

THE GALVESTON BAY COMPLEX AND THE "EDGE EFFECT"

*Richard J. Baldauf, Ph.D.
Director of Education, Houston
Museum of Natural Science*

Ecologists recognize that a transitional zone between two or more diverse communities contains many species of organisms from each of the overlapping communities and, in addition, species which are characteristic of and often restricted to the zone. The increased variety and density of species in a transitional zone is known as the "edge effect".

An estuary may be considered a zone of transition between fresh water and marine ecosystems. The Galveston Bay complex is such a zone and is important to commercial fisheries, to the structural stability of the geographic area, and to the biological productivity of the area. The most important commercial role of the complex is its function as a nursery area for about 80% of the young of marine species that constitute the marine fisheries industry of the Texas coast.

Consideration of the edge effect is particularly appropriate for the Galveston Bay complex, in view of its uniqueness as a discrete system. Life cycles of marine species of other Gulf coast states are remarkably similar to those of the Texas coast, but none of these states has such a discrete unit as the Galveston Bay complex. The broad deltaic region of the Mississippi and its vast estuaries can, by size alone, tolerate some water development projects without a measurable loss of production. This is not the case with the Galveston Bay complex. Galveston Bay is a sensitive and fragile ecological system.



The edge is also observable in shoreline shallows. It is here where the greatest diversity of species occurs and where the greatest population densities of animals and plants are to be found. It is here that juvenile shrimp of commercial importance find optimum conditions for feeding and developing. There is little doubt that various sizes of commercially important species of shrimp serve as an important food source for a variety of freshwater, marine, and estuarine species of fishes that frequent these shallow waters when feeding and developing.

However, the commercially important species of shrimp follow an annual cycle of emigration and immigration in relation to the Galveston Bay complex, because the Complex serves only as a nursery area where immature and juvenile animals have access to optimum salinities, water flow, and nutrients. The open water of the Gulf of Mexico provides the spawning habitat for these shrimp.

To maintain this important supply of nutrients to fishes, it may be necessary for

the commercially important species of shrimp to be replaced by other species when the former emigrate to the open waters of the Gulf. Such replacement may be served by the various species of grass shrimp (*Palaemonetes*) found in these waters. The grass shrimps are represented by freshwater, estuarine, and marine species. Because of the prominence of grass shrimp in the diet of numerous sport fishes of the Gulf coast, including the redfish and trout, and because of the assumed importance of grass shrimp in the food web of the Galveston Bay complex, a detailed account of the physioecology of *Palaemonetes pugio* was issued by Wood in 1967. (*Contr. Mar. Sci.*, 12:54079)

The opinions of the contributors do not necessarily reflect the opinions of the Galveston Bay Foundation.

1989 BOARD OF TRUSTEES

Regular Trustees

Perry Bass
 James B. Blackburn, Jr.*
Chairman
 Ben Blackledge
 George Bolin
 Anton B. Brucks
 Glenda Callaway*
Treasurer
 Gene Campbell
 John B. Cheesman, Jr.*
 Russel W. Clapper
 Tommy C. Douglas
 Albert B. Fay
 John Fenoglio
 Sally Fish*
 Frank Fisher
 Rosine Hall
 Ralph Harper
 Charles Harter, III
 Robert J. Heineman
 Jacob W. Hershey
 Ned Holmes
 Howard Horne
 Felix H. Jackson
 Lynne Johnson
 Wayne D. Johnson*
Secretary
 Gary Jones
 Thomas R. Kelsey
 Joe Lagow
 Mike Martin
 Jack H. Mayfield, Jr.
 Peter Meyer*
 John Middleton
 Richard R. Morrison, III*
First Vice Chairman
 Doris Nelson*
 Sammy M. Ray
 B. C. Robison
 A. R. "Babe" Schwartz*
 D. Eugene Simmons*
 Frank C. Smith, Jr.*
Second Vice Chairman
 Thomas Stauffer
 Sharron Stewart*
 David Todd
 Walter Umphrey

Delegate Trustees

Armand Bayou Nature Center
 Jim Larrabee
 Boating Trades Association
 Jack Mitchell, Jr.
 Galveston Bay Conservation
 and Preservation Association
 John Grimes*
 Greater Houston Chamber of Commerce
 Neil Bishop*
 Gulf Coast Conservation Assn.
 Walter Fondren*
 Houston Audubon Society
 Stennie Meadours
 Houston Canoe Club
 Leonard Hulsebosch
 Houston Sportsmen's Club
 Hubert Roger
 Houston Yacht Club
 Elynn Roof*
 Lakewood Yacht Club
 Alex Prati
 League of Women Voters
 Mary Gillette
 Outdoor Nature Club of
 Houston
 Jack Gillette
 PISCES
 C. L. Standley
 Sierra Club, Houston
 Evelyn Merz*
 Texas Corinthian Yacht Club
 John Kirksey
 Texas Environmental Coalition
 Barbara Bain
 Texas Shrimp Association
 Ralph Rayburn
 Wetland Habitat Alliance of Texas
 Bob Jungman

