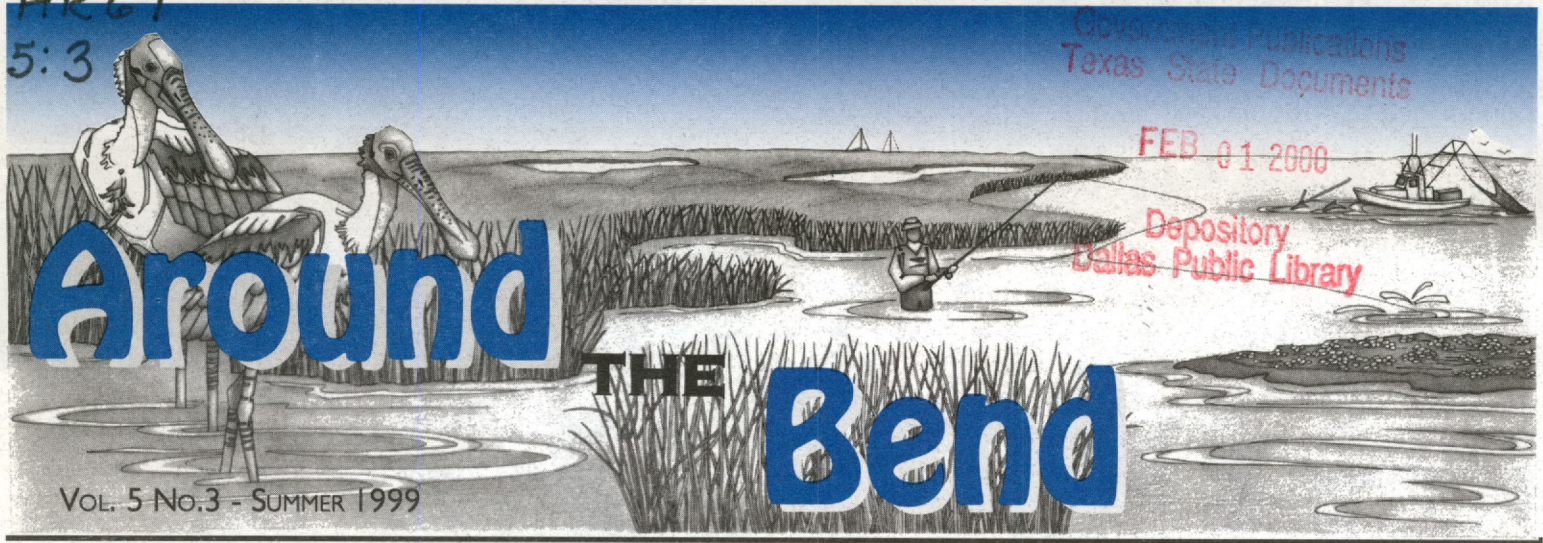


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# Around THE Bend

VOL. 5 No.3 - SUMMER 1999

NEWSLETTER OF THE COASTAL BEND BAYS AND ESTUARIES PROGRAM - SOUTH TEXAS

## Shamrock Island Restoration and Monitoring Continues

Located on the eastern portion of Corpus Christi Bay and west of Mustang Island, Shamrock Island is the remainder of a recurved barrier spit that once extended southwestward from Mustang Island into Corpus Christi Bay. The island was separated from Mustang Island by Hurricane Celia in 1970; however, it still functions as a barrier spit that protects habitats on Mustang Island from wave, tidal, and wind effects.

In 1992, a pipeline ruptured, flooding a 38-acre marsh with 123,900 gallons of crude oil. As a result, negotiations took place between the petroleum pipeline company and state and federal

resource trustees: the Texas Natural Resource Conservation Commission (TNRCC), Texas Parks and Wildlife Department (TPWD), Texas General Land Office (TGLO), and the U.S. Fish and Wildlife Service (USFWS) to determine what needed to be done to help correct the damage. The pipeline company was required to pay \$130,000 in compensation for losses to the ecosystem. The funds were transferred to the Nature Conservancy specifically for the purchase of Shamrock Island as a wildlife habitat conservation area.

would have to be stabilized. He recommended either a physical barrier along the shoreline or shoreline nourishment.

