FY 2020 Comprehensive Annual Work Plan

COASTAL BEND BAYS & ESTUARIES PROGRAM

Protecting our bays and estuaries

FY 2020
Comprehensive Annual Work Plan

Approved by
CBBEP Board of Directors
August 22, 2019

Coastal Bend Bays & Estuaries Program
615 North Upper Broadway, Suite 1200
Corpus Christi, Texas 78401

www.cbbep.org

COASTAL BEND BAYS & ESTUARIES PROGRAM

FY 2020 Comprehensive Annual Work Plan

TABLE OF CONTENTS

I. Introduction

History

In its 1987 reauthorization of the Water Quality Act, the U.S. Congress established the National Estuary Program (NEP) to promote long-term planning and management of nationally significant estuaries threatened by pollution, development, or overuse. The Administrator of the Environmental Protection Agency (EPA) was given authority to convene Management Conferences and to award Federal financial assistance grants to approved state programs for the purpose of developing and implementing a Comprehensive Conservation and Management Plan (CCMP). The Act defines criteria by which Management Conferees are charged with balancing the conflicting uses in target estuaries, while restoring or maintaining their natural character.

The Coastal Bend Bays & Estuaries Program (formerly the Corpus Christi Bay National Estuary Program) was formally established in October 1993 with committee meetings beginning in late 1993. The CBBEP was one of the first NEPs to use a streamlined approach to the development of a CCMP. The goal of the CBBEP to complete a Preliminary CCMP within 12 to 18 months (from 09/01/94) and a final CCMP (*Coastal Bend Bays Plan)* in approximately four years (by September 1998) was achieved.

A State-EPA Management Conference Agreement detailing this and other specific outputs of the four-year program was signed in May 1994 by the Regional Administrator of the EPA and the Chairman of the State-lead agency for the Program, the Texas Natural Resource Conservation Commission (now the Texas Commission on Environmental Quality – TCEQ). The CBBEP had been established since December 1993 as a program of the TCEQ. In 1999, CBBEP became a non-profit organization to lead implementation.

CBBEP Operations

The 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 priority Issues for the CBBEP are:

- Alteration of Freshwater Inflow into Bays and Estuaries
- Condition of Living Resources
- Loss of Wetlands and Estuarine Habitats
- Degradation of Water Quality
- Altered Estuarine Circulation
- Bay Debris
- Selected Public Health Issues

The *Coastal Bend Bays Plan* has been developed to address each of these priority issues under the following categories of action plans: Human Uses; Maritime Commerce and Dredging; Habitat and Living Resources; Water and Sediment Quality; Freshwater Resources; and Public Education and Outreach. The projects selected for implementation under this Cooperative

Agreement reflect a combination of priority and readiness or feasibility for implementation. Implementing Partners for other actions of the *Bays Plan* will likewise be called upon to begin and continue to implement their own portions of the Plan. The role of Program staff is multi-faceted, but will include at a minimum the following tasks: (1) acquire, manage, and disperse funds to implement the *Bays Plan*; (2) develop and implement partnership projects with local governments, state and federal agencies, and private organizations; (3) monitor, track, and report on implementation performance by implementing partners, and work to maintain implementation commitments; and (4) coordinate the environmental monitoring and assessment of *Bays Plan* implementation effectiveness.

Work Plan Development

The FY 2020 Comprehensive 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 "public education and outreach" chapter of the *Bays Plan*, will continue to guide public participation efforts in the *Bays Plan* implementation. The list of Priority Issues, refined through public input and characterization projects will continue to serve as the focus for implementation.

II. Starting Date

The starting date for this FY 2020 Comprehensive Work Plan will be September 1, 2019.

III. Federal and State Program Coordinators and Project Officers

Federal
Mr. Doug Jacobson
CBBEP Program Coordinator
U.S. EPA Region 6
Marine and Wetlands Section (6WQ-EM)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Ms. Teresita Mendiola
CBBEP Project Officer
U.S. EPA Region 6
Office of State & Tribal Program Section (6WQ-AT)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

State
Mr. Cory Horan
CBBEP Program Coordinator
Texas Commission for Environmental Quality
P.O. Box 13087, MC 203
Austin, TX 78711-3087

IV. 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 2019, 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, NGOs, and state and federal agencies. The CBBEP Bays Council continues to support the priorities as listed in the *Bays Plan*.

In 2019 the CBBEP implemented numerous projects aligned with the goals and objectives of EPA's *Strategic Plan and Government Performance and Results Act*. These projects include well-defined outputs and outcomes.

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 FY 2016, FY 2017, FY 2018 and FY 2019, as allowed by the funding entity.

The project implementation teams continue to identify, initiate and select project ideas for inclusion in the Program work plans. The teams are: Habitat & Living Resources Team, Human Uses Team; Maritime Commerce & Dredging Team; Water & Sediment Quality Team; and Environmental Education & Outreach Team. The *Bays Plan* 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 reviews and proposes update recommendations to the *Bays Plan*.

V. Goals for FY 2020

The overarching goal for FY 2020 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 Team; Maritime Commerce and Dredging Team; Water & Sediment Quality Team; and Environmental Education & Outreach Team. The CBBEP Coordination Team, consisting of all the chairs of the Implementation Teams and key members of the Conference, coordinates the annual work plan recommendations to the CBBEP Board of Directors, and reviews and proposes update recommendations to the *Bays Plan.*

VI. Statement of Competency

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 that 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 Agency and can demonstrate this through the following commitment:

"Competency for generating environmental measurement data under USEPA 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."

VII. Implementation of Projects

Project activities for FY 2020 have been selected for their contribution towards implementation of the *Coastal Bend Bays Plan*. Twenty-four projects will be implemented in FY 2020. A comprehensive list of projects outlining project numbers, titles, action items, performing party(s), and budget can be found in Table 1: FY 2020 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.*

VIII. 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 FY20 are as listed below:

Project 2001 CBBEP Coastal Bird Management

Performing Organization: **CBBEP**
Total Project Funding: **$253,655**
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 CBBEP Colonial Waterbird projects from previous years through the continued implementation and improvement of specific management actions from the *CBBEP Colonial Waterbird Rookery Island Management Plan*. This plan outlines habitat management actions such as planting and establishing native shrubs, removing exotic/invasive vegetation, building artificial nest platforms, and removing nest predators as needed throughout the year. With approximately 60 islands to manage, the CBBEP will continue to strive to develop and improve more efficient and effective methods of habitat management on rookery islands. All habitat management actions such as planting native vegetation and removing exotic/invasive vegetation will be completed by February 1, as this is the beginning of the waterbird nesting season. Predator management will be conducted 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, where appropriate, in efforts to assess changes in populations, current wintering and migratory movements, and important areas of habitat for non-breeding coastal species. The timeline for these efforts will depend on the seasonality of the non-breeding species, but will begin September 1, and be completed by June 15.

