



Protecting Our Bays & Estuaries

FY 2015 Comprehensive Annual Work Plan

**Coastal Bend Bays & Estuaries Program, Inc.
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COASTAL BEND BAYS & ESTUARIES PROGRAM

FY 2015 Comprehensive Annual Work Plan

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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 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 1992 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 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 Program Office had been established as a program of the TNRCC since December 1993. 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 Texas 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 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 Plan implementation effectiveness.

Work Plan Development

The FY 2015 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 Comprehensive Conservation and Management Plan (CCMP) 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 2015 Comprehensive Work Plan will be September 1, 2014.

III. Federal and State Program Coordinators and Project Officers

Federal

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State

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IV. Accomplishments To Date

The CBBEP achieved its primary goal for FY 2014, which was to continue the successful initiation and completion of projects developed to implement the *Coastal Bend Bays Plan*. The Program and its partners achieved programmatic progress on 94 percent of CCMP actions. Action-specific environmental progress directly attributed to CBBEP activities has resulted in thousands of acres of restored or protected habitat. The Program's success in leveraging funds for CBBEP projects has also been noteworthy. Broad support for the Program's activities is evidenced by the range of contributors, including local governments, industries, NGOs and state and federal agencies. The CBBEP Management Conference has not made any changes in the priorities as listed in the CCMP.

All project deliverables identified during the FY 1999 through FY 2011 implementation years have been completed. FY 2011 projects (federal) are expected to be completed by August 31, 2014. FY 2012 projects are expected to be completed by August 31, 2014, and FY 2013 projects are expected to be completed by August 31, 2015.

V. Goals for FY 2015

The overarching goal for FY 2015 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. Implementation of Projects

Project activities for FY 2015 have been selected for their contribution towards implementation of the *Coastal Bend Bays Plan*. Twenty-nine projects will be implemented in FY 2015. A comprehensive list of projects outlining project numbers, titles, action items, performing party(s), and budget can be found in Table 1: FY 2015 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*.

VII. 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.

Performing Organization: CBBEP
Total Project Funding: \$168,189
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.

Building on the efforts of the CBBEP Colonial Waterbird projects from previous years, this project will continue the implementation of specific management actions of the *CBBEP Colonial Waterbird Rookery Island Management Plan*. Additionally, these efforts will extend to activities that support the conservation of non-breeding coastal bird species and their habitat. Management actions will include efforts to reduce anthropogenic impacts, habitat management and protection, and predator control when necessary. Public education and outreach will continue to be a major component in achieving project objectives.

Objectives:

This project will:

- 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 monitor 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.

Performing Organization: CBBEP
Total Project Funding: \$181,818
CBBEP *Bays Plan* Actions: BTR-1, PEO-2, PEO-3, PEO-5

Background:

Delta Discovery (formerly known as *Learning on the Edge*) embraces our entire environmental education program. The educational program costs consist of the following:

- Salary of CBBEP environmental educators, temporary part-time staff, and interns.
- Supplies needed for the Nueces Delta Learning Preserve
- Supplies and food for Teacher workshops

Fieldtrips: Many of the students that are being exposed to scientific concepts for the first time have never really spent much time outdoors. There is a need to bring classroom concepts alive in the proper setting through fieldtrips. Getting students out of the classroom and into the outdoors adds greatly to the students understanding of natural processes.

CBBEP Environmental Educators provide fieldtrip 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 exposes over 8000 students a year to quality outdoor environmental education experiences.

Fall/Spring 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. Hands-on learning in the field will dominate and field work correlation to the classroom will follow the outdoor learning experience. 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 Texas Coastal Bend. The funding provides all fees for partnering, curriculum, and substitute teachers in order for these workshops to occur on weekdays.

Summer Workshops: CBBEP partners with already successful educational programs. By combining all of these resources into one program, Coastal Bend Environmental Science seeks 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. Additionally, the program will provide teachers with supplies for use in their classroom and in the field.

Nueces Delta Preserve Upkeep: Upkeep of the Nueces Delta Preserve consists of electricity costs, phone and internet costs, Port-a-Potty maintenance, trash pick-up, supplies for programming, staff accreditation and educational training, and mileage, etc.

Objectives:

- Provide teacher workshops that support environmental education and stewardship: CBBEP partners will facilitate and perform a major portion of teaching during the week-long summer teacher academy. The teachers will receive all curricula and information provided by these partners, a curricula guide from CBBEP, and equipment for the classroom. The academic year workshops will be small scale educational seminars with supplies needed for teaching the curricula provided to participants.
- Facilitate and lead environmental education fieldtrips: CBBEP Educator and partners will organize and conduct fieldtrips for students throughout the Coastal Bend to come to the Nueces Delta Preserve for a day long outdoor experience connecting the classroom to local nature. We provide funding to assist schools in their ability to take such trips.

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

Background:

Classroom teachers today face an almost overwhelming challenge of helping students progress through the required subject material. Many of the students that are being exposed to scientific concepts for the first time have never really spent much time outdoors or in dedicated environmental education facilities. There is a need to bring classroom concepts alive in the proper setting through field trips.

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

Objective:

Getting students out of the classroom and into the outdoors adds greatly to the students understanding of natural processes. 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 animals and plant life.

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.

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 funds.

Performing Organization: CBBEP
Total Project Funding: \$25,000
CBBEP *Bays Plan* Actions: PEO-1, PEO-2, PEO-3, PEO-4 and PEO-5 and 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. 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.

Objectives:

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 at various community events.

In addition, CBBEP may participate in:

- Community events and festivals
- CBBEP educational and promotional materials
- CBBEP web site
- CBBEP electronic updates
- Other outreach opportunities

Project 1506

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 (fieldtrips) is becoming more difficult. Buses are expensive and finding personnel to supervise, as well as scheduling, has become challenging. Fieldtrips 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.

Performing Organization: CBBEP
Total Project Funding: \$15,000
CBBEP *Bays Plan* Actions: BTR-1, PEO-2, PEO-3 and PEO-5

Background:

Public outreach continues to be a key element of CBBEP to educate Coastal Bend residents about the importance of bays and estuaries to their communities. CBBEP will utilize local and regional media, which includes television, radio, print, and websites, to implement the goals of the CBBEP Public Outreach Strategy. The priority issues for this media campaign as identified in the Coastal Bend Bays Plan are: altered freshwater inflow into bays and estuaries; non-point source pollution; loss of wetlands and estuarine habitats; degradation of water quality; condition of living resources; altered estuarine circulation; public health issues.

