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Shoreline and Wetland Protection at the Cohn Preserve

Objective

Stabilize the shoreline and address sediment and wetland loss at The Nature Conservancy's Francine Cohn Preserve (Cohn Preserve), while protecting critically important shallow wetlands on the back side of Mustang Island. The project will incorporate nature-based solutions (NBS) and act as a regional demonstration project that can be adapted elsewhere on Mustang Island.

Partners and Stakeholders

Texas Parks and Wildlife Department, U.S. Fish and Wildlife Service, Texas General Land Office (TGLO), Coastal Bend Bays Estuaries Program, Texas A&M University-Corpus Christi, Conrad Blucher Institute, Nueces County Coastal Parks

Project Description

This project focuses on shoreline protection and stabilization to address the significant loss of sediment and vegetation along the shoreline at TNC's Cohn Preserve. The Cohn Preserve is a 420-acre tract characterized by fringing mangroves and spartina marsh and is surrounded by upland coastal prairie. The shoreline of the Cohn Preserve protects the southern reach of Croaker Hole lagoon, a 2,000 acre shallow wetland complex on the bay side of Mustang Island that harbors extensive seagrass beds, which provide habitat for many coastal and marine species and provide recreational opportunities for bird watchers, wildlife photographers, kayakers and recreational fishers.

MUSTANG ISLAND, NUECES COUNTY, TEXAS



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There are approximately 4,000 acres of protected lands along the bay side of Mustang Island, including Mustang Island State Park, the Port Aransas Nature Preserves, and the Cohn Preserve, all of which are experiencing severe coastal erosion and the effects of sea level rise. There are opportunities for transferability and scalability of the conceptual NBS developed at Cohn Preserve to locations throughout Mustang Island and along the Texas coast.

Because of the severity of erosion at the Cohn Preserve, several conceptual NBS alternatives have been proposed, including a series of offshore breakwaters/intertidal reefs (to break most of the wave energy before arriving onshore), a series of nearshore breakwaters combined with sediment nourishment (shoreward of the extensive seagrass that is adjacent to the property), and/or a living shoreline system that includes a breakwater and fill material to create low marsh habitat (and possibly mid to high marsh as well). The alternatives would be oriented and designed to provide several levels of protection that, if combined, would provide a redundancy of defense against the erosional forces of waves coming from the bay. A living breakwater concept has also been proposed which would mitigate erosion and restore a large section of marsh habitat that has eroded away. This project will initially focus on furthering the engineering and design of alternatives, assessing the replicability of alternatives on adjacent parcels to maximize erosion control benefits, capturing and accruing sediment and protecting and/or restoring habitat to provide ecological benefits for fish and wildlife on the bay side wetlands on Mustang Island.

Outcomes

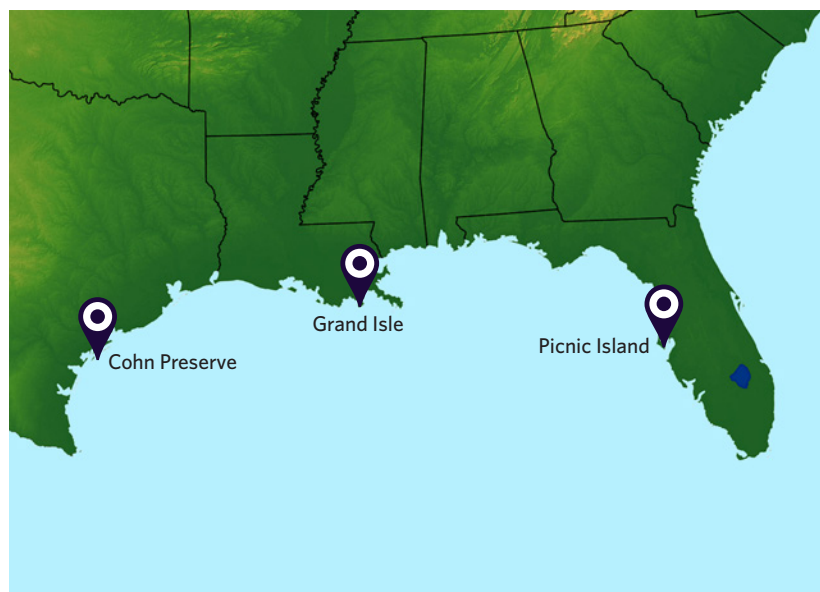
Project outcomes include restoration and protection of coastal habitat, mitigation of erosion, and enhancement of ecological benefits and potentially climate mitigation benefits such as carbon storage. This is also a case study, from which lessons learned can be applied to other sites along the backside of Mustang Island and in other parts of the Texas coast.

Site Rationale

The project is aligned with multiple other coastal plans and regional priorities. The project is a Tier 1 project in the TGLO's 2019 Texas Coastal Resiliency Master Plan (TCRMP), under the title "Restore Barrier Island Bayside Wetlands on Mustang Island" (R3-22). It will also address a portion of the proposed master sediment management plan for the eastern portion of Corpus Christi Bay and Mustang Island to address widespread shoreline habitat loss and the ability to retain lost sediment within the back bay and bay shoreline system. This project also aligns with two of the seven priority issues outlined in the Coastal Bend Bays Plan (2 ed.): loss of wetlands and estuarine habitats and altered estuarine circulation. By preserving functional, natural wetland habitats and creating new habitats and/or restoring degraded habitat where feasible, this project would help progress CBBEP's regional restoration goals. This project is also part of a scoping and feasibility analysis for the development of a blue carbon market in Texas, being led by TNC TX Coastal Resiliency Program.

Timeline

The development of NBS conceptual designs began in January 2022 and were incorporated into a Technical Memorandum finalized in August 2022. Next steps will be to complete engineering, design and permitting by May 2024 using funding provided by the TGLO's CEpra program and to seek funding for construction of the project.



Background

TNC's Gulf of Mexico Program is leading a Gulf wide effort to better understand what role mangrove engagement, restoration and management (MERM) might play in making human and natural communities more resilient to the impacts of climate change. As part of this effort, HDR was contracted for data collection and review, facilitation of stakeholder engagement, preparation of conceptual plans, cost estimates, permitting authority/agency pre-application meetings, and a completion of a final technical memorandum for three sites in three different states: Texas, Louisiana, and Florida; where mangroves are expanding their range due to climate change. Additional information regarding the MERM Project can be found in the forthcoming handbook titled "Ensuring a Future with Mangroves: Mangrove Engagement, Restoration, and Management in the Gulf of Mexico and on the Southeast Atlantic Coast".