

**FY 2021**  
**Comprehensive**  
**Annual Work Plan**







*Protecting our bays  
and estuaries*

# **FY 2021**

## **Comprehensive Annual Work Plan**

Approved by  
CBBEP Board of Directors  
August 27, 2020

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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

## 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 *The Coastal Bend Bays Plan, 2nd Edition* is currently awaiting EPA approval.

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 13,000 acres of valuable coastal habitats. The sections below highlight some of the successes of the CBBEP over the last twenty years.

**CBBEP RECEIVED THE GULF GUARDIAN AWARD from the EPA Gulf of Mexico Program for its  
160-acre Nueces Bay Marsh Restoration Project.**



### **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.

**Nueces Bay Marsh Restoration:** Restored 160 acres of marsh habitat in Nueces Bay by creating marsh terraces, intertidal marsh complex, and berms to protect the project site; project also included public access improvements and community planting events.



**Matagorda Island Marsh Restoration:** Restored water flow and circulation to 2,300 acres of emergent estuarine marsh habitat on Matagorda Island by removing four levees, repairing two culverts, and installing one new culvert.

**Texas Diamondback Terrapin Conservation:** Funded researchers at the Texas A&M University - Corpus Christi, Center for Coastal Studies to locate Texas diamondback terrapin nesting areas - they found that terrapins prefer to nest on sandy areas that are above the mean high tide line and close to marsh habitat.

**Indian Point Shoreline Protection:** Constructed a combination of shoreline revetment and off-shore breakwaters to provide the most functional and cost-effective solution for providing long-term protection to sensitive marsh habitat as well as important park infrastructure.

**Texas Gulf Region Cooperative Weed Management Area:** Supporting efforts of our local, state, and federal partners to prevent the spread of the invasive Brazilian peppertree by joining the Texas Gulf Region Cooperative Weed Management Area.

## Land Conservation and Stewardship

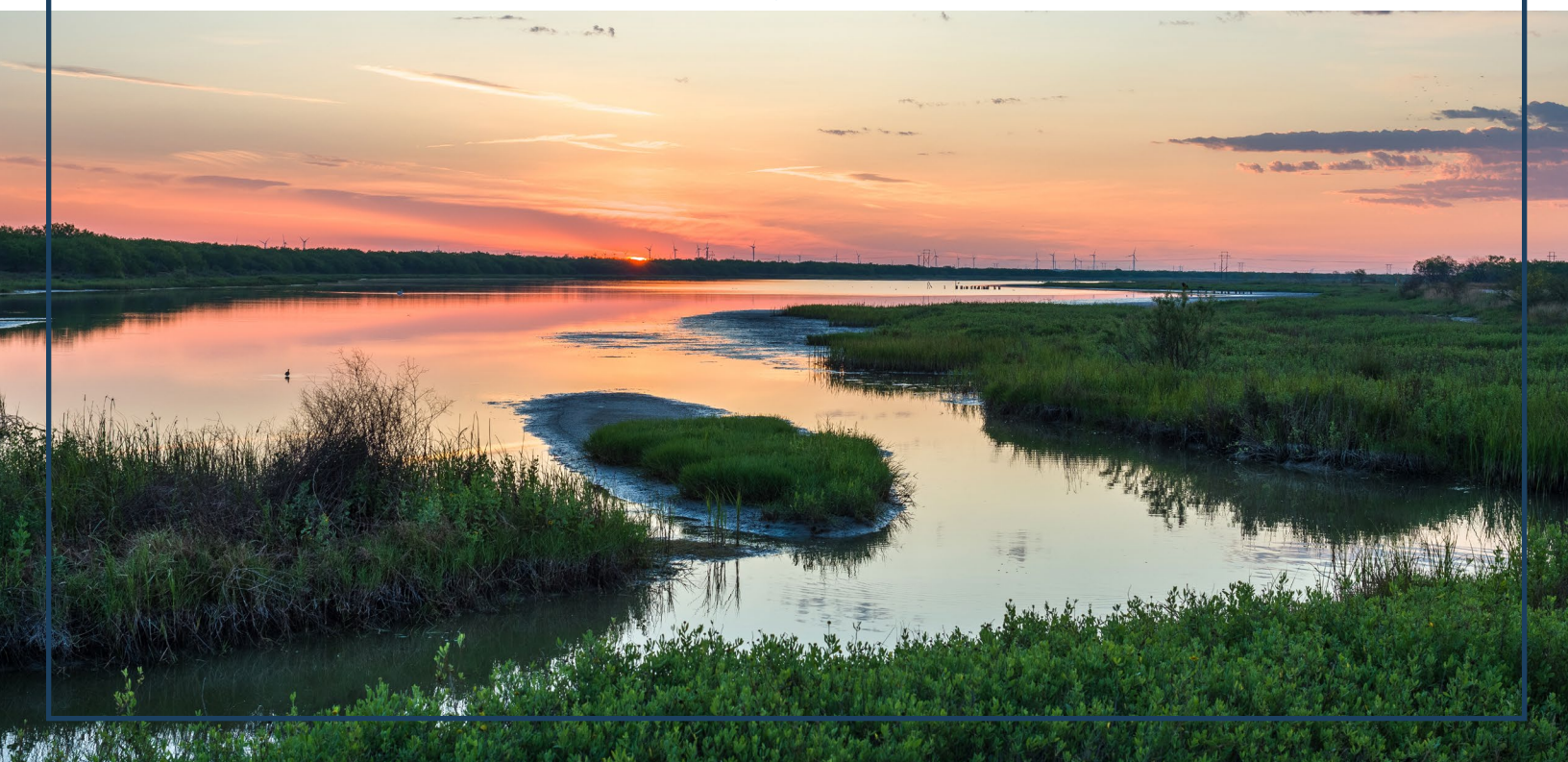
Despite their tremendous value, coastal habitats are threatened and at risk of being developed. The CBBEP Land Conservation Program has identified areas in need of protection within the Coastal Bend and is working with partners to conserve these valuable habitats. The Land Conservation Program has acquired either fee simple title or conservation easements for close to 13,000 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.

**Nueces Delta Preserve:** Acquired around 11,000 acres in the Nueces River Delta and established the Nueces Delta Preserve - 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.

**Mission River Delta Land Acquisition:** Acquired close to 1,000 acres of valuable coastal wetland habitat in the Mission River Delta and currently working on securing funds to purchase additional acreage - land conservation in this region is a priority because of documented use by Whooping Cranes.

**Prescribed Fire:** Use prescribed fire on a regular basis at the Nueces Delta Preserve and other CBBEP properties to stimulate growth of native grasses, such as Gulf cordgrass, remove dead vegetation, and control encroaching woody vegetation.

**CBBEP HAS PROTECTED 13,000 ACRES of important coastal habitat. The highlight of these land conservation and management efforts is the Nueces Delta Preserve, a 10,500 acre property near Odem.**





**Conservation of Barrier Island Habitats:** CBBEP owns several properties on Mustang Island - these properties connect thousands of acres of preserved, open space, and park lands owned by the State of Texas and Nueces County and protect valuable barrier island habitats from future development.

**Protecting Habitat on Lamar Peninsula:** In 2012, CBBEP worked with partners to purchase two tracts of land located on the Lamar Peninsula in Aransas County - the tracts total 178 acres and provide valuable habitat for endangered, wintering Whooping Cranes.

### 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. The Coastal Bend Bays & Estuaries Program 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.

**Nueces Delta Salinity Monitoring:** Since 2009, CBBEP has contracted with the Conrad Blucher Institute to monitor salinity at three stations within the Nueces Delta and Nueces Bay - data from these stations is used to monitor releases of freshwater from reservoirs into the Nueces Delta system.

**Baffin Bay Water Quality:** Using a multi-year grant from Celanese, CBBEP partnered with Texas A&M University - Corpus Christi to monitor water quality in Baffin Bay - with the help of volunteers, researchers have discovered high concentrations of dissolved organic nitrogen in the bay.

**Egery Flats Hydrologic Restoration:** Replaced culverts at the water exchange points along FM 236, near Bayside, to increase water flow and reduce salinities in 600 acres of salt marsh, seagrass beds, and tidal flats at Egery Flats - culverts have been replaced and the next step is to plant marsh grass.

**Bacterial Source Tracking:** CBBEP works with researchers at Texas A&M University - Corpus Christi to identify fecal pollution sources at Cole & Ropes Parks in Corpus Christi - by quantifying the abundance of human, gull, and dog fecal pollution, managers can better target bacterial sources.

**Long-term Seagrass Monitoring:** As part of the Texas seagrass monitoring program, CBBEP provided annual funding for researchers at the University of Texas Marine Science Institute to detect changes in the ecological integrity of seagrass habitats in Corpus Christi Bay and the Upper Laguna Madre.

**MONITORING WATER QUALITY pre- and post-construction was an important component of the hydrologic restoration project at Egery Flats.**



## 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. For over 15 years, the Coastal Bird Program at the Coastal Bend Bays & Estuaries 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. We have a strong track record of bringing innovative management, diversified partnerships, and science-based decision-making to bird conservation in the Coastal Bend.

**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:** Coastal Bird Program staff work with partners to better understand migratory connectivity and annual movements, abundance and distribution, reproductive success, and critical habitats of several imperiled shorebirds, such as the Red Knot.

**Rookery Island Cleanups:** Coastal Bird Program hosts annual rookery island cleanup days in the Upper and Lower Laguna Madre - volunteers have helped remove thousands of pounds of trash from sensitive rookery island habitats since the cleanups started.

**Construction of New Island:** Constructed a 3.75-acre island in Nueces Bay that provides critical nesting habitat for colonial waterbirds, many of which are suffering population declines - CBBEP's Coastal Bird Program actively manages the island to make sure it continues to provide quality habitat.

**Nueces Bay Rookery Islands Restoration:** Restored around two acres of important colonial waterbird nesting habitat on three rookery islands in Nueces Bay - islands were protected from further erosion and new material was placed on the islands to restore essential nesting habitat.

**CBBEP'S COASTAL BIRD PROGRAM has shed important light on the distribution and winter habitat use of Red Knots by capturing and marking birds, using tracking devices, and assessing blood and feather samples.**



## Environmental Education

The Coastal Bend Bays & Estuaries Program 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.



**Student Field Trips:** Annually provide thousands of students the opportunity to participate in a hands-on field experience at the Nueces Delta Preserve - students have the opportunity to build connections to nature that a conventional classroom environment cannot provide.

