# Coastal Bend Bays & Estuaries Program

# FY 2005 Comprehensive Annual Work Plan

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

## FY 2005 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 2005 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 2005 Comprehensive Work Plan will be September 1, 2004.

## III. Federal and State Program Coordinators and Project Officers

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## IV. Accomplishments To Date

The CBBEP achieved its primary goal for FY 2004, 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 Estuary Council has not made any changes in the priorities as listed in the CCMP.

All project deliverables identified for FY 1999, FY 2000 and FY 2001 have been completed. FY 2002 and FY 2003 projects are expected to be complete by August 31, 2005. The Estuary Council committees continue to identify, initiate and select project ideas for inclusion in the Program work plans.

In FY 2004 the CBBEP initiated a number of projects funded by various state, federal and local support. The following brief discussion highlights several of these projects.

**Committee Organization Development and Facilitation –** CBBEP saw a need to dissolve the two advisory committees, the scientific-technical advisory committee and the citizen's advisory committee, due to broad and overlapping responsibilities. Through a bid process, CBBEP contracted with Resolve, Inc., a professional development and facilitation organization to assist in the establishment of the four new advisory committees (Human Uses, Monitoring and Research, Natural Resources, and Education and Outreach Committees), and a coordinating committee to advise the Bays Council.

**Keepers of the Coast** – This project continues to provide a series of 'hands-on' learning experiences for youth and educators through the Texas State Aquarium. Targeting rural school districts with limited funding has provided enhanced learning experiences such as outreach visits and field trips, family learning events, and classroom activities utilizing the teaching guide which focuses on the Gulf of Mexico and its coastal habitats.

**Various Public Outreach and Education Projects** – One of the goals of the public outreach strategy is to take action to position the CBBEP in a way that improves communication and behavioral changes in the Texas Coastal Bend community. The CBBEP has become a clearinghouse for information related to the state of the bay, a network hub of information for media journalists on environmental issues, and established a strong brand name recognition in the community through the communication of media coverage.

Planned TV media campaigns were held with project partners: Seagrass Conservation media campaign with U.S. Fish and Wildlife and Texas Parks and Wildlife, and the Earth Day/Bay Day media campaign with the Coastal Bend Bays Foundation. There was TV news coverage on the Rockport Viewing Scope, *Keepers of the Coast* Educator Open House, Earth Day/Bay Day Festival, Buc Days Texas Coastal Expo and the Nueces Bay Boat Ramp christening.

Outreach activities included: Rockport Hummerbird Festival, National Estuaries Day, Keep Ingleside Beautiful, Bayfest, 2004 Boat Show, Great Texas Birding Classic Youth Teams and the TPWD Crab Trap Removal Project. The CBBEP held its inaugural highly successful *Birds, Plants & Reptiles Teacher Workshop.* The CBBEP "Fish Stick" blitz has been successful in distributing over 9,000 fish measuring tapes to 36 area boat/tackle shops and bait stands. Over 850 U.S. EPA *Protecting Our Nation's Estuaries* posters have been distributed via the website's "free poster" offer. The goal of the CBBEP's vivid and creative *"Living on the Edge"* communications campaign continues to focus on the CBBEP's *Priority Issues* and have a positive impact and, above all, the adoption of sustainable behaviors.

**Colonial Waterbird / Avian Resources Project** –The Program continues to a focus on the management of Colonial Waterbirds and their habitat through the implementation of the Rookery island Management Plan. Management for nesting sites has proven successful as evidenced by marked increases in nesting birds at various managed sites.

## V. Goals for FY 2005

The primary goal for FY 2005 is to continue the successful initiation and completion of projects developed to implement the *Coastal Bend Bays Plan*.

The CBBEP continues to focus on habitat protection, restoration and enhancement – including colonial waterbird habitat management and public access, assisting the recovery of species of concern, and public education and outreach. This work plan allocates funds for efforts to protect and restore estuarine wetlands lost to erosion. Halting and reversing the long-term decline of intertidal marsh habitat and associated uplands is critical to the long-term health of the bay system.

Public Education and Outreach remains an important component of the *Bays Plan.* The Advisory Committees of CBBEP have shown great interest in focusing on public outreach through the media, with emphasis on the priority issues as described in the *Bays Plan.*

The Rookery Island Strategic Master Plan has been developed by CBBEP staff, and focuses on maintaining healthy populations of colonial waterbirds with specific emphasis on those species showing a significant population decline. CBBEP has two avian biologists on staff who will continue to implement the Master Plan.

Maintaining a long-term water quality monitoring program is an important component of our effort to assess the health of the bay system. Monitoring data allows the CBBEP and other resource managers to identify "problem" areas and focus limited financial and manpower resources. Areas not meeting the water quality standards for their designated use will be monitored more frequently. Sources of pollution will be identified and remediation strategies developed for areas not meeting the standards.

Program staff will continue to seek additional partners to assist with the implementation of the *Bays Plan*.

## VI. Implementation of Projects

Project activities for FY 2005 have been selected for their contribution towards implementation of the *Coastal Bend Bays Plan*. Thirty-three projects will be implemented in FY 2005. A comprehensive list of projects outlining project numbers, titles, action items, performing party(s), and budget can be found in Table 1: FY 2005 Comprehensive Annual Work Plan Outline.

## 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.

## Project #0501 Habitat Restoration & Enhancement Projects

**Performing Organization:** **To Be Determined**
**Total Project Funding** **$100,000**
**CBBEP Bays Plan Actions:** **HLR-1, HLR-2**

The *Bays Plan* recognizes the need for efforts to identify habitat types that are most at risk and to work with landowners and local and state governments to conserve, preserve and/or enhance those habitats. Within the Coastal Bend area, many separate efforts are underway to protect wetland and upland habitat. It is critical to the CBBEP's long-term environmental planning effort to be well prepared and have future project ideas identified and well planned.

In addition, funds frequently become available to the CBBEP for possible habitat conservation projects, especially wetland conservation projects. Wetlands have been specifically identified by the CBBEP and others as an important coastal natural resource that is at risk. However, preparation of documents describing project parameters sufficient to justify receipt of funding is often difficult to accomplish in the short time frame frequently provided. Therefore, it is important that potential projects be identified and well delineated prior to the availability of the funds. High priority wetland conservation project plans should include detailed project descriptions, goals, objectives, and have the alternatives defined, including all options and costs associated with the implementation of the project actions.

CBBEP Project #0319 was designed to develop an information database of potential project sites. The project continued in FY04 (Project #0412). These projects identified and described potential projects; however, the need to identify all the specific actions, options and cost estimates remains. This project will utilize project deliverables from CBBEP #0318, #0319 and #0412 as well as other project ideas to address the restoration needs in the Texas Coastal Bend. Projects such as the need to protect habitat and combat erosion problems in the Nueces Delta, to restore wetlands in Nueces Bay, enhancement of colonial waterbird island habitat, and various other sites that require habitat restoration or protection, have been identified but need further development prior to implementation

**Project Objectives**:

1. To utilize existing information regarding conservation, protection and habitat enhancement project ideas within the CBBEP area and further develop project ideas.
2. To take selected priority projects and evaluate their constructability and feasibility through assessment, development of conceptual alternatives and evaluation of those alternatives to select the optimum design and develop preliminary engineering design in preparation of implementation.

## Project #0502 CBBEP Colonial Waterbird Project

**Performing Organization:** **CBBEP Staff**
**Total Project Funding:** **$150,000**
**CBBEP Bays Plan Actions:** **HLR-1**

The Living Resources Characterization Report prepared for the Estuary Program documented the declining populations of certain colonial waterbird populations. Colonial waterbird populations are indicators of the overall health of the estuary. Birding, especially viewing colonial waterbirds, is an important and growing component of ecotourism and the local economy.

