

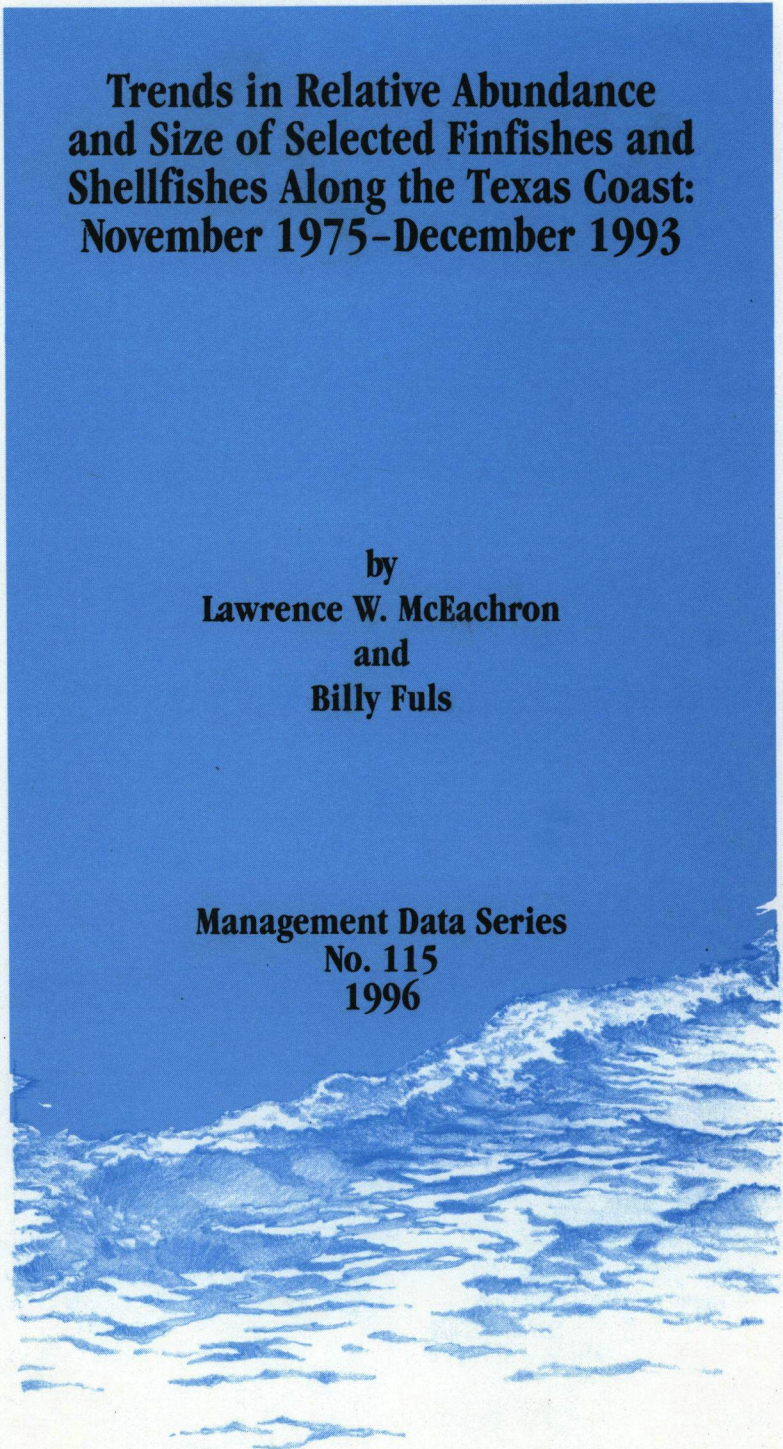
**Trends in Relative Abundance
and Size of Selected Finfishes and
Shellfishes Along the Texas Coast:
November 1975-December 1993**

**by
Lawrence W. McEachron
and
Billy Fuls**

**Management Data Series
No. 115
1996**

COASTAL FISHERIES DIVISION

4200 Smith School Road
Austin, Texas 78744



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ABSTRACT

The objective of coastal monitoring projects is to determine the status of marine resources for management and harvest purposes. Trends in relative abundance and size of finfishes and shellfishes have been monitored since 1975 using a standardized fishery-independent sampling program in Texas bay systems. Data were collected with bag seines along bay and gulf shorelines, gill nets along bay shorelines, beach seines along gulf shorelines, and trawls in coastal bay waters and in the Texas Territorial Sea. Oyster dredges were used to sample bay oyster reefs.

Data comparisons were made between 1992 and 1993 for coastwide catch rates for all gears. Coastwide spring gill net catch rates revealed red drum (Sciaenops ocellatus) declined but were the 2nd highest on record, whereas, fall catch rates increased; spotted seatrout (Cynoscion nebulosus) catch rates declined slightly in spring but remained the same in fall; spring and fall black drum (Pogonias cromis) catch rates increased to the highest levels on record. Coastwide seasonal bay bag seine catch rates increased for white shrimp (Penaeus setiferus) and decreased for red drum, spotted seatrout, black drum, brown shrimp (P. aztecus) and blue crab (Callinectes sapidus). Coastwide annual bay trawl catch rates decreased for blue crab, brown shrimp, and white shrimp. Coastwide annual gulf trawl catch rates increased for brown shrimp, decreased for white shrimp, and had no change for blue crab. Coastwide annual catch rates for market size Eastern oysters (Crassostrea virginica) increased in 1993, to the 2nd highest level recorded with all bay systems recording large increases in catch. Data collected during 1993 were used to make resource and harvest management decisions and to assess effects of catastrophic events.

INTRODUCTION

Fishery independent monitoring data are used to determine relative abundance and size of finfishes and shellfishes in Texas coastal waters to regulate and allocate harvest in Texas jurisdictional waters. To collect these data, the Texas Parks and Wildlife Department (TPWD) has used various gears systematically in Texas estuaries and the Gulf of Mexico since 1975 (Appendix A, Tables A.1-5). Eastern oyster populations have been monitored in Galveston Bay since 1951 (Hofstetter 1977). Penaeid shrimp populations have been monitored in at least some bays since 1958 (Benefield and Baker 1980). Blue crab populations have been monitored in Texas bays since 1977 (Hammerschmidt 1982). The TPWD initiated a standardized fishery independent monitoring program in 1975 using gill nets, in 1977 using bag seines, in 1982 using trawls in bays, in 1984 using oyster dredges on bay oyster reefs, in 1985 using trawls in the gulf, and in 1987 using beach seines to monitor and assess relative trends in abundance and size of finfishes and shellfishes. Gill nets set during spring (11 April-20 June) and fall (12 September-21 November), and monthly bag seine, trawl, oyster dredge, and beach seine samples provide a statistically consistent and cost efficient method for obtaining information on juvenile, sub-adult, and adult finfish and shellfish populations.

The objectives of the present study were to:

1. monitor and determine trends in species composition, size and relative abundance of selected finfishes and shellfishes in the coastal bay systems and in the gulf off Texas.
2. publish the results in a report which will assist resource managers to effectively manage finfishes and shellfishes.

Differences in the information in this report compared to previous reports are due to updating the data base. The present report should be considered the most accurate to date.

MATERIALS AND METHODS

Bag seines, trawls and monofilament gill nets (Appendix A) were used in each of the 9 Texas bay systems: Sabine Lake, Galveston, East Matagorda, Matagorda, San Antonio, Aransas, Corpus Christi, upper Laguna Madre and lower Laguna Madre. Trawls, identical to those used in the bays, were used in five gulf areas of the TTS (Figure 1) ≤ 16.7 km from shore: 24.1 km either side of each of the Sabine Pass jetties (Sabine), Galveston jetties (Galveston), Matagorda jetties (Port O'Connor), Aransas Pass jetties (Port Aransas), and 48.2 km north from the Texas-Mexico border (Port Isabel). Oyster dredges (Appendix A) were used in the Galveston, Matagorda, San Antonio and Aransas bay systems. Bag seines, identical to those used in Texas bays, and beach seines (Appendix A) were used along gulf beach shorelines in five areas: Sabine Pass-Bolivar Peninsula, Galveston Island-Follets Island-Surfside Beach, Matagorda Peninsula, Matagorda Island and Mustang Island-South Padre Island (Figure 1).

Gill net, bag seine, and beach seine sites were randomly selected from grids (1 minute longitude by 1 minute latitude) that contained ≥ 15.2 m of shoreline. Each selected grid was subdivided into 144 5-second "gridlets". All "gridlets" that contained shoreline were used to randomly choose sample sites.

Gill net sets were conducted overnight during each spring and fall season (Appendix A). The spring season began with the 2nd full week in April and extended for 10 full weeks. The fall season began with the 2nd full week in September and extended for 10 full weeks. Between three and five nets were set each week in each bay, except in East Matagorda Bay where only two overnight sets were made during each week. On no more than six nights during each season could as many as three nets be set in a bay system. Each sampling week extended from 1 h before sunset on Sunday through 4 h after sunrise the following Sunday. Gill nets were set perpendicular to shore with the smallest mesh shoreward. Nets were set within 1 h before sunset and were retrieved within 4 h after the following sunrise. Total fishing time was recorded (nearest 0.1 h).

One half of the monthly gulf and bay bag seine samples were collected during each of the 1st-15th and the 16th-31st of the month (Appendix A). Bay and gulf bag seines were pulled parallel to the shoreline for 15.2 m; gulf bag seines were pulled in the same direction as the longshore current. The surface area sampled (nearest 0.01 ha) was estimated using distance pulled and length of extension of the bag seine. No grid was duplicated in a month.

One half of the monthly beach seine samples were collected during each of the 1st-15th and 16th-31st of the month (Appendix A). Beach seines were pulled parallel to gulf shorelines in the same direction as the longshore current for 30.5 m. The surface area sampled (nearest 0.01 ha) was estimated using distance pulled and length of extension of the beach seine. No grid was duplicated in a month.

Trawls were used in bays which were stratified into three zones: Zone 1 (upper bay nearest mouths of rivers), Zone 2 (lower bay farthest from rivers), and Zone 5 [Intracoastal Waterway (ICWW)]. Trawl sites in Zones 1 and 2 were randomly selected from bay grids (1-minute longitude by 1-minute latitude) that contained water ≥ 1 m deep in at least 1/3 of the grid and which were known to be free of obstructions. One half of the monthly trawl samples in each zone in each bay system were collected during each of the 1st-15th and 16th-31st of the month (Appendix A). In East Matagorda Bay all water was designated as Zone 1; in each of Sabine Lake, upper and lower Laguna Madre all water was designated as Zone 2. In Zones 1 and 2, trawls were towed in a circular motion near the center of each grid. Trawl sites for Zone 5 were randomly selected from all grids containing the ICWW. Each randomly selected grid was divided into 144 5-second "gridlets"; the center-most gridlet which contained the center of the ICWW within that grid was used as a starting point for the sample. Trawls in Zone 5 were pulled linearly in the channel either toward the nearest gulf pass or away from it; this direction was alternated with each sample. All trawl tows within bays were 10 minutes in duration. No grid was duplicated in a month.

Gulf trawl sites in each area were randomly selected from gulf grids in the TTS (Figure 1) that contained water ≥ 1.8 m deep in at least 1/3 of the grid and which was known to be free of obstructions. One half of the samples in each area were collected during each of the 1st-15th and 16th-31st of the month (Appendix A). Trawls were towed linearly, parallel to the fathom curve; direction of tow (north or south) was randomly chosen for the initial tow and alternated on subsequent tows. All tows were 10 minutes in duration. No grid was duplicated in a month.

Trawls were used during daylight in the gulf off Sabine Pass, Galveston, Port O'Connor, Port Aransas, and Port Isabel during June and November 1993 in conjunction with the Southeast Area Monitoring and Assessment Program (SEAMAP). Detailed descriptions of the gear, sample stations, and sample procedures are reported by Stuntz et al. (1985).

Each bay was stratified into oyster reef areas, mapped areas in which Eastern oysters form reefs which are ≥ 0.2 m higher than adjacent bottom for a continuous distance of ≥ 91.4 m long and 0.4 m wide. Oyster dredge sites were randomly selected from bay grids containing defined oyster reefs. Each selected grid was divided into 144 5-second "gridlets". All gridlets that contained defined oyster reefs were used to randomly choose sample sites. One half of the oyster samples were collected during each of the 1st-15th and 16th-31st of the month (Appendix A). Dredges were pulled linearly for 30 seconds. Stations were not duplicated within a month.

Sample catch rates for each species, or category of species, were calculated by dividing total number captured by either total hours fished (gill net, trawl, and oyster dredge) or ha sampled (bag seine and beach seine). Catch rates for each bay system were then calculated by month, year or season. Bay specific catch rates were weighted for coastwide estimates (Appendix A). Fish greater than 204 mm long were eliminated from bag seine catch rate calculations based on the findings of McEachron and Green (1986). Live Eastern oysters were grouped into spat (5-25 mm), small oysters (26-75 mm), and market oysters (≥ 76 mm).

Lengths (total, fork or standard) of animals caught were recorded. In gill nets, up to 19 individuals of each species, within each mesh size, were measured on each sampling day. In trawls, 50 shrimp of each species (brown, white, pink), 35 blue crabs and up to 19 individuals of all other species were measured in each sample. For all other gears, up to 19 specimens were measured for each species in each sample collected.

Mean total lengths of individual species in gill nets were calculated for each of the four mesh sizes. Mean lengths for the combined meshes were calculated by weighting individual species mean lengths in each mesh by the number of each species caught in each mesh. For all other gears, mean lengths of individual species were calculated from individuals measured in each sample. Coastwide total mean lengths for each species in all gears were weighted according to the catch rate in each bay system, and by bay specific and gear specific weighting factors used for coastwide catch rates.

Surface salinity (ppt), water temperature ($^{\circ}$ C) and turbidity [Nephelometric Units (NTU)] were measured at the set and pickup for each gill net and prior to each bag seine and beach seine sample (Appendix B). Bottom salinity, water temperature, and turbidity were measured prior to each trawl and oyster dredge sample (Appendix B).

RESULTS

Gill Net

Coastwide spring red drum catch rate declined in 1993 (1.0/h) but was the 2nd highest on record (Table 1; Figure 2). Highest spring coastwide red drum catch rate (1.3/h) occurred in 1992, with lowest catch rates during 1977-79 (0.3/h). Average size increased to 496 mm in 1993 (Table 1; Figure 4).

Coastwide fall red drum catch rate increased in 1993 (1.0/h); highest fall coastwide catch rate for red drum (1.0/h) occurred in 1979 and 1993, with lowest catch rates (0.5/h) in 1982 and 1983 (Table 2; Figure 3). Average size increased to 496 mm in 1993 (Table 2; Figure 5).

Coastwide spring spotted seatrout catch rate declined slightly in 1993 (0.7/h); highest spring coastwide spotted seatrout catch rate (1.1/h) occurred in 1976, with lowest catch rates in 1979 and 1984 (0.3/h) (Table 1; Figure 2). Average size decreased to 459 mm in 1993 (Table 1; Figure 4).

Coastwide fall spotted seatrout catch rate in 1993 equaled 1992 (0.4/h); highest fall coastwide spotted seatrout catch rate (0.7/h) occurred in 1976, with lowest catch rate in 1979 (0.2/h) (Table 2; Figure 3). Average size decreased to 444 mm in 1993 (Table 2; Figure 5).

Coastwide spring black drum catch rate in 1993 was the highest on record (1.3/h); lowest occurred in 1978 (0.3/h) (Table 1; Figure 2). Average size increased to 400 mm in 1993 (Table 1; Figure 4).

Coastwide fall black drum catch rate in 1993 was the highest on record (1.6/h); lowest occurred in 1979 and 1984 (0.3/h) (Table 2; Figure 3). Average size increased to 421 mm (Table 2; Figure 5).

Spring and fall coastwide southern flounder (Paralichthys lethostigma) and sheepshead (Archosargus probatocephalus) catch rates varied little over the past 10 years (<0.1-0.1/h), but are generally down from pre-1983 years (0.1-0.3/h) (Tables 1 and 2).

Coastwide spring Atlantic croaker (Micropogonias undulatus) catch rates have remained at $\leq 0.3/h$ (Table 1, Figure 2). The 1993 fall catch rate was the highest on record (0.5/h); lowest catch rate occurred in 1975 (0.1/h) (Table 2; Figure 3).

Spring and fall coastwide catch rates of blue crab have remained at $\leq 0.1/h$ over the past 6 years, but are generally down from pre-1987 years (0.1-0.2/h) (Table 1 and 2). Average size increased in 1993 to 150 mm in spring and 153 mm in fall.

Coastwide 1993 catch rates for all fish combined increased to 7.2/h in spring, and 6.7/h in fall, the second highest catch rates on record (Tables 1 and 2).

Bay Bag Seine

Annual (calendar year) catch rates for select species are listed in Table 3. For the following select species, seasonal trends in catch rates and mean lengths are presented.

Coastwide red drum catch rates decreased in 1993; they were highest during November 1990-March 1991 and lowest during November 1989-March 1990 (Figure 6). Mean lengths have fluctuated between 46 and 58 mm TL (Figure 7).

Coastwide spotted seatrout catch rates decreased in 1993; they were highest during July through November 1991 and lowest during 1984-86 (Figure 6). Mean lengths have fluctuated between 44 and 56 mm TL (Figure 7).

Coastwide black drum catch rates decreased in 1993 to a record low of 0.5/h; they were highest in 1979 and 1990 (Figure 6). Mean lengths fluctuated between 54 and 84 mm TL (Figure 7).

Coastwide Atlantic croaker catch rates decreased in 1993; they were highest in 1982 and lowest in 1989 (Figure 6). Mean coastwide lengths fluctuated between 58 and 66 mm TL (Figure 7).

Coastwide brown shrimp catch rates decreased in 1993; they were highest in 1987 and lowest in 1989 (Figure 8). Mean coastwide lengths fluctuated between 54 and 64 mm TL (Figure 9).

Coastwide white shrimp catch rates increased in 1993; they were highest in 1982 and lowest in 1985 (Figure 8). Coastwide mean length has fluctuated between 52 and 59 mm TL (Figure 9).

Coastwide blue crab catch rates decreased in 1993; they were highest in 1985 and lowest in 1989 (Figure 8). Coastwide mean lengths fluctuated between 25 and 28 mm TL (Figure 9).

Annual catch rates of other species caught in bag seines varied by species and bay (Table 3).

Bay Trawl

Coastwide catch rates for all finfish combined decreased in 1993 (252/h); they ranged from 134/h in 1984 to 318/h in 1991 (Table 4).

Coastwide brown shrimp catch rates decreased in 1993 (32/h); they ranged from 21/h in 1983 to 34/h in 1989 (Table 4; Figure 10). Coastwide mean length increased in 1993, and has ranged from 83-97 mm TL (Figure 11).

Coastwide white shrimp catch rates decreased in 1993 (23/h); they ranged from 20/h in 1988 and 1989 to 46/h in 1982 (Table 4; Figure 10). Mean coastwide length fluctuated between 90 and 100 mm TL (Figure 11).

Coastwide annual blue crab bay trawl catch rates decreased in 1993 (20/h); they ranged from 15/h in 1984 to 24/h in 1992 (Table 4; Figure 10). Coastwide mean length rose in 1993, increasing from a gradual decline observed in past years (Figure 11).

Coastwide Atlantic croaker catch rates decreased in 1993 (79/h); they ranged from 27/h in 1985 to 112/h in 1992 (Table 4; Figure 10). Coastwide mean length increased in 1993, but has generally declined since 1983 (Figure 11).

Coastwide pink shrimp catch rates decreased in 1993 (1/h); they were highest in 1991 (5/h) (Table 4).

Annual catch rates of other major species caught in bay trawls varied by species and bay (Table 4).

Gulf Trawl

Coastwide catch rates for all finfish combined decreased in 1993 (377/h), and have ranged from 174/h in 1985 to 406/h in 1992 (Table 5).

Coastwide brown shrimp catch rates increased in 1993 (14/h); they ranged from 9/h in 1986 to 58/h in 1989 (Table 5; Figure 12). Coastwide mean length increased in 1993, and has ranged from 97 (1992) to 109 (1985) mm TL (Figure 13).

Coastwide annual white shrimp catch rates decreased in 1993 (17/h); they ranged from 10/h in 1990 to 24/h in 1985 and 1986 (Table 5; Figure 12). Mean coastwide length increased in 1993, and has ranged from 105 (1986 and 1992) to 115 (1985) mm TL (Figure 13).

Coastwide blue crab gulf trawl catch rates remained at 2/h in 1993; they ranged from 1/h in 1987-89 to 6/h in 1991 (Table 5; Figure 12). Coastwide mean length increased in 1993 to 95 mm, but in previous years decreased from 127 mm (1985) to 69 mm (1992) (Table 5; Figure 13).

Coastwide Atlantic croaker catch rates increased from 23/h in 1985 to 162/h in 1993 (Table 5; Figure 12). Mean coastwide length decreased from 142 mm in 1985 to 113 mm in 1993 (Table 5; Figure 13).

Coastwide annual pink shrimp catch rates increased to a record high of 4/h in 1993; they ranged from 1-2/h in past years (Table 5).

Annual catch rates of other major species caught in Gulf trawls varied by species and bay (Table 5).

Oyster Dredge

Coastwide catch rates of Eastern oyster spat decreased slightly in 1993 (1,440/h); they ranged from 491/h in 1984 to 1,880/h in 1989 (Table 6; Figure 14).

Coastwide catch rates of small Eastern oysters decreased in 1993 (1,926/h); they ranged from 1,001/h in 1986 to 2,615/h in 1991 (Table 6; Figure 14). Mean coastwide length increased in 1993 and has ranged from 46-54 mm TL (Figure 15).

Coastwide catch rates of market Eastern oysters greatly increased in 1993 to 664/h; they ranged from 215/h (1990) to 674/h (1985) (Table 6; Figure 14). Coastwide mean length remained at the record low of 87 mm; greatest was in 1984 at 91 mm TL (Figure 15).

Beach Seine

Coastwide and annual catch rates and mean lengths of select finfish and shellfish species varied among species, gulf areas and years (Table 7). Striped mullet (Mugil cephalus) generally had highest catch rates.

Beach Bag Seine

Coastwide and annual catch rates and mean lengths of select finfish and shellfish species varied among species, gulf areas and years (Table 8). Generally, striped mullet, blue crab and white shrimp had highest catch rates.

Intracoastal Waterway Trawl

Coastwide annual catch rates and mean length of individual select finfish and shellfish species varied among species and bays, but in general, catch rates in 1993 were lower than those in 1992 (Table 9). Atlantic croaker had the highest coastwide catch rate (241/h) in 1992; the San Antonio Bay system had the highest total finfish catch rate (1,181/h) in 1992.

Hydrologic Data

Hydrologic data varied among years, among bay systems and among gulf areas (Appendix B). Coastwide annual salinity increased during 1993 in coastal bays and decreased in gulf waters. Bay salinities were generally higher in upper Laguna Madre than in any other bay. Gulf salinities were generally higher off Port Isabel and Port Aransas. Water temperatures followed seasonal trends. Coastwide annual bay and gulf bottom water temperature remained about the same as during 1992, but have varied in past years.

SEAMAP

Summer (June)

Catch rates of brown shrimp by depth zone ranged from 236/h in 19-37 m to 34/h in 74-91 m during 1993 (Appendix C, Table C.1). Historically, brown shrimp were predominately caught in water 19-37 m deep.

White shrimp were caught primarily in water from 0-18 m deep during all years (Appendix C, Table C.1). At these depths catch rates ranged from 4/h-41/h in all years.

Pink shrimp were captured in waters from 0-55 m deep (0-195/h) during all years (Appendix C, Table C.1). They were caught predominately in waters 0-37 m deep.

Blue crab were caught primarily in the 0-18 m zone (Appendix C, Table C.1). Catch rates at these depths ranged from 3-20/h in all years.

Fall (November)

Brown shrimp were caught in all depth zones, with highest catch rates generally >18 m (Appendix C, Table C.2). White shrimp and pink shrimp were predominately caught in waters 0-37 m deep. Blue crab catch rates were \leq 2/h in all years.

OVERVIEW

TPWD is mandated by the Texas Legislature and the TPWD Commission to annually investigate population trends, habitat variability, socio-economics, commercial and recreational fishing impacts and any other factors or conditions which may result in increases or decreases of finfishes and shellfishes in Texas waters. Long-term trend data based on independent standardized monitoring programs are necessary to assess changes in relative abundance of these populations. Shrimp data were used to recommend dates for the annual closure of Texas gulf waters to shrimping. Oyster data were used to establish the oyster transplant season in Galveston Bay. Finfish data were used to recommend changes in fishing regulations. These data were used to develop management plans for shrimp, oysters, and blue crabs as mandated by the Texas Legislature. Additionally, these data are used routinely by "outside" scientists in the private and public sector, especially the Gulf of Mexico Fisheries Management Council and the Gulf States Marine Fisheries Commission. The TPWD data base was used extensively by the Galveston Bay and Corpus Christi Bay National Estuary Programs to determine status and trends of populations. Data in the present report are used to determine long-term trends in abundance and stability of finfishes and shellfish populations in Texas coastal waters and to implement management regulations.

Effective management of marine species populations requires knowledge of the relationship between spawning and subsequent adult abundance (Cushing 1970, Gulland 1977). Since it has been possible to detect changes in annual abundances with bag seines and gill nets, it may be possible to determine stock-recruitment relationships utilizing these gears. To determine these relationships, it is imperative that the standardized monitoring program used by TPWD be maintained.

To determine effects of natural or man induced events in the Texas coastal ecosystem, standardized monitoring programs used by TPWD should be

maintained. The following "unusual/significant" meta events affecting coastal waters were documented in 1993. Other unreported events may have occurred.

1. Weather conditions were highly variable during the year. A strong "norther" hit the upper coast in March, causing record low water levels; tides 3.2 feet below normal were recorded. Spring 1993 was one of the coolest in the past decade. Spring rainfall exceeded the historical average but was not as high as in spring 1992; annual rainfall totals were higher than normal along the coast. During summer, a dry spell of 57 consecutive days in Corpus Christi and 60 days in San Antonio broke records for arid conditions set in 1895 and 1957. Dry conditions were caused by a high-pressure ridge that ran from Texas throughout the southeast. This system was present for most of the summer and is partly responsible for heavy rains and flooding in the Midwest. An early cold weather system in fall shattered records in the Coastal Bend area. A temperature of 28°F on 31 October was the coldest on record for October; the previous low was 39°F recorded on 20 October 1989. It was the earliest autumn freeze since 1887 in Corpus Christi. The record temperature in October was also lower than any temperature ever recorded for November (29°F).
2. On 19 June, Tropical Storm Arlene produced heavy rains and high tides along the entire coast. Salinities dropped to abnormally low levels during early summer in all bays. Brown shrimp abundance was adversely affected due to the low salinities, but abundance was not as low as recorded in 1992. Falling tides trapped fish in marsh ditches in the Sea Rim State Park and caused a fish kill due to low dissolved oxygen levels.
3. Spring and summer floodwaters from the Mississippi River doubled the "dead Zone" in the Gulf along the upper-Texas and Louisiana coasts. Low oxygen levels were found across 6,800 square miles. Effects on organisms in the area are unknown but the low dissolved oxygen levels were low enough to cause avoidance and/or death of animals.
4. Brown tide persisted in the Laguna Madre (upper and lower) for the fourth consecutive year. No mortalities were associated with these blooms, but low dissolved oxygen levels were observed in rearing ponds at the MDC. Low levels of oxygen adversely affected pond production of fingerling red drum. TPWD sampling continues to reveal no adverse effects on fish and shellfish populations in the Laguna Madre.
5. On 24 September a large fish kill was observed between High Island and Port Arthur. Twenty-two tarpon (6-7 ft. long), over 100 large red drum, five sea turtles, countless menhaden and many sharks were seen on the beach. The cause was never identified, but commercial fishing activity (shrimp trawlers, menhaden purse seiners) was observed within one mile of the beach.
6. Because of health concerns of eating raw shellfish by the public and resultant low market prices, oysters were left on leases until the demand and prices for oysters went up. The out-of-state market dropped so low that leaseholders were operating under a 200 sack daily limit in an attempt to boost prices. The entire Texas oyster industry remained distressed throughout the year, though oyster abundance was very high on public reefs and on leases.
7. A large trotline fishery for black drum developed in East and West Matagorda Bays by out-of-area fishermen in the cooler winter months.

Landings were difficult to monitor because fish were kept iced down and the fish picked up twice a week by truck. Fishermen moved from place to place and none of the fish were handled by local fishhouses. It was reported but not verified that most of the black drum were sold in the Austin-San Antonio area.

8. Several oil spills were reported. On 20 April, 90,000 gallons of light crude oil spilled into the Neches River and surrounding marshes. Oil was reported from Gray's Bayou to the Bessie Heights Canal. A small spill (3,500 gallons) was reported on the ICWW near Star Lake, McFaddin National Wildlife Refuge. Only 20 gallons leaked into surrounding marsh land.
9. Pink water in subdivision channels on Padre Island was observed in August. The pink color was caused by an unidentified marine bacteria. No fish kills were noted; water conditions returned to normal within two weeks.
10. Fish samples collected from Clear Creek (Galveston Bay system) in November were found to contain high concentrations of aromatic compounds: 1,2-dichloroethane, 1,1,2-trichloroethane, and carbon disulfide. These compounds probably came from the Brio Superfund site located on Mud Gully. The Texas Department of Health issued a fish consumption advisory for all aquatic species found in the area. There is no indication that contamination extends into adjacent Clear Lake or Galveston Bay.
11. A 42-pound grass carp was caught in the Nueces River in April, a new state record. This fish was capable of reproducing, and is the second grass carp to be recorded from this river.