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

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 events, and other forms of public communications such as the distribution of flyers, regular updates on social media, interviews with local news agencies, and with the regular engagement of volunteers. Public outreach efforts will take place throughout the year.

Project Objectives:

- 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.
- Develop and implement public education and outreach programs that promote awareness and stewardship of coastal birds and their habitats.
- Assist partners in efforts to observe changes in coastal bird populations for management purposes.
- 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.
- 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 2002 Delta Discovery

Performing Organization: **CBBEP**
Total Project Funding: **$259,179**
CBBEP *Bays Plan* Actions: **BTR-1, PEO-2, PEO-3, PEO-5**

Background:
Delta Discovery has become the tagline for our entire education program. The educational program cost consists of the following:

- Salary and continued training of CBBEP environmental educators & part time Teacher Naturalists.
- Supplies and facility expenses Nueces Delta Preserve educational (utilities, custodial and equipment.
- Bus funding for field trips.
- Supplies and food for teacher workshops

Teacher Workshops: CBBEP Environmental Educators will facilitate workshops throughout the school year. These workshops will address local environmental science topics and will align to the TEKS objectives. Participating teachers will receive SBEC credits. The workshops focus on equipping teachers with the skills, curriculum, support, and materials to strengthen science teaching as it relates to the environmental treasures of the Texas Coastal Bend. Partnering throughout the year would allow the CBBEP to introduce environmental issues to teachers who may not be able to dedicate time in the summer to workshops. The funding provides all fees for partnering, curriculum, and substitute teachers in order for these workshops to occur on weekdays. During the summer, the CBBEP partners with other successful educational programs to provide teachers the tools needed to successfully teach science and promote student awareness of local ecology and environmental issues affecting the bays and estuaries. CBBEP provides up to three free summer workshops per year

Fieldtrips: Many of the students that are being exposed to scientific concepts for the first time have never spent much time outdoors CBBEP Environmental Educators provide field trip opportunities for teachers and students to visit the Nueces Delta Preserve. The cross-curricular trip may to be organized by the teacher, with assistance from the Environmental Educator, to create an educational TEKS-aligned agenda for outdoor education. This program sees over 8000 students per school-year. The goal is to plant seeds of appreciation and passion for a new generation of naturalists, biologists, and nature lovers to protect and preserve the Coastal Bend through educating school children about preserving our environment and protecting our animal and plant life.

Home School Days: Home School families often request field experiences, yet have difficulty meeting our minimum student quota for the day. To better serve this audience, we offer five home school experience days to allow home school families and their students an opportunity to connect their classroom science curriculum to the natural world of the Coastal Bend using both place based and discovery education.

Delta Discovery Days: CBBEP will host ten Delta Discovery Days. These hands-on “picnic days” provide families 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 facilitates learning activities throughout the four-hour picnic.

Nature Story Time: CBBEP will host fourteen nature story times. These programs are geared for 2-5 year olds and introduce children to nature and the joys of reading through stories, crafts, and outdoor play. Children and their families will explore and connect with the estuary and its inhabitants.

Project Objectives:
- 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.
- 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 2003 Nutrient Sampling in Petronila Creek

Performing Organization: **Nueces River Authority**
Total Project Funding: **$40,722**
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 for a period of one year 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 2004 Connecting Communities in the Oso Bay/Oso Creek Watershed

Performing Organization:	**Center for Coastal Studies at TAMUCC**
Total Project Funding:	**$4,000**
CBBEP Bays Plan Actions:	**PH-1, WSQ-1, WSQ-5, FW-1, PEO-5**

Background:

Staff from the Center for Coastal Studies at Texas A&M University–Corpus Christi have been working with stakeholders since 2013 to develop a plan for water quality improvements in the Oso Bay/ Oso Creek Watershed (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 Texas A&M University-Corpus Christi (TAMUCC), 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 will give the Islander Stream Team latitude to move out into the rural areas of the Oso Watershed and help build relationships with the Colonias communities.

The data collected by the Islander Stream Team is submitted to the Center for Coastal Studies at Texas A&M University-Corpus Christi, which is the hub for the Coastal Bend Regional Stream Team. The Center for Coastal Studies takes the water quality data through Quality Assurance/ Quality Control (QAQC) measures before final submission to the Texas Stream Team database. Our partner, the Nueces River Authority supported the formation of the Islander Stream Team by purchasing kits, standards, refractometers, buckets, and other supplies needed for the students to sample.

The funding will support the Islander Stream Team by allowing the team to continue to expand their sampling activities to the rural areas of the Oso Watershed and connecting with the Colonias communities. Funds would also be used to purchase standards and water quality kits. The Islander Stream Team, with the help of the Center for Coastal Studies, will build relationships and communication with the Colonias communities using water quality monitoring as the foundation. Breaking the barrier between urban and rural watershed communities and building a strong relationship with the Colonias community is vital for the Oso Watershed TMDL and I-Plan process currently in progress by TCEQ. The Islander Stream Team would be our conduit to connect the rural Oso Creek Colonias communities with the urban communities along Oso Bay. This plan to connect communities in the Oso Watershed is essential and key to a successful I-Plan for Oso Bay and Oso Creek. This will be accomplished by visiting rural grade-schools and giving students hands on education about water quality using standard LaMotte Kits and visiting the Colonias communities and talking with them about water quality. Building and growing communities in the Oso Watershed to protect our water is the ultimate goal of this project.

Project Objective:

The project objective is to continue and expand water quality outreach and build relationships with residents in the rural Colonias areas and urban communities of the Oso Bay/Oso Creek Watershed (Oso Watershed).