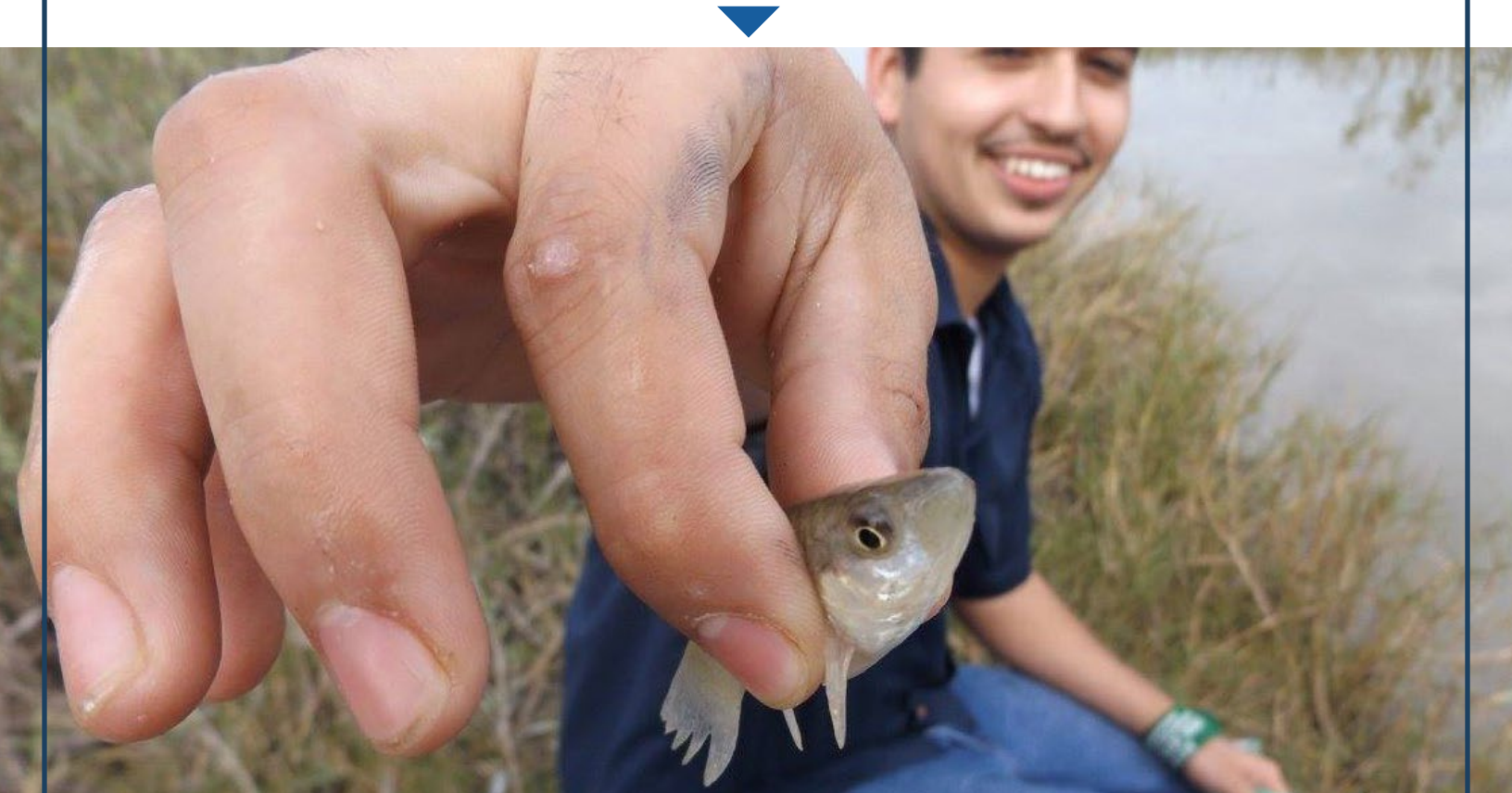
**Training Educators:** Facilitate multiple workshops each year that focus on equipping teachers and educators with the skills, curriculum, and materials they need to strengthen science teaching as it relates to the environmental resources of the Coastal Bend.

**Community Programs:** Provide families with the opportunity to visit the Nueces Delta Preserve and participate in programs like Nature Story Times and Family Picnic Days - programs are designed to create conservation-minded families that are connected to nature and have a desire to protect it.

**Coastal Issue Forums:** CBBEP supports 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.

**Earth Day - Bay Day:** CBBEP supports the Coastal Bend Bays Foundation's efforts to host Earth Day - Bay Day annually - the festival offers an array of family-friendly activities that focus on connecting people to nature and inspiring conservation of our bays and estuaries.

**CBBEP'S ENVIRONMENTAL EDUCATION PROGRAM provides opportunities for classrooms and families to connect with nature and plants the seeds of stewardship in individuals whose decisions affect our estuaries.**



### **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.

**Packery Flats Improvements:** At the Packery Flats Coastal Habitat, nestled on the backside of Mustang Island adjacent to Packery Channel, CBBEP improved road access and parking at two locations along Highway 361, installed interpretive signage, and expanded bollard and cable systems to protect the sensitive habitats.

**Protection of Whooping Crane Habitat on Lamar Peninsula:** Whooping Cranes are sensitive to human disturbance, and efforts are needed to minimize disturbance in areas close to urban development. At properties owned by CBBEP on Lamar Peninsula, bollard and cable systems were installed to minimize disturbance to Whooping Cranes, and signs were installed to highlight the importance of the habitats for these endangered birds.

**Public Access Improvements at Padre Balli Park Pollinator Habitat:** CBBEP provided funds for Nueces County to enhance public access at the Pollinator Habitat at Padre Balli Park - ADA compliant parking facilities were installed and interpretive signs provide awareness of the invaluable relationship between our native pollinator species and our local ecology.

**CBBEP WORKS WITH PARTNERS** to ensure that Coastal Bend residents and visitors have adequate, well-planned access to the local bays and can enjoy opportunities to fish for species like the red drum.





## WORK PLAN DEVELOPMENT

The FY 2021 Comprehensive Annual Work Plan will allow the CBBEP to continue the implementation of the *Coastal Bend Bays Plan*. 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 2021 Comprehensive Annual Work Plan will be September 1, 2020.

## PROGRAM COORDINATORS AND PROJECT OFFICERS

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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 needs to be better 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 EPA funds on a timelier basis.

The CBBEP achieved its primary project-related goal for FY 2020, which was to continue the successful initiation and completion of projects developed to implement the *Coastal Bend Bays Plan*. 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 CBBEP FY 2015 implementation years have been completed. CBBEP will prepare a draft Revised Comprehensive Work Plan that reallocates funds not identified with projects for FY 2016, FY 2017, FY 2018 and FY 2019, as allowed by the funding entity.

## 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 US Environmental Protection Agency (USEPA) 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 FY 2021

The overarching goal for the FY 2021 Work Plan is to continue the successful implementation of the *Coastal Bend Bays Plan*. 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 update recommendations to the *Bays Plan*.

## IMPLEMENTATION OF PROJECTS

Project activities for the FY 2021 Work Plan have been selected for their contribution towards implementation of the *Coastal Bend Bays Plan*. Forty-one projects will be implemented in FY 2021. 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 2021 Comprehensive Annual Work Plan Outline." 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 2021 are as listed on the following pages:



## Project #2101    CBBEP Coastal Bird Program

Performing Organization:    CBBEP Coastal Bird Program  
Total Project Funding:       \$181,297  
CBBEP Bays Plan Actions:    HLR-1, HLR-4

### **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 up to a 90% reduction in breeding pairs since the 1960's. Research continually provides evidence of the importance of the Texas coast to many other non-breeding coastal bird species, many of which are also experiencing major population declines.

This project will build on the efforts of the Coastal Bird Program from previous years through the continued implementation of 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. All habitat management will be completed by February 1, as this is the beginning of the waterbird nesting season. Predator management will be conducted on an as-needed basis for the entirety of 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 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 CBBEP's Coastal Bird Program uniquely qualified to provide expertise and assistance to partners and stakeholders working to conserve coastal birds. The Coastal Bird Program 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 the Coastal Bird Program for the coming years.

Public outreach will also be 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 other forms of public communication, such as distribution of flyers, social media, interviews with news outlets, and engagement of volunteers. Outreach efforts will take place throughout the year

### **Project Objectives:**

1. Continue the restoration efforts of coastal bird populations through management of colonial waterbird nesting sites, including habitat enhancement, protection, and predator control, and by reducing anthropogenic impacts to coastal birds.
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 changes in coastal bird populations for management purposes.
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 #2102    Delta Discovery

**Performing Organization:**      CBBEP Delta Discovery Program  
**Total Project Funding:**        \$252,702  
**CBBEP Bays Plan Actions:**      BTR-1, PEO-2, PEO-3, PEO-5

### **Background:**

The mission is to connect Coastal Bend Communities with opportunities and resources that plant the seeds of conservation for protecting our bays & estuaries. The staff uses discovery-based learning to allow participants to “open up to wonder” through their senses. The CBBEP builds relationships with nature in order to create in the community a legacy of conservation through exciting and innovative environmental programs. The educational program cost consists of the following: (1) salary of full-time CBBEP environmental educators & part time “teacher naturalists,” (2) supplies needed for the Nueces Delta Preserve, (3) bus funding for field trips, and (4) supplies and food for teacher workshops.

Teacher Workshops: These workshops will address local environmental science topics and align to the Texas Essential Knowledge and Skills (TEKS) objectives. Participating teachers will receive both SBEC & TEEAC credits. The workshops focus on equipping teachers with the skills, curriculum, support, and materials to strengthen science teaching as it relates to the diverse environments of the Texas Coastal Bend. The funding provides all fees for partnering, curriculum, equipment for the classroom, and substitute teachers in order for these workshops to occur.

Fieldtrips: The CBBEP Environmental Educators provide field trip opportunities for teachers and students at the Nueces Delta Preserve. Field trips are discovery based and aligned with TEKS science objectives, providing students a connection between classroom instruction and practical application through memorable outdoor experiences.

Delta Discovery Days: The CBBEP will host 11 Delta Discovery Days. These hands-on “family picnic days” provide multigenerational 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 the 4 hour program. Delta Discovery Days serve a dual purpose; one is to encourage students attending Nueces Delta Preserve field trips to return with their families to demonstrate what they have learned. The second purpose is to welcome new audiences--families and members of the community-- to the Nueces Delta Preserve for a day of nature-based learning.

Nature Story Time: The CBBEP will host 15 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 2 Home School Days to meet the needs and interest of home school families seeking field experiences, but often fall short of the minimum student quota for student field days. 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. The CBBEP Education Staff will facilitate a series of hands-on activities that support select program themes and facilitate the engagement of mixed age student audiences.

Nueces Delta Preserve Upkeep: Upkeep of the Nueces Delta Preserve consists of electricity costs, phone and internet costs, bathroom cleaning/maintenance, trash pick-up, equipment for programming, staff accreditation and educational training, and mileage, etc.



**Bus Funding:** The Coastal Bend Bays & Estuaries Program will conduct environmental education learning experiences for students and their teachers. This funding is intended to support the education trip in its entirety, including associated educational materials, substitutes if needed for school trips, and the necessary and reasonable costs associated with transporting the teacher and students from the school to the destination.

**Project Objectives:**

1. Provide educational field trips for K-12 students and also aid teachers in the community to increase their knowledge, skills and provide resources to more effectively teach science to their students in local schools.
2. Provide educational outdoor experiences to the coastal community residents that instill a sense of appreciation/value of the area and desire for conservation natural resources.

## **Project #2103    Outreach to Wastewater Treatment Plants in Baffin Basin**

**Performing Organization:**        **Nueces River Authority**  
**Total Project Funding:**        **\$34,774**  
**CBBEP Bays Plan Actions:**       **WSQ-1, NPS-1, BTR-1, PH-1, HLR-2**

### **Background:**

Baffin Bay and two of its primary tributaries, San Fernando Creek and Petronila Creek, have long documented water quality problems with bacteria and nutrients. In June 2019, under contract with CBBEP, Nueces River Authority (NRA) performed a riparian evaluation of conditions along tributaries streams to Baffin Bay. While not the intended purpose, during the aerial evaluation, some distinct water clarity and watercolor changes were observed in the vicinity of the discharge points for municipal wastewater treatment plants. Subsequent conversations with two plant operators in the area revealed a sincere desire for non-regulatory guidance and support in addressing wastewater needs. Based on this initial interest, identified needs, and NRA staff capability, the proposed project will provide outreach and assistance to wastewater treatment plant operations that discharge effluent to Baffin Bay tributaries. With the funding requested, the NRA will offer assistance to approximately 13 domestic wastewater treatment plants, on a strictly voluntary basis, to identify and address possible equipment and capacity needs.

### **Project Objective:**

The expected outcomes of this effort include: (1) wastewater treatment plant operation personnel engaged in Baffin Bay water quality improvement; (2) equipment and capacity needs identified; (3) identification of possible funding sources to address identified needs; and (4) facilitation of funding relationships between WWTP personnel/municipal leadership and funding sources.



