



FY 2023 Annual Work Plan





*Protecting our bays
and estuaries*

FY 2023

Comprehensive Annual Work Plan

Approved by
CBBEP Board of Directors
August 25, 2022

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INTRODUCTION

PROGRAM OVERVIEW

The Coastal Bend Bays & Estuaries Program (CBBEP) was formed as a nonprofit to ensure that there is a thriving bay system in the Texas Coastal Bend that supports a high-quality life and is sustained for generations to come. For over twenty years, the organization has been driven and guided by local stakeholders whom recognize our interdependence on the bay system and place a high value on protecting and restoring our bays and estuaries. As part of the National Estuary Program, the CBBEP is a nonregulatory, voluntary partnership effort working with industry, environmental groups, bay users, governments, and resource managers to improve the health of the bay system. Public participation by individuals and organizations is encouraged. A mix of local governments, private industry, and state (Texas Commission on Environmental Quality) and federal (United States Environmental Protection Agency) agencies provide program funding. The CBBEP also seeks private grants/donations and additional governmental funding.

The CBBEP project area encompasses the estuarine environment of 75 miles of the south central Texas coastline, and includes the 12 counties of the region known as the Coastal Bend. This 514 square mile area of water includes all bays, estuaries, and bayous in the Copano, Aransas, Corpus Christi, Nueces, Baffin, and upper Laguna Madre bay systems, which together represent three of the seven major Texas estuaries.

The CBBEP's mission is to protect the bays and estuaries of the Coastal Bend, while supporting continued economic growth and public use of the bays. Major milestones for the CBBEP include:

- In 1994, the Corpus Christi Bay National Estuary Program is established and a multi-year, stakeholder-driven planning effort begins to develop the *Coastal Bend Bays Plan*
- *Coastal Bend Bays Plan* is approved in 1998
- In 1999, the CBBEP is established as a nonprofit organization, responsible for overseeing implementation of the *Coastal Bend Bays Plan*
- CBBEP's Coastal Bird Program is established in 2000 to halt declines of heron, egret, pelican, tern, and other colonial waterbird populations
- In 2003, CBBEP begins acquiring property in the Nueces River Delta to create the Nueces Delta Preserve
- CBBEP's environmental education program, now called Delta Discovery, begins using the Nueces Delta Preserve in 2007 to educate students, teachers, and families about the importance of conserving our bays and estuaries
- In 2016, CBBEP began working with stakeholders to develop the *Coastal Bend Bays Plan, 2nd Edition*, which received approval from EPA in January 2021

HISTORY AND ACCOMPLISHMENTS

Efforts to improve the health and productivity of the Coastal Bend bays and estuaries began in the 1990's and resulted in the region being designated as an "estuary of national significance." This eventually led to the establishment of the Corpus Christi Bay National Estuary Program, which in turn initiated a multi-year, community-based planning effort to identify the problems facing the bay system and to develop a long-term "Comprehensive Conservation and Management Plan" (CCMP) that outlined how to address the major priorities and issues.

The CCMP, often referred to as *The Coastal Bend Bays Plan*, identified specific actions that would benefit the bay system and the users of the bays. It was designed to complement and coordinate existing resource management programs and plans, and it received approval in 1998. The action plans were developed and refined through a series of workshops and committees that involved more than 325 individuals representing over 100 organizations. Federal and state agencies played an important role in the development of *The Coastal Bend Bays Plan*. However, stakeholders wanted to localize and take ownership of *The Bays Plan* as it moved forward into the implementation phase. Therefore, the CBBEP was created in 1999 as a non-profit organization with the specific role of implementing *The Bays Plan*, which calls for the protection and restoration of the health and productivity of the bays and estuaries, while still supporting continued economic growth and public use of the bays. The CBBEP recognizes that its action plans cannot remain static and must be modified to respond to the changing needs of communities, incorporate new programmatic, scientific, and technological advances, and address new environmental challenges. In 2016, the CBBEP initiated a new collaborative effort to revise *The Bays Plan* in order to incorporate developments that have occurred since the previous plan was

drafted and to ensure that new priorities are being addressed. The *Coastal Bend Bays Plan, 2nd Edition* received EPA approval in January 2021.

The priority issues identified in *The Bays Plan, 2nd Edition* are: (1) alteration of freshwater inflow into bays and estuaries; (2) condition of living resources, (3) loss of wetlands and estuarine habitats, (4) degradation of water quality, (5) altered estuarine circulation, (6) increasing amounts of bay debris, (7) selected public health issues, (8) declining coastal bird populations, (9) resilient coastal ecosystems and human communities that can adapt to changing conditions, (10) implementation of effective adaptive management practices at CBBEP properties, and (11) well-educated public to be wise stewards of the environment. *The Bays Plan, 2nd Edition* addresses these priority issues under the following categories of action plans: (1) Human Uses, (2) Maritime Commerce and Dredging, (3) Habitat and Living Resources, (4) Coastal Birds, (5) Land Conservation and Stewardship, (6) Water and Sediment Quality, (7) Freshwater Resources, (8) Public Education and Outreach, (9) Delta Discovery, and (10) Coastal Resilience.

Since 1999, the CBBEP has been working to create a Texas Coastal Bend with cleaner water and sediment, healthier habitats and wildlife, greater public access, and a more aware and engaged public. With the help of numerous partners, the CBBEP has restored thousands of acres of marsh habitat, with projects stretching from Matagorda Island down to the Laguna Madre. We have also developed an education program that provides outdoor, hands-on learning experiences for thousands of students, teachers, and families every year. We have implemented projects that help provide better access to our bays for both residents and visitors, and we have partnered with local governments, agencies, and landowners to address water quality issues, such as harmful algal blooms, stormwater, and bacteria. We also started an important program to both study and address the issues associated with our declining coastal bird populations, and we of course cannot forget our land acquisition projects which have protected close to 14,000 acres of valuable coastal habitats. The sections below highlight some of the successes of the CBBEP in recent years.

CBBEP RECEIVED THE GULF GUARDIAN AWARD from the EPA's Gulf of Mexico Division for its Egery Flats Restoration Project. The project was designed to restore water flow to the Egery Flats system and reduce salinity to over 600 acres of marsh, seagrass and tidal flat habitat.



Habitat and Wildlife

Healthy bay and estuarine habitats provide the critical foundation for sustainable environments and thriving economies. These habitats help maintain wildlife and plant populations, improve water quality, support fishing activities, enhance

local tourism, and reduce the impact of coastal hazards, such as flooding and storm surge. Coastal population growth, development, and rising sea levels threaten coastal habitats and wildlife, and this effect will continue unless projects are implemented to address these ongoing threats.

Abandoned Crab Trap Removal: With funding from the NOAA Marine Debris Program, CBBEP has been working with partners to expand efforts to remove derelict crab traps on the mid-Texas coast and gather standardized data that can be used to better assess the ecological and economic impacts, as well as the root causes of trap abandonment. Removal efforts over the last two years have involved 121 boats and 332 volunteers, with volunteers collecting a total of 2,254 derelict crab traps and removing approximately 11.25 tons of debris from our bays.

Protection and Restoration of Rookery Islands: CBBEP is undertaking two major rookery island restoration projects in the Upper Laguna Madre - one at Triangle Tree Island and another at Tern Island. Both islands are suffering from severe erosion, which is limiting the amount of nesting habitat available for colonial waterbirds in the Coastal Bend. CBBEP has secured millions in funding from the Texas General Land Office, US Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration to construct shoreline protection structures that increase the long-term productivity of these islands. In 2021, CBBEP also received funds from the Texas General Land Office to begin looking at restoration and protection options for three additional rookery island complexes: Deadman and Long Reef Islands in Aransas Bay, Benny's Shack Islands in the Lower Laguna Madre, and Pita Chain Islands in the Upper Laguna Madre. Once engineering and design options are complete, the project will begin the permitting process and CBBEP will seek additional funds for the construction phase.

Dune Management and Restoration on Mustang Island: Partners of the Texas Gulf Region Cooperative Weed Management Area (CWMA) have recently chosen to focus their removal and restoration efforts on four zones of dune habitat located in Port Aransas on Mustang Island. These areas have high concentrations of peppertrees and are owned by CWMA partners. In 2021, with funding from the Texas General Land Office, Coastal Management Program, the CWMA removed peppertrees from an impacted dune habitat on Mustang Island and also began the dune restoration process by replanting and/or reseeding treated areas. This restoration provides habitat and dune stabilization, while also preventing the reintroduction of peppertrees by limiting the germination of seeds that are otherwise easily dispersed.

CWMA FREQUENTLY HOSTS VOLUNTEER REMOVAL EVENTS targeted at removing invasive Brazilian peppertrees. CBBEP staff are pictured below with partners from the Mission-Aransas National Estuarine Research Reserve and Texas Parks & Wildlife Department at a recent removal event on Mustang Island.



Nueces Delta Shoreline Protection and Restoration: The Nueces Delta is experiencing rapid erosion that is causing the loss of significant marsh habitat for a variety of estuarine species, including juvenile fishes, shrimp, and crabs that support important commercial and recreational fisheries. In 2020, CBBEP received over \$3,000,000 in funding from the National Fish and Wildlife Foundation - Gulf Environmental Benefit Fund to construct 3,900 linear feet of breakwater to protect 650 acres of marsh habitat along the face of the Nueces Delta shoreline. In 2021, CBBEP received notice of award for an additional \$1,290,925 from the Texas General Land Office - Coastal Erosion Planning and Response Act Program to help cover increased costs of construction. The project is permitted and construction will begin in 2022.

Land Conservation and Stewardship

Despite their tremendous value, coastal habitats are threatened and at risk of being developed. The CBBEP Land Conservation Program has identified areas in need of protection within the Coastal Bend and is working with partners to conserve these valuable habitats. The Land Conservation Program has acquired either fee simple title or conservation easements for close to 14,000 acres of freshwater and saltwater marsh, forested wetlands, mudflats, riparian corridors, and native upland habitat. The CBBEP also works to manage these lands responsibly and sustainability for the long-term benefit of both wildlife and people.

Expansion of Nueces Delta Preserve: CBBEP has acquired around 11,500 acres in the Nueces River Delta and established the Nueces Delta Preserve. This area serves as a haven for fish and wildlife, while also providing a place for education programs, monitoring and freshwater inflow projects, and habitat restoration efforts. CBBEP continues to look for opportunities to expand the Nueces Delta Preserve by acquiring additional adjacent tracts. In 2021, CBBEP purchased a 58.6 acre “tamaulipian thorn scrub, low lying deltaic” tract of land in the Nueces River watershed. The property was purchased fee simple for the purpose of habitat conservation.

Packery Flats Cleanup: CBBEP manages several properties on Mustang Island, including portions of an area known as Packery Flats. In September 2021, CBBEP hosted the “4th Annual Packery Flats Cleanup.” 124 volunteers helped remove 200 bags of trash and harmful debris from intertidal and marsh areas, as well as along two miles of highway roadside! This area sees such high usage that CBBEP added a winter cleanup in February 2022 as well. The winter cleanup attracted 207 volunteers of all ages who contributed an astounding 621 hours of their time to remove 350 bags of trash from these critical habitats.

CBBEP HAS BEEN WORKING WITH PARTNERS AND VOLUNTEERS for multiple years to cleanup trash and debris from the Packery Flats area. They are now hosting two events each year to focus removal efforts on this popular public access site and its valuable coastal habitats.



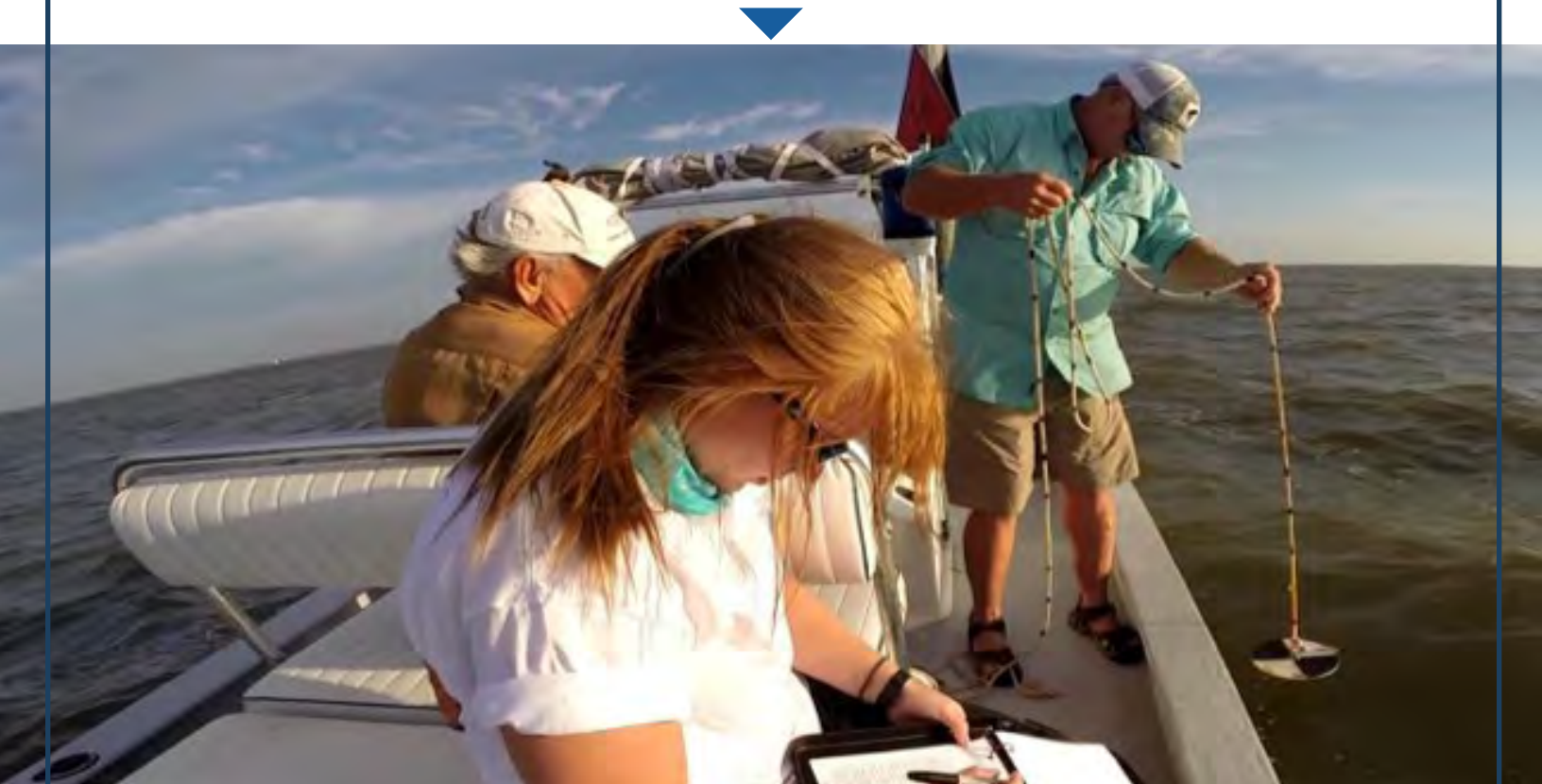
Texas Mid-Coast Initiative: In 2021, CBBEP entered into a partnership with Ducks Unlimited and the Guadalupe Blanco River Trust to implement the “Texas Mid-Coast Initiative,” a Wetland Reserve Enhancement Partnership project through the Natural Resources Conservation Service. The project seeks to conserve nearly 700 acres of priority wetland habitats for migratory birds and other state and federally listed species through restoration and enhancement efforts. CBBEP’s Land Conservation Program is working closely with partners to help identify willing landowners and develop effective project ideas that will conserve and restore wetland habitats.

