Living on the Edge
Protecting Our Bays and Estuaries

Coastal Bend Bays & Estuaries Program

FY 2006 Comprehensive Annual Work Plan

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COASTAL BEND BAYS & ESTUARIES PROGRAM

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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 2006 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 2006 Comprehensive Work Plan will be September 1, 2005.

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 2005, 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 through FY 2002 have been completed. FY 2003, 2004 and FY 2005 projects are expected to be complete by August 31, 2006. The Estuary Council continues to identify, initiate and select project ideas for inclusion in the Program work plans.

In FY 2005 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 selection 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: Public Opinion Survey results with Port Industries, and the Earth Day/Bay Day media campaign with the Coastal Bend Bays Foundation. There was TV news coverage on the Association of National Estuaries Program (ANEP) meeting, Bays Council meeting, *Keepers of the Coast* Teacher Open House, Earth Day/Bay Day Festival, Water Quality in Corpus Christi Bay announcement, success of the

Nueces Bay Island Restoration project, debris in the bay, Christmas Bird Count results, Causeway Island nesting bird success, Coastal Bend Environmental Science: Learning on the Edge project, and special coverage for the Muscular Dystrophy Telethon where CBBEP took a future Marine Biologist on a boat ride on the Nueces Bay.

Outreach activities included: Adventure Bay - National Estuaries Day, Bayfest, 2005 Boat Show, Great Texas Birding Classic Youth Teams, National Ocean Sciences Bowl, Flat Out Fishing, and the TPWD Crab Trap Removal Project. The First Lifetime Environmental Protection Award was presented to a long-time supporter of CBBEP. The CBBEP "Fish Stick" blitz has been successful in distributing over 25,000 fish measuring tapes to 36 area boat/tackle shops and bait stands. Over 2,000 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. CBBEP received over 100 entries this past year to the CBBEP Estuary Coloring Contest featured on our website.

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 2006

Environmental Indicators

The CBBEP has as a priority goal for FY 2006 to complete development of environmental indicators and a summary scorecard. Indeed the CBBEP and its partners have already made great progress in developing the required scientific data and information that will be incorporated into the environmental indicators report and scorecard.

Specifically, the CBBEP has worked with EPA ORD and OW (Barry Burgan) to collect extensive water quality data, sediment quality data, benthic community data, and fish tissue contamination data for use in the National Coastal Condition Report and in an EPA prepared CBBEP specific report.

Our partners at Texas Parks and Wildlife Department's – Coastal Fisheries Division have been systematically collecting fisheries data for years and are in the process of updating a fisheries status and trends report specifically for the CBBEP project area.

The US Fish and Wildlife Service and Texas Colonial Waterbird Society are helping the CBBEP develop status and trends data for colonial waterbirds in the program area.

In FY'2006 the CBBEP will be working with our partners to update seagrass coverage data in the program area (see Project 0601 below).

Most importantly, the CBBEP has invested in improving our public input process with the development of new priority issue specific "Implementation Teams" and a "Coordination Team" to help select indicators most appropriate for our area.

Continued Implementation of the Coastal Bend Bays Plan

The other priority goal for FY 2006 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, 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 2006 have been selected for their contribution towards implementation of the *Coastal Bend Bays Plan*. Thirty-one projects will be implemented in FY 2006. A comprehensive list of projects outlining project numbers, titles, action items, performing party(s), and budget can be found in Table 1: FY 2006 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 #0601 Status and Trends of Seagrasses in the Coastal Bend Region

Performing Organization: **Texas Parks & Wildlife Department**
Total Project Funding **$21,000**
CBBEP Bays Plan Actions: **HLR-2**

The State of Texas approved a seagrass monitoring plan in 2003. This plan includes mapping of seagrasses at five-year intervals to assess their status and trends in Texas bays, at regional and statewide scales. Seagrass distribution in Coastal Bend bays was last mapped in 1994 (published in 1997) and included detailed species composition data collected during extensive ground-truthing. The TAMU-CC Center for Coastal Studies (CCS) has recently been awarded a grant from NOAA for seagrass mapping along the Texas coast. NOAA has committed approximately $250,000, for acquisition of aerial photography and cartography.

The maps published in 1997 need to be updated to ascertain the current status and trends of the seagrasses in the Coastal Bend. To assess the effects and dynamics of ecosystem and regional scale processes on the distribution and abundance of seagrasses in Coastal Bend bays, a robust ground-truthing effort is required to get the most information and value from the aerial mapping effort. Since we have already obtained funding for acquisition of imagery, it is imperative that ground-truthing is completed so that the best and most accurate maps can be produced from that imagery. Additional funding is needed to adequately ground-truth the imagery and mapping in a manner consistent with the maps published in 1997.

The field ground-truthing effort will couple re-sampling of a random sample of previously sampled stations along with generation of a new set of randomly placed stations. Some of the upper Laguna Madre transects used by Chris Onuf will also be re-sampled so that mapping and seagrass species composition and biomass data will be comparable to his multi-decadal studies.

This project will collect physical, chemical and biological data to include, at a minimum, the following: 1) salinity, water temperature, dissolved oxygen, pH; 2) Secchi disk depth; 3) seagrass species identification, percent cover and biomass; 4) root to shoot biomass ratios; 5) epiphytes (if an appropriate method can be found); and 6) chlorophyll *a.* Other parameters may also be measured after reviewing current research pertaining to seagrass health conducted by Dr. Ken Dunton and others in the CBBEP region.