## **Project #2104     Connecting Communities in the Oso Bay/Oso Creek Watershed**

<b>Performing Organization:</b>	<b>Center for Coastal Studies at Texas A&amp;M University – Corpus Christi</b>
<b>Total Project Funding:</b>	<b>\$4,000</b>
<b>CBBEP Bays Plan Actions:</b>	<b>PH-1, BD-1, WSQ-1, WSQ-5, FW-1, PEO-1, PEO-2, PEO-3, PEO-4, and PEO-5</b>

### **Background:**

Staff from the Center for Coastal Studies (CCS) at Texas A&M University–Corpus Christi (TAMUCC) have been working with stakeholders since 2013 to develop an Implementation Plan for water quality improvements in the Oso Watershed. The efforts of this plan have identified the need to connect the urban and rural communities within the Oso Watershed, specifically with the Colonias communities.

The Islander Stream Team, established in August 2015 at TAMUCC and now a committee under the Islander Green Team, is composed of both undergraduate and graduate TAMUCC student volunteers. The students collect monthly water quality data at sites along Corpus Christi Bay and Oso Bay. This project gives the Islander Stream Team and CCS latitude to move out into the rural areas of the Oso Watershed and help build relationships with the rural and Colonias communities as well as attend urban events to provide water quality education to the public.

As of 2019, over 600 individuals have been talked to, one-on-one, at community food bank events about the importance of water quality. The funding of this project will support the continued outreach efforts to expand the geographic range to build relationships with communities of rural and urban areas of the Oso Watershed and connect with the Colonias communities. Funds will also be used to purchase La Motte water quality kits and supplies. The Islander Stream Team, with the help of the Center for Coastal Studies, will build relationships and communication with the Oso Watershed communities using water quality monitoring as the foundation. Building strong and trusting relationships with residents in the Oso Watershed is vital for the Oso Watershed TMDL and I- Plan process currently in progress by TCEQ.

This will be accomplished by (1) visiting rural and urban community events and providing residents with water quality education using standard LaMotte Kits; and (2) visiting with the residents of the Colonias communities and talking with them about water quality. Building and growing communication in communities in the Oso Watershed to protect our surface water is the ultimate goal of this project.

### **Project Objective:**

The project objective is to expand water quality outreach and build relationships with residents in the rural Colonias areas and urban communities of the Oso Bay/Oso Creek Watershed using the Islander Stream Team at TAMUCC. This will be accomplished by (1) visiting rural and urban community events and providing residents with water quality education using standard LaMotte Kits and (2) visiting with the residents of the Colonias communities and talking with them about water quality.

## **Project #2105     Baffin Bay Water Quality Monitoring**

**Performing Organization:** Texas A&M University – Corpus Christi  
**Total Project Funding:** \$50,000 (Funding is Pending)  
**CBBEP Bays Plan Actions:** WSQ-3

### **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 (Montagna and Palmer, 2012). Additional symptoms include blooms of potential HAB 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 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 Objective:**

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 #2106    Outdoor Classrooms**

**Performing Organization:**        CBBEP  
**Total Project Funding:**        \$10,000  
**CBBEP *Bays Plan* Actions:**    PEO-3, PEO-5

### **Background:**

In several discussions with teachers and principals, it has been determined that moving students to learning opportunities (field trips) is becoming more difficult. 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.

One way to solve this problem would be to bring learning opportunities to schools in the form of an outdoor classroom. Outdoor classroom is defined as an outdoor area on campus set aside for student investigation and learning. Components are varied but often include benches or picnic tables adjacent to a study or natural area where students can gain field experience.

### **Project Objective:**

To provide public schools with the option of an outdoor classroom that will promote interest in science, include community experts, support parent involvement, provide field experience to students, and help to improve scores.

## **Project #2107    Up2U Litter Campaign**

**Performing Organization:**      CBBEP, Nueces River Authority  
**Total Project Funding:**        \$422,857  
**CBBEP Bays Plan Actions:**      BD-1, PEO-5

### **Background:**

This five-year project will cultivate a sustainable behavior-changing litter prevention program for Gulf of Mexico watersheds within the Coastal Bend of Texas by expanding the Up2U litter prevention program from the headwaters of the Nueces basin to six counties and ten watersheds within the Coastal Bend. Up2U is the battle cry of an innovative project begun by the Nueces River Authority (NRA) and river recreation-oriented businesses with grant funding from the Environmental Protection Agency in 2004. The goal of the campaign was to curb litter along the waterways of the Nueces basin. At that time, market research determined that the littering population was concentrated in the 18-25 year old age group and that they could be motivated to change their behavior and adopt a personal responsibility for water resource protection by a direct, factually-blunt, and empowering campaign message. Upon testing litter prevention messages with this age group, it was clear that an empowering message was more impactful than a “don’t” message, as this group “did not want to be told what to do.” Instead, they would respond positively to a challenge, especially if that challenge was logical and fact-based.

The CBBEP will contract with the Nueces River Authority to implement the program. The cornerstone of the program is a yellow mesh bag emblazoned with the empowering Up2U message. The litter bags hold approximately 1/3rd yard of litter and serve as a tool for trash removal, trash prevention, and outreach. In the Nueces basin headwaters, the Up2U campaign has improved water quality through litter prevention and community engagement, distributing over 750,000 litter bags since 2004, which equates to about 250,000 cubic yards of litter prevented. The headwaters campaign has been completely self-sustaining since 2007. Much of the original art and Up2U campaign material will be repurposed for use in coastal areas. The project will include strategic billboards, radio spots, litter bag distribution points, and community cleanup events. By the end of this project, we expect strong partners to have emerged to carry on the distribution of litter bags and support of the message and the program into the future.

### **Project Objective:**

1. To develop partner sites for litter bag distribution.
2. To distribute 150,000 litter bags (30,000 bags/year for 5 years) through community/civic events, CBBEP education program, and distribution sites.
3. To support billboards, posters, and radio spots supporting the campaign.
4. To support community-based cleanup efforts to remove tires and appliances.



## **Project #2108     CBBEP Community Outreach Partnerships**

**Performing Organization:** Coastal Bend Bays Foundation  
**Total Project Funding:** \$30,000  
**CBBEP *Bays Plan* Actions:** PEO-1, PEO-2, PEO-3, PEO-4, PEO-5

### **Background:**

As stated in the *Coastal Bend Bays Plan*, 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*. 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* 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 communications 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 #2109    CBBEP Property Management**

**Performing Organization:**      CBBEP Land Conservation Program  
**Total Project Funding:**        \$105,000  
**CBBEP Bays Plan Actions:**      HLR-1

### **Background:**

CBBEP is owner and steward of properties in Nueces, San Patricio, Aransas, and Refugio Counties which includes the 10,500-acre Nueces Delta Preserve, public access properties, and more recently the Mission River Delta along the Mission River and Mission Bay.

The CBBEP Nueces Delta Preserve is located 3 miles from the City of Odem and 20 miles from downtown Corpus Christi. The CBBEP Nueces Delta Preserve consists of approximately 10,500 acres in San Patricio and Nueces Counties that are owned and managed by CBBEP as a conservation site for the purpose of preserving natural habitat, function, and species diversity in the Nueces River Delta. The Preserve is rich in diversity that can be characterized by Tamaulipan thorn scrub, grasslands, lomas, freshwater wetlands, riparian habitat, brackish wetlands, tidal mud flats and estuarine shoreline. CBBEP's secondary goal for the preserve is for the property to be used for a variety of educational and research opportunities.

The funds provided by the project help support the land ownership obligations and some routine maintenance associated with CBBEP owned properties. Maintenance activities including but not limited to paying for portions of road maintenance, fencing replacement and repairs, brush control, equipment maintenance and purchases, habitat and predator management (as appropriate and necessary), and the payment of property taxes.

Past project accomplishments include fencing projects, preparation for prescribed burns, constructed wetland dike repair and vegetation manipulation, management of equipment purchases, building maintenance, volunteer project coordination, application of herbicide to invasive brush, road repairs, creation of wildlife observation areas, and establishing routine mowing of common areas and roadways.

### **Project Objectives:**

1. To provide the required ongoing maintenance and management of properties owned by Coastal Bend Bays & Estuaries Program.
2. Contract for the implementation of controlled burns on approximately 700 acres.
3. Constructed wetland maintenance and manipulation.
4. Infrastructure improvements to include construction of a covered workspace.

## **Project #2110    Oso Bay/Oso Creek Watershed Model and Outreach/Education**

**Performing Organization:**      CBBEP, Nueces River Authority, and Center for Coastal Studies at Texas A&M University – Corpus Christi  
**Total Project Funding:**        \$38,710  
**CBBEP Bays Plan Actions:**      PEO-3, PEO-5, WSQ-1

### **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, multi-acre 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. 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 4-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 Objective:**

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 taking place in the watershed.



## **Project #2111    Nueces Delta Environmental Monitoring Project**

**Performing Organization:** Conrad Blucher Institute at Texas A&M University – Corpus Christi  
**Total Project Funding:** \$32,194  
**CBBEP Bays Plan Actions:** FW-1, FW-2, FW-3, FW-4, HLR-1, HLR-2

### **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 pass-throughs 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 Objective:**

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 #2112     Port Aransas Nature Preserve – Clay’s Hill and Charlie’s Pasture Habitat Enhancement**

**Performing Organization:**     City of Port Aransas  
**Total Project Funding:**     \$16,000  
**CBBEP Bays Plan Actions:**     HLR-1, HLR-2

### **Background:**

The purpose of this project is to enhance the wildlife habitat at Clay's Hill and surrounding areas within the Port Aransas Nature Preserve at Charlie's Pasture. The Port Aransas Nature Preserve acts as important stopover grounds for migrating neotropical bird species. There are very few wooded areas within the salt marshes and grassland prairies of the Nature Preserve. Clay's Hill was created as an alternative freshwater-wooded habitat for resident and migratory bird species. However, since its creation, drought, invasive species, and a hurricane have slowed the progress of this new habitat's success. This project will continue the ongoing habitat restoration at Clay's Hill and its surrounding habitats that were funded through a USFWS cooperative agreement and the Gulf Corps Program (through the American Conservation Experience (ACE)). This project will be accomplished by first removing invasive trees and grasses through a contract with ACE. Following invasive plant removal, native trees/shrubs and grasses will be planted. Nature Preserve staff will monitor the area for invasive plant regrowth and treat as necessary.

### **Project Objective:**

The primary project objective is to restore and enhance wildlife habitat at Clay's Hill and the surrounding areas within the Port Aransas Nature Preserve at Charlie's Pasture by removing invasive species and planting native vegetation.

## **Project #2113     Water Quality Status and Trends**

**Performing Organization:**     Harte Research Institute at Texas A&M University – Corpus Christi  
**Total Project Funding:**       \$36,532  
**CBBEP Bays Plan Actions:**     WSQ-3, WSQ-5, NPS-4, HLR-8, FW-1

### **Background:**

Water quality is a key determinant of ecosystem health. The purpose of this project is to provide resource managers with an updated assessment of water quality status and trends in Coastal Bend bays. A previous assessment, completed with data collected through 2010, provided valuable insight into "hot spots" of water quality change as well as overall condition of Coastal Bend bays. Given ongoing pressures on water quality in the region, there is a need to quantify water quality trends and identify areas that may need management intervention.

Water quality data through 2019 will be downloaded from the TCEQ Surface Water Quality Monitoring Information System (SWQMIS) database. The data will then be assembled in Excel files for each sampling site in the following Assessment Units (AU) of the Coastal Bend: Mesquite Bay, St Charles Bay, Copano/Port/Mission Bay, Aransas Bay, Redfish Bay, Nueces Bay, Corpus Christi Bay, Corpus Christi Bay Inner Harbor, Oso Bay, Laguna Madre, Baffin/Alazan/Cayo del Grullo/Laguna Salada.

Water quality variables of ecological significance as well as those for which TCEQ has established standards or screening levels will be assessed. Spatial patterns of these variables will be quantified and graphically represented in maps created using ArcGIS. The maps will highlight AU's or specific sites that exceed regulatory criteria. Because many of the variables include censored data, we will apply the Kendall's tau-b test to quantify trends over time.