Water Quality and Freshwater Inflows

Water quality is important to estuarine productivity, wildlife habitats, and the economic vitality of the Coastal Bend. Maintaining water quality is challenging as populations increase and development continues, but it is possible through proper planning, pollution prevention programs, and other best management practices. CBBEP collaborates with partners to implement projects, programs, and planning efforts that seek to get ahead of water quality problems. We also work with partners on efforts to ensure that our bays and estuaries receive the optimal amount of freshwater inflows they need to maintain productive ecosystems.

Baffin Bay Water Quality Monitoring: Baffin Bay is considered the jewel of the Texas coast because of its tremendous fishing and recreation potential, as well as its positive economic impact on surrounding communities. However, water quality degradation in Baffin Bay poses a long-term threat to the ecosystem and its fishery. In 2021, the “Baffin Bay Water Quality Monitoring” efforts marked its ninth straight year of collecting water quality data, such as inorganic nutrients, total dissolved nitrogen/organic carbon, chlorophyll-a, and phytoplankton. The long-term Baffin Bay water quality study has been critical for identifying nutrient inputs as the cause of this water quality degradation. With millions of dollars in funding targeted to improve conditions in the Baffin Bay watershed and bay, this effort is more crucial than ever as it allows stakeholders to evaluate the impact of restoration efforts.

LONG-TERM WATER QUALITY SAMPLING has been critical in identifying excessive nutrient pollution from the bay’s watershed as the cause of water quality degradation in Baffin Bay.



Outreach to Wastewater Treatment Plants: In 2021, the Nueces River Authority (NRA) worked as a contractor for the CBBEP on the Wastewater Treatment Plant Assistance Program - they reached out to the 13 wastewater plants discharging to streams leading into Baffin Bay. In several cases, NRA was able to provide immediate assistance by recommending process changes to improve wastewater treatment quality and efficiencies. Several other issues were discovered, such as staffing issues, lack of preventative maintenance, inability to pursue grant opportunities, etc.

Building on this project, NRA and CBBEP are collaborating on a second phase of the program to work with a subset of the facilities to address the grant and funding needs that would help address ongoing issue at the sites. This second phase is currently underway.

Welder Flats Hydrologic Restoration: In 2021, CBBEP began working in partnership with US Fish and Wildlife Service, through the Gulf Coast Conservation Initiative, to enhance Whooping Crane Habitat by implementing a hydrologic restoration project on private lands. The project involves planning, designing, and constructing a series of culvert systems across a ranch road that is currently impeding circulation. The project is currently in the planning and design phase.

Water Quality Status and Trends: In 2021, researchers at the Harte Research Institute completed an updated analysis of water quality in Coastal Bend bays using data obtained from the Texas Commission on Environmental Quality through 2019. Summary statistics for the period 2010 through 2019 and trend analysis over the period of record suggested that some bays are experiencing effects of eutrophication, changing freshwater inflows, and watershed derived pollutants. Observations determined that: (1) several Coastal Bend bays are experiencing signs of eutrophication such as high and/or increasing chlorophyll a concentrations - the most consistent trends were observed in Port Bay, Oso Bay, Baffin Bay and segments of the Laguna Madre; (2) fecal bacteria concentrations periodically exceeded the single sample limit in several bays; and (3) metal concentrations were below criteria except for copper, which exceeded criteria at all four stations where it is measured.

Freshwater for Whooping Cranes: With funding from an industry partner, CBBEP was able to partner with a local land trust, Aransas Pathways, to install a new water well on a property located in the Whooping Crane wintering grounds. The water well will provide reliable freshwater resources that can be used by cranes and other wildlife during times of drought. Funds were also used to purchase game cameras for the International Crane Foundation to monitor the well for use by Whooping Cranes.

Coastal Birds

South Texas is the cradle and crossroads for an array of resident and migratory birds. A variety of coastal habitats support millions of shorebirds, waterfowl, and wading birds. CBBEP's Coastal Bird Program has worked to conserve coastal birds and their habitats, identifying and addressing conservation needs through on-the-ground management actions, research, and education and outreach. The Program has a strong track record of bringing innovative management, diversified partnerships, and science-based decision-making to bird conservation on the Texas coast.

PROTECTION AND RESTORATION OF CAUSEWAY ISLAND has been a priority for CBBEP for many years. Construction of a rock breakwater around the island began in December 2021 and was completed in February 2022.



Rookery Island Restoration: Erosion is causing the on-going loss of critical nesting island habitat for colonial waterbirds such as Great Blue Herons, Great Egrets, Snowy Egrets, Roseate Spoonbills, Reddish Egrets, Royal Terns, and Black Skimmers. Protection and restoration of Causeway Island has been a priority for CBBEP for many years. With funding from the Texas General Land Office, Coastal Erosion Planning and Response Act program and the U.S. Fish and Wildlife Service, CBBEP constructed a rock breakwater around the island to protect it from further erosion. Construction began in December 2021 and was completed in February 2022. The breakwater will also allow for future expansion of the island through placement of sediment.

Rookery Island Monitoring & Management: Every year, the Coastal Bird Program manages hundreds of bird nesting islands from San Antonio Bay down to the Lower Laguna Madre to ensure that colonial waterbirds have a safe place to nest - islands are also monitored annually to determine nesting success.

Shorebird Research & Management: The Coastal Bird Program has expanded its conservation and research efforts to include migratory shorebirds which depend on the Texas coast for portions of their life cycles. For example, with two monitoring projects initiated in the Boca Chica region starting in 2017, the Program has documented declines in shorebird populations over time that correspond with increasing human disturbance in the region. This data has proven crucial for wildlife agencies to properly evaluate impacts to Endangered Species and other wildlife.

Rookery Island Cleanups: CBBEP's Coastal Bird Program created the annual "Rookery Island Cleanup" as an opportunity to engage with volunteers from the public on waterbird conservation and to clean important waterbird rookery shorelines. The event has grown considerably and now focuses additional effort on also cleaning shorelines where the birds feed. The 2021 cleanup was held on October 24, removing over 50 bags of trash along with other miscellaneous items from rookery islands and shorelines in the Lower and Upper Laguna Madre.

Environmental Education

CBBEP is committed to fostering the next generation of environmental stewards. To fulfill this commitment, the CBBEP has created the Delta Discovery Program which provides opportunities for students, teachers, and families to connect with the outdoors at the Nueces Delta Preserve. Delta Discovery strives to remove educational roadblocks by offering programs to local communities at no cost. In recent years, the pandemic has impacted CBBEP's ability to host many of our traditional educational programs, but our staff continue to adapt and find new ways to connect students, teachers, and families with nature.

STUDENTS VISITING THE NUECES DELTA PRESERVE participate in field trips that are TEKS-aligned, developmentally-appropriate, and give them the opportunity to further develop their process skills.



Student Field Trips: In 2021, the Delta Discovery Program was thrilled to start welcoming students back out to the Nueces Delta Preserve for hands-on, discovery-based field trips that get them out in nature and help reinforce the concepts they learn in the classroom. However, restrictions on travel due to the pandemic, have continued to limit the ability of many schools to travel outside of the school for field trips. In an effort to address this issue and continue connecting students and teachers with nature, Delta Discovery began offering “hybrid” field trips that include a virtual visit to the Nueces Delta Preserve, followed by a trip to the classroom by staff. Just like our regular field trips, content is aligned to state standards, is developmentally-appropriate, and gives students opportunities to further develop their process skills. Students are presented with tools and information that they cannot get from reading or talking about it in the classroom. For example, students are able to see the coastal prairie habitat at the Nueces Delta Preserve during the virtual field trip, and they then get to touch and feel some of the animals that call that habitat home when staff come into the classroom.

Training Educators: CBBEP’s Delta Discovery Program facilitates multiple workshops each year that focus on equipping teachers and educators with the skills, curriculum, and materials they need to strengthen science teaching as it relates to the environmental resources of the Coastal Bend. In 2021, workshops focused on educating teachers about the Project Learning Tree curriculum and how to conduct Science in the Schoolyard.

Community Programs: CBBEP’s Delta Discovery Program provides families with the opportunity to visit the Nueces Delta Preserve and participate in programs like Nature Story Times, Delta Discovery Days, and Home School Days - programs are designed to create conservation-minded families that are connected to nature and have a desire to protect it. Delta Discovery staff and expert volunteers also focus on providing programs that bring the learning to the community. Through school science nights, after school clubs, parks and recreation events, and other public programs, staff are reaching thousands of individuals each year.

Coastal Issue Forums: CBBEP continues to support the Coastal Bend Bays Foundation’s efforts to host monthly public forums that bring together diverse community interests to discuss regional resource management issues and seek solutions. Despite COVID-19 restrictions, the Bays Foundation has continued to engage with stakeholders in the region by hosting the Coastal Issue Forums virtually on Facebook live.

Public Access & Nature Tourism

To ensure that people continue to benefit from a safe, clean bay system, it is important to promote stewardship of our bay resources and to plan for the increasing number of people who visit the Coastal Bend to enjoy its natural resources. Well-planned and well-managed access areas help curtail resource damage, while providing enough parks and facilities for the growing number of users. It is also important to inform the citizens of our community and the millions of visitors about how to enjoy the resources without degrading them. Ensuring that the waters are safe to swim in and that the fish, crabs, and shrimp are safe to eat are also extremely important goals.

Public Access Enhancements at Packery Flats: In 2020, Hurricane Hanna made landfall south of Corpus Christi bringing strong winds and large storm surge to the Coastal Bend region. Packery Flats Coastal Habitat, a very popular public access location, was damaged by the storm surge associated with the hurricane. CBBEP received funds in 2021 to add road base and replace any missing or damaged bollards that delineate the road and parking area that helps keep vehicles out of sensitive habitat areas.

Educational Signage for the Leonabelle Turnbull Birding Center: CBBEP partnered with the City of Port Aransas Nature Preserve to install new signs at the Leonabelle Turnbull Birding Center. With funding from CBBEP, the Nature Preserve was able to design, purchase, and install 15 interpretive signs detailing insects, reptiles, amphibians, as well as resident birds.

Port Aransas Nature Preserve - Charlie’s Pasture Habitat Enhancement: CBBEP partnered with the City of Port Aransas Nature Preserve to continue invasive plant and grass removal and plant native grasses or seeds to enhance the habitat within and surrounding the Clay’s Hill at Charlie’s Pasture. Removing the invasive species and replanting native plants and grasses will enhance the food, water and cover in the area and potentially attract a variety of wildlife that visitors can enjoy. The site offers freshwater marsh habitat and the hills within the 40-acre project site provide shelter from the salt air and high winds. The City contracted with Gulf Corps to remove Guinea grass and white lead tree from the area in December 2021. Around 75 trees and shrubs were planted and the area was seeded following the invasive plant removal. Additional re-treatments of the invasive grasses are planned.

Up2U Litter Campaign: The Up2U Litter Prevention Campaign has been in full swing for over a year with the goal of cultivating a sustainable behavior-changing litter prevention program in the Coastal Bend. The cornerstone of the program is a yellow mesh bag emblazoned with the empowering Up2U message. The bag serves as a tool for trash removal but also contains a powerful outreach message. In the first year of the campaign, 12 distribution partners were established. Through these partners and other events, over 30,000 Up2U litter bags were distributed. In 2022, CBBEP and partners kicked off the Up2U PLUS program, which is designed to address illegal dump sites that pose health hazards and have economic impacts on local communities. Up2U PLUS will strive to remove barriers like cost and accessibility that prevent correct disposal of dumped items. Dumpsters that highlight the Up2U message will be provided for communities at no cost, while clean up of existing dump sites will also be part of the project.

PACKERY FLATS IS A POPULAR PUBLIC ACCESS SITE in the Coastal Bend, but roads at the site sustained damage during a recent hurricane. CBBEP placed 125 tons of road material at the site to repair the damaged roads. In addition, replacement of damaged bollards and installation of new signs will occur in 2022.



WORK PLAN DEVELOPMENT

The FY 2023 Comprehensive Annual Work Plan will allow the CBBEP to continue the implementation of the *Coastal Bend Bays Plan, 2nd Edition*. This Work Plan describes implementation projects and administrative support that will be undertaken pending approval and receipt of funds by the funding entities.

All data and information produced under the auspices of the CBBEP will adhere to standardized formats and be made publicly accessible. A public participation strategy, refined under the “The Bays Plan” chapter of the *Coastal Bend Bays Plan, 2nd Edition* will continue to guide public participation efforts regarding implementation of action plans. The list of “Priority Issues,” refined through public input and characterization projects will continue to serve as the focus for implementation.

STARTING DATE

The starting date for this FY 2023 Comprehensive Work Plan will be September 1, 2022.

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ACCOMPLISHMENTS TO DATE

CBBEP regularly assesses administrative program activities in order to improve its success. CBBEP has continuously had favorable annual financial audits, as well as the quality system audits conducted by the Texas Commission on Environmental Quality (TCEQ). The Program has identified the need for more project documentation in a timely manner. Specifically, project progress and accomplishments need to be well-documented in the CBBEP project database on a more regular basis – not just when reporting deadlines are due. In addition, CBBEP recognizes the need to make draw-downs on federal and state funds on a timely basis.

The CBBEP achieved its primary project-related goal for FY 2023, which was to continue the successful initiation and completion of projects developed to implement the *Coastal Bend Bays Plan, 2nd Edition*. To date, CBBEP and its partners have achieved programmatic progress on 94 percent of *Bays Plan* actions. The Program's success in leveraging funds for CBBEP projects has also been noteworthy. Broad support for CBBEP's activities continues to be evidenced by the range of contributors, including local governments, industries, foundations, nonprofits, and state and federal agencies. The CBBEP Bays Council continues to support the priorities as listed in the *Bays Plan*.

All project deliverables identified prior to the CBBEP FY 2015 implementation years have been completed.

COMPETENCY STATEMENT

CBBEP is committed to the development and implementation of procedures and policies in order to assure that activities that acquire, generate, compile, or use environmental data and technology are of the appropriate type and quality for their intended use. CBBEP operates under and maintains an annually approved Quality Management Plan to continually assure that quality of the data generated is sufficient to meet the objectives of the project. To this end, CBBEP's activities meet all the requirements that have been set forth to receive and utilize funds from the EPA and can demonstrate this through the following commitment:

"Competency for generating environmental measurement data under EPA funded assistance is demonstrated at the CBBEP through the maintenance of quality assurance project plans for data collection activities that involve water quality monitoring and other environmental measurements, and through the approved Quality Management Plan that provides descriptions of the quality policies, including all requirements described in EPA QA/R-2."

