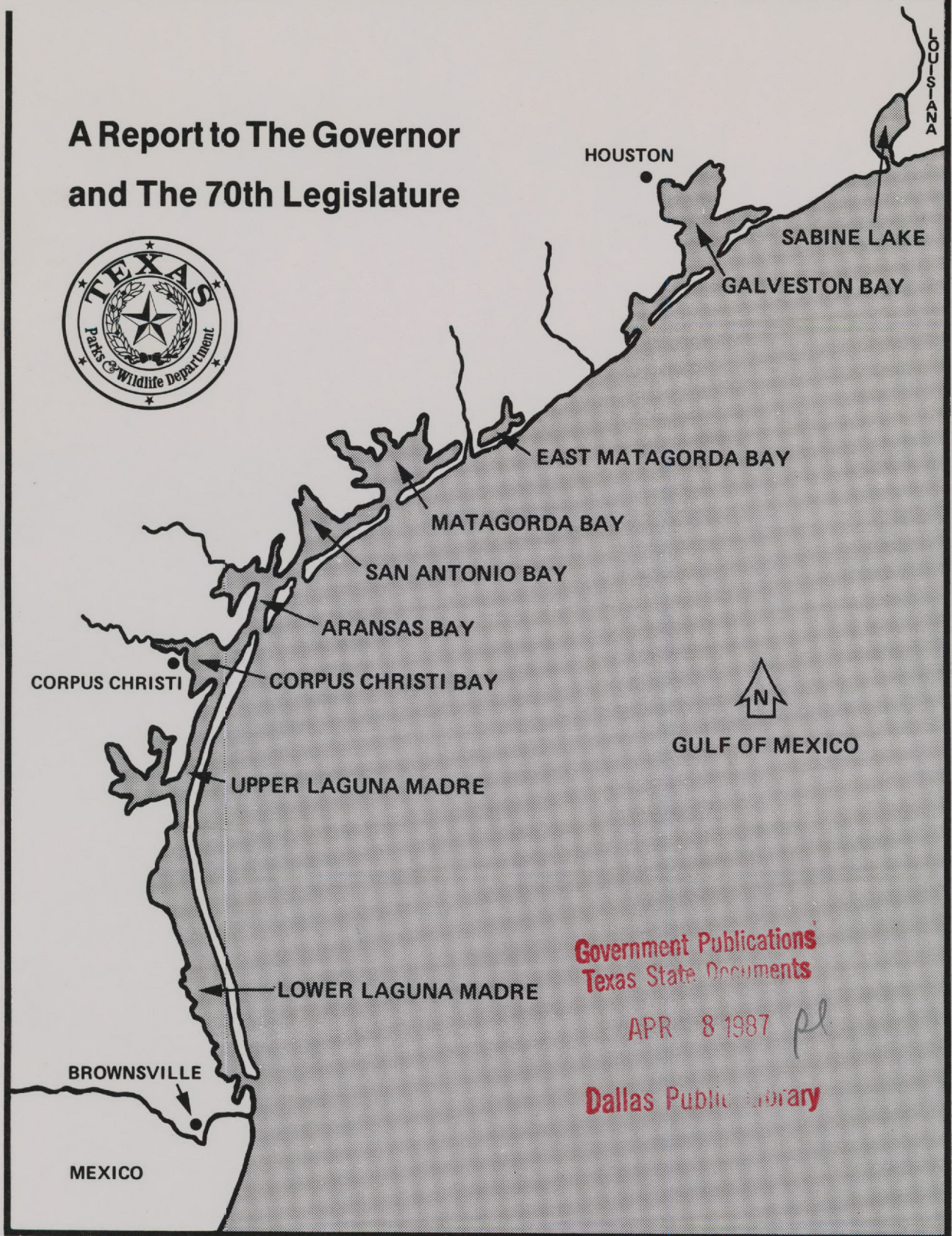


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# THE TEXAS SHRIMP FISHERY

A Report to The Governor  
and The 70th Legislature



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January 1987

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

The Honorable Members of the  
Seventieth Legislature  
State Capitol Building  
Austin, Texas 78711

Dear Governor Clements and Members:

In compliance with the provisions of Section 77.006(b), Texas Parks and Wildlife Code, I hereby respectfully submit a report on the Texas shrimp fishery. Recent findings are included for your review and consideration. More detailed information concerning the shrimp conservation is available, and this Department will be pleased to work with you in the development of the best possible program of conservation and management of this valuable fishery.

