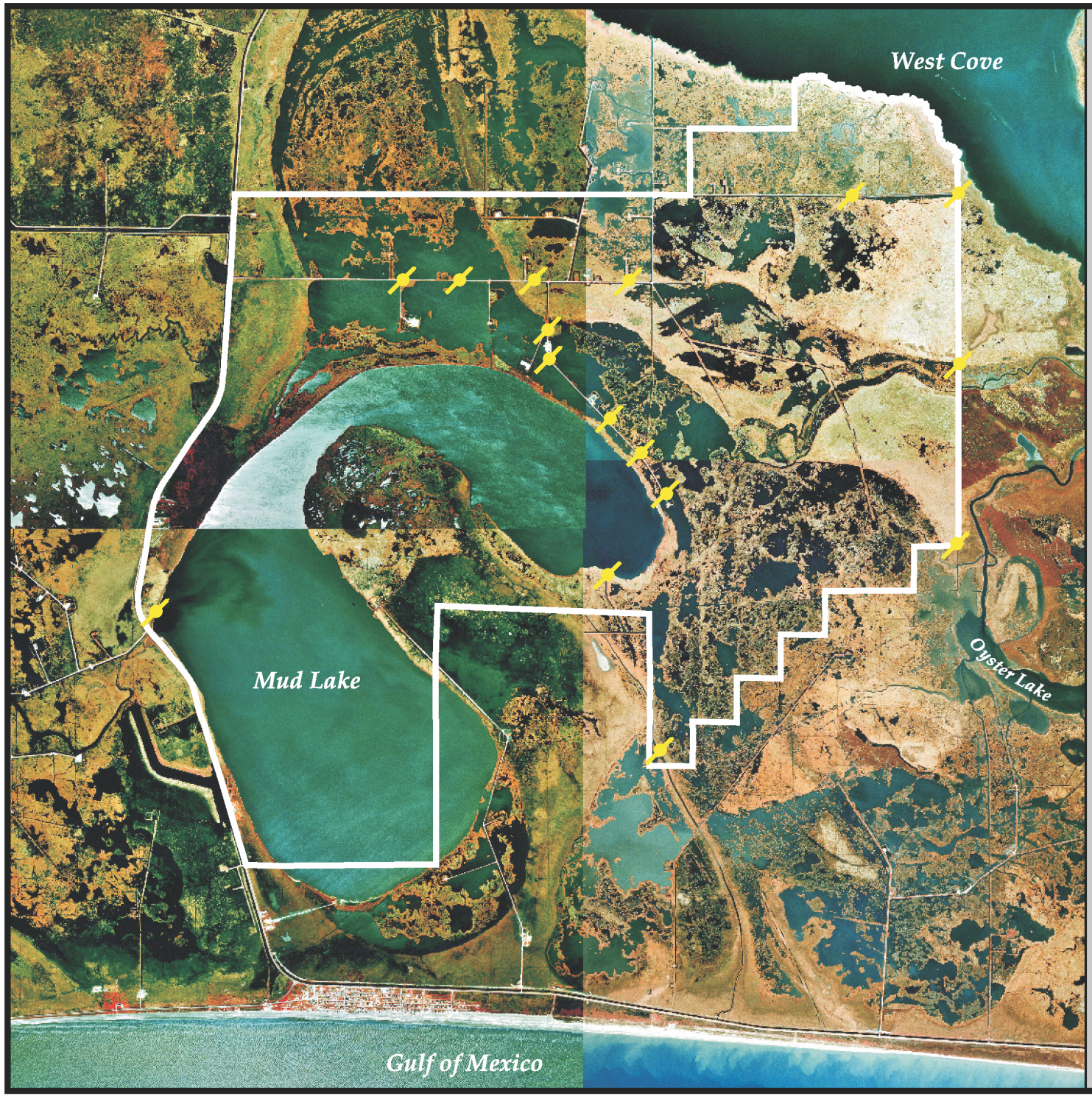
This project is on Priority Project List 2.

A gate in operation. A healthy stand of cordgrass protects the gate's flanks.

For more project information, please contact:

Federal Sponsor:
Natural Resources Conservation Service
Alexandria, LA
(318) 473-7756

Local Sponsor:
Coastal Protection and Restoration Authority
Baton Rouge, LA
(225) 342-4736



East Mud Lake Marsh Management (CS-20)

Water Control Structure

Project Boundary

USGS science for a changing world

Louisiana

Project Location

N

0.5 0 0.5 1 Miles

0.5 0 0.5 1 Kilometers

Map Produced By:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station

Background Imagery:
1998 Digital Orthophoto Quarter Quadrangle

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