2.0 INTRODUCTION

In Texas, the recreational fishery is an economically and biologically important segment of the total coastal fishery. During 1989-1990, there were about 1.1 million saltwater sport fishermen in Texas (Texas Parks and Wildlife Department 1991). Annually, direct expenditures by these fishermen translate into over two billion dollars of economic benefits to the State of Texas (Texas Water Development Board 1987, U.S. Fish and Wildlife Service 1989).

Almost 40 percent (over two million man-hours) of coastwide fishing pressure exerted by sport-boat fishermen in Texas' bays and passes occurs in the Galveston Bay system. Similarly about 35 percent of the total sport-boat landings in bays and passes comes from the Galveston Bay system (Figure 1). Because landings data are required to assess the needs for and the effects of fishing regulations (Green et al. 1991a), the Texas Parks and Wildlife Department (TPWD) has conducted surveys of recreational fishermen in saltwater since 1974 (Heffernan et al. 1976, Maddux et al. 1989, Campbell et al. 1991).

As participation in the saltwater fishery has increased over the past 15 years, recreational landings have decreased (Figure 2; Campbell et al. 1991). Declines in finfish abundance have been documented in TPWD fishery-independent surveys using gill nets, otter trawls and bag seines (McEachron and Green 1984b, Rice et al. 1988, Mambretti et al. 1990). Episodic declines in fish abundance have been attributed to events such as winter kills (Gunter 1941, McEachron et al. 1984b), whereas, long-term declines have been attributed to loss of habitat, environmental degradation and overfishing (Matlock 1980, 1983; Matlock and Osburn 1987; Matlock et al. 1977). In addition, regulations have limited retention of fish by recreational and commercial fishermen.

Spotted seatrout and red drum together make up almost half of the landings of sport-boat fishermen in Texas bays and passes (Campbell et al. 1991). The Texas Legislature and Texas Parks and Wildlife Commission have enacted bag, possession and size limit regulations designed to restrict the harvest of red drum and spotted seatrout and other species to prevent overfishing (Texas Parks and Wildlife Department 1979, 1981, 1983, 1985, 1987, 1989, 1991). In the past twenty years, a virtually unregulated commercial and recreational finfish fishery has undergone dramatic changes. For example, commercial fishing for red drum and spotted seatrout has been prohibited since 1981 and commercial fish nets (e.g., gill nets) have been outlawed on the Texas coast. Recreational fish retention has been significantly reduced by size and bag limits on an ever-growing number of species (Texas Parks and Wildlife Department 1979, 1981, 1983, 1985, 1987, 1989, 1991).

Regulations which restrict retention of fish, either through size limits or bag limits, typically require the return to the water of some fish during a fishing trip. From a management perspective, it is important that fish not legally retainable survive capture and release in order for the regulation to accomplish management objectives, such as increasing yield or providing for a trophy fishery (Hegen et al. 1984). Similarly, species not targeted by fishermen may be handled and released, used as bait or discarded to die (Figure 3). Those fish which do not