Building on the efforts of the CBBEP Colonial Waterbird projects in previous years, this project will continue the implementation of specific management actions of the CBBEP Colonial Waterbird Rookery Island Management Plan. Management actions will include efforts to reduce human-disturbance, nesting substrate management, vegetation management to enhance rookery island habitat, and predator control where necessary. Outreach will continue to be a crucial component in achieving project objectives.

**Project Objectives**:

1. Continue efforts on enhancement and construction of nesting habitat.
2. Continue to promote public programs to protect colonial waterbirds.
3. Monitoring of Colonial Waterbird populations.
4. Install signage to reduce impacts of human disturbance on waterbird colonies.

## Project #0503 Environmental Indicators/Scorecard

**Performing Organization:** **To Be Determined**
**Total Project Funding:** **$50,000**
**CBBEP Bays Plan Actions:** **FW-1, WSQ-4, HLR-2, BTR-4**

It is important that the CBBEP track key indicators regarding the health and productivity of area bays in order to determine progress being made to protect bay resources. The development of key environmental indicators regarding water and sediment quality, commercial and recreationally important fish and shrimp species, the condition of other living resources including colonial waterbirds, changes in habitat condition, and other to be determined indicators, will be based on input from the stakeholders actively working to help implement the *Coastal Bend Bays Plan*.

It is also important that this information be conveyed to the many stakeholders and interested public in a manner that accurately portrays the condition of the bays in an easy to understand format. The presentation of information about our bays in a meaningful and concise manner will provide both the general public and key decision makers with the information needed to develop and implement public policies to help protect natural resources.

**Project Objectives**:

1. To develop measurable and meaningful indices to track the estuaries ecological health in a manner that understandable to targeted stakeholders.
2. To develop an “Environmental Score Card” that allows effective communication of information concerning the condition of the estuary.

## Project #0504 Fisheries Status & Trends Report

**Performing Organization:** **To Be Determined**
**Total Project Funding:** **$25,000**
**CBBEP Bays Plan Actions:** **HLR-4, HLR-7, HLR-2**

Fish and shellfish populations are a key indicator of the overall health of our bays and estuaries. In addition to their ecological importance, healthy populations are important to the local economy, providing many jobs in the commercial fishing industry and the tourist industry. The CBBEP needs to be able to assess population trends in order to identify any developing problems and implement corrective management actions.

Texas Parks and Wildlife Department collects a variety of data associated with the inshore fisheries. This project by the CBBEP will allow us to analyze that data and present it in a format for use by the general public and policy makers.

**Project Objectives**:

1. To evaluate marine fisheries status and trends within the CBBEP project area.
2. Assist resource managers in implementing fisheries management decisions to ensure a sustainable, healthy fishery in the Texas Coastal Bend.

## Project #0505 Public Outreach Events and Activities

**Performing Organization:** **CBBEP**
**Total Project Funding:** **$60,000**
**CBBEP Bays Plan Actions:** **BTR-1, PEO-2, PEO-3, PEO-5**

One of the most important goals of the *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 to understand the complex issues concerning bay resource management will be 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.

As a result of the need for the Public Outreach Events and Activities, the CBBEP will participate in the following projects:

(a) Community Events and Festivals – CBBEP's presence at community events plays an important role to draw the public's attention to bay resources and environmental protection. Community events may include: Earth Day/Bay Day, Bayfest, Great Texas Birding Classic, International Migratory Bird Day, and other area events. *Project cost: $13,000*

(b) CBBEP Educational Materials – The CBBEP will create an educational poster and will continue to update and develop materials that will serve as general information and/or overview about the Program. The materials will be distributed at all events, meetings, outreach, schools, etc. *Project cost: $12,000*

(c) CBBEP Website – One of the CBBEP's most informative and interactive tools has become a tremendous resource for the general public. The CBBEP will continue to update the website, improve navigation, information flow, and increase interactivity. *Project cost: $6,500*

(d) CBBEP Newsletter – This informational newsletter will serve as an important outreach tool and help keep Program Council members, legislators, government officials, and the general public informed about local environmental issues and CBBEP activities. *Project cost: 6,500*

(e) CBBEP Annual Meeting and Forums – The CBBEP Annual Meeting will bring together all Program Committees for project updates including past, present and future plans. The CBBEP sees an opportunity to partner with the Coastal Bend Bays Foundation on their monthly forum meetings. This creates an educational opportunity for the public. *Project cost: $5,000*

(f) Other Outreach Opportunities - Public outreach continues to be a key element of the CBBEP to educate Coastal Bend residents about the importance of bays and estuaries to their communities. Program staff will utilize local and regional media (newspapers, television, radio stations, websites, etc.) other public events, exhibit ideas, and other CBBEP materials to implement the goals of the CBBEP Public Outreach Strategy. *Project cost: $15,000*

(g) National Ocean Sciences Bowl - This event provides the opportunity to increase knowledge of the aquatic environment on the part of high school students, their teachers and parents, as well as to raise public awareness of ocean-related concerns. *Project cost: $2,000*

**Project Objective:**

1. The goal of these public education and outreach projects is 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.

## Project #0506 Copano Bay Bacteria Source Tracking - Phase II

**Performing Organization:** **Texas A&M University-Corpus Christi**
**Total Project Funding:** **$125,000**
**CBBEP Bays Plan Actions:** **PH-2, WSQ-1, WSQ-5**

The purpose of this project is to determine the source of bacterial contamination in Copano Bay through bacteria source tracking. Copano Bay is listed on the state's 303(d) list of impaired waters for the harvesting of oysters. Both the Texas Department of Health (TDH) and the Texas Commission on Environmental Quality (TCEQ) want to determine where the contamination is originating so that a Total Maximum Daily Load (TMDL) can be developed. In addition, if the source is non-human in origin (as expected), TDH will use this data to begin reviewing changes in oyster harvesting rules.

During the previous phase, Texas A&M University-Corpus Christi developed Quality Assurance Project Plan (QAPP), expand their existing DNA bacteria database and analyzed samples collected during eight events at 14 stations within Copano Bay. Analysis of the samples included filtration of water samples, isolation of E. coli, and verification of the samples. Thirty isolates were verified from each station. Of these, 25 were analyzed for antibiotic resistance, and a subset of 10 isolates was fingerprinted by PFGE (Pulse Field Gel Electrophoresis). Water quality samples from 8 events were analyzed and included in the final report.

This project will build on the work that was completed during the previous phase for use in identifying the sources of bacteria into the Copano Bay system.

**Project Objectives**:

1. To expand the existing DNA bacteria database of possible contributors of fecal bacteria to Copano Bay.
2. To collect and analyze bacteria samples from Copano Bay.
3. To determine the relative contribution of bacteria to Copano Bay by source.

## Project #0507 Seagrass Monitoring Project – Phase II

**Performing Organization:** **University of Texas- Marine Science Institute**
**Total Funding:** **$68,050**
**CBBEP Bays Plan Actions:** **HLR-1**

Data collected in 1994 documented that seagrass meadows covered over 92,000 acres of bay bottom in the Coastal Bend, representing almost 40 percent of the seagrasses found in all Texas waters. While a number of researchers have conducted limited surveys and studies since 1994, there has not been a comprehensive update of the status and trends analysis previously conducted by the CBBEP.

The importance of seagrasses to the health and productivity of the bays and estuaries is recognized by resource managers. The Seagrass Conservation Plan of Texas (1998) called for the development and implementation of an on-going monitoring program based on the following justification:

- X Seagrass Monitoring Program was a major recommendation of the Seagrass Conservation Plan for Texas, adopted in 1998 by TPWD, TCEQ (formerly TNRCC), and TGLO.
- X Surface Water Quality (SWQ) standards were recently changed by TCEQ (2000) (based on TPWD recommendations) to include Seagrasses as a new Aquatic Life Use in the standards. This designation requires that quantitative, water quality, and related seagrass habitat, criteria be defined in order to apply the new standards to environmental assessment actions in Seagrass areas.
- X A formal seagrass monitoring program was recognized by TCEQ and TPWD as necessary to obtain the required information and quantitative data to establish SWQ standards.
- X Monitoring data are also routinely needed to assess seagrass impacts in other coastal regulatory or management actions involving:
  (a) Nutrient enrichment from NPS runoff and watershed loadings (eg. agriculture, mariculture, septic tanks or storm drains).
  (b) Dredging (especially GIWW channel) that produces high levels of suspended solids and turbidity.
  (c) Shallow-draft boating activities which cause propeller scarring.
  (d) Shoreline and marina developments, especially near seagrasses.
  (e) National Estuary Program projects.
  (f) Restoration and mitigation projects.
  (g) State scientific areas and estuarine reserves, like Redfish Bay.