GOALS FOR FISCAL YEAR 2023

The overarching goal for the FY 2023 Work Plan is to continue the successful implementation of the *Coastal Bend Bays Plan, 2nd Edition*. CBBEP Implementation Teams continue to identify, initiate and select project ideas for inclusion in the Program work plans. The teams are: Habitat & Living Resources; Human Uses; Maritime Commerce and Dredging; Water & Sediment Quality; and Environmental Education & Outreach. The CBBEP Coordination Team, consisting of all the chairs of the Implementation Teams and key members of the Bays Council, coordinates the annual work plan recommendations to the CBBEP Bays Council and Board of Directors, and reviews and proposes recommended updates to the *Bays Plan*.

IMPLEMENTATION OF PROJECTS

Project activities for the FY 2023 Work Plan have been selected for their contribution towards implementation of the *Bays Plan*, with 34 projects included in the Plan. A comprehensive list of projects outlining project numbers, titles, action items, performing party(s), and total project cost can be found in “Table 1: FY 2023 Comprehensive Annual Work Plan Project List.” This list represents the combined efforts of the many volunteers who have donated their time and expertise to help assure the successful implementation of the *Coastal Bend Bays Plan*.

PROJECT DELIVERABLES & SCHEDULE

Specific project deliverables and schedules for completion are to be negotiated with the sub-contractor of the project and will be included in the scope of work of the project contract. The project contract and any amendments will be subject to review by funding entities and are incorporated into this annual work plan by reference. The projects to be performed in FY 2023 are as listed on the following pages:



PROJECT #2301 CBBEP Coastal Bird Program

Performing Organization: Coastal Bend Bays & Estuaries Program

Total Project Cost: \$439,680

Bays Plan, 2nd Ed. Actions: CB 1.1, CB 2.1, HLR 1.1, HLR 1.2

Background:

Coastal birds are important components of estuarine ecosystems and serve as indicators of ecosystem health. In addition, recreational bird viewing is a significant and growing component of ecotourism, a major facet of the local economy. The 2010 Environmental Indicators Report prepared by CBBEP documented the declining populations of many colonial waterbird species in Texas, with some species experiencing a 90% reduction in breeding pairs since the 1960's. CBBEP recently released the 2020 Environmental Indicators Report, which pointed out that a few species of colonial waterbirds have shown nesting pair recovery levels but many are still declining. An ever-increasing body of research continually provides evidence of the importance of the Texas coast to many non-breeding coastal bird species, several of which are also experiencing population declines.

This project will build on the efforts of the CBBEP Colonial Waterbird projects from previous years through the continued implementation and improvement of specific management actions from the CBBEP Colonial Waterbird Rookery Island Management Plan. This plan outlines habitat management actions such as planting and establishing native shrubs, removing exotic/invasive vegetation, building artificial nest platforms, and removing nest predators as needed throughout the year. All habitat management actions such as planting native vegetation and removing exotic/invasive vegetation will be completed by February 1, as this is the beginning of the waterbird nesting season. Predator management will be conducted as-needed throughout the year.

Additionally, these efforts will extend to activities that support the conservation of non-breeding coastal bird species and their habitat. This project will provide assistance to other partners, where appropriate, in efforts to assess changes in populations, current wintering and migratory movements, and important areas of habitat for non-breeding coastal species. The timeline for these efforts will depend on the seasonality of the non-breeding species, but will begin September 1, and be completed by June 15.

Years of experience working with coastal bird species in the Coastal Bend makes the CBBEP uniquely qualified to provide expertise and assistance to partners and stakeholders working to conserve coastal birds. The CBBEP will assist resource agencies, universities, and other stakeholders in joint efforts to monitor changes in coastal bird populations at a large scale. These monitoring efforts will take place primarily in December and May and provide information that helps direct waterbird management priorities for CBBEP for the coming years. In addition, the CBBEP will meet with partners and stakeholders throughout the year to provide updated information on coastal bird species ecology and management in the Coastal Bend area.

Public outreach is also a key component of this project, with the objectives of minimizing anthropogenic impacts to rookeries, educating the public, and promoting stewardship of waterbird resources. This will be accomplished through on-site signage at rookery islands, public presentations and events, and other forms of public communications, such as the distribution of flyers, updates on social media, interviews with local news outlets, and regular engagement of volunteers. Public outreach efforts will take place throughout the year.

Project Objectives:

The objectives of this project include: (1) continue restoring waterbird populations through management of nesting sites, including habitat enhancement, protection, predator control, and reduction of anthropogenic impacts; (2) develop and implement public education and outreach programs that promote awareness and stewardship of coastal birds and their habitats, (3) assist partners in efforts to observe and monitor changes in coastal bird populations; and (4) provide resource agencies, researchers, and other stakeholders with expertise on coastal bird ecology, habitats, and conservation needs including assistance in tagging migratory birds for tracking.

PROJECT #2302 Delta Discovery

Performing Organization: Coastal Bend Bays & Estuaries Program

Total Project Cost: \$169,544

Bays Plan, 2nd Ed. Actions: DD 1.1, DD 1.2, DD 1.3, DD 2.1

Background:

Delta Discovery's mission is to connect Coastal Bend communities with opportunities and resources that plant the seeds of conservation for protecting our bays & estuaries. The educational program cost consists of the following: (1) field trips for students, (2) teacher workshops, and (3) community programs, such as Delta Discovery Days, Nature Story Times, and Home School Days.

Field trips: Many of the students that are being exposed to scientific concepts for the first time have never spent much time outdoors. CBBEP Environmental Educators provide field trip opportunities for teachers and students to visit the Nueces Delta Preserve. The cross-curricular trip may be organized by the teacher, with assistance from the Environmental Educator, to create an educational TEKS-aligned agenda for outdoor education. This program sees thousands of students per school-year. The goal is to plant seeds of appreciation and passion for a new generation of naturalists, biologists, and nature lovers to protect and preserve the Coastal Bend through educating school children about preserving our environment and protecting our animal and plant life.

Teacher Workshops: CBBEP Environmental Educators will facilitate a minimum of four workshops throughout the school year. These free workshops will address local environmental science topics and will align to the TEKS objectives, and participating teachers will receive SBEC credits. The workshops focus on equipping teachers with the skills, curriculum, support and materials to strengthen science teaching as it relates to the environment resources of the Coastal Bend. Hands-on learning in the field will be correlated to classroom instruction. The funding provides all fees for partnering, curriculum, and substitute teachers in order for these workshops to occur on weekdays.

Delta Discovery Days: The CBBEP will host a minimum of five Delta Discovery Days. These hands-on "family picnic days" provide multi-generational audiences time and guidance to discover, connect, and learn about the estuary in their back yard. Families bring a sack lunch and the CBBEP Education Staff facilitate interactive learning activities that model nature-play strategies throughout half-day program. Delta Discovery Days serve two purposes: (1) encourage students attending Nueces Delta Preserve field trips to return with their families to demonstrate what they have learned and (2) welcome new audiences -- families and members of the community -- to the Nueces Delta Preserve for a day of nature-based learning.

Nature Story Time: CBBEP will host a minimum of ten Nature Story Times. These early learner programs introduce children, ages 2-5, to nature and the joys of reading through stories, crafts, and outdoor play. Children and their "grown-ups" will build a sense of place and connection as they explore the estuary and its inhabitants.

Home School Days: The CBBEP will host a minimum of three Home School Days to meet the needs and interest of home school families seeking field experiences. Home School Day programming will provide home school families and their students an opportunity to connect their classroom science/environmental curriculum to the natural world of the Coastal Bend using both place-based and discovery education. CBBEP Education Staff and partners will facilitate a series of hands-on activities that support select program themes and the engagement of mixed age student audiences.

Nueces Delta Preserve Upkeep: Upkeep of the Nueces Delta Preserve consists of electricity, trash and water costs, phone and internet costs, temporary assistance for field trip days and staff mileage.

Project Objectives:

The objective of this project is to provide educational field trip opportunities for K-12 students and also to aid teachers in increasing their knowledge, skills, and resources available to effectively teach science to students in local schools.

PROJECT #2303 Rookery Island Productivity for Priority Waterbird Species

Performing Organization: Harte Research Institute for Gulf of Mexico Studies at Texas A&M University - Corpus Christi

Total Project Cost: \$96,375

Bays Plan, 2nd Ed. Actions: CB 1.1, HLR 1.1, HLR 1.2

Background:

Rookery islands are being eroded by ship traffic, storms, and rising seas, leading managers to begin putting significant resources toward rookery island rehabilitation. Their efforts are guided by the Texas Colonial Waterbird Survey, an annual statewide effort to document the location and size of colonial waterbird rookeries. However, there is no corresponding information on how many fledglings rookeries produce (i.e., productivity), which is a key component of their conservation value. With roughly 200 rookery islands on the Texas coast, agencies will not have enough funds to intensively manage all rookery islands. Nor do all islands have the same potential to increase waterbird nesting populations. Some rookeries initiate every year but repeatedly fail, whereas others seem to consistently produce fledglings, although the numbers have rarely been measured. Information to help prioritize islands that have the greatest potential to sustain waterbird populations based on actual reproductive performance of birds is urgently needed to guide the selection of islands for restoration and to focus scarce resources used for management of rookery islands on the most beneficial islands.

The proposed project leverages information provided by a project led by the Harte Research Institute (HRI) and initiated in 2022 to develop an island prioritization tool that incorporates traditional expert knowledge, the available food in the habitat around each colony, and the productivity of the four priority species above for a small set of islands. The productivity portion of the HRI project will be incorporated into this proposed project at no cost to boost both the sample of islands where productivity is measured and the power of the analysis to test for differences in reproductive performance among island types.

The expected outcome of this assessment is an improved understanding of the degree to which different rookery island types produce fledglings and therefore have the greatest potential to increase colonial waterbird populations. Sampling will occur at two large rookeries (e.g., Shamrock Island and Pita Island) and 18 rookeries that span the range of smaller island types. The results of the project will also support ongoing efforts by CBBEP and partners to prioritize funding for island management and restoration efforts towards projects that will have the greatest impact on coastal bird populations.

Project Objectives:

The objectives of this project are to (1) assess productivity (nest survival and number of fledglings) of four priority coastal bird species (Reddish Egret, Tricolored Heron, Great Egret, and Black Skimmer) and (2) test for differences in productivity among island types.

PROJECT #2304 Expansion of Pro-Active Monitoring Capacity for Harmful Algal Blooms

Performing Organization: National Park Service, Padre Island National Seashore

Total Project Cost: \$23,470

Bays Plan, 2nd Ed. Actions: PH 1.1, HLR 2.5

Background:

Algal blooms are caused by phytoplankton species, and the harmful variety are known as harmful algal blooms (or HABs) due to their detrimental effects on human and pet health, marine ecosystems and wildlife, and the resulting negative impacts to the economies of coastal communities and industries. In the Texas Coastal Bend, the phenomenon known as “red tide,” a bloom of *Karenia brevis*, has occurred periodically for hundreds of years with bloom frequency increasing since the mid-1990s. “Novel blooms” of other HAB species have also been observed.

At the Padre Island National Seashore (PINS), HABs sampling has typically been limited to event response, primarily caused by *K. brevis*. In 2021, however, the Park initiated participation in PA’s BloomWatch Program, as well as the National Oceanic and Atmospheric Administration’s (NOAA) Phytoplankton Monitoring Network (PMN). PINS staff collected biweekly samples at two sites from early August through mid-December. In 2022, PINS intends to continue proactive sampling at the two sites, one on the Gulf of Mexico beach and one on the Laguna Madre. Existing capacity and funding limit sampling to locations near the Park’s headquarters, leaving more than 60 miles of Gulf and Laguna coastlines unsampled.

The goal of the project is to increase the capacity for pro-active sampling of HABs at PINS, including sampling in the high priority area of the Laguna Madre adjacent to Baffin Bay. The work of the project would allow for early warning of public health and/or environmental concerns across an expanded area. HABs have direct and indirect negative impacts on visitor use and enjoyment of the Park, and early warnings of HABs events would substantially improve visitor and pet safety within both the Park and adjacent lands and waters.

Funding will support a full-time intern for six months over the course of one year to complete the work of the project. Specific tasks will include: (1) recruiting citizen scientists and building a volunteer program to provide longevity and consistency for PMN; Bloom Watch, and HABscope activity at PINS and elsewhere in the Coastal Bend beyond the period of the internship, (2) sampling (PMN and HABscope) and deploying cameras (BloomWatch) at up to four additional field locations within the park boundary, including a high priority site adjacent to Baffin Bay at Yarborough Pass; (3) species identification and enumeration and data entry/reporting; deploying and retrieving Bloom Watch cameras; (4) enhance HABs public education by producing science communication products, including social media and website content to be hosted by PINS and partners; and (5) raising awareness of existing HABs science communication products, including by distribution of existing lesson plans with local educational partners and through national distance-learning initiatives. The project leverages in-kind support (non-match) from PINS in the form of staff time, vehicle usage, and supplies.

The expected outcome of this project is increased capacity for pro-actively monitoring HABs at PINS and an increased awareness of HABs impacts by visitors of the Park and the general public.

Project Objectives:

The objectives of the proposed project include (1) expanding harmful algal bloom monitoring capacity and program longevity at the Padre Island National Seashore, (2) enhancing public education related to harmful algal blooms, and (3) encouraging stewardship of public and other lands through service learning.

PROJECT #2305 Baffin Bay Water Quality Monitoring

Performing Organization: Texas A&M University – Corpus Christi

Total Project Cost: \$50,000

Bays Plan, 2nd Ed. Actions: WSQ 2.1, WSQ 2.2

Background:

The purpose of this project is to help continue a water quality monitoring program in Baffin Bay that will gather water samples and identify potential sources of water quality degradation in the system. Baffin Bay is undergoing significant eutrophication, as exemplified by a long-term increase in nitrogen and phosphorus loads and chlorophyll-a concentrations that have exceeded state criteria for nearly the past decade. Additional symptoms include blooms of potential harmful algal species (*A. lagunensis*, *Pyrodinium bahamense*), episodic hypoxia, and fish kills.

In response to concerns over water quality changes in Baffin Bay, Texas A&M University-Corpus Christi (TAMUCC) initiated a spatially-temporally intensive water quality monitoring program to: (1) generate data for construction of nutrient budgets and to identify potential sources of nutrient/organic matter loadings that are contributing to water quality degradation in the system, and (2) characterize the ecosystem response to fish kills and loading events, including from episodic storm events.

As part of the ongoing water quality monitoring program, as well as a TAMUCC Ph.D. student project, samples will be collected at six sites from Baffin Bay on a monthly basis, as well as at higher frequencies in response to episodic storm events or fish kills. Two of the sites overlap with TCEQ quarterly monitoring stations, allowing for comparison with longer-term trends within Baffin Bay. At each site, vertical profiles will be performed, and discrete surface samples collected. Additionally, a YSI Ecomapper Autonomous Underwater Vehicle (AUV), equipped with water quality sensors (temperature, salinity, D.O., pH, chlorophyll fluorescence) may be deployed to identify water quality “hot spots” and to characterize environmental conditions pre- and post-storm.