Some or all of the priority issues listed above will be considered for public outreach through the media.

Objective:

Use the media to provide the public with the environmental science knowledge to make sound decisions regarding the effective management of bay resources and to promote environmental stewardship through increasing awareness of the resources and the issues regarding their use.

Performing Organization: Nueces River Authority
Total Funding: \$30,000
CBBEP Bays Plan Actions: BD-1, HLR-1, WSQ-1

Background:

The City of Corpus Christi Water Department (City) supplies water to nearly 500,000 people in the Coastal Bend Region, drawing this water out of the Nueces River at Calallen for treatment at the O.N. Stevens Water Treatment Plant (WTP). The City experienced a turbidity spike at the WTP in November 2009 which resulted in a drinking water violation. From 2010 through 2012, the Nueces River Authority (NRA) worked with the City to develop a Source Water Protection Plan (SWPP) for the Lower Nueces River. The Nueces River Watershed Partnership was formed to help direct the development of the SWPP and identify best management practices (BMPs) to help preserve and protect water quality in this segment.

In addition, a group of primarily CR 73 residents have formed the Nueces River Preservation Association (NRPA). This volunteer group spends their time and resources removing debris from the river and educating the community about the importance of preserving the river. NRA, with previous funding from the Coastal Bend Bays & Estuaries Program and generous donations from AEP, Nueces County, and the City of Corpus Christi, has helped the NRPA with CR 73 and on-the-river cleanups.

One of the identified BMPs is to conduct a large debris survey and develop a management plan for removal. A survey of the lower Nueces will be conducted in spring 2014 using a side-scan sonar to identify submerged items. In the meantime, NRPA has been conducting on-the-river cleanups and have been very successful in removing smaller trash and debris from the river. There are some larger objects such as partially submerged and buried boats and refrigerators that could be removed prior to the survey. However, this endeavor is beyond the means of the NRPA. There are also some partially submerged boats in the tidal portion of the river that could be added to this project.

A contractor with the necessary equipment will be needed to remove these items from the river. Provisions for disposal will also be needed, possibly through waived disposal fees from Nueces County, San Patricio County, and/or the City of Corpus Christi.

Objectives:

To contract with debris removal contractors, to remove and dispose of large objects, primarily partially submerged and buried boats, from Segment 2102 of the Nueces River and Segment 2101, Nueces River Tidal

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

Background:

CBBEP is responsible for several properties including over 5,800 acres along the Nueces River and Nueces River Delta, 35 acres along Nueces Bay (HWY 181) and 160 acres on Mustang Island, and 180 acres on the Lamar Peninsula.

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 5,800 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 necessary management and routine maintenance of the CBBEP owned properties, including but not limited to road maintenance, fencing maintenance, gates, brush control, equipment purchases, habitat and predator management (as appropriate and necessary), and property taxes.

Past project accomplishments include dike repair to a 50 acre created wetland, management equipment purchases, nest box construction, building maintenance, volunteer projects, aerial application of herbicide to invasive *huisache*, road repairs, preparation for prescribed fire, construction of a parking area for school buses, creation of a wildlife observation area and water sampling station, establishing routine mowing of common areas, portable toilet and trash collection service.

Objective:

Provide for the ongoing maintenance and management of the Nueces Delta Preserve and other CBBEP properties.

Project 1510

Carbon Sequestration and 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
CBBEF Bays Plan Actions: WSQ-4, WSQ-5

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 Estuary 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 2014 and 2015. The effort since 2011 is unprecedented in its breadth and scope and will serve as an invaluable database of existing seagrass resources available for various local, state, and national groups. In addition, this program includes the measurement of the carbon:nitrogen:phosphorus (C:N:P) content of blade tissues collected at nearly 500 stations across the Texas coast that represent over 94% of the State's seagrass resources. 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 at a minimum 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.

Performing Organization: Conrad Blucher Institute
Total Project Funding: \$37,000
CBBEP Bays Plan Actions: FW-1, FW-2, FW-3, FW-4

Background:

The purpose of this project is for the Conrad Blucher Institute for Surveying and Science (CBI) at Texas A&M University - Corpus Christi (TAMUCC) to continue to maintain 3 current real-time salinity monitoring stations along the Rincon Bayou and 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 (RBP) from the Nueces River and will report water temperature, conductivity and salinity every 30 minutes. Data from these salinity stations are used by the Nueces Inflow Pipeline Advisory Committee (IPAC) to help determine when to recommend the schedule of pass-through of "banked" water to the City of Corpus Christi and by the Nueces Estuary Advisory Council (NEAC) to create freshwater inflow recommendations. The Center for Coastal Studies (CCS) at TAMUCC uses 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 Marine Science Institute (UTMSI) to support various modeling projects which will investigate the interaction between water in sediment and tidal creeks and in the Nueces Delta. Additionally, the data is intended for use in the calibration and validation of the Nueces Delta Hydrodynamic Model. 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. 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 at CBI's webpage (<http://cbi.tamucc.edu>).

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 has had a pipeline and pump station built to divert up to the first 3,000 AF 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, 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.

Performing Organization: The Nature Conservancy
Total Project Funding: \$35,000
CBBEP Bays Plan Actions: SM-2, HLR-1, PEO-1

Background:

This project is for conducting a Climate Change Vulnerability Assessment within the Coastal Bend of Texas. The work will include an analysis of climate change data, developing partnerships, hosting a workshop, writing a report, disseminating results to the community via an online decision support tool, and adding new action items within the Comprehensive Conservation and Management Plan (CCMP) to inform adaptation strategies for the region. This project will be lead by Coastal Bend Bays & Estuaries Program (CBBEP) in partnership with The Nature Conservancy (TNC).

The intent of this project aligns with the initiative of the EPA's Climate Ready Estuaries (CRE) program to (1) assess climate change vulnerabilities, (2) develop adaptation strategies, and (3) engage and educate stakeholders. This project focuses on assessing significant potential changes in the Coastal Bend region and how those changes have an effect on climate stability, sea level, hydrology, geomorphology, natural habitats and species, land use changes, economy, human health, human infrastructure, and variable risk projections. This involves engagement with local municipalities, counties, state agencies and regional governance bodies on a complex suite of natural hazard risk and vulnerability assessments, and an examination of adaptation options using natural protection solutions. The project will build on the modeling of sea level rise (SLR) impacts on coastal wetland systems using the Sea Level Affecting Marshes Models (SLAMM) and storm surge scenarios that TNC completed during the summer of 2013.