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Table 1. (Cont'd.)

| Species | Year | Sabine Lake | | Galveston | | East Matagorda | | Matagorda | | San Antonio | | Arkansas | | Corpus Christi | | Upper Laguna Madre | | Lower Laguna Madre | | Coastwide | |
|---------------------------|------|-------------|--------|-----------|--------|----------------|--------|-----------|--------|-------------|--------|----------|--------|----------------|--------|--------------------|--------|--------------------|--------|-----------|--------|
| | | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length |
| Total finfishes (Cont'd.) | 1982 | ND | | 378 | 4.7 | 368 | 4.7 | 435 | 5.3 | 411 | 6.8 | 417 | 4.6 | 400 | 4.5 | 367 | 8.8 | 394 | 6.4 | 397 | |
| | 1983 | ND | | 369 | 7.6 | 384 | 3.7 | 417 | 4.5 | 422 | 7.2 | 404 | 5.5 | 397 | 5.0 | 373 | 7.5 | 409 | 6.6 | 394 | |
| | 1984 | ND | | 389 | 3.7 | 397 | 3.8 | 449 | 4.3 | 431 | 5.6 | 432 | 4.8 | 397 | 3.2 | 369 | 4.6 | 412 | 4.7 | 410 | |
| | 1985 | ND | | 381 | 3.8 | 408 | 3.7 | 446 | 5.2 | 479 | 4.1 | 452 | 5.0 | 368 | 3.6 | 350 | 5.2 | 384 | 5.1 | 404 | |
| | 1986 | 4.9 | 432 | 377 | 5.4 | 381 | 5.4 | 425 | 5.0 | 422 | 3.5 | 418 | 5.7 | 371 | 2.9 | 387 | 5.2 | 425 | 5.3 | 398 | |
| | 1987 | 2.0 | 517 | 373 | 4.3 | 384 | 4.3 | 430 | 4.0 | 420 | 2.9 | 420 | 3.8 | 420 | 3.0 | 402 | 5.9 | 436 | 4.8 | 408 | |
| | 1988 | 2.5 | 472 | 385 | 4.6 | 401 | 4.5 | 411 | 4.7 | 444 | 6.4 | 431 | 6.4 | 390 | 3.2 | 407 | 5.4 | 434 | 4.8 | 411 | |
| | 1989 | 2.6 | 474 | 365 | 7.4 | 396 | 5.1 | 428 | 6.4 | 437 | 6.4 | 403 | 4.4 | 402 | 2.8 | 432 | 4.7 | 425 | 5.5 | 403 | |
| | 1990 | 2.5 | 485 | 367 | 8.2 | 403 | 6.6 | 432 | 6.1 | 448 | 5.1 | 410 | 6.8 | 410 | 3.5 | 405 | 5.2 | 424 | 6.5 | 405 | |
| | 1991 | 3.1 | 474 | 367 | 11.7 | 358 | 6.4 | 415 | 6.1 | 437 | 6.1 | 400 | 5.8 | 405 | 5.3 | 381 | 7.2 | 409 | 6.4 | 398 | |
| 1992 | 2.6 | 445 | 395 | 8.8 | 423 | 6.3 | 407 | 5.9 | 448 | 7.1 | 412 | 7.0 | 410 | 5.7 | 409 | 8.4 | 431 | 7.0 | 414 | | |
| 1993 | 2.4 | 480 | 390 | 8.7 | 459 | 7.0 | 424 | 8.6 | 467 | 8.6 | 453 | 9.5 | 420 | 4.8 | 427 | 8.3 | 428 | 7.2 | 424 | | |
| Blue crab | 1983 | ND | | 151 | 0.3 | 154 | 0.3 | 151 | 0.1 | 142 | 0.2 | 142 | 0.2 | 151 | 0.1 | 156 | 0.2 | 145 | 0.2 | 147 | |
| | 1984 | ND | | 150 | 0.4 | 135 | 0.4 | 143 | 0.1 | 137 | 0.2 | 142 | 0.3 | 147 | 0.3 | 145 | 0.2 | 142 | 0.2 | 144 | |
| | 1985 | ND | | 149 | 0.5 | 151 | 0.5 | 144 | 0.2 | 136 | 0.3 | 141 | 0.2 | 149 | 0.3 | 141 | 0.2 | 158 | 0.2 | 147 | |
| | 1986 | 0.2 | 146 | 131 | 0.6 | 133 | 0.6 | 140 | 0.2 | 135 | 0.1 | 144 | 0.1 | 154 | <0.1 | 147 | 0.1 | 148 | 0.2 | 145 | |
| | 1987 | 0.3 | 152 | 139 | 0.3 | 138 | 0.3 | 138 | 0.1 | 140 | 0.2 | 155 | 0.1 | 151 | <0.1 | 137 | 0.1 | 142 | 0.1 | 141 | |
| | 1988 | 0.3 | 154 | 148 | 0.1 | 159 | 0.1 | 135 | <0.1 | 141 | <0.1 | 150 | 0.1 | 145 | <0.1 | 115 | 0.1 | 152 | 0.1 | 147 | |
| | 1989 | 0.2 | 157 | 137 | 0.4 | 128 | 0.4 | 136 | <0.1 | 128 | <0.1 | 131 | <0.1 | 149 | <0.1 | 72 | <0.1 | 147 | 0.1 | 136 | |
| | 1990 | 0.2 | 154 | 141 | 0.2 | 129 | 0.2 | 138 | 0.2 | 135 | 0.1 | 135 | 0.2 | 140 | <0.1 | 114 | 0.1 | 139 | 0.1 | 138 | |
| | 1991 | 0.1 | 141 | 132 | 0.4 | 135 | 0.2 | 144 | 0.1 | 136 | 0.1 | 144 | 0.1 | 140 | <0.1 | 105 | 0.1 | 152 | 0.1 | 138 | |
| | 1992 | 0.1 | 151 | 133 | 0.1 | 135 | <0.1 | 144 | 0.1 | 133 | 0.1 | 142 | 0.3 | 150 | 0.4 | 146 | 0.1 | 146 | 0.1 | 147 | |
| 1993 | 0.2 | 161 | 146 | 0.2 | 162 | 0.1 | 155 | 0.1 | 148 | 0.1 | 152 | 0.1 | 149 | 0.1 | 147 | <0.1 | 136 | 0.1 | 150 | | |

Table 2. (Cont'd.)

| Species | Year | Sabine Lake | | Galveston | | East Matagorda | | Matagorda | | San Antonio | | Aransas | | Corpus Christi | | Upper Laguna Madre | | Lower Laguna Madre | | Coastwide | |
|-----------------|------|-------------|--------|-----------|--------|----------------|--------|-----------|--------|-------------|--------|---------|--------|----------------|--------|--------------------|--------|--------------------|--------|-----------|--------|
| | | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length |
| Total finfishes | 1975 | 3.0 | 383 | 5.1 | 396 | ND | 385 | 6.6 | 355 | 4.9 | 339 | 7.9 | 345 | 5.7 | 343 | 4.3 | 374 | 4.8 | 394 | 5.5 | 365 |
| | 1976 | ND | ND | 7.2 | 334 | 4.0 | 362 | 4.9 | 388 | 9.1 | 365 | 5.0 | 363 | 5.0 | 349 | 5.1 | 383 | 11.1 | 400 | 6.8 | 369 |
| | 1977 | ND | ND | 6.2 | 334 | 3.2 | 342 | 5.4 | 389 | 6.2 | 348 | 3.6 | 344 | 5.8 | 326 | 5.2 | 343 | 6.5 | 381 | 5.5 | 353 |
| | 1978 | ND | ND | 4.0 | 342 | 4.0 | 325 | 5.0 | 359 | 5.1 | 383 | 5.2 | 341 | 3.8 | 322 | 3.6 | 358 | 3.1 | 395 | 4.3 | 355 |
| | 1979 | ND | ND | 3.5 | 367 | 2.0 | 372 | 4.3 | 350 | 5.6 | 368 | 3.8 | 372 | 3.5 | 327 | 2.6 | 367 | 3.5 | 393 | 3.7 | 365 |
| | 1980 | ND | ND | 4.0 | 371 | 2.9 | 375 | 3.3 | 346 | 6.1 | 342 | 4.8 | 350 | 5.0 | 336 | 2.5 | 354 | 4.2 | 390 | 4.3 | 357 |
| | 1981 | ND | ND | 4.2 | 357 | 3.3 | 355 | 3.0 | 384 | 4.8 | 358 | 4.4 | 375 | 4.8 | 364 | 3.1 | 357 | 5.5 | 388 | 4.2 | 369 |
| | 1982 | ND | ND | 6.2 | 346 | 6.2 | 341 | 3.7 | 372 | 5.1 | 360 | 4.5 | 366 | 5.1 | 338 | 3.5 | 363 | 5.9 | 381 | 5.0 | 360 |
| | 1983 | ND | ND | 6.0 | 350 | 6.2 | 341 | 4.0 | 378 | 5.3 | 352 | 3.9 | 396 | 5.8 | 356 | 3.0 | 362 | 5.5 | 399 | 4.9 | 367 |
| | 1984 | ND | ND | 6.5 | 364 | 5.7 | 379 | 4.4 | 369 | 3.9 | 362 | 3.8 | 399 | 4.2 | 347 | 3.1 | 373 | 4.2 | 406 | 4.6 | 373 |
| | 1985 | ND | ND | 7.1 | 335 | 4.5 | 366 | 3.7 | 380 | 4.2 | 376 | 3.3 | 396 | 4.0 | 358 | 3.4 | 362 | 4.6 | 390 | 4.6 | 364 |
| | 1986 | 2.6 | 395 | 6.0 | 349 | 4.4 | 390 | 4.6 | 379 | 4.7 | 408 | 4.0 | 378 | 5.3 | 347 | 2.2 | 381 | 5.2 | 404 | 4.6 | 377 |
| | 1987 | 2.2 | 430 | 5.8 | 334 | 4.7 | 390 | 5.0 | 323 | 5.2 | 428 | 3.3 | 391 | 4.9 | 353 | 1.6 | 406 | 4.6 | 444 | 4.4 | 374 |
| | 1988 | 2.5 | 371 | 6.2 | 346 | 6.5 | 398 | 5.5 | 361 | 5.8 | 393 | 4.3 | 382 | 5.0 | 358 | 3.1 | 396 | 5.7 | 410 | 5.2 | 374 |
| | 1989 | 2.2 | 394 | 6.8 | 363 | 5.2 | 387 | 4.3 | 361 | 5.6 | 402 | 4.7 | 374 | 5.4 | 388 | 2.9 | 417 | 5.2 | 408 | 5.0 | 382 |
| | 1990 | 2.4 | 401 | 5.2 | 343 | 4.9 | 387 | 4.2 | 345 | 5.5 | 399 | 4.5 | 400 | 4.5 | 398 | 2.7 | 433 | 4.5 | 431 | 4.4 | 384 |
| | 1991 | 3.1 | 389 | 5.4 | 341 | 5.4 | 376 | 4.9 | 362 | 6.5 | 389 | 4.9 | 373 | 6.3 | 371 | 4.0 | 397 | 7.6 | 389 | 5.5 | 372 |
| | 1992 | 2.7 | 439 | 6.1 | 356 | 6.1 | 439 | 5.6 | 366 | 2.8 | 408 | 6.2 | 419 | 5.8 | 377 | 3.4 | 425 | 7.3 | 399 | 5.4 | 389 |
| | 1993 | 2.7 | 379 | 6.8 | 347 | 7.1 | 457 | 5.8 | 380 | 7.6 | 430 | 6.4 | 455 | 7.3 | 394 | 6.3 | 443 | 7.9 | 425 | 6.7 | 407 |
| Blue crab | 1983 | ND | ND | 0.1 | 136 | 0.3 | 153 | 0.1 | 151 | 0.1 | 138 | 0.2 | 146 | 0.2 | 146 | 0.3 | 146 | 0.3 | 146 | 0.2 | 144 |
| | 1984 | ND | ND | 0.1 | 151 | 0.1 | 140 | 0.1 | 147 | 0.1 | 147 | 0.2 | 145 | 0.2 | 141 | 0.2 | 138 | 0.2 | 148 | 0.1 | 145 |
| | 1985 | ND | ND | <.1 | 149 | 0.1 | 154 | <.1 | 142 | 0.1 | 139 | 0.1 | 141 | 0.1 | 143 | 0.2 | 147 | 0.1 | 148 | 0.1 | 145 |
| | 1986 | 0.2 | 150 | <.1 | 146 | <.1 | 144 | <.1 | 161 | 0.1 | 146 | <.1 | 138 | 0.1 | 144 | <.1 | 147 | 0.1 | 149 | <.1 | 147 |
| | 1987 | 0.2 | 154 | 0.1 | 140 | 0.1 | 158 | 0.2 | 154 | 0.3 | 153 | <.1 | 158 | 0.1 | 157 | 0.3 | 157 | 0.1 | 152 | 0.2 | 153 |
| | 1988 | 0.2 | 155 | 0.1 | 144 | 0.2 | 150 | <.1 | 137 | 0.1 | 138 | 0.1 | 145 | 0.1 | 147 | <.1 | 129 | <.1 | 152 | 0.1 | 147 |
| | 1989 | 0.1 | 157 | <.1 | 136 | <.1 | 144 | <.1 | 139 | <.1 | 133 | <.1 | 148 | <.1 | 159 | 0.0 | 129 | <.1 | 152 | <.1 | 143 |
| | 1990 | 0.2 | 146 | 0.1 | 149 | 0.1 | 144 | 0.2 | 144 | 0.1 | 144 | <.1 | 149 | 0.1 | 138 | 0.1 | 129 | 0.2 | 148 | 0.1 | 144 |
| | 1991 | 0.1 | 152 | <.1 | 151 | 0.1 | 152 | 0.1 | 131 | 0.2 | 150 | <.1 | 136 | 0.1 | 153 | 0.1 | 139 | 0.2 | 148 | 0.1 | 146 |
| 1992 | 0.1 | 161 | <.1 | 143 | 0.1 | 156 | 0.1 | 153 | <.1 | 136 | 0.1 | 140 | <.1 | 148 | 0.2 | 138 | 0.1 | 152 | 0.1 | 144 | |
| 1993 | 0.1 | 169 | <.1 | 145 | 0.1 | 150 | <.1 | 156 | <.1 | 146 | <.1 | 160 | 0.1 | 155 | <.1 | 156 | <.1 | 142 | <.1 | 153 | |

Table 3. Annual mean catch rate (No./ha) and mean total lengths (mm) of selected fishes and shellfishes caught with 18.3-m bag seines by bay system during 1977-93. Blank indicated no measurement taken; ND = no data.

| Species Year | Sabine Lake | | Galveston | | East Matagorda | | San Antonio | | Aransas Christi | | Upper Laguna Madre | | Lower Laguna Madre | | Coastwide | |
|-------------------------|-------------|--------|-----------|--------|-----------------|--------|-------------|--------|-----------------|--------|--------------------|--------|--------------------|--------|-----------------|--------|
| | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length |
| FINFISHES | | | | | | | | | | | | | | | | |
| Red drum 1977* | ND | | 20 | 35 | ND | 51 | 85 | 51 | 14 | 44 | 1 | 41 | 0 | 39 | 18 | 46 |
| 1978 | ND | | 3 | 67 | ND | 43 | 13 | 51 | 4 | 94 | 3 | 67 | 11 | 52 | 7 | 58 |
| 1979 | ND | | 17 | 62 | ND | 92 | 11 | 67 | 5 | 92 | 18 | 85 | 27 | 64 | 14 | 70 |
| 1980 | ND | | 59 | 74 | ND | 68 | 28 | 50 | 5 | 88 | 16 | 75 | 4 | 72 | 23 | 70 |
| 1981 | ND | | 26 | 52 | ND | 86 | 29 | 53 | 30 | 38 | 40 | 46 | 5 | 56 | 26 | 52 |
| 1982 | ND | | 53 | 62 | ND | 76 | 19 | 102 | 26 | 103 | 21 | 62 | 1 | 89 | 24 | 76 |
| 1983 | ND | | 47 | 67 | 11 ^b | 66 | 7 | 99 | 12 | 98 | 7 | 88 | 2 | 92 | 20 ^b | 78 |
| 1984 | ND | | 13 | 66 | 6 | 70 | 12 | 56 | 4 | 100 | 4 | 80 | 2 | 52 | 6 | 69 |
| 1985 | ND | | 3 | 131 | 10 | 106 | 7 | 114 | 19 | 82 | 9 | 67 | 1 | 61 | 9 | 86 |
| 1986 | 19 | 87 | 8 | 86 | 2 | 78 | 6 | 105 | 1 | 117 | 4 | 98 | 3 | 84 | 7 | 90 |
| 1987 | 6 | 99 | 45 | 58 | 47 | 61 | 15 | 89 | 9 | 59 | 7 | 71 | 2 | 117 | 32 | 63 |
| 1988 | 13 | 78 | 8 | 78 | 27 | 79 | 4 | 82 | 8 | 65 | 4 | 49 | 4 | 66 | 10 | 73 |
| 1989 | 61 | 44 | 3 | 59 | 24 | 47 | 10 | 89 | 10 | 78 | 9 | 83 | 1 | 54 | 18 | 69 |
| 1990 | 5 | 62 | 17 | 53 | 27 | 50 | 19 | 50 | 43 | 40 | 4 | 83 | 1 | 39 | 20 | 46 |
| 1991 | 6 | 97 | 14 | 73 | 30 | 81 | 36 | 79 | 25 | 61 | 28 | 72 | 5 | 88 | 43 | 71 |
| 1992 | 5 | 71 | 9 | 85 | 23 | 56 | 77 | 22 | 84 | 83 | 7 | 74 | 14 | 51 | 14 | 76 |
| 1993 | 11 | 73 | 28 | 58 | 40 | 66 | 17 | 58 | 13 | 60 | 12 | 73 | 9 | 62 | 18 | 60 |
| Spotted seatrout | | | | | | | | | | | | | | | | |
| 1977* | ND | | 34 | 87 | ND | 84 | 50 | 73 | 1 | 99 | 7 | 84 | 16 | 83 | 23 | 82 |
| 1978 | ND | | 35 | 52 | ND | 86 | 11 | 69 | 8 | 50 | 4 | 59 | 14 | 93 | 14 | 61 |
| 1979 | ND | | 37 | 79 | ND | 83 | 12 | 70 | 7 | 68 | 12 | 53 | 13 | 80 | 2 | 75 |
| 1980 | ND | | 17 | 72 | ND | 84 | 21 | 71 | 11 | 74 | 11 | 79 | 3 | 56 | 10 | 73 |
| 1981 | ND | | 16 | 85 | ND | 110 | 9 | 68 | 13 | 70 | 12 | 65 | 4 | 64 | 10 | 80 |
| 1982 | ND | | 37 | 82 | ND | 99 | 19 | 62 | 15 | 76 | 4 | 75 | 5 | 78 | 15 | 79 |
| 1983 | ND | | 26 | 84 | 4 ^b | 101 | 8 | 72 | 14 | 71 | 4 | 79 | 5 | 101 | 11 | 82 |
| 1984 | ND | | 7 | 71 | 2 | 85 | 1 | 83 | 10 | 81 | 4 | 79 | 5 | 80 | 4 | 81 |
| 1985 | ND | | 5 | 80 | 24 | 73 | 4 | 64 | 24 | 74 | 1 | 54 | 5 | 88 | 4 | 77 |
| 1986 | 2 | 67 | 2 | 85 | 17 | 66 | 5 | 78 | 12 | 60 | 3 | 50 | 9 | 72 | 5 | 68 |
| 1987 | 7 | 92 | 22 | 73 | 14 | 68 | 3 | 82 | 13 | 69 | 10 | 76 | 1 | 104 | 3 | 72 |
| 1988 | 6 | 88 | 6 | 88 | 14 | 75 | 5 | 67 | 28 | 68 | 7 | 65 | 5 | 65 | 3 | 87 |
| 1989 | 5 | 63 | 6 | 79 | 10 | 80 | 20 | 61 | 16 | 71 | 6 | 71 | 4 | 50 | 2 | 74 |
| 1990 | 3 | 69 | 5 | 56 | 10 | 74 | 8 | 61 | 14 | 61 | 13 | 65 | 2 | 54 | 8 | 68 |
| 1991 | 1 | 67 | 16 | 63 | 13 | 71 | 34 | 59 | 20 | 65 | 8 | 72 | 6 | 63 | 7 | 63 |
| 1992 | 2 | 73 | 6 | 73 | 4 | 82 | 42 | 52 | 12 | 64 | 8 | 69 | 18 | 50 | 14 | 64 |
| 1993 | 5 | 84 | 6 | 61 | 19 | 71 | 15 | 54 | 12 | 68 | 7 | 69 | 14 | 59 | 12 | 58 |
| Black drum | | | | | | | | | | | | | | | | |
| 1977* | ND | | 0 | 95 | ND | 147 | 6 | 179 | 1 | 142 | 1 | 150 | 0 | 0 | 3 | 156 |
| 1978 | ND | | 36 | 83 | ND | 112 | 22 | 110 | 2 | 163 | 1 | 122 | 4 | 106 | 13 | 102 |
| 1979 | ND | | 40 | 93 | ND | 106 | 5 | 97 | 1 | 85 | 8 | 89 | 6 | 140 | 15 | 92 |
| 1980 | ND | | 4 | 122 | ND | 102 | 0 | 141 | 2 | 100 | 2 | 75 | 3 | 95 | 8 | 97 |
| 1981 | ND | | 12 | 124 | ND | 110 | 2 | 90 | 5 | 141 | 2 | 113 | 11 | 130 | 2 | 108 |
| 1982 | ND | | 4 | 91 | ND | 138 | 9 | 132 | 7 | 94 | 1 | 109 | <1 | 155 | 8 | 110 |
| 1983 | ND | | 23 | 108 | 3 ^b | 118 | 1 | 132 | 2 | 145 | 2 | 108 | 2 | 107 | 7 ^b | 110 |
| 1984 | ND | | 8 | 141 | 3 | 156 | 0 | 140 | 1 | 140 | 0 | 108 | 1 | 141 | 4 | 115 |
| 1985 | ND | | 4 | 141 | 3 | 83 | 1 | 122 | <1 | 124 | 0 | 68 | 2 | 82 | 2 | 115 |
| 1986 | 2 | 141 | 2 | 107 | 5 | 113 | 1 | 149 | <1 | 124 | 6 | 68 | 0 | 86 | 2 | 112 |
| 1987 | 0 | 106 | 1 | 106 | 0 | 130 | 1 | 118 | 0 | 130 | <1 | 96 | 2 | 68 | 1 | 110 |
| 1988 | 2 | 146 | 5 | 107 | 5 | 126 | 4 | 132 | 2 | 128 | 6 | 74 | 44 | 63 | 6 | 72 |
| 1989 | 0 | 124 | 4 | 124 | 8 | 109 | 1 | 125 | 3 | 116 | 1 | 110 | 11 | 158 | 4 | 114 |
| 1990 | 3 | 128 | 4 | 99 | 41 | 117 | 6 | 123 | 2 | 127 | 15 | 64 | 833 | 45 | 150 | 108 |
| 1991 | 1 | 124 | 3 | 111 | 10 | 155 | 3 | 113 | <1 | 174 | <1 | 112 | 61 | 77 | 102 | 49 |
| 1992 | <1 | 142 | <1 | 142 | 3 | 146 | 3 | 123 | 0 | 99 | 3 | 70 | 6 | 59 | 9 | 92 |
| 1993 | 2 | 129 | <1 | 109 | 3 | 122 | <1 | 158 | <1 | 99 | 1 | 67 | 1 | 39 | 2 | 80 |

Table 3 (Cont'd.)

| Species Year | Sabine Lake | | Galveston | | East Mataforda | | Mataforda | | San Antonio | | Aransas | | Corpus Christi | | Upper Laguna Madre | | Lower Laguna Madre | | Coastwide | | |
|-------------------|-------------|--------|-----------|--------|-------------------|--------|-----------------|--------|-------------|--------|---------|--------|----------------|--------|--------------------|--------|--------------------|--------|------------------|--------|--|
| | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | |
| Sheepshead | | | | | | | | | | | | | | | | | | | | | |
| 1977 ^a | ND | | 0 | | ND | | 1 | 128 | <1 | 68 | 0 | 54 | 0 | 59 | 0 | 122 | 0 | 61 | <1 | 128 | |
| 1978 | ND | | 15 | 66 | ND | | 1 | 86 | 6 | 63 | 1 | 56 | 1 | 41 | 1 | 0 | 1 | 50 | 6 | 70 | |
| 1979 | ND | | 1 | 114 | ND | | 1 | 94 | 1 | 41 | 0 | 51 | 1 | 0 | 1 | 0 | 1 | 60 | 1 | 61 | |
| 1980 | ND | | 1 | 158 | ND | | 2 | 68 | 0 | 0 | 1 | 95 | 1 | 41 | 0 | 0 | 1 | 92 | 1 | 86 | |
| 1981 | ND | | 1 | 174 | ND | | 0 | | 3 | 67 | <1 | <1 | <1 | <1 | 0 | 0 | 0 | 0 | 1 | 101 | |
| 1982 | ND | | 1 | 23 | ND | | <1 ^b | 93 | 1 | 102 | <1 | 67 | <1 | 99 | 0 | 0 | 3 | 52 | 1 | 90 | |
| 1983 | ND | | 0 | | ND | | <1 | 178 | 1 | 30 | <1 | 36 | <1 | 30 | 0 | 0 | 0 | 0 | <1 ^b | 52 | |
| 1984 | ND | | 2 | 20 | ND | | 1 | 157 | 3 | 39 | 1 | 35 | 0 | 0 | 0 | 0 | 2 | 57 | 1 | 43 | |
| 1985 | ND | | <1 | 114 | ND | | 1 | 203 | 1 | 48 | 1 | 50 | 0 | 0 | 0 | 0 | 1 | 73 | <1 | 80 | |
| 1986 | 0 | | <1 | 60 | ND | | 1 | 94 | <1 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 47 | <1 | 80 | |
| 1987 | 0 | | <1 | 59 | ND | | <1 | 124 | 2 | 58 | 1 | 55 | 3 | 35 | 0 | 0 | <1 | 40 | 1 | 64 | |
| 1988 | 0 | | <1 | 126 | ND | | <1 | 116 | 25 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | <1 | 89 | 3 | 56 | |
| 1989 | 1 | 91 | <1 | 146 | ND | | <1 | 79 | <1 | 85 | <1 | 115 | 0 | 0 | 0 | 0 | <1 | 48 | 3 | 44 | |
| 1990 | <1 | 146 | 1 | 55 | ND | | <1 | 101 | 1 | 81 | <1 | 29 | 0 | 0 | 0 | 0 | <1 | 70 | <1 | 86 | |
| 1991 | <1 | 97 | 3 | 41 | ND | | <1 | 36 | 5 | 39 | <1 | 66 | <1 | 40 | 0 | 0 | 4 | 63 | <1 | 69 | |
| 1992 | <1 | 50 | <1 | 147 | ND | | 0 | 47 | 1 | 98 | <1 | 36 | <1 | 19 | 0 | 45 | 4 | 63 | <1 | 69 | |
| 1993 | <1 | 50 | <1 | 147 | ND | | 0 | 47 | 1 | 98 | <1 | 36 | <1 | 19 | 0 | 45 | <1 | 51 | <1 | 77 | |
| Southern Flounder | | | | | | | | | | | | | | | | | | | | | |
| 1977 ^a | ND | | 0 | | ND | | 1 | 171 | 0 | 37 | 0 | 98 | 0 | 44 | 0 | 128 | 0 | 46 | <1 | 171 | |
| 1978 | ND | | 1 | 40 | ND | | <1 | 43 | 3 | 85 | 1 | 0 | 1 | 122 | 1 | 46 | 1 | 38 | 1 | 42 | |
| 1979 | ND | | 1 | 85 | ND | | <1 | 135 | 2 | 55 | 0 | 0 | 3 | 64 | 1 | 43 | 5 | 38 | 4 | 71 | |
| 1980 | ND | | 10 | 54 | ND | | 1 | 38 | 2 | 53 | 0 | 90 | 1 | 67 | 1 | 66 | 11 | 55 | 4 | 51 | |
| 1981 | ND | | 5 | 57 | ND | | 7 | 79 | 2 | 56 | 18 | 37 | 2 | 62 | 1 | 53 | 13 | 39 | 8 | 64 | |
| 1982 | ND | | 9 | 67 | ND | | 3 | 82 | 6 | 56 | 6 | 39 | 2 | 34 | 0 | 0 | 2 | 45 | 4 ^b | 51 | |
| 1983 | ND | | 9 | 46 | ND | | 2 | 54 | 3 | 58 | 6 | 39 | 1 | 34 | 0 | 0 | 2 | 45 | 4 ^b | 46 | |
| 1984 | ND | | 2 | 83 | ND | | 1 | 78 | 1 | 67 | 3 | 62 | 3 | 45 | 1 | 86 | 1 | 64 | 2 | 69 | |
| 1985 | ND | | 4 | 83 | ND | | 5 | 78 | 1 | 63 | 7 | 55 | 5 | 55 | 1 | 71 | 12 | 67 | 3 | 64 | |
| 1986 | 2 | 83 | 4 | 83 | ND | | 2 | 112 | 2 | 43 | 4 | 55 | 2 | 54 | 2 | 79 | 12 | 44 | 6 | 63 | |
| 1987 | 2 | 47 | 4 | 83 | ND | | 19 | 66 | 2 | 70 | 4 | 64 | 2 | 34 | 1 | 79 | 12 | 44 | 6 | 63 | |
| 1988 | 15 | 66 | 14 | 61 | ND | | 3 | 62 | 3 | 44 | 1 | 103 | 1 | 37 | <1 | 69 | 3 | 56 | 6 | 53 | |
| 1989 | 10 | 74 | 3 | 62 | ND | | 3 | 85 | 3 | 69 | 5 | 48 | 1 | 60 | <1 | 60 | 5 | 60 | 6 | 53 | |
| 1990 | 12 | 68 | 22 | 59 | ND | | 15 | 48 | 10 | 51 | 24 | 38 | 8 | 53 | <1 | 106 | 2 | 62 | 7 | 50 | |
| 1991 | 7 | 58 | 5 | 34 | ND | | 5 | 68 | 11 | 50 | 3 | 55 | 12 | 47 | <1 | 67 | 9 | 51 | 12 | 54 | |
| 1992 | 7 | 66 | 3 | 41 | ND | | 3 | 53 | 2 | 94 | 1 | 55 | 2 | 46 | <1 | 27 | 2 | 60 | 3 | 49 | |
| 1993 | 4 | 95 | 6 | 56 | ND | | 6 | 46 | 3 | 47 | 2 | 57 | 3 | 69 | <1 | 22 | 2 | 56 | 2 | 46 | |
| Atlantic croaker | | | | | | | | | | | | | | | | | | | | | |
| 1977 ^a | ND | | 20 | 96 | ND | | 0 | | 0 | 100 | 1 | 36 | 11 | 50 | 1 | 181 | 4 | 83 | 6 | 88 | |
| 1978 | ND | | 320 | 61 | ND | | 239 | 59 | 10 | 100 | 37 | 73 | 11 | 30 | 11 | 86 | 29 | 38 | 121 | 61 | |
| 1979 | ND | | 463 | 52 | ND | | 109 | 74 | 52 | 49 | 7 | 76 | 3 | 65 | 3 | 92 | 221 | 44 | 162 | 53 | |
| 1980 | ND | | 1,085 | 55 | ND | | 82 | 69 | 17 | 89 | 16 | 56 | 25 | 24 | 1 | 40 | 198 | 42 | 290 | 54 | |
| 1981 | ND | | 528 | 57 | ND | | 24 | 94 | 26 | 73 | 26 | 42 | 20 | 55 | 1 | 112 | 32 | 46 | 136 | 58 | |
| 1982 | ND | | 1,812 | 61 | ND | | 165 | 74 | 67 | 67 | 142 | 61 | 32 | 54 | 0 | 0 | 49 | 53 | 471 | 58 | |
| 1983 | ND | | 888 | 55 | 56 ^b | | 236 | 66 | 67 | 80 | 63 | 62 | 6 | 61 | 2 | 86 | 49 | 51 | 254 ^b | 58 | |
| 1984 | ND | | 815 | 59 | 210 | | 64 | 60 | 25 | 83 | 155 | 68 | 1,160 | 61 | 4 | 102 | 133 | 59 | 404 | 60 | |
| 1985 | ND | | 242 | 64 | 121 | | 63 | 72 | 13 | 88 | 46 | 78 | 4 | 76 | 11 | 87 | 87 | 42 | 122 | 66 | |
| 1986 | 126 | 74 | 148 | 54 | 198 | | 2,138 | 52 | 17 | 99 | 12 | 72 | 12 | 78 | <1 | 89 | 62 | 57 | 364 | 55 | |
| 1987 | 79 | 70 | 335 | 54 | 110 | | 207 | 78 | 33 | 47 | 9 | 81 | 4 | 40 | <1 | 60 | 10 | 62 | 113 | 61 | |
| 1988 | 154 | 68 | 485 | 53 | 160 | | 60 | 80 | 13 | 66 | 3 | 50 | 8 | 50 | 0 | 15 | 63 | 125 | 56 | 56 | |
| 1989 | 111 | 56 | 36 | 49 | 190 | | 45 | 56 | 9 | 61 | 18 | 62 | 10 | 61 | 0 | 9 | 15 | 63 | 125 | 56 | |
| 1990 | 97 | 67 | 316 | 51 | 117 | | 46 | 68 | 24 | 32 | 58 | 65 | 14 | 59 | 2 | 78 | 46 | 62 | 103 | 55 | |
| 1991 | 208 | 57 | 635 | 52 | 343 | | 47 | 58 | 156 | 57 | 63 | 63 | 35 | 66 | 11 | 36 | 46 | 62 | 103 | 55 | |
| 1992 | 225 | 56 | 505 | 47 | 450 | | 47 | 48 | 430 | 47 | 215 | 44 | 35 | 50 | 13 | 54 | 157 | 46 | 353 | 55 | |
| 1993 | 232 | 64 | 358 | 50 | 421 | | 44 | 47 | 48 | 47 | 25 | 66 | 25 | 53 | 2 | 67 | 195 | 44 | 326 | 47 | |
| Sand seatrout | | | | | | | | | | | | | | | | | | | | | |
| 1977 ^a | ND | | 0 | | ND | | 11 | 61 | 0 | 0 | 0 | 0 | 0 | <1 | 0 | 0 | 0 | 0 | 2 | 61 | |
| 1978 | ND | | 13 | 58 | ND | | 3 | 59 | 0 | 0 | 0 | 0 | <1 | 54 | 0 | 0 | 0 | 4 | 4 | 58 | |