Sincerely,

A handwritten signature in cursive script, appearing to read "Charles D. Travis".

Charles D. Travis  
Executive Director

CDT:CEB:lms

cc: Commissioners



## INTRODUCTION

Marine shrimp, with reported landings of 207.3 million pounds<sup>1</sup> worth \$472.8 million in 1985, continued to support the most valuable commercial food fishery in the United States<sup>2</sup>. The Gulf of Mexico shrimp harvest of 163.3 million pounds worth \$398.7 million in 1985 exceeded that of any other coastal region in volume and value. Shrimp constitute Texas' most valuable commercial food fishery with 1985 landings of 51.1 million pounds and a value to the fishermen of \$161.4 million (Table 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.

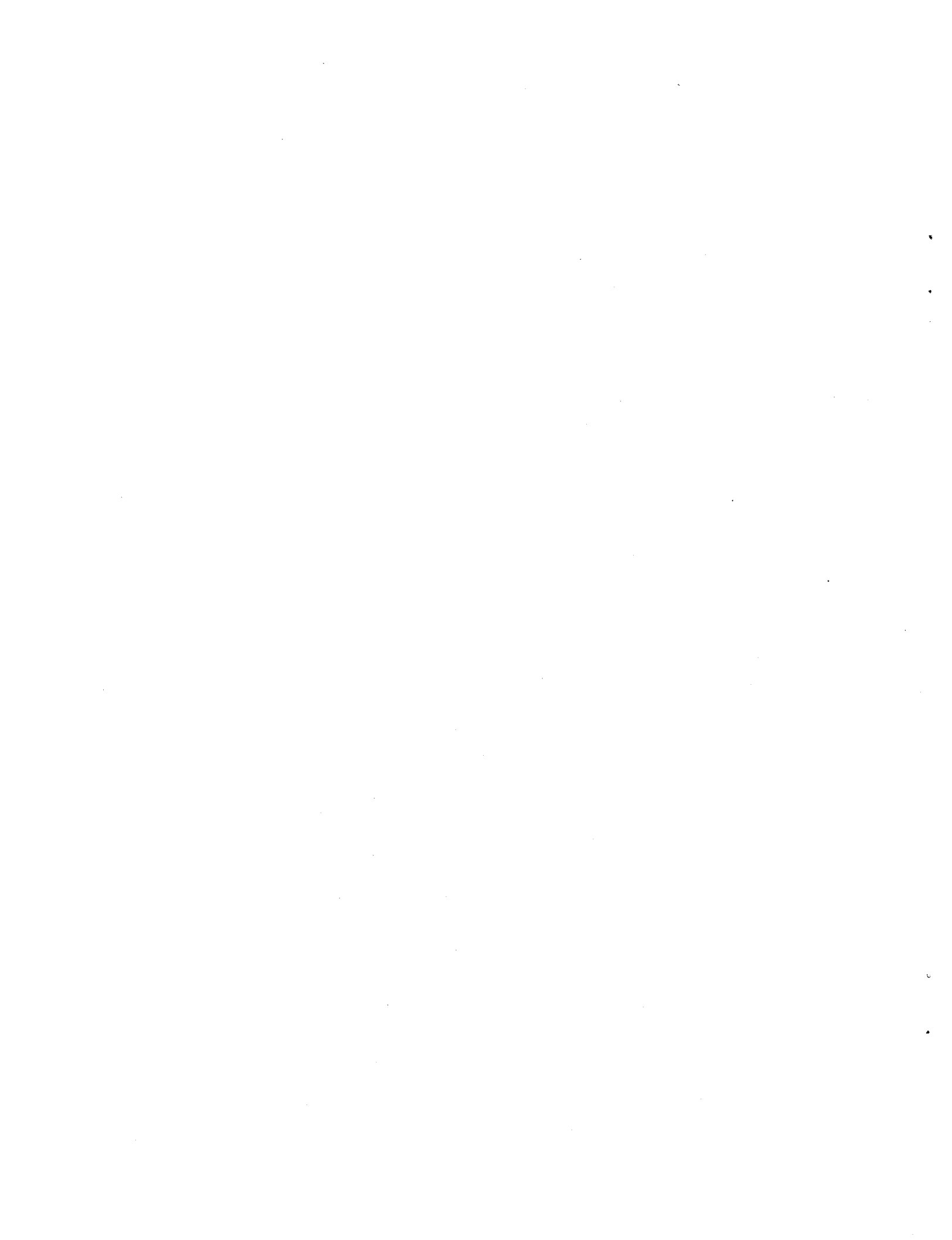
Brown shrimp (Penaeus aztecus), white shrimp (P. setiferus) and pink shrimp (P. duorarum) make up the bulk of Gulf coast landings. The principal species landed in Texas is the brown shrimp, which generally makes up about 70-80% of the total landings for food. Texas has consistently led all other states 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 and pink shrimp in 1985 was \$113.4 million.