### **Project Objective:**

The objective of this project is to assemble a database of available water quality data from the TCEQ, SWQMIS database that consists of individual Excel files for each sampling site. Spatial patterns of these variables will be quantified and graphically represented in maps created in ArcGIS. The maps will highlight AU's or specific sites that exceed regulatory criteria. Because many of the variables include censored data, the Kendall's tau-b test will be applied to quantify significance and magnitude/direction of trends over time.



## Project #2114    CBBEP Public Outreach Events and Activities

Performing Organization:    CBBEP  
Total Project Funding:    \$36,450  
CBBEP Bays Plan Actions:    PEO-1, PEO-2, PEO-3, PEO-4, PEO-5, BTR-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 Objective:**

CBBEP will raise awareness of environmental issues by connecting with the Coastal Bend public through our websites and 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.

In addition, CBBEP may participate in:

1. Community events and festivals
2. CBBEP may produce or purchase educational and promotional materials
3. CBBEP will maintain a web site(s)
4. CBBEP develop and provide electronic updates
5. Other outreach opportunities

## **Project #2115     Benchmarking community structure of estuarine-dependent nekton near the Aransas Pass inlet**

**Performing Organization:** Texas A&M University – Corpus Christi  
**Total Project Funding:** \$28,582  
**CBBEP Bays Plan Actions:** HLR-1, HLR-3, HLR-6, HLR-7, WSQ-4

### **Background:**

Many nekton occurring in coastal waters share a common estuarine-dependent life history strategy characterized by near-shore spawning in the Gulf of Mexico (Gulf) with larvae migrating through tidal inlets into shallow estuarine nursery habitats. Access to high quality habitat and spawning grounds via tidal inlets is essential for reproduction, growth, survival, and maintenance of these populations. Because 75% of commercially or recreationally important species in the Gulf are estuarine-dependent, evaluating how anthropogenic activities may impair this connection between Gulf and bay waters is critical to understand the population dynamics in this system and how these factors may affect larval fish development and fishery productivity. The Aransas Pass inlet is the major tidal inlet for the region and is characterized by a channel confluence of several primary branches that has a notable bottleneaking effect resulting in an extraordinarily high abundance of economically and ecologically important species (e.g., red drum, *Sciaenops ocellatus*; Atlantic croaker, *Micropogonias undulatus*; southern flounder, *Paralichthys lethostigma*; post-larval penaeid shrimps, *Farfantepenaeus aztecus*, *F. duorarum*, *Litopenaeus setiferus*; blue crab, *Callinectes sapidus*) at several life stages (larval through adult). As a result, anthropogenic activities that may alter water chemistry, flow, and quality have the potential for significant negative impacts on the marine life using this migration corridor, which could lead to major changes in community structure, larval fish development, and fishery productivity.

The proposed industrial development of the Aransas Pass inlet region (e.g., Harbor Island) presents a critical opportunity to establish baseline community structure in the adjacent estuarine habitats. Seagrass meadows are the predominant habitat type used by recruiting nekton in this region; the project will assess community structure using epibenthic sled tows in the spring, fall, and winter, which are established seasonal recruitment and settling periods for economically and ecologically important estuarine-dependent species. Eight sites near Port Aransas, where impacts from industrial development are likely to occur; and four near Packery Channel (located ~29 km south), where these impacts will likely be absent will be surveyed seasonally. Water quality parameters will be assessed at each sampling site in conjunction with established long-term System-wide Monitoring Program stations located in the adjacent MANERR.

### **Project Objective:**

The purpose of this study is to determine baseline seasonal community structure of estuarine-dependent nekton (fish, shrimp, and crab) in the Aransas Pass inlet region in order to establish a pre-operational benchmark prior to newly proposed industrial development in this area. Furthermore, this baseline information will facilitate the development of Best Management Practices for the future preservation of estuarine habitats and aid in the protection of nursery areas for a diversity of economically and ecologically important estuarine-dependent species.

## **Project #2116     Waters for Wildlife: Increasing Freshwater Resources for Whooping Cranes and Wildlife**

**Performing Organization:**     San Antonio Bay Partnership  
**Total Project Funding:**     \$16,145  
**CBBEP Bays Plan Actions:**     HLR-1, HLR-2

### **Background:**

Providing freshwater resources to Aransas-Wood Buffalo (AWB) Whooping Cranes, the last naturally migrating population, in their only wintering grounds in the central Texas coast is critical to their survival, health and ability to migrate back to their Canadian breeding grounds. The San Antonio Bay Partnership (SABP) is committed to addressing this issue by identifying Whooping Crane habitat where freshwater availability is still lacking and overseeing the installation of a solar well at the prioritized wetland site.

The SABP received CBBEP funding in 2014 to develop a Water Well Suitability Index GIS platform to identify and prioritize sites where freshwater resources are needed for cranes. Criteria used for site evaluation will include wetland characteristics (i.e., altered by excavation, impoundment, levees or natural depression; distance from other freshwater resources) and distance to occupied crane territories and land ownership. This year, SABP will continue to address areas where freshwater availability is still lacking by working with a local water well contractor to install a well at a prioritized wetland site and then working with the International Crane Foundation to monitor crane use at these sites in relation to other wetland sites. Game cameras will be installed at the beginning of the 2021-2022 winter season as approved by a Special Use Permit from Aransas National Wildlife Refuge (if the preferred site is located on ANWR property) or on private land as approved by a private landowner partner. This approach will help to ensure that resources are utilized wisely by investing in water well locations that are more likely to provide the greatest benefit to Whooping Cranes.

San Antonio Bay Partnership will incorporate information generated from previous projects (2012-2019) and use the Water Well Suitability Index to identify one wetland site within the current wintering range of the Endangered Whooping Crane and install a solar-powered water well.

### **Project Objective:**

The primary project objective is to identify one wetland site within the current wintering range of the endangered Whooping Crane and install a solar-powered water well.



## **Project #2117    Triangle Tree Rookery Island Protection and Restoration**

**Performing Organization:**        CBBEP  
**Total Project Funding:**        \$1,620,000  
**CBBEP Bays Plan Actions:**      HLR-1, HLR-2

### **Background:**

Triangle Tree, an island in the upper Laguna Madre immediately south of Corpus Christi, Texas, is approximately 2 acres in size. Currently, the northern edge of the Triangle Tree Island is experiencing severe erosion, primarily from wave damage produced during heavy cold fronts. Erosion at a rate of approximately 2.5 ft/yr is occurring where mature native shrubs have been established and some of these shrubs are beginning to fall into the water. Erosion of Triangle Tree is causing the on-going loss of critical rookery island habitat.

CBBEP received previous funding from the Coastal Erosion Planning and Response Act (CEPRA) Program for preliminary engineering, alternatives analysis, 70% construction design, and submittal of a USACE Permit application for shoreline protection at Triangle Tree. CBBEP is in the process of working with an engineering firm to develop the design and permit application for shoreline protection at Triangle Tree. It is anticipated that the structure will be a minimum of 900 feet in length and positioned to protect the north/west side of the rookery island where erosion is the most severe. Due to the close proximity to the Gulf Intercoastal Waterway, the engineering and design will include an offshore structure designed to protect the north/west side of the island and take into consideration potential placement of dredge material.

CBBEP has received additional funding from the CEPRA Program to complete the final engineering/design and construction of the shoreline protection structure at Triangle Tree. Once the permit is received, CBBEP will begin working immediately on acquiring a lease from TGLO. CBBEP anticipates having the lease complete within the first 2-3 months of receiving the permit. Following construction, CBBEP will conduct monitoring to gauge 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 Objective:**

The primary objective of this project is to complete the final engineering/design and construction of a shoreline protection structure at Triangle Tree Rookery Island. This will ultimately protect, enhance, and expand the amount of nesting habitat available for numerous species of colonial waterbirds.

## **Project #2118     Reduction of Ghost Fishing from Derelict Blue Crab Traps on the Mid-Texas Coast**

**Performing Organization:**     CBBEP and San Antonio Bay Partnership  
**Total Project Funding:**     \$104,931  
**CBBEP Bay Plan Actions:**     HLR-1, HLR-4

### **Background:**

Abandoned crab traps are known to be a significant source of mortality for a variety of organisms, many of which are recreationally or commercially important (e.g., blue crabs, Gulf stone crabs, sheepshead, spotted seatrout, hardhead catfish, black drum, Atlantic croaker, and Texas diamondback terrapins). These traps can also have negative effects on sensitive habitats like seagrass and salt marsh and the species that depend on them (i.e., endangered Whooping Crane). In addition to the ecological impacts caused by derelict traps, there are potential economic impacts as well by continuing to capture estuarine organisms that would have contributed to commercial or recreational harvests. Lost traps can also lead to user conflicts when the motors of boaters contact them and when shrimpers nets become entangled.

To help address the problems associated with abandoned crab traps, the State of Texas closes every bay system in the State to crabbing for a 10-day period each February to allow for derelict traps to be removed. The Texas Parks and Wildlife Department (TPWD) leads a volunteer-based, statewide effort every year to remove derelict traps. Although the number of abandoned traps has decreased over time, there are still numerous derelict traps collected each year. Many of them show signs of continuing to catch estuarine wildlife – a concept known as “ghost fishing.” A more strategic effort is needed to locate and remove derelict traps and gather standardized data that can be used to better assess ecological and economic impacts and to help identify the root causes of trap abandonment.

This project will organize volunteers to locate and remove derelict crab traps in coastal waters from Matagorda Bay to Aransas Bay during the TPWD’s 10-day closure period in February 2021 and February 2022. In addition to trap removal, volunteers will also be responsible for collecting specific data parameters about each derelict trap. Volunteers will utilize a smart phone-based application to collect the necessary data parameters – a pilot of the technology was conducted in February 2019. The data gathered will be analyzed to better understand both the ecological and economic impacts of abandoned crab traps and to identify potential root causes of the dereliction. Results will be used to engage commercial crabbers in this region in constructive, two-way conversations that seek to identify root causes of dereliction and develop alternatives for reducing the number of lost traps, ultimately reducing the amount of ghost fishing and potential economic losses.

### **Project Objective:**

The overall goal of the project is to reduce the amount of ghost fishing from derelict crab traps by development of an active and involved volunteer group. This will be accomplished by: (1) implementing a comprehensive and systematic cleanup of derelict crab traps in mid-Texas coast bay systems utilizing a volunteer-based effort, (2) developing a database that can be used to assess ecological and economic impacts of derelict crab traps, while also being used to determine the cause of trap abandonment and engage with commercial crabbers, and (3) developing recommendations, supported by the local commercial crabbing community, that could potentially reduce crab trap dereliction.

## **Project #2119     Causeway Rookery Island Protection and Restoration**

**Performing Organization:**     CBBEP  
**Total Project Funding:**     \$2,740,000  
**CBBEP Bays Plan Actions:**     HLR-1, HLR-2

### **Background:**

This project will address actions needed to protect important rookery island habitat at Causeway Island, located in Nueces County on the north side of US Highway 181, between the cities of Corpus Christi and Portland, TX. The Island is currently 7 acres and serves as nesting habitat for thousands of pairs of breeding colonial waterbirds every year. The Island harbors numerous threatened avian species including the Reddish Egret and White-faced Ibis, and priority species such as Roseate Spoonbill, Little Blue Heron, Black Skimmer, and Gull-billed Tern. Audubon Texas leases Causeway Island, under an agreement with the Texas General Land Office (TGLO), and the Coastal Bend Bays & Estuaries Program (CBBEP) conducts routine monitoring and management of the Island.

CBBEP has been working for years to address erosion issues at Causeway Island. In 2003, CBBEP installed geotextile tubes on the north side of the Island. In early 2014, the geotextile tubes began to fail, and the Island has been eroding at a rapid rate since that time. CBBEP has sought to restore some of this lost habitat through the placement of dredge material on the Island. CBBEP has an ongoing partnership with the Port of Corpus Christi (POCC) to beneficially place dredged material on the island. POCC routinely dredges the Rincon Channel which is in the vicinity of Causeway Island. Dredge material was placed on Causeway Island in 2007, 2012, and 2017.