**Project Objectives**:

1. To continue to monitor status and trends of seagrass distribution utilizing aerial photography at 1:24,000 scale within the CBBEP project area.
2. To continue to establish 16-20 aerial photography high-resolution (1:9,600) seagrass monitoring sites for long-term monitoring and assessment.

## Project #0508 Reopening of Cedar Bayou Feasibility Analysis

**Performing Organization:** **Save Cedar Bayou, Inc.**
**Total Funding:** **$10,000**
**CBBEP Bays Plan Actions:** **HLR-1, HLR-2**

Cedar Pass, located at Cedar Bayou is a natural fish pass the separates Matagorda Island from St. Joe Island. The pass is located at the southern end of Mesquite Bay between San Antonio Bay and Carlos Bay (or the greater Aransas Bay complex). Although the pass has been dredged several times over the last 60 years, the pass has been closed for several years until a recent storm made a small opening the allows exchange of water with the Gulf of Mexico. Until recently, a "sand bridge" joining St. Joe and Matagorda Island existed at the mouth of the bayou preventing water exchange and movement of organisms through the pass. The endangered Whooping Crane population on the Aransas National Refuge about 5-7 miles from Cedar Bayou Pass has potential for benefiting from the opening of this pass. Representatives of the Aransas National Wildlife Refuge have indicated that opening the pass would directly benefit the Whooping Crane by increasing the number of blue crabs in the area. The blue crab is the preferred food of the Whooper. It has been reported that poor feeding conditions has resulted in fewer chicks being produced on the Canada breeding grounds.

The CBBEP has received a number of inquiries regarding the possibility of reopening Cedar Bayou and Vinson's Slough. The motivation for reopening the pass is driven by the need to improve water exchange with the Gulf of Mexico with the hope of improving fishing in the area. TPWD has indicated that their data shows a significant increase in the number of juvenile and adult fish, shrimp and crabs when the pass is open.

"Save Cedar Bayou, Inc." has taken the lead in the advancement of activities aimed at restoring the flow through the pass and has been awarded a grant of to use towards the development of an alternative analysis/feasibility study. CBBEP and other local funds will be used as "match" for the grant thus making this $100,000 project come to fruition

**Project Objective:**

1. To conduct an alternatives analysis/feasibility study for the reopening of Cedar Pass to be used in future consideration of dredging to restore natural water and marine migration between the bay and the Gulf of Mexico

**Project #0509 Nueces Delta Acquisition**

**Performing Organization:** **CBBEP**
**Total Funding:** **$135,000**
**CBBEP Bays Plan Actions:** **HLR-1, HLR-2, SM-3**

Due to its close proximity to a major urban area (Corpus Christi), much of the shoreline and wildlife habitat areas around Nueces Bay have experienced degradation due to land-use conversion and/or human encroachment. Essentially all of the southern and eastern shorelines of Nueces Bay have experienced a significant amount of anthropogenic impact. The northern shoreline of Nueces Bay, in San Patricio County, has experienced a slow but steady increase in residential and commercial development creeping to the west from the City of Portland. Only the Nueces River Delta, located at the west end of Nueces Bay, remains in relatively natural condition.

Long-term protection of the Delta is best accomplished through acquisition, including either outright ownership or the purchase of conservation easements. Once these areas are protected by acquisition, future projects can implement management strategies to restore the value and functionality of the habitat.

The CBBEP is working with the Nature Conservancy of Texas and the Coastal Bend Land Trust on this effort.

**Project Objectives:**

1. Protection and restoration of wildlife habitat through acquisition and conservation easements.
2. Development of a management strategy for each of the properties acquired

## Project #0510 Rookery Island Protection

**Performing Organization:** **To Be Determined**
**Total Funding:** **$60,000**
**CBBEP Bays Plan Actions:** **HLR-4, HLR-2**

The Living Resources Characterization Report prepared for the Estuary Program documented the declining populations of certain colonial waterbird populations. Colonial waterbird populations are indicators of the overall health of the estuary. Birding, especially viewing colonial waterbirds, is an important and growing component of ecotourism and the local economy.

Over the recent years, as a result of increasing population, colonial waterbirds have encountered a decline in suitable roosting and nesting habitat thus placing them at risk. In the CBBEP area, these species are highly dependent on a few important bay islands for successful nesting and fledgling of their offspring. These islands important because they not only provide a are predator-free environment but also offer suitable habitat structure for these specialized birds. Erosion at many of these islands is a constant problem. Without protection from wave-induced erosion, these islands, as others have, will slowly disappear. This project will identify a actions and implement solutions for protecting colonial waterbird rookeries in the CBBEP project area.

**Project Objective:**

1. To protect rookery islands from losses due to wave-induced erosion for the benefit of the colonial waterbird populations nesting in the CBBEP area.

## Project #0511 Keepers of the Coast

**Performing Organization:** **Texas State Aquarium**
**Total Funding:** **$35,000**
**CBBEP Bays Plan Actions:** **PEO-3**

The Keepers of the Coast educator/student outreach project was successfully initiated in FY 2001. This project provides educators with the opportunity to enhance current classroom teaching strategies with the resources of additional education facilities. The project provides staff development in the environmental sciences for teachers in targeted grades in the CBBEP area school districts selected based on economic need, minority population, and historically low visitation rate to the Texas State Aquarium (TSA). The selected school districts have limited funds for extended learning experiences such as outreach visits and field trips.

The teachers receive classroom and field instruction during a workshop designed to focus on area watershed and coastal resources. The goals of the workshop are to introduce national environmental education standards, to review state standards, and incorporate standards and school curriculum requirements into resources provided by TSA (e.g. TSA Marine Science Activities, Project WILD). Emphasis is on science and math with social studies and language arts incorporated. The workshop will also provide information on establishing local community clean-up projects using strategies from organizations such as Texas Parks and Wildlife Department and the Ocean Conservancy.

Keepers of the Coast outreach instructors participate directly in educating students in each of the participating districts. Educational materials presented to the students include inland and coastal environmental science and support material provided to the educators. Educational materials utilized and those developed through this project, will conform to state and national academic and environmental education standards, and outreach and field trip programs utilized by this project will continue to address CBBEP issues.

**Project Objectives:**

1. Select the target schools within the CBBEP area.
2. Select a teacher coordinator for each participating campus.
3. Conduct professional development sessions for participating teachers.
4. Conduct educational outreach programs for participating schools.
5. Coordinate and implement educational field trips to local facilities.
6. Host an Educator Open House.
7. Provide logistical support.

## Project #0512 Teaching Environmental Science I, II & III

**Performing Organization:** **Texas A&M University-Corpus Christi**
**Total Funding:** **$25,000**
**CBBEP Bays Plan Actions:** **PEO-3**

One of the many goals of the *Coastal Bend Bays Plan*, is to provide curricula for all levels of environmental education and promote greater use of outdoor educational facilities as a means of reaching children, young people, and adults. The environmental science courses include workshops and teacher training classes that focus on training key educators and leaders within the project area to subsequently train others within their organizations or community.

**TES I** - The TES course is designed to increase teachers' understanding of environmental concepts and principles regarding air, water and waste management, and a clean and healthy environment. The goal is to provide balanced information and to promote partnerships among teachers, government agencies, businesses, and community organizations. Course activities will include fieldwork, field trips, hands-on lab activities, and guest speakers. Grades assigned for the course will be "credit" (CR) or "no credit" (NC). Course content will enhance the ability of participating teachers to satisfy the Texas Education Agency's requirements included in the Texas Essential Knowledge and Skills (TEKS).