Project Objectives:

1. Conduct field ground-truthing to evaluate current seagrass coverage at sites sampled during previous (1994) mapping effort and establish additional sites that will serve to develop a baseline for future assessments.
2. Assess results of current seagrass research efforts to develop a suite of parameters that will adequately assess the health of the seagrass beds in the Coastal Bend.

Project #0602 Protection of Seagrasses in the Redfish Bay Scientific Area

Performing Organization: **Texas Parks & Wildlife Dept.**
Total Project Funding: **$21,000**
CBBEP Bays Plan Actions: **HLR-2**

Redfish Bay, between Aransas and Corpus Christi Bay systems, contains the densest seagrass concentrations within the CBBEP and perhaps along the entire Texas coast. During the past five years a concentrated effort was made by Texas Parks and Wildlife Department to develop a management plan for seagrass protection in the area. The area was designated a Scientific Area (SA) via TPWD code, and an array of voluntary no-propeller zones were established within the area to protect the seagrasses. Extensive education was conducted in terms of signage, videos, and constituent surveys. Success and evaluation of the voluntary no-propeller zone was marginal at best, and extremely difficult to enforce. The SA has been renewed for another five years along with a renewed initiative by TPWD to promulgate some regulatory measures to prohibit the destruction of seagrasses within the area. Such an effort will require extensive signage, education, and continued coordination and communication with the area constituents. Additionally, research must be conducted to document success or failure of any regulatory measures protecting seagrasses.

Seagrasses are extremely important as habitats for fish and wildlife as well as the lesser understood roles they play in water quality and nutrient processes. Increased human use in this area is already having detrimental impacts on the seagrasses. Continuation of the seagrass protection and monitoring program will help develop methodologies for successful delineation of the area for user education and evaluation of regulatory measures.

Project Objectives:

1. Developing a seagrass protection and management strategy for the Redfish Bay Scientific Area.
2. Develop a monitoring program to measure the effectiveness of seagrass management.

Project #0603 Whooping Crane Habitat Enhancement – Invasive Species Control

Performing Organization: **Aransas National Wildlife Refuge**
Total Project Funding: **$40,000**
CBBEP Bays Plan Actions: **HLR-2, HLR-4, HLR-10**

On March 11, 1967, the whooping crane was designated as Endangered in the Entire (except where listed as an experimental population). The whooping crane population, estimated at 500 to 700 individuals in 1870 had declined to only 16 individuals in the migratory population by 1941 as a consequence of hunting and specimen collection, human disturbance, and conversion of the primary nesting habitat to hay, pastureland, and grain production. The current nesting range of the self-sustaining natural wild population is restricted to Wood Buffalo National Park in Canada; the current wintering grounds of this population are restricted to the Texas Gulf Coast at Aransas National Wildlife Refuge (and nearby vicinity).

On the wintering grounds at Aransas National Wildlife Refuge in Texas, whooping cranes use the salt marshes that are dominated by salt grass, saltwort, smooth cordgrass, glasswort, and sea ox-eye. They also forage in the interior portions of the refuge, which are gently rolling, sandy, and are characterized by oak brush, grassland, swales, and ponds. Typical plants include live oak, redbay, Bermuda grass, and bluestem. Whooping cranes are omnivorous feeders. They feed on insects, frogs, rodents, small birds, minnows, and berries in the summer. In the winter, they focus on predominantly animal foods, especially blue crabs and clams. They also, however, forage for acorns, snails, crayfish and insects in upland areas.

This project will focus on restoring and enhancing critical whooping crane habitat, as detailed under CFR 50 17.95(b). Restoration will be accomplished by removing and suppressing invasive native and non-native species, thereby greatly enhancing the area as a foraging site for whooping cranes. (Phase I of this project was implemented in FY 2003, and recently completed.)

Project Objectives:

1. Restore and enhance critical whooping crane habitat.
2. Suppress and reduce invasive running live oak density.
3. Remove non-native vegetation (Chinese Tallow and Salt Cedar).

Project #0604 Expansion of Texas Beach Watch Program

Performing Organization: **Texas A&M University-Corpus Christi**
Total Project Funding: **$28,000**
CBBEP Bays Plan Actions: **WSQ-1, BTR-1, PH-1**

According to current General Land Office estimates, Texas has approximately 2,500 miles of coastal shoreline, which includes; Gulf shoreline, and the bays and estuaries of Texas. The Texas Beach Watch Program, administered by the General Land Office, currently funds bacteria monitoring of public use beaches only in portions of Nueces and Aransas Counties within the CBBEP area. This leaves numerous other beaches and public use areas within the CBBEP area that have no bacteria monitoring of beaches that are used for swimming and wade fishing.

This study will identify five public use beaches, within the CBBEP area, that are not included in the current GLO Texas Beach Watch Program. Selection of the beaches will be made in consultation with the Texas Beach Watch coordinator, utilizing existing Texas General Land Office lists of identified beaches in the CBBEP area, discussion with CBBEP personnel and visits to potential sites. The stations may include beaches in the counties of Kleberg (e.g. Riviera Beach, Kaufer-Hubert Memorial Park), San Patricio (e.g. Indian Point Park) and Nueces (e.g. Lighthouse Lakes Beach, SH 361 along the causeway).