CBBEP previously received Texas General Land Office, Coastal Management Program and Coastal Erosion Planning and Response Act grant funding for preliminary engineering, alternatives analysis, 70% construction design, and submittal of a USACE Permit application for shoreline protection at Causeway Island. The permit was received in March 2018. The permitted design includes construction of a segmented rock breakwater around the perimeter of the Island that is approximately 3,400 linear feet. The system will include 9 breakwater segments of various lengths with crest elevations of approximately 3 feet above the bay bottom. Each breakwater will be between 175 feet to 1,050 feet in length with small and/or large gaps between the breakwater segments to allow water circulation and support of shorebird beach areas. The structure is designed to also allow for the placement of beneficial dredge material to further enhance restoration. Funding for this project will allow CBBEP to complete the final engineering/design and construction of the permitted breakwater system described above.

### **Project Objective:**

The project objective is to increase the amount of bird nesting habitat on Causeway Rookery Island by completing the final engineering design and construction of a segmented rock breakwater around the perimeter of the Island which includes 9 breakwater segments of various lengths. The breakwaters will protect the Island from erosion and allow for the expansion (17.8 acres over time) of the Island through accretion and continued beneficial use of dredge material.

## **Project #2120     Vulnerability Assessment of Corpus Christi and Nueces Bays**

**Performing Organization:**     Harte Research Institute at Texas A&M University – Corpus Christi  
**Total Project Funding:**     \$63,500  
**CBBEP Bays Plan Actions:**     FW-1, BTR-3, MC-1, HLR-1, WSQ-1

### **Background:**

Visualizations for project siting and localized and broader environmental impacts are key tools managers can use to make informed decisions regarding various aspects of project design and implementation. Heat maps, which are graphical representations of data using a matrix of colors, are useful for visualizing attributes of ecosystems. This approach has been used successfully to create a heat map of ecosystem services provided by habitats within the CBBEP area so that valued ecosystem components could be identified for ecosystem-based management approaches (Montagna et al. 2011, Hutchison et al. 2013). A new tool and updated charts identifying salinity model outputs during wet and dry years, fish abundance and distribution (larval, juvenile, small adult), species-specific salinity tolerances will be created leveraging the original map, because it already has the habitats and values identified within the region. This heat map can serve as a valuable tool to better understand the bay system and inform future development.

Many nekton occurring in coastal waters share a common estuarine-dependent life history strategy characterized by near-shore spawning in the Gulf of Mexico with larvae migrating through tidal inlets into shallow estuarine nursery habitats (Minello 1999). Access to high quality habitat and spawning grounds via tidal inlets is essential for reproduction, growth, survival, and maintenance of these populations. Because 75% of commercially or recreationally important species in the Gulf are estuarine-dependent (Chambers 1991), identifying areas of particular environmental importance or vulnerability in the Corpus Christi Bay region is critical to evaluating how the location of future anthropogenic activities may affect important marine species at various life stages (larval through adult). Therefore, the following new data would be added as GIS layers: (1) salinity model output for wet and dry years obtained from the Texas Water Development Board and used in environmental flow recommendation report (NBBEST 2011); (2) larval fish abundance and distributions obtained from Scott Holt (UTMSI) (e.g., Brown et al. 2004); (3) small adult and juvenile fish and invertebrate abundance and distributions obtained from long-term, fisheries-independent bag seine surveys conducted by the Texas Parks and Wildlife Department (e.g., Nanez-James et al. 2009); and (4) additional larval and juvenile fish and invertebrate data as it becomes available. Available information on species-specific salinity tolerances (e.g., Banks et al. 1991) will be integrated.

### **Project Objective:**

The purpose of this project is to identify and map areas of particular ecological importance and/or vulnerability in Corpus Christi and Nueces Bays based on seasonal salinity modeling, species abundance and distribution (larval through adult), and species-specific salinity tolerances.



## **Project #2121     Mapping Distribution and Chemical Levels of Nurdles in the Coastal Bend**

**Performing Organization:**     University of Texas Marine Science Institute  
**Total Project Funding:**     \$78,000  
**CBBEP Bays Plan Actions:**     WSQ-3

### **Background:**

Data has shown that the occurrence of plastic pellets (nurdles) is becoming increasingly widespread in the Coastal Bend. The pellets look similar to food that birds, sea turtles, and fish eat, which makes them particularly dangerous to wildlife. Additionally, these pellets have been found to have dangerous levels of harmful chemicals in other parts of the world since the pellets act like sponges, absorbing PCBs, DDT, PAHs, and other chemicals. The purpose of this project is to utilize the Nurdle Patrol Citizen Science Project to map plastic pellet (nurdle) concentrations throughout the Coastal Bend. This project will also analyze absorbed chemical levels of nurdles (plastic pellets) collected within the Gulf beaches and bays of the Coastal Bend.

### **Project Objective:**

The objective of this project is to map the distribution and abundance of nurdles across bay and Gulf beaches within the CBBEP project area to determine their locations, while also mapping their chemical concentration levels from different locations around the Coastal Bend.

## **Project #2122     Management of Brazilian Peppertree in and Around Port Aransas**

**Performing Organization:**     CBBEP and University of Texas Marine Science Institute  
**Total Project Funding:**     \$23,200  
**CBBEP Bays Plan Actions:**     HLR-1, HLR-2, HLR-10

### **Background:**

The purpose of this project is to continue Brazilian peppertree (*Schinus terebinthifolius*) control within the Texas Gulf Region Cooperative Weed Management Area (TGR-CWMA) on public and private lands. Brazilian Peppertree (BPT) is a non-native plant that is invading important coastal prairie along the Texas Gulf Coast, reducing habitat for native plants and animals, including migratory birds and shoreline marine life, as well as reducing the resiliency of the coast in the face of storms. To help counter this threat, the TGR-CWMA was formed with several state, county, city, and local partners. It covers the coastal barrier islands from Packery Channel north to Port O'Connor, TX. The TGR-CWMA's focus has been on removal of BPT from the public lands and natural areas on Mustang Island in and around Port Aransas, TX.

The TGR-CWMA recognizes that BPT also grows on private property and that these trees represent a continuous supply of seeds for the public lands that make it difficult to keep BPT from re-invading the preserves. While we know that outreach has increased the awareness of the BPT problem among homeowners and that many would like to remove them, we know that this is not always easily accomplished. Removing BPT is not as simple as cutting it down; herbicide must be applied to prevent re-sprouting. Therefore, the TGR-CWMA is using CBBEP funding to pilot a BPT replacement program for homeowners in Port Aransas. Funding will be used to hire a vegetation management firm to ensure that BPT is removed correctly from the homeowner's property. The firm will remove BPT from a maximum of 20 properties in Port Aransas and will also install the replacement tree/s given to the homeowner. Each property partaking in the program will receive a maximum of two (2) replacement trees. The City of Port Aransas will haul the removed BPT away for free. As part of the BPT replacement program, the TGR-CWMA will develop and deploy a marketing campaign to increase participation by Port Aransas property owners.

The TGR-CWMA will also use CBBEP funding to continue the restoration of public lands by planting native species (where appropriate) and removing BPT and other invasive plant species from Charlie's Pasture and other public properties in and around Port Aransas, TX.

### **Project Objectives:**

The goal of this project is to continue BPT control within the TGR-CWMA on public and private lands. To accomplish this goal, the TGR-CWMA will: (1) develop and deploy a marketing campaign to increase participation in their Brazilian peppertree (BPT) replacement program, (2) hire a vegetation management firm to remove BPTs from a maximum of 20 private properties in Port Aransas and also install the replacement tree/s given to the homeowner (maximum of two replacement trees), and (3) continue the restoration of public lands by planting native species (where appropriate) and removing BPT and other invasive plant species from Charlie's Pasture and other public properties in and around Port Aransas, TX.

## **Project #2123      Gulf Coast Conservation Initiative: Enhancing Whooping Crane Habitat Through Hydrologic Restoration**

**Performing Organization:**      CBBEP  
**Total Project Funding:**      \$326,000  
**CBBEP Bays Plan Actions:**      HLR-1, HLR-2

### **Background:**

CBBEP will partner 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 will involve planning, designing, and constructing a series of culvert systems across a ranch road that is currently impeding circulation. The property where the project will take place is under a conservation easement. Any funds not used on the culvert project could go to enhance other habitat for the target species in the cooperative agreement.

### **Project Objectives:**

The primary project objective is to enhance Whooping Crane wintering habitat by improving water flow on a private property.

## **Project #2124    CBBEP Coastal Bird Program – Laguna Madre Initiative**

**Performing Organization:** CBBEP Coastal Bird Program  
**Total Project Funding:** \$100,000  
**CBBEP *Bays Plan* Actions:** HLR-1, HLR-2, HLR-4

### **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:**

- 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.
- Implement monitoring efforts on shorebird populations to identify potential conservation actions.
- Engage volunteers and communities in coastal bird conservation efforts through the coastal portion of the Rio Grande Valley.



## **Project #2125     Planktonic larval fin and shellfish ingress and vertical distribution in the Aransas Pass Inlet system**

**Performing Organization:**     Texas A&M University – Corpus Christi  
**Total Project Funding:**     \$29,916  
**CBBEP Bays Plan Actions:**     HLR-1, HLR-2, HLR-4

### **Background:**

The several ongoing and planned industrial development projects in the study area include the shipping channel deepening, desalination plants with water intake and brine outflow, and oil shipment terminals. During the planning and permitting process, concerns on potential negative impacts of these projects on the recruitment of fish and shellfish were raised by citizens, nonprofits, the City of Port Aransas and local scientists. For estuarine dependent species, such as Red Drum, Southern Flounder, Atlantic Croaker, shrimp and blue crab species, the Aransas Pass Inlet system is the main connection that allows their planktonic larvae to travel from their spawning areas in the coastal Gulf of Mexico to their juvenile nursery habitats in the Corpus Christi Bay and the Mission-Aransas National Estuarine Research Reserve (MANERR) area.

To allow for science-based decisions on how to minimize the impact of industrial development projects and to estimate the effect of different planning options, data on the abundance of vertical distribution of larval fish and shellfish at different sites following possible larval ingress transport routes are needed, including depth discrete sampling during both daylight and dark night hours, to identify hotspots for larval ingress transport and the water depths at which larval stages are found during different times of the day. This projects aims to fill this currently existing knowledge gap of recent data for larval fish ingress, and add additional data to the routine MANERR sampling for shellfish larvae, by a monthly sampling program over six months with stations distributed from the nearshore Gulf of Mexico into all three tributaries of the Aransas Pass Coastal Inlet.

### **Project Objective:**

The objective of this project is to create a dataset on the abundance of planktonic larval fish and shellfish stages of estuarine dependent species that use the Port Aransas Shipping Channel coastal inlet to enter their juvenile nursery habitats in Corpus Christi Bay and the MANERR at different locations of their ingress trajectory.

## **Project #2126     Development, verification, and implementation of an eDNA detection assay for diamondback terrapins in the Texas Coastal Bend**

**Performing Organization:** Texas A&M University – Corpus Christi  
**Total Project Funding:** \$31,858  
**CBBEP Bays Plan Actions:** HLR-1, HLR-2

### **Background:**

Diamondback terrapins are North America's only brackish water turtle species, inhabiting coastal areas from Cape Cod, MA to Corpus Christi, TX. These habitats include marshes, tidal creeks/river, and embayments. Diamondback terrapins are still poorly understood in Texas, and as a result, cannot be adequately managed. The largest obstacle facing state resource managers is a lack of location data for this species. There are still large, unsampled areas of the Texas coast that may, or may not, contain terrapin populations.