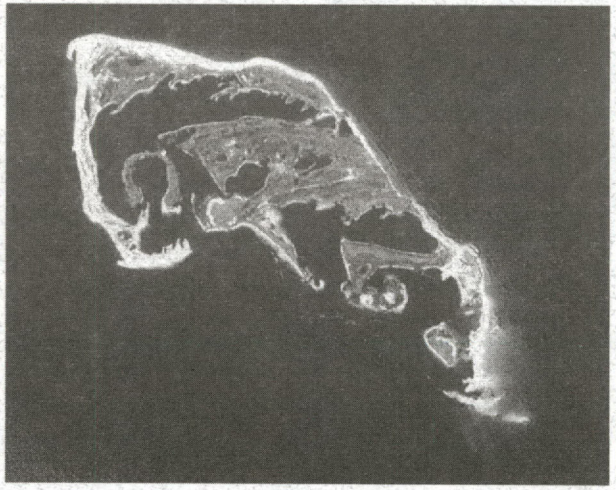
The TGLO and the TPWD received a grant from USFWS to help protect and restore wetlands and other habitats on and near the island. The project will protect and restore Shamrock Island

In 1997 a series of historic photographs was used to determine physical changes to Shamrock Island. A shoreline erosion study of Shamrock Island funded by the Nature Conservancy emphasized that after 1956 the northwest shoreline eroded rapidly. Geologist Harry Williams stated that by 1995 up to 156 meters (515 ft) of shoreline retreat had occurred on the northwest shoreline. The erosion now threatens to breach the island, which may result in degradation of an interior lagoon and loss of valuable wildlife habitats. Williams concluded that if breaching of the island is to be prevented, the northwest shore

wetland habitats that are integral to the Corpus Christi estuarine ecosystem and provide tremendous biologic and economic values.

### Restoration Efforts

Plans to protect the highly degraded north and northwest shorelines included the installation of a 4,000 foot Geo-



Aerial view of Shamrock Island in 1999.



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- Riparian Habitat Restoration Project

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tube breakwater allowing the southern shoreline to regain sand from the submerged part of the former spit. Geotube is an extremely strong woven polypropylene fabric filled with dredge sand. The exposed two to three feet of the Geotube were covered with a black shroud to protect it from UV radiation. Along with the installation of the Geotube, five acres of wetland vegetation (Smooth Cordgrass) will be planted between the wave barrier and shoreline. Construction began in December 1998 and was completed in March 1999, with the vegetation planting planned for either September 1999 or next spring.

### Waterbird Colonies

One of the most significant functions of Shamrock Island is the habitat it provides for colonies of nesting waterbirds. A diversity of nesting habitats occurs on the island, including sandy and shell beaches and ridges, upland grasses, shrubs, and salt cedars. Waterbirds feed on seagrasses, shellfish, benthic organisms, and fish that are found in the surrounding shallow marshes. During nesting season, waterbirds are especially dependent upon adjacent marsh habitats, in order to minimize time spent foraging away from their nests.

Shamrock Island is also used for foraging and resting by federally-listed threatened and endangered species such as the piping plover and the American peregrine falcon. A census of waterbirds performed each spring has reported a total of 21 species on the island between 1973 and 1999, with total bird populations ranging from 1,100 to over 15,000.

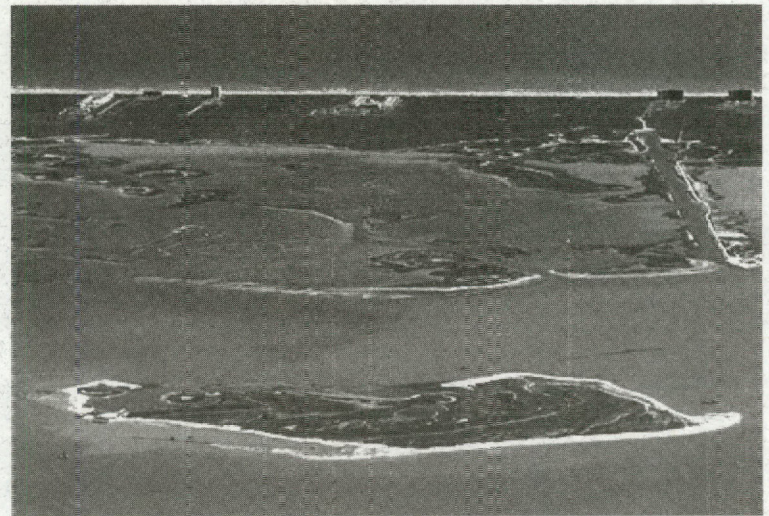
As a follow-up to the restoration construction, it is important to evaluate the effectiveness of methods used. The Nature Conservancy and the TGLO are providing funds for long-term monitoring under a contract pending with Dr. Liz Smith, a wetlands scientist with the Center for Coastal Studies at Texas A&M University-Corpus Christi. Smith be-