Sampling and analysis will follow Texas Beach Watch procedures as described in the Texas Beach Watch QAPP. Sampling will be conducted weekly during the summer months (May through September) and twice a month October-April. (to follow the Beach Watch sampling schedule), at the five stations. Re-sampling will be conducted if enterococci levels at a station exceed the EPA standard of 104-cfu/100 ml. Two water samples will be collected from each station and analyzed for enterococci bacteria using EPA Method 1600.

Field observations will be documented using standard beach watch field data sheets, including water and air temperature, general water and wind conditions and any activities at the beaches. The data will be made available, either through the Texas Beach Watch website or e-mail to local officials.

Project Objectives:

1. To sample public use beaches in the CBBEP area that are not currently sampled as part of the Texas General Land Office, Texas Beach Watch Program.
2. To analyze for enterococcus bacteria and make that data available to beach users and local officials.

Project #0605 Flounder Population Assessment

Performing Organization: **Texas Parks & Wildlife Dept.**
Total Project Funding: **$25,000**
CBBEP Bays Plan Actions: **HLR-4**

Southern flounder became a species of concern for TPWD Coastal Fisheries in the early 1990's. This species' relative abundance decreased steadily during the 1980's and early 90's.

In 1996 regulations were implemented to address the decline in flounder populations. These included a bag and size limits for both commercial and recreational fishermen and a limited entry (or license limitation) for commercial finfish. In 2000 TPWD adopted shrimp fishery regulations that included the requirement of bycatch reduction devices. These regulations were implemented in an attempt to reduce the impact of shrimping on this and other species of marine fish. Furthermore, the reduction in shrimping activities (via 'shrimp license limited entry and buy-back programs') will help further reduce mortality of juvenile flounder and protect the spawning population.

Historically, flounder has received user impact from both recreational and commercial fishing activities. Both user groups derive significant revenue from and/or create an impact on the southern flounder. There is a need to 1) update and improve our understanding of the (both recreational and commercial) flounder fishery, 2) identify environmental requirements for successful flounder recruitment, and 3) identify essential flounder habitats. Continued stressors and regulations of the flounder fishery (without a better understanding) may be detrimental to the resource.

Project Objectives:

1. Summarize existing flounder data.
2. Initiate flounder recruitment studies.
3. Evaluate current flounder management strategies and offer alternatives.

Project #0606 Corpus Christi Botanical Gardens Habitat Protection

Performing Organization: **Corpus Christi Botanical Gardens**
Total Project Funding: **$10,000**
CBBEP Bays Plan Actions: **HLR-2, BTR-2**

The Corpus Christi Botanical Gardens is currently in negotiations to lease approximately 90 acres of city-designated parkland on Oso Creek, with the intention of establishing a greenbelt containing nature trails and natural habitat exhibits. The area is home to or is used by various neo-tropical songbirds, brown pelicans, peregrines, and other birds – and an attempt is being made to establish the endangered Albert's Rainbow Cactus in the greenbelt.

An adjacent development (The Coves at Lago Vista) threatens natural habitat along Oso Creek. Once the development is completed, residents (as well as the general public) will have unhindered access to the greenbelt – creating the potential for habitat destruction due to activities such as illegal dumping, the use of ATVs and dirt bikes, and the clearing of brush (by residents who might wish to have an unobstructed view of Oso Creek). The developer has indicated that he is unwilling to install a protective fence at his expense. As completion of the development progress – especially as more lots are sold and houses are built – the logistics of constructing a fence will become more difficult.

Two privately owned plots lie between the greenbelt and South Staples. The greenbelt can currently only be accessed by a narrow right-of-way between these properties. The first property (unknown owner) has a private residence on a raised dune structure – the remainder of the property is undevelopable marshland. The second property (Huerta) is not being used and is developable. The acquisition of the Huerta property would allow the maximum potential of the greenbelt be to achieved, as it would 1) prevent future development, 2) increase the greenbelt's road frontage, and 3) allow for the construction of controlled public access.

This project provides only partial funding necessary to properly protect and enhance the Oso Creek greenbelt at the Botanical Gardens. This partial funding will allow implementation of the first objective – the installation of a protective fence.

Project Objective:

1. Preserve functional, natural habit by installing a protective fence between the Oso greenbelt and the adjacent development.

Project #0607 CBBEP Colonial Waterbird Management

Performing Organization: **CBBEP Staff**
Total Funding: **$200,000**
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.
5. Management of predator control efforts.

Project #0608 CBBEP Outreach Events & Activities

Performing Organization: **CBBEP**
Total Funding: **$40,000**
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.

The *Bays Plan* clearly identifies the need for Public Outreach Events and Activities with the following Action Plans:

- BTR-1 – Encourage and assist regional tourism organizations to adopt a "theme" of resource protection and stewardship in their promotion of tourism. The number of visitors and residents using the bays is projected to increase in the future resulting in more pressure on coastal natural resources.
- PEO-2 – Establish a Bay Day celebration to focus attention on bay resources and uses.
- PEO-3 – 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.
- PEO-5 – Promote public participation and recognition programs to protect the bay system and its resources.

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: Bayfest, Great Texas Birding Classic, International Migratory Bird Day, and other area events.

(b) CBBEP Educational Materials – The CBBEP will print 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.

(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.

(d) CBBEP E-Newsletter – This informational electronic 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.

(e) 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.

(f) 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 Objective:

1. 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 #0609 CBBEP Outreach Media Campaign

Performing Organization: **CBBEP**
Total Funding: **$25,000**
CBBEP Bays Plan Actions: **BTR-1, PEO-2, PEO-3, PEO-5**

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. The 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 media.