Project Objectives:

The objective of this project is to support a water quality monitoring program through TAMUCC and collect monthly data, and rain event data, to identify nutrient concentrations and loading throughout the bay system.

PROJECT #2306 Outdoor Classrooms

Performing Organization: CBBEP Delta Discovery

Total Project Cost: \$21,000

Bays Plan, 2nd Ed. Actions: DD 1.1., DD 1.2, DD 1.3, DD 2.1

Background:

Research suggests that children who play and learn in nature are healthier, happier, and perform better in school. However, children have become increasingly disconnected from nature. This disconnect has led to physical and emotional health problems and a sense of isolation. Additionally, there are not enough safe outdoor spaces close to home for most Texas children, especially those from disadvantaged families.

CBBEP created its environmental education program, called Delta Discovery, to help address this “nature-deficit” and connect classrooms and families to nature. Delta Discovery has an outstanding track record for environmental education in the Coastal Bend. Every year we provide field trips to thousands of students, train teachers on how to connect classrooms to outdoor experiences and provide opportunities for families to experience nature. Delta Discovery operates primarily at the Nueces Delta Preserve, a 10,500-acre property that is comprised of diverse habitats, including wetlands and prairies.

However, teachers and principals at local schools are finding it more and more difficult to move students off campus to outside learning opportunities (i.e., field trips) like those offered by CBBEP at the Nueces Delta Preserve. Buses are expensive and finding personnel to supervise, as well as scheduling, has become challenging. Field trips at the middle school and junior high level are almost non-existent. The ability to leave the school campus has been even further reduced due to the conditions created by the COVID-19 pandemic.

One way to solve this problem is to bring learning opportunities to schools in the form of outdoor classrooms. An outdoor classroom is defined as an outdoor area on a school campus that is set aside for student investigation and learning. Outdoor classrooms directly support US Fish and Wildlife Service’s Schoolyard Habitat Program that is designed to connect students with the outdoors, restore wildlife habitat on urban school grounds, and inspire the next generation of environmental leaders.

Components of outdoor classrooms are varied but often include benches or picnic tables adjacent to a study or natural area where students can gain field experience and spend time outdoors. While every outdoor classroom contains its own unique design elements, CBBEP will strive to ensure that they all observe the following key elements: ecologically sound, benefit wildlife and people, integrated into curriculum, designed to encourage long-term stewardship. Schools will be encouraged to follow the process described in the USFWS Schoolyard Habitat Project Guide for the development of outdoor classrooms, and CBBEP staff will be available to assist them with this process.

Project Objectives:

CBBEP will contract with local schools to install three outdoor classrooms in the coming fiscal year.

PROJECT #2307 Installation of Mission River Water Quality Monitoring Equipment

Performing Organization: Mission-Aransas National Estuarine Research Reserve – University of Texas Marine Science Institute

Total Project Cost: \$17,945

Bays Plan, 2nd Ed. Actions: FW 1.1, FW 1.4

Background:

This project will assist in collecting data that will help address questions on freshwater inflows in the Mission-Aransas Estuary. By collecting water quality parameters and data along the Mission River at frequencies and intervals like those collected at multiple locations within the connecting bay systems, researchers will be able to address multiple questions and needs. Data collected from this station could help meet the Mission-Aransas National Estuarine Research Reserve's (NERR's) System Wide Monitoring Program goal of measuring short-term variability and long-term changes in the estuary to gain a better understanding of how our estuaries function, change over time, and to predict how coastal systems respond to natural and human-induced change.

Currently the Mission-Aransas NERR has five water quality stations with Copano Bay (2), Aransas Bay (1), Mesquite Bay (1), and the Aransas Pass Ship Channel (1- currently under construction). These stations collect water quality data at 15-minute increments, with real-time data availability. Due to data-hosting limitations, this new, Mission River station would not be hosted by NOAA's Center for Data Management Office, but the data would still be publicly available for researchers through simple email request. The Mission-Aransas NERR would promote its availability on our webpage alongside the information for the existing SWMP program.

This water quality station would be equipped with an Aqua TROLL 500 Multiparameter Sonde. Although this is not the YSI EXO that the Mission-Aransas NERR's SWMP water quality platforms are currently outfitted with, it is a comparable, cheaper unit. The Aqua Troll 500 will be equipped with sensors to record temperature, salinity, conductivity, pH, and DO (additional parameter could be included if desired). The data would be collected every 15 minutes (same as the other SWMP platforms) and equipped with telemetry capabilities.

The station would be located along the Mission-River at the boat ramp located at Fennessey Ranch. This location is known to be tidal influenced during low flow periods. At Fennessey Ranch the instrument would be attached to a piling that would need to be installed. Having the equipment located at the Ranch, provides limiting accessibility, as compared to installing the equipment at a public facility with existing infrastructure. The Mission-Aransas NERR has a conservation easement on the Ranch and is responsible for management of the Ranch. Staff from the Mission-Aransas NERR and Fennessey Ranch would routinely maintain and calibrate the equipment.

Water quality data from this station would also lend itself to educators teaching students and the general public about freshwater inflows and the connections between the rivers and our bays. Educators could discuss the transitions that occur starting in the Mission River and ending where the bay meets the sea at the UT Marine Science Institute.

Project Objectives:

Project will install a water quality station along the Mission River that collects water quality data (i.e., temperature, conductivity, pH, and DO) using similar protocols to those that are used by the Mission-Aransas NERR's existing monitoring program. By utilizing similar protocols to the existing stations, the data collected at this new station on the Mission River would be directly comparable to those collected within the neighboring bay systems.

PROJECT #2308 CBBEP Community Outreach Partnerships

Performing Organization: Coastal Bend Bays Foundation

Total Project Cost: \$30,000

Bays Plan, 2nd Ed. Actions: PEO 1.1, PEO 1.2, PEO 1.4, PEO 1.5

Background:

As stated in the Coastal Bend Bays Plan, 2nd Ed., CBBEP is constantly working to promote public and private partnerships to help achieve its educational goals. The CBBEP partnership with the Coastal Bend Bays Foundation (CBBF) addresses our educational goals set forth in the Bays Plan, 2nd Ed. One of the benefits of the partnership between the CBBEP and CBBF is addressing the need for continued dialogue between competing user groups and the need for an engaging public forum to allow for individual input in the public policy debate. The Bays Plan, 2nd Ed. calls for continued involvement from CBBF, as the region prepares itself for ever-increasing number of people wanting to make use of the bays and estuaries. Minimizing conflict through informed discussion will help achieve the overall objective of ensuring the public's safety, health and enjoyment of our bays and estuaries. This project will result in increase in the community's awareness of local environmental issues through Earth Day, forums and an awards banquet. An estimated 12,000 people are expected to attend these events.

Project Objectives:

1. Organize, coordinate, and host turnkey operation of Earth Day festival.
2. Organize, coordinate, and host CBBF Conservation and Environmental Stewardship Annual Awards Banquet.
3. Host Coastal Issues Forums to increase communication between resource managers, users, and the general public.
4. Organize and coordinate bay-resource/related workshops with CBBEP's approval.
5. Continue to seek matching and/or leveraging funds.

PROJECT #2309 CBBEP Property Management

Performing Organization: Coastal Bend Bays & Estuaries Program

Total Project Cost: \$244,570

Bays Plan, 2nd Ed. Actions: LCS 1.1, LCS 1.2

Background:

CBBEP is owner and steward of Program-owned conservation properties across South Texas primarily located in Aransas, Nueces, San Patricio, Refugio, and Cameron Counties.

Included in the list of conserved properties is the CBBEP Nueces Delta Preserve which is located just outside of Odem, Texas and is the focal point of the CBBEP Land Conservation Program. The CBBEP Nueces Delta Preserve encompasses over 11,000 acres of the Nueces River Delta and is in both San Patricio and Nueces Counties. The Nueces Delta Preserve was purchased with the intent of preserving natural habitat, species, and function of the Nueces River Delta. This property is also home to the CBBEP Environmental Education Program “Delta Discovery” program.

CBBEP has taken the successful model of the Nueces Delta Preserve and has focused on preserving contiguous acres of habitat in Refugio County’s Mission River Delta, Aransas County’s Lamar Peninsula, and on Mustang Island.

The project funds are dedicated to help support land ownership obligations and some routine maintenance associated with land ownership. Maintenance activities include but are not limited to habitat management activities, road and culvert repairs, maintenance and operation of CBBEP facilities, equipment repairs purchases and maintenance, development and enhancement of public access sites, and the payment of property taxes.

Past project accomplishments have included, perimeter fencing, herbicide applications for brush control, development and implementation of prescribed burn program, road reconstruction, installation of solar water wells, and wetland enhancement and creation.

Project Objectives:

1. Provide the required ongoing maintenance and management of properties owned by CBBEP.
2. Implement prescribed burn plan on a minimum of 700 acres of grasslands.
3. Mechanical brush removal to enhance at least 100 acres.
4. Replace sections of perimeter fence.
5. Facility maintenance and improvements.
6. Repair road and culvert systems.
7. Design and build equipment storage and workshop facility.

PROJECT #2310 Oso Bay/Oso Creek Watershed Model & Outreach and Education

Performing Organization: Nueces River Authority, Center for Coastal Studies at Texas A&M University – Corpus Christi

Total Project Cost: \$15,767

Bays Plan, 2nd Ed. Actions: WSQ 1.1, PEO 1.1, PEO 1.2, PEO 1.3, PEO 1.4

Background:

The Oso Bay/Oso Creek watershed drains an area of approximately 255 square miles and is located in the northern-most portion of the Nueces-Rio Grande Coastal Basin. Oso Bay is an enclosed, shallow body of water situated along the southern shore of Corpus Christi Bay, with a surface area of approximately seven square miles. Oso Bay receives much of the storm water runoff from the City of Corpus Christi as well as the cooling water from the Barney Davis Power Plant. The housing developments around the bay range from large, multiacre tracts, to neighborhoods with many houses per acre, to apartment complexes.

Stakeholders identified a number of human activities as potential contributors to water quality problems in the Oso Bay/Oso Creek watershed. A lack of natural resource awareness, a depreciated value for clean streams coupled with a deficit in the understanding of human activities that contribute to nonpoint pollution underlie the existing water quality impairments. Refrigerators, tires, dead animals, and household garbage dumped at public road crossings testify to this awareness problem. The proposed public education and outreach project results from recommendations made by stakeholders during the I-Plan development process and is included as a measure within the Implementation Plan.

The goal of this four-year project is to create an education and outreach program that cultivates personal responsibility for water quality and polluting behaviors in the Oso Bay/Oso Creek Watershed. This program will connect urban and rural communities of the Oso Bay/Oso Creek Watershed by educating the public about urban waters, the effects of polluting behavior, and the impacts land use transitions have on water quality. Community awareness of the existing water quality bacteria issues in Oso Creek and Oso Bay will promote community engagement to protect and improve water quality that will in turn improve public health and revitalize watershed communities. The education and outreach will connect communities with their watershed by using a plastic, custom relief model of the Oso Bay/Oso Creek Watershed. The model will promote personal responsibility in revitalizing and restoring Oso Bay and Oso Creek by helping stakeholders visualize their “place” within the watershed and better understand pollutant pathways and the role they can play in reducing pollutant loads. These models have been used in other watersheds and have proven to be a powerful tool for educating communities about the ways runoff pollutants affect public health and the environment. The plastic watershed model will be used at every elementary school located within the Oso Bay/Oso Creek Watershed to reinforce 5th grade Texas Essential Knowledge and Skills and cultivate their understanding of the watershed in which they live. Bilingual outreach materials (e.g., PSA, news stories, posters, fact sheets, etc.) will also be developed to support the education and outreach efforts described above and provide the public with information regarding trash and flooding, septic issues, and keeping our creek and drainage areas clean.

Project Objectives:

This four-year project will implement measures outlined in the draft Oso Bay/Oso Creek TMDL Implementation Plan. Funds will be used to construct a custom, plastic relief model of the Oso Bay/Oso Creek watershed and use that model for education and outreach efforts in local schools and underserved communities located within the watershed. Bilingual outreach materials will also be developed to support education activities in the watershed. The funds listed above will be used to support the third-year of this multi-year project.

PROJECT #2311 Nueces Delta Environmental Monitoring

Performing Organization: Conrad Blucher Institute at Texas A&M University – Corpus Christi

Total Project Cost: \$28,996

Bays Plan, 2nd Ed. Actions: FW 1.1, FW 1.2, FW 1.3, FW 1.4

Background:

Normally, a river flows through a delta area prior to making its confluence with its receiving water body. The Nueces River is different in that it flows into Nueces Bay at a point along the south shore of the bay, 2 ½ to 3 miles from the delta-bay interface, completely bypassing the delta. Only during times of severe flooding, causing over-banking of the river, or locally heavy rain, does much freshwater make it into the delta proper. To provide more freshwater diversions during normal flow conditions, the City of Corpus Christi built the Rincon Bayou Pipeline and pump station to divert up to the first 3,000 acre-feet of passthroughs per month from above the saltwater barrier dam directly into the upper Rincon Bayou.

The purpose of this project is to continue maintaining monitoring equipment in and around the Nueces Delta to observe freshwater inflows downstream of Rincon Bayou diversion pipeline so that spatial and temporal environmental effects can be calculated as well as the amount of freshwater needed to manage a healthier estuary. This project will be conducted by the Conrad Blucher Institute (CBI) at Texas A&M University – Corpus Christi. CBI will monitor and maintain one (1) a real-time meteorological station, one (1) tide gauge station with meteorological sensors, and one (1) permanent real-time salinity station within the Nueces River Delta.

Project Objectives:

Maintain real-time water quality, tide gauge, and meteorological monitoring stations in the Nueces Delta and Bay to measure effects of Rincon Pipeline freshwater inflows.

PROJECT #2312 Protection of the GIWW Shoreline at the Aransas National Wildlife Refuge

Performing Organization: CBBEP

Total Project Cost: \$236,894

Bays Plan, 2nd Ed. Actions: SM 1.1, HLR 1.1, HLR 1.2, HLR 1.3, HLR 2.4

Background:

The Aransas National Wildlife Refuge (ANWR) was bisected by the Gulf Intracoastal Waterway (GIWW) in 1941. This created approximately 12 miles of GIWW shoreline on each side of the waterway that the ANWR is responsible for managing. Much of the existing GIWW shoreline is covered in protective revetments known as articulated concrete block mattresses to prevent erosion of the shoreline. Portions of the revetment, however, have been observed becoming dislodged or out of place since their original installation in 1999. The failure of various portions of this shoreline protection system has led to localized erosion and shoreline and habitat loss along the shorelines of the ANWR.

