THE TEXAS SHRIMP FISHERY

A Report to The Governor
and The 71st Legislature

Gulf of Mexico

Upper Laguna Madre

Lower Laguna Madre

Corpus Christi

Corpus Christi Bay

Aransas Bay

San Antonio Bay

Matagorda Bay

East Matagorda Bay

Sabine Lake

Galveston Bay

Houston

Brownsville

Mexico
January 1989

The Honorable William P. Clements  
Governor of Texas  
State Capitol Building  
Austin, TX 78711

The Honorable Members of the  
Seventy-first Legislature  
State Capitol Building  
Austin, TX 78711

Ladies and Gentlemen:

I hereby respectfully submit a report on the Texas shrimp fishery.

This report is submitted pursuant to the provision of Section 77.006 (b) of the Texas Parks and Wildlife Code.

Your support of the Texas Parks and Wildlife Department programs is very much appreciated.

Sincerely,

Charles D. Travis  
Executive Director

CDT:CEB:dc

cc: Commissioners
INTRODUCTION

Marine shrimp, with reported landings of 363.1 million pounds\(^1\) worth $578.1 million in 1987, continued to support one of the most valuable commercial food fisheries in the United States\(^2\). The Gulf of Mexico shrimp harvest of 257.1 million pounds worth $469.3 million in 1987 exceeded that of any other coastal region in volume and value. Shrimp constitute Texas' most valuable commercial food fishery with 1987 landings of 88.4 million pounds and a value to the fishermen of $182.3 million (Figure 1). The total economic impact of shrimp landings in the marketing system is considered to be at least a half billion dollars to the Texas economy.

Brown shrimp (*Penaeus aztecus*), white shrimp (*P. setiferus*) and pink shrimp (*P. duorarum*) make up the bulk of Gulf coast landings. The principal species landed in Texas is the brown shrimp, which generally makes up about 70-80% of the total landings for food. Texas has consistently led all other states in the value of shrimp landed in its ports since the discovery of previously unfished stocks in the Gulf in the late 1940's and subsequent development of the brown shrimp fishery. The dockside value of brown shrimp and pink shrimp in 1987 was $144.7 million.

White shrimp, second in importance in Texas, support a large food fishery in the shallow Gulf and in the bays on the upper coast. Reported landings have fluctuated between 9.9 and 28.0 million pounds since 1962, with 19.7 million pounds valued at $37.6 million landed in 1987.

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\(^1\)All weights in this report are expressed in whole weight (heads-on). Values are based on price received at the dock (ex-vessel price).

Figure 1. Annual Texas landings and ex-vessel value of penaeid shrimp.

Pink shrimp (an important food and bait shrimp in south Texas), seabob (Xiphopenaeus kroyeri), rock shrimp (Sicyonia brevirostris), royal red shrimp (Hymenopenaeus robustus) and roughback shrimp (Trachypenaeus sp.) are landed in relatively small quantities.

This report reviews the current status and recent developments that affect the Texas shrimp fishery.
SHRIMP LIFE CYCLE

The life cycles of brown shrimp and white shrimp include Gulf and bay phases. Both species spawn in the Gulf of Mexico. Generally brown shrimp spawn during fall-spring in depths greater than 60 feet while white shrimp spawn during late spring-summer in depths less than 60 feet. The young shrimp go through several larval stages as they are carried shoreward by winds and currents. By the time the young shrimp reach tidal passes and enter protected "inside" waters, they are in a transparent, shrimplike postlarval stage and are 1/4 to 1/2 inch long.

Postlarvae drift or migrate to shallow bays, tidal creeks and marshes (nursery areas) where food and protection necessary for growth and survival are available. There they grow, acquire color and become bottom dwellers. If conditions in nursery areas are favorable, the young shrimp grow rapidly and soon move to the deeper water of the major bays.

The time shrimp spend in estuaries is usually 2-4 months; the season differs among species. When shrimp reach juvenile and subadult stages (3-5 inches long), they migrate from the bays to the Gulf of Mexico where they mature and complete their life cycle. Characteristically, there is one major influx of brown shrimp which enters the bays in early spring and begins gulfward migration in May or June. Postlarval white shrimp begin entering the bays as the juvenile brown shrimp are leaving. White shrimp generally remain in bays longer and grow larger than brown shrimp before they begin emigrating to the shallow Gulf in the fall.
Shrimp Monitoring Program

The Department's shrimp monitoring program is designed to assess the status of the resource and tracks the life cycle of the shrimp. Randomly selected (unbiased) stations are sampled along shorelines of bays to determine recruitment of young shrimp from the Gulf to the bays, in the deeper portion of bays to determine recruitment to the bay shrimping grounds, and in Gulf of Mexico waters where shrimp complete their life cycle. Water and weather data are collected with each biological sample to determine current hydrological and meteorological conditions which may affect abundance, growth and distribution. In 1982, the sampling system was improved and made more efficient by doubling the area sampled without an increase in the number of personnel. During 1986, a new field station was established in Port Arthur and cooperative agreements with Louisiana enable TPWD to sample bay and Gulf waters in the Sabine Lake area for the first time.