**TES II –** A graduate course offered to a maximum of twenty-five Corpus Christi and surrounding area secondary (6-12) public and private school teachers. Course participants will receive formal and informal training focusing on important land, air and water issues relating to the environment/conservation including the ecologic and economic importance of management issues unique to the Coastal Bend environment. Tuition for teachers is included and three (3) hours of graduate credit will be awarded by TAMUCC to each participant completing the course. The Texas Education Agency will award each course participant with Forty-five (45) hours of TEEAC credit.

TES I and II participants receive various teaching aids/materials during the course. Tuition for all participants selected for the respective programs is provided by the CBBEP. Transportation to and from the field is provided. Recruitment and selection of course participants will be handled jointly by the TCEQ, CBBEP, and TAMU-CC. The TCEQ, CBBEP and CCS will provide course-appropriate written materials for each course participant. TCEQ will provide, administer, collect and analyze evaluations for each course participant following each major course activity including a final course evaluation. All evaluations will serve as guidelines for future course improvement/refinement.

Due to the growing success of TES I and II, TES III will be introduced this year to provide educational training for an additional session to include up to 25 teachers.

**Project Objective:**

1. To provide specialized natural resource curricula materials and training to area teachers for their use in teaching natural resource stewardship.

## Project #0513 Kritters 4 Kids

**Performing Organization:** **Coastal Bend Wildlife Photo Contest**
**Total Funding:** **$10,000**
**CBBEP Bays Plan Actions:** **PEO-3**

One of the strongest messages the public has put forth in the development of the ***Bays Plan*** is that efforts to educate tomorrow's leaders must begin today. The Plan thus calls for the design and implementation through school districts of environmental curricula on bay resources issues.

The *Kritters 4 Kids* curricula teaches school children about the importance of wildlife and habitat, the threat of urbanization, local ecosystems, food webs, and includes an interactive learning tool called the *Treasure Hunt.*

The curricula targets the 7$^{th}$ grade Texas Essential Knowledge & Skills (TEKS) guidelines that specifically require students to study the relationships of organisms to the environment.

Eight lessons have been developed following the TEKS guidelines. The lessons will focus on: Ecological Regions, Native Plants/Introduced Species, Ecosystems, Producers, Consumers, and Decomposers, Energy Pyramids and Food Webs, Adaptations, Pollution Research and Stewardship and Conservation.

Schools will be selected from the CBBEP area based on economic need and other available statistics. The project will provide a variety of components, including teacher orientation and outreach visits to schools. The distribution of the *Kritters 4 Kids* curricula utilizes classroom activities that focus on wildlife and habitat in the Texas Coastal Bend. The programs and activities in the curricula support the state education standards. Through the project, the selected schools will gain knowledge and understanding of the linkages between wildlife and inland and coastal habitats. With this knowledge, the students will be better prepared to encourage sustainable management of local natural and wildlife resources.

**Project Objectives:**

1. Select the target schools within the CBBEP area.
2. Utilize available education resources and contacts.
3. Conduct teacher orientation.
4. Conduct educational outreach visits to schools.

## Project #0514 Curricula Needs Assessment Project

**Performing Organization:** **CBBEP**
**Total Funding:** **$15,000**
**CBBEP Bays Plan Actions:** **PEO-3, HLR-4, BTR-2**

The *Coastal Bend Bays Plan* identifies promoting the use of existing curricula with emphasis on local ecology. It calls for a survey of school districts to determine extent and success of materials currently used. This includes working with school administrations to identify needs and coordinate development of new materials, if necessary. Any curricula developed will include Grades K-12 and will follow the Texas Essential Knowledge & Skills (TEKS).

The CBBEP's Environmental Education & Outreach Implementation Team (EEOIT) reviewed PEO Actions 1-5 and found that all have been implemented or are currently in progress. The EEOIT felt it was important to research all the valuable and educational curricula (PEO-3) currently available to area teachers that also meets state guidelines. The goal of the *Curricula Needs Assessment Project* is to assess curricula with local ecological focus availability by researching the existing inventory, exploring what curricula teachers are using and how the teachers are using it to determine if there are any curricula gaps.

**Project Objectives:**

1. Define the curricula needs focused on local ecology.
2. Create a listing of available programs and begin process for a clearinghouse of curricula and resources collected including outdoor educational facilities.
3. Review gap analysis – once the information has been collected, target audiences (geographic and demographic) will be considered and what to do with the information. The goal is to create stronger programs.

## Project #0515 CBBEP Info Book

**Performing Organization:** **CBBEP**
**Total Funding:** **$10,000**
**CBBEP Bays Plan Actions:** **PEO-1, BTR-3**

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.

One of the newest outreach tools is the CBBEP Info Book. This informational resource is reader-friendly, highly visual and targets specific audiences. It tells the CBBEP story that includes what the Program is about, its history, priority issues, biennium focus and completed and on-going projects.

The CBBEP Info Book is designed to: raise the public's environmental awareness; foster community stewardship of bay resources; and increase individual involvement in bay resource management issues. 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 resources of the bay.

**Project Objective:**

1. To produce and distribute current project information to the general public, local governments, industry, environmental/conservation groups, bay users, university researchers, state and federal agencies, and private and nonprofit organizations.

## Project #0516 CBBEP Bay Area Map/Users Guide

**Performing Organization:** **CBBEP**
**Total Funding:** **$10,000**
**CBBEP Bays Plan Actions:** **PEO-1, HLR-1, BTR-1, BTR-2, BTR-3**

The Coastal Bend bays and estuaries contain a wealth of resources for people to enjoy and appreciate. These resources are central to the quality of life for many who live or come to recreate here. But our use of these waters – what we put into them and what we take from them – must be monitored to ensure that the bay system remains healthy and productive.

The CBBEP Bay Area Map/Users Guide is designed to increase the public's understanding and enjoyment of Texas Coastal Bend bays and estuaries. The guide will highlight natural resources that characterize the Coastal Bend, including seagrass beds, oyster reefs, coastal marshes, and tidal flats.

The guide will also contain features relevant to recreational users including marinas, boat ramps and fishing piers. Popular kayak, windsurfing, and birding locations will also be indicated.

**Project Objective:**

1. To create, produce and distribute the CBBEP Bay Area Map/Users Guide to residents and visitors that recreate in Coastal Bend bays and estuaries.

**Project #0517 Comprehensive Characterization of Oso Bay**

**Performing Organization:** **To Be Determined**
**Total Funding:** **$150,000**
**CBBEP Bays Plan Actions:** **WSQ-1, WSQ-4, and WSQ-5**

Oso Bay, (Segment 2485) a shallow (< 1meter), secondary Bay off of Corpus Christi Bay receives freshwater from Oso Creek (Segment 2485A) and other storm water outfalls from the City of Corpus Christi and exchanges saline water with Corpus Christi Bay and the Laguna Madre via tidal exchange and industrial wastewater flows respectively. The Oso Bay watershed drains an area of approximately 255 square miles and has a surface area of approximately 7.2 square miles. Oso Creek, which flows into Oso Bay, is an effluent dominated stream that originates near Robstown, Texas. During normal flow conditions, the wastewater plant at Robstown will be the headwater of the Creek. Texas Commission on Environmental Quality (TCEQ) data for Oso Bay shows 9 domestic and 10 industrial wastewater discharges empty into Oso Bay. Corpus Christi is experiencing major growth towards Oso Bay and Oso Creek. As such, significant amounts of storm water enter the Oso from subdivisions that lie in the drainage basin. The upper portion of the watershed is dominated by farming for cotton and grains and receives heavy agricultural runoff into Oso Creek following heavy rains.