Table 3 (Cont'd.)

| Species Year | Sabine Lake | | Galveston | | East Matagorda | | Matagorda | | San Antonio | | Aransas | | Corpus Christi | | Upper Laguna Madre | | Lower Laguna Madre | | Coastwide | | | | | | | | | | | | |
|------------------------|-------------|--------|-----------|--------|-------------------|--------|-----------|--------|-------------|--------|---------|--------|-------------------|--------|-----------------------|--------|-----------------------|--------|-----------|--------|-----|-----|-----|----|-----|-----|-----|-----|-----|----|--|
| | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | | | | | | | | | | | |
| White shrimp (Cont'd.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1983 | ND | | 1,524 | | 50 | | 348 | | 70 | | 394 | | 65 | | 135 | | 42 | | 7 | | 67 | | 218 | | 52 | | 478 | | 53 | | |
| 1984 | ND | | 1,557 | | 59 | | 409 | | 65 | | 438 | | 71 | | 166 | | 56 | | 17 | | 58 | | 625 | | 58 | | 759 | | 628 | | |
| 1985 | ND | | 307 | | 61 | | 552 | | 61 | | 584 | | 63 | | 37 | | 44 | | 6 | | 73 | | 204 | | 54 | | 241 | | 58 | | |
| 1986 | 308 | 73 | 1,389 | 62 | 62 | | 173 | 65 | 65 | 66 | 66 | 66 | 66 | 140 | 66 | 287 | 44 | 58 | 2 | 48 | 175 | 121 | 61 | 61 | 49 | 386 | 58 | 491 | 61 | 58 | |
| 1987 | 682 | 68 | 972 | 53 | 53 | | 577 | 61 | 579 | 67 | 67 | 67 | 67 | 90 | 90 | 111 | 65 | 61 | 7 | 37 | 121 | 121 | 73 | 73 | 61 | 61 | 361 | 63 | 63 | | |
| 1988 | 796 | 63 | 482 | 66 | 66 | | 429 | 66 | 341 | 68 | 68 | 68 | 68 | 168 | 168 | 425 | 47 | 59 | 2 | 68 | 194 | 194 | 54 | 54 | 49 | 356 | 60 | 60 | 55 | | |
| 1989 | 615 | 61 | 559 | 55 | 55 | | 76 | 59 | 384 | 78 | 78 | 78 | 78 | 145 | 145 | 631 | 60 | 67 | 35 | 40 | 368 | 368 | 49 | 49 | 61 | 704 | 55 | 55 | | | |
| 1990 | 425 | 65 | 1,698 | 54 | 54 | | 690 | 57 | 451 | 63 | 63 | 63 | 63 | 335 | 335 | 50 | 50 | 67 | 77 | 49 | 381 | 381 | 61 | 61 | 61 | 645 | 55 | 55 | | | |
| 1991 | 385 | 71 | 1,723 | 50 | 50 | | 273 | 51 | 624 | 58 | 58 | 58 | 58 | 236 | 236 | 361 | 71 | 62 | 77 | 49 | 381 | 381 | 61 | 61 | 52 | 383 | 58 | 58 | | | |
| 1992 | 463 | 68 | 924 | 54 | 54 | | 264 | 62 | 643 | 60 | 60 | 60 | 60 | 115 | 115 | 211 | 96 | 66 | 32 | 58 | 750 | 750 | 60 | 60 | 52 | 383 | 58 | 58 | | | |
| 1993 | 324 | 68 | 526 | 56 | 56 | | 449 | 62 | 585 | 61 | 61 | 61 | 61 | 132 | 132 | 96 | 96 | 69 | 137 | 58 | 58 | 750 | 750 | 60 | 437 | 61 | 61 | | | | |

^aData for October - December only.

^bEast Matagorda Bay data are only for February-September 1983. Coastwide values do not include East Matagorda Bay data.

Table 4. (Cont'd.)

| Species | Year | Sabine Lake | | Galveston | | East Matagorda | | Matagorda | | San Antonio | | Arkansas | | Corpus Christi | | Upper Laguna Madre | | Lower Laguna Madre | | Coastwide ^b | |
|------------------------|-------|-------------|--------|-----------|-----------------|-----------------|--------|-----------|--------|-------------|--------|----------|--------|----------------|--------|--------------------|--------|--------------------|--------|------------------------|--------|
| | | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length |
| Blue crab (Cont'd.) | 1987 | 5 | 135 | 19 | 78 | 28 ^c | 87 | 10 | 77 | 40 | 93 | 18 | 84 | 6 | 95 | 8 | 108 | 19 | 88 | 17 | 86 |
| | 1988 | 5 | 137 | 9 | 71 | 13 | 91 | 3 | 77 | 89 | 75 | 57 | 63 | 7 | 88 | 7 | 98 | 18 | 84 | 22 | 74 |
| | 1989 | 5 | 135 | 25 | 66 | 51 | 63 | 6 | 80 | 50 | 74 | 24 | 68 | 2 | 94 | 2 | 107 | 9 | 77 | 19 | 72 |
| | 1990 | 6 | 98 | 31 | 72 | 15 | 79 | 4 | 90 | 39 | 69 | 17 | 71 | 14 | 96 | 5 | 93 | 33 | 91 | 21 | 76 |
| | 1991 | 7 | 117 | 10 | 64 | 26 | 76 | 6 | 75 | 68 | 58 | 51 | 58 | 7 | 102 | 5 | 105 | 35 | 89 | 20 | 65 |
| | 1992 | 7 | 139 | 8 | 77 | 2 | 102 | 6 | 65 | 105 | 54 | 38 | 56 | 10 | 81 | 26 | 110 | 27 | 98 | 24 | 65 |
| | 1993 | 5 | 131 | 16 | 70 | 6 | 93 | 14 | 82 | 50 | 80 | 35 | 78 | 10 | 96 | 16 | 114 | 22 | 88 | 20 | 81 |
| | 1982* | ND | ND | 23 | 90 | ND | ND | 25 | 94 | 17 | 101 | 54 | 80 | 40 | 90 | 40 | 101 | 6 | 61 | 27 | 91 |
| | 1983 | ND | ND | 12 | 99 | ND | ND | 26 | 100 | 31 | 99 | 56 | 91 | 8 | 99 | 8 | 102 | 9 | 66 | 21 | 97 |
| | 1984 | ND | ND | 13 | 102 | ND | ND | 7 | 102 | 58 | 96 | 107 | 80 | 50 | 103 | 25 | 108 | 6 | 74 | 30 | 94 |
| 1985 | ND | ND | 33 | 75 | ND | ND | 24 | 89 | 27 | 90 | 67 | 81 | 24 | 96 | 16 | 108 | 11 | 63 | 30 | 83 | |
| 1986 | <1 | 99 | 15 | 94 | ND | ND | 99 | 29 | 99 | 98 | 111 | 96 | 42 | 95 | 7 | 108 | 15 | 64 | 34 | 96 | |
| 1987 | 4 | 92 | 24 | 88 | 7 ^c | 76 | 47 | 91 | 91 | 93 | 85 | 101 | 88 | 66 | 94 | 8 | 100 | 5 | 70 | 46 | 89 |
| 1988 | 3 | 85 | 24 | 84 | 10 | 91 | 32 | 100 | 124 | 91 | 139 | 86 | 17 | 89 | 6 | 93 | 3 | 73 | 44 | 90 | |
| 1989 | 8 | 84 | 29 | 84 | 47 | 97 | 39 | 91 | 156 | 90 | 105 | 90 | 105 | 17 | 88 | 5 | 92 | 9 | 63 | 49 | 89 |
| 1990 | 1 | 113 | 11 | 98 | 40 | 100 | 26 | 96 | 104 | 92 | 78 | 90 | 90 | 28 | 88 | 12 | 91 | 27 | 79 | 34 | 92 |
| 1991 | 1 | 93 | 13 | 87 | 63 | 96 | 21 | 86 | 51 | 89 | 158 | 91 | 29 | 91 | 19 | 97 | 8 | 80 | 32 | 90 | |
| 1992 | 3 | 83 | 38 | 82 | 9 | 90 | 23 | 82 | 65 | 82 | 64 | 81 | 30 | 92 | 40 | 110 | 7 | 73 | 37 | 84 | |
| 1993 | 9 | 79 | 18 | 85 | 14 | 69 | 43 | 94 | 45 | 82 | 95 | 88 | 22 | 87 | 12 | 103 | 5 | 67 | 32 | 88 | |
| 1982* | ND | ND | <1 | 94 | ND | ND | <1 | 113 | <1 | 96 | 7 | 89 | 2 | 100 | 1 | 96 | 0 | 0 | 1 | 94 | |
| 1983 | ND | ND | <1 | 95 | ND | ND | 1 | 112 | 5 | 95 | 9 | 94 | 2 | 103 | 1 | 113 | 1 | 88 | 2 | 99 | |
| 1984 | ND | ND | 0 | 88 | ND | ND | <1 | 76 | <1 | 72 | 3 | 86 | 3 | 109 | <1 | 94 | <1 | 71 | 1 | 98 | |
| 1985 | ND | ND | <1 | 118 | ND | ND | 104 | 3 | 98 | 4 | 100 | 4 | 100 | 5 | 96 | 4 | 107 | 1 | 98 | 2 | 99 |
| 1986 | 0 | 0 | <1 | 111 | ND | ND | 114 | 4 | 103 | 4 | 103 | 11 | 101 | 12 | 103 | 1 | 109 | <1 | 70 | 3 | 104 |
| 1987 | 0 | 0 | <1 | 111 | 2 ^c | 102 | 5 | 95 | 2 | 92 | 6 | 84 | 12 | 101 | 1 | 107 | 2 | 72 | 2 | 95 | |
| 1988 | 0 | 0 | 1 | 79 | <1 | 110 | 2 | 89 | 6 | 86 | 20 | 82 | 8 | 93 | <1 | 76 | 2 | 77 | 4 | 85 | |
| 1989 | 0 | 0 | <1 | 90 | <1 | 94 | 1 | 102 | 8 | 93 | 14 | 91 | 8 | 95 | <1 | 85 | 1 | 80 | 3 | 93 | |
| 1990 | 0 | 0 | <1 | 84 | 0 | 0 | 0 | <1 | 106 | 1 | 97 | 23 | 88 | 4 | 97 | 3 | 71 | 3 | 85 | 3 | 90 |
| 1991 | 0 | 0 | <1 | 101 | 1 | 115 | 1 | 102 | 8 | 84 | 27 | 88 | 8 | 97 | 4 | 103 | 4 | 79 | 5 | 90 | |
| 1992 | 0 | 0 | <1 | 58 | <1 | 101 | 2 | 102 | 8 | 84 | 7 | 77 | 10 | 95 | 9 | 103 | 20 | 82 | 3 | 89 | |
| 1993 | 0 | 0 | <1 | 87 | 0 | 0 | <1 | 100 | <1 | 86 | 5 | 76 | 4 | 91 | 1 | 98 | 4 | 79 | 1 | 85 | |
| 1982* | ND | ND | 88 | 93 | ND | ND | 86 | 39 | 86 | 14 | 99 | 16 | 95 | 26 | 101 | 17 | 110 | 4 | 61 | 46 | 92 |
| 1983 | ND | ND | 78 | 93 | ND | ND | 102 | 20 | 102 | 13 | 96 | 18 | 100 | 14 | 111 | 6 | 112 | 2 | 86 | 36 | 95 |
| 1984 | ND | ND | 60 | 98 | ND | ND | 99 | 15 | 99 | 8 | 99 | 38 | 106 | 24 | 106 | 11 | 126 | 10 | 109 | 32 | 101 |
| 1985 | ND | ND | 62 | 99 | ND | ND | 110 | 21 | 110 | 23 | 91 | 17 | 106 | 22 | 104 | 6 | 120 | 1 | 105 | 33 | 101 |
| 1986 | 14 | 105 | 45 | 95 | ND | ND | 98 | 60 | 98 | 15 | 96 | 13 | 101 | 19 | 98 | 3 | 108 | 5 | 57 | 34 | 97 |
| 1987 | 23 | 101 | 37 | 97 | 22 ^c | 92 | 16 | 97 | 42 | 87 | 10 | 94 | 15 | 99 | 2 | 105 | 2 | 76 | 24 | 95 | |
| 1988 | 39 | 107 | 21 | 91 | 8 | 95 | 16 | 98 | 41 | 93 | 16 | 91 | 12 | 95 | 3 | 102 | <1 | 79 | 20 | 94 | |
| 1989 | 29 | 107 | 29 | 89 | 11 | 98 | 9 | 98 | 43 | 99 | 7 | 98 | 9 | 100 | 3 | 97 | <1 | 114 | 20 | 93 | |
| 1990 | 50 | 90 | 14 | 98 | 14 | 103 | 16 | 115 | 47 | 97 | 13 | 108 | 22 | 98 | 21 | 100 | 1 | 113 | 21 | 100 | |
| 1991 | 17 | 91 | 76 | 97 | 7 | 99 | 11 | 95 | 24 | 94 | 30 | 89 | 24 | 94 | 14 | 113 | 1 | 107 | 37 | 98 | |
| 1992 | 37 | 88 | 59 | 93 | 5 | 99 | 31 | 96 | 27 | 95 | 53 | 93 | 5 | 111 | 6 | 114 | 1 | 104 | 36 | 94 | |
| 1993 | 11 | 81 | 39 | 91 | 31 | 83 | 17 | 97 | 18 | 88 | 21 | 95 | 10 | 90 | 14 | 96 | 2 | 97 | 23 | 92 | |

^aValues include May-Dec only.
^b1966 values include Sabine Lake; 1987 values include East Matagorda.
^cValues include Apr-Dec only.

Table 5. Annual mean catch rates (No./h) and mean total lengths (mm) of select finfishes and shellfishes caught with 6.1-m trawls in the Texas Territorial Sea during 1985-93. Blank indicates no measurement taken; ND = no data.

| Species | Year | Sabine | | Galveston | | Port O'Connor | | Fort Aransas | | Port Isabel | | Coastwide | | |
|---------------------|-------------------|-------------------|-----------------|-----------|--------|---------------|--------|--------------|--------|-------------|--------|-----------|--------|-----|
| | | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | |
| FINFISHES | | | | | | | | | | | | | | |
| Atlantic croaker | 1985 ^a | ND ^b | | 22 | 145 | 42 | 139 | 17 | 145 | 9 | 149 | 23 | 142 | |
| | 1986 | 44 | 134 | 45 | 126 | 98 | 136 | 43 | 130 | 9 | 132 | 49 | 132 | |
| | 1987 | 9 | 114 | 110 | 119 | 65 | 131 | 28 | 134 | <1 | 157 | 44 | 124 | |
| | 1988 | 79 | 122 | 78 | 118 | 89 | 132 | 23 | 130 | 2 | 128 | 55 | 125 | |
| | 1989 | 64 | 115 | 117 | 117 | 75 | 128 | 28 | 128 | 6 | 137 | 60 | 121 | |
| | 1990 | 175 | 117 | 139 | 111 | 69 | 135 | 65 | 131 | 4 | 119 | 91 | 119 | |
| | 1991 | 272 | 111 | 153 | 114 | 201 | 121 | 87 | 129 | 4 | 162 | 145 | 117 | |
| | 1992 | 229 | 110 | 228 | 116 | 153 | 116 | 81 | 106 | 6 | 126 | 142 | 113 | |
| | 1993 | 437 | 111 | 200 | 110 | 74 | 123 | 91 | 121 | 10 | 144 | 162 | 113 | |
| | Black drum | 1985 ^a | ND ^b | | 0 | | 0 | | <1 | 825 | 0 | | <1 | 825 |
| | | 1986 | 0 | | <1 | 760 | <1 | 900 | 0 | 0 | 0 | | <1 | 900 |
| | | 1987 | <1 | 851 | <1 | 752 | 0 | 680 | <1 | 680 | 0 | | <1 | 741 |
| | | 1988 | 0 | | <1 | | 0 | 506 | 0 | | 0 | | <1 | 752 |
| | | 1989 | <1 | 698 | 0 | | <1 | 0 | 0 | 0 | 0 | | <1 | 631 |
| | | 1990 | 0 | | <1 | 528 | 0 | 0 | 0 | 0 | 0 | | <1 | 538 |
| | | 1991 | 0 | | <1 | 970 | 0 | 889 | 0 | 0 | 0 | | <1 | 970 |
| 1993 | | <1 | 146 | <1 | 825 | 0 | 0 | 0 | 0 | 780 | <1 | <1 | 889 | |
| Gafftopsail catfish | 1985 ^a | ND ^b | | <1 | 165 | <1 | 156 | <1 | 136 | 0 | | <1 | 160 | |
| | 1986 | 13 | 121 | <1 | 118 | <1 | 115 | <1 | 176 | 0 | | 3 | 121 | |
| | 1987 | 3 | 116 | 0 | | <1 | 158 | <1 | 134 | 0 | | <1 | 118 | |
| | 1988 | 2 | 118 | <1 | 169 | <1 | 168 | 0 | 180 | <1 | 180 | <1 | 126 | |
| | 1989 | 2 | 144 | 1 | 123 | <1 | 546 | <1 | 187 | 0 | | <1 | 143 | |
| | 1990 | 3 | 119 | <1 | 123 | 0 | | 0 | 0 | 0 | | <1 | 119 | |
| | 1991 | 1 | 145 | <1 | 170 | <1 | 181 | <1 | 178 | 0 | | <1 | 150 | |
| | 1992 | 12 | 125 | 1 | 148 | <1 | 148 | <1 | 209 | 0 | | 3 | 127 | |
| | 1993 | 6 | 123 | <1 | 129 | <1 | 182 | <1 | 145 | 0 | | 1 | 127 | |
| | Gulf menhaden | 1985 ^a | ND ^b | | 2 | 150 | 1 | 159 | 1 | 151 | 0 | | 1 | 152 |
| | | 1986 | 4 | 125 | 2 | 147 | <1 | 180 | 0 | 197 | 0 | | 1 | 135 |
| | | 1987 | 3 | 132 | 5 | 135 | 1 | 146 | <1 | 159 | 0 | | 2 | 136 |
| | | 1988 | 5 | 124 | 10 | 57 | 6 | 107 | <1 | 122 | 0 | | 4 | 87 |
| 1989 | | 1 | 137 | 1 | 144 | <1 | 131 | <1 | 177 | <1 | 51 | 1 | 138 | |
| 1990 | | 2 | 133 | 4 | 136 | 1 | 122 | 0 | 162 | 0 | | 1 | 134 | |
| 1991 | | 7 | 134 | 1 | 144 | 1 | 130 | <1 | 148 | 0 | | 2 | 135 | |
| 1992 | | 4 | 141 | 14 | 116 | 1 | 139 | 1 | 145 | 0 | | 4 | 123 | |
| 1993 | | 8 | 142 | <1 | 129 | <1 | 159 | 0 | 0 | 0 | | 2 | 141 | |
| King mackerel | | 1985 ^a | ND ^b | | <1 | 173 | 0 | | <1 | 124 | 0 | | <1 | 142 |
| | | 1986 | 0 | | <1 | 159 | 0 | 120 | 0 | 200 | 0 | | <1 | 159 |
| | | 1987 | 0 | | 0 | | <1 | 0 | <1 | 0 | 0 | | <1 | 131 |
| | | 1988 | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| | 1989 | 0 | | 0 | | <1 | 161 | <1 | 164 | 0 | | <1 | 162 | |
| | 1990 | 0 | | <1 | 201 | 0 | 223 | 0 | 0 | 0 | | <1 | 210 | |
| | 1991 | 0 | | <1 | 172 | <1 | 157 | <1 | 99 | 0 | | <1 | 132 | |
| | 1992 | 0 | | <1 | 149 | <1 | 152 | <1 | 136 | <1 | 192 | <1 | 144 | |
| | 1993 | 0 | | 0 | | 0 | 0 | <1 | 169 | 0 | | <1 | 169 | |
| | Pinfish | 1985 ^a | ND ^b | | <1 | 124 | 3 | 109 | 4 | 110 | 1 | 135 | 2 | 112 |
| 1986 | | <1 | 98 | 2 | 104 | 2 | 105 | 4 | 107 | 2 | 103 | 2 | 105 | |
| 1987 | | 0 | | <1 | 100 | 3 | 111 | 3 | 115 | <1 | 112 | 1 | 113 | |
| 1988 | | <1 | 93 | <1 | 112 | 8 | 105 | 8 | 110 | 3 | 105 | 4 | 107 | |
| 1989 | | <1 | 100 | 1 | 108 | 3 | 116 | 7 | 110 | 6 | 105 | 3 | 109 | |
| 1990 | | <1 | 86 | 1 | 111 | 4 | 110 | 18 | 105 | 2 | 105 | 5 | 105 | |
| 1991 | | <1 | 121 | 1 | 132 | 2 | 116 | 18 | 113 | 2 | 118 | 4 | 114 | |
| 1992 | | <1 | 115 | 2 | 121 | 2 | 110 | 6 | 103 | 3 | 107 | 3 | 108 | |
| 1993 | | 2 | 115 | <1 | 121 | 3 | 110 | 6 | 103 | 2 | 107 | 3 | 108 | |

Table 5. (Cont'd.)

| Species | Year | Sabine | | Calveston | | Port O'Connor | | Port Aransas | | Port Isabel | | Coastwide | |
|------------------|-------------------|-------------------|-----------------|-----------|--------|---------------|--------|--------------|--------|-------------|--------|-----------|--------|
| | | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length |
| Red drum | 1985 ^a | ND ^b | | 0 | | 0 | | <1 | 84 | 0 | | <1 | 84 |
| | 1986 | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | |
| | 1987 | 0 | | 0 | | <1 | 948 | 0 | | <1 | 42 | <1 | 520 |
| | 1988 | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | |
| | 1989 | 0 | | <1 | 1,110 | 0 | | 0 | | 0 | | <1 | 1,110 |
| | 1990 | 0 | | <1 | 61 | 0 | | 0 | | 0 | | <1 | 61 |
| | 1991 | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | |
| | 1992 | 0 | | 0 | | 0 | | 0 | | 0 | | <1 | 95 |
| | 1993 | 0 | | <1 | 1,013 | 0 | | 0 | | 0 | | <1 | 1,013 |
| | Red snapper | 1985 ^a | ND ^b | | 0 | | 0 | | 2 | 85 | 7 | 89 | 2 |
| 1986 | | 0 | | 0 | | <1 | 152 | 1 | 95 | <1 | 103 | <1 | 100 |
| 1987 | | 0 | | 0 | 68 | <1 | 88 | 1 | 122 | <1 | 83 | <1 | 107 |
| 1988 | | 0 | | 0 | | 0 | | 1 | 111 | 1 | 106 | <1 | 109 |
| 1989 | | 0 | | <1 | 74 | 2 | 87 | 4 | 87 | 3 | 90 | 2 | 88 |
| 1990 | | 0 | | 0 | | <1 | 94 | 3 | 105 | 2 | 113 | 2 | 106 |
| 1991 | | 0 | | 0 | | 0 | | 9 | 80 | 2 | 106 | 2 | 84 |
| 1992 | | 0 | | 0 | | 0 | 79 | 6 | 77 | 2 | 99 | 2 | 81 |
| 1993 | | 0 | | <1 | 126 | 1 | 76 | 2 | 77 | 3 | 98 | 1 | 88 |
| Sand seatrout | | 1985 ^a | ND ^b | | 10 | | 6 | 168 | 3 | 140 | <1 | 221 | 5 |
| | 1986 | 5 | 164 | 4 | 141 | 3 | 151 | 1 | 174 | 0 | | 3 | 154 |
| | 1987 | 7 | 131 | 6 | 133 | 5 | 134 | 2 | 162 | <1 | 108 | 4 | 135 |
| | 1988 | 3 | 148 | 5 | 114 | 11 | 129 | 1 | 184 | <1 | 137 | 4 | 130 |
| | 1989 | 22 | 133 | 41 | 110 | 16 | 127 | 7 | 155 | 2 | 123 | 18 | 122 |
| | 1990 | 50 | 136 | 8 | 126 | 7 | 139 | 2 | 118 | 1 | 118 | 14 | 135 |
| | 1991 | 28 | 130 | 12 | 143 | 7 | 146 | 12 | 129 | 1 | 153 | 12 | 135 |
| | 1992 | 41 | 132 | 11 | 138 | 6 | 148 | 5 | 131 | <1 | 161 | 13 | 135 |
| | 1993 | 45 | 129 | 7 | 131 | 15 | 116 | 10 | 112 | 2 | 121 | 16 | 124 |
| | Southern flounder | 1985 ^a | ND ^b | | 0 | | <1 | 280 | <1 | 137 | 0 | | <1 |
| 1986 | | 1 | 162 | <1 | 255 | <1 | 184 | <1 | 311 | 0 | | <1 | 173 |
| 1987 | | <1 | 256 | <1 | 197 | 0 | | <1 | 179 | <1 | 168 | <1 | 191 |
| 1988 | | <1 | 204 | 0 | | <1 | 214 | <1 | 225 | 0 | | <1 | 214 |
| 1989 | | 0 | | 0 | | <1 | 210 | <1 | 298 | 0 | | <1 | 239 |
| 1990 | | <1 | 187 | 0 | | <1 | 212 | <1 | 164 | <1 | 250 | <1 | 197 |
| 1991 | | <1 | 286 | <1 | 260 | <1 | 194 | <1 | 188 | 0 | | <1 | 220 |
| 1992 | | <1 | 143 | <1 | 240 | 0 | | <1 | 284 | <1 | 418 | <1 | 270 |
| 1993 | | <1 | 124 | 0 | | 0 | | <1 | 279 | <1 | | <1 | 201 |
| Spanish mackerel | | 1985 ^a | ND ^b | | 0 | | 0 | | 0 | | 0 | | 0 |
| | 1986 | <1 | 200 | 0 | | 0 | | 0 | | 0 | | <1 | 200 |
| | 1987 | <1 | 93 | <1 | 183 | 0 | | <1 | 258 | 0 | | <1 | 203 |
| | 1988 | <1 | 166 | <1 | 178 | <1 | 182 | <1 | 110 | <1 | 200 | <1 | 180 |
| | 1989 | <1 | 206 | <1 | 172 | <1 | 175 | <1 | 175 | 0 | | <1 | 182 |
| | 1990 | <1 | 174 | <1 | 176 | <1 | 225 | <1 | 192 | 0 | | <1 | 180 |
| | 1991 | 1 | 184 | 1 | 144 | <1 | 144 | <1 | 134 | 0 | | <1 | 168 |
| | 1992 | <1 | 158 | <1 | 163 | <1 | 181 | <1 | 164 | 0 | | <1 | 168 |
| | 1993 | 1 | 167 | <1 | 188 | 0 | | <1 | 237 | 0 | | <1 | 190 |
| | Spot | 1985 ^a | ND ^b | | 3 | | 20 | 130 | 21 | 141 | 1 | 142 | 11 |
| 1986 | | 3 | 124 | 8 | 128 | 7 | 124 | 25 | 123 | 2 | 125 | 9 | 124 |
| 1987 | | 5 | 140 | 9 | 126 | 4 | 170 | 22 | 129 | <1 | 125 | 8 | 129 |
| 1988 | | 4 | 115 | 7 | 116 | 23 | 128 | 23 | 122 | 3 | 110 | 12 | 123 |
| 1989 | | 6 | 120 | 27 | 108 | 18 | 124 | 48 | 121 | 4 | 121 | 21 | 118 |
| 1990 | | 9 | 123 | 25 | 121 | 102 | 125 | 93 | 117 | 4 | 112 | 47 | 125 |
| 1991 | | 18 | 117 | 4 | 125 | 67 | 122 | 37 | 129 | 1 | 129 | 26 | 123 |
| 1992 | | 5 | 127 | 12 | 126 | 6 | 122 | 10 | 126 | 2 | 117 | 7 | 125 |
| 1993 | | 7 | 122 | 14 | 119 | 4 | 126 | 19 | 125 | 4 | 138 | 9 | 124 |