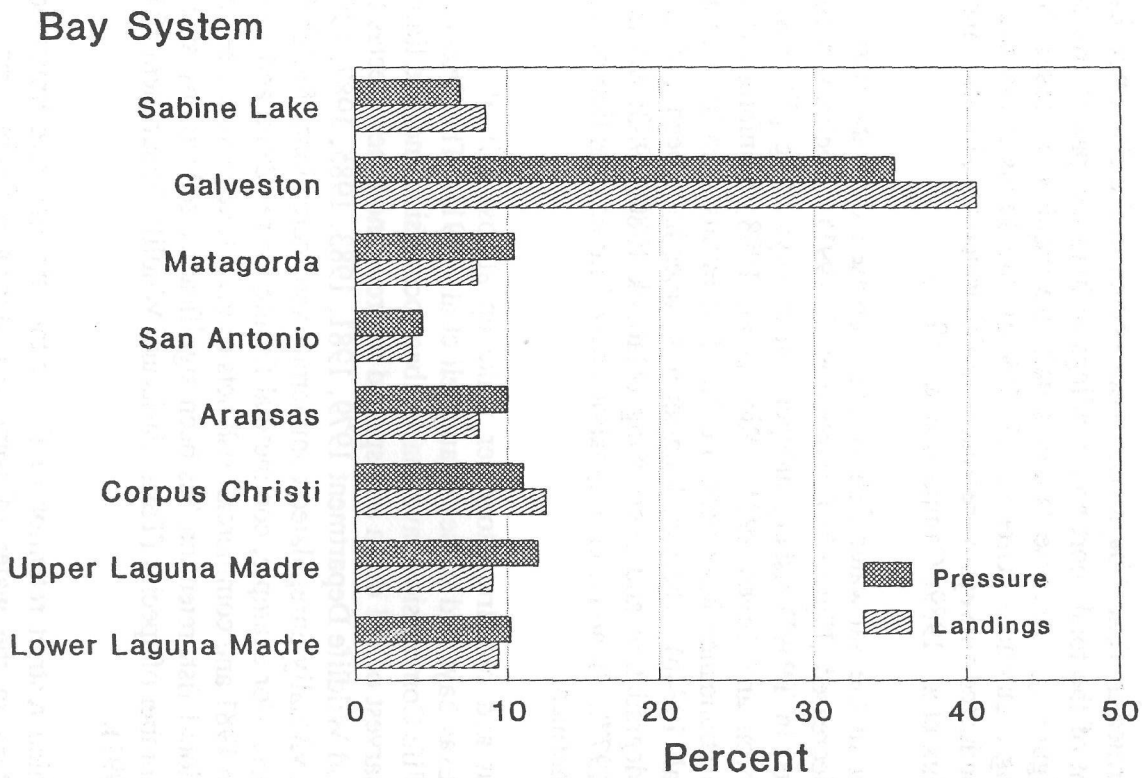

Figure 1. Distribution of annual coastwide by and pass private-boat fishing pressure and landings among bay systems, May 1979-May 1990 (based on 3-year mean in Sabine Lake system and 11-year means in all other bay systems). Data from Campbell et al. (1991).

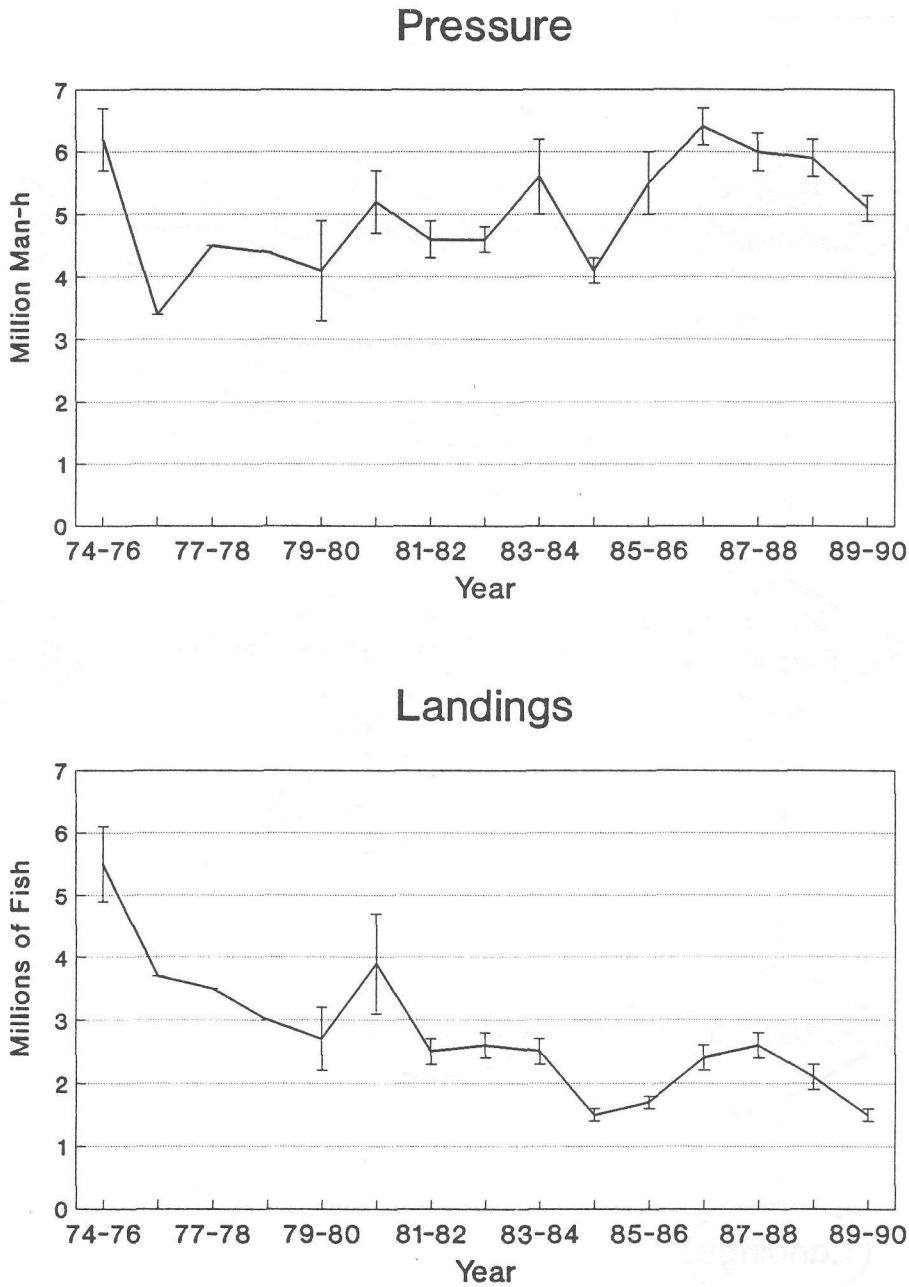

Figure 2. Annual coastwide private-boat fishing pressure (±1 SE) and landings (±1 SE) in Texas bays and passes, May 1974-May 1990. Data from Campbell et al. (1991).