Range wide population declines have been documented for this species and terrapin populations in Texas face threats such as habitat loss/fragmentation, boat strikes, and crab trap bycatch mortality. Because this species occurs in small, localized populations, it can be easily extirpated from an area, with little, to no chance, for re-population. The largest obstacle facing state resource managers is a lack of location data for this species. There are still large, unsampled areas of the Texas coast that may, or may not, contain terrapin populations. For these reasons, it is imperative to first, identify locations that contain terrapins and second, provide that data to state resource managers to mitigate these threats.

Traditional sampling methods are intensive and expensive, and due to limited funding, only a few select locations have been adequately sampled for the presence of terrapins. Environmental DNA, or eDNA, is a technique that relies on taking environmental samples that contain trace amounts of DNA, isolating that DNA, and using it to demonstrate the presence of a species in a particular area. These trace amounts of DNA are present in the environment because organisms leave behind cells through the release of skin, fecal matter, blood, etc. that can be found in sediment and water. When properly analyzed, these genetic signals indicate the presence of the species of focus. This method is especially suitable for cryptic species, such as diamondback terrapins.

### **Project Objective:**

The objective of this project is to develop an eDNA assay specific to diamondback terrapins that would make it possible to detect the presence of this species by analyzing water samples taken from various coastal habitats.

## **Project #2127    Nueces County Youth Water Awareness Day**

**Performing Organization:**    Texas A&M AgriLife, City of Corpus Christi, and Natural Resources Conservation Service

**Total Project Funding:**    \$4,631

**CBBEP Bays Plan Actions:**    PEO-1, PEO-2, PEO-3

### **Background:**

The purpose of the Nueces County Youth Water Awareness Day is to educate area middle school students about the value and quality of our local bodies of water, bays, and estuaries. With collaborators such as the City of Corpus Christi, Natural Resource Conservation Service (NRCS), and Texas A&M AgriLife Extension Service, the goal is to expose the youth to water education through a one-day event. The event will provide learning activities that teach the youth to become more conscience about their daily lives and the effect their actions have on our area waterways and the environment; helping them form an understanding of how important water is to every citizen.

This event will consist of presentations on various topics, such as the water cycle, water conservation, water quality, water recreation, aesthetic value, and environmental stewardship - students will rotate, round-robin style through the presentations. Additionally, handouts and classroom activities will be provided to the teachers and students for in-school and take-home use as a follow up to the day's activities. This event will be a collaborative effort between the City of Corpus Christi, NRCS, and the Texas A&M AgriLife Extension Service and other partners.

### **Project Objective:**

The overall objective of the Nueces County Youth Water Awareness Day is to educate area youth about the value and quality of our local bodies of water, bays, and estuaries, therefore helping to create the next generation of environmental stewards in the Coastal Bend.

## **Project #2128     Public Access Enhancement at New Indian Point Park Pavilion**

**Performing Organization:**     CBBEP and City of Portland  
**Total Project Funding:**     \$15,000  
**CBBEP Bays Plan Actions:**     PEO-5, BTR-2, HLR-1

### **Background:**

Indian Point Park is located in the City of Portland on Corpus Christi Bay. The Park features a lighted pier that is free of charge for the public to access. The Park is a popular destination for both locals and visitors that wish to enjoy birdwatching and fishing. The City of Portland has approved the construction of a pavilion at Indian Point Park. The pavilion is designed to serve both as an access to and ancillary support for the existing public pier, but it is also designed to serve as its own destination for events and/or activities. The structure will enhance the boardwalks that access the fishing pier and make them accessible by disabled persons and service vehicles. The project also increases the amount of parking available at the site and provides additional portable restrooms.

CBBEP will support the City of Portland's efforts to enhance public access at Indian Point Park by providing funds for educational signs and native vegetation for landscaping. Funds will be used to design, construct, and install educational signs that highlight the habitats/wildlife at Indian Point Park, as well as the need to conserve and protect our coastal resources. Funds will also be used to support the planting of native vegetation near the new Pavilion once construction is complete.

### **Project Objectives:**

The primary project objective is to support the City of Portland's efforts to enhance public access at Indian Point Park by installing educational signs and planting native vegetation once the new Pavilion is constructed.



## **Project #2129    Nueces Delta Shoreline Protection**

**Performing Organization:**      CBBEP  
**Total Project Funding:**       \$3,191,793  
**CBBEP Bays Plan Actions:**    HLR-1, HLR-2

### **Background:**

The Nueces Delta is currently undergoing rapid erosion that is causing the loss of significant marsh habitat. Numerous estuarine species utilize the coastal marsh habitat within the Nueces River Delta as foraging, breeding, nesting, and nursery grounds. The area harbors many state and federally listed endangered species, as well as several species-of-concern. However, studies show that the Nueces Delta shoreline is eroding at a rapid rate, and significant amounts of marsh habitat are being lost. 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 for protection.

As the size of these habitats decrease, so will the abundance and diversity of wildlife that breed, nest, forage, and shelter in the Nueces River Delta. CBBEP has long recognized the ecological value provided by the Nueces River Delta coastal marshes and has been working to protect this rapidly eroding shoreline for many years.

Project funds will be used for the final engineering and design of a porous circular concrete breakwater system to be constructed parallel to the Nueces Delta shoreline. The proposed breakwater system will also help protect the CBBEP's 11,500-acre Nueces Delta Preserve and improve the area's resilience against sea level rise, storm surge, and flooding.

### **Project Objective:**

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.

## **Project #2130     Protection and Restoration of Matagorda Island West Marsh, Aransas National Wildlife Refuge**

**Performing Organization:**        CBBEP  
**Total Project Funding:**        \$2,000,000  
**CBBEP Bays Plan Actions:**       HLR-1, HLR-2

### **Background:**

On August 25, 2017 Hurricane Harvey passed over the Matagorda Island Unit of the US Fish & Wildlife Service (USFWS) Aransas National Wildlife Refuge (ANWR) and caused damage to facilities on Matagorda Island as well as the levee/water control infrastructure within the West Marsh area. These levees and water control structures protect and preserve important coastal marshes within the Refuge that provide critical habitat for numerous types of wildlife, including significant numbers of wintering waterfowl and shorebirds, as well as the endangered Whooping Crane.

In February 2019, the Coastal Bend Bays & Estuaries Program (CBBEP) entered into a cooperative agreement with USFWS to perform levee and water control infrastructure repairs. Restoring levees and water control structures within the West Marsh will help restore and create a more resilient marsh system on Matagorda Island. CBBEP has previously worked with USFWS on levee and culvert improvements in this part of Matagorda Island. Many of the culverts that were previously repaired remain in good condition following the storm and will be utilized as part of the future work.

CBBEP received some funding from the USFWS to implement this project, but early assessments by contracted engineers revealed that damages were more severe than initially estimated and extensive repairs were needed to the levees and culverts. As a result, CBBEP has been seeking additional funds to add to the construction budget of this scalable project. In 2020, CBBEP secured an additional \$2 million from the Texas General Land Office, Coastal Erosion Planning and Response Act Program (TGLO-CEPRA) to help support engineering and construction costs.

Using the funds that have been received to date from USFWS, CBBEP has contracted with a qualified engineering firm to assess hurricane damage to the infrastructure on the Matagorda Island Unit, complete the engineering and design for repair/replacement and protection of levees and water control structures, apply for a permit, and develop a bid package for construction. Currently, 50% engineering and design is complete, a permit application has been submitted, and final engineering/design is underway. Once engineering and design and permitting are complete, a competitive bidding process will be used to identify a construction contractor. Construction tasks will include mobilization, transportation, and placement of material to staging area, repair and replacement of levees and culverts, and a final grade survey. CBBEP anticipates the completion of engineering/design and permitting by December 2020. The TGLO-CEPRA funds will primarily support the construction component of the project, which is anticipated to begin in early 2021.

### **Project Objective:**

By repairing and replacing the levees and water control structures in the West Marsh area of the Matagorda Island Unit, the project will enhance thousands of acres of coastal wetlands that provide critical habitat for numerous types of wildlife, including significant numbers of wintering waterfowl and shorebirds, as well as the endangered Whooping Crane.

## **Project #2131    CBBEP Coastal Bird Program – Midcontinent Shorebird Conservation Initiative**

**Performing Organization:**        CBBEP Coastal Bird Program  
**Total Project Funding:**        \$79,500  
**CBBEP Bays Plan Actions:**       HLR-1, HLR-2, HLR-4

### **Background:**

The midcontinent of North and South America provides critical breeding, migration stopover, and nonbreeding habitat for numerous shorebirds. Of the 45 shorebird species using the midcontinent region of Canada and the United States, 55 percent show long-term declines, while only 9 percent show increases. Multiple factors negatively influence midcontinent shorebirds, including habitat conversion/degradation and disturbance.

Despite the importance of the midcontinent to shorebird populations, a coordinate approach to conservation is lacking. Development of a Midcontinent Americas Shorebird Initiative is needed to bring together biologists, land managers, researchers, decision-makers, and other partners to work on shorebird conservation. The Initiative will allow for the exchange of information and development of collaborative approaches to monitoring, researching, and managing shorebirds and their habitats, leading to more effective conservation. The Initiative will place local action in a large flyway context and facilitate collaboration at scales necessary to truly conserve migratory shorebirds.

CBBEP Coastal Bird Program has played an important role in the development of the Initiative to conserve migratory shorebirds that utilize habitats in the midcontinent regions of North and South America, complementing similar efforts along the Pacific and Atlantic Flyways. Funding from U.S. Fish and Wildlife Service will be used to facilitate the broad consensus-based conservation planning processes and meetings necessary to create a draft conservation strategy, pay for publication and distribution of the final product, and begin on-the-ground implementation.

### **Project Objectives:**

The primary project objective is the development of a conservation strategy that will support the advancement of the Midcontinent Americas Shorebird Conservation Initiative and facilitate collaboration at scales necessary to truly conserve migratory shorebirds.

## **Project #2132    Mission River Delta Land Acquisition**

<b>Performing Organization:</b>	<b>CBBEP Land Conservation Program</b>
<b>Total Project Funding:</b>	<b>\$599,183</b>
<b>CBBEP Bays Plan Actions:</b>	<b>HLR-1</b>

### **Background:**

CBBEP has received funds through the National Fish and Wildlife Foundation, Gulf Environmental Benefit Fund to acquire and permanently protect a 375-acre property in the Mission River Delta. The parcel is almost entirely composed of coastal marsh and tidal flat habitats that provide critical habitat for migratory waterfowl, shorebirds, waterbirds, fish, shrimp, crabs and other wildlife. Recent observations and tracking data also show use of this area by the endangered Whooping Crane. The requested funds will go towards the protection, through fee-title acquisition, of the parcel, as well as associated closing costs, due diligence expenses (e.g., appraisal, survey, environmental site assessment), and third-party conservation easement. By permanently protecting coastal marshes through acquisition, the 375-acre parcel will directly support the Gulf Environmental Benefit Fund's efforts to remedy harm caused to habitats during the Deepwater Horizon oil spill. The project will also expand the network of state, federal, and private conservation areas and will help connect previously conserved areas. The site is located adjacent to lands that have already been conserved by CBBEP and other conservation partners. Conservation efforts by CBBEP and partners represent a strategic effort to expand and connect existing conservation areas and create a large, unfragmented corridor throughout the entire Mission River Delta.

### **Project Objective:**

Through the acquisition of a 375-acre property in the Mission River Delta, the project will permanently protect important coastal habitats for migratory waterfowl, shorebirds, waterbirds, fish, shrimp, and crabs. The 375-acre property is primarily composed of coastal wetlands (coastal marsh and tidal flats) and its acquisition will help connect previously conserved areas to create a large, unfragmented corridor for wildlife.



## **Project #2133     Nutrient Sampling in Petronila Creek**

**Performing Organization:** Nueces River Authority  
**Total Project Funding:** \$56,947 (CBBEP = \$31,000; NRA In-Kind = \$25,974)  
**CBBEP Bays Plan Actions:** WSQ-3

### **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-CC, Coastal Bend Bays and Estuaries Program, USDA-NRCS, Texas State Soil & Water Conservation Board, Texas Water Resources Institute, Texas Commission on Environmental Quality, Texas Sea Grant, Texas General Land Office, NRA, and a host of concerned citizens, including commercial and recreational fishermen, ranchers, and business owners. This group has begun an effort to develop a watershed protection plan (WPP) for Baffin Bay.