Table 5. (Cont'd.)

| Species | Year | Sabine | | Galveston | | Fort O'Connor | | Fort Aransas | | Fort Isabel | | Coastwide | | | |
|------------------|-------------------|-------------------|-------------------|-----------------|--------|---------------|--------|--------------|--------|-------------|--------|-----------|--------|-----|-----|
| | | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | | |
| Spotted seatrout | 1985 ^a | ND ^b | | 0 | | 0 | | <1 | 140 | 0 | | <1 | 140 | | |
| | 1986 | <1 | 163 | <1 | 172 | <1 | 165 | 0 | | 0 | | <1 | 165 | | |
| | 1987 | <1 | 178 | 0 | | 0 | | 0 | | 0 | | <1 | 178 | | |
| | 1988 | 0 | | <1 | 65 | <1 | 110 | 0 | | 0 | | <1 | 88 | | |
| | 1989 | <1 | 98 | 0 | | <1 | 173 | 0 | | 0 | | <1 | 137 | | |
| | 1990 | <1 | 110 | <1 | 160 | <1 | 122 | <1 | 144 | 0 | | <1 | 132 | | |
| | 1991 | 0 | | 0 | | <1 | 148 | 0 | | 0 | | <1 | 148 | | |
| | 1992 | <1 | 112 | 0 | | <1 | 0 | 0 | | 0 | | <1 | 112 | | |
| | 1993 | 0 | | 0 | | <1 | 160 | 0 | | 0 | | <1 | 160 | | |
| Total finfishes | 1985 ^a | ND ^b | | 148 | | 188 | | 227 | 114 | 130 | 101 | 174 | 114 | | |
| | 1986 | 159 | 122 | 207 | 118 | 215 | 123 | 292 | 119 | 123 | 110 | 190 | 120 | | |
| | 1987 | 158 | 98 | 289 | 111 | 229 | 118 | 226 | 114 | 80 | 96 | 199 | 110 | | |
| | 1988 | 153 | 120 | 273 | 104 | 379 | 114 | 291 | 106 | 110 | 103 | 234 | 110 | | |
| | 1989 | 178 | 114 | 301 | 111 | 350 | 118 | 354 | 113 | 106 | 108 | 261 | 114 | | |
| | 1990 | 477 | 121 | 355 | 113 | 464 | 138 | 337 | 115 | 180 | 103 | 346 | 122 | | |
| | 1991 | 427 | 117 | 322 | 125 | 666 | 115 | 458 | 108 | 124 | 102 | 404 | 115 | | |
| | 1992 | 524 | 115 | 499 | 116 | 523 | 111 | 332 | 103 | 128 | 96 | 406 | 111 | | |
| | 1993 | 666 | 117 | 324 | 116 | 376 | 102 | 381 | 104 | 135 | 106 | 377 | 110 | | |
| | SHELLFISHES | Blue crab | 1985 ^a | ND ^b | | 105 | 1 | 134 | 1 | 127 | 127 | <1 | 144 | <1 | 127 |
| | | | 1986 | 4 | 96 | 6 | 105 | 1 | 141 | 1 | 145 | 1 | 123 | 3 | 110 |
| | | | 1987 | 3 | 96 | 1 | 112 | 2 | 105 | <1 | 142 | <1 | 140 | 1 | 106 |
| | | | 1988 | 2 | 85 | <1 | 104 | 1 | 113 | 1 | 128 | <1 | 160 | 1 | 105 |
| 1989 | | | 4 | 61 | 2 | 72 | 1 | 130 | <1 | 134 | <1 | 146 | 1 | 78 | |
| 1990 | | | 15 | 80 | 4 | 63 | 1 | 118 | 1 | 126 | 1 | 127 | 4 | 84 | |
| 1991 | | | 19 | 72 | 6 | 58 | 1 | 102 | 2 | 114 | <1 | 121 | 6 | 73 | |
| 1992 | | | 7 | 58 | 1 | 104 | 1 | 85 | 1 | 95 | <1 | 123 | 2 | 69 | |
| 1993 | | | 5 | 78 | 1 | 83 | 2 | 116 | 1 | 130 | <1 | 102 | 2 | 95 | |
| Brown shrimp | | 1985 ^a | ND ^b | | 7 | 103 | 7 | 125 | 47 | 109 | 18 | 106 | 19 | 109 | |
| | | 1986 | 10 | 107 | 13 | 99 | 6 | 114 | 10 | 105 | 6 | 110 | 9 | 105 | |
| | | 1987 | 7 | 104 | 24 | 104 | 9 | 108 | 14 | 106 | 1 | 118 | 11 | 106 | |
| | | 1988 | 15 | 102 | 5 | 109 | 24 | 103 | 28 | 106 | <1 | 116 | 15 | 104 | |
| | | 1989 | 33 | 103 | 50 | 96 | 56 | 105 | 140 | 95 | 12 | 94 | 58 | 98 | |
| | | 1990 | 34 | 101 | 10 | 108 | 55 | 107 | 58 | 114 | 20 | 106 | 36 | 108 | |
| | | 1991 | 12 | 90 | 2 | 102 | 12 | 93 | 9 | 101 | 17 | 123 | 10 | 104 | |
| | | 1992 | 9 | 91 | 20 | 103 | 4 | 96 | 19 | 92 | 2 | 115 | 11 | 97 | |
| | | 1993 | 23 | 100 | 21 | 97 | 13 | 105 | 9 | 97 | 4 | 109 | 14 | 100 | |
| | | Pink shrimp | 1985 ^a | ND ^b | | <1 | 120 | <1 | 130 | 1 | 119 | 1 | 108 | 1 | 116 |
| 1986 | 0 | | | <1 | 124 | 2 | 110 | 4 | 105 | 3 | 118 | 2 | 111 | | |
| 1987 | 0 | | | 0 | | 1 | 114 | 5 | 102 | 1 | 124 | 1 | 108 | | |
| 1988 | <1 | | 87 | 0 | | 1 | 108 | 7 | 103 | 1 | 125 | 2 | 106 | | |
| 1989 | 0 | | | <1 | 105 | 1 | 103 | 7 | 100 | 4 | 117 | 2 | 105 | | |
| 1990 | 0 | | | <1 | 104 | 1 | 101 | 2 | 118 | 3 | 117 | 1 | 114 | | |
| 1991 | <1 | | 101 | <1 | 99 | 1 | 109 | 6 | 112 | 2 | 118 | 2 | 112 | | |
| 1992 | <1 | | 88 | <1 | 79 | <1 | 114 | 4 | 102 | <1 | 122 | 1 | 104 | | |
| 1993 | 0 | | | <1 | 104 | 4 | 99 | 5 | 104 | 9 | 112 | 4 | 107 | | |

Table 5. (Cont'd.)

| Species | Year | Sabine | | Galveston | | Port O'Connor | | Port Aransas | | Port Isabel | | Coastwide | |
|--------------|-------------------|-----------------|--------|-----------|--------|---------------|--------|--------------|--------|-------------|--------|-----------|--------|
| | | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length |
| White shrimp | 1985 ^a | ND ^b | | 53 | 110 | 26 | 124 | 11 | 126 | 1 | 105 | 24 | 115 |
| | 1986 | 41 | 101 | 53 | 101 | 15 | 120 | 8 | 124 | 2 | 137 | 24 | 105 |
| | 1987 | 26 | 105 | 14 | 109 | 16 | 112 | 8 | 119 | 1 | 121 | 13 | 110 |
| | 1988 | 14 | 105 | 17 | 100 | 19 | 110 | 9 | 116 | <1 | 133 | 12 | 107 |
| | 1989 | 21 | 102 | 25 | 106 | 22 | 108 | 14 | 113 | 1 | 122 | 17 | 107 |
| | 1990 | 18 | 104 | 11 | 115 | 15 | 118 | 6 | 136 | 2 | 136 | 10 | 115 |
| | 1991 | 28 | 105 | 10 | 117 | 30 | 106 | 6 | 127 | 1 | 122 | 15 | 109 |
| | 1992 | 51 | 98 | 31 | 108 | 11 | 112 | 10 | 118 | 1 | 145 | 21 | 105 |
| | 1993 | 61 | 101 | 10 | 108 | 11 | 121 | 5 | 134 | 1 | 133 | 17 | 106 |

^aValues include Feb-Dec only off Port Aransas and Aug-Dec only off all other areas.

^bValues include Jun-Dec only.

Table 6. Annual mean catch rates (No./h) and mean total lengths (mm) by size class^a of Eastern oyster caught with 46.0-cm wide dredges on "reef" stations in Texas bay systems during 1984-93. Blank indicates no measurement taken; ND = no data.

| Size Class | Year | Galveston | | Matagorda | | San Antonio | | Arkansas | | Coastwide | | |
|------------|-------|-----------|--------|-----------|--------|-------------|--------|----------|--------|-----------|--------|----|
| | | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | |
| Spat | 1984 | 491 | | ND | | ND | | ND | | 491 | | |
| | 1985 | 891 | | ND | | ND | | ND | | 891 | | |
| | 1986 | 1,010 | | 764 | | 499 | | 551 | | 770 | | |
| | 1987 | 1,054 | | 654 | | 66 | | 4,269 | | 1,382 | | |
| | 1988 | 1,440 | | 938 | | 439 | | 1,772 | | 1,202 | | |
| | 1989 | 1,322 | | 2,019 | | 1,864 | | 3,071 | | 1,880 | | |
| | 1990 | 2,147 | | 1,289 | | 1,117 | | 1,611 | | 1,685 | | |
| | 1991 | 1,458 | | 718 | | 894 | | 410 | | 1,022 | | |
| | 1992 | 3,083 | | 454 | | 268 | | 82 | | 1,487 | | |
| | 1993 | 3,194 | | 139 | | 122 | | 0 | | 1,440 | | |
| | Small | 1984 | 1,705 | 47 | ND | | ND | | ND | | 1,705 | 47 |
| | | 1985 | 2,096 | 54 | ND | | ND | | ND | | 2,095 | 54 |
| | | 1986 | 1,316 | 54 | 382 | 51 | 565 | 58 | 1,273 | 51 | 1,001 | 54 |
| 1987 | | 1,070 | 51 | 555 | 51 | 240 | 55 | 2,499 | 50 | 1,077 | 51 | |
| 1988 | | 1,500 | 53 | 580 | 52 | 235 | 42 | 2,187 | 52 | 1,208 | 52 | |
| 1989 | | 1,086 | 47 | 706 | 48 | 1,985 | 50 | 2,278 | 49 | 1,463 | 48 | |
| 1990 | | 2,996 | 45 | 417 | 48 | 1,401 | 53 | 1,495 | 45 | 1,971 | 46 | |
| 1991 | | 4,927 | 48 | 1,040 | 51 | 538 | 54 | 1,016 | 48 | 2,615 | 49 | |
| 1992 | | 4,601 | 51 | 622 | 52 | 92 | 48 | 263 | 54 | 2,168 | 51 | |
| 1993 | | 3,895 | 54 | 396 | 54 | 500 | 51 | 296 | 59 | 1,926 | 54 | |
| Market | | 1984 | 447 | 91 | ND | | ND | | ND | | 447 | 91 |
| | | 1985 | 674 | 88 | ND | | ND | | ND | | 674 | 88 |
| | | 1986 | 617 | 88 | 212 | 92 | 444 | 92 | 191 | 86 | 438 | 89 |
| | 1987 | 370 | 91 | 167 | 91 | 238 | 93 | 411 | 86 | 323 | 90 | |
| | 1988 | 397 | 89 | 201 | 91 | 23 | 89 | 402 | 87 | 284 | 88 | |
| | 1989 | 232 | 90 | 177 | 90 | 414 | 90 | 282 | 85 | 275 | 89 | |
| | 1990 | 179 | 88 | 114 | 89 | 445 | 88 | 99 | 83 | 215 | 88 | |
| | 1991 | 502 | 87 | 216 | 89 | 377 | 91 | 65 | 84 | 349 | 88 | |
| | 1992 | 796 | 87 | 164 | 88 | 24 | 93 | 40 | 83 | 384 | 87 | |
| | 1993 | 1,346 | 88 | 204 | 92 | 74 | 87 | 161 | 87 | 664 | 87 | |

^a Spat (5-25 mm), small (26-75 mm), market (\geq 76 mm).

Table 7. Seasonal (May-Nov) mean catch rates (No./ha) and mean total lengths (mm) of select finfishes and shellfishes caught with 60.9-m beach seines in 5 Texas gulf shoreline areas during 1987-93. Blank indicates no measurement taken; ND = no data.

| Species | Year | Gulf-17 | | Gulf-18 | | Gulf-19 | | Gulf-20 | | Gulf-21 | | Coastwide | |
|-------------------|-------------------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|-----------|--------|
| | | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length |
| FINFISHES | | | | | | | | | | | | | |
| Atlantic croaker | 1987 ^a | 2 | 267 | <1 | 306 | <1 | 239 | 0 | 0 | 0 | 0 | 1 | 267 |
| | 1988 | 1 | 264 | <1 | 252 | <1 | 260 | 0 | 0 | 292 | <1 | <1 | 262 |
| | 1989 | 2 | 257 | <1 | 263 | <1 | 205 | 0 | 0 | 0 | <1 | <1 | 253 |
| | 1990 | 1 | 260 | <1 | 250 | 0 | 0 | 0 | 0 | 230 | <1 | <1 | 259 |
| | 1991 | 2 | 257 | <1 | 224 | <1 | 251 | 238 | 0 | 0 | 0 | <1 | 256 |
| | 1992 | <1 | 307 | <1 | 233 | <1 | 255 | 0 | 0 | 0 | 0 | <1 | 264 |
| | 1993 | 1 | 255 | 0 | 233 | <1 | 289 | <1 | <1 | 290 | <1 | <1 | 270 |
| Black drum | 1987 ^a | 1 | 344 | <1 | 215 | 1 | 287 | <1 | <1 | 236 | 1 | 293 | |
| | 1988 | 1 | 240 | 1 | 226 | 1 | 281 | <1 | <1 | 0 | 1 | 253 | |
| | 1989 | 1 | 286 | 2 | 262 | 2 | 249 | 1 | 236 | 216 | 1 | 256 | |
| | 1990 | 2 | 318 | 2 | 243 | 2 | 300 | 2 | 276 | 280 | 2 | 292 | |
| | 1991 | 3 | 264 | 1 | 231 | 1 | 257 | 11 | 240 | 233 | 3 | 245 | |
| | 1992 | 1 | 258 | 3 | 254 | 2 | 305 | 2 | 287 | 340 | 2 | 286 | |
| | 1993 | 1 | 334 | 2 | 303 | 1 | 354 | 1 | 340 | 394 | 1 | 339 | |
| | 1987 ^a | 0 | 158 | 0 | 166 | 0 | 197 | 0 | 0 | 226 | 0 | 0 | 159 |
| | 1988 | 7 | 158 | 1 | 158 | <1 | 63 | <1 | <1 | 0 | <1 | <1 | 69 |
| | 1989 | 0 | 0 | <1 | 214 | 0 | 187 | <1 | <1 | 234 | <1 | <1 | 232 |
| 1990 | 0 | 0 | <1 | 211 | <1 | 187 | <1 | <1 | 0 | <1 | <1 | 206 | |
| 1991 | 0 | 0 | <1 | 197 | 0 | 161 | 0 | 0 | 0 | 0 | <1 | 197 | |
| 1992 | 0 | 0 | <1 | 209 | <1 | 161 | 0 | 0 | 0 | 0 | <1 | 198 | |
| 1993 | 0 | 0 | <1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <1 | 0 | |
| Gulf menhaden | 1987 ^a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1988 | 7 | 158 | 1 | 166 | <1 | 197 | <1 | <1 | 226 | 2 | 159 | |
| | 1989 | 0 | 0 | <1 | 158 | <1 | 63 | <1 | <1 | 0 | <1 | <1 | 69 |
| | 1990 | 0 | 0 | <1 | 214 | 0 | 187 | <1 | <1 | 234 | <1 | <1 | 232 |
| | 1991 | 0 | 0 | <1 | 211 | <1 | 187 | <1 | <1 | 0 | <1 | <1 | 206 |
| | 1992 | 0 | 0 | <1 | 197 | 0 | 161 | 0 | 0 | 0 | 0 | <1 | 197 |
| | 1993 | 0 | 0 | <1 | 209 | <1 | 161 | 0 | 0 | 0 | 0 | <1 | 198 |
| | 1987 ^a | 0 | 0 | 0 | 0 | 1 | 337 | <1 | <1 | 340 | <1 | <1 | 338 |
| | 1988 | <1 | 460 | <1 | 324 | <1 | 370 | <1 | <1 | 702 | <1 | <1 | 459 |
| | 1989 | <1 | 552 | <1 | 501 | <1 | 391 | <1 | <1 | 352 | <1 | <1 | 485 |
| 1990 | 0 | 321 | <1 | 320 | 1 | 317 | 2 | 320 | 356 | <1 | <1 | 384 | |
| 1991 | 4 | 436 | 1 | 496 | 1 | 415 | 2 | 320 | 375 | <1 | <1 | 320 | |
| 1992 | <1 | 438 | <1 | 337 | <1 | 498 | <1 | <1 | 365 | <1 | <1 | 417 | |
| 1993 | <1 | 0 | <1 | 0 | 0 | 0 | 0 | 0 | 330 | <1 | <1 | 397 | |
| Sand seatrout | 1987 ^a | 1 | 328 | 0 | 276 | 0 | 298 | 0 | 0 | 286 | <1 | <1 | 328 |
| | 1988 | <1 | 322 | <1 | 0 | <1 | 0 | 0 | 0 | 0 | <1 | <1 | 297 |
| | 1989 | 0 | 0 | <1 | 284 | 0 | 287 | 0 | 0 | 0 | <1 | <1 | 353 |
| | 1990 | <1 | 291 | <1 | 251 | <1 | 319 | 0 | 0 | 0 | <1 | <1 | 287 |
| | 1991 | 0 | 0 | <1 | 301 | 0 | 0 | 0 | 0 | 0 | <1 | <1 | 307 |
| | 1992 | 0 | 0 | <1 | 0 | 0 | 0 | 0 | 0 | 0 | <1 | <1 | 301 |
| | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | <1 | 360 | 0 | <1 | <1 | 360 |
| Sheepshead | 1987 ^a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1988 | <1 | 416 | <1 | 445 | <1 | 292 | <1 | <1 | 0 | <1 | <1 | 366 |
| | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <1 | <1 | 370 |
| | 1990 | 0 | 0 | <1 | 375 | <1 | 312 | <1 | <1 | 298 | <1 | <1 | 344 |
| | 1991 | 0 | 0 | <1 | 270 | <1 | 328 | 0 | 0 | 460 | <1 | <1 | 314 |
| | 1992 | 0 | 0 | <1 | 458 | <1 | 327 | 0 | 0 | 441 | <1 | <1 | 382 |
| | 1993 | 0 | 0 | <1 | 361 | <1 | 413 | 0 | 0 | 0 | <1 | <1 | 372 |
| Southern flounder | 1987 ^a | 0 | 0 | 1 | 250 | 0 | 203 | <1 | <1 | 313 | <1 | <1 | 262 |
| | 1988 | <1 | 279 | 1 | 261 | <1 | 270 | <1 | <1 | 434 | <1 | <1 | 265 |
| | 1989 | <1 | 375 | <1 | 276 | 0 | 270 | <1 | <1 | 0 | <1 | <1 | 319 |
| | 1990 | <1 | 264 | 1 | 220 | <1 | 193 | <1 | <1 | 217 | <1 | <1 | 231 |
| | 1991 | 1 | 308 | 1 | 267 | <1 | 265 | 0 | 0 | 0 | <1 | <1 | 279 |
| | 1992 | <1 | 465 | <1 | 270 | <1 | 309 | <1 | <1 | 192 | <1 | <1 | 303 |
| | 1993 | <1 | 381 | 1 | 338 | <1 | 324 | 0 | 0 | 177 | <1 | <1 | 347 |
| Spanish mackerel | 1987 ^a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1988 | 0 | 0 | 0 | 606 | 0 | 0 | 0 | 0 | 392 | <1 | <1 | 392 |
| | 1989 | 0 | 0 | <1 | 0 | 0 | 0 | 0 | 0 | 0 | <1 | <1 | 606 |

Table 7. (Cont'd.)

| Species | Year | Gulf-17 | | Gulf-18 | | Gulf-19 | | Gulf-20 | | Gulf-21 | | Coastwide | | |
|-------------------------------|-------------------|-------------------|--------|---------|--------|---------|--------|---------|--------|---------|--------|-----------|--------|-----|
| | | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | |
| Spanish mackerel (Cont'd.) | 1990 | 0 | | 0 | 415 | <1 | 477 | <1 | 521 | <1 | 521 | <1 | 486 | |
| | 1991 | 0 | 264 | <1 | 353 | <1 | 0 | 0 | 0 | 0 | 0 | <1 | 303 | |
| | 1992 | 0 | 0 | <1 | 54 | <1 | 0 | 0 | 0 | 0 | 0 | <1 | 135 | |
| | 1993 | 0 | 415 | <1 | 143 | <1 | 0 | 0 | 0 | 0 | 0 | <1 | 209 | |
| Spot | 1987 ^a | 2 | 244 | 2 | 248 | <1 | 214 | 2 | 214 | 0 | 0 | 1 | 235 | |
| | 1988 | 3 | 245 | 1 | 235 | <1 | 243 | 1 | 243 | <1 | 237 | 1 | 242 | |
| | 1989 | <1 | 210 | 1 | 230 | <1 | 230 | <1 | 236 | 2 | 236 | <1 | 237 | |
| | 1990 | <1 | 319 | <1 | 224 | <1 | 212 | 1 | 238 | 1 | 238 | <1 | 227 | |
| | 1991 | <1 | 238 | 1 | 210 | <1 | 217 | 1 | 220 | <1 | 230 | <1 | 220 | |
| | 1992 | <1 | 231 | 1 | 235 | <1 | 241 | 1 | 257 | <1 | 257 | <1 | 236 | |
| | 1993 | 1 | 229 | <1 | 228 | <1 | 229 | 2 | 267 | 2 | 267 | 1 | 240 | |
| | Spotted seatrout | 1987 ^a | <1 | 408 | <1 | 403 | <1 | 516 | <1 | 469 | 0 | 0 | <1 | 417 |
| | | 1988 | 3 | 410 | 2 | 431 | 1 | 440 | <1 | 414 | <1 | 414 | 2 | 414 |
| | | 1989 | 1 | 419 | 3 | 431 | <1 | 428 | 1 | 445 | <1 | 428 | 1 | 426 |
| 1990 | | 2 | 440 | 2 | 417 | <1 | 431 | <1 | 437 | 1 | 437 | 1 | 437 | |
| 1991 | | 3 | 406 | 2 | 441 | 1 | 399 | 1 | 424 | <1 | 424 | 1 | 415 | |
| 1992 | | <1 | 432 | 2 | 428 | 2 | 423 | 1 | 489 | 1 | 426 | 1 | 426 | |
| 1993 | | 1 | 430 | 1 | 432 | 1 | 420 | 1 | 501 | <1 | 501 | 1 | 438 | |
| Striped mullet | | 1987 ^a | 13 | 393 | 5 | 358 | 1 | 343 | 5 | 343 | 17 | 349 | 7 | 368 |
| | | 1988 | 19 | 362 | 32 | 342 | 7 | 344 | 14 | 356 | 5 | 346 | 14 | 351 |
| | | 1989 | 39 | 370 | 28 | 344 | 3 | 360 | 1 | 360 | 8 | 341 | 15 | 358 |
| | 1990 | 44 | 350 | 52 | 336 | 5 | 349 | 6 | 349 | 6 | 376 | 21 | 344 | |
| | 1991 | 23 | 345 | 65 | 336 | 34 | 326 | 25 | 326 | 13 | 326 | 32 | 330 | |
| | 1992 | 34 | 343 | 51 | 341 | 42 | 355 | 25 | 344 | 10 | 344 | 34 | 343 | |
| | 1993 | 22 | 350 | 24 | 341 | 14 | 357 | 10 | 355 | 13 | 355 | 16 | 345 | |
| | Total finfishes | 1987 ^a | 23 | 327 | 9 | 305 | 6 | 295 | 10 | 295 | 18 | 332 | 12 | 312 |
| | | 1988 | 54 | 322 | 44 | 326 | 43 | 189 | 40 | 189 | 11 | 343 | 41 | 237 |
| | | 1989 | 52 | 341 | 48 | 288 | 20 | 100 | 39 | 100 | 15 | 298 | 34 | 254 |
| 1990 | | 59 | 337 | 63 | 314 | 16 | 269 | 18 | 269 | 13 | 323 | 32 | 319 | |
| 1991 | | 50 | 322 | 80 | 309 | 46 | 284 | 46 | 284 | 20 | 324 | 48 | 304 | |
| 1992 | | 37 | 338 | 65 | 316 | 55 | 316 | 35 | 316 | 13 | 334 | 44 | 323 | |
| 1993 | | 30 | 338 | 32 | 324 | 21 | 283 | 22 | 283 | 23 | 314 | 25 | 321 | |
| SHELLFISHES | | 1987 ^a | <1 | 118 | <1 | 159 | 0 | 138 | 0 | 138 | 0 | 126 | <1 | 129 |
| | | 1988 | 2 | 117 | <1 | 143 | <1 | 137 | <1 | 126 | <1 | 126 | 1 | 125 |
| | | 1989 | 2 | 137 | 2 | 135 | <1 | 140 | 0 | 153 | <1 | 153 | 1 | 137 |
| | 1990 | 5 | 139 | 7 | 136 | <1 | 132 | <1 | 128 | <1 | 128 | 2 | 137 | |
| | 1991 | 7 | 143 | 20 | 137 | 5 | 123 | 1 | 131 | 1 | 131 | 6 | 136 | |
| | 1992 | 3 | 133 | 3 | 126 | 2 | 142 | 1 | 132 | 1 | 132 | 2 | 136 | |
| | 1993 | 1 | 133 | 3 | 132 | 1 | 132 | <1 | 127 | <1 | 127 | 1 | 133 | |
| | Blue crab | 1987 ^a | <1 | 118 | <1 | 159 | 0 | 138 | 0 | 138 | 0 | 126 | <1 | 129 |
| | | 1988 | 2 | 117 | <1 | 143 | <1 | 137 | <1 | 126 | <1 | 126 | 1 | 125 |

^a Values include Oct-Nov only.