The information developed through this effort and through other relevant CBBEP work will be communicated widely through existing coastal resilience networks such as EPA's CRE program, as well as through existing government and non-governmental programs. The information will also be used to update CBBEPs CCMP with critical new action items for implementing activities related to climate change and sea level rise.

Objective:

This project will host a stakeholder workshop to receive information and to inform planners, managers, decision makers, scientists and general public on the impacts of climate change in coastal marsh habitat in the Coastal Bend area, and develop a final report including workshop participants needs, climate change impacts on water quality, GIS analysis and adaptation strategies, and associated maps.

Performing Organization: Texas A&M University-Corpus Christi
Total Project Funding: \$50,000
CBBEF Bays Plan Actions: WSQ-3

Background:

The purpose of this project is to help establish a volunteer water quality monitoring program in Baffin Bay that will be gathering 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) recently initiated a spatially-temporally intensive volunteer 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 volunteer program and a TAMU-CC Ph.D. student project, samples will be collected from 8 sites in Baffin Bay on a monthly basis, as well as at higher frequencies in response to episodic storm events or fish kills (Figure 1). 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) will be regularly deployed to identify water quality “hot spots” and to characterize environmental conditions pre- and post-storm.

Objective:

Establish and support a volunteer 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.

Performing Organization: Texas A&M University – Corpus Christi
Total Project Funding: \$75,000
CBBEP Bays Plan Actions: WSQ-3, WSQ-4, WSQ-5,

Background:

This project will use sediment cores to document how water quality and chlorophyll concentrations in the Baffin Bay system have changed through time with a primary focus from AD 1850 to the present. This period of time corresponds with the start of significant human impact, and thus, increased loadings from farming, grazing, and other land use changes. Preliminary analysis of a sediment core from the Cayo del Grullo tributary shows a strong increase in chlorophyll concentrations towards the top of the core, which reflects loading from recent human impact, as mentioned above. But the sediment core also archives individual algal blooms (potentially brown tide) and periods of increased primary productivity (based on elevated chlorophyll concentrations) from periods before the first recorded brown tide bloom in 1990, and even before 1850. This confirms that these phenomena are not simply the result of excess nutrient delivery related to recent human impact. In fact, it is clear that natural forcings, possibly related to wet/dry climate regimes, and the very restricted circulation of Baffin Bay, strongly moderate the system. In turn, the human impact component is overlaid on to this natural background variability. Thus, to provide context for understanding the present state of the system, and to make the most informed management decisions and recommendations for the future, a longer-term perspective is needed.

While modern observations provide a critical body of evidence for understanding the current state of the system, the existence of algal blooms and periods of elevated chlorophyll concentrations prior to 1990, and even 1850, also make it clear that we must understand the natural variability to put the modern condition into perspective.

The goal with this project is to use sediment cores to provide the needed perspective, and look back in time to track the evolution and development of water quality and chlorophyll concentrations in the bay system over the last ~150 years.

Objective:

This project will collect sediment cores from Baffin Bay to determine historical water quality results, allowing for a better understanding of natural water quality variability in the bay system.

Performing Organization: CBBEP
Total Project Funding: \$60,000
CBBEP Bays Plan Actions: BTR-2, PEO-3

Background:

The CBBEP owns a 33 acre strip of land along the south bound side of HWY 181 bordering the north east portion of Nueces Bay. The majority of land surrounding Nueces Bay is under private ownership therefore limiting the amount of public access points. The CBBEP is also currently constructing approximately 175 acres of marsh adjacent to the CBBEP land along HWY 181 in State owned waters. This portion of Nueces Bay is protected on the south by HWY 181 and on the north by the bluffs along Nueces Bay. This shallow portion of Nueces Bay is ideal for kayaking and launching of small motorized skiffs.

The CBBEP would like to dedicate an old oilfield dock, which has been converted into a parking area by a previous CBBEP Project (#0932) for public access to Nueces Bay.

Objectives:

- Finish developing a parking and staging area for fisherman and paddle craft users (\$10,000).
- Finish the installation of a bollard & cable perimeter to keep vehicles in the approved parking areas and out of sensitive wetland habitat (\$10,000).
- Remove invasive species and debris from the parking area (\$3,000).
- Design & Construct an ADA accessible elevated platform & informational kiosk overlooking the CBBEP Marsh Restoration Site (\$35,000).
- Install interpretive signage at the site about the history of the site, marsh restoration project, and the wildlife that will benefit from the rebuilding of the marsh (\$7,000).
- Identify all project partners in the signage.

Performing Organization: Nueces County
Total Project Funding: \$72,400
CBBEP Bays Plan Actions: BTR-1, BTR-2, BTR-3, HLR-1, PEO-4, PEO-5

Background:

The Packery Channel Nature Preserve is a dedicated nature park that is owned and managed by Nueces County. A Master Plan was originally developed for this park in 2008 and several grants have been received to enhance, restore, and preserve the park's native habitats along with providing public access to the parks recreational features. The Coastal Bend Bays & Estuaries Program (CBBEP) partnered with Nueces County Parks to fund and construct a project in the winter of 2010. Nueces County has also received a Coastal Impact Assistance Program (CIAP) grant to enhance and restore neotropical migratory songbird habitat within the park. The CIAP project includes the construction of 2 acres of native trees, shrubs, and other native vegetation, the eradication and maintenance of highly invasive non-indigenous Brazilian pepper trees, the construction of a 6' wide elevated timber maintenance path, the installation of a security gate and additional bollards, and the development of a habitat management plan for the entire park. The CIAP-funded project has recently gone through the planning and design stages. Portions of the CIAP project are anticipated to begin in the fall of 2014.

The currently proposed CBBEP project includes a covered observation deck and educational signage at the end of the CIAP-funded elevated timber maintenance path. This 6-foot wide maintenance path, which will be several hundred feet long, will be constructed with an 18' long by 6' wide T-head. This timber path will access the 2-acre CIAP-funded habitat enhancement/restoration areas (which will involve planting trees and shrubs) and bird drip stations. One component of the CBBEP funded project is to cover the T-head portion (observation deck) of the timber path and to provide educational exhibits focusing on migratory birds and their habitats. A second component of the CBBEP funded project the construction of an additional ADA-accessible covered pavilion to be located along the Park's shoreline. The shoreline is a popular area for bank fisherman, bird watchers and kayakers.

Objectives:

- Construct a 24' x 24' elevated observation pavilion overlooking Packery Channel.
- Construct a 18' x 6' covered pavilion at the end of the 6' CIAP funded maintenance path.
- Create, construct, and install interpretative and educational signage throughout the Packery Channel Park. Consisting of three large displays and at minimum 12 small displays.