The scientists at HRI have determined that the primary causes of the water quality concerns are due to excessive nutrients in the bay. To identify sources of these nutrient concentrations, monthly water quality monitoring for nutrients will be conducted in Petronila Creek and its tributaries. The Nueces River Authority (NRA) collects chloride, sulfate, and total dissolved solids (TDS) samples monthly at one main stem site and 10 tributary sites. Two additional main stem sites are monitored quarterly for NRA's Clean Rivers Program (CRP), therefore monthly data is collected in the non-CRP sampling months. This sampling is being conducted to support the Petronila Creek Implementation Plan (I-Plan). 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 nutrients.

### **Project Objective:**

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 #2134     Parking Lot and Trails to Burton Lamar Preserve Wetlands**

**Performing Organization:**     Aransas First Land Trust  
**Total Project Funding:**     \$15,000  
**CBBEP Bays Plan Actions:**     BTR-3

### **Background**

Aransas First, through a generous contribution from a Lamar Peninsula resident dedicated to permanently preserving valuable habitat on the Lamar Peninsula, has purchased the 105-acre tract east of Highway 35 between Holiday Beach East and Lamar Preserve subdivision on Seaside Loop. It is directly across from 300 acres of coastal grassland and brackish/saltwater wetlands recently acquired by the Texas Parks and Wildlife Department, and the 104 acres adjacent acres to the north are owned by Coastal Bend Bays and Estuary 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, clams, and finfish of the Mission Aransas Estuary. 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 LiveOak/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 is proposing to create a public access site to the south side of this property with a parking area 30' x 80' off Seaside Loop with a fenced mowed trail with a 36" entry swing gate reaching the edge of the deeper pond. A walkable trail will also be created along the west side of the wetlands near a natural and old created berm, above the maximal water level for wildlife observation. Previous aerial surveys have shown Whooping Cranes feeding in these wetlands. Many other native and migratory birds use this site, along with a few alligators, deer, rabbits, bobcat, coyotes, and feral hogs. Aransas First also proposes placing a new 330 ft fence on the correct surveyed boundary line north from Seaside loop to better delineate the property boundary, allowing Aransas First to deviate former storm water drainage back to the wetland.

### **Project Objective**

1. Create a public access site to the south side of the 105-acre Aransas First property on Lamar Peninsula by constructing a parking area 30' x 80' off Seaside Loop.
2. Create a fenced mowed trail with a 36" entry swing gate reaching the edge of the deeper pond.
3. Create a walkable trail along the west side of the wetlands near a natural and old created berm, above the maximal water level for wildlife observation.
4. Place a new 330 ft fence on the correct surveyed boundary line north from Seaside loop.

## **Project #2135     Educational Signage for Leonabelle Turnbull Birding Center and Paradise Pond**

**Performing Organization:**     City of Port Aransas  
**Total Project Funding:**     \$5,000  
**CBBEP Bays Plan Actions:**     PEO-5, BTR-2, HLR-1

### **Background**

The City of Port Aransas Nature Preserve would like to provide museum quality educational placards on the new Leonabelle Turnbull Birding Center and at Joan and Scott Holt Paradise Pond. The signs would focus on bird identification, plant identification, insect identification, and the water cycle (15 signs total). The signs for the Birding Center were intended to be a part of the Boardwalk grant. However, added construction fees utilized the entire budget and signs have not been purchased. The Port Aransas Nature Preserve staff have collected some photographs from local photographers and are working to acquire more for use in the signs. The Nature Preserve has worked with Outburst Advertising on the design of other new signs within the Nature Preserve, so we would like to have them create the design for these signs and ensure consistent overall design with other Nature Preserve signage.

### **Project Objective**

The project will design, purchase, and install 15 educational signs in the City of Port Aransas Nature Preserve at the Leonabelle Turnbull Birding Center and Paradise Pond.

## **Project #2136     Bayside Kayak Launch and Bird Watching Gazebo**

**Performing Organization:**        Town of Bayside  
**Total Project Funding:**        \$23,000 (CBBEP = \$18,000; Town of Bayside = \$5,000)  
**CBBEP *Bays Plan* Actions:**    BTR-1, BTR-2

### **Background**

Ensuring public access to the Coastal Bend bays is critically important to maintaining the ecotourism economies of the coastal communities in the region. As communities in the Coastal Bend continue to grow and tourism increases, the pressure to provide public access is becoming an increasing issue. Well-planned and well-managed access areas will do much to curtail resource damage, while providing enough parks and facilities for the growing numbers of residents and visitors.

Although there are numerous existing public access sites within the Coastal Bend, there is still a need in some areas of the region to develop an appropriate number of new, well-managed sites in order to protect the coastal resources and ensure their longevity for future bay users. In Refugio County, there is a need to provide additional public access and nature-oriented tourism opportunities. The proposed project will allow CBBEP to collaborate with the Town of Bayside to provide public access to Copano Bay through the construction of a public kayak launch. The project will also enhance public access for residents and tourists by providing a boardwalk and gazebo for bird watching at the same site.

### **Project Objective**

The project will (1) install a public kayak launch to allow access to Copano Bay and (2) construct a boardwalk and gazebo for bird watching.



## **Project #2137    Texas Gulf Region Cooperative Weed Management Area: Dune Management and Restoration on Mustang Island**

**Performing Organization:**        CBBEP  
**Total Project Funding:**        \$75,000  
**CBBEP Bays Plan Actions:**      HLR-1, HLR-2, HLR-10

### **Background:**

Dunes provide critical habitat for wildlife and serve as defense for inland areas against storm surge and beach erosion by absorbing the impact of waves and the intrusion of water. Brazilian peppertree is an invasive, noxious, and prohibited species in Texas that negatively impacts dune habitats, as well as many other coastal environments. Through rapid and aggressive growth, as well as allopathic chemicals, the species quickly modifies and degrades the quality of dune habitats.

In 2014, the Texas Gulf Region Cooperative Weed Management Area (CWMA) received a grant through the National Fish and Wildlife Foundation to establish the organization and develop a Brazilian peppertree management plan. Since that time, the CWMA has expanded to include 9 partners and over 30 participating members, including representatives from the City of Port Aransas, Nueces County, Texas Parks & Wildlife Department, Texas Forest Service, US Fish & Wildlife Service, Coastal Bend Bays & Estuaries Program (CBBEP), Mission-Aransas Reserve/University of Texas Marine Science Institute (UTMSI), University of Texas at Austin Lady Bird Johnson Wildflower Center (LBJWC), and members of the community. The CWMA has reached over 3,000 landowners within the boundary; completed 14 volunteer workdays; removed Brazilian peppertree from over 200 acres; and improved management on over 9,000 acres of public and managed lands.

The CWMA has currently 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 (i.e., Nueces County, UTMSI). This project will not only advance the local Brazilian peppertree management efforts of the CWMA, but to go a step further, and focus on the restoration of dune habitats that are currently highly impacted by the invasion of Brazilian peppertree. CBBEP is an active member of the CWMA and is committed to working with other members to prevent the spread and movement of invasive species and restore native habitats.

### **Project Objective:**

For this project, CBBEP and the CWMA will remove Brazilian peppertree from an impacted dune habitat on Mustang Island and also begin the dune restoration process by replanting and/or reseeding treated areas. This restoration will provide habitat and dune stabilization, while also preventing the reintroduction of peppertrees by limiting the germination of seeds that are otherwise easily dispersed. Another goal of the CWMA effort is to educate the community on the importance of Funding will also support the purchase of supplies needed for community workdays and educational events.

## **Project #2138    Tern Island Protection and Restoration – Phase 1**

**Performing Organization:**        CBBEP  
**Total Project Funding:**        \$125,000  
**CBBEP Bays Plan Actions:**       HLR-1, HLR-2

### **Background:**

Tern Island is a rookery island located in the upper Laguna Madre near Corpus Christi, Texas. The Island is approximately 1.65 acres in size and is an active rookery island that supports large numbers of nesting colonial waterbirds like pelicans, egrets, skimmers, and terns. However, erosion of the eastern shoreline of the Island is causing the on-going loss of this critical rookery island habitat. The decline of colonial waterbird populations in the Coastal Bend region is directly related to the loss of important islands, such as Tern Island, that provide important nesting habitat.

Currently, the eastern edge of Tern Island is experiencing erosion from continuous wave and wind action. Erosion and loss of 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 in the near future. Protection of Tern Island from ongoing erosion and future sea level rise will help conserve and enhance an important rookery, making this a high priority for CBBEP. The importance of protecting Tern Island was also recognized in the 2019 Texas Coastal Resiliency Master Plan. "Tern Island and Triangle Tree Island Rookery Habitat Protection" is a Tier 1 project in the 2019 Plan.

CBBEP is proposing to address erosion problems at Tern Island by constructing a structure that will protect the Island from wind and wave action and will help the Island be more resilient to sea level rise. The structure will also be designed to trap and secure sediment from future dredge placement events. The proposed rookery island protection project will be implemented in three phases. The Coastal Bend Bays & Estuaries Program has received funding from the Texas General Land Office, Coastal Management Program for Phase 1 of the project will include completion of a feasibility study and alternatives analysis by a qualified engineering firm.

### **Project Objective:**

The primary objective of this project is to complete the feasibility study and alternatives analysis of shoreline protection options at Tern Island Rookery. Once additional phases are implemented, this will ultimately protect, enhance, and expand the amount of nesting habitat available for numerous species of colonial waterbirds.

## **Project #2139    CBBEP Coastal Bird Program: Gulf Connections Phase IV – Revealing Critical Nodes and Pathways for the Conservation Coastal Birds**

**Performing Organization:**        CBBEP Coastal Bird Program  
**Total Project Funding:**        \$40,000  
**CBBEP Bays Plan Actions:**       HLR-1, HLR-4

### **Background:**

The Gulf of Mexico supports a huge diversity of birds that depend on healthy coastal environments, and that are connected to distant and often unknown locations through migration. These funds support expansion of ongoing research into two species of concern – the Red Knot and Black Skimmer. Previous phases of this project have led to breakthroughs in understanding of migratory connectivity and are leading to management actions that can be implemented to better conserve them.

Over two decades the Coastal Bird Program’s research has led to better understanding of potential causes in the decline of Black Skimmers in Texas. We have determined that southern Mexico and the Pacific coast of Central America is a critically important wintering area for northern Gulf skimmers, and that nesting failures are probably the strongest contributing factor to the overall decline in populations. Our recent deployments of 12 solar GPS devices is providing data on important habitat and movement patterns with extremely high spatial and temporal precision, while our monitoring is providing new insight into nest site abandonment and failures. In addition to deploying 3 new GPS tags on skimmers next season, we will be relocating birds with previously deployed devices to download a full year’s worth of high-resolution data we will share with partnering organizations in other parts of range to develop better conservation practices there.

Our research on Red Knots has provided a wealth of information on the use of the western Gulf by this species, but a few significant gaps remain. Knots coming through Texas depend heavily on the Laguna Madre and barrier islands, but data from adjacent Tamaulipas is nonexistent. We also know many birds coming through Louisiana in spring spend winter in Central or South America, but we do not know what specific habitats they are using, how they use them, or even where they breed. In addition to continued geolocator recovery efforts, we will deploy up to 30 new GPS tags that transmit data via satellite to help us fill in these important gaps.

### **Project Objectives:**

The primary project objective is to extend research efforts related to Black Skimmers and Red Knots in order to define specific ground-level conservation measures that can benefit both species.