Table 8. Seasonal (May-Nov) mean catch rates (No./ha) and mean total lengths (mm) of select finfishes and shellfishes caught with 18.3-m bag seines in 5 Texas gulf shoreline areas during 1987-93. Blank indicates no measurement taken.

| Species | Year | Gulf-17 | | Gulf-18 | | Gulf-19 | | Gulf-20 | | Gulf-21 | | Coastwide | |
|-------------------|-------------------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|-----------|--------|
| | | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length |
| FINFISHES | | | | | | | | | | | | | |
| Atlantic croaker | 1987 ^a | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | |
| | 1988 | 30 | 37 | 1 | 62 | 0 | 64 | 0 | 0 | 0 | 0 | 7 | 39 |
| | 1989 | 3 | 32 | 0 | | 0 | | 0 | 0 | 0 | 0 | 1 | 32 |
| | 1990 | 1 | 171 | 0 | 84 | 0 | | 0 | 22 | 2 | 157 | 1 | 127 |
| | 1991 | 50 | 31 | 1 | 150 | 0 | 150 | 0 | 31 | 0 | | 13 | 33 |
| | 1992 | 0 | | 1 | 91 | 1 | 61 | 0 | 0 | 0 | 0 | 1 | 70 |
| | 1993 | 1 | 193 | 4 | 113 | 0 | | 0 | 0 | 2 | 25 | 1 | 119 |
| Black drum | 1987 ^a | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | |
| | 1988 | 1 | 111 | 1 | 104 | 0 | 168 | 0 | 0 | 0 | 0 | 0 | 132 |
| | 1989 | 2 | 170 | 0 | | 0 | | 0 | 0 | 1 | 182 | <1 | 170 |
| | 1990 | 4 | 154 | 6 | 142 | 1 | 114 | 0 | 0 | 0 | 0 | 2 | 143 |
| | 1991 | 3 | 151 | 2 | 151 | 1 | 193 | 0 | 0 | 0 | 0 | 1 | 162 |
| | 1992 | 4 | 159 | 1 | 179 | 0 | | 0 | 0 | 0 | 0 | 1 | 160 |
| | 1993 | 2 | 122 | 0 | | 0 | | 0 | 0 | 0 | 0 | 1 | 122 |
| Gulf menhaden | 1987 ^a | 0 | | 0 | | 4 | 48 | 0 | 0 | 0 | 0 | 1 | 48 |
| | 1988 | 2 | 93 | 22 | 87 | 5 | 87 | 0 | 28 | 0 | 0 | 10 | 63 |
| | 1989 | 2 | 86 | 6 | 76 | 9 | 100 | 0 | 0 | 2 | 74 | 5 | 92 |
| | 1990 | 3 | 59 | 0 | | 5 | 57 | 1 | 1 | 17 | 81 | 5 | 68 |
| | 1991 | 0 | | 3 | 46 | 2 | 71 | 0 | 0 | 0 | 0 | 1 | 62 |
| | 1992 | 1 | 91 | 9 | 72 | 4 | 50 | 0 | 0 | 0 | 0 | 3 | 63 |
| | 1993 | 13 | 39 | 9 | 87 | 7 | 70 | 0 | 0 | 0 | 0 | 7 | 59 |
| | 1987 ^a | 0 | | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1988 | 0 | | 0 | | 0 | | 0 | 0 | 2 | 67 | <1 | 67 |
| | 1989 | 0 | | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| 1990 | 0 | | 0 | | 3 | 48 | 0 | 0 | 0 | 0 | 1 | 48 | |
| 1991 | 0 | | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | |
| 1992 | 0 | | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | |
| 1993 | 0 | | 0 | | 0 | 45 | 0 | 0 | 0 | 0 | <1 | 45 | |
| Pinfish | 1987 ^a | 0 | | 0 | | 1 | 85 | 0 | 0 | 0 | 0 | <1 | 85 |
| | 1988 | 0 | | 1 | 100 | 1 | 122 | 0 | 0 | 103 | 105 | 12 | 105 |
| | 1989 | 0 | | 0 | | <1 | 69 | 0 | 0 | 0 | <1 | <1 | 69 |
| | 1990 | 0 | | 0 | | 1 | 97 | <1 | <1 | 2 | 133 | 1 | 101 |
| | 1991 | 0 | | 2 | 98 | 26 | 71 | 1 | 1 | 27 | 67 | 12 | 70 |
| | 1992 | 1 | 68 | 1 | 125 | 0 | | 0 | 0 | 1 | 62 | <1 | 77 |
| | 1993 | 1 | 66 | 5 | 89 | 1 | 127 | 0 | 0 | 6 | 79 | 2 | 88 |
| | 1987 ^a | 0 | | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1988 | 0 | | 12 | 48 | 1 | 61 | 0 | 0 | 0 | 0 | 2 | 50 |
| | 1989 | 11 | 44 | 0 | | 0 | | 0 | 0 | 0 | 0 | 3 | 44 |
| 1990 | 0 | | 0 | | <1 | 124 | 0 | 0 | 0 | 0 | <1 | 124 | |
| 1991 | 5 | 31 | 2 | 40 | 6 | 86 | 0 | 0 | 0 | 0 | 3 | 64 | |
| 1992 | 2 | 34 | <1 | 42 | 0 | | 0 | 0 | 0 | 0 | 1 | 35 | |
| 1993 | 74 | 65 | 0 | | <1 | 96 | 0 | 0 | 0 | 0 | 17 | 65 | |
| Southern flounder | 1987 ^a | 0 | | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1988 | 0 | | 5 | 107 | 1 | 126 | 0 | 0 | 0 | 0 | 0 | 112 |
| | 1989 | 1 | 114 | 10 | 91 | 0 | | 0 | 0 | 0 | 0 | 2 | 95 |
| | 1990 | 0 | | 2 | 107 | 1 | 183 | 0 | 0 | 0 | 0 | 1 | 151 |
| | 1991 | 0 | | 0 | | 0 | | 0 | 2 | 0 | 0 | <1 | 102 |
| | 1992 | 1 | 134 | 11 | 120 | 0 | | 2 | 102 | 0 | 162 | 3 | 116 |
| | 1993 | 4 | 135 | 11 | 110 | 0 | | 4 | 90 | 0 | 0 | 2 | 119 |
| Spanish mackerel | 1987 ^a | 41 | 50 | 0 | 59 | 0 | | 0 | 0 | 0 | 0 | 9 | 50 |
| | 1988 | 0 | | 1 | | 2 | 53 | 0 | 0 | 2 | 110 | 1 | 64 |

Table 8. (Cont'd.)

| Species | Year | Gulf-17 | | Gulf-18 | | Gulf-19 | | Gulf-20 | | Gulf-21 | | Coastwide | |
|-------------------------------|-------------------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|-----------|--------|
| | | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length | No./ha | Length |
| Spanish mackerel (Cont'd.) | 1989 | 0 | | 6 | 37 | 0 | | 8 | 60 | 0 | | 2 | 51 |
| | 1990 | 0 | | 1 | 25 | 2 | 35 | 0 | | 0 | | 1 | 34 |
| | 1991 | 0 | | <1 | 40 | 0 | | 0 | | 0 | | <1 | 40 |
| | 1992 | 0 | | 0 | | 0 | | 1 | 55 | 0 | | <1 | 55 |
| 1993 | 0 | | 0 | | 1 | 54 | 14 | 25 | 0 | | 3 | 27 | |
| Spot | 1987 ^a | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | |
| | 1988 | 0 | | 1 | 80 | 0 | | 0 | | 52 | 92 | 6 | 91 |
| | 1989 | 0 | | 0 | | 1 | 78 | 0 | | 2 | 104 | <1 | 89 |
| | 1990 | 1 | 182 | 0 | | 1 | 86 | <1 | 66 | 0 | | 0 | 119 |
| 1991 | 0 | | <1 | 182 | 0 | | <1 | 64 | 0 | | <1 | 122 | |
| 1992 | 1 | 109 | 0 | | 0 | | 1 | 26 | 0 | | 0 | 81 | |
| 1993 | 0 | | 0 | | 9 | 87 | 0 | | 4 | 81 | 3 | 87 | |
| Striped mullet | 1987 ^a | 7 | 26 | 0 | | 0 | | 2 | 100 | 14 | 146 | 4 | 84 |
| | 1988 | 50 | 97 | 36 | 115 | 22 | 59 | 1 | 31 | 0 | | 24 | 88 |
| | 1989 | 253 | 86 | 42 | 90 | 15 | 187 | 1 | 93 | 3 | 191 | 69 | 95 |
| | 1990 | 49 | 66 | 86 | 79 | 3 | 32 | 10 | 32 | 5 | 155 | 27 | 75 |
| 1991 | 18 | 173 | 141 | 130 | 23 | 140 | 1 | 144 | 2 | 106 | 32 | 138 | |
| 1992 | 11 | 70 | 10 | 138 | 4 | 53 | 2 | 53 | 3 | 127 | 6 | 89 | |
| 1993 | 5 | 160 | 5 | 62 | 5 | 159 | 4 | 64 | 0 | | 4 | 128 | |
| Total finfishes | 1987 ^a | 344 | 66 | 449 | 60 | 475 | 73 | 668 | 45 | 2,142 | 83 | 659 | 69 |
| | 1988 | 1,046 | 65 | 6,271 | 96 | 2,351 | 58 | 1,702 | 48 | 3,164 | 84 | 2,572 | 74 |
| | 1989 | 2,413 | 95 | 2,794 | 75 | 3,590 | 68 | 9,527 | 59 | 1,159 | 80 | 4,009 | 69 |
| | 1990 | 1,168 | 76 | 1,125 | 71 | 1,292 | 55 | 3,075 | 46 | 1,081 | 105 | 1,538 | 61 |
| 1991 | 1,140 | 84 | 1,625 | 83 | 4,006 | 64 | 7,512 | 54 | 2,140 | 73 | 3,439 | 63 | |
| 1992 | 1,312 | 84 | 1,029 | 65 | 1,990 | 59 | 2,514 | 47 | 923 | 58 | 1,371 | 61 | |
| 1993 | 1,545 | 82 | 4,223 | 51 | 2,267 | 92 | 4,671 | 46 | 1,158 | 69 | 2,685 | 66 | |
| SHELLFISHES | | | | | | | | | | | | | |
| Blue crab | 1987 ^a | 0 | | 0 | | 0 | | 0 | | 3 | 22 | <1 | 22 |
| | 1988 | 14 | 101 | 1 | 25 | 4 | 83 | 0 | | 0 | | 0 | 93 |
| | 1989 | 33 | 95 | 65 | 34 | 2 | 108 | 0 | | 0 | | 5 | 63 |
| | 1990 | 11 | 85 | 52 | 90 | 1 | 113 | 1 | 24 | 0 | | 17 | 89 |
| 1991 | 42 | 107 | 72 | 69 | 24 | 117 | 1 | 91 | 0 | | 10 | 96 | |
| 1992 | 30 | 92 | 49 | 84 | 9 | 116 | 2 | 21 | 1 | 174 | 28 | 92 | |
| 1993 | 20 | 104 | 26 | 85 | 4 | 109 | 1 | 157 | 0 | | 17 | 98 | |
| Brown shrimp | 1987 ^a | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | |
| | 1988 | 7 | 52 | 0 | | 3 | 76 | 0 | | 1 | 46 | 3 | 60 |
| | 1989 | 0 | | 0 | | 0 | | 0 | | 0 | | 2 | 56 |
| | 1990 | 9 | 44 | 47 | 76 | 0 | 58 | 0 | | 0 | | 7 | 76 |
| 1991 | 27 | 66 | 10 | 52 | <1 | 92 | 1 | 31 | 0 | | 2 | 45 | |
| 1992 | 13 | 59 | 1 | 39 | 1 | 92 | 0 | | 0 | | 8 | 63 | |
| 1993 | 11 | 78 | 16 | 71 | 71 | 69 | 2 | 72 | 0 | | 29 | 70 | |
| White shrimp | 1988 | 35 | 64 | 6 | 77 | 2 | 61 | <1 | 45 | 1 | 69 | 10 | 65 |
| | 1989 | 38 | 58 | 4 | 70 | 20 | 65 | 2 | 52 | 0 | | 16 | 61 |
| | 1990 | 8 | 75 | 9 | 57 | 0 | 59 | <1 | 59 | 0 | | 3 | 67 |
| | 1991 | 664 | 53 | 4 | 70 | 1 | 69 | 0 | | 0 | | 154 | 53 |
| 1992 | 285 | 75 | 12 | 86 | 2 | 81 | 0 | | 0 | | 68 | 75 | |
| 1993 | 49 | 57 | 7 | 61 | <1 | 60 | 0 | | 1 | 38 | 12 | 57 | |

^aValues include Oct-Dec only.

Table 9. Annual mean catch rate (No./h) and mean total lengths (mm) of selected fishes and shellfishes caught with 6.1-m trawls within the Intracoastal Waterway in Texas bay systems during 1992-93.

| Species | Year | Sabine Lake | | Galveston | | East Matagorda | | San Antonio | | Aransas | | Corpus Christi | | Upper Laguna Madre | | Lower Laguna Madre | | Coastwide | | |
|----------------------|------|-------------|--------|-----------|--------|----------------|--------|-------------|--------|---------|--------|----------------|--------|--------------------|--------|--------------------|--------|-----------|--------|-----|
| | | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | |
| FINFISHES | | | | | | | | | | | | | | | | | | | | |
| Atlantic croaker | 1992 | 88 | 133 | 306 | 125 | 38 | 109 | 130 | 96 | 83 | 684 | 82 | 26 | 114 | 27 | 119 | 45 | 122 | 241 | 97 |
| | 1993 | 190 | 132 | 135 | 119 | 57 | 131 | 270 | 108 | 355 | 155 | 109 | 23 | 147 | 5 | 174 | 37 | 134 | 130 | 113 |
| Black drum | 1992 | 1 | 234 | <1 | 250 | 1 | 180 | 0 | 190 | 0 | 0 | 0 | 0 | 0 | 1 | 240 | <1 | 282 | <1 | 245 |
| | 1993 | 6 | 197 | <1 | 142 | <1 | 173 | <1 | 190 | 0 | 0 | 0 | 0 | 0 | <1 | 264 | 0 | 0 | 1 | 196 |
| Gafftop-sail catfish | 1992 | 32 | 110 | 11 | 153 | 2 | 151 | 8 | 129 | 81 | 44 | 130 | <1 | 176 | 0 | 0 | <1 | 186 | 18 | 135 |
| | 1993 | 13 | 121 | 18 | 145 | 2 | 135 | 31 | 123 | 80 | 36 | 118 | <1 | 167 | 0 | 0 | 1 | 170 | 17 | 136 |
| Gulf menhaden | 1992 | 1 | 120 | 5 | 93 | 5 | 89 | 13 | 113 | 19 | 25 | 102 | 1 | 138 | <1 | 119 | 1 | 139 | 6 | 101 |
| | 1993 | 16 | 77 | 9 | 102 | <1 | 75 | 2 | 124 | 6 | 8 | 85 | 7 | 62 | 0 | 0 | 1 | 126 | 6 | 94 |
| Pinfish | 1992 | 0 | 117 | 2 | 142 | 1 | 121 | 6 | 106 | 5 | 31 | 113 | 206 | 105 | 57 | 119 | 18 | 112 | 31 | 108 |
| | 1993 | 2 | 117 | 2 | 113 | 2 | 108 | 4 | 109 | 13 | 93 | 110 | 101 | 115 | 25 | 131 | 19 | 97 | 20 | 112 |
| Red drum | 1992 | 0 | 0 | 0 | 0 | <1 | 81 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 277 | <1 | 106 | <1 | 104 |
| | 1993 | 0 | 0 | 0 | 0 | <1 | 271 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <1 | 73 | <1 | 73 | <1 | 193 |
| Sand seatrout | 1992 | 9 | 113 | 17 | 127 | 4 | 134 | 4 | 110 | 32 | 114 | 12 | 133 | 4 | 149 | 1 | 138 | 11 | 157 | 11 |
| | 1993 | 36 | 115 | 22 | 129 | 15 | 129 | 7 | 121 | 43 | 120 | 9 | 112 | 6 | 120 | 1 | 221 | 3 | 152 | 17 |
| Sheeps-head | 1992 | <1 | 160 | <1 | 155 | <1 | 132 | <1 | 137 | <1 | 96 | <1 | 96 | <1 | 121 | <1 | 405 | <1 | 115 | <1 |
| | 1993 | <1 | 134 | <1 | 190 | <1 | 144 | 0 | 0 | 1 | 116 | <1 | 100 | 0 | 0 | 0 | 0 | <1 | 309 | <1 |
| Southern flounder | 1992 | 1 | 256 | 5 | 239 | 1 | 220 | 3 | 209 | 1 | 211 | 1 | 193 | <1 | 198 | <1 | 398 | <1 | 248 | 2 |
| | 1993 | 2 | 252 | 2 | 256 | 3 | 183 | 3 | 167 | 3 | 149 | 1 | 190 | <1 | 161 | <1 | 217 | 1 | 204 | 2 |
| Spot | 1992 | 3 | 134 | 149 | 124 | 10 | 122 | 44 | 110 | 150 | 102 | 55 | 103 | 38 | 111 | 12 | 148 | 32 | 127 | 57 |
| | 1993 | 17 | 119 | 33 | 121 | 9 | 124 | 117 | 115 | 97 | 112 | 80 | 94 | 231 | 120 | 6 | 150 | 15 | 151 | 45 |
| Spotted seatrout | 1992 | <1 | 184 | 3 | 144 | 2 | 145 | <1 | 165 | 3 | 115 | 5 | 120 | <1 | 158 | 2 | 200 | 3 | 205 | 2 |
| | 1993 | 2 | 188 | 1 | 159 | 4 | 169 | 2 | 154 | 2 | 138 | 1 | 125 | <1 | 100 | 1 | 202 | 2 | 279 | 2 |
| Striped mullet | 1992 | <1 | 136 | 3 | 183 | 1 | 147 | 0 | 216 | 2 | 125 | 3 | 188 | <1 | 281 | <1 | 291 | <1 | 250 | 1 |
| | 1993 | 10 | 215 | <1 | 202 | <1 | 338 | <1 | 216 | 0 | 0 | <1 | 222 | <1 | 136 | <1 | 294 | 0 | 0 | 2 |
| Total finfish | 1992 | 291 | 131 | 585 | 125 | 83 | 115 | 322 | 98 | 1,670 | 94 | 972 | 333 | 111 | 157 | 119 | 200 | 134 | 461 | 107 |
| | 1993 | 453 | 127 | 266 | 122 | 432 | 127 | 560 | 105 | 699 | 109 | 669 | 432 | 121 | 85 | 126 | 177 | 146 | 302 | 113 |
| SHELLFISHES | | | | | | | | | | | | | | | | | | | | |
| Blue crab | 1992 | 40 | 74 | 67 | 73 | 64 | 78 | 41 | 62 | 222 | 55 | 238 | 14 | 94 | 66 | 95 | 26 | 72 | 77 | 64 |
| | 1993 | 59 | 69 | 47 | 77 | 57 | 93 | 76 | 81 | 63 | 74 | 129 | 78 | 109 | 44 | 98 | 59 | 90 | 59 | 80 |
| Brown shrimp | 1992 | 44 | 79 | 209 | 79 | 21 | 84 | 19 | 84 | 269 | 81 | 340 | 34 | 83 | 92 | 99 | 33 | 84 | 117 | 81 |
| | 1993 | 135 | 81 | 74 | 84 | 48 | 78 | 39 | 89 | 323 | 78 | 301 | 27 | 90 | 33 | 94 | 48 | 82 | 104 | 83 |
| Pink shrimp | 1992 | 0 | 0 | 0 | 0 | <1 | 91 | <1 | 87 | 2 | 74 | 40 | 73 | 18 | 86 | 48 | 104 | 57 | 90 | 20 |
| | 1993 | 0 | 0 | 0 | 0 | 2 | 89 | 1 | 110 | 2 | 90 | 19 | 71 | 13 | 91 | 3 | 103 | 29 | 87 | 7 |
| White shrimp | 1992 | 35 | 100 | 77 | 90 | 8 | 82 | 5 | 92 | 28 | 85 | 42 | 91 | 5 | 94 | 4 | 104 | 5 | 106 | 28 |
| | 1993 | 75 | 85 | 28 | 91 | 62 | 89 | 50 | 86 | 26 | 85 | 30 | 88 | 3 | 107 | 12 | 102 | 15 | 102 | 35 |

Figure 1. Texas gulf shoreline and Texas Territorial Sea (TTS).

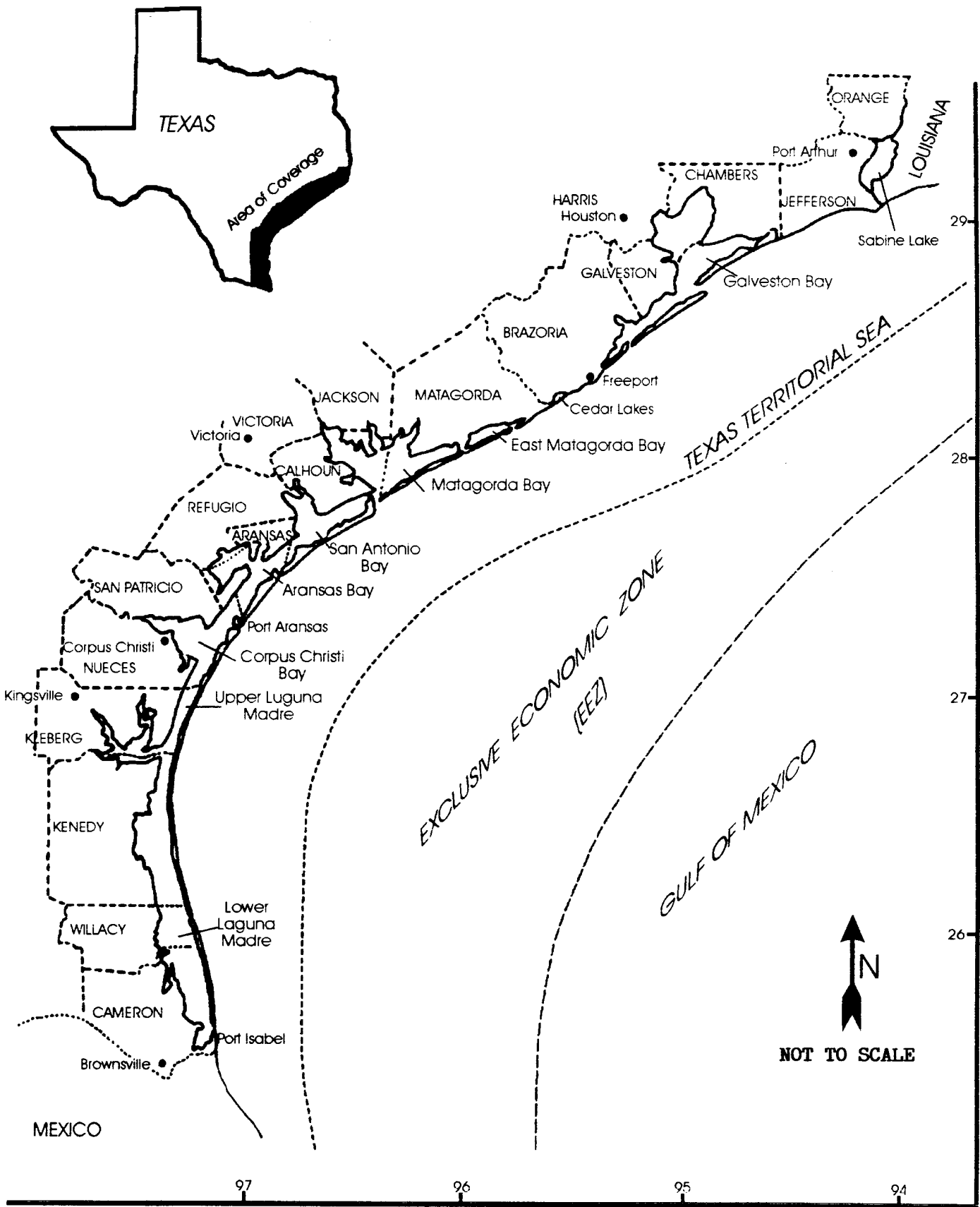
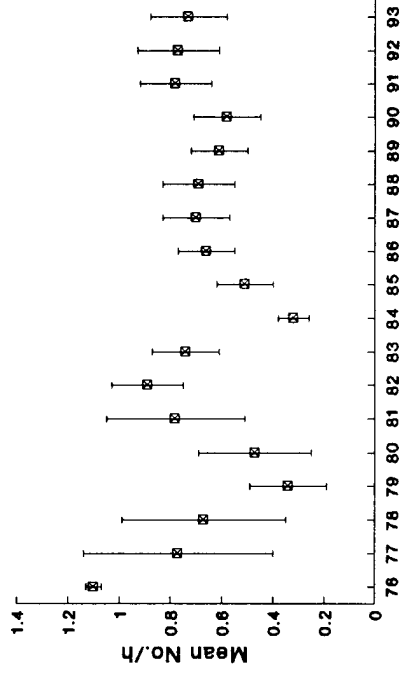
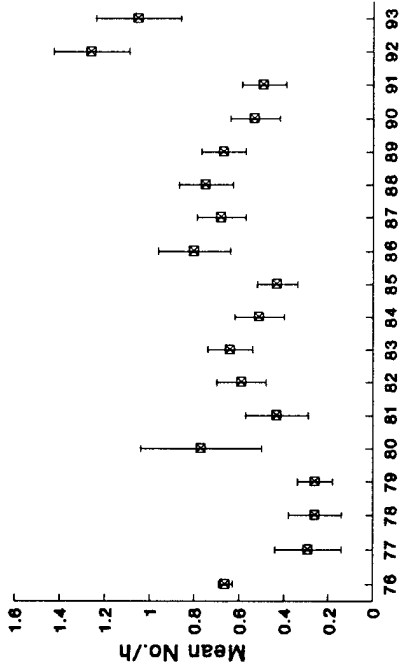


Figure 2. Spring gill net mean catch rates (No./h \pm 1SE) for red drum, black drum, spotted seatrout and Atlantic croaker during 1976-93.

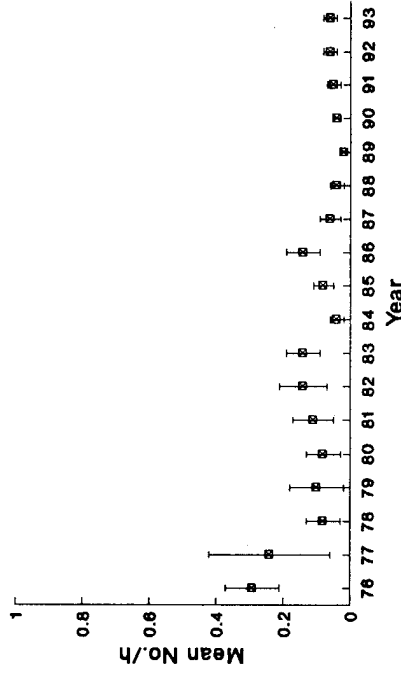
Spotted Seatrout



Red Drum



Atlantic Croaker



Black Drum

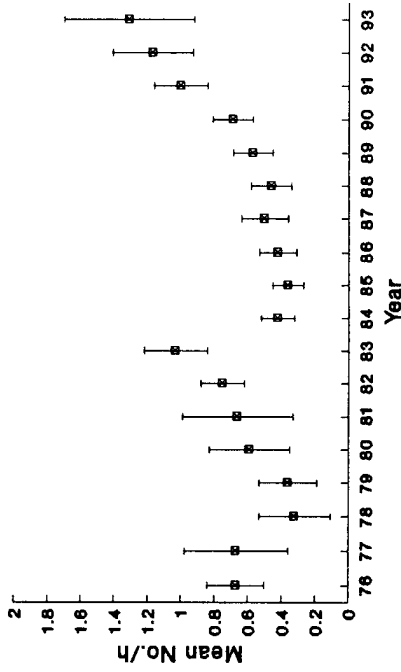
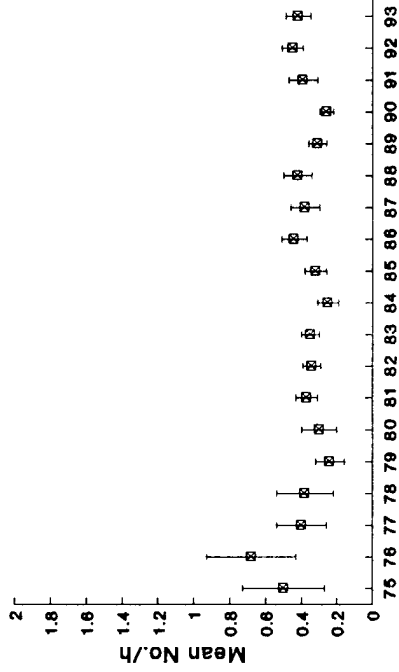
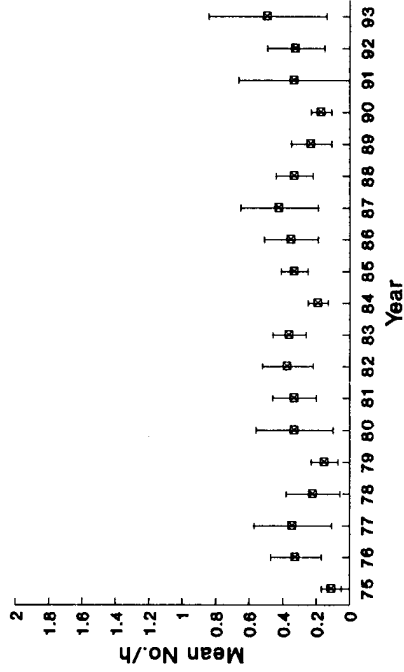


Figure 3. Fall gill net mean catch rates (No./h \pm 1SE) for red drum, black drum, spotted seatrout and Atlantic croaker during 1975-93.

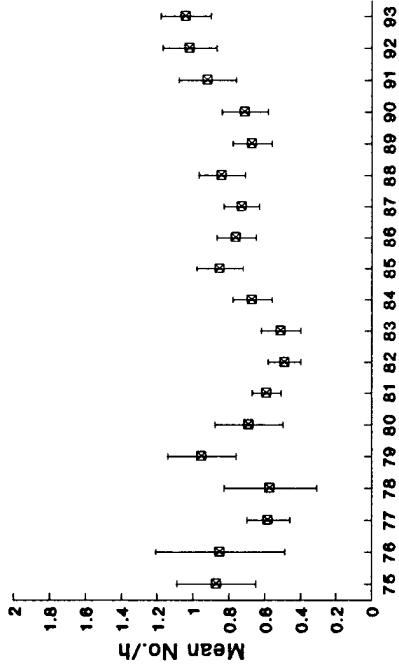
Spotted Seatrout



Atlantic Croaker



Red Drum



Black Drum

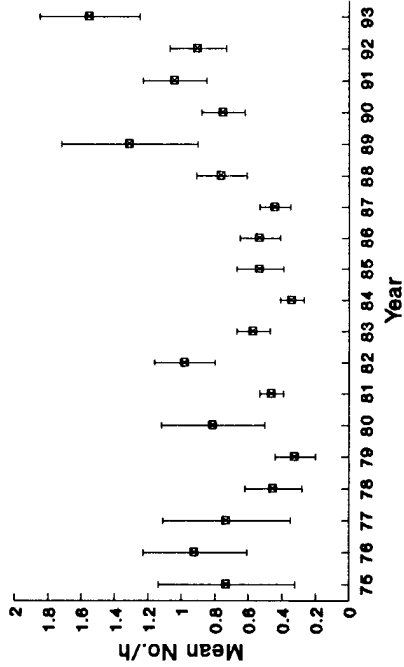
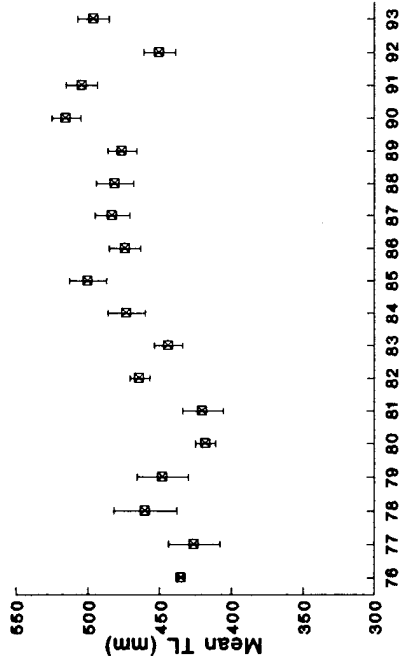
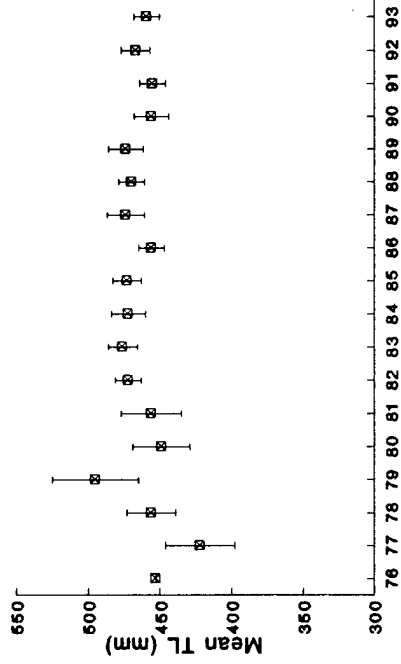


Figure 4. Spring gill net mean total lengths (mm \pm 1SE) for red drum, black drum, spotted seatrout and Atlantic croaker during 1976-93.