Project 2005 Quantifying Septic Effuent Nitrogen Loading and Processing in the Baffin Bay Watershed

Performing Organization: **TAMU-CC**
Total Project Funding: **$51,750**
CBBEP Bays Plan Actions: **WSQ-3, NPS-3, FW-1**

Background:
The Baffin Bay watershed is 2,177,965 acres and contains three tributaries: Petronila, San Fernando, & Los Olmos creeks. There currently are impairments on two tributaries (Petronila Creek, San Fernando Creek), and ongoing water quality degradation has been documented in Baffin Bay (e.g., prolonged brown tide events). The watershed is primarily rural and privately owned.

The purpose of this project is to provide an estimate of septic system effluent nitrogen (N) loading and processing in the Baffin Bay watershed. Septic systems provide a cost-effective means of wastewater disposal in rural areas lacking access to a centralized wastewater treatment facility, however septic system effluent can lead to groundwater quality decline and increased N loading to coastal waters. Due to the anaerobic conditions in septic systems, a majority of N in the effluent exists as ammonium (NH4+) (70 to 90%) and dissolved organic N (DON) (10 to 30%). The effluent is discharged to the surrounding natural soils and ideally the N is processed to harmless forms of N (e.g. N2). However, depending on the physical and chemical properties of the natural soils and the depth of the water table, bioavailable forms of N (e.g. NH4+, NO3-) can infiltrate the groundwater and subsequently be delivered to coastal waters. Increased bioavailable N loading to coastal waters can cause detrimental effects including eutrophication and harmful algal blooms. There are ~63,000 septic systems in the 18 counties of the Texas coastal zone and there is a lack of knowledge of how the septic systems located in the Baffin Bay watershed may be contributing to coastal N loading. Porewater NH4+ in Baffin Bay is an order of magnitude higher than other S. Texas estuaries and this may be partially due to unprocessed septic system effluent infiltrating the groundwater. In order to develop informed mitigation strategies to decrease the harmful effects of N loading in the region, it is necessary to understand the significance of each N source contribution.

Project Objective:
This project will address the significance of septic N loading to the Baffin Bay watershed through three (3) objectives:

- Quantify nitrogen species in septic system effluent and groundwater
- Characterize transport and processing of nitrogen species to groundwater
- Provide a first estimate of septic system derived N load processing in the Baffin Bay Watershed using Soil Treatment Unit Model

.

Project 2006 Outdoor Classrooms

Performing Organization: **CBBEP & USFWS**
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.

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 2007 Hurricane Harvey Debris Removal – CBBEP Tracts, Holiday Beach

Performing Organization: **CBBEP**
Total Project Funding: **$100,000**
CBBEP *Bays Plan* Actions: **BD-2**

Background:
Coastal Bend Bays and Estuaries Program's (CBBEP) Holiday Beach property is a low-lying wetland habitat area and consists of coastal marsh transitioning to estuarine marsh and sand flats. The debris present consists of construction and housing materials and household items and is a result from the strong hurricane winds and tidal storm surge of Hurricane Harvey. The highest points in elevation found on the property, mesquite tree mots, represent approximately 8 acres of dense debris fields. The remaining 170 acres has mostly scattered debris.

Success at this project site would consist of debris removal from the entire 170 acres, with minimal to no long-term impacts to the existing sensitive habitats. Most of the 170 acre area will need to be handpicked or accessed by utility vehicles. The debris that landed on higher elevations will be primarily removed by machines. Removal techniques will include mechanical grapple, trailers, ATV/UTV, airboats, drone technology, and hand picking. Paid contractors and volunteers will all be relied upon to assist in the removals. Debris will be hauled off to a permitted landfill. The debris is currently covering plants and feeding areas that wildlife depends on. If left in place it could decrease abundance and diversity of plant species found on the properties. Some of the debris is likely to be hazardous to wildlife and marine resources. Landowners surrounding the property will be engaged and encouraged to participate as they directly benefit by living adjacent to these natural areas. CBBEP will engage the Holiday Beach Property Owners Association about projected timelines and volunteer opportunities. No permits are known to be required for this project area.

Project Objectives:
- Remove and dispose of debris from CBBEP owned properties located in the Holiday Beach area of Aransas County.
- Pre and post assessment of the area using drone technology.
- Post assessment of the property once debris has been removed. Document any damage to the property and implement necessary restoration actions.

Project 2008 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 and PEO-5**

Background:
As stated in the *Coastal Bend Bays Plan,* CBBEP is constantly working to promote public/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:
- Host, organize and coordinate turnkey operation of Earth Day festival.
- Host organize and coordinate CBBF Conservation and Environmental Stewardship Annual Awards Banquet.
- Conduct Coastal Issues Forums to increase communications between resource managers, users and general public.
- Organize and coordinate bay-resource/related workshops with CBBEP's approval.
- Continue to seek matching and/or leveraging funds.

Project 2009 CBBEP Property Management

Performing Organization: **CBBEP**
Total Project Funding: **$118,000**
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 a wildlife observation area, and establishing routine mowing of common areas and roadways.

Objectives:
- To provide the required ongoing maintenance and management of properties owned by Coastal Bend Bays & Estuaries Program.
- Purchase of replacement mower deck for use in vegetation maintenance and manipulation. Including mowing of roadways, fence lines, trails, and fireguards.
- Replace approximately 3.6 miles of perimeter fence.

Project 2010 Functionality of Oso Bay Wind Tidal Flats

Performing Organization: **Texas A&M University-Corpus Christi**
Total Project Funding: **$25,270**
CBBEP Bays Plan Actions: **HLR-1, HLR-2, HLR-4, SM-1, FW-1**

Background:
The purpose of this project is to evaluate the effects of ongoing changes in the hydrodynamics of Oso Bay to tidal flat productivity. Wind-tidal flats in the Texas Coastal Bend are preferred shorebird foraging habitat and provide critical food resources during a stressful part of annual cycle, migration and winter at the Oso Bay flats around Ward Island are designated critical habitat of endangered/threatened Piping Plover; about half of the continental population of the species winters in Texas. Many other shorebirds use Oso Bay tidal flats. More than 50% of the historical extent of wind-tidal flats in the Coastal Bend have already been lost, largely due to relative sea-level rise which converts flats to either permanently submerged habitat, or vegetated habitat. From the standpoint of tidal flat functionality as shorebird foraging habitat, increasing vegetation on the Blind Oso wind-tidal flats is one of the most damaging effects of the alterations to hydrology that have occurred over the last 40+ years. Vegetated habitats, especially those with water depths that exceed 1-2 cm are not suitable habitat for foraging shorebirds. Increased wastewater outflow will continue and hasten expansion of marsh vegetation on the flats, particularly the flat in the Blind Oso, which will result in reduced suitability of the tidal flats around Ward Island as shorebird habitat.