White shrimp, second in importance in Texas, support a large food fishery in the shallow Gulf and in the upper bays. Reported landings have fluctuated between 6.4 and 18.2 million pounds since 1964, with 15.7 million pounds

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<sup>1</sup>All weights in this report are expressed in headless weight. Values are based on price received at the dock (ex-vessel price).

<sup>2</sup>Fishery of the United States. 1985. U.S. Department of Commerce, Current Fishery Statistics No. 8380 (reported whole weights were divided by 1.61 to convert to headless weights).



valued at \$47.8 million landed in 1985. Record highs in harvest and value for white shrimp were recorded in 1984 and 1985.

Table 1. Texas shrimp landings, 1964-1985, expressed in millions of pounds and dollars.

| Year              | Brown shrimp |         | White shrimp |         | Other  |         | Total  |         |
|-------------------|--------------|---------|--------------|---------|--------|---------|--------|---------|
|                   | Pounds       | Dollars | Pounds       | Dollars | Pounds | Dollars | Pounds | Dollars |
| 1964              | 25.9         | 16.7    | 12.1         | 7.2     | 3.6    | 2.2     | 41.6   | 26.1    |
| 1965              | 34.3         | 22.2    | 9.2          | 5.7     | 4.7    | 3.3     | 48.2   | 31.2    |
| 1966              | 33.9         | 30.3    | 7.9          | 6.4     | 2.0    | 1.8     | 43.8   | 38.5    |
| 1967              | 55.5         | 39.3    | 6.4          | 5.0     | 2.2    | 2.1     | 64.1   | 46.4    |
| 1968              | 37.0         | 33.2    | 12.5         | 10.1    | 2.8    | 2.6     | 52.3   | 45.9    |
| 1969              | 30.1         | 29.7    | 12.0         | 10.8    | 2.4    | 2.4     | 44.5   | 42.9    |
| 1970              | 41.6         | 36.9    | 12.4         | 10.2    | 1.4    | 1.5     | 55.4   | 48.6    |
| 1971              | 44.1         | 51.9    | 9.2          | 11.1    | 1.1    | 1.3     | 54.4   | 64.3    |
| 1972              | 48.3         | 62.8    | 11.4         | 15.2    | 1.4    | 2.1     | 61.1   | 80.1    |
| 1973              | 33.5         | 59.2    | 14.9         | 23.0    | 3.0    | 4.7     | 51.4   | 86.9    |
| 1974              | 35.6         | 48.8    | 11.5         | 16.1    | 2.4    | 2.8     | 49.5   | 67.7    |
| 1975              | 33.6         | 70.2    | 9.5          | 16.2    | 1.2    | 1.5     | 44.3   | 87.9    |
| 1976              | 36.0         | 94.4    | 10.1         | 23.4    | 0.8    | 2.0     | 46.9   | 119.8   |
| 1977 <sup>a</sup> | 44.7         | 100.8   | 12.6         | 24.6    | 0.2    | 0.2     | 57.5   | 126.5   |
| 1978              | 38.7         | 101.8   | 13.9         | 38.8    | 0.2    | 0.3     | 52.8   | 140.9   |
| 1979              | 31.3         | 117.2   | 10.7         | 34.7    | 0.4    | 0.4     | 42.4   | 152.3   |
| 1980              | 36.2         | 114.0   | 9.2          | 25.6    | 0.8    | 0.4     | 46.2   | 140.0   |
| 1981              | 48.7         | 133.2   | 10.5         | 31.8    | 0.6    | 0.3     | 59.8   | 165.3   |
| 1982              | 31.9         | 131.7   | 11.9         | 43.7    | 0.8    | 0.5     | 44.6   | 175.9   |
| 1983              | 31.5         | 125.4   | 13.2         | 45.7    | 0.6    | 0.3     | 45.3   | 171.4   |
| 1984              | 38.5         | 125.7   | 18.2         | 53.6    | 0.1    | 0.2     | 56.8   | 179.5   |
| 1985              | 35.7         | 113.4   | 15.7         | 47.8    | 0.4    | 0.2     | 51.8   | 161.4   |

<sup>a</sup>1977-1985 brown and pink shrimp combined.