Project 1517 Determining the Effects on Benthic Macrofauna from Pumped Flows into Rincon Bayou

Performing Organization: **Harte Research Institute for Gulf of Mexico Studies**
Total Project Funding: **\$48,600**
CBBEP Bays Plan Actions: **FW-1, FW-2, HLR-1, WQ3, WSQ-4**

Background:

The purpose of this project is to determine the effects of pumped inflows into Rincon Bayou on benthic macrofauna during normal and drought precipitation events. This information is needed by managers to create an effective pumping strategy for the Rincon Bayou pipeline.

In 2009, a pipeline and pumping station was constructed to pump freshwater from the Calallen Pool to Rincon Bayou so that flow would not rely on overflowing the Calallen Dam. The most beneficial pumping regime (i.e., the timing and quantity of pumped inflow) has yet to be resolved. The upper and central Rincon Bayou have been sampled for benthic macrofauna during pumping periods between 2009 and 2013 by the Harte Research Institute, and pumping-specific studies took place in 2014. Pumping periods coincided with a high and low precipitation periods, so benefits of the pumped inflows can be determined. Monitoring of macrofauna in the upper Rincon Bayou during pumping must be performed in order to determine the effects of pumped inflows on estuarine productivity, and to quantify the optimal quantity and frequency of pumped inflows. A recent synthesis of research in the Rincon Bayou has determined that cycles of inflow to Nueces Delta follow a roughly two-year cycle, so intense study for a second year is required.

Studies will be conducted in the Nueces Delta, near Corpus Christi, Texas. Sampling stations are located at sites where baseline data are available to facilitate assessment of ecosystem changes. Sampling will be conducted quarterly at three stations (463, 400F, 466C) located in the upper Rincon Bayou, and biweekly at station 466C to capture pumping events.

Sampling methodologies will be the same as those performed earlier. Water column characteristics (i.e., depth, salinity, temperature, dissolved oxygen, pH), water quality (chlorophyll a, and nutrient concentrations), and benthos (i.e., abundance, biomass, and diversity) will be measured quarterly for two years. Sediment grain size will be performed annually. Historical samples of water quality and macrofauna communities have also been taken, and these data will be incorporated into this project's statistical analysis.

Objective:

This project will help determine the effects of pumped inflows into Rincon Bayou on benthic macrofauna in order to inform water managers on how to create an ecologically effective pumping strategy.

Performing Organization: Nueces County
Total Project Funding: \$25,000
CBBEP Bays Plan Actions: BTR-2, BD-1, HLR-1, HLR-2, WSQ-1

Background:

Hazel Bazemore Park is a 77.6 acre outdoor recreation and nature park along the Nueces River near Calallen. The park is a mixed use outdoor recreational area that includes picnic and playground areas, fishing, the award winning "Hawk Watch Tower and Pavilion", two birding blinds overlooking a wetland marsh and pond, and the Louis Kimmel Woodland Trail. Although the park allows walking and biking along the Nueces River and more active fishing and boat access areas, the project will provide managed public access and ADA accessibility to undeveloped bottomland habitat managed as a nature preserve. Project will complete the bottomlands nature trail by expanding the walking path from the bridge, to be constructed in 2014, to observation decks overlooking the Nueces River Riparian Habitat.

Nueces County is proposing an addition to the nature preserve and public access/eco-tourism opportunities at Hazel Bazemore Park through development of the Nueces River Bottomland Nature Trail. Providing a trail area through the already accessed bottomland natural area will help further protect, restore, and enhance this unique Nueces River habitat by encouraging foot traffic in the trail area. The Bottomland Nature Trail will also promote public awareness of the ecological value of riparian habitat.

The "Continued Phase of the Bottomlands Nature Trail" will expand the bottomland trail west along the Nueces River to an observation kiosk/pavilion. In addition, the observation area would include interpretative signage identifying the characteristic bottomland habitats and their representative wildlife and vegetation. The importance of the riparian bottomlands to maintaining water quality in the watershed and bay system would be a key educational component reflected in the signage.

Objectives:

- 1) Expand the hazel Bazemore Park with a new nature trail component along the Nueces River Bottomlands starting at the western end of the bridge.
- 2) Improved public access and habitat protection through park expansion with nature/birding interpretative areas along the Nueces River Bottomlands.

Performing Organization: San Antonio Bay Partnership (SABP)
Total Project Funding: \$28,000
CBBEP Bays Plan Actions: HLR-1, HLR-2

Background:

The purpose of this project is to assist resource managers and conservation groups with identifying the highest priority areas for water well rehabilitation and installation throughout the Whooping Crane wintering range. The Aransas National Wildlife Refuge (ANWR) is the winter home for the last naturally migrating flock of endangered Whooping Cranes. Recent drought conditions have drastically diminished available fresh water supplies, creating additional threats to the recovery of the population. While Whooping Cranes are predominantly linked to coastal marsh and flat habitats along a restricted area within the San Antonio and Aransas Bay systems, dietary freshwater is necessary when bay salinities exceed 15-18 ppt. Availability of freshwater during drought periods is often limited to excavated earthen ponds (i.e., stock tanks) in upland areas adjacent to fringing coastal marsh areas. In a study conducted by the International Crane Foundation during an exceptional drought (2012-2013), daily use of stock tanks with surface water by banded Whooping Cranes was documented throughout the winter, often at one specific location. By strategically providing reliable freshwater resources through the placement of solar powered water wells across the landscape and proximal to Whooping Crane territories, stress reduction and increased fitness will be achieved.

The SABP is collaborating with the ANWR and other conservation organizations on a “Waters for Wildlife” initiative. Currently, the initiative is working to rehabilitate/repair water wells that can supply water to adjacent ponds at the ANWR to provide critically needed fresh water sources for Whooping Cranes and other wildlife during drought conditions. SABP has received funding from Coastal Bend Community Foundation; Texas State Aquarium Wildlife Care, Conservation, and Research Program; Friends of Aransas and Matagorda Island Refuge; San Antonio River Authority; and CBBEP to refurbish two to three wells at ANWR. However, the long-term goal of the “Waters for Wildlife” initiative is to repair and put into service as many existing wells as possible throughout the entire Whooping Crane wintering range, and to drill and equip several new wells in areas where territories are located but wells do not currently exist. The initiative will also strive to create public awareness of Whooping Crane freshwater needs by generating publicity about the well refurbishment through an outreach and education campaign.