Project Objectives:
- Compile and review the recent literature on biotic and abiotic process and dynamics related to wind-tidal flats in Oso Bay
- Map the current extent of marsh vegetation in Oso Bay from SPID to Ward Island (excluding NAS) and characterize its species composition
- Evaluate the functionality of the tidal flats using the method developed in Withers and Tunnell (1998), a project that was funded by the CCBNEP (now CBBEP).

Project 2011 Nueces Delta Environmental Monitoring Project

Performing Organization: **Conrad Blucher Institute**
Total Project Funding: **$60,644**
CBBEP Bays Plan Actions: **FW-1, FW-2, FW-3, FW-4**

Background:
The purpose of this project is for the Conrad Blucher Institute to continue to maintain 3 current real-time salinity monitoring stations along the Rincon Bayou, and a fourth station at "South Lake" and continue to maintain a tide gauge in west Nueces Bay in order to characterize freshwater inflows into the Nueces Delta. Salinity sensors along the Nueces Delta will be used to trace freshwater inflows from freshwater pumping events via the Rincon Bayou Pipeline from the Nueces River and will report water temperature, conductivity, and salinity every 30 minutes. Data from these salinity stations will be used to aid in the development of management strategies for the Rincon Bayou Pipeline. The Center for Coastal Studies, the Harte Research Institute at TAMUCC use the salinity data provided from the salinity stations to support various projects involving sampling in the Nueces Delta. Data from these salinity stations are also utilized by the University of Texas (UT) at Austin and the UT Marine Science Institute in Port Aransas to support various modeling projects which are investigating the interactions between water in sediment and tidal creeks in the Nueces Delta. The Nueces Delta Hydrodynamic Model being conducted by UT also utilized the tide gauge data in the western Nueces Bay. Several Texas Water Development Board funded projects have and currently are utilizing the available data. A weather station will also be maintained in the Nueces Delta and will provide air temperature, wind, precipitation, barometric pressure, relative humidity, and solar radiation data. All data will be available to the public on the contractor's webpage.

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, did much freshwater make it into the delta proper. To provide more freshwater diversions during normal flow conditions, the City of Corpus Christi built a 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 primary project objectives will be to continue monitoring the freshwater inflows coming into the delta via the pipeline by recording salinities within the water column at various stations along the Rincon Bayou and within the Nueces Delta, as well as to maintain a real-time weather station and a tide gauge in Nueces Bay for the period of one year. These instruments will be used to calculate spatial and temporal environmental effects as well as the amount of freshwater needed to manage a healthier estuary.

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 2012 City of Port Aransas Nature Preserve – New Trail Connection/Boardwalk

Performing Organization: **City of Port Aransas**
Total Project Funding: **$23,417**
CBBEP Bays Plan Actions: **HLR-1, PEO-1, BD-1, FW-1**

Background:
Since the conceptual plans for the Preserve first started, in 2002, there has been a desire to connect the Leonabelle Turnbull Birding Center and the Charlie's Pasture trail system. This site received over 60,000 visitors in 2017. Hurricane Harvey destroyed the existing boardwalk and observation tower at this site and has expedited the need to build this trail connection and restore access to the freshwater wetlands and pond habitat that draw so many eco-tourists to the area. The geographic scope of Port Aransas includes stopover habitat for neotropical migrating birds in the spring and fall, summer nesting grounds for a variety of birds, wintering grounds for the endangered Piping Plover and Whooping Crane. This location brings in a tremendously diverse amount of birds. Families on summer vacation, nature lovers chasing migration and annually returning Winter Texans all frequent the site. Based on a study conducted by the City, the Nature Preserve was ranked as the most important recreation need of the region. There is great potential for loss of tourism due to destruction of the boardwalk and limited access to the site that could make a large impact to Port Aransas' eco-tourism driven economy.

A 500ft boardwalk and 20ft tall observation tower has been designed as a hike and bike trail and will create a new tie in to the Port Aransas Community Park as well as the only remaining Nature Preserve trail. The boardwalk will be constructed from more resilient materials than the previous lumber boardwalks. Work will be done in phases eventually creating a loop of trails that connects each of the popular nature destinations to each other. This project has been given $400,700 by the Rebuild Texas Fund to cover debris removal and new construction. The total project cost for debris removal, construction of the boardwalk and construction of the observation tower is $776,200. FEMA will not cover the construction of the boardwalk or observation tower as they are new constructions, and FEMA support is restricted to the rebuilding of previous structures.

Project Objectives:
- Continuation on the construction of public access improvements that were severely damaged by Hurricane Harvey.
- Construct in part a ADA concrete sidewalk that ties portions of the Port Aransas Nature Preserve to existing boardwalks and hiking trails.
- Construct and or improve existing access locations providing residents and visitors an enhanced experience while at the Port Aransas Nature Preserve.

Project 2013 Water Quality Monitoring Program in Baffin Bay

Performing Organization: **Texas A&M University-Corpus Christi**
Total Project Funding: **$50,000**
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 identifying potential sources of water quality degradation in the system. Baffin Bay is also 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 (TAMU-CC) has 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 program and a TAMU-CC 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 TAMU-CC and collect monthly data, and rain event data, to identify nutrient concentrations and loading throughout the bay system.

Project 2014 CBBEP Public Outreach Events and Activities

Performing Organization: **CBBEP**
Total Project Funding: **$43,500**
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.

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:
- Community events and festivals
- CBBEP may produce or purchase educational and promotional materials
- CBBEP will maintain a web site(s)
- CBBEP develop and provide electronic updates
- Other outreach opportunities

Project 2015 MarineGEO Texas Biodiversity Assessment 2019

Performing Organization: **Texas A&M University Corpus Christi**
Total Project Funding: **$32,732**
CBBEP Bays Plan Actions: **HLR-1, HLR-2, PEO-1**

Background:
Gulf waters are extraordinarily rich and nurture 8% of the world's marine biodiversity (Felder 2009, Mora et al. 2011). The Coastal Bend's location at the transition between temperate and tropical climates make it a key area for understanding how coastal marine ecosystems work, how they are structured, and how they respond to climate change.