Due to its small size, 7.2 sq. mi., and the number of permitted (19) and storm water discharges to Oso Bay and Oso Creek, 100% of the Bay does not support the oyster water use designation by the Texas Department of Health. The non-supporting areas are restricted to the harvesting of shellfish due to potential bacteriological contamination. In addition, the aquatic life use is also only partially supported due to depressed dissolved oxygen concentrations. The TCEQ has projects underway to assess the water quality standard and to confirm the bacteriological and dissolved oxygen impairment and conduct a total maximum daily load evaluation.

A comprehensive characterization of the Oso Bay watershed is warranted due to potential changes to point source discharges into the Bay and it's drainage basin, Oso Creek. One of the more significant changes will be if American Electric Power, formerly Central Power and Light, shuts down the Barney Davis power plant, thereby eliminating the 200-500 million gallons per day of once thru cooling water taken from the Laguna Madre and then discharged to Oso Bay. This combined with the rapid growth of the City of Corpus Christi into this watershed and resulting changes in habitat and non-point source discharges from predominately farm and ranch to urban. With these changes, and possible others, new data needs to be gathered as part of this characterization project to provide decision makers with current information to make informed decisions so negative environmental impacts are avoided. Data includes; 1) water quality including both field and lab chemical analysis, 2) sediment quality data including metals and organic/inorganic constituents, and 3) various biological information such as benthic, fish and shellfish, and sea grass mapping. This characterization of Oso Bay data will assist in future assessments and decision-making to ensure that future changes result in best management of the Oso Bay system.

**Project Objectives:**

1. Develop new information on water, sediment, and various biological data to document current health of the Oso Bay and its habitats for future reference.
2. Research and compare existing data sets, agency reports, and available scientific literature to new data collected as part of this project to ensure that no harm is done to Oso Bay.

3. Analyze the data and information to describe historical and recent changes to Oso Bay make a current assessment of overall water, sediment, and biological conditions of Oso Bay

**Project #0518** **Corpus Christi Bay – Swantner Park Reef Ball Project –Site Assessment and Permit**

**Performing Organization:** **To Be Determined**
**Total Funding:** **$10,000**
**CBBEP Bays Plan Actions:** **HLR-2**

Corpus Christi Bay (Segment 2481) located in Nueces County, Texas is two to three meters deep and normally has very featureless bottom topography. Live oyster reefs that existed in the past are now gone due to commercial dredging and salinity changes from construction of reservoir systems on rivers that discharged into the estuarine system. Commercial shrimping and dragging of shrimp nets plow the open bay system and further prevent the formation of bottom structure and eliminate sea grasses. All these issues and others have resulted in a lack of hard structure being available for fish, shrimp, and other creatures. The creation of artificial reefs in Corpus Christi Bay has been attempted in the past and has resulted in limited success, as the reefs were small and poorly marked.

Manmade reefs in Bays and the Open Ocean are becoming more popular worldwide. With the development of Reef Balls, a patented and designed artificial concrete reef structure, new fishing, diving, and shoreline stabilization projects have been constructed worldwide that have been shown to be very successful in creation of reef or hard substrate/habitat systems. This project seeks to perform site assessment and permit actions to construct an artificial reef or hard substrate/habitat system off of a public park in the City of Corpus Christi. This system would benefit fishermen by providing a hard reef habitat area, and could provide a more protected area for kayaking. In addition to providing a hard reef habitat in Corpus Christi Bay, it may also assist in shoreline stabilization and help control erosion along this portion of the Bay.

The construction of reefs in bays is not new. It is being extensively done in bays along the east coast of the United States and in Florida. Although a variety of artificial habitat materials have been used, by far the most used designed artificial reefs in the world are now made by Reef Ball, which come in a variety of sizes to complement the environment or water system in which they are proposed to be used. Numerous sport fishing associations and conservation groups have sponsored the construction and deployment of these reef systems. This project seeks to perform initial site assessment and development of all necessary permits for possible construction of a hard reef substrate/habitat system off of Swantner Park in Corpus Christi, Texas. If this project is selected for implementation, then additional contract work will be required.

**Project Objectives:**

1. Research and compile existing data sets, agency reports, and available scientific literature for a site assessment for placement of a hard substrate reef habitat structure in Corpus Christi Bay off of Swantner Park.
2. Select location for proposed reef structure and develop conceptual design.
3. Develop data into necessary permits and submit permit applications for the hard substrate reef habitat to the appropriate resource agencies.

## Project #0519 Rincon Channel Marsh Mounds Project- Site Assessment & Permit

**Performing Organization:** **To Be Determined**
**Total Funding:** **$10,000**
**CBBEP Bays Plan Actions:** **HLR-2**

Texas coastal wetlands serve as nursery grounds for over 95 percent of the recreational and commercial fish species found in the Gulf of Mexico. They provide breeding, nesting, feeding grounds for more than a third of all threatened and endangered animal species and support many threatened plant species.

The Rincon Channel wetlands are a 36-acre wetland that lies adjacent to Highway 181 within walking distance to popular resorts on Corpus Christi Beach. These wetlands serve as important habitat for numerous species and also serve as educational opportunities for area students.

Within the Rincon Channel emergent marsh exists mostly on the fringe leaving a large expanse of open water. This project seeks to perform site assessment and permit actions to create marsh mounds within the wetland to create more emergent marsh habitat. The marsh mounds would benefit a variety of species by providing more usable habitat.

**Project Objectives**:

1. Research and compile existing data sets, agency reports, and available scientific literature for a site assessment for mound structures to be placed in Rincon Channel.
2. Conduct bathometric survey to use in development of a conceptual plan.
3. Develop conceptual plan for marsh mound enhancement.
4. Develop data into necessary permits and submit permits for the marsh mound structures to the appropriate resource agencies.

## Project #0520 Oso Bay Well Pad Ecological Enhancement Project – Site Assessment and Permit

**Performing Organization:** **To Be Determined**
**Total Funding:** **$10,000**
**CBBEP Bays Plan Actions:** **HLR-2**

The *Bays Plan* calls for efforts to identify habitat types that are degraded and to work to preserve and restore these habitats. Throughout the CBBEP study area well pads and roads have been created in for the purpose of natural gas or oil production. Often these well pads and roads remain after the wells have been abandoned. In Oso Bay along the South Padre Island Drive (SPID) exist such abandoned oil pads and a road.

Currently, on the north side of SPID an old roadbed exists that is actively used by fishermen and protects a large area of seagrass directly behind it. In addition, the well pad at the end of the road is utilized by a Black Skimmer colony. To protect the habitat and the Black Skimmer colony, it is proposed to determine the best course of action to remove a section of the road while leaving the well pad. The area will still provide adequate seagrass habitat and access for local fishermen while protecting the Black Skimmer colony. The abandoned well pad on the south side of SPID, once removed should allow the area to colonize with seagrass providing additional aquatic habitat.

**Project Objectives:**

1. Research and compile existing data sets, agency reports, and available scientific literature for a site assessment removing a portion of the road and the well pad.
2. Develop conceptual plan for remedial activities.
3. Develop data into necessary permits and submit permits for the removal of these structures to the appropriate resource agencies.

## Project #0521 Project Implementation – Phase 2 of Projects 0518, 0519, 0520

**Performing Organization:** **To Be Determined**
**Total Funding:** **$100,000**
**CBBEP Bays Plan Actions:** **HLR-2**

The *Bays Plan* calls for efforts to identify habitat types that are most at risk and to work with landowners and local and state governments to conserve those habitats. Within the Coastal Bend, many separate efforts are underway to protect wetland and upland habitat. This habitat restoration and protection project will implement the habitat restoration/enhancement plans developed through Projects 0518,0519 and 0520 of this Workplan. Given that the deliverables for Projects 0518, 0519 and 0520 are not yet developed, the cost of implementing the plans and actions needed to complete the recommendations and restoration/enhancement actions cannot be accurately estimated. Therefore this project will prioritize and allocate funds to implement the following projects as permitted by the budget.