lieves that follow-up assessments are important in providing information for future restoration projects. "The first phase will include compiling all available information concerning causes of long-term change into a comprehensive report," says Smith. "This is an important component in developing and implementing a multilevel monitoring approach to evaluate project success," she says. There will be four sampling stations on the island for gathering information on water quality as well as flow and water level data. In addition, sample areas will be studied to find out what vegetation predominates, with particular interest in seagrasses between the shoreline and Geotube.

For information about Shamrock Island, please contact Dr. Smith at 361/994-6069.



*Piping plovers, federally listed endangered species, rest and forage on Shamrock Island.*



*Aerial view of Shamrock Island, 1996*



*Around the Bend is produced quarterly by the Coastal Bays & Estuaries Program with funding from the U.S. Environmental Protection Agency and the Texas Natural Resource Conservation Commission. For more information about the Program or to request a subscription to Around the Bend, contact the CBBEP office at 361/980-3420.*

*Articles are provided through contract with the Center for Coastal Studies, TAMU-CC. Contributors to this issue include: Quenton Dokken, Ph.D., Lee Elliott, Tom Calnan, Susan Childs, Liz Smith, Ph.D., Marcia Lochmann, Sandra Alvarado, and Mercedes M. Salinas.*

*News items, photographs, and letters are welcome and may be submitted to the CBBEP office, Natural Resources Center, Suite 3300, TAMU-CC, 6300 Ocean Drive, Corpus Christi, Texas 78412. The submission deadline for the next issue is August 31, 1999.*

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# CBBEP Launches Recreational Water Quality Study

## Storm drain outfalls monitored along Corpus Christi Bay

Epidemiology studies in the United States have consistently found an association between gastrointestinal illness and exposure to contaminated recreational waters. Americans continue to face risks of illness from swimming and other recreational activities in coastal areas, lakes, and rivers that are contaminated with disease-causing microbes. Local monitoring and management programs for recreational waters vary widely. As a result, there are different standards and levels of protection across the country. Under EPA programs, funding has been provided for studies to improve knowledge of water quality in the Coastal Bend.

The Coastal Bend area includes three estuaries that are used extensively for recreational activities including windsurfing, fishing, boating, and swimming. Monitoring of water quality along the Corpus Christi Bay shoreline is conducted on a routine basis (monthly) in dry weather conditions to ensure that ambient levels of indicator bacteria do not exceed acceptable state standards for recreational waters. Wet weather monitoring is not performed.



*Windsurfing is one of the most popular recreational water sports in Corpus Christi Bay.*

### Exposure and Health Effects

Combined sewer overflows (CSOs) discharge a mixture of stormwater and domestic waste when the flow capacity of a sewer system is exceeded during rainstorms. Due to the presence of untreated sewage in CSO discharges, they are potentially a greater risk to swimmers

than dry-weather discharges from other point sources. Increased pathogen exposure at recreational areas may also occur due to sanitary sewer overflows (SSOs) or watershed runoff during heavy rainfall. While it is known that CSOs can contribute excessive enteric pathogens to surface waters, the contributions of SSOs and watershed runoff have not been well described. Nonpoint contamination components, such as septic systems, domestic and wild animals, and livestock, may contribute different pathogen numbers and types and human health risks.

In December 1998, the CBBEP issued a contract to Dr. Joanna Mott, assistant professor at Texas A&M University-Corpus Christi, to evaluate effects of rainfall events on microbiological water quality in the CBBEP area. The data analysis is intended to provide sufficient information to make an initial assessment of the extent that runoff affects Corpus Christi Bay water quality at several recreational shoreline parks. This pilot study will serve as a model for future studies on other high-profile recreational areas in the CBBEP study area.

