

# WETLAND ENHANCEMENT



Matagorda Island National Wildlife Refuge, which includes a section of the barrier islands that run from Galveston to Brownsville, consists of more than 56,000 acres along 38 miles of the Texas coast. Habitat types within the refuge include tidal marshes, wetlands, grassland, sand dunes, and beaches that provide essential refuge and breeding ground for thousands of migratory birds and native wildlife, including the endangered whooping crane, one of the rarest colonial birds in North America.

Unfortunately, an estimated 15,000 acres of marsh habitat on Matagorda Island suffer from degradation after landowners sectioned off large portions of the marsh many years ago to install levees and pumps to dewater the area for cattle grazing, build roads, and install a variety of artificial barriers, ditches, and control structures.

Eventually Matagorda's bay system began to function less and less like a natural estuary, adversely affecting the habitat of crabs, shrimp, insects, and other natural resources that whooping cranes—still struggling to repopulate—and other estuarine species need to thrive. Land managers with good intent tried to help by installing numerous culverts throughout the marsh during the 1970s but they were ill planned and poorly constructed. Most had failed within a short period, resulting in the area reverting to its current state of poor natural water flow and circulation patterns, marsh habitat, wildlife abundance and diversity, and water quality.

## THE NATIONAL ESTUARY PROGRAM IN ACTION

## Coastal Bend Bays & Estuaries Program

Working with the U.S. Fish and Wildlife Service, a private engineering firm, and the Refuge, Coastal Bend Bays & Estuaries Program (CBBEP) is implementing an ambitious, multi-year Whooping Crane Recovery Plan to restore circulation and bring back functional wetland habitat to the island.

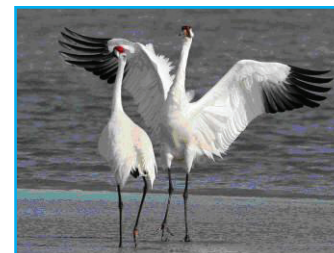
After assessing the island and identifying and prioritizing areas

for levee removal and culvert installation, CBBEP examined aerial photos dating back to the 1930s, before the levees were built, to determine what had been filled and altered. CBBEP identified control structures at approximately 30 locations throughout the site that existed in varied states of function, failure, and maintenance. These sites showed signs of scouring, erosion, and sediment deposi-

tion, providing evidence that the culverts did not facilitate natural flow rates. Approaching the project from the waterside and looking inland, they also discovered some separation of sections of marsh between which water used to flow freely, and decided to prioritize those areas first.

During CBBEP's first call for a restoration master plan proposal, engineers suggested a need to

collect vast amounts of field data in an attempt to characterize the entire site and base restoration actions on that information. The scope of services was expensive — nearly \$90,000 just for data collection — and did not include



any data analysis, action item recommendations, engineering design, or follow-up monitoring. This was a concern, as CBBEP knew that when working in such a large system, changes made in one area would affect other areas and much of the initial data would be of little use.

CBBEP decided that an adaptive management plan (AMP) would be critical to their success and

would also save them time, effort, and cost. Taking a learn-as-you-go approach would also allow for better understanding of the physical and ecological processes and more informed decision-making. The team conducted investigations to prioritize locations that needed improvement, based on data collected at each “bottleneck” location — a process that has ensured sug-

gestions are always based on current field data.

With the first phase of the AMP finalized, construction is well underway. The CBBEP is providing all of the technical support, meeting with the engineers and landowners, and giving guidance on the best way to approach the construction activity. Refuge staff and contracted labor are carrying out the plans, which, among other activities, include installing solid culverts designed to last. Using rock to stabilize the levy right at the culverts will avoid undercutting—something that was not addressed previously—and all the soil they remove during assembly is stabilized with a cement mixture of clay and rock before it is put back.

CBBEP and its partners have completed some sections of the

marsh with new culvert installations and set up some water monitoring stations to determine the water flow. The U.S. Fish and Wildlife Service is collecting data from monthly surveys and mappings of the whooping cranes during the winter season, which will provide an index of crane use in the area so the CBBEP can better assess restoration efforts.

Working from the AMP has cut costs measurably, from the original proposed budget of \$90,000 (which included data collection only) during the first phase to \$60,000 (including fieldwork, prioritization of action item locations, and restoration recommendations). Depending on how much work the Refuge is able to complete in-house, CBBEP estimates each phase of monitoring, analysis, and new recommendations for actions will cost between \$10,000 and \$30,000.

CBBEP and Aransas National Wildlife Refuge are currently implementing the second phase of improvements recommended by the Adaptive Management Plan. When complete, the first two phases will have addressed seven action item locations throughout the marsh, restoring almost 2,000 acres of impacted wetland.

In addition to the Whooping Crane Recovery Plan, the AMP will play a major role in maintaining diversity in the coastal barrier island community, enhancing objectives and strategies using new ideas and techniques to achieve the overall habitat goals of improving and restoring the western marsh on Matagorda Island. The AMP will also serve as a step-down plan of the overall Comprehensive Conservation Management Plan for the Aransas National Wildlife Refuge Complex.

Visit [www.cbbep.org](http://www.cbbep.org) to learn more about this and other CBBEP efforts.

*EPA's National Estuary Program (NEP) is a unique and successful coastal watershed-based program established in 1987 under the Clean Water Act Amendments. The NEP involves the public and collaborates with partners to protect, restore, and maintain the water quality and ecological integrity of 28 estuaries of national significance located in 18 coastal states and Puerto Rico.*

*For more information about the NEP go to [www.epa.gov/owow/estuaries](http://www.epa.gov/owow/estuaries).*