**Projects under consideration:**

**Project #0516 Corpus Christi Bay – Swantner Park Reef Ball Project**
This project seeks to construct an artificial reef or hard substrate/habitat system off of a public park in the City of Corpus Christi. This system would be of a benefit to fishermen by providing a hard reef habitat area, and could provide a more protected area for kayaking. In addition to providing a hard reef habitat in Corpus Christi Bay, it may also assist in shoreline stabilization and help control erosion along this portion of the Bay.

**Project #0517 Rincon Channel Marsh Mounds Project-**
The Rincon Channel wetlands are a 36-acre wetland that lies adjacent to Highway 181 within walking distance to popular resorts on Corpus Christi Beach. These wetlands serve as important habitat for numerous species and also serve as educational opportunities for area students.

Within the Rincon Channel emergent marsh exists mostly on the fringe leaving a large expanse of open water. This project would create marsh mounds within the wetland to create more emergent marsh habitat. The marsh mounds would benefit a variety of species by providing more usable habitat.

**Project #0518 Oso Bay Well Pad Ecological Enhancement Project-**
In Oso Bay along the South Padre Island Drive (SPID) exist an abandoned oil pad and a road that is actively used by fishermen and protects a large area of seagrass directly behind it. In addition, the well pad at the end of the road on the north side of (SPID) is utilized by a Black Skimmer colony. To protect the habitat and the Black Skimmer colony, a section of the road will be removed leaving the well pad. The area will still provide adequate seagrass habitat and access for local fishermen while protecting the Black Skimmer colony. The abandoned well pad on the south side of SPID, once removed should allow the area to colonize with seagrass providing additional aquatic habitat.

**Project Objective:**

1. Restore/Enhance habitat therough the implementation of the above listed projects as permitted by the budget funds

## Project #0522 Rockport Memorial Park Wetland Enhancement Project

**Performing Organization:** **To Be Determined**
**Total Funding:** **$25,000**
**CBBEP Bays Plan Actions:** **HLR-2**

Memorial Park is a 52-acre multi-recreational park located in Aransas County, managed by the City of Rockport. Within the nature park is a 2.6-acre man-made freshwater pond, and adjacent to the pond exist an area with seasonal wetlands.

The man-made pond is relatively deep and exhibits steep slopes and therefore does not currently support native wetland plant species. The seasonal wetlands adjacent to the pond frequently dry thus causing the aquatic vegetation to die. This lack of native aquatic and emergent shoreline vegetation creates a less than optimal cover and roosting habitat for area aquatic and avian species. This project would enhance the wildlife habitat functions and educational values of the existing habitat in Memorial Park by improving the flow of water between the main pond and the seasonal wetlands.

To improve water quality, fish and wildlife habitat in the park, this project will explore and implement actions to provide a more consistent water inflow to the seasonal wetlands to cause water to gravity flow to the main pond under certain control conditions. To accomplish this, the project will entail either the installation of a pump to take water from the pond and deliver it to the upper portions of the wetland of the installation of water well and pump in a nearby area to pump groundwater to the upper portions of the wetland. Improving the water quality and reliability in the seasonal wetlands will result in an overall improvement of wildlife habitat in the park. Appropriate educational signage will be constructed to provide information on the ecological value of the pond and surrounding area.

**Project Objectives:**

1. To improve water quality and fish habitat by improving the flow of water between the seasonal wetlands and the main pond.
2. To create and install educational signage providing the public with information on the ecology of Memorial Park.

## Project #0523 Invasive Species (Brazilian Pepper) Management Project

**Performing Organization:** **To Be Determined**
**Total Funding:** **$15,000**
**CBBEP Bays Plan Actions:** **HLR-1, HLR-10**

Invasion of non-native species can alter both habitat structure and function, resulting in the displacement of native flora and fauna. Brazilian Pepper (*Schinus terebinthifolius*), a native of Argentina, Paraguay, and Brazil has invaded native habitats in the CBBEP region and pushed out native vegetation. Efforts will be undertaken to remove and control Brazilian Pepper population at four sites through the removal of the plants and herbicide application.

Control of Brazilian Pepper will take place at the following sites:

**Ward Island, Texas A&M University-Corpus Christi** is located on the east end of Ocean Drive along the north side of Oso Bay and the south side of Corpus Christi Bay. Stands of Brazilian Pepper are located along the walking trail that follows the perimeter of the Oso Bay side of the island. The mud flats surrounding Ward Island are important feeding habitat for waterfowl, shorebirds, and wading birds while the brush is used as nesting grounds and habitat for various birds and mammals.

**Hans and Pat Suter Park** is located at the intersection of Ennis Joslin Road and Nile Road along the shoreline on the west side of Oso Bay. Hans and Pat Suter Park wetlands are used as nesting grounds for many types of shorebirds. The mud flats are important feeding habitat for waterfowl, shorebirds, and wading birds while the brush is used as nesting grounds and habitat for various birds and mammals.

**Redhead Pond** is located within the city limits of Corpus Christi, Texas, adjacent to upper Laguna Madre ecosystem. The importance of Redhead Pond to Redhead ducks has been established historically, as an essential source of dietary freshwater. The wetland also serves as important nesting grounds and habitat for various birds and mammals.

**Flour Bluff ISD- Educational Wetlands** are located on the Flour Bluff ISD campus. The area will be utilized as educational wetlands for the students of Flour Bluff ISD. The habitat serves as important habitat for various birds and mammals.

**Project Objective:**

1. To remove and control Brazilian Pepper at Ward Island Texas A&M University-Corpus Christi, Hans and Pat Suter Park, Redhead Pond, and Flour Bluff ISD Educational Wetlands.

**Project #0524 Triangle Tree Island Debris Cleanup Project**

**Performing Organization:** **Coastal Conservation Association**
**Total Funding:** **$5,000**
**CBBEP Bays Plan Actions:** **HLR-2**

Bay debris, including abandoned and sunken boats, floating cabins, and other large-debris, causes a severe problem and its clean up is a priority issue within coastal waters. Submerged debris degrades coastal resources, impedes navigational and boating safety, damages seagrasses and bottom habitats utilized by fish and wildlife, and detracts from the aesthetics and health of bay ecosystems. The goal of the project is to remove abandoned and derelict cabins, pilings, markers, and other debris and trash from coastal waters and beaches of Triangle Tree Island. To date, approximately 10 million pounds of rusted steel, old pilings, dredge pipe, obstructions, concrete, cabin rubbish, wood and fiberglass, abandoned barges, and sunken boats have been removed from local bays, shorelines, and wetlands. Debris removal has enhanced shorelines and revitalized waterways. The project will have a direct beneficial environmental impact on island habitat.

**Project Objective:**

1. The CBBEP will contract with CCA and a selected contractor to remove identified debris on Triangle Tree Island.

## Project #0525 Support Local Land Trust Conservation Efforts

**Performing Organization:** **Coastal Bend Land Trust**
**Total Funding:** **$50,000**
**CBBEP Bays Plan Actions:** **SM-3, HLR-1, HLR-2**

During the development of the *Coastal Bend Bays Plan*, the CBBEP Management Conference called for the establishment of a locally administered land trust fund for the dedicated purpose of habitat protection. During FY 2000, and 2001 the CBBEP provided the Coastal Bend Bays Foundation with funds to establish the Coastal Bend Land Trust (CBLT). The purpose of this project is to continue to assist the CBLT with their conservation efforts.

Over the past five years, the CBLT has become incorporated as an independent organization, formed a Board of Directors, developed a detailed business plan including operating and organizational procedures, developed a strategic financial plan aimed at achieving financial security, and updated outreach materials including a landowner information brochure. The CBLT has also identified specific habitat protection objectives and focus areas within the CBBEP region and acquired property and/or conservation easements within those focus areas for the purpose of preserving habitat, maintaining open space, and ensuring watershed and water quality protection within the CBBEP region. The CBLT has become an active focal point for conservation efforts through acquisition of property and conservation easements within the CBBEP region.

