II. INTRODUCTION

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In May of 1988 Galveston Bay was nominated by the governor of Texas as a candidate for National Estuary designation under the National Estuary Program, authorized by the Water Quality Act of 1987 (Anonymous 1989). The Galveston Bay Estuary (including Galveston, Trinity, West, East, Christmas, Bastrop, and several other minor bays; hereafter referred to as the Galveston Estuary) was already recognized in the Water Quality Act as a Estuary of National Significance. The nomination was approved and the Galveston Bay National Estuary Program (GBNEP) was initiated in October 1988. The goal of this program is to maintain estuaries in a healthy biological state while providing for other uses by developing a coordinated local, State and Federal management program.

The diverse uses of Galveston Estuary inevitably pose potential threats to the survival of many estuarine species. The most urbanized areas of Texas lie within the Galveston Estuary drainage basin (Ditton et al. 1989). Approximately half of the nation's chemical production and a third of its petroleum industry are located in the area. Fifty-one percent of the wastewater discharge permits issued in 1987 by the Texas Water Commission were in its watershed. Yet in 1989, the Galveston Estuary produced 24-38 percent by weight of the Texas coastwide commercial landings of finfish, shrimp, crab, and oysters (Johns 1990). Almost 40 percent of the landings and 35 percent of the pressure by bay and pass sportboat fishermen occurred in the Galveston Estuary (Green et al. 1991).

A healthy ecosystem and a sustainable fishery are matters of substantial long-term economic concern. The Texas Legislature initiated studies to maintain the ecological health and productivity of Texas estuaries in 1967 (64th State Legislature, Senate Bill 137; 69th State Legislature, Senate Bill 683). These studies continue today under new legislation passed in 1985.

The two principal goals of the GBNEP are to protect and improve water quality, and to maintain or enhance the living resources of the Galveston Estuary. These goals are to be accomplished by first identifying and setting priorities on specific environmental problems, scientifically characterizing the ecosystem in relation to those problems, and ultimately creating a unified management action plan, the Comprehensive Conservation and Management Plan (CCMP).

The study documented by this report is part of the effort to characterize the ecosystem of the Galveston Estuary. Its purpose is to determine the status and trends of several selected species living in the Galveston Estuary in order to identify potential problems, as indicated by significant declines in abundance, and to initiate the investigation of the probable causes of those declines.

The species studied were selected by members of the GBNEP Scientific and Technical Advisory Committee. The list was assembled to include those groups fundamental to maintaining the Galveston Estuary ecosystem, and economically important taxa: commercially and ecologically important finfish and shellfish, locally breeding birds, alligators, plankton, and open bay and marsh benthos. There were two phases to the project: the identification and examination of existing data sets containing information about target species, and the statistical analysis of those data sets with sufficient information to permit the investigation of temporal change.

The analyses of finfish and shellfish populations depended principally on data from the Resource Monitoring Program conducted by the Coastal Fisheries Branch of the Texas Parks and Wildlife Department (TPWD), described in Chapter III. Several data sets were used in the evaluation of bird populations, and TPWD Wildlife Division surveys were used to analyze alligators (described in Chapter IV). The characterizations of plankton and benthic communities in Galveston Bay (Chapters V, VI, and VII) relied on literature searches for previously published studies.