EPA has allocated additional funds to enhance the initial microbiological study by increasing the number of dry and wet weather sampling events and by obtaining additional information on various indicator groups sampled. This project is to be completed by August 31, 2000.



*Pleasure boats sail the Corpus Christi bayfront year round.*

This project will further the Implementation Strategy for the Coastal Bend Bays Plan, which includes an action plan for public health as it relates to human use of recreational waters. The first objective of the Plan is to minimize any threat of waterborne illness and disease. The goals of the action plan are twofold. First, a workgroup of regional health officials will be convened to discuss recreational water quality assessment and monitoring needs. Second, dry and wet weather monitoring will be conducted for use in developing a predictive model for assessing contact recreation risk.



*Stormwater gushes from a storm drain near Cole Park during a large rain event.*

### Disease-Causing Microorganisms in Sewage

<b>Bacteria</b>	Gastroenteritis (includes diarrhea and abdominal pain), salmonellosis (food poisoning), cholera
<b>Viruses</b>	Fever, common colds, gastroenteritis, diarrhea, respiratory infections, hepatitis
<b>Protozoa</b>	Gastroenteritis, cryptosporidiosis and giardiasis (including diarrhea and abdominal cramps), dysentery
<b>Worms</b>	Digestive disturbances, vomiting, restlessness, coughing, chest pain, fever, diarrhea.

# Land Trusts

*Protecting open spaces threatened by population growth and development*

A Land Trust is a nonprofit, voluntary organization that works hand-in-hand with landowners to protect America's open spaces, which are increasingly threatened by population growth and development. A trust uses a variety of tools, such as conservation easements, to manage purchased or donated lands. A conservation easement allows landowners to protect valuable resources while either maintaining or transferring ownership. Some conservation easements may qualify for tax deductions. Local, regional, and national land trusts are helping communities save America's land heritage without relying exclusively on government resources.

The Coastal Bend Bays Foundation is taking the lead by organizing the "Coastal Bend Land Trust" (CBLT). There are over 20 land trusts in Texas, each with its own mission. Some focus on specific geographic areas, while others concentrate on protecting certain natural features. The CBLT's primary mission is to preserve, conserve, restore, and enhance ecosystems of the Coastal Bend region of Texas.

Dr. Jennifer Prouty, past President of the Coastal Bend Bays Foundation says the Coastal Bend Land Trust will focus on habitats of ecological significance. "There are many important ecosystems in the Coastal Bend and we want to preserve a variety including wetlands, riparian corridor (river bottomlands) upland woods and others," she said. Prouty adds, "Those that will receive special attention will be areas of land that are in immediate likelihood of development or which require restoration efforts to return lost functions and values to the system."

The CBLT has just received its first property as of April 1999. The property includes a 2.5 acre tract with dense vegetation and is located near Aker Gulf Marine in Aransas Pass. The owner of the property (who wishes to remain anonymous) was "pleased to donate the land to the CBLT for conservation purposes."

Texas is one of the three fastest growing states, along with California and Florida. Growth and development continue to threaten ecologically significant habitats. "A nagging concern for many Texas landowners is the uncertain long-term future of rural land," says Carolyn Scheffer of the Texas Parks and Wildlife Department. "Various social and economic forces are gradually grinding many family-owned farms and ranches of Texas into small fragments," says Scheffer. The cost of land ownership often prevents landowners from keeping or bequeathing their land. To address these concerns, land trusts are being set up throughout the country. The

trusts offer a way for landowners to enjoy valuable tax benefits while ensuring that their land is permanently maintained as a heritage to future generations.

As part of the "Coastal Bend Bays Plan - Shoreline Management Action Plan," the CBBEP has been charged with helping to establish a locally administered Land Trust Fund, which will augment public access, sensitive habitat protection, and open space preservation. For FY'99, the CBBEP provided \$15,000 to "jump start" the CBLT by supporting the development and publication of a brochure along with a series of workshops, educating landowners, farmers, and developers about the various benefits of a land trust.

## Coastal Bend Land Trust Goals

Hold and enforce easements or acquire area lands to ensure long-term protection of Coastal Bend habitats.