The major objectives of this project are to continue the process of informing landowners about the benefits of land conservation and conservation easements, to continue acquiring property and/or easements for the purposes of conservation, raise funds for operation, acquisition, and stewardship, perform and complete baseline assessments of all CBLT Properties, and prepare management plans for all CBLT properties.

**Project Objectives:**

1. Contact and inform landowners about the benefits of land conservation and conservation easements.
2. Acquire property and/or easements for the purposes of conservation.
3. Raise funds for operation, acquisition, and stewardship
4. Perform and complete baseline assessments for all CBLT properties.

**Project #0526 CBLT Oso Bay- May Property Habitat Protection Project**

**Performing Organization:** **To Be Determined**
**Total Funding:** **$10,000**
**CBBEP Bays Plan Actions:** **HLR-2**

The May Preserve is located in the Oso Bay Watershed, in Nueces County and within the Corpus Christi, TX city limits. It is located along the Westside of Oso Bay, which lies just south of Corpus Christi Bay. The 54-acre May Property consists of a 23-acre upland area, and 31-acres of mudflats and wetlands. The upland eastern portion of the property consists primarily of Mesquite (*Prosopis glandulosa*) dominated Tamaulipan thorn scrub forest. Palillo or Cortes croton (*Croton cortesianus*), a very rare species in the Coastal Bend region, is locally common on the hillier southeastern part of the May Property. The western portion of the property lies under the waters of Oso Bay as wetlands and mudflats. The shoreline vegetation is characteristic of Oso Bay consisting of the few halophytic, low-growing, semi-woody perennials, including Glasswort (*Salicornia* spp.), that grow along salty to brackish shorelines throughout the Coastal Bend area.

The May Property wetlands and mudflats provide important feeding habitat for waterfowl, shorebirds, wading birds, and the state threatened reddish egret. They also provide nesting areas for snowy plovers, and provide important nursery areas for commercially and recreationally important finfish and shellfish. The upland vegetation and the mudflats together serve as a sink for temporarily retaining pollutants, such as suspended material, excess nutrients, toxic chemicals, and disease-causing microorganisms from washing into the Oso Bay from the urban development uphill. The May Property uplands are also valuable to various migratory and resident songbird species.

Off road vehicles have free access to the site and have caused erosion on the mudflats. Vehicle intrusion control is needed along the northwestern portion of the flat and at the northern corner entrance trail. In coordination with the managing entity, CBBEP will implement actual improvements that may include installing bollards to limit vehicular access to sensitive habitats.

**Project Objective:**

1. Implement specific access improvements including installation of physical barrier to assist in controlling undesirable access by “off-road” vehicles to sensitive areas of the property.

2. Provide signage to complement the efforts to protect the habitat within the property

**Project #0527 Nueces Bay Ichthyoplankton Monitoring**

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| **Performing Organization:** | **Center for Coastal Studies, Texas A&M University-Corpus Christi** |
| **Total Funding:** | **$20,000** |
| **CBBEP Bays Plan Actions:** | **FW-1, WSQ-4** |

This is a continuation of the Nueces Bay Ichthyoplankton Monitoring Project.

Nearly all marine fishes have an early life history involving a planktonic phase. Variability in numbers of larvae surviving through the dispersal and settlement phase can be the ultimate determinant in adult population sizes, creating a great potential for enormous variation from season to season. Numerous estuarine-dependent species (those utilizing the estuary as a nursery ground for the early portion of their life cycle) spawn well offshore and their eggs and larvae must be transported into coastal and estuarine nursery grounds against the net seaward flow. These species (including several commercially important ones) typically have extended larval periods, which are subjected to the widest degree of physical processes and can ultimately affect recruitment. Along the lower Texas coast, the Corpus Christi/Nueces Bay system serves as an important estuarine nursery ground for fish and shrimp.

Alternative efforts to maximize freshwater inflow to the Nueces River Delta, such as the Rincon Bayou channel and pipeline, are being pursued. To determine the ecological benefits and to provide assurances that “no harm" is caused by utilizing these efforts, water quality, biological, and ecological response data must be collected and analyzed. This ichthyoplankton monitoring project will show the type and extent of effects the altered flows have on fish and shrimp populations and community structure.

Although Texas Parks and Wildlife are implementing the ichthyoplankton monitoring project, CBBEP funding will provide the needed additional support for student workers to assist with field sampling and laboratory analysis. Texas Parks and Wildlife will provide a copy of the results of their monitoring project to the CBBEP.

**Project Objectives:**

1. Provide new graduate student assistance to water quality and biological monitoring in Nueces Bay, Rincon Delta and the Nueces River Tidal.
2. Expand our knowledge of larval fish recruitment to the Nueces delta with the addition of inflow from the Rincon Bayou and a pipeline project.
3. Continue our documentation of the ichthyoplankton distribution of commercially important, estuarine-dependent finfish to the system with changes to inflow amounts and locations.
4. Assess the spatial and temporal distribution of larval and post-larval fish within Nueces Bay, Rincon Delta and the Nueces River Tidal.
5. Determine if the discharge of the Nueces River away from the delta region acts as a “recruitment barrier” for transport and recruitment of fishes into the Nueces delta.

**Project #0528 Corpus Christi Bay Hypoxia Monitoring Project**

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| **Performing Organization:** | **The University of Texas, Marine Science Institute** |
| **Total Funding:** | **$3,000** |
| **CBBEP Bays Plan Actions:** | **WSQ-1, WSQ-5** |

This is for the continuation of the Corpus Christi Bay Hypoxia Monitoring Project.

A portion of Corpus Christi Bay, located in the southeast corner of the Bay, where the Laguna Madre joins Corpus Christi Bay, has been an area of decreased dissolved oxygen (DO) or hypoxia, during summer months that has been monitored and documented by scientist from the University of Texas at Austin, Marine Science Institute at Port Aransas, Texas since 1988.

Hypoxia (DO less than 2 mg/L) is a serious water quality problem as fish and benthic organisms require oxygen to live. The DO water quality standard for Corpus Christi Bay (Segment 2481) is not less than 5.0 mg/L over a 24-hour period of time. During July, 2005, this study will deploy continuous DO recorders for two weeks and collect water quality profiles weekly during July, the peak time for the hypoxia conditions. This investigation is critical to our understanding of two planned construction and development projects in this portion of Corpus Christi Bay. The dredging of Packery Channel and the elevation of the Kennedy Causeway should have profound impact towards the improvement or elimination of the hypoxia conditions and improve water quality and DO conditions in this portion of the Bay.

**Project Objectives:**

1. Provide new graduate student assistance to water quality monitoring in Corpus Christi Bay.
2. Monitor the spatial and temporal extent of the hypoxia in Corpus Christi Bay during July.
3. Continue our documentation of the hypoxia conditions and determine if the ongoing construction and development activities improve water quality conditions of Corpus Christi Bay.
4. Compile the results of the analysis into a comprehensive report assessing the historical, current, and future needs for continuing study in this area.

**Project #0529 Aransas County/Copano Bay Kayak Park Public Access Project**

**Performing Organization:** **To Be Determined**
**Total Funding:** **$25,000**
**CBBEP Bays Plan Actions:** **HLR-2**

The *Coastal Bend Bays Plan* identifies the need for protecting environmental resources, especially wildlife habitat, while providing appropriate public access. One of the goals listed in the *Bays Plan* is to maintain and expand tourism and recreational opportunities in a way that enhances the local economy while protecting the environment.

The County of Aransas has recognized the economic benefits of preserving ecologically special areas. Tourism, especially eco-tourism is an important part of the local economy.

In coordination with managing government entities, CBBEP will implement actual improvements which may include designated specific parking sites, installing bollards to limit vehicular access to sensitive habitats, and installing interpretive signage.

**Project Objectives:**

1. Work with managing government entities to implement specific access improvements.
2. Protect habitat at key locations while improving the quality of public access, and also provide for the on-going operation of commercial establishments.