The purpose of this project is to disseminate the results of a rigorous biodiversity inventory of estuarine habitats in the Texas Coastal Bend. Leveraging commitments from UTMSI, TAMUCC, and the Smithsonian Tenembaum Marine Observatory Network, the work will produce a comprehensive list of invertebrate and fish species identified and confirmed by expert taxonomists, with associated genetic barcodes, high resolution images, and voucher specimens curated by the Smithsonian Museum of Natural History. The results of this "bioblitz" will be disseminated to technical and non-technical audiences in the form of a technical report and summary, a white paper fact sheet for the general public, and a short video developed and disseminated by the Texas State Aquarium (TSA). The video is anticipated to reach an audience of greater than 100,000 viewers, through showings in the TSA 4D Theater, use in TSA Educational STEM Programs, and dissemination by partner organizations involved in the "bioblitz" (Smithsonian, TAMUCC, UTMSI) and museums and aquariums in the TSA professional network. Specific technical outcomes will include:

This common resource will be of value to ecosystem and fisheries management, conservation work, research endeavors, and increasing public awareness of the incredible diversity of life present in the waters of the Coastal Bend.

Project Objectives:
The project objectives are the development and dissemination of:
- A list of species present in estuarine habitats of the Coastal Bend
- A list of species previously undescribed by science
- A list of species previously undescribed in the region (comparisons with CBBEP Species Checklist and state surveys)
- A list of exotic species previously undescribed in the region
- Technical summarizations of regional biodiversity by bay system and habitat including phylogenetic diversity.
- A publicly accessible library of taxonomic barcodes for use in future studies such as metagenomic biodiversity sampling, diet studies (gut-content analysis), and environmental DNA surveys.

Project 2016 Texas Marine Mammal Stranding Network - Coastal Bend

Performing Organization: **Texas Marine Mammal Stranding Network – Coastal Bend**
Total Project Funding: **$5,000**
CBBEP Bays Plan Actions: **HLR-5**

Background:
Texas Marine Mammal Stranding Network (TMMSN) is a 501(c)(3) on-profit organization established by researchers in 1980, and is dedicated to the rescue, rehabilitation, and research of marine mammals along the Texas coast. TMMSN is the only organization in the state of Texas authorized under the Marine Mammal Protection Act to respond to marine mammal stranding events and operates as a branch of the national Marine Mammal Health and Stranding Response Program. TMMSN is a dedicated group of trained individuals committed to promoting the conservation of marine mammal species and their habitats. The TMMSN Coastal Bend team needs to be ready to deploy a reserve of specialized response equipment and a dedicated corps of local volunteers at a moment's notice.

The purpose of this proposed project is to support the efforts of the Corpus Christi and Port Aransas (Coastal Bend) regions of the TMMSN by updating essential field supplies and equipment that will last for multiple years.

Project Objective:
The allotted funding is for the purchase of new supplies and equipment, so that the Coastal Bend TMMSN can continue to perform the following objectives:

- Properly train individuals to be safe volunteers within the network
- Provide volunteers with personal protective equipment and supplies
- Provide a reliable and safe means of transportation to and from sometimes remote locations and in less than optimal conditions
- Improve the survival rates of stranded marine mammals by applying what we learn from each event to improve response protocols
- Provide researchers the opportunity and means to advance science
- Educate the public

Project 2017 Waters for Wildlife: Increasing Freshwater Resources for Whooping Cranes

Performing Organization: **San Antonio Bay Partnership**
Total Project Funding: **$17,000**
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. 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. Last year, Hurricane Harvey damaged all solar panels and functioning windmills in the core wintering area, and SABP was successful in completing repairs in time for 2018-2019 season. This year, SABP continues to address areas where freshwater availability is still lacking by installing a well by a local contractor at a prioritized wetland site.

Project Objective:
The objective of this project is to incorporate information generated from previous monitoring projects (2012-2018) 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 2018 Triangle Tree Rookery Island Protection

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

Background:
Triangle Tree, an island in the upper Laguna Madre immediately south of Corpus Christi (27.554147, -97.286063), is approximately 2 acres in size. The island is owned by the Texas General Land Office (TXGLO) and leased for the purposes of protection and management of colonial nesting waterbirds by Audubon Texas. The CBBEP has partnered with Audubon Texas to manage and protect rookery islands, including Triangle Tree, throughout the mid and lower Texas coasts for over 15 years. Currently, the northern edge of the island is experiencing erosion, primarily from wave damage produced during heavy cold fronts throughout the year. 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.

This project will include preliminary engineering, alternatives analysis, and 70% construction plan design. The final engineering and design will include a structure designed to protect the north side of Triangle Tree Island from wind and wave erosion and will also trap and secure sediment from future dredge placement events. It is anticipated that the structure will be a minimum of 900 feet in length and positioned to protect the existing rookery habitat.

Project Objectives:
The objective of this project is the long-term shoreline protection of the Triangle Tree Rookery Island from wind and wave erosion

Project 2019 Improving Stormwater Management for the City of Port Aransas

Performing Organization: **City of Port Aransas**
Total Project Funding: **$30,000**
CBBEP Bays Plan Actions: **WSQ-1, HLR-1, PEO-5**

Background:
In the aftermath of Harvey, the City of Port Aransas is committed to better management of stormwater, increasing resiliency in flood events and reducing and/or eliminating direct inputs of stormwater into the bay and Gulf of Mexico. Currently the city's stormwater drains into the City Marina, Corpus Christi Bay, the Gulf of Mexico or into wind-tidal flats. Sedimentation of the flats, extreme tides and sea level rise has caused water to stack up preventing proper draining. This is a critical time to improve stormwater management to reduce non-point source (NPS) pollution and protect vital fish habitat.

In a joint effort with the Mission-Aransas NERR at the UT Marine Science Institute, our goal is to reduce NPS pollution into local waters, reduce flooding from improper drainage and high tides, and inform our citizens of the value of our coastal resources and their role in ensuring sound management. Steps to accomplish this goal are: 1) Hire consultant/engineer to complete a data review of LIDAR and historical data for Port Aransas, including relative sea level rise model projections. 2) Formalize the Stormwater Advisory Group to recruit project partners and community members. 3) Communicate data review findings to Advisory Group and evaluate the applicable sections of the "Guidance for Sustainable Stormwater Drainage on the Texas Coast" for use in Port Aransas stormwater management.4) Develop a Port Aransas Stormwater Management Plan for new development and ideas to retrofit existing development to improve stormwater quality and reduce stormwater to the bay. 5) Involve the local community and area resource managers through workshops. 6) Create City ordinance and outreach campaign for improved stormwater management.