Develop site-specific management plans, including compatible land and water uses, that can serve as models for other sites and landowners.

Establish education programs for Coastal Bend residents about the importance of habitat conservation and potential conservation opportunities and partnerships.

Assist in developing research programs that will increase the ability to assess habitats and restore them successfully.



For more information call the  
Coastal Bend Land Trust at  
361/882-4363

# Assessment to determine baseline inventory of riparian habitats



Over half of the wetland zones and river bottomlands, also known as riparian zones, have been destroyed in the contiguous 48 states, with only a few zones remaining unimpacted. The destruction of riparian ecosystems is largely associated with human activities, especially clearing for agriculture, stream-channel modifications, water impoundments, and urbanization. Road and pipeline construction often disrupt the natural drainage patterns of riparian ecosystems. Even recreational development can destroy natural plant diversity and structure, lead to soil compaction and erosion, and disturb wildlife.



*The Mission River in Refugio County is one of the riparian corridor study sites.*

In addition to the loss of riparian habitat through land uses such as agriculture and recreation, some major river systems have a long history of land alterations associated with flood control measures. Since the late seventeenth century, levees have been constructed along the lower Mississippi River. The 600 miles of river between the Gulf of Mexico and Missouri is controlled by over 2,000 miles of levees and has about 40,000 acres of pits from which the levee material was taken. As native riparian landscapes have been increasingly affected by flood control projects, the need has grown for restoration, not only along existing rivers and streams but also on newly created floodways and distribution canals.

The Coastal Bend Bays and Estuary Program (CBBEP) has made a considerable investment in creating a general description of eight major estuarine habitat types. The program is currently developing a detailed inventory of riparian habitats and a strategy for protecting the ones that remain.

## **Project Development**

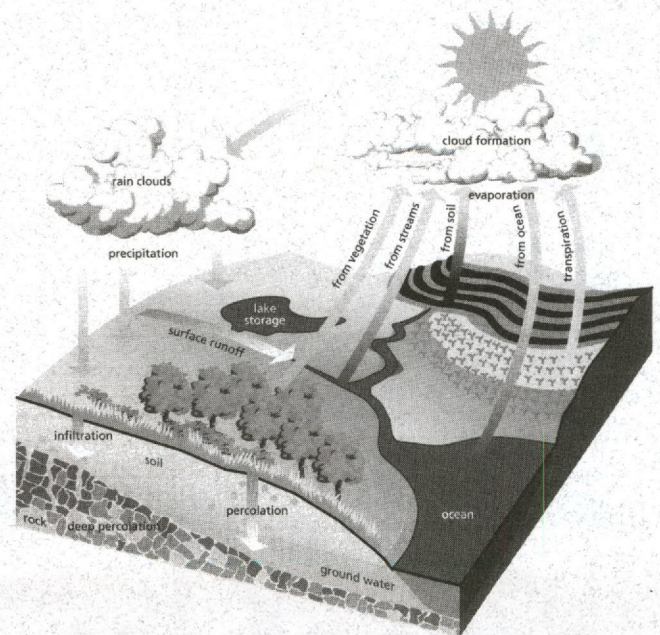
The CBBEP project has been developed to assess existing riparian habitats along the major drainage areas within five counties of the Coastal Bend (Refugio, Aransas, San Patricio, Nueces, and Kleberg). The existing riparian habitats will be inventoried, including habitat quality and size. The vegetative communities will be described including dominant species and community structure, with areas identified that exhibit the greatest potential for threats from urbanization and those in need of restoration.

The evaluation process to assess the status of riparian habitat corridors within the Texas Coastal Bend from the Mission Watershed south to Los Olmos Watershed is scheduled to begin this summer and will be spearheaded by the Center for Coastal Studies at Texas A&M University-Corpus Christi and Texas Parks and Wildlife Department. Additional partners include the Welder Wildlife Foundation, and USDA/NRCS Kika de la Garza Plant Materials Center.