Project Objective:

1. To 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.

Project #0610 Kritters 4 Kids Educational Materials & Learning on the Edge

Performing Organization: **Coastal Bend Wildlife Photo Contest**
Total Funding: **$37,000**
CBBEP Bays Plan Actions: **HLR-4, HLR-7, HLR-2**

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 7th 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.

Ten 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
5. Provide training, curricula and 40 classroom sets of books for teachers enrolled in the Coastal Bend Environmental Science: Learning on the Edge Science Academy

Project #0611 Coastal Bend Environmental Science: Learning on the Edge

Performing Organization: **CBBEP**
Total Funding: **$64,000**
CBBEP Bays Plan Actions: **BTR-1, PEO-2, PEO-3, PEO-5**

The CBBEP's Environmental Education & Outreach Implementation Team (EEOIT) identified challenges that teachers face with the Texas Education Agency (TEA) and Texas Essential Knowledge and Skills (TEKS) state requirements, communicating directly with teachers, and how elementary teachers are disadvantaged compared to high school teachers.

Coastal Bend Environmental Science: Learning on the Edge will utilize the methods below to achieve its aims.

1) Summer Teacher Workshops

In conjunction with the well-regarded science education programs of the Texas State Aquarium, Texas A&M University-Corpus Christi and the Coastal Bend Wildlife Photo Contest, the CBBEP will deliver a locally-based environmental science curriculum to area teachers. Teachers will learn the curriculum in an interactive manner, designed to go beyond what conventional textbooks and TEKS currently provide, so that they can see the actual presentation of the material with real students.

The innovative merger of these three highly successful programs will benefit local teachers seeking continuing education. These three programs are each successful and effective, but this project elevates them to a higher level of excellence by delivering them in tandem to have a more significant impact on the community and the way students learn about the world around them. Grades 3-5 will be targeted to support preparation for the state-mandated TEKS assessment in Grade 5.

Under the direction of a CBBEP Environmental Science Educator (to be retained), these three programs would be merged and launched in two week-long summer sessions of 20 teachers each where all three curricula are presented. The highly successful program *Teaching Environmental Science* (TES) will be used as the model for these sessions. The Environmental Science Educator would present content and activities in Days 1-4. Day 5 would bring in experts from each program along with students in Grades 3-5 (25 per session). This one-day "Science Academy" would provide the heretofore non-existent opportunity for teachers to see curriculum implementation in *real time* with *real students*. Current programs have demonstrated that presentation of new curriculum in an interactive way, where teachers can witness its actual implementation in a classroom setting, are more successful than those solely housed in textbooks. The "Science Academy" will involve a half-day of classroom instruction and half-day of field based experiences at the CBBEP Nueces Delta Preserve to provide hands-on experiences in both environments.

Teachers will be provided with equipment necessary to implement the curriculum in their classrooms during the school year. Supplies include the following for each program component:

Keepers of the Coast	Kritters 4 Kids	Teaching Environmental Science
Teacher resource guides in coastal wildlife/habitats, wetlands and marshes & teacher supplies	Wildlife in Focus books & Activity Guide	Water quality testing gear, seines, nets; education materials for air quality & waste issues.

2) In-classroom Curriculum Instruction during the school year

This project will address the gap that exists between the delivery and implementation of new curriculum by teachers. Follow-up visits to assist teachers further with implementation of the curriculum in their classrooms would be conducted throughout the school year by the Environmental Science Educator. Along with program partners, the Educator will identify teachers and schools for participation in the program. Selection will be based on factors such as economic need, expressed interest in additional resources and past participation in similar programs. An Educator, who can have regular contact with area school districts and provide valuable information on the local environment and how to incorporate related issues into the curriculum, will be an enormous asset. Coordinated field trips to area sites will provide hands-on experiences in the local environment. Education partners will coordinate with the Educator to provide in-class curriculum instruction and implementation.

3) Teacher Education & Outreach through media materials

Highlights of Teacher Workshops and the "Science Academy" will be professionally recorded with a final product, including relevant curriculum resources for each program component, distributed on DVD to participating teachers in targeted schools in the Coastal Bend to broaden and expand the reach of this innovative project. Teachers who participate in the Summer Workshops will be the point of contact at their schools to provide information on the curriculum and to receive a resource DVD (40 count). In addition, each program partner may provide the schools they currently serve in their respective programs with the resource DVD (60 count). In this way, the project will serve as a model for other schools that wish to implement similar programs. The Environmental Science Educator will follow-up with teachers to determine if the resource DVD is being utilized in the classroom.

Project Objective:

1. By the end of this year-long project, 40 teachers in the community will have increased knowledge, skills and resources to more effectively teach science in local schools as measured by teacher reported implementation of new techniques in classrooms.

Project #0612 Keepers of the Coast and Learning on the Edge

Performing Organization: **Texas State Aquarium**
Total Funding: **$41,000**
CBBEP Bays Plan Actions: **PEO-3**

The Keepers of the Coast educator/student outreach project was successfully implemented 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 Resource Guide, supplies and help coordinate curricula for Coastal Bend Environmental Science: Learning on the Edge project.
8. Provide logistical support.

Project #0613 Teaching Environmental Science I, & II and Learning on the Edge

Performing Organization: **Texas A&M University-Corpus Christi**
Total Funding: **$33,000**
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.