CBBEP contracted with a qualified engineering firm to conduct an existing condition evaluation and develop potential shoreline stabilization concepts for the GIWW shoreline at ANWR. The entire 12-mile length of the GIWW shoreline within the ANWR was visually inspected, and select areas along the northern shoreline were logged, surveyed, and photographed. Priority areas for repair were identified, but further detailed engineering analysis and surveying is needed to determine the exact dimensions, alignment, and materials used for each segment of proposed revetment repairs and modifications. The priority areas include: (1) Mustang Lake, (2) Sundown Bay, (3) Lakes North of Dunham Bay, (4) Southern ANWR near Grass Island, (5) Southern Islands of Sundown Bay, (6) Back-Bay Shoreline of Sundown Bay, and (7) Southwestern Mustang Lake.

Additional detailed engineering efforts are needed to better define the protection strategies for the priority areas listed above and subsequently provide more accurate design details and associated construction costs for each of the priority areas. CBBEP will utilize \$199,200 from the Texas General Land Office, Coastal Erosion Planning and Response Act and \$37,694 from Aransas County, along with \$95,106 additional matching funds from a previously received USFWS grant, to contract with a qualified engineering firm to (1) complete surveying and geotechnical probing, (2) develop preliminary engineering and design (30%), and (3) submit a permit application and coastal lease application (if needed) for the construction of the protection structure. The project cost is comparable to other shoreline protection permitting and design projects completed in the region, particularly when compared to the high value habitat provided by the wetlands in this section of ANWR and the many species they support, including the endangered Whooping Crane.

Project Objectives:

Address erosion issues in high-priority areas along the GIWW by contracting with an engineering firm to (1) complete surveying and geotechnical probing, (2) develop preliminary engineering and design (30%), and (3) submit a permit application and coastal lease application (if needed) for the construction of the protective structures.

PROJECT #2313 Tern Island Protection and Restoration, Phase II

Performing Organization: CBBEP

Total Project Cost: \$2,691,272

Bays Plan, 2nd Ed. Actions: HLR 1.1, HLR 1.2, CB 1.1

Background:

Tern Island is a rookery island located in the upper Laguna Madre near Corpus Christi, Texas. The Island is approximately 1.5 acres in size and is owned by the Texas General Land Office (TGLO) and leased for the purposes of protection and management of colonial nesting waterbirds by Audubon Texas. CBBEP's Coastal Bird Program partners with Audubon Texas to manage and protect rookery islands, including Tern Island, throughout the mid- and lower-Texas coast. On Tern Island, CBBEP has annually controlled invasive vegetation, placed and maintained protective signs, restored native vegetation, and treated and removed red imported fire ants and other nest predators.

Tern Island supports large numbers of nesting colonial waterbirds like pelicans, egrets, skimmers, and terns, but erosion of the northern and southern shorelines of the Island is causing the on-going loss of this critical rookery island habitat. Tern Island is experiencing erosion from continuous wave and wind action, and the rate of erosion and the subsequent loss of nesting habitat is expected to increase as sea level continues to rise. Despite its small size, Tern Island is an extremely important rookery island and currently supports a high number of nesting waterbirds. Unlike many other low-lying rookery islands in this region, Tern Island has enough elevation to support a healthy shrub community that can be utilized by a large number of nesting birds. With projected sea level rise and increasing human development further limiting available nesting habitat in this region, Tern Island will likely become an even more critical nesting site. Protection of Tern Island from ongoing erosion and future sea level rise is a high priority project for CBBEP.

CBBEP received Coastal Management Program (CMP), Cycle 25 funds to contract with a qualified engineering firm to complete a feasibility study and alternatives analysis for erosion protection of Tern Island. The alternatives analysis identified the construction of 1,300 linear feet of riprap breakwater around the perimeter of the Island as the best alternative. The breakwater structure will protect the Island from wind and wave action and will help the Island be more resilient to sea level rise. The structure is also designed to trap and secure imported fill to allow for island expansion. By adding fill material inside of the breakwater, the current 1.5-acre footprint of the island could be increased to approximately 2.5 acres.

CBBEP will utilize \$2,574,164 in funding from the Texas General Land Office, Coastal Erosion Planning and Response Act Program to complete the preliminary design (50%), permitting and lease application, final design (100%), bidding, and construction of the breakwater structure. Construction will also include placement of imported fill material inside the breakwater structure. CBBEP will provide \$118,108 in match to be put towards engineering and design costs. Following construction, CBBEP will conduct monitoring to gauge the success of the project in terms of bird usage (e.g., yearly bird surveys to document total number of breeding pairs and number of active nests). CBBEP will also inspect the integrity of the breakwater structures through site visits and a final grade survey.

Project Objectives:

The project objective is to increase the amount of bird nesting habitat on Tern Island by completing the engineering design, permitting, and construction of a rock breakwater around the perimeter of the Island. The breakwaters will protect the Island from erosion and allow for the expansion of the Island through the placement of imported fill material.

PROJECT #2314 CBBEP Public Outreach Events and Activities

Performing Organization: CBBEP

Total Project Cost: \$44,250

Bays Plan, 2nd Ed. Actions: PEO 1.1, PEO 1.2, PEO 1.3, PEO 1.4, PEO 1.5, TR 1.1

Background:

One of the most important goals of the Coastal Bend Bays Plan is to educate citizens about the ecology of the bay system, its many environmental and economic values, and how an individual can make a positive difference to ensure its long-term health. To accomplish this, the Public Education and Outreach Action Plan is designed to raise the public's environmental awareness, foster community stewardship of bay resources; and increase individual involvement in bay resource management issues. Helping residents and visitors understand the complex issues concerning bay resource management is a priority. CBBEP utilizes a public opinion survey to gauge the effectiveness of our education and outreach efforts. In addition to understanding how the bay system functions, it is important that citizens develop a sound appreciation for the significant value and economic impact derived from the renewable resources of the bays. CBBEP is constantly working to promote public/private partnerships as stated in the Coastal Bend Bays Plan to help achieve its educational goals.

Project Objectives:

CBBEP will raise awareness of environmental issues by connecting with the Coastal Bend public through our websites and social media channels, as well as at community events and festivals. We will spread the CBBEP brand through promotional and educational materials, such as posters, reusable bags, and other items. We expect to reach thousands of people at various community events.

To accomplish its public education and outreach goal, CBBEP will:

1. Participate in community events and festivals,
2. Produce or purchase educational and promotional materials,
3. Maintain a website(s) and active social media channels (i.e., Facebook, Instagram),
4. Develop and provide electronic updates,
5. Participate in outreach opportunities, such as clean up events.

PROJECT #2315 Violet Andrews Park Shoreline Improvements

Performing Organization: City of Portland

Total Project Cost: \$40,000 (City of Portland = \$10,000 cash)

Bays Plan, 2nd Ed. Actions: TR 1.1, TR 2.1, SM 1.1

Background:

The purpose of this project is to engage in planning and engineering of improved recreational access to the waters at Violet Andrews Park in Portland. Violet Andrews Park is often cited as one of the top ten locations in the nation, and one of the top in the world, for kite-boarding. This is due in large part to the shallow, sandy, bottom which allows easy access to kite boarders to walk out into the water. Currently, to access the water the public must walk across several feet of dangerous rip-rap. This is especially dangerous for children and kite-boarders who are often barefoot and carrying bulky equipment.

The City of Portland will partner with CBBEP to engage a firm to conduct planning and engineering for improvements to the entry-point and surrounding shoreline. Actual improvements currently under consideration include removal of rip-rap, addition of path to water and directional signage, and review of any additional recommendations emerging from study. Actual construction and implementation of recommendations would be conducted as part of a latter stage of the project. Benefits of undertaking this project include: enhanced public access for tourism and recreational activity; focus of recreational activity to this designated location which in turn decreases the intrusion and impacts to other shoreline areas; and, review of shoreline management.

Project Objectives:

Engage a firm to conduct planning and engineering for improvements to the entry-point and surrounding shoreline at Violet Andrews Park in the City of Portland.

PROJECT #2316 Padre Island National Seashore-Up2U Litter Bags Partnership

Performing Organization: CBBEP and National Park Service - Padre Island National Seashore

Total Project Cost: \$5,000

Bays Plan, 2nd Ed. Actions: BD 1.1, PEO 1.1, PEO 1.3

Background:

The purpose of the project is to establish a partnership between Padre Island National Seashore {PINS} and the Up2U Litter Prevention Campaign. Specifically, this project will purchase 12,000 Up2U litter bags for distribution at PINS. Up2U litter bags are the cornerstone of the Up2U litter prevention campaign, a 5-year year litter prevention campaign that will distribute 150,000 bags (30,000 / year) through distribution partners in the Coastal Bend. The litter bags serve as a tool for trash removal, prevention, and outreach; however, the program in its second year is already distributing 30,000 bags per year through partners and cannot provide the volume of bags that could be utilized at PINS.

Annual visitation to the park averaged 618,849 per year from 2016 to 2020, with an average of 65,795 visitors camping overnight each year in developed campgrounds or on the beach. The park estimates they currently provide 6,000 traditional trash bags per year for beach use/marine debris removal, and for day-to-day visitor use. They only supply trash bags to visitors who ask for them. It would be a great benefit to expand the Up2U program throughout PINS - not only are the yellow mesh bags preferred over traditional trash bags because of their ease of use in our environment, but 12,000 bags would provide for very welcome additional capacity to supply visitors with bags so they can pack out more than they pack in.

Project Objectives:

Establish a partnership between PINS and the Up2U Litter Prevention Campaign that leads to the distribution of 12,000 bags at PINS.

PROJECT #2317 Educational Signs for the City of Corpus Christi - Parks and Recreation Department

Performing Organization: City of Corpus Christi – Parks and Recreation Department

Total Project Cost: \$15,000

Bays Plan, 2nd Ed. Actions: TR 2.1, PEO 1.1

Background:

CBBEP will partner with the City of Corpus Christi – Parks and Recreation Department to install new educational signs at three of its parks: (1) Suter Wildlife Refuge, (2) Lakeview Park, and (3) West Guth Park.

Currently, the signs at the Suter Wildlife Refuge are outdated, aged, and/or reference plants that are no longer in place. Funding would be used to redesign and manufacture new signage regarding the history of the park, the wildlife, and the plant life. New plant signs would include QR code tags for trees so they can be reused if a plant is lost to age, disease, or natural disaster.

At Lakeview Park and West Guth Park, funding would be used to design and install signs sharing information about feeding of domestic and wild ducks. These two City parks have historical duck populations and are water bodies that are rarely able to be flushed. With improper feeding of excess bread, crackers, and high densities of ducks and turtles, these ponds have the potential for high bacterial counts and poor water quality. By providing information on proper diets for ducks, the public can engage more appropriately with the waterfowl and improve water quality in these ponds. Signage regarding this topic has become more commonplace in many municipalities and is needed in our community as well. This will also be one of many steps the City's Parks and Recreation Department can take to move towards certification in the Bird City Texas program through Audubon Texas and Texas Parks and Wildlife Department.

Project Objectives:

1. Design and install new educational signs at the Suter Wildlife Refuge that highlight the history of the park, the wildlife, and the plant life.
2. Design and install signs at Lakeview Park and West Guth Park that share information about proper interactions, including feeding, of domestic and wild ducks.

PROJECT #2318 Burton Lamar Preserve Improvements – Phase II

Performing Organization: Aransas First

Total Project Cost: \$15,000

Bays Plan, 2nd Ed. Actions: TR 2.1, TR 3.1, PEO 1.1,

Background:

Aransas First, through a generous contribution from a Lamar Peninsula resident, purchased the 105-acre tract east of Highway 35 between Holiday Beach East and Lamar Preserve subdivision on Seaside Loop. The tract is known as the Burton Lamar Preserve. It is directly across from 214 acres of coastal grassland and brackish/saltwater wetlands acquired by the Texas Parks and Wildlife Department, and the 106 acres adjacent to the north are owned by the Coastal Bend Bays & Estuaries Programs. All of these areas are important wintering habitat for Whooping Cranes, especially as the population increases toward recovery. The areas are also adjacent to Newcomb's Bend, an important nursery habitat for crabs, oysters, and finfish. The 105-acres owned by Aransas First contains greater than 60 acres of woody and emergent wetlands that serve as the freshwater collection pool for the rainwater coming directly from the adjacent Live Oak/Red Bay/Yaupon uplands. The freshwater wetlands and ponds on the site allow freshwater to slowly seep underground to the saltwater in Copan Bay near Newcomb's Bend, creating the brackish to saltwater gradient necessary for the productive estuarine habitat.

Aransas First, with previous funding from CBBEP, is currently in process of completing Phase I public access improvements to the Burton Lamar Preserve. Phase I improvements included educational signs, fenced parking area off Seaside Loop, improved/mowed trails that reach the edge of the deeper pond, and addition of a walkable trail along the west side of the wetlands on a berm above the maximal water level for wildlife observation.

Aransas First will use funds from CBBEP to implement Phase II of the public access improvements at the Preserve. Proposed improvements include the creation of shaded/covered pavilion areas where visitors can stop and rest. Structures will be installed near the parking lot and along the shade less trail around and between the coastal plain and wetlands – these areas are open and very hot in the summer. A 20 x20 ft covered pavilion will be constructed at the entrance of Seaside Loop trail and a smaller 12 x 12 ft covered pavilion will be installed about two-thirds distance (about 1200 ft) down the trail for shade and rain protection. Structures will be metal, A- framed, with a sloped roof that is attached to a concrete floor. Wooden seating and educational signs will also be placed at each pavilion.

Project Objectives:

1. Install a 20 x 20 ft covered pavilion near the entrance of the Seaside Loop trail at the Burton Lamar Preserve.
2. Install a 12 x 12 ft covered pavilion along the Seaside Loop trail at the Burton Lamar Preserve.
3. Install wooden seating and educational signs at each proposed pavilion.

PROJECT #2319 Refugio County Boat Ramp Area Improvements

Performing Organization: Refugio County

Total Project Cost: \$28,800

Bays Plan, 2nd Ed. Actions: TR 2.1, TR 3.1

Background:

The purpose of this project is to install game-cleaning stations at multiple locations in Refugio County, including the Mission River Boat Ramp, Aransas River Boat Ramp, and Austwell Pier and Boat Ramp. The proposed project will provide opportunities for fisherman, hunters and families from both near and far to connect and interact with the outdoors in all three areas. The game-cleaning stations will help promote these areas as ecotourism sites, while also providing opportunities for proper waste disposal. Cleaning one's catch is a dirty, time consuming, and potentially dangerous activity, if you are balancing a cutting board on a cooler. The proposed game cleaning stations will not take all the chores out of the task of moving the catch-of-the-day from the water to the dinner table, but they will provide a stable, accommodating location to clean game. In addition, the project provides an opportunity for future phases of improvements, if funding becomes available.

Project Objectives:

Install game-cleaning stations at the following locations in Refugio County: (1) Mission River Boat Ramp, (2) Aransas River Boat Ramp, and (3) Austwell Pier and Boat Ramp.