Objectives:

- Develop an inventory of existing water well locations within the entire Whooping Crane wintering range.
- Identify the most suitable areas for water well rehabilitation and/or installation.
- Use the information gathered in Objectives 1 and 2 to prioritize locations for future rehabilitation and/or installation of water wells.
- Based on the suitability and prioritization results, either install one new water well or rehabilitate two existing wells that are in need of repair.

Project 1520

Texas Gulf Region Cooperative Weed Management Area: Brazilian Peppertree Control Project

Performing Organization: TBD
Total Project Funding: \$25,000
CBBEP Bays Plan Actions: HLR-1, HLR-2, HLR-10

Background:

The purpose of this project is to assist Brazilian peppertree (*Schinus terebinthifolius*) control on Mustang Island. Brazilian peppertree is a non-native, invasive woody plant with the ability to completely dominate and change the landscape. Brazilian peppertree dominated landscapes have been shown to be poor habitat for native wildlife and may negatively impact grassland bird populations. In Florida, it is estimated that Brazilian Pepper now occupies approximately 700,000 acres. The species is easily spread by some birds, which consume the fruit and seeds. The negative environmental impact of the Brazilian peppertree is so extreme that the Texas Parks and Wildlife Department lists the species as a Prohibited Aquatic Species, making it illegal to release the species into waters of the state (Texas Administrative Code, Title 31, part 2, Chapter 57, Subchapter A). Additionally, the Texas Department of Agriculture lists the species as a noxious species, in which a person commits an offense under Texas Agricultural Code §71.151 if the person sells, distributes or imports the plant listed in any live form without permit.

To address the threat of Brazilian peppertree, in 2006 the City of Port Aransas and the U.S. Fish and Wildlife Service began a project to control Brazilian Pepper in the newly formed Charlie's Pasture Nature Preserve. Although much was accomplished in areas of the Nature Preserve, the effort highlighted the need to broaden the scale and scope of control efforts to the entire Gulf Coast Region. To this end, the City of Port Aransas with support from the Texas Forest Service and Lady Bird Johnson Wildflower Center submitted a proposal to the National Fish and Wildlife Foundation (NFWF) to develop a Cooperative Weed Management Area (CWMA) that includes the barrier islands stretching from Packery Channel north to Port O'Connor TX. The City of Port Aransas and partners are forming a regional Cooperative Weed Management Area to address the Brazilian peppertree issue on a landscape scale. CWMA's 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. Because of the current extent of infestation and the potential for Brazilian peppertree to invade native grasslands the initial focus of the CWMA will be Brazilian peppertree control along the Texas Gulf Coast.

Objective:

Funding from CBBEP will be used for Brazilian Pepper control within the CWMA boundary which will enhance more than 100 gross acres of coastal grasslands and native plant communities.

Performing Organization: International Crane Foundation
Total Project Funding: \$15,000
CBBEF Bays Plan Actions: HLR-1, HLR-2

Background:

The purpose of this project will be to gather information needed to develop a Strategic Work Plan for acquisition, habitat restoration, and effective management of Whooping Crane wintering grounds. The Aransas National Wildlife Refuge and the area immediately surrounding it are the only known wintering habitat of this federally endangered species. Reproductive success is directly tied to this landscape's ability to support a growing population. Whooping Cranes rely on these coastal wetlands and tidal marshes to provide food and refuge. It is also where the birds select mates and establish lifelong pair bonds. The Gulf Coast of Texas is also home to a growing human population, which creates many use conflicts for the Whooping Crane.

During a continental-wide, year-long effort across Canada and United States, conservation action planning (CAP) process was undertaken in the breeding, migration, and wintering grounds of the Whooping Crane range. Key strategic actions were identified for early implementation in the wintering range that included identifying and mapping sufficient suitable Whooping Crane wintering habitat to allow use by at least 250 family groups and account for potential habitat loss due to sea level rise (Chavez-Ramirez et al. 2012). This project has been funded and in final review by the Gulf Coast Prairie Landscape Conservation Cooperative program (Smith et al. in preparation). The CAP also recommended that, by 2014, to develop a work plan to protect identified habitat areas. The Wintering Whooping Crane Working Group has begun work on this component of the strategic work plan, and believes that a comprehensive plan is necessary to capitalize on a diversity of opportunities to implement strategies that would continue the recovery of this species. The Group has developed an outline to be addressed in this plan that would include: Habitat Protection (acquisition, conservation easement, policy changes), Habitat Management, Habitat Restoration, Monitoring & Maintenance (freshwater sources, prescribed burning invasive species control), Hydrologic Restoration, Freshwater Inflow Needs, GIS Mapping Needs. Conservation professionals with expertise in these fields will be contributing to the plan development.

Project Objective:

This project will fund a plan manager to assist in gathering, synthesizing, and coordinating the development and completion of the *Winter Range Whooping Crane Strategic Plan*.

Project 1522

Hydrologic Change and Wading Bird Guild Use in the Restored Western Marsh Project Area, Matagorda Island: Monitoring Plan Development

Performing Organization: International Crane Foundation
Total Project Funding: \$10,400
CBBEP Bays Plan Actions: HLR-2, WSQ-4

Background:

The purpose of this project will be to develop a monitoring plan that would quantitatively assess hydrologic changes and associated prey abundance for avifauna in the Western Marsh following project completion. The Coastal Bend Bays & Estuaries Program (CBBEP) and US Fish & Wildlife Service (USFWS) have been instrumental in accomplishing the first construction phases of a major restoration project on Matagorda Island's Western Marsh within the Aransas National Wildlife complex, and the monitoring and assessment phase is ready to be implemented. Natural hydrology of the marsh was effectively altered in the 1950s from the placement of levees, barriers and ditches for cattle grazing. The multi-million dollar project has been designed in phases (Phase II Adaptive Management Plan developed by CBBEP for the Western Marsh, Matagorda Island), with initial phases completed and additional work to be completed in summer 2014. This project will develop a monitoring plan that would quantitatively assess hydrologic changes and associated prey abundance for avifauna in the Western Marsh following project completion.

Development of the monitoring and assessment plan is essential to determine hydrologic recovery of the marsh for resident wading birds and the federally endangered Whooping Crane. This species began using the Matagorda and San Jose islands as wintering areas as they expanded from Blackjack Peninsula, and over half of their winter territories are located on the barrier island chain. By monitoring hydrologic parameters and avian use of the wading bird guild, the project's effectiveness can be assessed and recommendations for next phases developed.