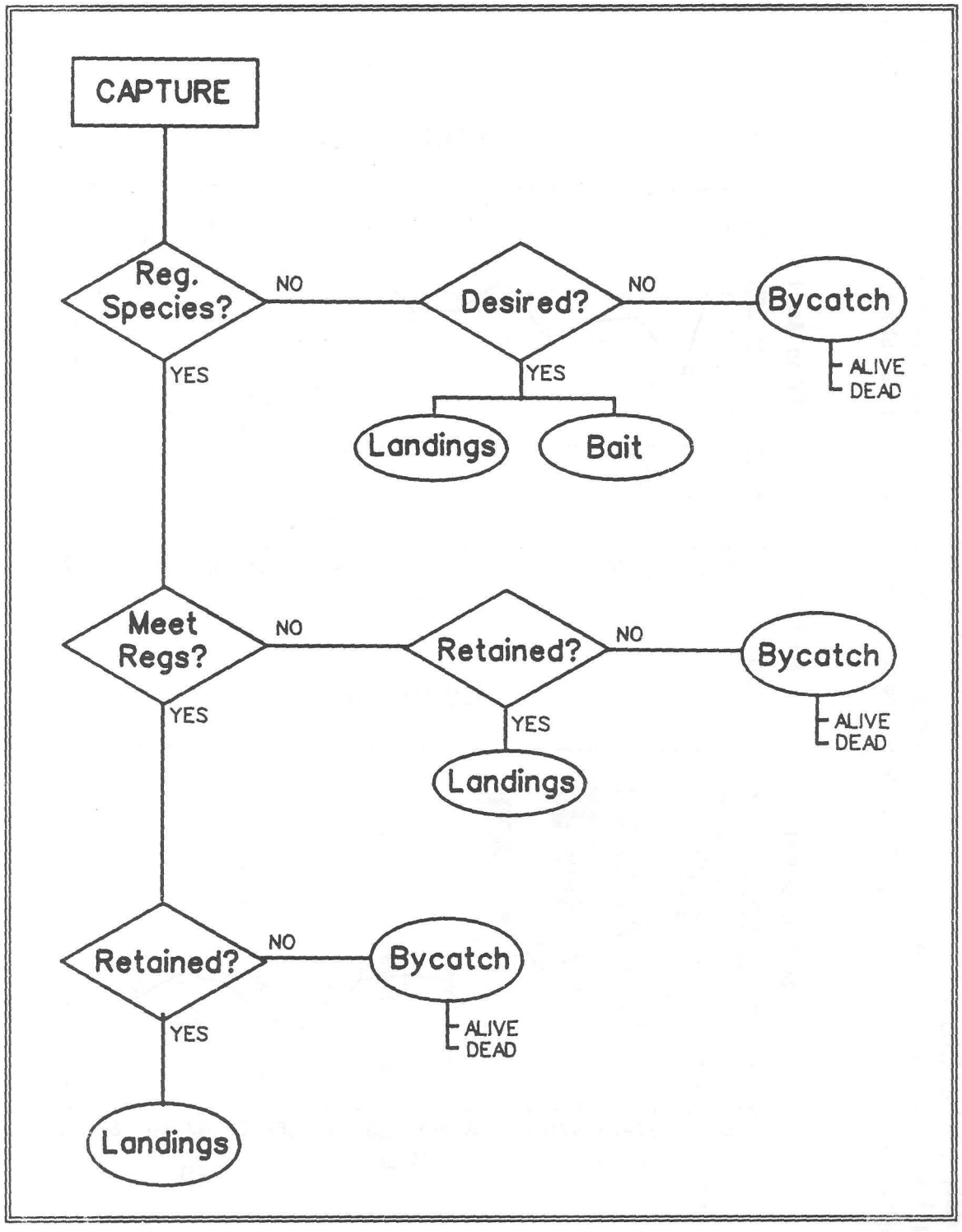

Figure 3. Conceptual model of fate and classification of fish captured by recreational fishermen.

survive are lost from the population. If capture and handling mortalities are significant, the magnitude of this by-catch (i.e., nontargeted or unutilized species or individuals) may contribute to the decline of fish population levels. Recreational by-catch is defined as those fish that are not retained by a sport fishermen.

2.1 Project Objectives

This project was designed to identify and obtain information from previously conducted studies, and to determine, if possible, the numbers and sizes or biomass of selected species comprising the recreational by-catch in the Galveston Bay system. The specific tasks undertaken to accomplish the project objectives were:

- conduct a literature review;
- conduct a telephone and mail survey;
- conduct a workshop using available data;
- evaluate existing information and make recommendations for determining recreational by-catch based on available information.