Source: Shrimp Landings, National Marine Fisheries Service, 1964-1976 and Texas Commercial Harvest Statistics 1977-1985 (preliminary).

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

This report reviews the current status and recent developments which affect the Texas shrimp fishery.





## SHRIMP LIFE CYCLE

The life cycles of brown 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  $\frac{1}{4}$  to  $\frac{1}{2}$  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 bays (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 "brood" 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.



## MANAGEMENT

### 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 enabled 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 the past six years (Table 2). 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 2. Year, date and duration of modifications to the normal June 1-July 15 closed Gulf shrimping season<sup>a</sup>.

| Year | Date    |         | Duration<br>(days) |
|------|---------|---------|--------------------|
|      | Closing | Opening |                    |
| 1967 | May 17  | July 1  | 45                 |
| 1972 | May 17  | July 1  | 45                 |
| 1976 | May 17  | July 16 | 60                 |
| 1981 | May 22  | July 16 | 55                 |
| 1982 | May 25  | July 14 | 50                 |
| 1983 | May 27  | July 15 | 49                 |
| 1984 | May 16  | July 6  | 51                 |
| 1985 | May 20  | July 8  | 49                 |
| 1986 | May 10  | July 2  | 53                 |

<sup>a</sup>In 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 which will 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. Once a basic model is developed it may be continually improved as more knowledge is gained through special studies such as tagging and routine monitoring of the resource, its environment and the effects of fishing.





## 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 required in Texas--three for commercial shrimp vessels (Gulf, bay and bait) and one for recreational shrimpers (Figure 1). The commercial Gulf and bay boat licenses allow the capture of larger 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 in 1985 and 1986. Sales of the sport trawl license tags have shown a steady decline since 1979. The daily poundage limit for sport shrimpers in bays was decreased from 100 pounds to 15 pounds in 1979.

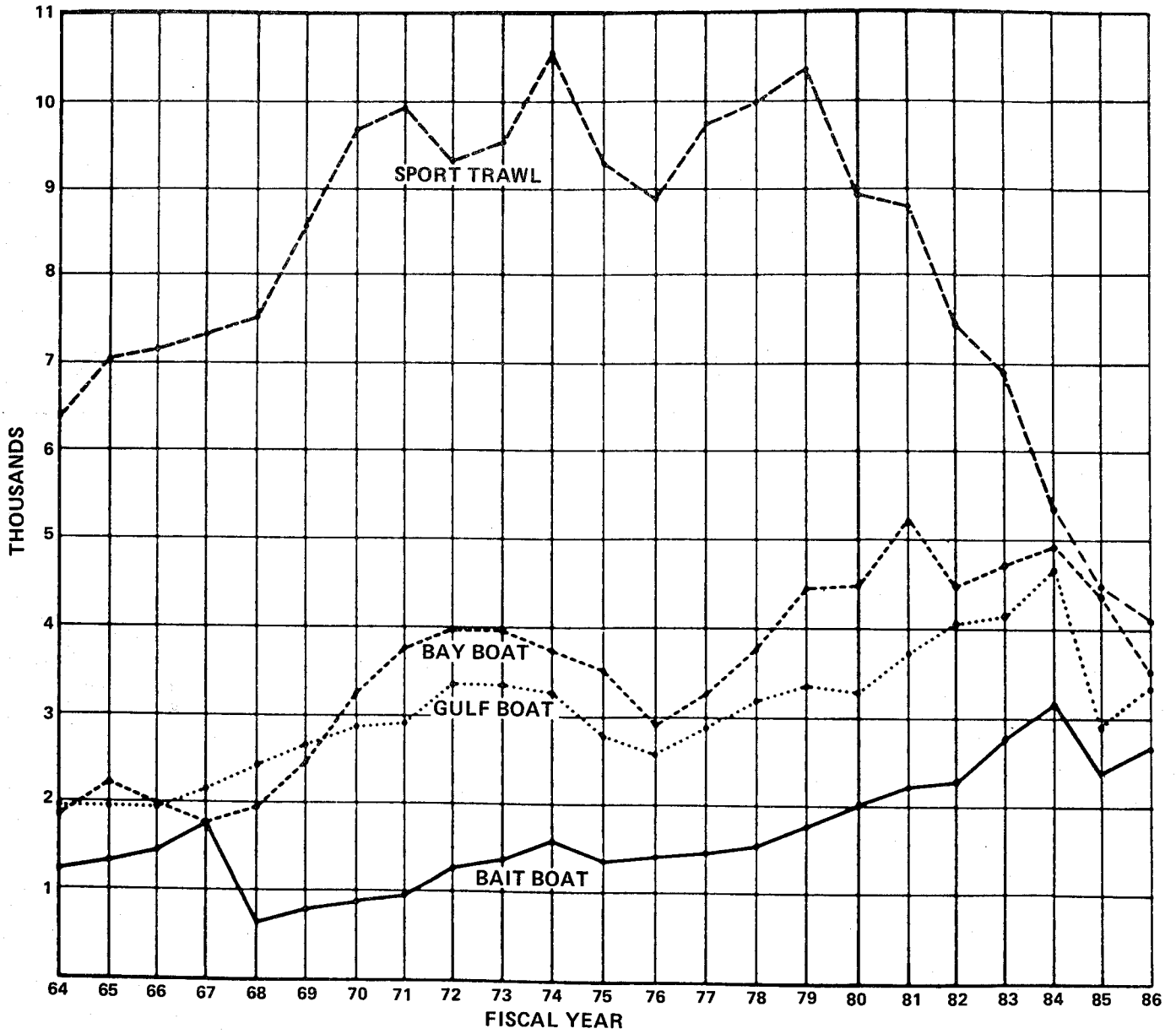
There has been a trend toward decreasing sizes in annual catches of both brown and white shrimp in Texas and Louisiana. Since total production is not increasing significantly, the proportionate share of the catch per boat is decreasing, resulting in more effort at higher costs for fewer shrimp.