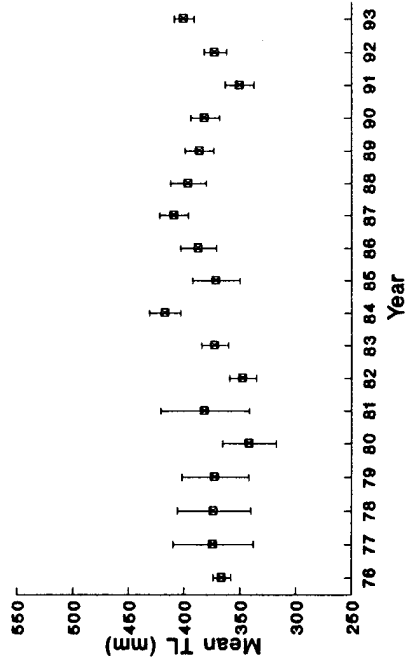
Red Drum



Spotted Seatrout



Black Drum



Atlantic Croaker

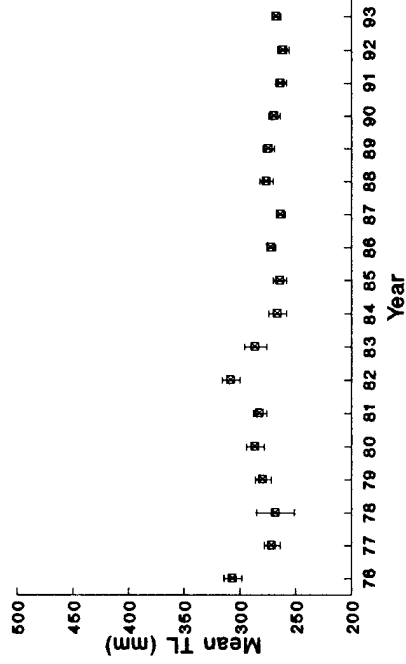
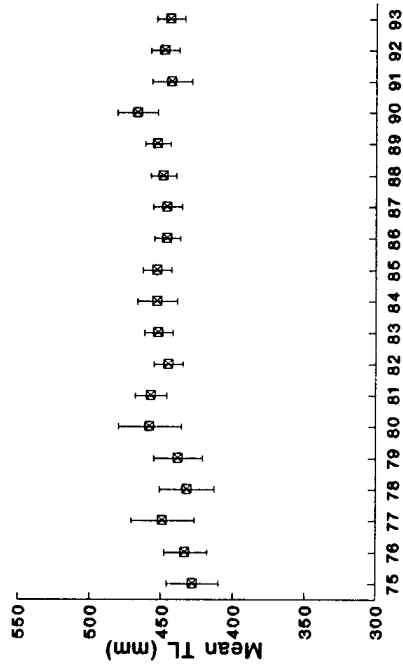
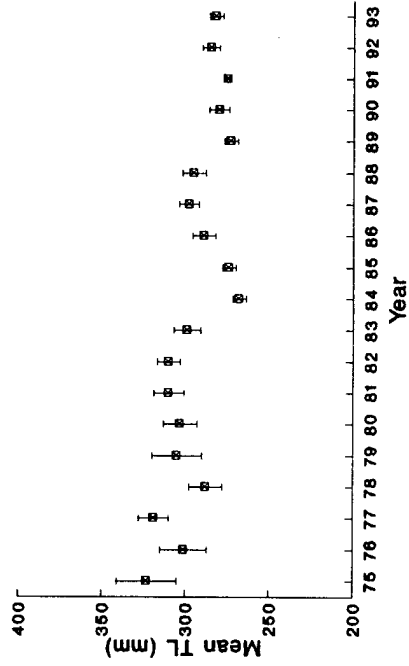


Figure 5. Fall gill net mean total lengths (mm \pm 1SE) for red drum, black drum, spotted seatrout and Atlantic croaker during 1975-93.

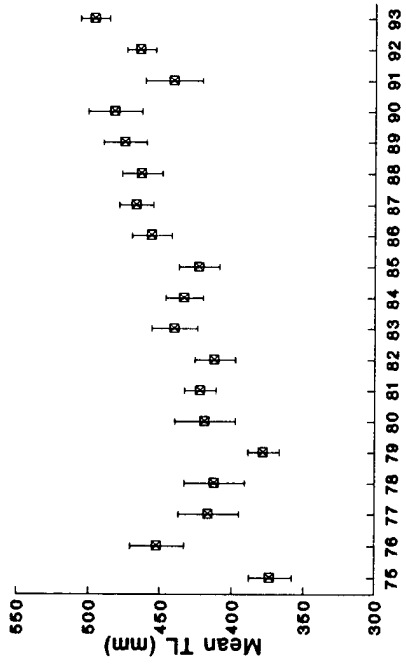
Spotted Seatrout



Atlantic Croaker



Red Drum



Black Drum

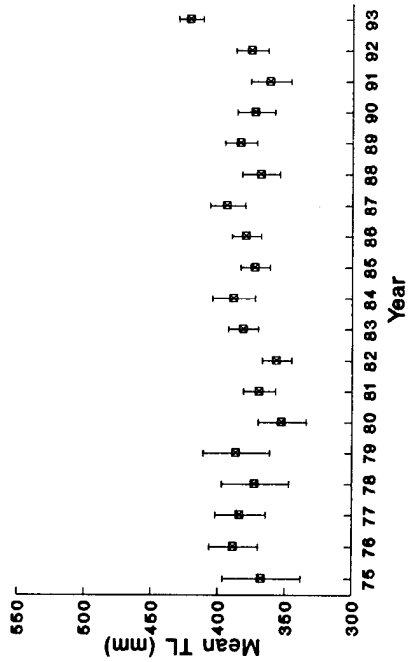
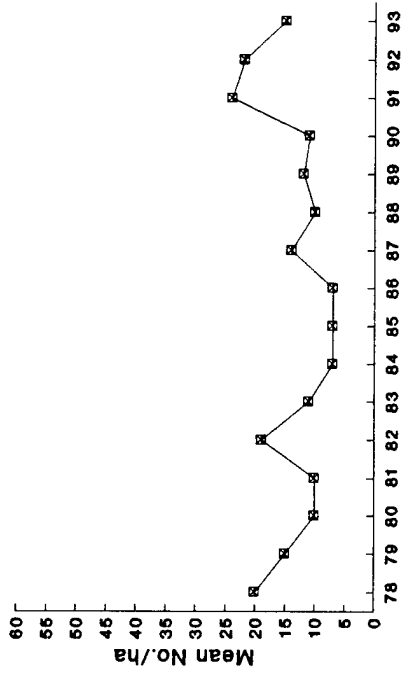
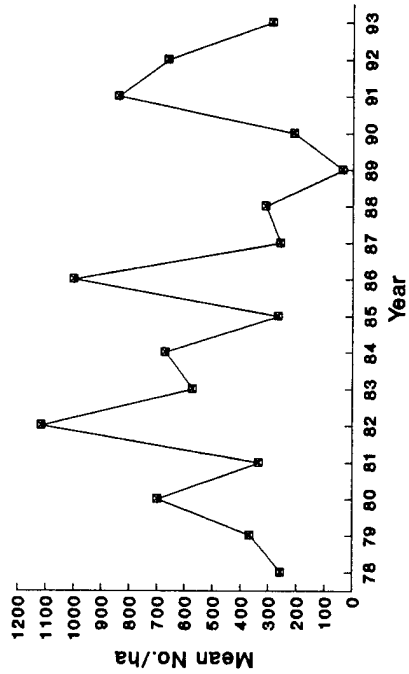


Figure 6. Seasonal bag seine mean catch rates (No./ha) for juvenile red drum (Nov-Mar), black drum (Jun-Jul), spotted seatrout (Jul-Nov) and Atlantic croaker (Feb-May) during 1978-93. Red drum 35-75 mm, spotted seatrout 20-75 mm, black drum 35-110 mm and Atlantic croaker 30-85 mm are considered to be young-of-the-year.

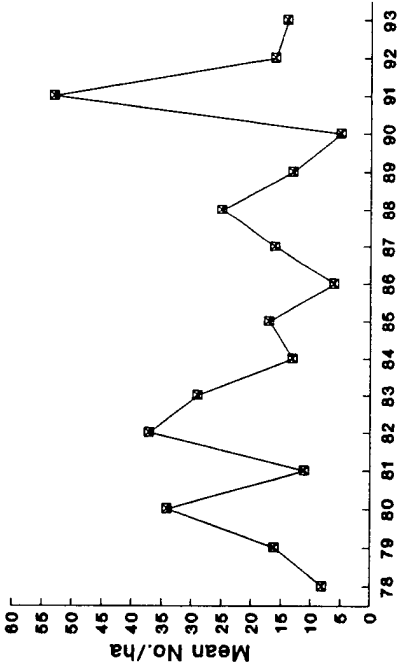
Spotted Seatrout



Atlantic Croaker



Red Drum



Black Drum

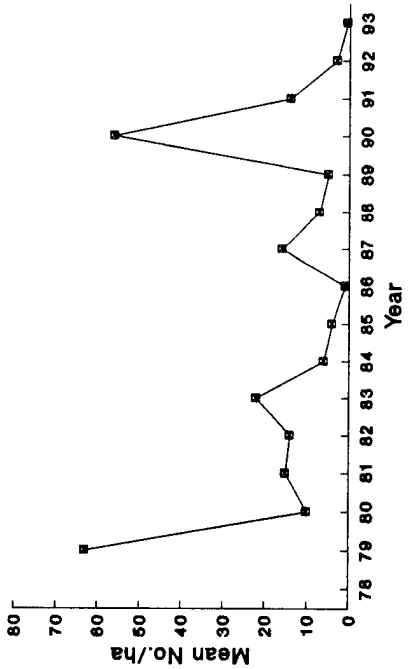
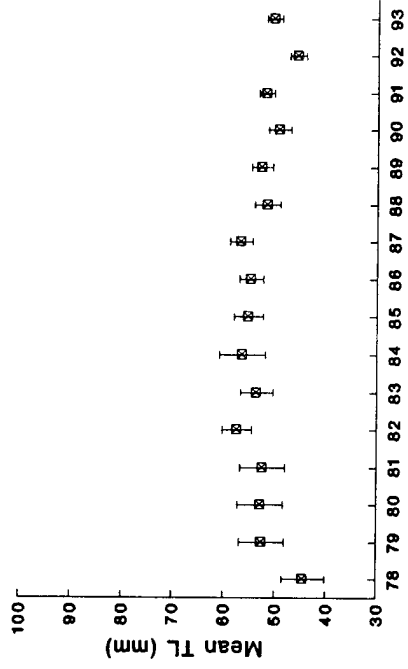
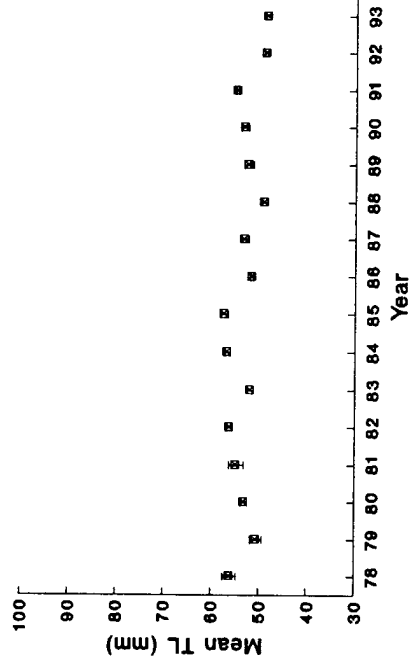


Figure 7. Seasonal bag seine mean total lengths ($\text{mm} \pm 1\text{SE}$) for juvenile red drum (Nov-Mar), black drum (Jun-Jul), spotted seatrout (Jul-Nov) and Atlantic croaker (Feb-May) during 1978-93. Red drum 35-75 mm, spotted seatrout 20-75 mm, black drum 35-110 mm and Atlantic croaker 30-85 mm are considered to be young-of-the-year.

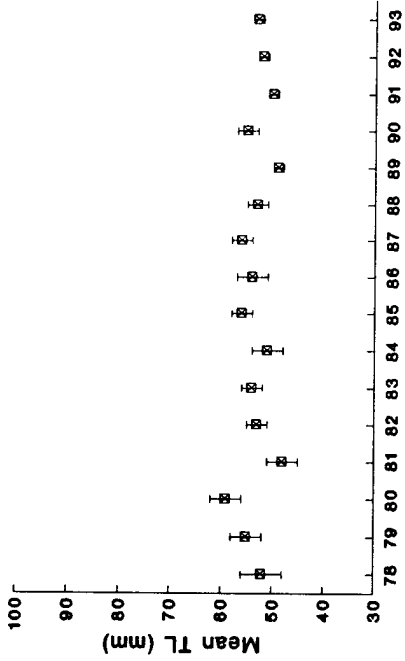
Spotted Seatrout



Atlantic Croaker



Red Drum



Black Drum

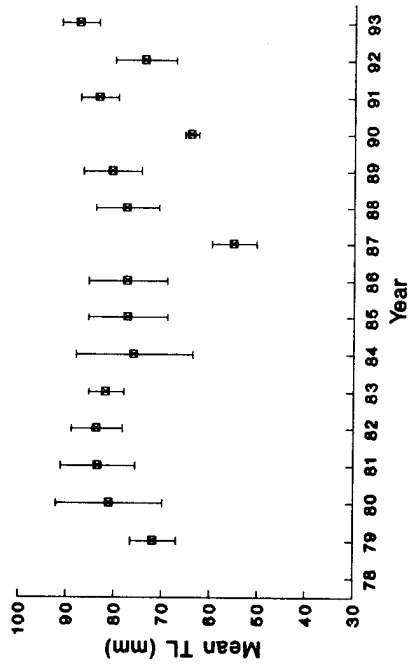
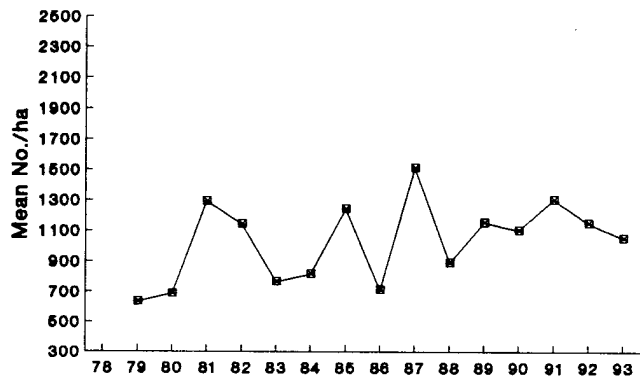
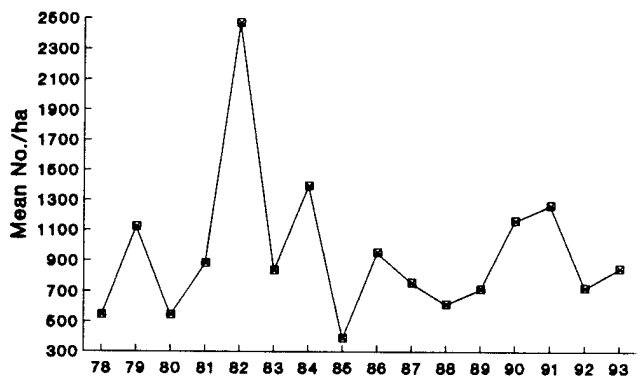


Figure 8. Seasonal bag seine mean catch rates (No./ha) for juvenile brown shrimp (Apr-Jul), white shrimp (Jul-Nov) and blue crab (Mar-Jun) during 1978-93. Brown and white shrimp 33-82 mm and blue crab 13-42 mm are considered to be young-of-the-year.

Brown Shrimp



White Shrimp



Blue Crab

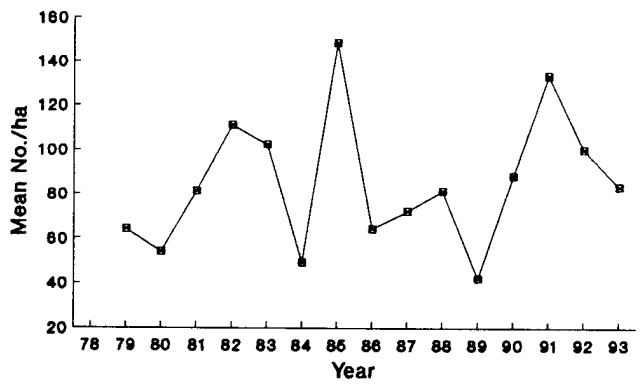
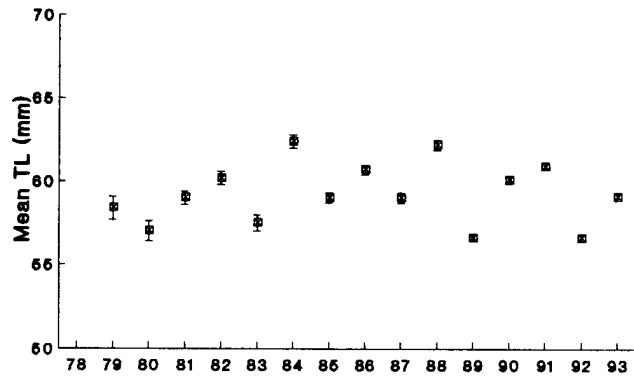
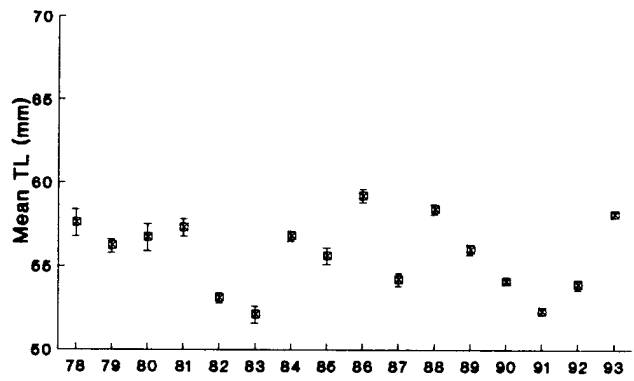


Figure 9. Seasonal bag seine mean total lengths (mm \pm 1SE) for brown shrimp (Apr-Jul), white shrimp (Jul-Nov) and blue crab (Mar-Jun) during 1978-93. Brown and white shrimp 33-82 mm and blue crab 13-42 mm are considered to be young-of-the-year.

Brown Shrimp



White Shrimp



Blue Crab

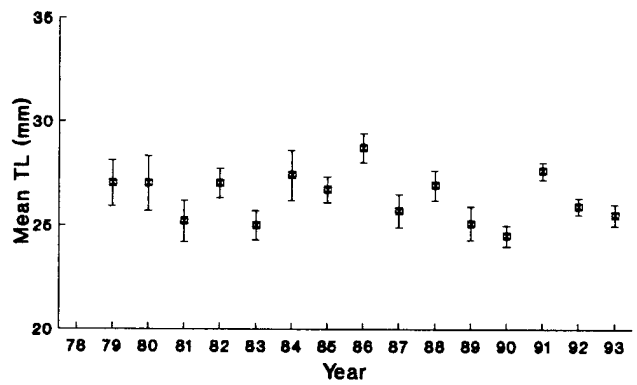
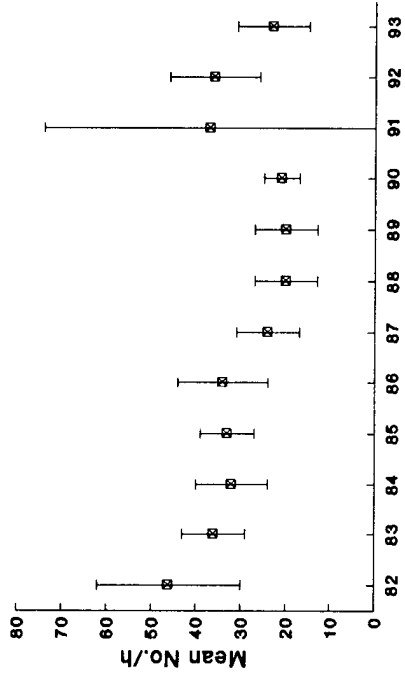
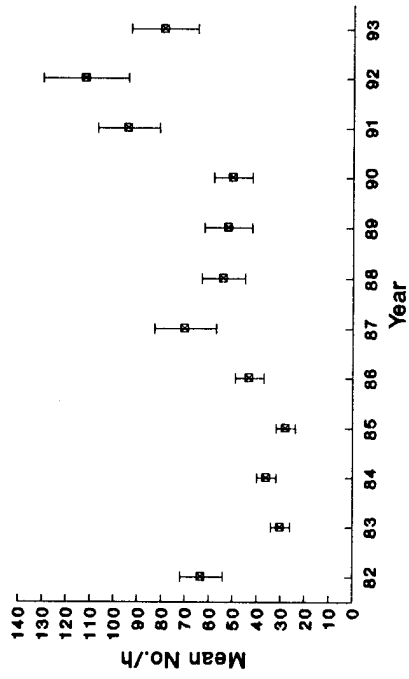


Figure 10. Annual bay trawl catch rates (No./h \pm 1SE) for brown shrimp, white shrimp, blue crab and Atlantic croaker during 1982-93.

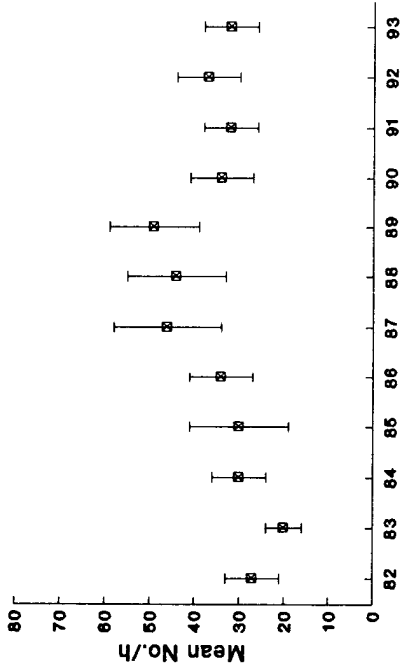
White Shrimp



Atlantic Croaker



Brown Shrimp



Blue Crab

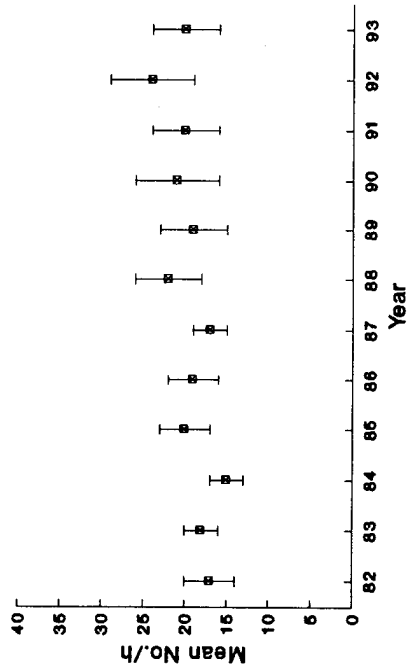
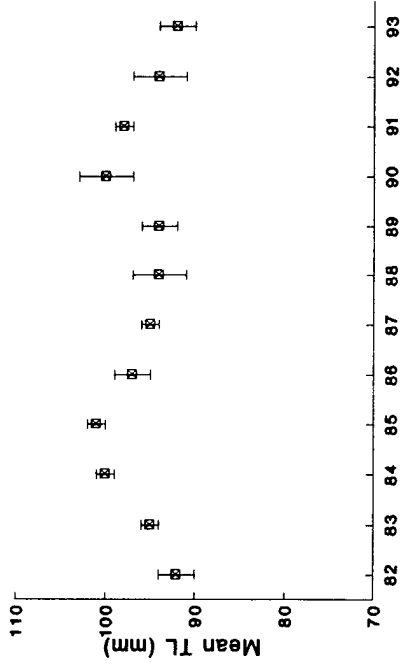
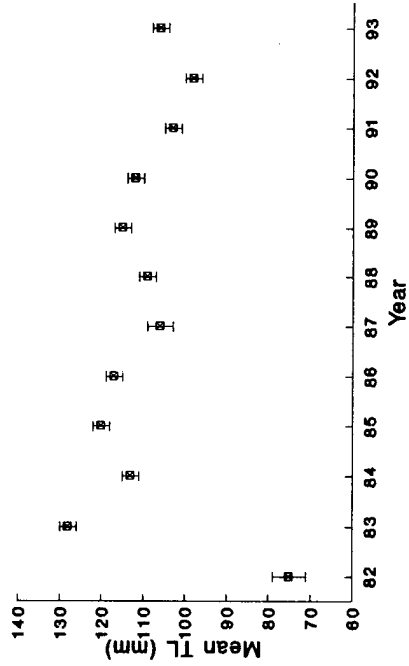


Figure 11. Annual bay trawl mean total lengths (mm \pm 1SE) for brown shrimp, white shrimp, blue crab and Atlantic croaker during 1982-93.

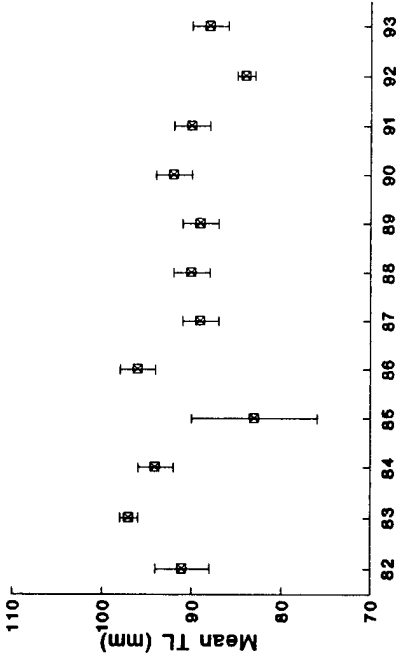
White Shrimp



Atlantic Croaker



Brown Shrimp



Blue Crab

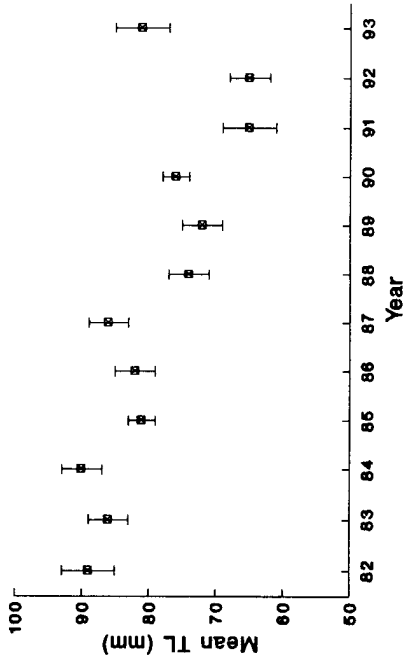
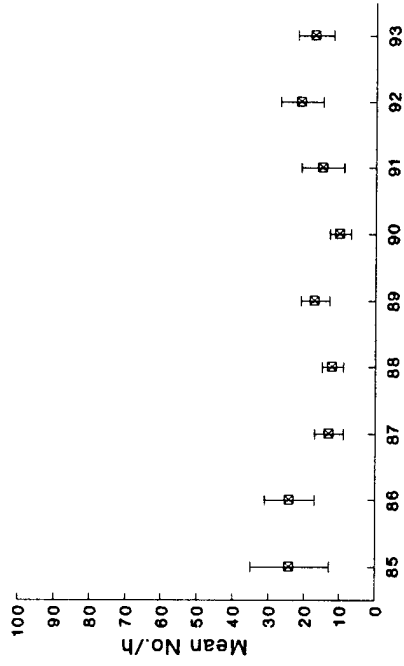
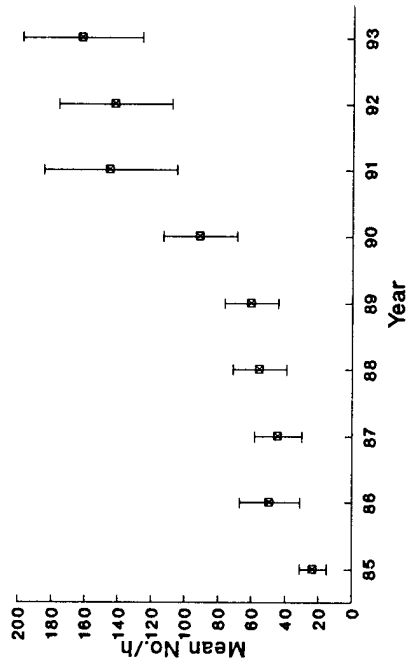


Figure 12. Annual gulf trawl mean catch rates (No./h \pm 1SE) for brown shrimp, white shrimp, blue crab and Atlantic croaker during 1982-93.

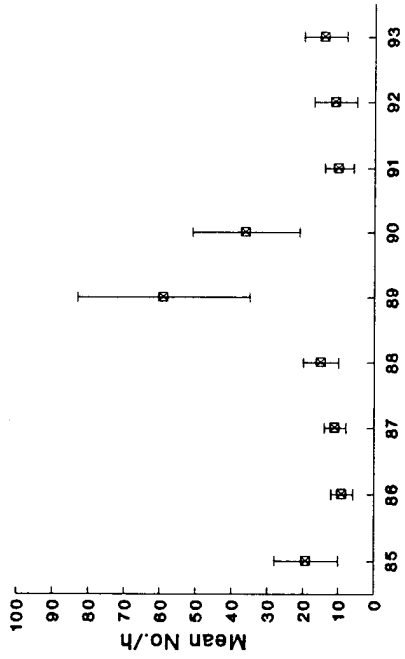
White Shrimp



Atlantic Croaker



Brown Shrimp



Blue Crab

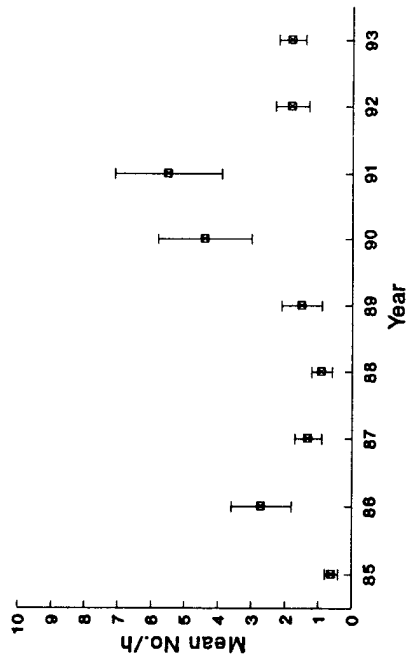
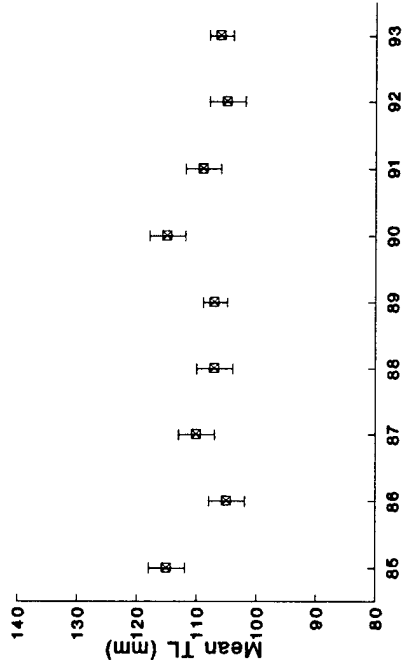
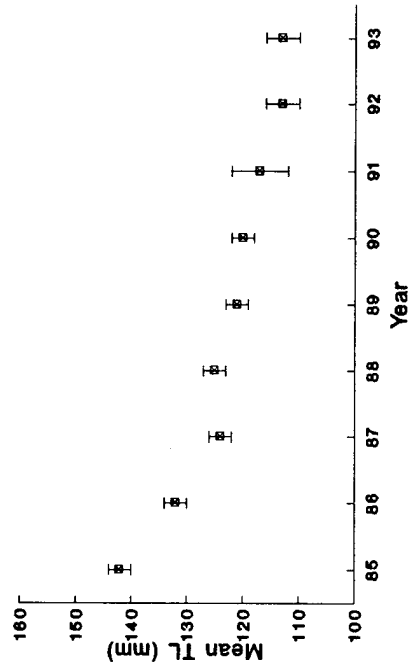


Figure 13. Annual gulf trawl mean total lengths (mm \pm 1SE) for brown shrimp, white shrimp, blue crab and Atlantic croaker during 1982-93.