Success will be measured by these deliverables:1) Establishment of an Advisory Group that meets regularly 2) Completion of a data review Report 3) Completion of the Port Aransas Stormwater Management Plan 4) Written ordinance for Stormwater Management ready to present to the Port Aransas City Council for approval

Project Objective:
The project objective is to reduce NPS pollution into local waters, reduce flooding from improper drainage and high tides, and inform citizens of the value of or coastal resources and their role in ensuring sound management.

Project 2020 Indian Point Shoreline Stabilization and Habitat Protection Project

Performing Organization: **Texas General Land Office – CEPRA**
Total Project Funding: **$100,000**
CBBEP *Bays Plan* Actions: **HLR-1, HLR-2**

Background:
Indian Point Peninsula supports the section of U.S. Highway 181 that crosses Nueces Bay and separates it from Corpus Christi Bay. The southwestern shoreline of Indian Point Park has been eroding rapidly over the last 50 years. A review of historical aerial photography since 1948 shows that the shoreline has retreated 500 feet and approximately 19 acres public park comprised of beach, shallow lagoons, and marsh have been converted to open bay water. Erosion threatens public infrastructure including park roads, parking and recreational areas inclusive of support facilities associated with the fishing pier structure. Continuing erosion due to wind waves, tidal currents, ship traffic, and storm events is undermining the stability of the shoreline that protects this crucial infrastructure and habitat.

To offset documented habitat loss and protect valuable habitat and infrastructure, CBBEP, The City of Portland and their partners have already restored approximately 160 acres of marsh habitat along the northwest side of the peninsula. In 2013 CBBEP developed and implemented plans to protect the new marsh complex, adjacent habitat, and back-lying infrastructure along the peninsula with a 4,300-foot rock breakwater.

In a continued effort to further reduce shoreline erosion on the Indian Point Peninsula, CBBEP will assess the feasibility and conduct an alternatives analysis of a living shoreline erosion control strategies.

Project Objectives:
The proposed project will determine and identify alternative erosion control strategies aimed at reducing erosion while protecting the existing public use areas, infrastructure, and access to the park.
.

Project 2021 Causeway Rookery Island Restoration Final Design

Performing Organization: **TBD**
Total Project Funding: **$66,275**
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 middle section of the geotextile tube began to fail, and by November 2014, approximately 230 feet of the tube had failed causing the shoreline to be exposed to wave energy and resulting in approximately 45 feet of shoreline eroded in less than a year. By 2016, approximately 650 feet of the geotube had failed 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 received grant funding from the TX Coastal Management Program and Coastal Erosion Planning and Response Act (CEPRA) 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.

CBBEP will provide match to be put towards final engineering and design towards the development of a bid package for construction. CBBEP will begin the task of obtaining a lease from TGLO. CBBEP anticipates having the lease complete within the first 7 months of the project.

Project Objective:
CBBEP will contract with a local engineering firm to complete construction design of a breakwater structure to protect Causeway Island from wind and wave erosion and also trap and secure sediment from future dredge placement events. CBBEP will also develop a bid package for the construction phase of this project.

Project 2022 TX CWMA Controlling the Brazilian Peppertree

Performing Organization: **TBD**
Total Project Funding: **$40,000**
CBBEP Bays Plan Actions: **HLR-1, HLR-2, HLR-10**

Background:
Brazilian peppertree is an invasive, noxious, and prohibited species within Texas that negatively impacts property access, coastal prairie habitats, and shorelines. Through rapid and aggressive growth, as well as allopathic chemicals, the species quickly modifies habitats and degrades the quality of natural systems. To address this issue, the Texas Gulf Region Cooperative Weed Management Area (CWMA) was established in 2014. CWMAs are local, non-regulatory, invasive plant management organizations that are led by steering committees and organized through formal agreements between interested public and private partners. The mission of the Texas Gulf Region CWMA is to address invasive Brazilian peppertree from Port O'Connor to Packery Channel on the Texas Gulf Coast.

The Texas Gulf Region CWMA Management Plan was approved in February 2016 and includes a monitoring component for invasive species in the CWMA. To date, the CWMA has successfully reached over 3,000 landowners within the CWMA boundary; completed twelve volunteer work days consisting of the removal of Brazilian peppertree at Port Aransas Nature Preserve at Charlie's Pasture, Paradise Pond, IB Magee Beach Park, and Mustang Island State Park; removed Brazilian peppertree from over 200 acres; and improved land management practices on over 9,000 acres of public and managed lands.

Funding will be used specifically for Brazilian peppertree control on public lands within the CWMA boundary. The CWMA members will determine the project location and preferred treatment by looking at a variety of factors, such as land usage, tree density, accessibility, proximity to water, and level of impact.

Another goal of the CWMA effort is to educate the community on the importance of the natural habitats within our ecosystem and promote stewardship of our resources. Therefore, a small amount of funding is also being requested to support the purchase of supplies needed for community workdays and educational efforts and events.

Project Objective:
The objective of this project is to perform Brazilian peppertree control on more than 30 gross acres of public lands and to educate the community on the importance of natural habitats within our ecosystem and promote stewardship of our resources.

Project 2023 Gulf Coast Conservation Initiative

Performing Organization: **CBBEP**
Total Project Funding: **$180,000**
CBBEP Bays Plan Actions: **BTR-3, SM-3, HLR-1, HLR-2**

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

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

Since 2002, CBBEP has worked to acquire either fee simple title or conservation easements for more than 12,000 acres of freshwater marsh, forested wetlands, mudflats, riparian corridors, and native upland habitat for conservation management. CBBEP has coordinated with U.S. Fish & Wildlife Service, Natural Resources Conservation Services, and The Nature Conservancy to develop and implement management plans and restoration actions throughout this protected habitat. CBBEP has also coordinated and worked with other property owners (such as Aransas National Wildlife Refuge, Texas Parks and Wildlife Department, City of Corpus Christi, South Texas Botanical Gardens and Nature Center, and private property owners) to develop and implement restoration actions on their property.