PROJECT #2320 Black Rail Occupancy in the CBBEP Boundary

Performing Organization: Texas A&M University – Corpus Christi

Total Project Cost: \$50,000

Bays Plan, 2nd Ed. Actions: HLR 2.1, HLR 1.3, HLR 2.4

Background:

The eastern black rail (*Laterallus jamaicensis ssp. jamaicensis*) (BLRA) was listed as threatened under the Endangered Species Act in 2020 primarily due to loss of habitat. The BLRA is a secretive marsh bird and the smallest rail species found in North America. BLRA forage on a variety of small (<1 cm) aquatic and terrestrial invertebrates, especially insects, and seeds (e.g., *Typha*, *Scirpus*, *Spartina* spp.). Its habitat can be tidally or non-tidally influenced, and range in salinity from salt to brackish to fresh. It requires dense overhead perennial herbaceous cover with underlying soils that are moist to saturated (occasionally dry) interspersed with or adjacent to very shallow water. BLRA depend on this dense cover throughout their life cycle and is their primary strategy to avoid predation. Researchers working long periods (months to years) at locations where the species is present rarely see birds.

Because of the secretive nature of this bird, very little is known about the occurrence of BLRA within the Coastal Bend region. Support of inventory and monitoring efforts that improve our understanding of distribution and abundance of existing BLRA populations is listed as a need for the species in the Recovery Outline (ECOS 2021). To help support this need, the proposed project will conduct surveys of BLRA within the Coastal Bend region, including within Nueces River Delta and at Padre Island National Seashore (PINS). Surveys will be conducted using Automated Recording Units (ARUs) and environmental DNA (eDNA). Vegetation and wetland characteristics (species, cover, height, and soil moisture) will be collected at each site for later analyses.

ARU's will be positioned in suitable wetland habitat during the months of April, May, and June and analyzed for passive calls. PINS has 10 ARU's currently that will be deployed at PINS. We propose to purchase and deploy 10 additional ARU's in the Nueces River Delta or other suitable areas within the Coastal Bend region. In addition, a subset of sites will be sampled for eDNA analysis. A specified eDNA technique was previously developed to verify the presence of the BLRA along the coast of North Carolina. Vegetation characteristics will be measured from four randomly chosen sample points at each ARU station. In addition, the ground will be classified as dry, moist, or standing water (and depth) and distance from standing water will be recorded.

The final product will be a report that summarizes the findings and compares habitat parameters to occupancy by BLRA. Occupancy will be determined by ARU's and/or eDNA. This information will be useful to site managers in the Coastal Bend, providing site specific characteristics of habitat used by this species.

Project Objectives:

Study the occupancy and habitat characteristics of the black rail within the Coastal Bend region, thereby supporting the recovery efforts for this threatened species.

PROJECT #2321 Relative Sea Level Rise and Habitat Assessment in the Nueces Delta

Performing Organization: University of Texas Marine Science Institute

Total Project Cost: \$6,900

Bays Plan, 2nd Ed. Actions: CR 1.1, HLR 1.1, HLR 1.3

Background:

The project will help determine the impacts of sea level rise on marsh habitats in the Nueces Delta Preserve by gathering data on both vegetative communities and elevation change. Information generated by the project will help CBBEP and resource agencies plan for and adapt to future sea level rise impacts at the Preserve. More specifically, the results of this project can be used to help answer questions related to the management and restoration of the Nueces Delta Preserve, which is owned by CBBEP.

This scope includes the monitoring of Surface Elevation Tables (SETs) and marker horizons (MH) at two sites within the CBBEP Nueces Delta Preserve (total of 6 SETs and 24 MH). Using the elevation data gathered from SETs and MHs, we can compile a more complete picture of habitat changes due to relative sea level rise within the Nueces Delta. This proposal builds upon other efforts along the Texas coast to maintain and monitor SETs and MHs. The Mission-Aransas NERR has worked with UTMSI researchers to install, maintain, and survey five groups of SETs and MHs since 2012. These existing Mission-Aransas NERR SETs and MHs are located in the NERR boundary, which are situated just north of Nueces Bay.

Overtime SETs and MHs help researchers acquire the fundamental data and information needed to understand the effects of changing local sea level and inundation patterns on the response of vegetative communities. Knowledge about other factors such as changes in vegetative communities, precipitation, temperature, water chemistry, and invasive species is helpful in segregating the impacts of changing land and water levels from other environmental influences. Previous, on-going, and planned research projects at the Nueces Delta will be invaluable in identifying the key indicators that are environmentally important and will complement the data gathered through this proposed project.

In particular, the SET and MH data will greatly benefit a long-term vegetation monitoring program that has been maintained and monitored by the University of Texas Marine Science Institute (UTMSI) for many years at the Nueces Delta. Measurements at vegetation transects have been made continuously for over 20 years (since 1999) and have included: percent cover, species composition, sediment ammonium, pore water salinity, and sediment moisture. By placing SETs and MHs in close proximity to these transects, researchers will have a much more complete picture of habitat changes due to relative sea level rise and inundation changes. Since funding is no longer available for UTMSI to monitor these vegetation transects on a regular basis, the current proposal also includes funds to allow UTMSI to continue monitoring vegetation transects within the Nueces Delta.

Project Objectives:

1. Continuation of a long-term marsh vegetation monitoring program at the Nueces Delta.
2. Supplement the existing marsh monitoring program with elevation data by monitoring SETs and MHs.

PROJECT #2322 Brazilian Peppertree Removal and Treatment in the City of Port Aransas

Performing Organization: City of Port Aransas

Total Project Cost: \$45,000 (Funding Source TBD)

Bays Plan, 2nd Ed. Actions: HLR 1.1, HLR 1.2, HLR 2.1

Background:

The City of Port Aransas is one of the founding members of the Texas Gulf Region Cooperative Weed Management Area (CWMA) and along with US Fish and Wildlife Service, CBBEP, Texas A&M Forest Service, Texas Parks and Wildlife Department, University of Texas Marine Science Institute, Invasive Species Institute, and the Texas General Land Office, the CWMA works to manage and educate people on the invasive Brazilian peppertree.

The Nature Preserve at Charlie's Pasture is 1,217 acres of grassland prairie, tidal flat, and fresh and salt marsh habitat within Port Aransas. The grassland prairie habitat requires constant management for the invasive Brazilian peppertree. In 2017, Hurricane Harvey destroyed over two miles of trails and boardwalks within the Preserve. Later this year, the City of Port Aransas is planning to rebuild the one mile of boardwalks and trails at the South access point of the Preserve. The construction is planned to take place April 1 thru October 30, 2022 (when Whooping Cranes are not present). Due to inaccessibility without the trails and boardwalks, many Brazilian peppertrees have regrown along the trail, and 6.5-acre area of uplands near the entrance to those trails also has some Brazilian peppertrees that need to be treated. In addition, there is a 20-acre area owned by the Texas General Land Office that is leased by the City of Port Aransas which also requires treatment.

Funds will be utilized to treat Brazilian peppertree in the areas owned by the City of Port Aransas, estimated at a total of 16.5 acres. A contractor will cut stump treat the Brazilian peppertrees and provide follow up treatments. City staff will treat the Brazilian peppertree in the 20-acre area leased from the General Land Office.

Project Objectives:

Continue ongoing efforts to manage the invasive Brazilian peppertree within the City of Port Aransas Nature Preserve.

PROJECT #2323 Gulf Coast Conservation Initiative

Performing Organization: Coastal Bend Bays & Estuaries Program

Total Project Cost: TBD

Bays Plan, 2nd Ed. Actions: LCS 1.1, LCS 1.2

Background:

The Gulf Coast Conservation Initiative (GCCCI)'s purpose is to protect, enhance, and/or restore habitat for Whooping Cranes, northern Aplomado falcons, Attwater's prairie chickens, Sprague's pipit and associated migratory bird species.

The Aplomado Falcon, Attwater's Prairie Chicken, and Whooping Crane are endangered species that occur in coastal Texas, and whose ranges overlap to varying degrees with one another, as well as with many migratory birds which have experienced long-term, broad-scale declines across much of their ranges. These species can neither recover nor be sustained unless habitat sufficient to support viable populations is conserved. Habitat for these species has been degraded by the production of food and fiber and is being lost to development and rising sea-levels. Protecting, enhancing, and restoring habitat for these species from development will in this area reduce or avoid impacts from recreational uses, protect and preserve functional sensitive natural habitat types, preserve open space, and restore degraded habitats in the GCCCI priority area.

Since 2002, CBBEP has worked to acquire either fee simple title or conservation easements for more than 14,000 acres of freshwater marsh, forested wetlands, mudflats, riparian corridors, and native upland habitat for conservation management. CBBEP has coordinated with U.S. Fish & Wildlife Service, Natural Resources Conservation Services, and The Nature Conservancy to develop and implement management plans and restoration actions throughout this protected habitat. CBBEP has also coordinated and worked with other property owners (such as Aransas National Wildlife Refuge, Texas Parks and Wildlife Department, City of Corpus Christi, South Texas Botanical Gardens and Nature Center, and private property owners) to develop and implement restoration actions on their property.

CBBEP will coordinate with USFWS, Grazing Lands Coalition, TNC, USDA-NRCS, and other conservation organizations to identify and implement restoration actions that benefit a minimum of 500 acres of habitat for Aplomado Falcons, Attwater's Prairie Chickens, and/or Whooping Cranes, as well as associated focal migratory birds' habitats. For projects on private lands CBBEP or a designated project partner will develop written 10-year long landowner assistance agreements.

Project Objectives:

Identify and implement restoration actions that benefit habitat for Aplomado Falcons, Attwater's Prairie Chickens, and Whooping Cranes.

PROJECT #2324 CBBEP Coastal Bird Program – Laguna Madre Initiative

Performing Organization: Coastal Bend Bays & Estuaries Program

Total Project Cost: \$100,000

Bays Plan, 2nd Ed. Actions: CB 1.1, CB 2.1, HLR 1.1, HLR 1.2

Background:

The Laguna Madre is one of the most important coastal wetland complexes for birds in the Western Hemisphere. Much of the value of this system for birds is based on the diversity of tidal flats and seagrass beds spread over a very large geography, extending from the Corpus Christi area down to Tamaulipas, Mexico.

Historically, the Coastal Bird Program has focused our management and monitoring efforts primarily on the mid-coast of Texas. However, bird populations span across program boundaries, and we recognized that expansion to the Lower Laguna Madre was needed to properly manage local waterbird populations. The Laguna Madre is used by the avian community as a contiguous ecological system and should be managed as such.

Thanks to the continued generosity of the Kleberg Foundation, the Coastal Bird Program has employed a full-time biologist in the Lower Laguna Madre who has, with the help of volunteers, implemented management actions at waterbird rookeries - installing protective signs, removing exotic vegetation, planting native shrubs, and eliminating nest predators. Staff has also focused on community engagement and coordinating volunteers. Consistent, annual efforts are vital in properly managing rookery islands. It takes several seasons of intense management to improve island habitat. Therefore, on-going investment in the Laguna Madre Initiative is needed to continue the habitat improvement and protection that is already underway.

In addition to rookery islands, other habitats found in the Laguna Madre support astounding numbers of migrating and wintering shorebirds. Millions of birds, many that migrate over 10,000 miles a year, make use of the beaches and tidal flats of the Laguna Madre. Advances in avian tracking systems are allowing us to learn more about these species and how important the Texas coast is to the migratory flyway. We have expanded our conservation and research efforts to include migratory shorebirds which depend on the Texas coast for portions of their life cycles.

Funding from the Kleberg Foundation and others has allowed us to effectively operate on the lower Texas coast and cultivate a network of local volunteers and partners. Continued investment in this program will allow us to build upon these partnerships, create new collaborative opportunities, and boost our volunteer and support base in the lower Laguna Madre, drawing us closer to our goal of a continuous, integrated, collaborative coastal bird conservation effort throughout the bi-national Laguna Madre system.

Project Objectives:

1. Improve colonial nesting waterbird populations in the Lower Laguna Madre by addressing proximate causes of nest failure such as predation, lack of suitable nesting substrate, and human disturbance.
2. Implement monitoring efforts on shorebird populations to identify potential conservation actions.
3. Engage volunteers and communities in coastal bird conservation efforts through the coastal portion of the Rio Grande Valley.

PROJECT #2325 Plastic Pollution Impacts on Bird Populations

Performing Organization: Amos Rehabilitation Keep – University of Texas Marine Science Institute

Total Project Cost: \$84,500

Bays Plan, 2nd Ed. Actions: HLR 2.2, HLR 2.4

Background:

While there have been several studies quantifying the abundance of plastic in our marine environment, there have been no studies to date looking at ingestion of plastic by birds in coastal environments along the northwestern Gulf of Mexico (GOM). Texas accumulates ten times more marine debris than other areas of the GOM. Due to the overwhelming amount of plastic in the northwestern GOM, we hypothesize that avian marine species have been impacted.

This project will utilize the carcasses of a wide array of marine associated bird species from the Amos Rehabilitation Keep (ARK) that either died before reaching the facility or died within 24 hours of arrival. In 2021, the ARK handled 635 migratory bird patients, comprising 99 species - 238 either died before reaching the facility or died within 24 hours of arrival. Such a short time span ensures that the food from the gastrointestinal tract would represent what the bird has eaten from natural environments. The gastrointestinal tract from each carcass would be evaluated to determine the types and abundances of plastics in the sample using microscopy Fourier transform infrared spectroscopy or pyrolysis gas chromatography mass spectrometry at UTMSI.

This project aims to evaluate the health of each bird by performing necropsies with veterinarian health assessments. Through these necropsies, data will be gathered to examine the connection of plastic ingestion with the overall health of each bird. Plastic ingestion in avian species is known to cause chronic debilitation along with other issues. In 2021, 30% of the birds that either died before reaching the facility or died within 24h of arrival were in a debilitated state. The information from these necropsies could provide valuable insight into the causes for this debilitation. Depending on the results of this study, this project could be expanded to include chemical analysis of muscle tissue to assess contamination levels from plastic ingestion, such as polybrominated diphenyl ethers (PBDEs) and polychlorinated biphenyls (PCBs).

A Quality Assessment Project Plan (QAPP) document will be developed to produce data of adequate quality to meet project objectives. Specifically, we will develop a procedure for sample pretreatment and plastic analysis at UTMSI. For example, we developed a procedure for polymer identification of the nurdles collected in the coastal bend region in a project funded by CBBEP last year (see publication CBBEP-150), and this procedure was approved by TCEQ and EPA. A similar protocol will be developed for samples from gastrointestinal tracts in this project.

Project Objectives:

Quantify the abundance of plastic pollution ingested by marine associated birds from the northwestern Gulf of Mexico to better inform resource management decision-making and improve education and outreach efforts related to plastic pollution.