**Project #0530 Tule Lake Public Access Enhancement Project**

**Performing Organization:** **To Be Determined**
**Total Funding:** **$50,000**
**CBBEP Bays Plan Actions:** **HLR-2**

The *Coastal Bend Bays Plan* identifies the need for protecting environmental resources, especially wildlife habitat, while providing appropriate public access. One of the goals listed in the *Bays Plan* is to maintain and expand tourism and recreational opportunities in a way that enhances the local economy while protecting the environment.

Tule Lake is located on the north side of Up River Road in the vicinity of the Corpus Christi Ship Channel and is on property owned by the Port of Corpus Christi Authority. Tule Lake provides a rich, protected feeding area for many area shorebirds, thus making it a popular venue for bird watching. The area has been identified in the Texas Birding Trail guides as a location good location for stopping for a few minutes to observe shorebirds. However, there are no amenities for parking or public access near this location.

This project will coordinate with the property owner and develop and implement a plan to provide parking and a viewing area in the vicinity of Tule Lake for public use.

**Project Objectives:**

1. Coordinate with the property owner and develop and implement a plan to provide parking and a viewing area in the vicinity of Tule Lake for public use.

**Project #0531 GIS Support Project**

**Performing Organization:** **Texas A & M University-Center for Coastal Studies**
**Total Funding:** **$20,000**
**CBBEP Bays Plan Actions:** **All Action Items**

The CBBEP has initiated development of a geographic information system (GIS) which provides a multi-scale tool to archive and integrate information layers. The GIS can be used to efficiently track and assess projects and help analyze status and trends to determine the direction of future projects. It also allows CBBEP staff to prepare maps and graphic presentation and proposal materials, and provide information to the public. In addition, GIS project layers provide a tool for quickly locating projects, determining stages of completion, and evaluating the progress made toward implementation of the Coastal Bend Bays Plan.

The purpose of the project is continue collecting relevant existing data, to enter select existing CBBEP project data into the GIS, to continue to provide assistance with development and implementation of the GIS, and to continue staff GIS training.

**Project Objectives:**

1. Collect relevant existing GIS data,
2. Enter select existing CBBEP project data into the GIS,
3. Continue to provide assistance with development and implementation of the GIS, and
4. Continue to provide GIS staff training.

## Project #0532 A Preliminary Assessment of *Vibrio vulnificus* Concentrations in South Texas Bays

**Performing Organization:** **Center for Coastal Studies, Texas A&M University - Corpus Christi**
**Total Funding:** **$25,000**
**CBBEP Bays Plan Actions:** **PH-1, WSQ-1**

"Vibrio is not new to the world, and it's not new to Texas, but some precautions are in order. We can't downplay the seriousness of Vibrio infections, but were really not seeing any unusual numbers." This was the quote from a Texas Department of Health Epidemiologist concerning the recent infections and subsequent death of several South Texas Fishermen after a fishing trip to one of South Texas Bays. These bacteria may not be something new, but to the Coastal Bend Bays and Estuaries Program it is something that needs to be addressed and many questions as to sources, control, and prevention need to be examined before any more fishermen or users of our bays become infected.

At least 43 cases of Vibrio infections, with seven deaths, were recorded in Texas last year. In addition to these there may have been many others as the reporting of cases is not required in Texas and with possible confusion of the symptoms with other diseases, the actual number of Vibrio cases could be much higher. Symptoms of infection include; low blood pressure, fever, chills, blistering or breakdown of the skin and ulcerations, and people with a weakened immune systems or liver problems can have serious complications such as fever, chills, and shock in a very short period of time after contact with the bacteria.

Currently, there is little information or literature about these bacteria and environmental living conditions or its distribution in bays or seawater. This project will initiate a literature search on occurrence and distribution of V. vulnificus in the environment. Further evaluation on analytical methods to enumerate V. vulnificus populations in bay water will also be conducted on up to five sampling events to test analytical methods and obtain an initial range of V. vulnificus levels in local waters. A draft and a final report will be prepared which will include recommendations for a future work within the CBBEP Program area to assess the occurrence and distribution of V. vulnificus for the purpose of developing scientific data for making decisions regarding protection of human health.

**Project Objectives:**

1. Initiate a literature search and gather information about the occurrence and distribution of Vibrio vulnificus in seawater.
2. Research and develop analytical methods for determining concentration(s) of Vibrio vulnificus in South Texas Bay waters.
3. Collect and perform analysis of Vibrio vulnificus in water and possibly sediment samples from local bays in order to develop analytical methodology for said species.
4. Prepare a draft and final report on the literature survey and results of initial sampling and testing of local bays for Vibrio vulnificus.
5. Make recommendations to further evaluate Bays in CBBEP program area to document occurrence and distribution of Vibrio vulnificus.

## Project #0533 The Effect of an Opened Packery Channel on Fisheries Recruitment in the Upper Laguna Madre

**Performing Organization:** **To Be Determined**
**Total Funding:** **$50,000**
**CBBEP Bays Plan Actions:** **HLR1, WSQ-1**

Two major projects in the southeast portion of Corpus Christi Bay and the Upper Laguna Madre will play a significant role in the occurrence and distribution of fisheries due to improved water quality and habitat changes. These projects are the opening of Packery Channel and the raising of the Kennedy Causeway from Flour Bluff to Mustang Island. Specifically, the opening of Packery Channel to the Gulf of Mexico, allowing fish, shrimp and other marine organisms that have a migration route to the Gulf as part of their life cycle could benefit greatly from this project. Numerous estuarine species life cycles require that adults go to the Gulf or pass opening to spawn then currents or water flow back into the bays provides a transportation route for eggs and larval fish and shrimp to populate the Bay and upper Laguna Madre. This action allows species to utilize these bodies of water as nursery grounds during their early life stages.

Since both of these projects are in the initial construction phase, there is limited time to initiate this project to gather and record pre-construction data to have for future comparisons to post construction populations. It is anticipated that there will be a beneficial increase in both fish and shrimp with the new open pass to the Gulf of Mexico, via Packery Channel. In the past, the pass has only been opened following a major storm event. These passes normally close due to sand movement along the beach making it unavailable to shrimp and fish as a migratory avenue to the Gulf for spawning or distribution of eggs or larval fish and shrimp back to the Bay or Laguna Madre.

This project will utilize several methods of capture to enumerate and document the presence and number of species of fish, shrimp, benthic organisms and sea grass populations. One method planned to be utilized will be the use of a large (3mX3m approx.) open ended container that will be lowered onto the bay bottom, the water from the inside of the container will then be pumped out allowing researchers to enumerate and determine species numbers and distribution of sea grasses and benthic organisms over the bay bottom. Other scientifically recognized methods will be employed to evaluate fish, shrimp, and benthic organism population and distribution for this project as well.

**Project Objectives:**

1. Initiate pre and post recruitment of fish, shrimp, benthic biota, and sea grass populations of Corpus Christi Bay and the Upper Laguna Madre in the vicinity of Packery Channel
2. Provide graduate students the opportunity to perform valuable scientific research on a local project that documents the environmental benefits of opening Packery Channel to the Gulf of Mexico.
3. Prepare a draft and final report on the effect of an opened Packery Channel on the Fisheries Recruitment and other estuarine species in the Upper Laguna Madre.

## VIII. Program Administration

CBBEP administrative staff (4 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.

## IX. Project Management

CBBEP Project Management staff (6 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 Estuary 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, 2004, the Coastal Bend Bays & Estuaries Program will begin Year 7 of implementing the *Coastal Bend Bays Plan*. This FY 2005 Work Plan describes the proposed work to be initiated during FY 2005. Of the total funds identified in the Work Plan budget, $506,984 are new (FY 2005) federal funds, $849,777 are new (FY 2005) state funds, $388,050 are new (FY 2005) special funds, $285,000 are new (FY 2005) local partner funds and $7,847,479 are carryfoward state and federal funds. The total budget for this FY 2005 Work Plan is $9,877,290.