The project will develop a monitoring plan that would quantitatively assess hydrologic changes and associated prey abundance for avifauna in the Western Marsh following project completion. This monitoring plan will be implemented at a later date. This process will be accomplished by organizing science and technical input from regional scientists into a comprehensive estuarine habitat restoration plan. Workshops will be held at beginning, midterm, and completion of the project to address past, ongoing, and potential monitoring projects and recommend standards and techniques into a monitoring plan for this back-barrier estuarine marsh complex restoration assessment program. Key parameters will include hydrologic flow and quality assessment, movement and abundance of key prey items (i.e., crabs, fish) for wading birds, and quantitative response of wading birds to restored areas in comparison to reference areas.

Project Objective:

This project will assemble a project advisory committee to organize a hierarchical, multi-level monitoring plan for the Western Marsh of Matagorda Island, Aransas National Wildlife Refuge.

Project # 1523

An Ecosystem-based Approach to Determine Black Drum Communities in Baffin Bay: Year 2

Performing Organization: Harte Research Institute
Total Project Funding: \$30,000
CBBEF Bays Plan Actions: HLR-1, HLR-4

Background:

The purpose of this project is to examine resource use (food, habitat) of black drum in Baffin Bay. Last year, alarming trends appeared in the south Texas black drum fishery. Specifically, a large proportion of black drum landed in Baffin Bay by both recreational and commercial anglers have exhibited abnormal physical characteristics. These alterations have included overall reduced condition, strange tissue morphology (fisherman have named “jellyflesh”), and empty guts. These unusual landings have prevented commercial dockside sale and recreational consumption of black drum. Black drum represent an important commercial and recreational fishery in the state of Texas. In 2010 alone, ~1.7 million pounds of black drum were landed (valued at ~\$1.6 M) second only to red snapper. It is hypothesized that these various characteristics are due to resource limitation (food, space, etc.), and may stem from altered water quality in Baffin Bay.

Following the design of previous work by Montagna and guidance from the Texas Parks and Wildlife Department, the team will resume a standardized benthic sampling program to understand the spatial and temporal patterns in the abundance of potential black drum prey (i.e., benthic invertebrates) across Baffin Bay. To examine black drum reliance on these potential resources and spatial variability in trophic role, the research group will continue to conduct comparative diet analyses from specimens collected from Baffin Bay. The final component of this project will examine movement patterns of black drum (e.g., fidelity to Baffin Bay) and how they relate to the environmental regime. A large number of black drum (n=25) will already be fitted with coded acoustic transmitters and tracked across receiver arrays deployed in Baffin Bay and adjacent water bodies. To do this, the research group will modify the current acoustic array deployed throughout the coastal bend and examine black drum fidelity to Baffin and potential connectivity with other embayments. Coupled with a concurrent, spatially explicit water quality study in Baffin Bay, the research group will integrate fine-scale environmental monitoring with tracking data and build a comprehensive picture of ecosystem dynamics in this system. In summary, this integrative project will identify the potential biological and physical factors plaguing the economically important black drum fishery in Texas waters.

Objective:

A comprehensive scientific understanding of how to best manage the Black Drum fishery in Baffin Bay.

Performing Organization: Texas Parks & Wildlife
Total Project Funding: \$18,000
CBBEF Bays Plan Actions: HLR-2

Background:

The purpose of this project is to enhance approximately 230 acres of coastal prairie and freshwater wetland habitat suitable for use by mottled ducks at Mustang Island State Park. Installation of a simple solar-powered well near an existing permanent wetland at the Park would increase the size of the wetland to approximately 10 acres. In turn, this would greatly increase and the amount of suitable foraging, pre-breeding, nesting, brood-rearing and molting habitat available to mottled ducks at the Park.

Historically, the Texas Mid-Coast supported moderate densities of mottled ducks which do not migrate and prefer to use shallow (6" – 12"), freshwater coastal wetlands throughout the entire year. The habitat on Mustang Island includes numerous shallow freshwater wetlands which provided habitat suitable for use by mottled ducks. However, as development and freshwater use on the island increase, freshwater wetlands of the type used by mottled ducks are steadily decreasing. Recent data from a joint-agency survey indicate a long-term decline in mottled duck numbers for Texas since 1970. Maintaining shallow water during summer months can provide maximum benefit to mottled ducks, as well as other wildlife, when natural wetlands are dry. In addition, periodic wetland management is necessary to maintain the early successional conditions that mottled ducks prefer. The Park has in place a fire management plan and regularly uses prescribed burns to manage vegetation. Burns could be conducted in a manner suitable for development of optimal conditions for mottled ducks.

Project Objective:

1. Installation of solar-powered well at Mustang Island State Park.
2. Development of *Mottled Duck Management Guidelines*.

Performing Organization: CBBEP
Total Project Funding: \$295,000
CBBEP Bays Plan Actions: BTR-3, SM-3, HLR-1, HLR-2

Background:

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

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

Since 2002, CBBEP has worked to acquire either fee simple title or conservation easements for more than 7,200 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 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, USDA-NRCS, and other conservation organizations to identify and implement restoration actions that benefit a minimum of 3,000 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.

Objective:

Identify and implement restoration actions that benefit a minimum of 3,000 acres of habitat for Aplomado Falcons, Attwater's Prairie Chickens, and Whooping Cranes.

Performing Organization: To Be Determined
Total Project Funding: \$135,000
CBBEP Bays Plan Actions: HLR-1, HLR-2

Background:

In November 2013 CBBEP received notification of funding from CEPRA for the second phase of the project, which includes permitting and final engineering. The match requirement for this project is 60/40, with CBBEP needing to fund 40% of the total project cost. The total project cost is \$135,000, with CBBEP's match requirement of \$54,000.

According to a study conducted by the University of Texas Marine Science Institute, the face of the Nueces River Delta is eroding at an average rate of 8.2 feet per year. The erosion of the delta is causing the on-going loss of emergent intertidal and sub-tidal marsh habitat. This disappearing fringe protects additional marsh habitat further inland, open-water channels and small lakes, and upland habitat that depends on the lower-lying marsh. As the size of these habitats decrease, so will the abundance and diversity of the wildlife that breeds, nests, and shelters in the delta. The delta harbors numerous state- and federally-listed endangered species and species-of-concern. Diamondback terrapin turtles and blue crabs utilize the Nueces Delta. Avian species found in the delta include the white pelican, brown pelican, peregrine falcon, Texas bald eagle, burrowing owl, reddish egret, black skimmer, least tern, snowy plover, and piping plover. Native Texas thorn scrub in the uplands is utilized by numerous birds and mammals for nesting and foraging.