Project Objectives:

1. Develop the curriculum for TES I and II.
2. Provide teaching aids/materials for TES I and II.
3. Recruit and select course participants.
4. Provide course-appropriate written materials for each course participant.
5. Provide classroom and help coordinate logistics for Coastal Bend Environmental Science: Learning on the Edge (LOTE) project.
6. Coordinate integrated curricula for LOTE project.
7. Provide equipment, supplies including the production and distribution of LOTE dvd.
8. Recruit and provide tuition for Science Academy participants.

Project #0614 Youth Odyssey Coastal Wilderness Camps

Performing Organization: **Youth Odyssey**
Total Funding: **$4,000**
CBBEP Bays Plan Actions: **PEO-3, PEO-5**

One of the strongest messages the public has put forth in the development of the *Coastal Bend Bays Plan* is that efforts to educate tomorrow's leaders must begin today. The *Bays Plan* calls for the design and implementation through school districts of environmental curricula on bay resource issues. Other actions will expand upon and promote the use of outdoor educational facilities that exist throughout the region, as well as identify new sites or opportunities to build or develop additional 'outdoor laboratories'.

Youth Odyssey is a non-profit organization that works with at-risk boys and girls between 12 and 17 years of age. Youth Odyssey's mission is to provide at-risk teens with youth development through adventure challenge programs.

Each Adventure Challenge Session provides outdoor challenges as a means of building core life skills. The challenges are resolvable and all activities are safe while having a perception of risk. Each session usually lasts six to nine weeks.

Youth Odyssey will focus on a sequence of development. Whether a challenge course or an adventure wilderness trip, learning and development follow a sequential process and the effectiveness and mastery at one level contributes to each subsequent level which includes *Goal Setting, Awareness, Trust, Cooperation, Group Challenge, Leadership* and *Application.*

Project Objectives:

1. Two sessions of two – four Portable team challenges
2. Two – four kayaking days or ropes courses
3. Two adventure wilderness trips to local waterways
4. Two graduation trips to beaches or local parks within one year of contract

Project #0615 CBBEP/Coastal Bend Bays Foundation Community Outreach Partnership

Performing Organization: **Coastal Bend Bays Foundation**
Total Funding: **$40,000**
CBBEP Bays Plan Actions: **PEO-1, PEO-2, PEO-3, PEO-4, PEO-5**

The CBBEP is constantly working to promote public/private partnerships as stated in the *Coastal Bend Bays Plan* to help achieve its educational goals. One of the benefits of the partnership between the CBBEP and Coastal Bend Bays Foundation (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 into the public policy debate. The *Bays Plan* calls for continued involvement from the Bays Foundation, as the region prepares itself for ever-increasing numbers 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.

The CBBEP will work closely with the CBBF on the project objectives outlined below but will not be limited to only those listed. The environmental education and outreach activities will include: monthly Coastal Issues Forums, bay-resource/related workshops, the Adopt-A-Beach program, the continuation of the Earth Day celebration held in April, and the coordination of the annual CBBF Conservation and Environmental Stewardship Awards. The CBBEP will be acknowledged as one of the major funding partners at the various events and activities.

CBBEP is the most important funding partner for Coastal Bend Bays Foundation programs. The Coastal Bend Bays Foundation is a public interest organization (non-profit 501(c)(3)) dedicated to the conservation of freshwater and coastal natural resources through communication, advocacy, research and education.

Project Objectives:

1. Host, organize and coordinate turnkey operation of Earth Day festival.
2. Host, organize and coordinate turnkey operation of Adventure Bay at Bayfest.
3. Host, organize and coordinate CBBF Conservation and Environmental Stewardship Annual Awards Banquet.
4. Conduct monthly Coastal Issues Forums to increase communication between resource managers and users.
5. Organize and coordinate Adopt-A-Beach beach clean ups.
6. Organize and coordinate bay-resource/related workshops with CBBEP's approval such as the Oso Creek Watershed workshop

Project #0616 CorpusBeat Environmental Journalists

Performing Organization: **CorpusBeat Magazine**
Total Funding: **$2,000**
CBBEP Bays Plan Actions: **PEO-1, PEO-5**

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.

CorpusBeat Magazine will focus on engaging students in activities outside the classroom by having them author original journalism style articles on specific environmental topics affecting the Texas Coastal Bend. The program is open to any student in high school, college, vocational and trade schools in the Coastal Bend. Students are required to review an action plan with an editor, research the topic, interview experts on the topic, write an article based on the information acquired and submit the work to the website for publishing. Once published, the article is then available for reprinting at no cost to the CBBEP and any of the Coastal Bend regional print publications.

In accordance to the *Bays Plan***,** the following series of topics will be offered to student authors to be researched, written and published on the CorpusBeat website as a public information and reference resource. The articles would also be made available for reprinting and use to benefit the public.

The student authors will write articles on the following *Bays Plan* topics: *Human Uses, Maritime Commerce and Dredging, Habitat and Living Resources, Water and Sediment Quality,* and *Freshwater Resources.*

Project Objective:

1. To encourage students to research and write articles on environmental topics.

Project #0617 Animal Rescue & Rehabilitation

Performing Organization: **Various**
Total Funding: **$10,000**
CBBEP Bays Plan Actions: **HLR-5**

Animal rescue and rehabilitation programs provide important information on species of concern and increase public awareness about our ecosystem. Each year thousands of protected, threatened, or endangered species become stranded, ill, or injured along the Texas coast. Services provided by existing programs include stranding response, evaluation, temporary refuge for exhausted migrant animals, acute and comprehensive medical care, release of rehabilitated animals, and long-term care for permanently disabled non-releasable animals. These animals are invaluable tools for education and for encouraging public environmental stewardship. Rescued animals remind the public of how closely we are tied to our environment, and of how our actions ultimately affect the health of our coastal waters and the animals that depend on them. The Coastal Bend Bays Plan identifies the need to continue vigilance on species of concern and to improve the existing network of animal rescue and rehabilitation programs.