## **Riparian Structure**

The hydrogeomorphic process is a driving force of riparian systems. *Hydrogeomorphic* refers to the hydrology or water of the system and how it interacts with the physical features or geology of that system. Understanding how water flows into and through stream corridors is critical to devel-

*see 'Riparian' page 6*



*Hydrogeomorphic cycle*

## Legislature Approves Funding for Bays & Estuaries Programs

The 76<sup>th</sup> Texas Legislative Session brought great news for the coast with the passage of the Texas Estuaries Act, in which the Legislature recognized the significance of estuaries in our state. The Act designates the Texas Natural Resource Conservation Commission (TNRCC) as the lead state agency for implementation of approved comprehensive conservation management plans developed under the National Estuary Program and makes implementation of the plans eligible for state funding.

In addition to the Texas Estuaries Act, the Legislature appropriated \$2 million in additional revenue to the TNRCC for implementation of the Coastal Bend Bays Plan and the Galveston Bays Plan each year of the biennium. The Coastal Bend Bays & Estuaries Program (CBBEP) will receive \$900,000 and the Galveston Bay Estuary Program (GBEP) will receive \$1.1 million each year. In addition, the Environmental Protection Agency (EPA) will grant \$340,000 to TNRCC for plan implementation for each program.

Community leaders in the Coastal Bend have been working diligently to establish the CBBEP (currently a program of the TNRCC) as a local program. This means that the program staff and duties would no longer be part of TNRCC but would become a separate entity reporting to the CBBEP Executive Council as described in the Coastal Bend Bays Plan. The local program will be created through an interlocal governmental agreement.

In mid-July the CBBEP Executive Council (EC) met for the first time in order to approve policies needed to establish a local program office. The EC is currently negotiating a contract with TNRCC for the funds. The EC also hired Ray Allen to serve as interim executive director of the CBBEP.



*'Riparian' from page 5*

oping restoration initiatives. How fast, how much, how deep, how often, and when water flows are important basic questions that must be answered in order to make appropriate decisions about the implementation of a stream corridor's restoration. The physical or geomorphic functions and characteristics are important because as water flows through streams, it is affected by the kinds of soils and alluvial features within the channel, floodplain, and/or the uplands. The amount and kind of sediments carried by a stream are largely determined by equilibrium characteristics including size, shape, and profile of the sediment. Successful implementation of a riparian corridor restoration plan depends on understanding how water and sediment are related to the form and function of the riparian corridors.

### **Watershed Approach**

A watershed approach (that is, collaboration among stakeholders in a particular watershed to identify and address water quality problems) will be used to achieve a comprehensive view of riparian habitats. Watersheds are areas of land that drain water, sediment, and dissolved materials to a common outlet at some point along a stream channel or body of water. Several fundamental steps are identified in watershed analysis, such as:

- Watershed characterization
- Issue identification/key questions
- Current condition documentation
- Description of reference conditions
- Identification of objectives
- Summary of conditions, and
- Determination of causes/recommendations.

The results of this project will provide detailed baseline information about the status of riparian habitat, including areas in need of protection and restoration. This information will be valuable in the next phase to develop preservation and restoration strategies for the Coastal Bend.



# Neighborhood News

## Hans & Pat Suter Wildlife Refuge

*Park renamed to include wife of conservation pioneer*

For over 10 years the Hans Suter Wildlife Area located on the Cayo del Oso in the heart of Corpus Christi has been an extraordinary wildlife and bird sanctuary visited by thousands of residents and tourists each year. The refuge was originally dedicated and named after Hans Suter, an advocate for environmental issues, on May 5, 1987.

Appropriately on Earth Day, April 22, 1999, the Hans Suter Wildlife Area was renamed the Hans and Pat Suter Wildlife Refuge in a ceremony that honored Pat Suter's many years of unyielding dedication and profound stewardship of the natural resources of the area. The Coastal Bend Bays and Estuaries Program (CBBEP), Coastal Bend Bays Foundation (CBBF), Koch Refining, and the City of Corpus Christi cosponsored the rededication of the refuge. "We feel that Pat Suter's continued work on behalf of the environment should not go without formal recognition of her extensive volunteer efforts," said Jennifer Lorenz, former CBBEP executive director.

Pat and the late Hans Suter were pioneers in the environmental movement in the Coastal Bend. They shared a reverence for life and became active stewards of the land, air, and water. Until Hans' death in 1984, both he and Pat addressed critical issues of the Coastal Bend bays and estuaries with scientific insight and concern for the environment. Today,

Pat charges forward with this agenda.