CBBEP has completed a feasibility and alternatives analysis, and is in the process of developing a conceptual design in order to apply for a U.S. Army Corps of Engineer permit to allow construction of the selected alternative. A near-shore protection structure will be constructed, parallel to the delta's shoreline. The structure will be designed to not only stabilize the delta shoreline, but also to trap sediment and allow for the eventual accretion of the shoreline. It is anticipated that the protection structure will be a minimum of 1,500 feet in length and positioned to protect the most vulnerable wetland habitat of the 10,000+ acre delta.

Objective:

Develop conceptual design and identify preferred actions for protection of the delta.
Complete final design and permitting for the selected protection actions.

Project 1527

Identifying Nesting Habitat for Texas Diamondback Terrapin in the Nueces Estuary with Implications for other Texas Estuaries

Performing Organization: Texas A&M University-Corpus Christi
Total Project Funding: \$19,500
CBBEP *Bays Plan* Actions: HLR-1

Background:

The purpose of this project is to identify nesting habitats for Texas diamondback terrapin. There is virtually nothing known regarding terrapin nesting in Texas. In order to ensure the longtime survival of this species, it is imperative to identify and preserve the habitats utilized for nesting. Terrapins are known to exhibit nest site fidelity, meaning they return to the same nesting beaches year after year. Bulk heading and other shoreline alterations can prevent terrapins from accessing nesting beaches. Until these areas are identified, there is no hope of preserving them as functional nesting habitats. This project aims not only to identify specific nesting sites in the Nueces Estuary but to provide a general framework for locating nesting habitat in other Texas estuaries.

Previous research, funded by CBBEP, has suggested methods for reducing mortality in juvenile and adult terrapins through the use of bycatch reduction devices. Attention should also be paid to the earliest life stages to ensure healthy recruitment into terrapin populations. In order to do this, nesting habitats must first be identified so that they can be preserved.

By utilizing radio telemetry researchers will actively track mature female terrapins during the nesting season in hopes of discovering nesting areas within the Nueces Estuary. Descriptive data, including percent vegetation cover, substrate type, and elevation, will be recorded if nesting sites are identified. Motion activated digital cameras will be deployed in areas that meet the criteria for nesting found in published literature from outside of Texas. This will allow us to monitor potential nesting sites for all female terrapins, not just those that have been tagged. By combining these two methods, chances of discovering nesting habitats will be increased.

Objective:

The project will be to identify diamondback terrapin nesting sites. The nesting habitat sites identified will then be marked for preservation.

Performing Organization: To Be Determined
Total Project Funding: \$101,154
CBBEP Bays Plan Action Items: HLR-2, HLR-4

Background:

Most Colonial nesting waterbird populations have declined over the past 40 years, according to data from the Texas Colonial Waterbird Survey. The reasons for the decline include mammalian predators, imported red fire ants, human disturbance of nesting sites, loss of coastal wetlands, and the direct loss of nesting habitat to erosion and sea level rise.

In 2001 CBBEP constructed New Island in Nueces Bay to help address the loss of nesting habitat. As part of that project, five other remnant islands were protected with geotextile tubes to prevent further erosion. The geotextile tubes were placed to allow for the addition of fill material that would increase nesting area (but due to financial constraints, the placement of fill has not occurred).

This project will restore one of the five islands, adding a total of approximately 0.5 acre of new nesting area, by placing approximately 2,000 cubic yards of material between the islands' current shorelines and existing geotextile tubes. The new material will provide habitat for bare-ground nesters, such as a black skimmers and gull-billed terns.

Objective:

Enlarge one of the five rookery islands in Nueces Bay by placing material between the island's current shorelines and existing geotextile tubes.

Performing Organization: To Be Determined
Total Project Funding: \$38,900
CBBEP Bays Plan Action Items: HLR-2, HLR-4

Background:

Violet Andrews Park is a 10-acre public park that is owned and managed by the City of Portland. This park site is unusual because it is located on a high bluff that overlooks the vast Corpus Christi Bay shoreline, in contains a significant amount of native coastal woody and grassland vegetation throughout the bluff area, and it is situated directly in the migratory pathway of Circum-Gulf and Trans-Gulf neotropical migratory birds.

This 10-acre public park site contains a quarter-mile long hike and bike path. There are many areas along this path which are currently devoid of vegetation, including groundcover. As a result, there is evidence of wind and rainfall runoff related erosion (see attached photographs). This 10-acre public nature park currently contains low-impact recreational amenities (walking paths, a pavilion, and several drinking fountains). The park site is also known to be a popular birding site. Native trees, shrubs, and forbs provide extremely important habitat for resident birds, insects, reptiles, and mammals, but their value as a stopover habitat is immeasurable. These woodland areas (such as the native vegetation occurring throughout the park's bluff) located along the Texas Coastal Bend's bay margins have historically, and continue to be used as important refuges for migrating passerines as they make landfall during their Circum-Gulf or Trans-Gulf migration. These migrants will seek out shelter and protection from strong winds and predators, then they seek out freshwater, and finally they will begin to forage before resuming their migratory trek to their Canadian and North American breeding grounds.

Funds from this Supplemental Environmental Project (SEP) will be used to restore native vegetation in strategic areas (that are currently denuded) located within the park site which will serve to reduce erosion and sedimentation, and enhance and restore native habitat. This project will reduce and prevent pollution (by stabilizing the unvegetated sandy substrate with native forb, shrub, and tree species), enhance the quality of the environment (particularly for resident and migratory bird species), and raise public awareness of environmental concerns.

This SEP project will also result in the restoration/enhancement of ecologically important habitats located within critical migratory pathways including the reduction of erosion/sedimentation, and provide excellent opportunities for education outreach and public/community awareness of environmental matters

Objective:

The objective of this project is to reduce erosion on upland area and sedimentation downstream of the area by creating a vegetative buffer using native plants to enhance habitat for birds and wildlife and providing outreach opportunities on the park.

VIII. Program Administration

CBBEP administrative staff (3 FTE's) will provide organizational and logistical support for Estuary 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 for overall program coordination with EPA Region 6 and TCEQ.
7. Participate in regional, state, and national conferences and meetings relevant to estuarine management.
8. 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.
9. Continued implement 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.

IX. Project Management and Implementation

CBBEP Project Management staff (9 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.