As a result of previous CBBEP funding, the Coalition of Animal Rescue and Rehabilitation (CARR) was formed as the coordinated communications network of professionals and volunteers involved with animal rescue and rehabilitation. CARR helped to develop a management plan identifying the priority needs of animal rescue and rehabilitation programs. During FY 2005, CARR met to identify, discuss, and prioritize funding needs for FY 2006. The resulting funding request was presented to the CBBEP Habitat and Living Resources Implementation Team and then to the CBBEP Coordination Committee.

Project Objective:

1. Continue to support organizations that implement animal rescue and rehabilitation operations for marine species of concern.

Project #0618 Support of Local Land Trust Conservation Efforts

Performing Organization: **Coastal Bend Land Trust**
Total Funding: **$75,000**
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. Over the past five years, 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 purpose of this project is to continue (and increase) CBLT funding, providing them will sufficient resources for both organizational development and land conservation efforts.

Project Objectives:

1. Continue to facilitate CBLT organizational and professional development, with the end goal of becoming a self-sufficient organization.
   a. Build partnerships and secure additional funding.
   b. Promote professional development training (such as management of non-profit organizations, strategic planning, fund development, and grant writing).
   c. Perform other tasks conducive to becoming an independent, self-sufficient organization.

2. Support CBLT in implementing land conservation functions.
   a. Inform landowners about the benefits of land conservation and conservation easements.
   b. Acquire property and/or easements for the purpose of conservation.
   c. Perform baseline assessments for CBLT properties.
   d. Prepare and implement management plans for CBLT properties.
   e. Develop a volunteer recruitment and training plan.

Project #0619 Invasive Species Management

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

Invasive species (both native and non-native) can alter both habitat structure and function, resulting in the displacement and/or destruction of native flora and fauna. Often, once an invasive species threat has been identified, corrective action must be completed quickly to minimize damage.

This project dedicated funds for the purpose of invasive species control, allowing for timely project implementation once a specific threat has been identified.

Project Objectives:

1. Allocate funds for the general purpose of "invasive species control".
2. Expeditiously implement appropriate control actions when a specific invasive species threat is identified. Develop conceptual plan for marsh mound enhancement.

Project #0620 Kaufer Hubert Park Shoreline Habitat Enhancement & Protection Project (Loyola Beach)

Performing Organization: **Texas A&M University-Kingsville, Environmental Engineering Department**
Total Funding: **$10,000**
CBBEP Bays Plan Actions: **SM-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.

Kleberg County, Loyola Beach has experienced accelerated rates of erosion along its 1500 feet of shoreline. A 600 ft. bulkhead seawall was constructed near one area at Loyola Beach to protect the Kaufer-Hubert Memorial Park from further erosion.

The Park is one of the most prominent and highly utilized public access points in the area; offering fishing, boat launching, camping, bird watching, and other recreational activities. Ecological engineering approaches were demonstrated on an approximately 150' stretch of eroding beach west of the two boat ramps at Kleberg County's Kaufer-Hubert Memorial Park. The ecological engineering approach accomplished shoreline stabilization, beach preservation and ecosystem rehabilitation.

Project Objective:

1. To tie-in and stabilize the ecologically engineered shoreline at Loyola Beach adjacent to Kaufer-Hubert Memorial Park that combines hard structures with living plant materials to the adjacent eroding area to the west. The enhancement will protect the restored area and stabilize that adjacent shoreline

Project #0621 Debris Management at Public Access Sites

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

Bay debris poses public health risks and reduces the aesthetic appeal of the bay system. It can degrade habitats, snare aquatic and wildlife species. These impacts result in costs: to the shrimper who tears his net by hanging up on debris; to the windsurfer who steps on a broken bottle; to the tourist industry when hotel rooms are unfilled because potential visitors would rather visit cleaner beaches; and to agencies and organizations who devote thousands of hours to cleaning the beaches along the bays.

Debris clean-up along the shoreline is a continual challenge along the Texas Coastal Areas. Every year, numerous clean-up events are coordinated and hundreds of tons of debris are collected and disposed. During certain periods of the year, heavy visitation by tourists results in overflowing garbage receptacles causing debris to be spread over large areas. Additionally, frustrated beach goers leave debris behind, not willing to transport it to with them to their lodging site. Since prevention is generally more cost-effective than clean-up, CBBEP will approach this issue by strategically placing large garbage receptacles in areas of high use to prevent debris from being mismanaged and wind up along the bay shorelines.

Project Objective:

1. To reduce the amount of debris along coastal roadsides and shorelines by the placement of large garbage receptacles in three Strategic Locations (Redfish Bay Marina, Molly Beaty Park and Billings Marina) during the three most critical weekends of the year (Memorial Day, Fourth of July and Labor Day).

Project #0622 Laguna Madre Public Access Sites

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

The bays and estuaries support an enormous segment of the local economy, supplying the community with recreational opportunities and dollars. The Bays Plan states that the Program is to work to improve existing public assess sites and develop the a appropriate number of well managed sites in order to protect the coastal resources and ensure the longevity for future bay users.