## **Project #2140    CBBEP Coastal Bird Program – Donation**

**Performing Organization:**      CBBEP Coastal Bird Program  
**Total Project Funding:**        \$100,000  
**CBBEP Bays Plan Actions:**    HLR-1, HLR-2, HLR-4

### **Background:**

This contribution will allow the Coastal Bird Program to substantially increase habitat management efforts for colonial nesting waterbird sites throughout the Coastal Bend. In addition to ongoing habitat improvement on sites in the Upper Laguna Madre and Redfish Bays, much of the work will focus on establishing optimal vegetation on the newly-restored islands in Nueces Bay.

### **Project Objectives:**

1. Continue the restoration efforts of coastal bird populations through management of colonial waterbird nesting sites, including habitat enhancement, protection, and predator control, and by reducing anthropogenic impacts to coastal birds.
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 changes in coastal bird populations for management purposes.
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 #2141    CBBEP Coastal Bird Program: A Genetic Investigation of Non-breeding Population Structure of Red Knots in the Americas**

**Performing Organization:**        CBBEP Coastal Bird Program  
**Total Project Funding:**        \$26,000  
**CBBEP *Bays Plan* Actions:**    HLR-4

### **Background:**

Data from recent tracking and isotope studies has indicated that there is genetic structuring that ties Arctic breeding grounds to wintering areas of Red Knots. This has implications for effective population size and the consequences of management actions and susceptibility to catastrophic events. Funds will support an analysis of genetic structuring of the three subspecies of Red Knots that breed in the North American Arctic and elucidate the degrees of isolation between populations in different parts of the Arctic. The Coastal Bird Program is participating in collaboration with US Fish and Wildlife Service, the University of Groningen, and partners from other regions.

### **Project Objectives:**

The primary project objective is to analyze the genetic structuring of three subspecies of Red Knots that breed in the North American Arctic in order to better understand potential consequences of management actions and catastrophic events.



## PROGRAM ADMINISTRATION

CBBEP administrative staff (7 FTE's) will provide organizational and logistical support for the Bays Council and subcommittee meetings, and coordinate/communicate as necessary with appropriate groups, including stakeholder groups, state/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 (19 FTE's) 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 be used to support continued Program implementation, evaluation, and reporting. Funds are also necessary to provide logistical support for the Bays Council and subcommittee 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, 2020, the Coastal Bend Bays & Estuaries Program will begin Year 22 of implementing the *Coastal Bend Bays Plan*. This FY 2021 Work Plan describes the proposed work to be initiated during FY 2020. Of the total funds identified in the Work Plan budget, \$662,500 are new (FY 2021) EPA federal funds; \$753,295 are new (FY 2021) TCEQ funds; \$11,731,209 are new (FY 2021) project-specific funds; and \$1,071,490 are new (FY 2021) local partner/federal court interest funds. The total budget for this FY 2021 Work Plan is \$14,218,494.

**TABLE 1. FY 2021 Comprehensive Annual Work Plan Outline.**

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY21 CWA 320 & GOMP	TCEQ FY20 (CF), TCEQ FY21, 604b & 319	LOCAL / INVESTMENTS	TGLO	MISC GRANTS	USFWS & NOAA	NFWF	TOTAL CBBEP FUNDING
2101	Coastal Waterbird Management	HLR-1 HLR-4	CBBEP CBP	128,825				45,000	7,472		181,297
2102	Delta Discovery	BTR-1 PEO-2 PEO-3 PEO-5	CBBEP DD	165,683		59,019		28,000			252,702
2103	Outreach to Wastewater Treatment Plants in Baffin Basin	WSQ-1 NPS-1 BTR-1 PH-1 HLR-2	Nueces River Authority	25,000	9,744						34,744
2104	Connecting Communities in the Oso Bay/Oso Creek Watershed	WSQ-1 WSQ-5 FW-1 PH-1 PEO-1 PEO-2 PEO-3 PEO-4 PEO-5 BD-1	Center for Coastal Studies, TAMU-CC		4,000						4,000
2105	Baffin Bay Water Quality Monitoring	WSQ-3	TAMU-CC					50,000			50,000
2106	Outdoor Classrooms	PEO-3 PEO-5	CBBEP						10,000		10,000
2107	Up2U Litter Campaign	BD-1 PEO-5	CBBEP, Nueces River Authority	422,857							422,857
2108	CBBEP Community Outreach Partnerships	PEO-1 PEO-2 PEO-3 PEO-4 PEO-5	Coastal Bend Bays Foundation		7,000	23,000					30,000

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PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY21 CWA 320 & GOMP	TCEQ FY20 (CF), TCEQ FY21, 604b & 319	LOCAL / INVESTMENTS	TGLO	MISC GRANTS	USFWS & NOAA	NFWF	TOTAL CBBEP FUNDING
2109	CBBEP Property Management	HLR-1	CBBEP			105,000					\$105,000
2110	Oso Bay/Oso Creek Watershed Model & Outreach and Education	PEO-3 PEO-5 WSQ-1	TAMU-CC, Nueces River Authority, CBBEP		12,710			26,000			\$38,710
2111	Nueces Delta Environmental Monitoring	FW-1 FW-2 FW-3 FW-4 HLR-1 HLR-2	Conrad Blucher Institute		32,194						\$32,194
2112	Port Aransas Nature Preserve - Clay's Hill & Charlie's Pasture Habitat Enhancement	HLR-1 HLR-2 PEO-1	City of Port Aransas		16,000						\$16,000
2113	Water Quality Status & Trends	WSQ-3 WSQ-5 NPS-4 HLR-8 FW-1	Harte Research Institute		36,532						\$36,532
2114	CBBEP Public Outreach Events & Activities	PEO-1 PEO-2 PEO-3 PEO-4 PEO-5	CBBEP			36,450					\$36,450
2115	Benchmarking Community Structure of Nekton Near the Aransas Pass Inlet	HLR-1 HLR-3 HLR-6 HLR-7 WSQ-4	TAMU-CC			28,582					\$28,582

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PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY21 CWA 320 & GOMP	TCEQ FY20 (CF), TCEQ FY21, 604b & 319	LOCAL / INVESTMENTS	TGLO	MISC GRANTS	USFWS & NOAA	NFWF	TOTAL CBBEP FUNDING
2116	Waters for Wildlife: Increasing Freshwater Resources for Whooping Cranes	HLR-1 HLR-2	San Antonio Bay Partnership		16,145						\$16,145
2117	Triangle Tree Rookery Island Protection	HLR-1 HLR-2	CBBEP				1,596,000		24,000		\$1,620,000
2118	Reduction of Ghost Fishing from Derelict Blue Crab Traps on the Mid-Texas Coast	HLR-1 HLR-4	CBBEP & San Antonio Bay Partnership						104,931		\$104,931
2119	Causeway Rookery Island Protection & Restoratoin	HLR-1 HLR-2	CBBEP				2,712,000		28,000		\$2,740,000
2120	Vulnerability Assessment of Cropus Christi & Nueces Bay	FW-1 BTR-3 MC-1 HLR-1 WSQ-1	Harte Research Institute		63,500						\$63,500
2121	Mapping Distribution & Chemical Levels of Nurdles in the Coastal Bend	WSQ-3	University of Texas Marine Science Institute		78,000						\$78,000
2122	Management of Brazilian Peppertree in and Around Port Aransas	HLR-1 HLR-2 HLR-10	CBBEP & University of Texas Marine Science Institute					23,200			\$23,200



**TABLE 1. FY 2021 Comprehensive Annual Work Plan Outline.**

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY21 CWA 320 & GOMP	TCEQ FY20 (CF), TCEQ FY21, 604b & 319	LOCAL / INVESTMENTS	TGLO	MISC GRANTS	USFWS & NOAA	NFWF	TOTAL CBBEP FUNDING
2123	Gulf Coast Conservation Initiative	HLR-1 HLR-2	CBBEP						326,000		\$326,000
2124	LLM Bird Conservation	HLR-1 HLR-2	CBBEP CBP					100,000			\$100,000
2125	Planktonic Larval Fin & Shellfish Ingress & Vertical Distribution in the Aransas Pass Inlet System	HLR-1 HLR-2 HLR-4	TAMU-CC			29,916					\$29,916
2126	Development, Verification, & Implementation of an eDNA Detection Assay for Diamondback Terrapins in the Texas Coastal Bend	HLR-1 HLR-2 HLR-4	TAMU-CC		31,858						\$31,858
2127	Nueces County Youth Water Awareness Day	PEO-1 PEO-2 PEO-3	Texas A&M AgriLife, City of Corpus Christi, & Natural Resources Conservation Service			4,631					\$4,631
2128	Public Access Enhancement at New Indian Point Park Pavilion	PEO-5 BTR-2 HLR-1	CBBEP & City of Portland					15,000			\$15,000
2129	Nueces Delta Shoreline Protection	HLR-1 HLR-2 HLR-4	CBBEP							3,191,793	\$3,191,793

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PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY21 CWA 320 & GOMP	TCEQ FY20 (CF), TCEQ FY21, 604b & 319	LOCAL / INVESTMENTS	TGLO	MISC GRANTS	USFWS & NOAA	NFWF	TOTAL CBBEP FUNDING
2130	Protection & Restoration of Matagorda Island West Marsh, Aransas National Wildlife Refuge	HLR-1 HLR-2	CBBEP				2,000,000				\$2,000,000
2131	Midcontinent Shorebird Conservation Initiative	HLR-1 HLR-2 HLR-4	CBBEP CBP						79,500		\$79,500
2132	Mission River Delta Land Aquisition	HLR-1	CBBEP							599,183	\$599,183
2133	Nutrient Sampling in Petronila Creek	WSQ-3	Nueces River Authority		31,000						\$31,000
2134	Parking Lot & Trails to Burton Lamar Preserve Wetlands	BTR-3	Aransas First Land Trust		15,000						\$15,000
2135	Educational Signs for Leonabelle Turnbull Birding Center & Paradise Pond	PEO-5 BTR-2 HLR-1	City of Port Aransas		5,000						\$5,000
2136	Bayside Kayak Launch & Bird Watching Gazebo	BTR-1 BTR-2	Town of Bayside		18,000						\$18,000
2137	Texas Gulf Region Cooperative Weed Management Area: Dune Management and Restoration on Mustang Island	HRL-1 HLR-2 HLR-10	CBBEP		23,000		45,000	7,000			\$75,000

**TABLE 1. FY 2021 Comprehensive Annual Work Plan Outline.**

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY21 CWA 320 & GOMP	TCEQ FY20 (CF), TCEQ FY21, 604b & 319	LOCAL / INVESTMENTS	TGLO	MISC GRANTS	USFWS & NOAA	NFWF	TOTAL CBBEP FUNDING
2138	Tern Island Protection & Restoration - Phase 1	HLR-1 HLR-2	CBBEP		12,000	38,000	75,000				\$125,000
2139	Gulf Connections Phase IV - Revealing Critical Nodes & Pathways for the Conservation Coastal Birds	HLR-1 HLR-4	CBBEP CBP					40,000			\$40,000
2140	Coastal Bird Program Increased Habitat Management	HLR-1 HLR-2 HLR-4	CBBEP CBP					100,000			\$100,000
2141	CBP Genetic Investigation of Non-Breeding Population Structure of Red Knots in the Americas	PEO-3 HLR-1 HLR-2	CBBEP CBP						26,000		\$26,000
<b>TOTAL FUNDING</b>				<b>\$742,365</b>	<b>\$411,683</b>	<b>\$324,598</b>	<b>\$6,428,000</b>	<b>\$434,200</b>	<b>\$605,903</b>	<b>\$3,790,976</b>	<b>\$12,737,725</b>
Administrative			CBBEP	355,364	416,515	337,569	12,527	213,106	119,262	26,426	\$1,480,769
<b>TOTAL FUNDING</b>				<b>\$1,097,729</b>	<b>\$828,198</b>	<b>\$662,167</b>	<b>\$6,440,527</b>	<b>\$647,306</b>	<b>\$725,165</b>	<b>\$3,817,402</b>	<b>\$14,218,494</b>