PROJECT #2326 Sunset Lake & Violet Andrews Park Invasive Species Eradication Plan

Performing Organization: City of Portland

Total Project Cost: \$15,000

Bays Plan, 2nd Ed. Actions: TR 1.1, HLR 2.6

Background:

Several invasive species, including salt cedar (*Tamarix ramosissima*), golden bamboo (*Phyllostachys aurea*) and Brazilian peppertree (*Schinus terebinthifolius*) are believed to be present within Sunset Lake and Violet Andrews parks. These properties are owned and managed by the City of Portland, and the City is seeking to undertake an effort to identify the scope of the problem and develop solutions. The areas listed above are important to the Coastal Bend because of their role as natural avian habitat as well as popular local and ecotourism destinations.

In the last twenty years, the City of Portland has witnessed a significant increase in invasive species, mainly salt cedar and golden bamboo. The Corpus Christi Bay and Nueces Bay shorelines in Portland are now dominated by salt cedar. Salt cedars are aggressive plants known for consuming large amounts of water. The salt cedar leaves and stems secrete a high concentration of salt into the ground around them thereby preventing growth and development of native plants. In addition, many birds find the plant undesirable. Golden bamboo is classified as a threat to Texas plant and wildlife because of its prolific growth rate, rapid reproduction and regeneration when damaged, and the risk it poses by reducing wildlife habitat. The extent of golden bamboo found in the Violet Andrews Park area has increased in last six years with much of the park area and surrounding private property areas affected.

This purpose of this project is to identify invasive plant species within Sunset Lake and Violet Andrews parks and develop plans to both eradicate existing plants and prevent future recurrence.

Project Objectives:

The City of Portland will partner with CBBEP to evaluate the extent of invasive species at Sunset Lake and Violet Andrews parks and identify the scope and methodology necessary for eradication and prevention of the species identified. The planning effort will also include an opinion of cost for eradication and prevention.

PROJECT #2327 Nueces River Tidal Stakeholder Group

Performing Organization: CBBEP

Total Project Cost: \$1,504

Bays Plan, 2nd Ed. Actions: HLR 1.3, WSQ 1.1, NPS 1.1

Background:

The tidal segment of the Nueces River has experienced numerous fish kills over the past several years, the last two of which occurred in early February and July 2022. These fish kills impacted a broad range of species from small bait fish to oversized game fish. Increasing concerns from local residents and members of the community have been raised regarding rising chlorophyll-a levels and repeated fish kills, and there is a growing need for the formation of a Stakeholder Group to facilitate discussion between residents, agencies, and local decision makers.

The proposed project would consist of a series of three public meetings to provide a platform for members of the community to voice their concerns and observations related to repeated fish kills and degrading water quality in the tidal segment of the Nueces River, facilitate communication from the environmental community, local government and regulatory agencies, discuss and help identify sources of pollution, and improve awareness and understanding of the issue and what is being done to address it.

Project Objectives:

Host three public meetings to facilitate the formation of a stakeholder group that can begin working collaboratively to address water quality issues in the tidal portion of the Nueces River.

PROJECT #2328 Baffin Bay Watershed Model

Performing Organization: Nueces River Authority

Total Project Cost: \$23,750

Bays Plan, 2nd Ed. Actions: WSQ 1.1, PEO 1.1, PEO 1.2, PEO 1.3, PEO 1.4

Background:

The project will create a custom, plastic topographic relief model of the Baffin Bay watershed that can be used by educators to help stakeholders visualize their “place” within the watershed and better understand pollutant pathways and measures they can undertake to address these pollutants. The model will help connect community members and landowners with the Baffin Bay watershed and will promote personal responsibility in revitalizing and restoring the bay. These types of models have been used in other watersheds and have proven to be a powerful tool for educating stakeholders about the impacts of runoff pollutants on public health and the environment.

The Baffin Bay watershed is 2,177,965 acres and contains three tributaries: Petronila, San Fernando, & Los Olmos creeks. There currently are impairments on two tributaries (Petronila Creek, San Fernando Creek), and ongoing water quality degradation has been documented in Baffin Bay (e.g., high nutrients, prolonged brown tide events). Baffin Bay and its watershed are extremely important, both economically and culturally, to the State of Texas, and education of stakeholders within the watershed would allow large steps to be made in addressing water quality protection in a cost-effective and economically beneficial way.

Following completion, the model will also be used for workshops/trainings, public demonstrations, and K-12 classroom visits. Additional funds will be requested for these types of activities in future years.

Project Objectives:

Construct a custom, plastic relief model of the Baffin Bay watershed that can be used for education and outreach efforts in local schools and communities.

PROJECT #2329 Nueces Delta Shoreline Protection and Restoration

Performing Organization: CBBEP

Total Project Cost: \$1,290,925

Bays Plan, 2nd Ed. Actions: HLR 1.1, HLR 1.2, SM 1.1

Background:

The westernmost shoreline of Nueces Bay at the Nueces River Delta is rapidly eroding. The erosion of the Delta is causing the on-going loss of coastal marsh habitat (i.e., emergent intertidal and sub-tidal marsh habitat). This disappearing, fringing coastal marsh protects additional marsh habitat further inland, open-water channels and small lakes, and upland habitat that depends on the lower-lying marsh. As the size of these habitats decrease, so will the abundance and diversity of wildlife that breed, nest, forage, and shelter in the Nueces Delta.

CBBEP has long recognized the ecological value provided by the Nueces Delta coastal marshes, and we have been working to protect this rapidly eroding shoreline since 2008. Coastal Technology Corporation was hired to develop several conceptual alternatives for meeting shoreline protection. Prior to contracting with Coastal Tech, CBBEP conducted several studies including Delta erosion rates, bathymetry, magnetometer surveys, and geotechnical investigations. CBBEP then employed Atkins Engineering and completed a more detailed feasibility study and alternatives analysis; wetland, oyster, and seagrass survey report; conceptual design; and an individual permit application submittal to the USACE with funding from the TGLO through the Coastal Erosion Planning and Response Act Program. The USACE permit for construction of the breakwater structure was approved and received on October 6, 2016. The permit authorized the installation of 0.74 miles (3,901 linear feet) of breakwater system to provide shoreline protection at the Nueces Delta. The breakwater system will consist of twelve breakwater structures, all of which were designed to be installed on sandy unvegetated bay bottom to avoid impacts to aquatic resources.

In 2020, CBBEP received \$3,328,000 from the National Fish and Wildlife Foundation, Gulf Environmental Benefit Fund (NFWF-GEBF) to fund the final engineering and construction of the breakwater. The project is currently underway, and to date, CBBEP has contracted with Anchor QEA to complete the final engineering. Recognizing that several years have elapsed and conditions may have changed since the feasibility study, alternatives analysis, surveys, conceptual design, and cost estimates were completed for this project, CBBEP requested that the engineering firm reexamine the site conditions and determine how the proposed project could be affected by any changes. Based on these more recent assessments and recommendations from Anchor QEA, the design of the breakwater has been modified. The breakwater is being moved to a shallower depth (2-foot contour) and will now be constructed out of rock (previous plans called for Oystercrete rings). A permit amendment addressing these changes has been acquired, and CBBEP is currently working on obtaining a lease from the TGLO. Once the lease is obtained, CBBEP is ready to administer a competitive bidding process to identify a construction contractor.

The modified design described above has increased the overall construction cost for the breakwater, which is now estimated to be \$4,000,000. CBBEP previously received \$2,709,075 from NFWF-GEBF for construction. CBBEP has received an additional \$1,290,925 from the TGLO-CEPRA Program to support the increased construction cost of the breakwater.

Project Objectives:

This project will construct 3,900 linear feet of breakwater to protect 650 acres of marsh habitat along the face of the Nueces Delta shoreline. Project activities include final engineering and design of a breakwater system, construction, and monitoring. The amount listed above represents new funds that were received to support an ongoing project.

PROJECT #2330 Seagrass Assessment in Baffin Bay, Corpus Christi Bay, and Upper Laguna Madre

Performing Organization: University of Texas Marine Science Institute

Total Project Cost: \$41,155

Bays Plan, 2nd Ed. Actions: HLR 1.1, HLR 1.3, HLR 2.4, CR 1.1

Background:

The overarching goal of this work is to continue the landscape approach to long-term seagrass monitoring to evaluate status and trends in Texas coastal seagrass populations with particular focus on Baffin Bay (BB), Upper Laguna Madre (ULM) and Corpus Christi Bay (CCB). A hierarchical strategy for seagrass monitoring outlined by Neckles et al. (2011) will be adopted to establish the quantitative relationships between physical and biotic parameters that ultimately control seagrass condition, distribution, persistence, and overall health. The approach proposed here follows a broad template adopted by several federal and state agencies across the country, but which is uniquely designed for Texas. The program is focused on “Tier-2” monitoring that includes a regional rapid assessment program using fixed stations sampled annually from a shallow-draft vessel and nutrient constituent analysis of leaf tissues.

For FY 2023, this research will monitor long-term health of Texas seagrass in the BB, ULM, and CCB in combination with leveraged funds from two other agency partners. The last census of ULM and CCB was conducted in 2021, and the last known census of all seagrasses in the Baffin Bay area was completed in 2004/2006. This long-term program contributes to a broader Tier-2 state-wide effort to assess seagrass condition and distribution that began in summer 2011 (see <http://www.texasseagrass.org/>). The program strongly complements a long-term commitment by both the Mission-Aransas National Estuarine Research Reserve (Mission-Aransas NERR) for sampling in Redfish and Aransas Bays and the National Park Service for Tier-2 sampling in the ULM (Padre Island National Seashore only).

Data collected since 2011 is posted on the dedicated website and serves as an invaluable database of existing seagrass resources available for various local, state, and national groups. This project contributes to our understanding of the quantitative relationships between physical and biotic parameters that ultimately control seagrass condition, distribution, and persistence.

Project Objectives:

Monitor seagrass/water quality in Baffin Bay, Corpus Christi Bay, and the Upper Laguna Madre to support the Texas Seagrass Monitoring Program and possible creation of water quality criteria for seagrass beds.

PROJECT #2331 Protection and Restoration of the Blackjack Peninsula, Aransas National Wildlife Refuge

Performing Organization: CBBEP

Total Project Cost: \$7,292,800

Bays Plan, 2nd Ed. Actions: HLR 1.1, HLR 1.2

Background:

Years and years of erosion along the Blackjack Peninsula shoreline at the Aransas National Wildlife Refuge (ANWR) have resulted in the loss of both wetland and upland habitats that were previously protected by the fringing marsh. Significant erosion in this area has created a bluff that is now 15 feet to 30 feet in elevation. The eroding bluff currently supports a mature stand of Texas Live Oak-Redbay Forest, a plant community that is listed as imperiled. Erosion along this shoreline also threatens nearby public infrastructure at the Refuge and increases the vulnerability of this infrastructure to extreme weather, climate hazards, and sea level rise. This infrastructure plays an important role in the local nature tourism economy, necessitating protection from these potential threats. In 2017, Hurricane Harvey made landfall near the Refuge, further exacerbating the erosion along this San Antonio Bay shoreline and causing significant loss of both habitats and infrastructure.

In 2019, the Coastal Bend Bays & Estuaries Program (CBBEP) entered into a cooperative agreement with U.S. Fish and Wildlife Service (USFWS) to address damages suffered at ANWR from Hurricane Harvey, as well as the ongoing loss of habitat along the Blackjack Peninsula shoreline. CBBEP received funds to work with USFWS to install a shoreline protection structure in San Antonio Bay that will protect the Blackjack Peninsula shoreline from ongoing erosion and storm events, and over time, restore upland and aquatic habitats that have been lost due to erosion. Once completed, the shoreline protection structure will stretch along close to 5 miles of the Blackjack Peninsula shoreline. The structure itself will provide habitat for fish and other wildlife, and it will also be designed to allow for colonization of aquatic plants between the barriers and the shoreline, which will create additional habitat for fisheries and wildlife and further diminish shoreline erosion. Funds will also be used to address the stabilization of the eroding bluffs along this shoreline.

Using funds received from USFWS and the Texas General Land Office, Coastal Erosion Planning and Response Act, CBBEP contracted with a qualified engineering firm to complete the engineering and design for the shoreline protection structure and bluff stabilization, apply for a permit, and develop a bid package for construction. Based on the draft basis of design report, the project will include alignment of the rock breakwater along the -1.5 to 2.0 foot contour to avoid impacts to seagrass and oyster reefs, while maintaining enough water depth for constructability and remaining near enough to the shoreline to protect from wave action. The project will also include stabilization of the eroding bluffs.

Based on cost estimates provided as part of the 30% design, CBBEP and ANWR have chosen to focus on the construction of three miles of breakwater and the bluff stabilization. The cost estimate for construction of these components is estimated at \$26,700,000. CBBEP has \$18,912,200 in funding available from USFWS and \$500,000 available from the Matagorda Bay Mitigation Trust for construction. CBBEP will be receiving the additional \$7,292,800 needed for construction from TGLO-CEPRA.

Project Objectives:

Install a shoreline protection structure in San Antonio Bay that will protect the Blackjack Peninsula shoreline from ongoing erosion and storm events, and over time, upland and aquatic habitats that have been lost due to erosion will be restored. Once completed, the shoreline protection structure will stretch along close to three miles of the Blackjack Peninsula shoreline. The project will also address the stabilization of the eroding bluffs along this shoreline. The amount listed above represents new funds that were received to support an ongoing project.

PROJECT #2332 Evaluating Potential Contamination of Port Bay

Performing Organization: University of Texas Marine Science Institute

Total Project Cost: \$29,009

Bays Plan, 2nd Ed. Actions: PH 2.1, WSQ 2.2, WSQ 2.1, NPS 1.1

Background:

In January 2022, an Aransas County Commissioner contacted the Mission-Aransas National Estuarine Research Reserve (NERR) regarding community concerns about potential contamination from the Sherwin Alumina storage ponds (i.e., tailings ponds) to nearby Port Bay. Community fears were intensified following the release of a YouTube video in December 2021, which suggested that the powerful winds and storm surge associated with Hurricane Harvey may have mobilized contaminants from the tailings ponds into Port Bay, resulting in potential risks to ecological and human health. This project proposes to use site-specific contaminant data to quantitatively evaluate risks to ecological and human health in Port Bay, thereby directly responding to the needs of area residents and stakeholders.

Although the production of aluminum from bauxite releases a variety of pollutants, mercury and polycyclic aromatic hydrocarbons (PAHs) are particularly relevant to this site in the context of risk prioritization. The project team believes there is little to no water or sediment data available in Port Bay to inform conclusions about the potential risks listed above. There is a need to address this lack of data, particularly with regard to the presence of contaminants in Port Bay sediments, because the bioavailable/highly toxic forms of mercury and PAHs will preferentially partition to sediments before entering/bioaccumulating in aquatic food webs (especially in higher trophic sportfish consumed by humans). Therefore, human health and ecological risks from mercury and PAHs in Port Bay should be evaluated using measured concentrations from water, sediment, and biota.

The project will characterize the presence of mercury and PAHs in water and sediment from Port Bay, as well as select hydrologically connected oyster waters. Water, sediment, and oyster samples will be collected quarterly at approximately 10 sites throughout the bay, with the potential for additional opportunistic sampling events following major storms. Total mercury, PAHs, nutrients (nitrate, nitrite, ammonium, soluble reactive phosphorus) and chlorophyll a will be analyzed in water samples, and total mercury and PAHs in surface sediments (top 5 cm) and oysters. Collection of these data will allow for the evaluation of the potential ecological and human health risks of contamination in Port Bay, as well as to evaluate ecosystem health.