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

Project Objective:
Identify and implement restoration actions that benefit a minimum of 500 acres of habitat for Aplomado Falcons, Attwater's Prairie Chickens, and Whooping Cranes.

Project 2024 Lower Laguna Madre Bird Conservation

Performing Organization: **CBBEP**
Total Project Funding: **$108,930**
CBBEP Bays Plan Actions: **HLR-1, HLR-2**

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

While CBBEP's Coastal Bird Program has conducted extensive management efforts focused on the Upper Laguna Madre within the CBBEP program area, virtually no management activity has been directed towards important sites in the Lower Laguna Madre which is nearly the same size.

The Coastal Bird Program has conducted some management activity in that area in the past, and is well acquainted with the area and the management needs of the islands. There are substantial opportunities to successfully manage these sites for the benefit of colonial nesting species.

This project will allow the Coastal Bird Program to initiate a slate of management actions at island sites throughout the Lower Laguna Madre, and establish a more permanent presence in the lagoon system and the surrounding communities. This will be accomplished by hiring one additional staff person who will work in conjunction with the current Bird Program staff. This expansion will allow the smooth transfer of knowledge and management methods that have been developed over years of the program's activities in the central coast.

The expansion will also allow the Coastal Bird Program to engage more directly with partners in coastal conservation on the Mexican portion of the Laguna Madre by offering training and assistance with management planning and implementation.

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 2025 Early Phase Watershed Planning for Baffin Bay

Performing Organization: **Texas Sea Grant**
Total Project Funding: **$42,637**
CBBEP Bays Plan Actions: **WSQ-1, WSQ-3, HLR-2, HLR-7, NPS-4**

Background:
Development of an early phase Baffin Bay watershed plan would expand the watershed protection efforts of the local Baffin Bay Working Group, further characterizing watershed needs to support a full Watershed Protection Plan. This group consists of researchers, commercial and recreational fisherman, landowners, ranchers, business owners, local governments, and federal and state agencies. This group has identified various watershed protection needs which require the development of a plan and funding to address. The Plan would serve as a means for identifying locally driven mechanisms for voluntarily addressing complex water quality & land use issues across multiple jurisdictions, promoting unified approaches to seek funding. Baffin Bay watershed is 2,177,965 acres, contains three tributaries, supports some of the highest recreational and commercial fishery landings, and contains critical habitat for migratory birds and other wildlife. Protection of Baffin Bay and its watershed is imperative to ensuring that this bay system continues to support the local, regional, & state economy. There are currently impairments on two tributaries and ongoing water quality degradation has been documented in Baffin Bay (e.g., high nutrient concentrations, prolonged brown tide events). Furthermore, adverse health effects to the Black Drum population were documented in 2012.

Project Objectives:
- Further characterize Baffin Bay watershed concerns
- Establish Task Force based on concerns of Baffin Bay watershed
- Compile site specific best management practice guidance and resources to assist with voluntary implementation.
- Support the ability of the Baffin Bay Working Group stakeholders to more easily manage and develop a future Watershed Protection Plan by initiating an inclusive planning process that includes the following steps: organize, connect, assess, envision, prioritize, compile, and modify/update per stakeholder feedback.

Project 2026 Long-Term Seagrass Monitoring in Corpus Christi Bay and Upper Laguna Madre

Performing Organization: **University of Texas Marine Science Institute**
Total Project Funding: **$15,000**
CBBEP Bays Plan Actions: **HLR-1, WSQ-1**

Background:
The purpose of this project is to support the Seagrass Monitoring Program (SMP) for monitoring Corpus Christi Bay and the Upper Laguna Madre seagrasses in order to establish the quantitative relationships between physical and biotic parameters that ultimately control seagrass condition, distribution, and persistence. The project will also assess the carbon storage of seagrasses.

This research will monitor long-term health of Texas seagrass in the ULM and CCB in combination with other leveraged funds from three other agency partners. It contributes to a broader Tier-2 state-wide effort to assess seagrass condition and distribution that began in late-summer 2011 (see http://www.texasseagrass.org/). The program also strongly complements a long-term commitment by both the Mission-Aransas National Estuarine Research Reserve Program for Tier-2 sampling in Redfish and Aransas bays and the National Park Service for Tier-2 sampling in the ULM (Padre Island National Seashore only), as well as new funding from the Texas General Land Office (TGLO) for the Lower Laguna Madre for 2017 and 2018. The effort since 2011 is unprecedented in its breath and scope and will serve as an invaluable database of existing seagrass resources available for various local, state, and national groups. This project should help to understand and establish the quantitative relationships between physical and biotic parameters that ultimately control seagrass condition, distribution, and persistence. All protocols and methodologies will be under the direction of a Quality Assurance Project Plan.

Water quality and other parameters to be sampled include: light attenuation, turbidity, depth, water temp, salinity, DO, TSS, Chl a, seagrass species composition, epiphyte density, and percent cover.

Objective:
Monitor seagrass/water quality in Corpus Christi Bay and the Upper Laguna Madre to support the SMP and possible creation of water quality criteria for seagrass beds.

Project 2027 Caring for Our Coast – Nueces Delta Preserve: Education and Habitat Restoration

Performing Organization: **CBBEP**
Total Project Funding: **$30,000**
CBBEP Bays Plan Actions: **PEO-3, HLR-1, HLR-2**

Background:
This project, sponsored by CITGO's Caring for Our Coast initiative is designed to support the activities and habitats at the Nueces Delta Preserve. 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 support the activities of the CBBEP Delta Discovery Program and also provide funding to enhance coastal grassland habitats through the treatment of encroaching brush within the boundaries of the Preserve. The project will additionally engage the community though conducting a large scale volunteer event to be held at the CBBEP Kate's Hole Preserve at Packery Flats on Mustang Island. This event will focus on cleaning debris from barrier island habitats on Mustang Island

Objectives:
- To educate area youth through the implementation of nature based educational field trips.
- To restore and enhance habitats in the Nueces Delta Preserve.
- To hold a volunteer event on Mustang Island and clean debris from Packery Flats.

IX. 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 and federal agencies, local governments, and professional groups relevant to CCMP 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 Estuary 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.