The Laguna Madre, a shallow water habitat with consistent winds provides numerous recreational opportunities. The area adjacent to Laguna Shores Road, Flour Bluff, has gained popularity from a number of recreational bay users. The area attracts anglers, kayakers, sail surfers and kite boarders alike. Currently the area does not enjoy a public access nor parking for this type of use. Bay users currently access the bay through private property. Providing a well-managed public access site would allow bay users to continue to utilize and enjoy the resources for years to come.

Project Objective:

1. Conduct an alternatives and feasibility analysis to determine availability of property appropriate for the development of a shore access in support of non-motorized recreational activities.

Project #0623 Land-Use Change Evaluation of Live Oak Peninsula

Performing Organization: **Texas A & M University-Corpus Christi, Center for Coastal Studies**
Total Funding: **$30,000**
CBBEP Bays Plan Actions: **HLR-1, HLR-2**

Live Oak Peninsula is located within the Corpus Christi/Aransas Bay system, hydrologically connected to Nueces and Aransas/Mission watersheds, as well as Gulf of Mexico through Aransas Pass. The vegetation is comprised of coastal woodland (primarily Live Oak-Red Bay Association), coastal prairie, and freshwater depressional wetlands. These habitats harbor a high diversity of resident wildlife, as well as support high numbers of migratory neotropical birds.

Three municipalities are located along the eastern shoreline, Fulton-Rockport, Aransas Pass, and Ingleside. Urban growth as well as industrial operations have historically occurred along this shoreline. The entire peninsula has experienced unprecedented growth during the past five years. Concern for continued unplanned development has been raised from county officials, residents, and conservation organizations. Understanding growth patterns will allow better planning and coordination of future growth, while providing information for an environmentally sound master plan.

Change detection maps will be generated using available data from 1995-2004, depicting all possible class conversion combinations that will assist in identifying locations exhibiting highest levels of change. Visualization software will also be employed to provide change simulation exhibits, and develop predictions where change is likely to continue. Tables will be generated quantifying change of each land use/land cover classification by conservation unit, as well as summary totals for the entire Live Oak Peninsula.

Project Objectives:

1. Quantify land-use changes that have occurred in the past ten years.
2. Determine growth patterns to assist in future planning of development and open space.
3. Identify habitat tracts that still have functional size and quality for conservation strategies.

Project #0624 Vibrio Monitoring in Recreational Waters

Performing Organization: **Texas A&M University-Corpus Christi**
Total Funding: **$100,000**
CBBEP Bays Plan Actions: **WSQ-1, BTR-1, PH-1**

Vibrio vulnificus is a common halophilic organism in coastal waters of some parts of the U. S. . It is a well-documented pathogen and is the leading cause of death in the US. related to seafood consumption. This species is also responsible for wound infections in persons who have had contact with marine waters. In the Coastal Bend region there have been recent cases of this pathogen infecting fishermen in causing death or severe illness and loss of limbs. Currently, there is no ongoing bacteria monitoring for this species in Texas coastal waters.

This study will identify the occurrence of Vibrio at five or six public use beaches, fishing areas, or recreational waters within the CBBEP area. Selection of the areas to be monitored will be in coordination with the CBBEP and the Water and Sediment Quality Implementation Team. In order to determine the distribution of the pathogen, for future education of the public, this study will examine levels of V.v. in our estuarine water in relation to other environmental parameters that will also be taken in conjunction with this study. This includes water quality data such as temperature, salinity/conductivity, dissolved oxygen and other water quality data. Sampling will be conducted bi-monthly for approx. nine months during a one year investigation (following QAPP approval). Water samples will be collected in sterile containers and Vv. will be isolated and enumerated following the Bacteriological Analytical Manual online May, 2004.

There is no one-step method to identify and enumerate V.v. Suspect isolates are obtained by filtration and plating or most probable number. Each isolate must then be confirmed using a molecular technique. The FDA manual describes two methods, the first using either a most probable number analysis or colony isolation on selective media followed by PCR to confirm isolates as V.v. or the second in which plating for colony isolation is followed by hybridization with DNA probes for colony identification. V.v. is known to enter a VBNC state during colder months, in cooler waters.

For South Texas waters where temperatures remain high, seasonal variation may differ. Additional funding over a two-year period would allow a study to examine seasonal variation at a greater number of locations.

Project Objective:

1. To determine the occurrence and distribution of the pathogen, *Vibrio vulnificus* (V.v.) in South Texas Coastal Bend area waters

* Prior to starting this project, the CBBEP will host a *Vibrio* workshop to consider lessons learned from other areas, and from the results of Project 0532 (FY05).

Project #0625 Assessment of Sediments as a Source of Fecal Bacteria

Performing Organization: **Texas A&M University-Corpus Christi**
Total Funding: **$20,000**
CBBEP Bays Plan Actions: **WSQ-1, BTR-1, PH-1**

Water quality is measured by numerous tests, one of which is measuring the presence or absence of fecal coliform or enterococci bacteria. These types of bacteria in marine waters are used as indicators of other more harmful fecal bacteria. Many bays in Texas are considered as non-attainment of water quality standards due to the presence of fecal or enterococci bacteria. Studies have shown that during periods of high inflow or stormwater runoff events, there are high bacteria counts in receiving waters. However, high levels of these bacteria are sometimes found during periods of little or no inflow.

Several studies from other parts of the U.S. have shown that certain fecal bacteria can survive in sand/sediment under certain environmental conditions. The sediments naturally harbor organics and or nutrients that may support these bacteria. If this is the case in south Texas, locations and types of sediments containing high levels of these bacteria in them potentially affect current classifications of water quality in our bays and estuaries.