(* denotes member of
 Executive Committee)

Allan Mueller
Editor
 Linda Shead
Executive Director

Honorary Trustees (non-voting)

Terry Hershey
 George Mitchell

Ex Officio Trustees (Public officials who are named trustees by virtue of their jurisdictions touching Galveston Bay)

U. S. Senator Lloyd Bentsen
 U. S. Senator Phil Gramm
 U. S. Representative Mike Andrews
 U. S. Representative Jack Brooks
 U. S. Representative Tom DeLay
 U. S. Representative Jack Fields
 Governor Bill Clements
 Lieutenant Governor Bill Hobby
 State Senator Chet Brooks
 State Senator J. E. "Buster" Brown
 State Senator Gene Green
 State Senator Carl Parker
 State Representative Lloyd Criss
 State Representative James Hury
 State Representative Mike Jackson
 State Representative Randy Pennington
 State Representative Mark Stiles
 State Representative John Willy
 County Judge John Damon
 County Judge Ray Holbrook
 County Judge Jon Lindsay
 County Judge Oscar Nelson

Advisory Trustees (non-voting)

Dr. Richard Baldauf, Houston Museum of Natural Science
 John Green, Gulf of Mexico Fisheries
 Management Council
 Jim Hightower, Texas Department of Agriculture
 Mike Hightower, Sea Grant College Program
 Paul Hopkins, Texas Water Commission
 Ken Kirkpatrick, Environmental Protection Agency
 Dr. Jack Matson, University of Houston
 Dr. Larry McKinney, Texas Parks & Wildlife Department
 Garry Mauro, General Land Office
 Dr. Bill Merrill, Texas A & M at Galveston
 Don Moore, National Marine Fisheries Services
 Charles Moss, Brazoria County Marine Extension
 Robert W. Nailon, Chambers-Harris Counties
 Marine Extension
 Melvin C. Russell, Galveston County Marine Extension
 Eddie Seidensticker, U. S. Soil Conservation Service
 Col. John A. Tudela, U. S. Army Corps of Engineers
 Fred Werner, U. S. Fish & Wildlife Service

**GALVESTON
 BAY
 FOUNDATION**

3027 Marina Bay Drive, Suite 110
 League City, Texas 77573

NONPROFIT ORG.
 U. S. Postage
 PAID
 Houston, Texas
 Permit No. 3540

Sample
 page - originals
 consulted by
 appointment
 only

A MESSAGE FROM THE CHAIR

by James B. Blackburn, Jr.

THE GALVESTON BAY NATIONAL ESTUARY PROGRAM

Since the Galveston Bay Foundation was formed, a major event has taken place that offers tremendous hope for the protection of the Galveston Bay system. Section 320 of the federal Water Quality Act of 1987 created the National Estuary Program (NEP) and specifically identified Galveston Bay as an estuary of national concern. This designation acknowledges the threatened nature of the Galveston Bay system and establishes a process for studying and protecting the bay.

The Galveston Bay National Estuary Program was formally initiated by Governor Clements, who appointed the Texas Water Commission to convene a so-called Management Conference. Primary funding for the Management Conference is provided by the U.S. Environmental Protection Agency, which also establishes federal regulations guiding the program. Over a five-year period, the Management Conference is to develop a Comprehensive Conservation and Management Plan (CCMP) for Galveston Bay.

The structure of the Management Conference is complicated, with several layers of committees with varying responsibilities. A Galveston Bay Public Forum and a Citizens Advisory Steering Committee exist to provide grass-roots input and support for the Galveston Bay NEP. A Scientific and Technical Advisory Committee will aid in the development of technical studies and proposals and in the critique of technical data and proposals. The Local Governments Advisory Committee will provide input from counties

and cities around the Bay. The Management Committee will be responsible for the day-to-day activities of the Conference, including defining and ranking the problems of the estuary and developing management strategy and plans. Finally, the Policy Committee will oversee all aspects of the Management Conference, including reviewing and approving other committee recommendations.

**"Without the . . . involvement
of [GBF] members, this
important opportunity for
Bay improvement could fail."**

The Galveston Bay NEP is just beginning, and the dynamics of the relationships between the committees are only now unfolding. A concern of many veterans of past management efforts, such as the Coastal Zone Management Program and Section 208 Water Quality Planning, is that little actual improvement of the Bay will occur during the period required to start up the Management Con-

ference, agree on priorities, contract for studies, review studies and act on those studies.

Indeed, a legitimate fear is that nothing but studies will result from this Management Conference. Without the active involvement of all Galveston Bay Foundation members, this important opportunity for Bay improvement could fail. It is up to all of us to become involved to make sure that this important effort will not fall by the wayside.

(See page 5 for a mail-in coupon.)

ARMAND BAYOU AND CHRISTMAS BAY

An immediate opportunity for the Galveston Bay NEP to demonstrate its willingness and intent to protect portions of Galveston Bay has been seized upon through the development of a proposal to set aside Christmas Bay and Armand Bayou for special protection. Last month, EPA announced that a one-time action demonstration grant was being

(please see page 5)