X. Project Management and Implementation

CBBEP Project Management staff (12 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, the Gulf of Mexico Program, the Texas Commission for Environmental Quality (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 Estuary 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.

XI. 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.

XII. 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.

XIII. Summary

On September 1, 2019, the Coastal Bend Bays & Estuaries Program will begin Year 21 of implementing the *Coastal Bend Bays Plan*. This FY 2020 Work Plan describes the proposed work to be initiated during FY 2020. Of the total funds identified in the Work Plan budget, $625,000 are new (FY 2020) EPA federal funds; $734,230 are new (FY 2020) TCEQ funds; $826,591 are new (FY 2020) project-specific funds; and $609,452 are new (FY 2020) local partner/federal court interest funds. The total budget for this FY 2020 Work Plan is $3,405,001.

TABLE 1: FY 2020 COMPREHENSIVE ANNUAL WORK PLAN OUTLINE

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY20 CWA 320	TCEQ FY20 & 604b	LOCAL/ COURT INTEREST	TGLO	MISC GRANTS	USFWS	NFWF	TOTAL CBBEP FUNDING
2001	Coastal Waterbird Management	HLR-1, HLR-4	CBBEP	124,332				73,834	7,472	48,017	253,655
2002	Delta Discovery	BTR-1, PEO-2, PEO-3, PEO-5	CBBEP	183,148		61,031		15,000			259,179
2003	Nutrient Sampling in Petronila Creek	WSQ-3	Nueces River Authority	25,000	15,722						40,722
2004	Connecting Communities in the Oso Bay/Oso Creek Watershed	WSQ-1, WSQ-5, FW-1, PH-1, PEO-5	Center for Coastal Studies, TAMU-CC		4,000						$4,000
2005	Quantifying Septic Effluent Nitrogen Loading and Processing in the Baffin Bay Watershed	WSQ-3, NPS-3, FW-1	TAMU-CC		51,750						$51,750
2006	Outdoor Classrooms	PEO-3, PEO-5	CBBEP & USFWS						10,000		$10,000
2007	Hurricane Harvey Debris Removal – CBBEP Tracts, Holiday Beach	BD-2	CBBEP					100,000			$100,000
2008	CBBEP Community Outreach Partnerships	PEO-1, PEO-2, PEO-3, PEO-4 PEO-5	Coastal Bend Bays Foundation		7,000	23,000					$30,000

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY19 CWA 320	TCEQ FY19 & 604b	LOCAL/ COURT INTEREST	TGLO	MISC GRANTS	USFWS	NFWF	TOTAL CBBEP FUNDING
2009	CBBEP Property Management	HLR-1	CBBEP			105,000		13,000			$118,000
2010	Functionality of Oso Bay Wind Tidal Flats	HLR-1, HLR-2, HLR-4, SM-1, FW-1	Texas A&M University Corpus Christi		25,270						$25,270
2011	Nueces Delta Environmental Monitoring	FW-1, FW-2, FW-3, FW-4	Conrad Blucher Institute		60,644						$60,644
2012	City of Port Aransas Nature Preserve New Trail Connection/ Boardwalk/Tower	HLR-1, PEO-1, BD-1 FW-1	City of Port Aransas		23,417						$23,417
2013	Volunteer Water Quality Monitoring Program in Baffin Bay	WSQ-3	Texas A&M University-Corpus Christi					50,000			$50,000
2014	CBBEP Public Outreach Events & Activities	PEO-1, PEO-2, PEO-3, PEO-4, PEO-5, BTR-1	CBBEP			33,000		10,500			$43,500
2015	MarineGEO Texas Biodiversity Assessment 2019	HLR-1, HLR-2, PEO-1	Texas A&M University-Corpus Christi			32,732					$32,732
2016	TX Marine Mammal Stranding Network – Coastal Bend	HLR-5	TX Marine Mammal Stranding Network			5,000					$5,000

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY20 CWA 320	TCEQ FY20 & 604b	LOCAL/ COURT INTEREST	TGLO	MISC GRANTS	USFWS	NFWF	TOTAL CBBEP FUNDING
2017	Waters for Wildlife: Increasing Freshwater Resources for Whooping Cranes	HLR-1, HLR-2	San Antonio Bay Partnership		17,000						$17,000
2018	Triangle Tree Rookery Island Protection	HLR-1, HLR-2	TBD			30,000	75,000		20,000		$125,000
2019	Improving Stormwater Management for the City of Port Aransas	WSQ-1, HLR-1, PEO-5	City of Port Aransas		30,000						$30,000
2020	Indian Point Shoreline Stabilization & Habitat Protection Project	HLR-1, HLR-2	Texas General Land Office				100,000				$100,000
2021	Causeway Rookery Island Restoration Final Design	HLR-1, HLR-2	TBD		24,275		42,000				$66,275
2022	TX CWMA Controlling the Brazilian Peppertree	HLR-1, HLR-2, HLR-10	TBD		16,000		24,000				$40,000
2023	Gulf Coast Conservation Initiative	BTR-3, SM-3, HLR-1, HLR-2	CBBEP						180,000		$180,000
2024	LLM Bird Conservation	HLR-1, HLR-2	CBBEP					108,930			$108,930

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY20 CWA 320	TCEQ FY20 & 604b	LOCAL/ COURT INTEREST	TGLO	MISC GRANTS	USFWS	NFWF	TOTAL CBBEP FUNDING
2025	Early Phase Watershed Planning for Baffin Bay	WSQ-1, WSQ-3, HLR-2, HLR-7, NPS-4	Texas Sea Grant		42,637						$42,637
2026	Long-term Seagrass Monitoring in Corpus Christi Bay and Upper Laguna Madre	HLR-1, WSQ-1	UTMSI			15,000					$15,000
2027	Caring for Our Coast – Delta Discovery and Habitat Protection/ Enhancement Activities	PEO-3, HLR-1, HLR-2	CBBEP					25,000			$25,000
	TOTAL PROJECT FUNDS			**332,480**	**317,715**	**304,763**	**241,000**	**396,265**	**217,472**	**48,017**	**1,857,712**
	Administrative		CBBEP	292,520	416,515	304,689	0	341,582	191,984		1,547,290
	TOTAL FUNDING			**$625,000**	**$734,230**	**$609,452**	**$241,000**	**$737,846**	**$409,456**	**$48,017**	**$3,405,001**