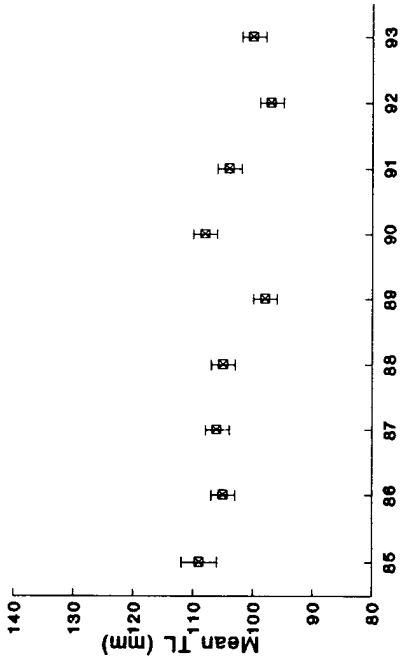
White Shrimp



Atlantic Croaker



Brown Shrimp



Blue Crab

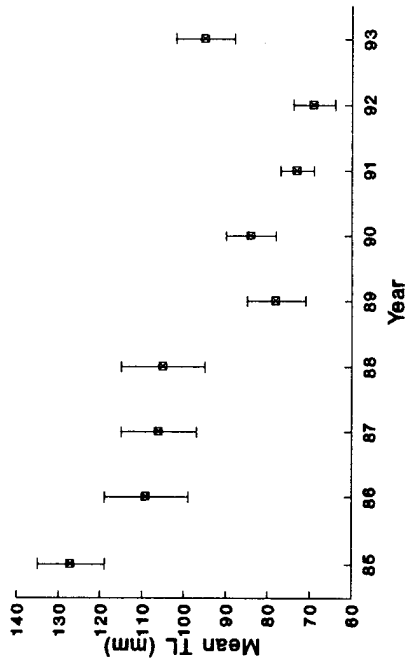
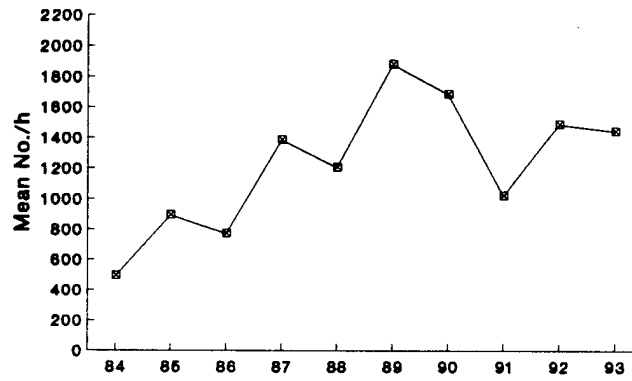
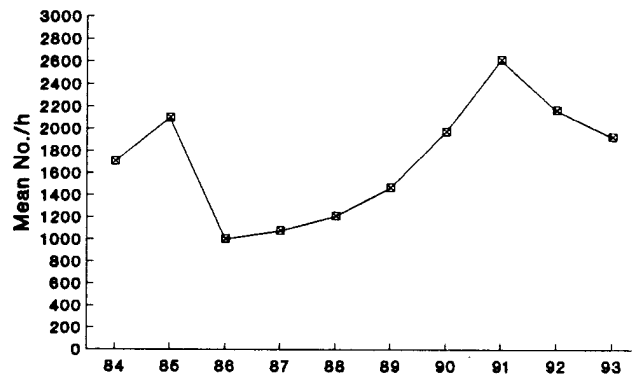


Figure 14. Annual mean catch rates (No./h) for Eastern oyster spat (≤ 25 mm), small oysters (26-75 mm) and market oysters (≥ 76 mm) during 1984-93.

Oyster Spat



Small Oysters



Market Oysters

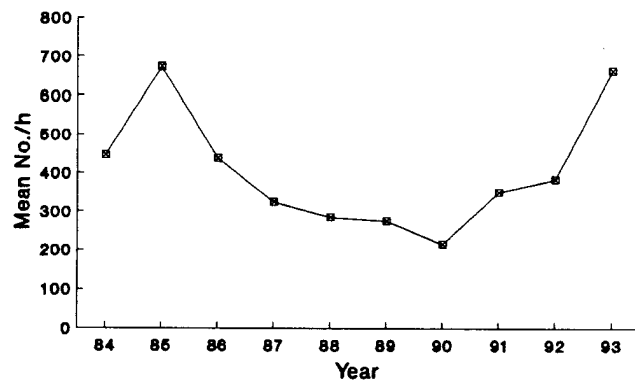
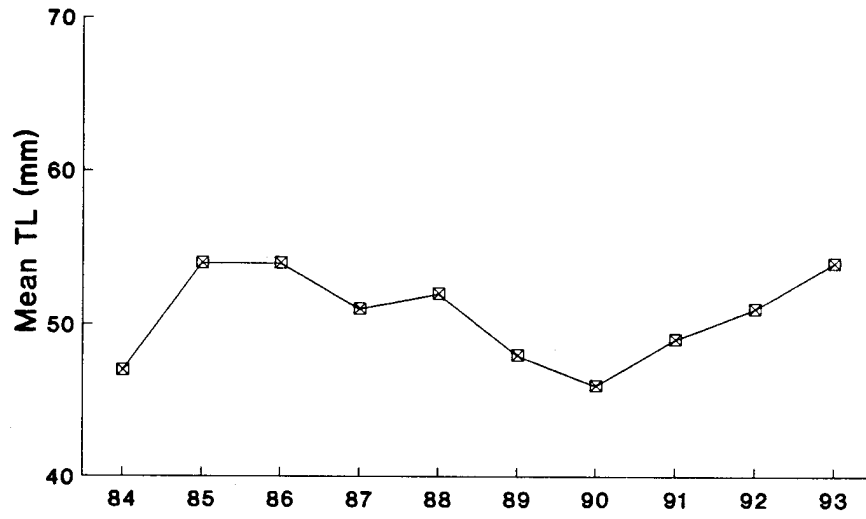
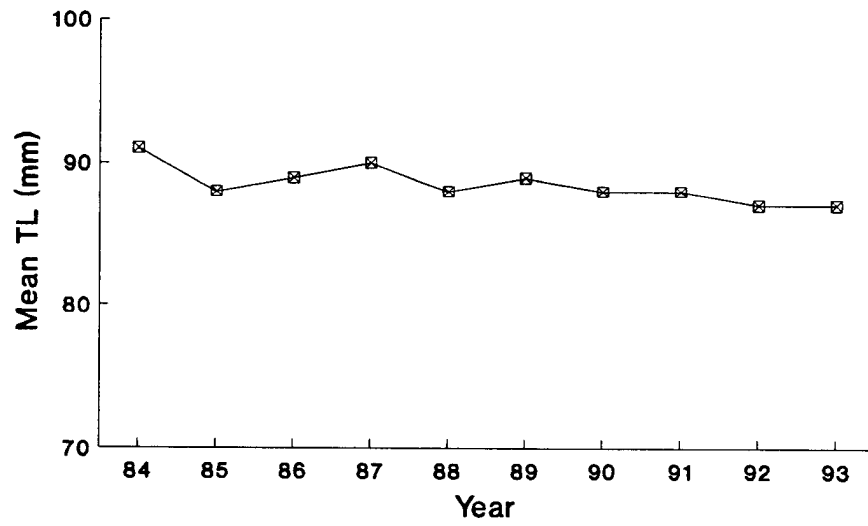


Figure 15. Annual mean total lengths (mm) for small and market Eastern oysters during 1984-93.

Small Oysters



Market Oysters



Appendix A. Summary of historical sampling dates, gear description, procedures, number of samples collected, weighting factors, and list of species collected.

Table A.1. Historical sampling dates (month/year) by bay system and gear.

| GEAR | SABINE | GALVESTON | EAST MATAGORDA | MATAGORDA | SAN ANTONIO | ARANSAS-COPANO | CORPUS CHRISTI | UPPER LAGUNA | LOWER LAGUNA |
|--------------------|-------------------------|------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| GILL NET | April 1986- Present. | Nov. 1975- Present. | Feb. 1976- Present. | Nov. 1975- Present. | Nov. 1975- Present. | Nov. 1975- Present. | Nov. 1975- Present. | Nov. 1975- Present. | Nov. 1975- Present. |
| GULF TRAWL | Jan. 1986- Present. | Jan. 1986- Present. | Not used. | Not used. | Jan. 1986- Present. | Not used. | Jan. 1986- Present. | Not used. | Jan. 1986- Present. |
| BAY TRAWL | Jan. 1986- Present. | Jan. 1982- Present. | April 1987- Present. | Jan. 1982- Present. | Jan. 1982- Present. | Jan. 1982- Present. | Jan. 1982- Present. | Jan. 1982- Present. | Jan. 1982- Present. |
| ICWW TRAWL | Jan. 1991- Present. | Jan. 1991- Present. | Jan. 1991- Present. | Jan. 1991- Present. | Jan. 1991- Present. | Jan. 1991- Present. | Jan. 1991- Present. | Jan. 1991- Present. | Jan. 1991- Present. |
| BEACH SEINE | Oct. 1987- Present. | Oct. 1987- Present. | Oct. 1987- Present. | Not used. | Oct. 1987- Present. | Oct. 1987-1991. | Not used. | Oct. 1987- Present. | Oct. 1987- Present. |
| BEACH BAG SEINE | Oct. 1987- Present. | Oct. 1987- Present. | Oct. 1987- Present. | Not used. | Oct. 1987- Present. | Oct. 1987-1991. | Not used. | Oct. 1987- Present. | Oct. 1987- Present. |
| BAY BAG SEINE | Jan. 1986- Present. | Oct. 1977- Present. | Feb. 1983- Present. | Oct. 1977- Present. | Oct. 1977- Present. | Oct. 1977- Present. | Oct. 1977- Present. | Oct. 1977- Present. | Oct. 1977- Present. |
| OYSTER REEF DREDGE | Jan. 1986-1991. | Jan. 1984- Present. | Not used. | Jan. 1986- Present. | Jan. 1986- Present. | Jan. 1986- Present. | Jan. 1986-1991. | Not used. | Jan. 1986-1991. |
| NON-REEF DREDGE | 1986-1989. | 1985-1989. | 1986-1989. | 1986-1989. | 1986-1989. | 1986-1989. | 1986-1989. | 1986-1988. | 1986-1988. |

Table A. 2. Gear descriptions.

| GEAR | GEAR DESCRIPTION |
|---------------|---|
| Gill Net | Monofilament, 183 m long; 1.2 m deep with separate 45.7-m sections of 7.6-, 10.2- (#12 monofilament), 12.7- and 15.2-cm (#18 monofilament) stretched mesh tied together in ascending mesh size. |
| Trawl | 6.1 m wide at mouth with 3.8-cm stretched nylon multifilament mesh throughout, and doors 1.2 m long and 0.6 m tall. |
| Beach Seine | 60.9-m long; 1.8-m deep with 7.6-cm stretched #12 monofilament mesh. |
| Bag Seine | 18.3 m long; 1.8 m deep with 1.3-cm stretched nylon multifilament mesh in the 1.8 m wide central bag with remaining webbing 1.9-cm stretched mesh. |
| Oyster Dredge | Louisiana style 8-tooth: 46 cm wide, 25 cm tall with a 36-cm deep bag. 6 bottom rows of linked metal rings 5 cm in diameter; four top rows of 7.6-cm mesh webbing made of 0.8-cm nylon rope. |

Table A.3. Historical sampling procedures by gear.

| GEAR | HISTORICAL SAMPLING PROCEDURES |
|----------------|---|
| GILL NET | <p>Monofilament gill nets have been systematically used in 7 Texas bay systems since November 1975; East Matagorda Bay was added in fall 1976 and Sabine Lake in April 1986 (Figure 1). Prior to September 1984, sites for setting gill nets during spring (15 April-15 June) and fall (15 September-15 November) were randomly selected from about 100 stations in each bay system (McEachron and Green 1985). Beginning September 1984 current site selection methods were adopted.</p> <p>Prior to fall 1981, no less than one nor more than 18 overnight gill net sets occurred in each season in each bay system. Since fall 1981, 45 gill nets were set overnight during each season in each bay system except East Matagorda Bay. In East Matagorda Bay, from fall 1981 to spring 1984 not less than six nor more than 12 gill nets were set during each season; since fall 1984, 20 sets were set in each season. No more than nine stations were duplicated each season.</p> |
| GULF TRAWLS | <p>Trawls have been systematically used in 5 gulf areas of Texas Territorial Seas since January 1986. Methods have not changed since the program began.</p> |
| BAY TRAWLS | <p>Trawls have been systematically used in Texas bays since January 1982; Sabine Lake was added January 1986 and East Matagorda Bay April 1987. Beginning in January 1982, 20 monthly samples were collected in the Galveston, San Antonio and Aransas systems. Beginning in May 1982 current methods were adopted.</p> |
| ICWW TRAWLS | <p>This program was initiated in 1992.</p> |

Table A.3. (Cont'd.)

| | |
|----------------------------|--|
| <p>BEACH SEINE</p> | <p>Beach seines have been systematically used on Texas gulf beaches since October 1987. Between October 1987 and November 1989, three beach seine samples were collected during the 1st-15th and during the 16th-31st of each month along gulf beach shoreline areas. Beginning January 1990 current methods were adopted.</p> |
| <p>BEACH BAG SEINE</p> | <p>Beach bag seine samples have been systematically used on Texas gulf beaches since October 1977. Between October 1987 and November 1989, three beach bag seine samples were collected during the 1st-15th and during the 16th-31st of each month along gulf beach shoreline areas. Beginning January 1990 current methods were adopted.</p> |
| <p>BAY BAG SEINE</p> | <p>Bay bag seine samples have been systematically collected in Texas bays since October 1977. Prior to September 1984, sites for sampling with bag seines (monthly) were randomly selected from about 100 stations in each bay system (McEachron and Green 1985) and the seine was pulled 15.2-30.5m parallel to shore for sample collection. Prior to October 1981, six bag seine samples were collected each month in each bay system. During October 1981 through August 1984 10 bag seine samples were collected each month in each bay system; half of the samples were collected during each of the first and last two fullest weeks of each month (McEachron and Green 1985). Beginning September 1984, five stations were sampled during the 1st-15th and during the 16th-31st of each month and the seine was pulled 15.2m parallel to shore for sample collection. During April 1988 through December 1989, 6 bag seine samples were collected during the 1st-15th and during the 16th-31st of each month in each bay system. Beginning January 1990, 8 bag seine samples were collected during the 1st-15th and during the 16th-31st of each month in each bay system. Beginning January 1992 current methods were adopted.</p> |

Table A.3. (Cont'd.)

| | |
|-----------------------------------|---|
| <p>OYSTER REEF DREDGE</p> | <p>Oyster dredges have been systematically used in Texas bays since January 1986. Monthly sample sizes in the Galveston system were: 20 in 1984; 80 in 1985; and 56 in 1986-1991. Monthly sample sizes in the Aransas system were: 56 in 1986-1989; and 26 in 1990-1991. From 1986 to 1991 10 samples per month were collected in Sabine Lake and the Lower Laguna Madre and 26 monthly samples were collected in the Matagorda, San Antonio, Corpus Christi and East Matagorda systems. Beginning January 1992 current methods were adopted.</p> |
| <p>NON-REEF DREDGE</p> | <p>Non-reef dredge samples were systematically collected in Texas bays from 1985-1989. In 1985 10 monthly samples were collected in the Galveston system. From 1986-1989 10 monthly samples were collected in all bay systems.</p> |

Table A.4. (Cont'd.)

| | Sabine Lake | Galveston | East Matagorda | Matagorda | San Antonio | Aranzas | Corpus Christi | Upper Laguna Madre | Lower Laguna Madre | Coastwide |
|--------------------|-------------|-----------|----------------|-----------|-------------|---------|----------------|--------------------|--------------------|-----------|
| (Spring) (Cont'd.) | 1993 | 45 | 44 | 20 | 45 | 45 | 45 | 45 | 45 | 380 |
| Gill Net (Fall) | 1975 | 2 | 8 | 0 | 5 | 5 | 5 | 5 | 5 | 40 |
| | 1976 | 0 | 12 | 4 | 8 | 8 | 8 | 8 | 8 | 64 |
| | 1977 | 0 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 64 |
| | 1978 | 0 | 7 | 7 | 7 | 8 | 8 | 8 | 7 | 59 |
| | 1979 | 0 | 18 | 9 | 17 | 16 | 15 | 17 | 16 | 125 |
| | 1980 | 0 | 11 | 10 | 9 | 10 | 10 | 10 | 10 | 79 |
| | 1981 | 0 | 45 | 8 | 45 | 45 | 45 | 45 | 45 | 323 |
| | 1982 | 0 | 45 | 11 | 45 | 45 | 45 | 45 | 45 | 326 |
| | 1983 | 0 | 45 | 12 | 45 | 45 | 45 | 45 | 45 | 327 |
| | 1984 | 0 | 45 | 20 | 45 | 45 | 45 | 45 | 45 | 335 |
| | 1985 | 0 | 45 | 20 | 45 | 45 | 45 | 45 | 45 | 335 |
| | 1986 | 45 | 45 | 20 | 45 | 45 | 45 | 45 | 45 | 380 |
| | 1987 | 45 | 45 | 20 | 45 | 45 | 45 | 45 | 45 | 380 |
| | 1988 | 45 | 45 | 20 | 45 | 45 | 45 | 45 | 45 | 380 |
| | 1989 | 45 | 45 | 20 | 45 | 45 | 45 | 45 | 45 | 380 |
| | 1990 | 45 | 45 | 20 | 45 | 45 | 45 | 45 | 45 | 380 |
| | 1991 | 45 | 45 | 20 | 45 | 45 | 45 | 45 | 45 | 380 |
| | 1992 | 45 | 45 | 20 | 45 | 45 | 45 | 45 | 45 | 380 |
| | 1993 | 45 | 45 | 20 | 45 | 45 | 45 | 45 | 45 | 380 |
| ICWW Trawl | 1992 | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 648 |
| | 1993 | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 648 |

Table A.5. Number of samples collected by oyster reef dredge during routine monitoring, by bay and year.

| | Galveston | Matagorda | San Antonio | Aranzas | Coastwide |
|--------------------|-----------|-----------|-------------|---------|-----------|
| Oyster Reef Dredge | 1984 | 240 | 0 | 0 | 240 |
| | 1985 | 959 | 0 | 0 | 959 |
| | 1986 | 672 | 312 | 672 | 1,968 |
| | 1987 | 672 | 312 | 672 | 1,968 |
| | 1988 | 672 | 312 | 672 | 1,968 |
| | 1989 | 672 | 312 | 672 | 1,968 |
| | 1990 | 672 | 312 | 672 | 1,968 |
| | 1991 | 672 | 312 | 672 | 1,604 |
| | 1992 | 360 | 240 | 240 | 1,080 |
| | 1993 | 360 | 239 | 240 | 1,079 |

Table A.6. Number of samples collected during routine monitoring in 5 Texas surf zones, by Gulf zone, gear and year.

| | Gulf-17 | Gulf-18 | Gulf-19 | Gulf-20 | Gulf-21 | Coastwide |
|-----------|---------|---------|---------|---------|---------|-----------|
| Beach Bag | 9 | 15 | 25 | 21 | 12 | 82 |
| Seine | 28 | 56 | 101 | 67 | 42 | 294 |
| | 29 | 55 | 91 | 74 | 42 | 291 |
| | 30 | 54 | 98 | 70 | 42 | 294 |
| | 26 | 58 | 97 | 71 | 42 | 294 |
| | 27 | 57 | 84 | 42 | 42 | 252 |
| | 28 | 56 | 84 | 42 | 42 | 252 |
| Beach | 9 | 15 | 26 | 22 | 12 | 84 |
| Seine | 28 | 56 | 100 | 68 | 42 | 294 |
| | 29 | 55 | 91 | 74 | 42 | 291 |
| | 30 | 54 | 98 | 70 | 42 | 294 |
| | 26 | 58 | 97 | 71 | 42 | 294 |
| | 27 | 57 | 84 | 42 | 42 | 252 |
| | 28 | 56 | 84 | 42 | 42 | 252 |

Table A.7. Number of Gulf trawl samples collected during routine monitoring in 5 Gulf zones, by Gulf area and year.

| | Sabine Lake | Galveston | Port O'Connor | Port Aransas | Port Isabel | Coastwide |
|------------|-------------|-----------|---------------|--------------|-------------|-----------|
| Gulf Trawl | 0 | 80 | 80 | 176 | 80 | 416 |
| | 112 | 192 | 192 | 192 | 192 | 880 |
| | 192 | 192 | 192 | 192 | 192 | 960 |
| | 192 | 192 | 192 | 184 | 184 | 952 |
| | 192 | 192 | 192 | 184 | 189 | 949 |
| | 192 | 192 | 192 | 192 | 192 | 960 |
| | 192 | 192 | 192 | 184 | 192 | 952 |
| | 192 | 192 | 192 | 184 | 192 | 952 |
| | 192 | 192 | 192 | 184 | 192 | 960 |

Table A.8. Weighting factors used in calculating coastwide average catch rates.

| Area | Gill net and ^a bay bag seine | Bay ^b trawl | ICWW ^c trawl | Oyster ^d dredge | Gulf ^e trawl |
|--------------------|--|---------------------------|----------------------------|-------------------------------|----------------------------|
| BAY SYSTEM | | | | | |
| Sabine | 75.6 | 1,220 | 57.6 | | |
| Galveston | 411.2 | 9,408 | 61.8 | 126 | |
| East Matagorda | 64.4 | 0,101 | 23.4 | | |
| Matagorda | 284.8 | 6,288 | 27.4 | 42 | |
| San Antonio | 225.2 | 3,680 | 27.0 | 66 | |
| Aransas | 263.5 | 2,251 | 25.2 | 55 | |
| Corpus Christi | 171.3 | 3,357 ^f | 13.8 | | |
| Upper Laguna Madre | 222.3 | 1,534 | 55.1 | | |
| Lower Laguna Madre | 252.1 | 1,153 | 46.6 | | |
| Total | 1,970.4 | 28,982 | 337.9 | 289 | |
| GULF AREA | | | | | |
| Sabine | | | | | 262 |
| Galveston | | | | | 273 |
| Port O'Connor | | | | | 277 |
| Port Aransas | | | | | 257 |
| Port Isabel | | | | | |
| Total | | | | | 1,317 |

^a Equals miles of shoreline (Matlock and Osborn 1982. Shallow-water surface areas and shoreline distances on the Texas coast).

^b Equals total bay surface area (divided by 10,000) minus 1977 estimate of shallow water area (≤ 1.2 m) (for the Lagunas Madre) or minus the mean of 1972 and 1977 estimates (for other bays) (Matlock and Osborn 1982).

^c Equals nautical miles of ICWW.

^d Equals total number of grids containing oyster reef.

^e Equals total number of Gulf trawlable grids.

^f No estimate was available for 1977 shallow water area, so 1977 area was estimated as proportion of sampling grid zones that are designated as trawls grids, times the total surface area of the bay.

Table A.9. Species caught (alphabetical by scientific name) in Texas marine waters by TPWD sampling gear during 1975-1993.

| Scientific Name | Common Name |
|------------------------------------|------------------------|
| Finfish | |
| <u>Abudefduf saxatilis</u> | Sergeant major |
| <u>Achirus lineatus</u> | Lined sole |
| <u>Adinia xenica</u> | Diamond killifish |
| <u>Aetobatis narinari</u> | Spotted eagle ray |
| <u>Agonostomus monticola</u> | Mountain mullet |
| <u>Alectis ciliaris</u> | African pompano |
| <u>Alosa chrysochloris</u> | Skipjack herring |
| <u>Aluterus heudeloti</u> | Dotterel filefish |
| <u>Aluterus schoepfi</u> | Orange filefish |
| <u>Aluterus scriptus</u> | Scrawled filefish |
| <u>Ambloplites rupestris</u> | Rock bass |
| <u>Ameiurus melas</u> | Black bullhead |
| <u>Ameiurus natalis</u> | Yellow bullhead |
| <u>Amia calva</u> | Bowfin |
| <u>Anchoa hepsetus</u> | Striped anchovy |
| <u>Anchoa lyolepis</u> | Dusky anchovy |
| <u>Anchoa mitchilli</u> | Bay anchovy |
| <u>Anchoa nasuta</u> | Longnose anchovy |
| <u>Ancylopsetta dilecta</u> | Three-eye flounder |
| <u>Ancylopsetta quadrocellata</u> | Ocellated flounder |
| <u>Anguilla rostrata</u> | American eel |
| <u>Antennarius radiosus</u> | Singlespot frogfish |
| <u>Antennarius striatus</u> | Striated frogfish |
| <u>Aplodinotus grunniens</u> | Freshwater drum |
| <u>Archosargus probatocephalus</u> | Sheepshead |
| <u>Arius felis</u> | Hardhead catfish |
| <u>Astroscopus y-graecum</u> | Southern stargazer |
| <u>Bagre marinus</u> | Gafftopsail catfish |
| <u>Bairdiella chrysoura</u> | Silver perch |
| <u>Balistes capriscus</u> | Gray triggerfish |
| <u>Bascanichthys bascanium</u> | Sooty eel |
| <u>Bascanichthys scuticaris</u> | Whip eel |
| <u>Bathygobius soporator</u> | Frillfin goby |
| <u>Bellator militaris</u> | Horned searobin |
| <u>Bodianus pulchellus</u> | Spotfin hogfish |
| <u>Bollmannia communis</u> | Ragged goby |
| <u>Bothus robinsi</u> | Twospot flounder |
| <u>Brevoortia patronus</u> | Gulf menhaden |
| <u>Brevoortia gunteri</u> | Finescale menhaden |
| <u>Brotula barbata</u> | Bearded brotula |
| <u>Calamus leucosteus</u> | Whitebone porgy |
| <u>Cantherhines pullus</u> | Orangespotted filefish |
| <u>Canthidermis maculata</u> | Rough triggerfish |
| <u>Caranx bartholomaei</u> | Yellow jack |
| <u>Caranx crysos</u> | Blue runner |
| <u>Caranx hippos</u> | Crevalle jack |
| <u>Caranx latus</u> | Horse-eye jack |
| <u>Caranx ruber</u> | Bar jack |

Table A.9. (Contd.)

| Scientific Name | Common Name |
|------------------------------------|------------------------|
| Finfish (Contd.) | |
| <u>Carassius auratus</u> | Goldfish |
| <u>Carcharhinus acronotus</u> | Blacknose shark |
| <u>Carcharhinus brevipinna</u> | Spinner shark |
| <u>Carcharhinus falciformis</u> | Silky shark |
| <u>Carcharhinus isodon</u> | Finetooth shark |
| <u>Carcharhinus leucas</u> | Bull shark |
| <u>Carcharhinus limbatus</u> | Blacktip shark |
| <u>Carcharhinus obscurus</u> | Dusky shark |
| <u>Carcharhinus plumbeus</u> | Sandbar shark |
| <u>Carcharhinus porosus</u> | Smalltail shark |
| <u>Centropomus parallelus</u> | Fat snook |
| <u>Centropomus undecimalis</u> | Common snook |
| <u>Centropristis ocyurus</u> | Bank sea bass |
| <u>Centropristis philadelphica</u> | Rock sea bass |
| <u>Chaetodipterus faber</u> | Atlantic spadefish |
| <u>Chaetodon ocellatus</u> | Spotfin butterflyfish |
| <u>Chasmodes bosquianus</u> | Striped blenny |
| <u>Chilomycterus schoepfi</u> | Striped burrfish |
| <u>Chloroscombrus chrysurus</u> | Atlantic bumper |
| <u>Citharichthys macrops</u> | Spotted whiff |
| <u>Citharichthys spilopterus</u> | Bay whiff |
| <u>Conodon nobilis</u> | Barred grunt |
| <u>Ctenopharyngodon idella</u> | Grass carp |
| <u>Cyclopsetta chittendeni</u> | Mexican flounder |
| <u>Cyclopsetta fimbriata</u> | Spotfin flounder |
| <u>Cynoscion arenarius</u> | Sand seatrout |
| <u>Cynoscion nebulosus</u> | Spotted seatrout |
| <u>Cynoscion nothus</u> | Silver seatrout |
| <u>Cyprinodon variegatus</u> | Sheepshead minnow |
| <u>Cyprinus carpio</u> | Common carp |
| <u>Dasyatis americana</u> | Southern stingray |
| <u>Dasyatis sabina</u> | Atlantic stingray |
| <u>Dasyatis say</u> | Bluntnose stingray |
| <u>Decapterus punctatus</u> | Round scad |
| <u>Diapterus auratus</u> | Irish pompano |
| <u>Dibranchius atlanticus</u> | Atlantic batfish |
| <u>Diodon hystrix</u> | Porcupinefish |
| <u>Diplectrum bivittatum</u> | Dwarf sand perch |
| <u>Diplectrum formosum</u> | Sand perch |
| <u>Diplodus holbrooki</u> | Spottail pinfish |
| <u>Dormitator maculatus</u> | Fat sleeper |
| <u>Dorosoma cepedianum</u> | Gizzard shad |
| <u>Dorosoma petenense</u> | Threadfin shad |
| <u>Echeneis naucrates</u> | Sharksucker |
| <u>Echiophis intertinctus</u> | Spotted spoon-nose eel |
| <u>Elagatis bipinnulata</u> | Rainbow runner |
| <u>Elops saurus</u> | Ladyfish |
| <u>Epinephelus nigritus</u> | Warsaw grouper |
| <u>Epinephelus niveatus</u> | Snowy grouper |