Project Objectives:

Investigate potential contamination in Port Bay and the associated ecological and human health risks by:

1. Collecting quarterly water, sediment, and oyster samples at approximately 10 sites throughout the bay.
2. Measuring levels of total mercury, PAHs, nutrients (nitrate, nitrite, ammonium, soluble reactive phosphorus) and chlorophyll a in the water samples and total mercury and PAHs in surface sediments (top 5 cm) and oysters.

PROJECT #2333 Nutrient Sampling in Petronila Creek

Performing Organization: Nueces River Authority

Total Project Cost: \$53,455

Bays Plan, 2nd Ed. Actions: WSQ 2.1

Background:

Petronila Creek is a tributary to Baffin Bay. The health of Baffin Bay has been of great concern to scientists and concerned citizens due to fish kills, water quality problems, and food web changes in the bay. The Baffin Bay Stakeholder Group, formed in 2012, is composed of scientists from Harte Research Institute (HRI) at Texas A&M University-Corpus Christi, Coastal Bend Bays and Estuaries Program (CBBEP), USDA-NRCS, Texas State Soil & Water Conservation Board, Texas Water Resources Institute, Texas Commission on Environmental Quality (TCEQ), Texas Sea Grant, Texas General Land Office, Nueces River Authority (NRA), and a host of concerned citizens, including commercial and recreational fishermen, ranchers, and business owners. The scientists at HRI have determined that the primary causes of the water quality concerns are due to excessive nutrients in the bay. The 2019 Texas Coastal Waters: Nutrient Reduction Strategies Report recommended the Petronila watershed as a priority for the implementation of nutrient reduction strategies. The Stakeholder Group has begun an effort to develop a watershed protection plan (WPP) for Baffin Bay.

The purpose of the project is to continue conducting monthly water quality monitoring for nutrients in Petronila Creek and its tributaries. NRA currently collects chloride, sulfate, and total dissolved solids (TDS) samples monthly at one main stem site and 10 tributary sites. Two additional main stem sites, Stations 13094 and 13096, are monitored quarterly for NRA's Clean Rivers Program (CRP), so monthly data is collected in the non-CRP sampling months. NRA will add the nutrient samples (nitrate, nitrite, total Kjeldahl nitrogen, total dissolved Kjeldahl nitrogen, ammonia, total phosphorus, chlorophyll-a, and pheophytin) to this monitoring. The nutrient data will be used to help fill the data gaps with respect to identifying all possible sources of the nutrient loading to Baffin Bay. This data collection project will also address two of the nine elements of a WPP: 1) Identify causes and sources of pollution, and 2) Estimate pollution loading into the watershed and expected load reductions.

Project Objectives:

The objective of this project is to conduct monthly water quality monitoring of nutrients in Petronila Creek and its tributaries to identify sources of excess nutrient concentrations in Baffin Bay. The nutrient data from Petronila Creek and its tributaries will be utilized by the Baffin Bay Working Group to help guide them in their watershed planning and restoration.

PROJECT #2334 CBBEP Coastal Bird Program – General Support

Performing Organization: CBBEP Coastal Bird Program

Total Project Cost: \$40,000

Bays Plan, 2nd Ed. Actions: CB 1.1, CB 1.2

Background:

The Coastal Bird Program at the Coastal Bend Bays & Estuaries Program is working to conserve coastal birds and their habitats on the Texas coast by identifying and addressing conservation needs through on-the-ground management, monitoring, research, and education/outreach. Prompted by declines in heron, egret, pelican, and other colonial waterbird populations, the Program was originally conceived to halt these declines and restore waterbird populations. Through partnerships with agencies, universities, conservation organizations, and a network of citizen scientists and volunteers, the Coastal Bird Program has expanded its work to include a wider array of coastal bird species and habitats, opening up new opportunities for collaboration and funding and building capacity to contribute to coastal bird conservation.

Project Objectives:

Contributions from Conoco Phillips will be used to support the ongoing work of CBBEP's Coastal Bird Program.

PROGRAM ADMINISTRATION

CBBEP administrative staff will provide organizational and logistical support for the Bays Council and implementation team meetings, and coordinate/communicate as necessary with appropriate groups, including stakeholder groups, state and federal agencies, local governments, and professional groups relevant to implementation. Staff will:

1. Acquire, manage, and disperse funds to implement the *Bays Plan*;
2. Monitor, track, and report on implementation performance by implementing partners, and work to maintain implementation commitments;
3. Develop a prioritized biennial work plan and budget for Bays Council review and approval;
4. Coordinate the periodic update of the *Bays Plan*, the State of the Bay report, the Implementation Strategy, and other key documents of the Program;
5. Provide logistical support for all meetings, workshops, symposia, and special events related to Program mission;
6. Provide outreach to the public through local and regional media;
7. Develop strategies for seeking funding sources;
8. Provide for overall Program coordination with EPA Region 6 and TCEQ.
9. Participate in regional, state, and national conferences and meetings relevant to estuarine management.
10. Develop and implement policies and procedures for an emergency contingency plan which will include: protecting financial records, office equipment, computers, and other vital records and equipment; employee responsibilities; backup and storage of data; and recovery actions.
11. Continued implementation of a management system to track and assess Quality Assurance Project Plans (QAPPs) and determine required corrective actions and follow-up to be completed on date determined by TCEQ.

PROJECT MANAGEMENT AND IMPLEMENTATION

CBBEP Project Management staff will coordinate/communicate as necessary with appropriate groups, including stakeholder groups, state and federal agencies, local governments, and professional groups relevant to *Bays Plan* implementation. Staff will:

1. Develop and implement partnership projects with local governments, state, and federal agencies, and private organizations;
2. Monitor, track, and report on implementation performance by implementing partners, and work to maintain implementation commitments;
3. Provide communication and coordination with the Texas Coastal Management Program and the Coastal Coordination Council, Gulf of Mexico Program, TCEQ, and other relevant coastal/watershed programs;
4. Coordinate the review of proposed actions of federal, state, and local projects in an open process for consistency with the *Bays Plan*;
5. Develop a prioritized biennial work plan and budget for Bays Council review and approval;
6. Provide for overall Program coordination, including quality control/quality assurance procedures with EPA Region 6 and TCEQ.
7. Participate in regional, state, and national conferences and meetings relevant to estuarine management.

PROGRAM EXPENSES

CBBEP funds will support continued Program implementation, evaluation, and reporting. Funds are also necessary to provide logistical support for the Bays Council and implementation team meetings. Expense categories are as follows:

1. Travel: Allows Program staff to attend state, regional and national meetings, workshops, and conferences.
2. Supplies: As needed, for the day-to-day operations of the Program.
3. Equipment: Purchase of items over \$1,000, i.e. computers.
4. Other: Copier rental, temporary staff, postage, communication services, accounting services, printing, etc.

WORKING CAPITAL

The CBBEP Board of Directors has established working capital out of local funding. The funds will be set aside for possible future projects, matching funds, and/or emergency funding.

SUMMARY

On September 1, 2022, the Coastal Bend Bays & Estuaries Program will begin Year 24 of implementing the *Bays Plan*. This FY 2023 Work Plan describes the proposed work to be initiated during FY 2023 (Sept 1, 2022 - Aug 31, 2023). Of the total funds identified in the Work Plan budget, \$750,000 are new (FY 2022) EPA federal funds; \$721,805 are new (FY 2023) TCEQ funds; \$80,000 are carry-forward (FY 2022) TCEQ funds; \$12,304,142 are new (FY 2023) project-specific funds; and \$462,200 are new (FY 2023) local partner/investment funds. The total budget for this FY 2023 Work Plan is \$15,227,947.



TABLE 1. FY 2023 Comprehensive Annual Work Plan Outline.

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY23 - CWA 320, BIL	TCEQ FY22, TCEQ FY23, 604b & 319	LOCAL / INVESTMENTS	TGLO	MISC GRANTS	USFWS	TPWD	TOTAL CBBEP FUNDING
2301	CBBEP Coastal Bird Program	CB 1.1 CB 2.1 HLR 1.1 HLR 1.2	CBBEP	\$ 59,522			\$ 136,390	\$ 25,000	\$ 61,921	\$ 156,847	\$ 439,680
2302	Delta Discovery	DD 1.1 DD 1.2 DD 1.3 DD 2.1	CBBEP	\$ 131,244		\$ 23,300		\$ 15,000			\$ 169,544
2303	Rookery island productivity for priority waterbird species	CB 1.1 HLR 1.1 HLR 1.2	Harte Research Institute	\$ 96,375							\$ 96,375
2304	Expansion of Pro-Active Monitoring Capacity for Harmful Algal Blooms	PH 1.1 HLR 2.5	National Park Service, PINS	\$ 23,470							\$ 23,470
2305	Baffin Bay Water Quality Monitoring	WSQ 2.1 WSQ 2.2	TAMU-CC					\$ 50,000			\$ 50,000
2306	Outdoor Classrooms	DD 1.1 DD 1.2 DD 1.3 DD 2.1	CBBEP						\$ 21,000		\$ 21,000
2307	Installation of Mission River Water Quality Monitoring Equipment	FW 1.1 FW 1.4	Mission-Aransas NERR		\$ 17,945						\$ 17,945
2308	CBBEP Community Outreach Partnerships	PEO 1.1 PEO 1.2 PEO 1.4 PEO 1.5	Coastal Bend Bays Foundation		\$ 15,000			\$ 15,000			\$ 30,000
2309	CBBEP Property Management	LCS 1.2 LCS 1.2	CBBEP			\$ 220,570		\$ 24,000			\$ 244,570

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2310	Oso Bay/Oso Creek Watershed Model & Outreach and Education	WSQ 2.1 WSQ 2.2 PEO 1.1	Harte Research Institute, Nueces River Authority		\$ 15,767						\$ 15,767
2311	Nueces Delta Environmental Monitoring	FW 1.1 FW 1.2 FW 1.3 FW 1.4	Conrad Blucher Institute		\$ 28,996						\$ 28,996
2312	Protection of the GIWW Shoreline at the Aransas National Wildlife Refuge	SM 1.1 HLR 1.1 HLR 1.2 HLR 1.3 HLR 2.4	CBBEP				\$ 199,200	\$ 37,694			\$ 236,894
2313	Tern Island Protection and Restoration, Phase II	HLR 1.1 HLR 1.2 CB 1.1	CBBEP	\$ 118,108			\$ 2,573,164				\$ 2,691,272
2314	CBBEP Public Outreach Events and Activities	PEO 1.1 PEO 1.2 PEO 1.3 PEO 1.4 PEO 1.5 TR 1.1	CBBEP			\$ 38,250		\$ 6,000			\$ 44,250
2315	Violet Andrews Park Shoreline Improvements	TR 1.1 TR 2.1 SM 1.1	City of Portland					\$ 40,000			\$ 40,000
2316	Padre Island National Seashore-Up2U Litter Bags Partnership	BD 1.1 PEO 1.1 PEO 1.3	National Park Service, PINS					\$ 5,000			\$ 5,000
2317	Educational Signs for the City of Corpus Christi - Parks and Recreation Department	TR 2.1 PEO 1.1	City of Corpus Christi Parks & Recreation		\$ 15,000						\$ 15,000

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2318	Burton Lamar Preserve Phase II	TR 2.1 TR 3.1 PEO 1.1	Aransas First		\$ 15,000						\$ 15,000
2319	Refugio County Boat Ramp Area Improvements	TR 2.1 TR 3.1	Refugio County		\$ 28,800						\$ 28,800
2320	Black Rail Occupancy in the CBBEP Boundary	HLR 2.1 HLR 1.3 HLR 2.4	TAMU-CC		\$ 50,000						\$ 50,000
2321	Relative Sea Level Rise and Habitat Assessment in the Nueces Delta	CR 1.1 HLR 1.1 HLR 1.3	UTMSI			\$ 6,900					\$ 6,900
2322	Brazilian Peppertree Removal and Treatment in the City of Port Aransas	HLR 1.1 HLR 1.2 HLR 2.1	City of Port Aransas								\$ -
2323	Gulf Coast Conservation Initiative	LCS 1.1 LCS 1.2	CBBEP								\$ -
2324	CBBEP Coastal Bird Program - Laguna Madre Initiative	CB 1.1 CB 2.1 HLR 1.1 HLR 1.2	CBBEP					\$ 100,000			\$ 100,000
2325	Plastic Pollution Impacts on Bird Populations	HLR 2.2 HLR 2.4	UTMSI, ARK		\$ 84,500						\$ 84,500
2326	Sunset-Violet Andrews Park Invasive Species Eradication Plan	TR 1.1 HLR 2.6	CBBEP, City of Portland					\$ 15,000			\$ 15,000
2327	Nueces River Tidal Stakeholder Group	HLR 1.3 WSQ 1.1 NPS 1.1	CBBEP		\$ 1,504						\$ 1,504

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2328	Baffin Bay Watershed Model	WSQ 2.1 WSQ 2.2 PEO 1.1	Nueces River Authority		\$ 23,750						\$ 23,750
2329	Nueces Delta Shoreline Protection	HLR 1.1 HLR 1.2 SM 1.1	CBBEP				\$ 1,290,925				\$ 1,290,925
2330	Seagrass Assessment in Baffin Bay, Corpus Christi Bay, and Upper Laguna Madre	HLR 1.1 HLR 1.3 HLR 2.4 CR 1.1	UTMSI		\$ 41,155						\$ 41,155
2331	Protection and Restoration of the Blackjack Peninsula, Aransas National Wildlife Refuge	HLR 1.1 HLR 1.2	CBBEP				\$ 7,292,800				\$ 7,292,800
2332	Evaluating Potential Contamination of Port Bay		UTMSI			\$ 29,009					\$ 29,009
2333	Nutrient Sampling in Petronila Creek	WSQ 2.1	Nueces River Authority		\$ 53,455						\$ 53,455
2334	Coastal Bird Program - General Support	CB 1.1 CB 2.1 HLR 1.1 HLR 1.2	CBBEP					\$ 40,000			\$ 40,000
TOTAL FUNDING				\$ 428,719	\$ 390,872	\$ 318,029	\$ 11,492,479	\$ 372,694	\$ 82,921	\$ 156,847	\$ 13,242,561
BIL Project Funding (Separate Work Plan)			CBBEP	\$ 791,692							\$ 791,692
TOTAL PROJECT FUNDING				\$ 1,220,411	\$ 390,872	\$ 318,029	\$ 11,492,479	\$ 372,694	\$ 82,921	\$ 156,847	\$ 14,034,253
Administrative			CBBEP	\$ 439,390	\$ 410,933	\$ 343,371					\$ 1,193,694
TOTAL FUNDING				\$ 1,659,801	\$ 801,805	\$ 661,400	\$ 11,492,479	\$ 372,694	\$ 82,921	\$ 156,847	\$ 15,227,947