X. 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.

XI. 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.

XII. Summary

On September 1, 2014, the Coastal Bend Bays & Estuaries Program will begin Year 17 of implementing the *Coastal Bend Bays Plan*. This FY 2015 Work Plan describes the proposed work to be initiated during FY 2015. Of the total funds identified in the Work Plan budget, \$573,000 are new (FY 2015) EPA federal funds, \$757,504 are new (FY 2015) TCEQ funds, \$649,954 are new (FY 2015) project-specific funds, \$302,500 are new (FY 2015) local partner/federal court interest funds and \$125,260 are FY 2014 Carry Forward funds. The total budget for this FY 2015 Work Plan is \$2,408,218.

TABLE 1: FY 2015 COMPREHENSIVE ANNUAL WORK PLAN OUTLINE

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY14 CWA 320	TCEQ FY14 & 604b	LOCAL/ COURT INTEREST	TGLO CMP & CEPRA	MISC GRANTS	NUECES COUNTY	USFWS	FY14 CF	TOTAL CBBEP FUNDING
1501	Coastal Waterbird Management	HLR-1, HLR-4	CBBEP	108,289			5,000		54,900			\$168,189
1502	Coastal Bend Environmental Science – Delta Discovery	BTR-1, PEO-2, PEO-3, PEO-5	CBBEP	181,818								\$181,818
1503	Fieldtrip Funding for the Delta Preserve	PEO-3, PEO-5	CBBEP					10,000				\$10,000
1504	CBBEP Community Outreach Partnership	PEO-1, PEO-2, PEO-3, PEO-4, PEO-5	Coastal Bend Bays Foundation		10,640	10,250					9,110	\$30,000
1505	CBBEP Public Outreach Events & Activities	PEO-1, PEO-2, PEO-3, PEO-4, PEO-5, BTR-1	CBBEP			25,000						\$25,000
1506	Outdoor Classrooms	PEO-3, PEO-5	CBBEP & USFWS							10,000		\$10,000
1507	CBBEP Habitat Protection Media Campaign	BTR-1, PEO-2, PEO-3, PEO-5	CBBEP			15,000						\$15,000
1508	Large Debris Removal from the Lower Nueces River	BD-1, HLR-1, WSQ-1	Nueces River Authority		30,000							\$30,000
1509	CBBEP Property Management	HLR-1	CBBEP			30,000						\$30,000
1510	Carbon Sequestration & Long Term Seagrass Monitoring	WSQ-1, WSQ-5	University of TX Marine Science Institute								15,000	\$15,000

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY14 CWA 320	TCEQ FY14 & 604b	LOCAL/ COURT INTEREST	TGLO CMP & CEPRA	MISC GRANTS	NUECES COUNTY	USFWS	FY14 CF	TOTAL CBBEP FUNDING
1511	Nueces Delta Environmental Monitoring	FW-1, FW-2, FW-3, FW-4	Conrad Blucher Institute		37,000							\$37,000
1512	Climate Change Vulnerability Assessment	SM-2, HLR-1, PEO-1	The Nature Conservancy	35,000								\$35,000
1513	Volunteer Water Quality Monitoring Program in Baffin Bay	WSQ-3	Texas A&M University-Corpus Christi					50,000				\$50,000
1514	Water Quality of the Baffin Bay System	WSQ-3, WSQ-4, WSQ-5	Texas A&M University-Corpus Christi		75,000							\$75,000
1515	Nueces Bay Marsh: Public Access Enhancements	BTR-2, PEO-3	CBBEP	6,500		2,350	34,000				17,150	\$60,000
1516	Packery Channel Nature Park – Phase II	BTR-1, BTR-2, BTR-3, HLR-1, PEO-4, PEO-5	Nueces County			72,400						\$72,400
1517	Effects on Benthic Macrofauna from Pumped Flows in Rincon Bayou	FW-1, FW-2, HLR-1, WQ-3, WSQ-4	Harte Research Institute		48,600							\$48,600
1518	Hazel Bazemore Park Bottomlands Nature Trail	BTR-2, BD-1, HLR-1, HLR-2, WSQ-1	Nueces County			25,000						\$25,000
1519	Waters for Wildlife: Enhancing Freshwater Sources for Whooping Cranes	HLR-1, HLR-2,	San Antonio Bay Partnership			16,000				12,000		\$28,000

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY14 CWA 320	TCEQ FY14 & 604b	LOCAL/ COURT INTEREST	TGLO CMP & CEPRA	MISC GRANTS	NUECES COUNTY	USFWS	FY14 CF	TOTAL CBBEP FUNDING
1520	TX Gulf Region Cooperative Weed Management Area	HLR-1, HLR-2, HLR-10	TBD		25,000							\$25,000
1521	Development of a Winter Range Whooping Crane Strategic Plan	HLR-1, HLR-2	International Crane Foundation			15,000						\$15,000
1522	Hydrologic Change & Wading Bird Guild Use in the Restored Western Marsh	HLR-2, HLR-4	International Crane Foundation		10,400							\$10,400
1523	An Eco-system-based Approach to Determine Black Drum Communities	HLR-1, HLR-4	Harte Research Institute		30,000							\$30,000
1524	Mustang Island State Park – Mottled Duck Habitat Enhancement	HLR-2	Texas Parks & Wildlife								18,000	\$18,000
1525	Gulf Coast Conservation Initiative	BTR-3, SM-3, HLR-1, HLR-2	CBBEP			20,000				275,000		\$295,000
1526	Nueces Delta Shoreline Stabilization & Habitat Protection Phase II	HLR-1, HLR-2	To Be Determined				81,000				54,000	\$135,000
1527	Identifying Nesting Habitat for Texas Diamondback terrapin	HLR-1	Texas A&M University-Corpus Christi	19,500								\$19,500
1528									101,154			\$101,154

PROJECT #	PROJECT TITLE	ACTION ITEM(S)	PERFORMING PARTY	EPA FY14 CWA 320	TCEQ FY14 & 604b	LOCAL/ COURT INTEREST	TGLO CMP & CEPRA	MISC GRANTS	NUECES COUNTY	USFWS	FY14 CF	TOTAL CBBEP FUNDING
1529	Violet Andrews Park Habitat Enhancement	HLR-2, HLR-4	To Be Determined					38,900				\$38,900
	TOTAL PROJECT FUNDS			\$351,107	\$266,640	\$231,000	\$120,000	\$98,900	\$156,054	\$275,000	\$125,260	\$1,623,961
	Administrative / Travel		CBBEP	\$221,893	\$490,864	\$71,500						\$784,257
	TOTAL FUNDING			\$573,000	\$757,504	\$302,500	\$120,000	\$98,000	\$156,054	\$275,000	\$125,260	\$2,408,218