This study will collect sediment samples from several south Texas Bays and evaluate the presence of fecal coliform and enterococci bacteria. Water and sediment environmental quality parameters will also be measured and evaluated to determine if this may contribute to the number and presence of bacteria in the sediment. Sampling will be at five or six locations during a one-year investigation. Sediment samples will be collected in sterile containers and fecal coliform bacteria will be isolated and enumerated based on standard EPA procedures.

Project Objective:

1. To evaluate the sediments in South Texas Coastal Bays as a source of fecal coliform bacteria.

Project #0626 Seagrass Restoration Efforts in Upper Laguna Madre through Public Outreach

Performing Organization: **The Nature Conservancy**
Total Funding: **$25,000**
CBBEP Bays Plan Actions: **HLR-2**

The Nature Conservancy of Texas, together with the Conservancy's Gulf of Mexico Initiative, proposes a large scale Seagrass Restoration Project encompassing over 8,000 contiguous acres in the Upper Laguna Madre, from just south of the JFK Causeway to just south of Pita Island. This critical estuary is one of several priority conservation areas as determined by the Northern Gulf Ecoregional Plan (2001), which also includes Redfish Bay, Nueces Bay, Corpus Christi Bay, and Baffin Bay. Along with its many conservation partners, the Conservancy recently completed strategic conservation planning for the Laguna Madre and Mustang Island Macro-Site, in which seagrasses were identified as a critical target for protection and restoration.

The guiding objective for this project will be preventing the degradation of seagrass meadows within the project area by reducing scarring of the bay bottom by boat props. This is to be accomplished via a comprehensive campaign to educate boaters as to the ecological importance and sensitivity of seagrass beds.

Project Objectives:

1. Design and install signs to promote public awareness of seagrass protection.
2. Develop and implement a public outreach and awareness campaign that targets recreational fishermen and other bay users.

Project #0627 Seagrass Monitoring Phase II

Performing Organization: **UT-Marine Science Institute & Texas State University**
Total Funding: **$143,050**
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:

- Seagrass Monitoring Program was a major recommendation of the Seagrass Conservation Plan for Texas, adopted in 1998 by TPWD, TCEQ (formerly TNRCC), and TGLO.
- 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.
- 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.
- 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 #0628 Port Aransas Nature Preserve Shoreline Protection

Performing Organization: **TBD**
Total Funding: **$5,250,000**
CBBEP Bays Plan Actions: **HLR-1**

The CBBEP is working with the City of Port Aransas and the non-profit Channel Improvement Corporation to address erosion concerns along the Corpus Christi Ship Channel adjacent to the Port Aransas Nature Preserve (formerly known as Charlie's Pasture) and at the entrance to Piper Channel.

The Port Aransas Nature Preserve consists of nearly 2000 acres of essential fish habitat, wetlands, wind tidal flats and associated uplands that is habitat for numerous species of finfish, shellfish, shorebirds, wading birds, waterfowl, and four species of sea turtles.

The project site is a rapidly eroding stretch of shoreline along Mustang Island adjacent to the Corpus Christi Ship Channel. Erosion is occurring at an estimated 17' per year according to Bureau of Economic Geology report prepared for the Texas General land Office in 1994. If the shoreline erosion continues at that pace a breach of the uplands along the Ship Channel would quickly result in the permanent alteration of the hundreds off acres of wetlands immediately behind those uplands.

In order to establish the Port Aransas Nature Preserve the City of Port Aransas obtained a long-term lease of state owned properties and has acquired additional properties in and around Charlie's Pasture. In addition, citizens of Port Aransas have approved a multi-million dollar bond package to provide appropriate public access (trails, observation platform, a controlled parking area, and other enhancements).

Project Objectives:

1. Design and construction of approximately 6,000 feet of shoreline along the Corpus Christi Channel
2. Design and Construction of jetties at the entrance to Piper Channel

Project #0629 Corpus Christi Bay Hypoxia Monitoring

Performing Organization: **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 could 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 #0630 Copano Bay Bacteria Source Tracking Phase II

Performing Organization: **Texas A&M University-Corpus Christi**
Total 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 #0631 CBBEP Nueces Delta Preserve Management

Performing Organization: **CBBEP**
Total Funding: **$8,000**
CBBEP Bays Plan Actions: **HLR-1**

The CBBEP Nueces Delta Preserve currently consists of approximately 2,500 acres in San Patricio County. The CBBEP's primary goal for owning this property is the protection and restoration of wildlife habitat, especially the brackish wetlands found in the delta. The CBBEP would also like to see the property used for a variety of educational programs.

The funds provided in this project are for the necessary routine management of the property including mowing, fence and gate repair, signage and other maintenance activities.

Project Objective:

1. Maintenance and management of the Nueces Delta Preserve.

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.

IX. Project Management

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 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, 2005, the Coastal Bend Bays & Estuaries Program will begin Year 8 of implementing the *Coastal Bend Bays Plan*. This FY 2006 Work Plan describes the proposed work to be initiated during FY 2006. Of the total funds identified in the Work Plan budget, $511,966 are new (FY 2006) federal funds, $849,777 are new (FY 2006) state funds, $5,658,050 are new (FY 2006) project-specific funds, and $285,000 are new (FY 2006) local partner funds. The total budget for this FY 2005 Work Plan is $7,246,743.