The smaller catch per vessel may be aggravated further by changes in economics. Imports of shrimp may increase substantially due to the development of mariculture, especially in South America. If demand for shrimp does not increase at the same rate as supply, prices received by shrimpers may be affected. From 1975 through 1985 the number of Shellfish Culture licenses sold in Texas ranged from 4 to 14. The number sold during 1986 was 17, indicating a growing interest in Texas aquaculture.



FIGURE 1

NUMBER OF TEXAS SHRIMP LICENSES SOLD BY YEAR



NOTE: After 1967 Bait Boats were required to keep half of their catch alive.





## TEXAS SHRIMP FISHERY MANAGEMENT PLAN

Senate Bill 609, 69th Regular Session, provided the Texas Parks and Wildlife Commission authority to regulate the catching, possession, purchase and sale of shrimp. However, the Commission may not regulate until it has approved and adopted a shrimp management plan developed by the department.

The legislature also established an interim committee made up of legislators, Parks and Wildlife Commissioners and public members to review the plan. The interim committee has reviewed plan development.

The Department formulated plan outlines and assigned staff members sections of the plan for literature research and writing. Writing of the draft plan is still in progress. Some delay was caused by red tide investigations and work done on the review of the proposed widening of the Houston Ship Channel in Galveston Bay.

Additional information was collected and considered in the development of the plan. In January-February 1986, the Department met with three shrimping organizations and an environmental group to obtain their views and input. Summaries of these meetings were given to all of the interested parties for comment, then provided to the interim committee for review.

The Department held seven public hearings along the coast during June through August 1986 to obtain input for plan development. Issues derived from these hearings, letters, personal contact and meetings with the industry and environmental organizations were summarized and provided to the interim committee. These summaries were also sent to each organization with whom staff had previously met for review.

Public comments indicate that current management is adequate but needs to be refined, clarified, simplified and made more easily enforceable. There was also a general desire that any major changes from current law be done



gradually. Suggested changes primarily concerned modification of items contained in current statutes dealing with means, manners, devices, places, closed areas, closed seasons, sizes, etc., for taking shrimp.

Prior to legislation providing for commission regulation of shrimp and oysters, there were three studies done. 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 and have been provided to the interim committee for review.

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 will be incorporated into a proposed management plan for shrimp. The Commission, after appropriate review, will adopt a State fisheries management plan for shrimp as soon as feasible.