In 1983, the Legislature provided the Department funding for construction of four vessels to broaden sampling in the state's Gulf waters. These vessels were fully operational in 1985. In January 1987, an additional vessel was added to sample the Gulf waters off Sabine Lake. In addition, the Department cooperates with the other Gulf states and the National Marine Fisheries Service in annual Gulf-wide sampling through the Southeast Area Monitoring and Assessment Program (SEAMAP) to gather baseline data on shrimp, bottomfish, ichthyoplankton and associated water and weather data.
Data from the Department's monitoring program are used to determine the closing and opening dates of the annual closure of the state's Gulf waters to shrimping. The closure is set by statute for June 1-July 15 but, based on sound biological data, may be changed by the Texas Parks and Wildlife Commission (or Executive Director) to an earlier, later or longer season not to exceed 60 days. Since 1960, the season dates have been modified nine times including six straight years from 1981 through 1986 (Table 1). The purpose of the closure is to delay the harvest of small shrimp emigrating from the bays until they reach a larger, more valuable size and to reduce discarding and waste of the smaller sizes.

Table 1. Year, date and duration of modifications to the normal June 1-July 15 closed Gulf shrimping season.

<table>
<thead>
<tr>
<th>Year</th>
<th>Closing Date</th>
<th>Opening Date</th>
<th>Duration (days)</th>
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<tbody>
<tr>
<td>1967</td>
<td>May 17</td>
<td>July 1</td>
<td>45</td>
</tr>
<tr>
<td>1972</td>
<td>May 17</td>
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<td>60</td>
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<td>May 22</td>
<td>July 16</td>
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</tr>
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<td>1985</td>
<td>May 20</td>
<td>July 8</td>
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</tr>
<tr>
<td>1986</td>
<td>May 10</td>
<td>July 2</td>
<td>53</td>
</tr>
</tbody>
</table>

*aIn 1975 the maximum length of the closed season was increased from 45 to 60 days. The minimum length remained at 45 days. Closing and opening times after 1981 were 30 minutes after sunset instead of 12:01 a.m.*

In addition to monitoring the status of the resource and recommending the Gulf seasonal closure, the Department is making improvements in the collection of landings data that include the bait and recreational shrimp fisheries.
Knowledge of the status of the resource is fundamental to any fishery. However, computer models using the best scientific data available are necessary to predict stock abundance and to evaluate the effects of alternate management strategies. The Department is currently fine-tuning a bioeconomic model that should provide valuable biological and economic information on the Texas shrimp fishery.

THE TEXAS SHRIMP FLEET

Shrimp are sought for both food and bait and most are captured by towing trawls (nets) behind boats. There are four types of shrimp licenses that may be purchased in Texas—three for commercial shrimp vessels (Gulf, bay and bait) and one for recreational shrimpers (Figure 2). The commercial Gulf and bay boat licenses allow the capture of shrimp as food during certain seasons in Gulf and bay waters. The commercial bait boat license permits the harvest of smaller shrimp for the bait industry. The recreational (sport trawl) license permits the taking of both food and bait shrimp for non-commercial use.

The size of the shrimp fleet generally increased until 1973 when higher costs of operation due to fuel prices caused a decline. Since 1976, the number of commercial shrimp boat licenses generally increased through 1984, then decreased from 1985 through 1988. Sales of the sport trawl license tags have shown a steady decline since 1979 when the daily poundage limit for sport shrimpers in bays was decreased from 100 pounds to 15 pounds.
There has been a trend toward decreasing size of both brown shrimp and white shrimp caught in Texas. Since total production is not increasing significantly in the Gulf fishery, the share of the total catch per boat is decreasing—resulting in more effort at higher costs for less product.

The smaller return per vessel may be aggravated further by changes in economics. Imports of shrimp are increasing substantially due to the development of aquaculture, especially in South America. If demand for shrimp does not increase at the same rate as supply, prices received by shrimpers may be affected. A growing interest in Texas aquaculture can be seen by examining license sales in recent years. From 1975 through 1987 the number of Shellfish
Culture licenses sold in Texas ranged from 4 to 25. The number sold during 1988 was 33. During 1987 approximately 1.2 million pounds of aquaculturally produced shrimp, valued at $2.9 million, were harvested in Texas.

TEXAS SHRIMP FISHERY MANAGEMENT PLAN

Senate Bill 609, 69th Regular Session, provided the Texas Parks and Wildlife Department authority to regulate the catching, possession, purchase and sale of shrimp. However, the Department may not assume that authority until it develops and adopts a shrimp management plan.

The Legislature also established an interim committee made up of Legislators, Texas Parks and Wildlife Commissioners and members of the public to review the plan. The Department formulated plan outlines and assigned staff members sections of the plan for literature research and writing. In January-February 1986, the Department met with three shrimping organizations and an environmental group to obtain their views and input. The Department held seven public hearings along the coast during June through August 1986 to obtain input for plan development.

Public comments indicate that current management is adequate but needs to be clarified, simplified and made more easily enforceable. Proposed changes primarily concerned modification of items contained in current statutes dealing with means, manners, devices, places, closed areas, closed seasons, and sizes. There was also a general desire that any major changes from current law be done gradually.

Prior to legislation providing for TPWD regulation of shrimp and oysters, there were three studies completed on the shrimp fishery in Texas.
Two of these were conducted by the Texas Coastal and Marine Council on the bay shrimping and oyster industries and the other was an interim study by the 68th Texas Legislature on the shrimping industry. Reports from these studies are being used as background documents in plan development.

Comments from the public, the various organizations and reports by the Texas Coastal and Marine Council and the 68th Texas Legislature indicate that provisions in current law are adequate to form the basis for future regulation and enhancement of the fisheries. The Legislature's policy statement taken from the Shrimp Conservation Act of 1959 provides a guide for management of shrimp and was incorporated into the management plan for shrimp. Input from public hearings and other sources will be considered before a final plan is drafted. The Texas Parks and Wildlife Commission, after appropriate review, will adopt a fisheries management plan for Texas shrimp as soon as feasible.