The Suters moved to Corpus Christi in 1954. Dr. Hans Suter, an industrial chemist, taught chemistry and physics at the university level, and for many years was a consultant on chemical pollution abatement. He wrote a weekly conservation column for the Corpus Christi Caller Times and was the founder of several area organizations including the Nueces Bay Conservation Coalition.

The Suters worked with concerned citizens in the area to stop the flushing of brine discharges into Oso Creek during the late 1960s. They led opposition to the draining of the Cayo del Oso for development, and fought to prevent effluent from being dumped into Corpus Christi Bay. Additional causes included advocacy of public access to North Beach and opposition to unbridled development of area waterways. They enjoyed many nature activities, such as birding, and often led student field trips.

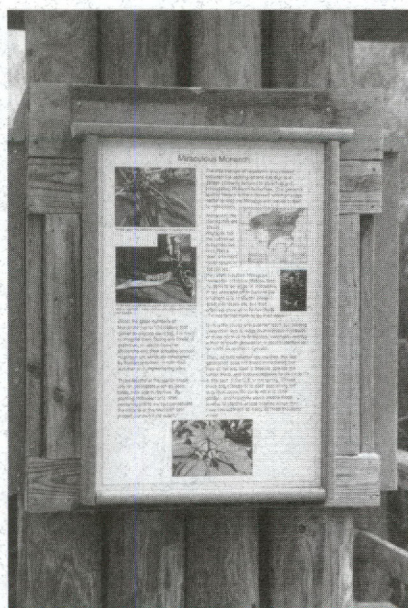
Pat Suter also made a career in the academic world where she taught chemistry at Del Mar College for 24 years. She remains one of the most active environmental advocates in South Texas. A founding member of at



*Pat Suter and her sons unveil park sign at the rededication ceremony of the park in April.*

least six conservation groups, she maintains active membership or chairmanship in 20 statewide, national, and local environmental boards and organizations. As a full-time volunteer, Pat attends government and private industry hearings and scans the legal section of the daily newspaper for potential environmental concerns. She often fields as many as 20 phone calls each day from agencies, colleagues, and concerned citizens and continues to volunteer her time and expertise to efforts of the CBBEP.

In addition to the renaming of the refuge, newly designed interpretive signs were unveiled at the park. The signs were redesigned by U.S. Fish and Wildlife Service, CBBF, Texas Audubon Society and the CBBEP to tell the story of the Cayo del Oso and of our fragile Coastal Bend ecosystem.



*Interpretive sign tells story of the area and the fragile ecosystem of the Coastal Bend*



## Coastal Bend Bays Foundation Hires New Executive Director

The Coastal Bend Bays Foundation (CBBF) is pleased to announce the selection of its new executive director Teresa Carrillo, effective September 1, 1999. Ms. Carrillo will replace Jennifer Lorenz, who moved to Houston. Ms. Carrillo is an environmental professional and a conservationist who has worked in the Coastal Bend area for 15 years. Her expertise includes coastal and watershed issues, endangered species, environmental contaminants and working with Coastal Bend stakeholders.

Ms. Carrillo will work under the direction of the CBBF board of directors and will work closely with a broad range of industry and business representatives, environmental professionals, private citizens, conservation groups, and regulatory agencies, which compose the CBBF membership.

She is a founding member of the CBBF and worked for the United States Fish & Wildlife Service (USFWS) for six years. She holds



*CBBF Executive Director  
Teresa Carrillo*

a bachelor's in marine science and is close to completing her master's in marine ecology at Texas A&M University-Corpus Christi.

The goal of the CBBF is to conserve natural resources through facilitation, conservation, education, advocacy, and research. The CBBF has been identified as the lead organization for 23 actions in the *Coastal Bend Bays Plan* pertaining to bay tourism and recreation, bay debris, dredging, habitat and living resources, water and sediment quality, freshwater resources, and public education and outreach. Ms. Carrillo will work closely with the Coastal Bend Bays & Estuaries Program to ensure success of these common goals.

*A CBBF general membership meeting will be held September 13, 1999 at 5:30 p.m. at the Natural Resources Center at Texas A&M University-Corpus Christi. This meeting will highlight several local projects with environmental issues and will showcase upcoming CBBF events for the next year.*

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