Table A.9. (Contd.)

| Scientific Name | Common Name |
|------------------------------------|-----------------------|
| Finfish (Contd.) | |
| <u>Equetus umbrosus</u> | Cubbyu |
| <u>Erotelis smaragdus</u> | Emerald sleeper |
| <u>Etropus crossotus</u> | Fringed flounder |
| <u>Etrumeus teres</u> | Round herring |
| <u>Eucinostomus argenteus</u> | Spotfin mojarra |
| <u>Eucinostomus gula</u> | Silver jenny |
| <u>Eucinostomus lefroyi</u> | Mottled mojarra |
| <u>Eucinostomus melanopterus</u> | Flagfin mojarra |
| <u>Evorthodus lyricus</u> | Lyre goby |
| <u>Fundulus chrysotus</u> | Golden topminnow |
| <u>Fundulus grandis</u> | Gulf killifish |
| <u>Fundulus pulvereus</u> | Bayou killifish |
| <u>Fundulus similis</u> | Longnose killifish |
| <u>Gadella maraldi</u> | (Barbelless codlet) |
| <u>Gambusia affinis</u> | Western mosquitofish |
| <u>Gerres cinereus</u> | Yellowfin mojarra |
| <u>Gnathagnus egregius</u> | Freckled stargazer |
| <u>Gobiesox punctulatus</u> | Stippled clingfish |
| <u>Gobiesox strumosus</u> | Skilletfish |
| <u>Gobioides broussoneti</u> | Violet goby |
| <u>Gobiomorus dormitor</u> | Bigmouth sleeper |
| <u>Gobionellus boleosoma</u> | Darter goby |
| <u>Gobionellus hastatus</u> | Sharptail goby |
| <u>Gobionellus shufeldti</u> | Freshwater goby |
| <u>Gobiosoma bosc</u> | Naked goby |
| <u>Gobiosoma robustum</u> | Code goby |
| <u>Gonioplectrus hispanus</u> | Spanish flag |
| <u>Gunterichthys longipenis</u> | Gold brotula |
| <u>Gymnachirus texae</u> | Fringed sole |
| <u>Gymnothorax nigromarginatus</u> | Blackedge moray |
| <u>Gymnura micrura</u> | Smooth butterfly ray |
| <u>Haemulon aurolineatum</u> | Tomtate |
| <u>Halieutichthys aculeatus</u> | Pancake batfish |
| <u>Harengula jaguana</u> | Scaled sardine |
| <u>Hemicaranx amblyrhynchus</u> | Bluntnose jack |
| <u>Hemiramphus brasiliensis</u> | Ballyhoo |
| <u>Hildebrandia flava</u> | Yellow conger |
| <u>Hippocampus erectus</u> | Lined seahorse |
| <u>Hippocampus zosterae</u> | Dwarf seahorse |
| <u>Histrio histrio</u> | Sargassumfish |
| <u>Holacanthus bermudensis</u> | Blue angelfish |
| <u>Hoplostethus mediterraneus</u> | Armorhead |
| <u>Hypleurochilus geminatus</u> | Crested blenny |
| <u>Hyporhamphus unifasciatus</u> | Silverstripe halfbeak |
| <u>Hypsoblennius hentz</u> | Feather blenny |
| <u>Hypsoblennius ionthas</u> | Freckled blenny |
| <u>Ictalurus furcatus</u> | Blue catfish |
| <u>Ictalurus punctatus</u> | Channel catfish |
| <u>Ictiobus bubalus</u> | Smallmouth buffalo |

Table A.9. (Contd.)

| Scientific Name | Common Name |
|--------------------------------|----------------------|
| Finfish (Contd.) | |
| <u>Ictiobus cyprinellus</u> | Bigmouth buffalo |
| <u>Isurus oxyrinchus</u> | Shortfin mako |
| <u>Jenkinsia lamprotaenia</u> | Dwarf herring |
| <u>Kyphosus incisor</u> | Yellow chub |
| <u>Kyphosus sectatrix</u> | Bermuda chub |
| <u>Labrisomus nuchipinnis</u> | Hairy blenny |
| <u>Lactophrys quadricornis</u> | Scrawled cowfish |
| <u>Lagocephalus laevigatus</u> | Smooth puffer |
| <u>Lagodon rhomboides</u> | Pinfish |
| <u>Larimus fasciatus</u> | Banded drum |
| <u>Leiostomus xanthurus</u> | Spot |
| <u>Lepisosteus oculatus</u> | Spotted gar |
| <u>Lepisosteus osseus</u> | Longnose gar |
| <u>Lepisosteus platostomus</u> | Shortnose gar |
| <u>Lepisosteus spatula</u> | Alligator gar |
| <u>Lepomis cyanellus</u> | Green sunfish |
| <u>Lepomis gulosus</u> | Warmouth |
| <u>Lepomis macrochirus</u> | Bluegill |
| <u>Lepomis megalotis</u> | Longear sunfish |
| <u>Lepomis microlophus</u> | Redear sunfish |
| <u>Lepophidium brevibarbe</u> | Blackedge cusk-eel |
| <u>Lobotes surinamensis</u> | Tripletail |
| <u>Lucania parva</u> | Rainwater killifish |
| <u>Lutjanus apodus</u> | Schoolmaster |
| <u>Lutjanus campechanus</u> | Red snapper |
| <u>Lutjanus griseus</u> | Gray snapper |
| <u>Lutjanus jocu</u> | Dog snapper |
| <u>Lutjanus synagris</u> | Lane snapper |
| <u>Lutjanus vivanus</u> | Silk snapper |
| <u>Megalops atlanticus</u> | Tarpon |
| <u>Membras martinica</u> | Rough silverside |
| <u>Menidia beryllina</u> | Inland silverside |
| <u>Menidia clarkhubbsi</u> | Texas silverside |
| <u>Menidia peninsulæ</u> | Tidewater silverside |
| <u>Menticirrhus americanus</u> | Southern kingfish |
| <u>Menticirrhus littoralis</u> | Gulf kingfish |
| <u>Menticirrhus saxatilis</u> | Northern kingfish |
| <u>Microgobius gulosus</u> | Clown goby |
| <u>Microgobius thalassinus</u> | Green goby |
| <u>Micropogonias undulatus</u> | Atlantic croaker |
| <u>Micropterus salmoides</u> | Largemouth bass |
| <u>Monacanthus hispidus</u> | Planehead filefish |
| <u>Monacanthus setifer</u> | Pygmy filefish |
| <u>Morone americana</u> | White perch |

Table A.9. (Contd.)

| Scientific Name | Common Name |
|----------------------------------|-------------------------------|
| Finfish (Contd.) | |
| <u>Morone chrysops</u> | White bass |
| <u>Morone mississippiensis</u> | Yellow bass |
| <u>Morone saxatilis</u> | Striped bass |
| <u>Morone X</u> | Hybrid bass (striped x white) |
| <u>Mugil cephalus</u> | Striped mullet |
| <u>Mugil curema</u> | White mullet |
| <u>Mullus auratus</u> | Red goatfish |
| <u>Mustelus canis</u> | Smooth dogfish |
| <u>Mycteroperca bonaci</u> | Black grouper |
| <u>Mycteroperca microlepis</u> | Gag |
| <u>Mycteroperca phenax</u> | Scamp |
| <u>Mycteroperca rubra</u> | Comb grouper |
| <u>Myrophis punctatus</u> | Speckled worm eel |
| <u>Narcine brasiliensis</u> | Lesser electric ray |
| <u>Negaprion brevirostris</u> | Lemon shark |
| <u>Neomerinthe hemingwayi</u> | Spinycheek scorpionfish |
| <u>Ogcocephalus nasutus</u> | Shortnose batfish |
| <u>Ogcocephalus pantostictus</u> | Spotted batfish |
| <u>Ogcocephalus parvus</u> | Roughback batfish |
| <u>Ogcocephalus radiatus</u> | Polka-dot batfish |
| <u>Ogcocephalus sp.</u> | (Batfish-unidentified) |
| <u>Oligoplites saurus</u> | Leatherjacket |
| <u>Ophichthus gomesi</u> | Shrimp eel |
| <u>Ophichthus ophis</u> | Spotted snake eel |
| <u>Ophichthus puncticeps</u> | Palespotted eel |
| <u>Ophidion grayi</u> | Blotched cusk-eel |
| <u>Ophidion holbrookii</u> | Bank cusk-eel |
| <u>Ophidion marginatum</u> | Striped cusk-eel |
| <u>Ophidion welshi</u> | Crested cusk-eel |
| <u>Opisthonema oglinum</u> | Atlantic thread herring |
| <u>Opsanus beta</u> | Gulf toadfish |
| <u>Opsanus pardus</u> | Leopard toadfish |
| <u>Orthopristis chrysoptera</u> | Pigfish |
| <u>Parablennius marmoreus</u> | Seaweed blenny |
| <u>Paraconger caudilimbatus</u> | Margintail conger |
| <u>Paralichthys albigutta</u> | Gulf flounder |
| <u>Paralichthys lethostigma</u> | Southern flounder |
| <u>Paralichthys sp.</u> | (Flounder-unidentified) |
| <u>Paralichthys squamilentus</u> | Broad flounder |
| <u>Parasudis truculenta</u> | Longnose greeneye |
| <u>Peprilus alepidotus</u> | Harvestfish |
| <u>Peprilus burti</u> | Gulf butterflyfish |
| <u>Phaeoptyx conklini</u> | Freckled cardinalfish |
| <u>Physiculus fulvus</u> | Metallic codling |
| <u>Platybelone argalus</u> | Keeltail needlefish |
| <u>Poecilia latipinna</u> | Sailfin molly |
| <u>Pogonias cromis</u> | Black drum |
| <u>Polydactylus octonemus</u> | Atlantic threadfin |
| <u>Pomacentrus variabilis</u> | Cocoa damselfish |

Table A.9. (Contd.)

| Scientific Name | Common Name |
|-----------------------------------|--------------------------|
| Finfish (Contd.) | |
| <u>Pomadasys crocro</u> | Burro grunt |
| <u>Pomatomus saltatrix</u> | Bluefish |
| <u>Pomoxis annularis</u> | White crappie |
| <u>Pomoxis nigromaculatus</u> | Black crappie |
| <u>Pontinus longispinis</u> | Longspine scorpionfish |
| <u>Porichthys plectrodon</u> | Atlantic midshipman |
| <u>Priacanthus arenatus</u> | Bigeye |
| <u>Prionotus longispinosus</u> | Bigeye searobin |
| <u>Prionotus martis</u> | Barred searobin |
| <u>Prionotus ophryas</u> | Bandtail searobin |
| <u>Prionotus paralatus</u> | Mexican searobin |
| <u>Prionotus roseus</u> | Bluespotted searobin |
| <u>Prionotus rubio</u> | Blackwing searobin |
| <u>Prionotus scitulus</u> | Leopard searobin |
| <u>Prionotus stearnsi</u> | Shortwing searobin |
| <u>Prionotus tribulus</u> | Bighead searobin |
| <u>Pristigenys alta</u> | Short bigeye |
| <u>Pristipomoides aquilonaris</u> | Wenchman |
| <u>Pristis pectinata</u> | Smalltooth sawfish |
| <u>Pylodictis olivaris</u> | Flathead catfish |
| <u>Rachycentron canadum</u> | Cobia |
| <u>Raja eglanteria</u> | Clearnose skate |
| <u>Raja texana</u> | Roundel skate |
| <u>Remora remora</u> | Remora |
| <u>Rhinobatos lentiginosus</u> | Atlantic guitarfish |
| <u>Rhinoptera bonasus</u> | Cownose ray |
| <u>Rhizoprionodon terraenovae</u> | Atlantic sharpnose shark |
| <u>Rhomboplites aurorubens</u> | Vermilion snapper |
| <u>Rypticus saponaceus</u> | Greater soapfish |
| <u>Sardinella aurita</u> | Spanish sardine |
| <u>Saurida brasiliensis</u> | Largescale lizardfish |
| <u>Saurida caribbaea</u> | Smallscale lizardfish |
| <u>Scartella cristata</u> | Molly miller |
| <u>Sciaenops ocellatus</u> | Red drum |
| <u>Scomber japonicus</u> | Chub mackerel |
| <u>Scomberomorus cavalla</u> | King mackerel |
| <u>Scomberomorus maculatus</u> | Spanish mackerel |
| <u>Scomberomorus sp.</u> | (Mackerel-unidentified) |
| <u>Scorpaena brasiliensis</u> | Barbfish |
| <u>Scorpaena calcarata</u> | Smoothhead scorpionfish |
| <u>Scorpaena plumieri</u> | Spotted scorpionfish |
| <u>Scyliorhinus retifer</u> | Chain dogfish |
| <u>Selar crumenophthalmus</u> | Bigeye scad |
| <u>Selene setapinnis</u> | Atlantic moonfish |
| <u>Selene vomer</u> | Lookdown |
| <u>Seriola dumerili</u> | Greater amberjack |
| <u>Seriola zonata</u> | Banded rudderfish |
| <u>Serraniculus pumilio</u> | Pygmy sea bass |
| <u>Serranus atrobranchus</u> | Blackear bass |

Table A.9. (Contd.)

| Scientific Name | Common Name |
|-------------------------------|---------------------------|
| Finfish (Contd.) | |
| <u>Serranus phoebe</u> | Tattler |
| <u>Serranus subligarius</u> | Belted sandfish |
| <u>Sparisoma radians</u> | Bucktooth parrotfish |
| <u>Sphoeroides parvus</u> | Least puffer |
| <u>Sphoeroides spengleri</u> | Bandtail puffer |
| <u>Sphyraena barracuda</u> | Great barracuda |
| <u>Sphyraena guachancho</u> | Guaguanche |
| <u>Sphyrna lewini</u> | Scalloped hammerhead |
| <u>Sphyrna mokarran</u> | Great hammerhead |
| <u>Sphyrna tiburo</u> | Bonnethead |
| <u>Sphyrna tudes</u> | Smalleye hammerhead |
| <u>Stellifer lanceolatus</u> | Star drum |
| <u>Stenotomus caprinus</u> | Longspine porgy |
| <u>Strongylura marina</u> | Atlantic needlefish |
| <u>Strongylura timucu</u> | Timucu |
| <u>Syacium gunteri</u> | Shoal flounder |
| <u>Syacium papillosum</u> | Dusky flounder |
| <u>Symphurus civitatus</u> | Offshore tonguefish |
| <u>Symphurus diomedianus</u> | Spottedfin tonguefish |
| <u>Symphurus parvus</u> | Pygmy tonguefish |
| <u>Symphurus plagiusa</u> | Blackcheek tonguefish |
| <u>Symphurus urospilus</u> | Spottail tonguefish |
| <u>Syngnathus floridae</u> | Dusky pipefish |
| <u>Syngnathus louisianae</u> | Chain pipefish |
| <u>Syngnathus pelagicus</u> | Sargassum pipefish |
| <u>Syngnathus scovelli</u> | Gulf pipefish |
| <u>Synodus foetens</u> | Inshore lizardfish |
| <u>Synodus poeyi</u> | Offshore lizardfish |
| <u>Thunnus thynnus</u> | Bluefin tuna |
| <u>Tilapia aurea</u> | Blue tilapia |
| <u>Trachinocephalus myops</u> | Snakefish |
| <u>Trachinotus carolinus</u> | Florida pompano |
| <u>Trachinotus falcatus</u> | Permit |
| <u>Trachinotus goodei</u> | Palometa |
| <u>Trachurus lathami</u> | Rough scad |
| <u>Trichiurus lepturus</u> | Atlantic cutlassfish |
| <u>Trinectes maculatus</u> | Hogchoker |
| <u>Umbrina coroides</u> | Sand drum |
| <u>Upeneus parvus</u> | Dwarf goatfish |
| <u>Urophycis cirrata</u> | Gulf hake |
| <u>Urophycis floridana</u> | Southern hake |
| <u>Xanthichthys ringens</u> | Sargassum triggerfish |
| Invertebrates | |
| <u>Acetes americanus</u> | (Sergestid shrimp) |
| <u>Agriopoma texasianum</u> | Texas venus |
| <u>Albunea gibbesii</u> | Surf mole crab |
| <u>Albunea paretii</u> | Beach mole crab |
| <u>Alpheus estuariensis</u> | Estuarine snapping shrimp |

Table A.9. (Contd.)

| Scientific Name | Common Name |
|--|------------------------------|
| Invertebrates (Contd.) | |
| <u>Amaea mitchelli</u> | Mitchell's wentletrap |
| <u>Anachis avara</u> | Greedy dovesnail |
| <u>Anadara brasiliiana</u> | Incongruous ark |
| <u>Anadara floridana</u> | Cut-ribbed ark |
| <u>Anadara ovalis</u> | Blood ark |
| <u>Anadara transversa</u> | Transverse ark |
| <u>Anasimus latus</u> | Stilt spider crab |
| <u>Anomia simplex</u> | Common jingle |
| <u>Aplysia brasiliiana</u> | Sooty seahare |
| <u>Arbacia punctulata</u> | Red sea urchin |
| <u>Arca imbricata</u> | Mossy ark |
| <u>Architectonica nobilis</u> | Common sundial |
| <u>Arcinella cornuta</u> | Florida spiny jewelbox |
| <u>Arenaeus cribrarius</u> | Speckled swimming crab |
| <u>Argopecten gibbus</u> | Atlantic calico scallop |
| <u>Argopecten irradians</u> | Bay scallop |
| <u>Armina tigrina</u> | Tiger armina |
| <u>Astropecten duplicatus</u> | Two-spined starfish |
| <u>Atrina serrata</u> | Sawtooth pen shell |
| <u>Aurelia aurita</u> | Moon jellyfish |
| <u>Barbatia candida</u> | White-beard ark |
| <u>Beroe ovata</u> | Sea walnut |
| <u>Brachidontes exustus</u> | Scorched mussel |
| <u>Brissopsis alta</u> | Heart urchin |
| <u>Bulla striata</u> | Striate bubble |
| <u>Bursatella leachii pleii</u> | Ragged seahare |
| <u>Busycon sinistrum</u> | Lightning whelk |
| <u>Busycotypus spiratus</u> | Pearwhelk |
| <u>Calappa flammea</u> | Flame box crab |
| <u>Calappa ocellata</u> | Ocellate box crab |
| <u>Calappa sulcata</u> | Yellow box crab |
| <u>Callianassa louisianensis</u> | Gulf estuarine ghost shrimp |
| <u>Callinectes marginatus</u> | (Sargassum crab) |
| <u>Callinectes sapidus</u> | Blue crab |
| <u>Callinectes similis</u> | Lesser blue crab |
| <u>Cancellaria reticulata</u> | Common nutmeg |
| <u>Cantharus cancellarius</u> | Cancellate cantharus |
| <u>Chasmocarcinus mississippiensis</u> | Roughwrist soft crab |
| <u>Chione cancellata</u> | Cross-barred venus |
| <u>Chione clenchi</u> | Clench venus |
| <u>Chione intapurpurea</u> | Lady-in-waiting venus |
| <u>Chiropsalmus quadrumanus</u> | Sea wasp |
| <u>Chrysaora quinquecirrha</u> | Sea nettle |
| <u>Clibanarius vittatus</u> | Thinstripe hermit |
| <u>Crassostrea virginica</u> | Eastern oyster |
| <u>Crepidula convexa</u> | Convex slippersnail |
| <u>Crepidula fornicata</u> | Common Atlantic slippersnail |
| <u>Crepidula plana</u> | Eastern white slippersnail |
| <u>Cyclinella tenuis</u> | Thin cyclinella |

Table A.9. (Contd.)

| Scientific Name | Common Name |
|-------------------------------------|----------------------------|
| Invetebrates (Contd.) | |
| <u>Cyrtopleura costata</u> | Angelwing |
| <u>Dardanus fucosus</u> | Bareye hermit |
| <u>Dinocardium robustum</u> | Atlantic giant-cockle |
| <u>Distorsio clathrata</u> | Atlantic distorsio |
| <u>Donax variabilis</u> | Variable coquina |
| <u>Dosinia discus</u> | Disk dosinia |
| <u>Dromidia antillensis</u> | Hairy sponge crab |
| <u>Dyspanopeus texana</u> | Gulf grassflat crab |
| <u>Echinometra lucunter</u> | Rock-boring urchin |
| <u>Emerita portoricensis</u> | Puerto Rican sand crab |
| <u>Ensis minor</u> | Minor jackknife |
| <u>Euceramus praelongus</u> | Olivepit porcelain crab |
| <u>Eurypanopeus abbreviatus</u> | Lobate mud crab |
| <u>Eurypanopeus depressus</u> | Flatback mud crab |
| <u>Exhippolysmata oplophoroides</u> | Redleg humpback shrimp |
| <u>Fasciolaria liliun liliun</u> | Banded tulip |
| <u>Glypturus acanthochirus</u> | Ghost shrimp |
| <u>Haminoea antillarum</u> | Antilles glassy-bubble |
| <u>Hepatus epheliticus</u> | Calico box crab |
| <u>Hepatus pudibundus</u> | Flecked box crab |
| <u>Heterocrypta granulata</u> | Smooth elbow crab |
| <u>Hexapanopeus angustifrons</u> | Smooth mud crab |
| <u>Hexapanopeus paulensis</u> | Knobbed mud crab |
| <u>Hypoconcha arcuata</u> | Granulate shellback shrimp |
| <u>Hypoconcha sabulosa</u> | Shellback crab (Dromiid) |
| <u>Ischadium recurvum</u> | Hooked mussel |
| <u>Isocheles wurdemanni</u> | Surf hermit |
| <u>Laevicardium mortoni</u> | Morton eggcockle |
| <u>Latreutes fucorum</u> | Slender sargassum shrimp |
| <u>Latreutes parvulus</u> | Sargassum shrimp |
| <u>Leander tenuicornis</u> | Brown grass shrimp |
| <u>Leiolambrus nitidus</u> | White elbow crab |
| <u>Lepidopa benedicti</u> | (Gulf mole crab) |
| <u>Libinia dubia</u> | Longnose spider crab |
| <u>Libinia emarginata</u> | Portly spider crab |
| <u>Littorina irrorata</u> | Marsh periwinkle |
| <u>Loligo pealeii</u> | Longfin squid |
| <u>Loligo pleii</u> | Arrow squid |
| <u>Lolliguncula brevis</u> | Atlantic brief squid |
| <u>Lucifer faxoni</u> | Sergestid shrimp |
| <u>Lucina pectinata</u> | Thick lucine |
| <u>Luidia alternata</u> | Banded sea star |
| <u>Luidia clathrata</u> | Large sea star |
| <u>Lysiosquilla scabricauda</u> | (Giant) mantis shrimp |
| <u>Lysmata wurdemanni</u> | Peppermint shrimp |
| <u>Lytechinus variegatus</u> | Short spined sea urchin |
| <u>Macrobrachium acanthurus</u> | Cinnamon river shrimp |
| <u>Macrobrachium ohione</u> | Ohio shrimp |
| <u>Macrocallista maculata</u> | Calico clam |

Table A.9. (Contd.)

| Scientific Name | Common Name |
|--|----------------------------|
| Invertebrates (Contd.) | |
| <u>Mactra fragilis</u> | Fragile Atlantic mactra |
| <u>Melampus bidentatus</u> | Eastern melampus |
| <u>Mellita quinquesperforata</u> | Five-lunuled sand dollar |
| <u>Menippe adina</u> | Gulf stone crab |
| <u>Mercenaria campechiensis</u> | Southern quahog |
| <u>Mercenaria campechiensis texana</u> | Texas quahog |
| <u>Metoporphaphis calcarata</u> | False arrow crab |
| <u>Mnemiopsis mccradyi</u> | Phosphorus jelly |
| <u>Molgula manhattensis</u> | Sea squirt |
| <u>Mulinia lateralis</u> | Dwarf surf clam |
| <u>Muricanthus fluvescens</u> | Giant eastern murex |
| <u>Nassarius vibex</u> | Bruised nassa |
| <u>Nemopsis bachei</u> | (Hydromedusa) |
| <u>Neritina virginea</u> | Virgin nerite |
| <u>Neverita duplicata</u> | Shark eye |
| <u>Noetia ponderosa</u> | Ponderous ark |
| <u>Octopus vulgaris</u> | Common octopus |
| <u>Oculina diffusa</u> | Ivory coral |
| <u>Ocypode quadrata</u> | Atlantic ghost crab |
| <u>Oliva sayana</u> | Lettered olive |
| <u>Ophiolepis elegans</u> | Brittle star |
| <u>Ostreola equestris</u> | Crested oyster |
| <u>Ovalipes floridanus</u> | Florida lady crab |
| <u>Paguristes hummi</u> | (Blue spot hermit crab) |
| <u>Pagurus annulipes</u> | (Brown-banded hermit crab) |
| <u>Pagurus brevidactylus</u> | Short-fingered hermit |
| <u>Pagurus impressus</u> | Dimpled hermit |
| <u>Pagurus longicarpus</u> | Longwrist hermit |
| <u>Pagurus pollicaris</u> | Flatclaw hermit |
| <u>Palaemonetes pugio</u> | Daggerblade grass shrimp |
| <u>Palaemonetes vulgaris</u> | Marsh grass shrimp |
| <u>Panopeus simpsoni</u> | Oystershell mud crab |
| <u>Paranthus rapiformis</u> | Onion anemone |
| <u>Parthenope serrata</u> | Sawtooth elbow crab |
| <u>Pelia mutica</u> | Cryptic teardrop crab |
| <u>Penaeus aztecus</u> | Brown shrimp |
| <u>Penaeus duorarum</u> | Pink shrimp |
| <u>Penaeus setiferus</u> | White shrimp |
| <u>Persephona crinita</u> | Pink purse crab |
| <u>Persephona mediterranea</u> | Mottled purse crab |
| <u>Petrochirus diogenes</u> | Giant hermit |
| <u>Petrolisthes armatus</u> | Green porcelain crab |
| <u>Phalium granulatum</u> | Scotch bonnet |
| <u>Physalia physalis</u> | Portuguese man-of-war |
| <u>Pinnotheres maculatus</u> | Squatter pea crab |
| <u>Pleuroploca gigantea</u> | Horse conch |
| <u>Podochela riisei</u> | Longfinger neck crab |
| <u>Podochela sidneyi</u> | Shortfinger neck crab |
| <u>Polymesoda maritima</u> | Southern marshclam |

Table A.9. (Contd.)

| Scientific Name | Common Name |
|-----------------------------------|--------------------------|
| Inveterbrates (Contd.) | |
| <u>Porcellana sayana</u> | Spotted porcelain crab |
| <u>Porcellana sigsbeiana</u> | Striped porcelain crab |
| <u>Portunus anceps</u> | Delicate swimming crab |
| <u>Portunus gibbesii</u> | Iridescent swimming crab |
| <u>Portunus sayi</u> | Sargassum swimming crab |
| <u>Portunus spinicarpus</u> | Longspine swimming crab |
| <u>Portunus spinimanus</u> | Blotched swimming crab |
| <u>Portunus ventralis</u> | (Portunid swimming crab) |
| <u>Procambarus clarkii</u> | Red swamp crawfish |
| <u>Pseudocyphoma intermedium</u> | Intermediate cyphoma |
| <u>Rangia cuneata</u> | Atlantic rangia |
| <u>Rangia flexuosa</u> | Brown rangia |
| <u>Raninoides louisianensis</u> | Gulf frog crab |
| <u>Renilla mulleri</u> | Sea pansy |
| <u>Rhithropanopeus harrisii</u> | Harris mud crab |
| <u>Scyllaea pelagica</u> | Sargassum nudibranch |
| <u>Sesarma reticulatum</u> | Heavy marsh crab |
| <u>Sicyonia brevirostris</u> | Brown rock shrimp |
| <u>Sicyonia dorsalis</u> | Lesser rock shrimp |
| <u>Sicyonia stimpsoni</u> | Eyespot rock shrimp |
| <u>Sicyonia typica</u> | Kinglet rock shrimp |
| <u>Simnialena marferula</u> | Sea-whip simnia |
| <u>Sinum perspectivum</u> | White baby-ear |
| <u>Solenocera vioscai</u> | Humpback shrimp |
| <u>Speocarcinus lobatus</u> | Gulf squareback crab |
| <u>Spisula lidissima</u> | Atlantic surfclam |
| <u>Squilla chydæa</u> | (Offshore mantis shrimp) |
| <u>Squilla empusa</u> | Mantis shrimp |
| <u>Squilla neglecta</u> | Lesser mantis shrimp |
| <u>Stenorhynchus seticornis</u> | Yellowline arrow crab |
| <u>Stomolophus meleagris</u> | Cabbagehead |
| <u>Strombus alatus</u> | Florida fighting conch |
| Suborder Reptantia | Suborder reptantia |
| Suborder Zygoptera | (Damselfly nymphs) |
| <u>Synalpheus fritzmuelleri</u> | Speckled snapping shrimp |
| <u>Tagelus plebeius</u> | Stout tagelus |
| <u>Tellina alternata</u> | Alternate tellin |
| <u>Tellina tampaensis</u> | Tampa tellin |
| <u>Terebra protexta</u> | Fine-ribbed auger |
| <u>Thais haemastoma floridana</u> | Florida rocksnail |
| <u>Thyone mexicana</u> | Sea cucumber |
| <u>Tonna galea</u> | Giant tun |
| <u>Tozeuma carolinense</u> | Arrow shrimp |
| <u>Trachycardium muricatum</u> | Yellow pricklycockle |
| <u>Trachypenaeus constrictus</u> | Roughneck shrimp |
| <u>Trachypenaeus similis</u> | Roughback shrimp |
| <u>Uca panacea</u> | Gulf sand fiddler |
| <u>Upogebia affinis</u> | Coastal mud shrimp |
| <u>Velella velella</u> | By-the-wind sailor |
| <u>Xiphopenaeus kroyeri</u> | Seabob |

Appendix B. Summary of hydrological data collected for gill net, bay and beach bag seine, oyster dredge, bay and gulf trawl and beach seine samples.

Table B.3. Annual mean surface turbidity at sampled gill net sites by bay system during spring and fall 1975-93. ND = no data.

| Year | Sabine Lake | | Galveston | | East Matagorda | | Mataforda | | San Antonio | | Aransas | | Corpus Christi | | Upper Laguna Madre | | Coastwide | |
|-------------------------|-------------|------|-----------|------|----------------|------|-----------|------|-------------|------|---------|------|----------------|------|--------------------|------|-----------|------|
| | Spring | Fall | Spring | Fall | Spring | Fall | Spring | Fall | Spring | Fall | Spring | Fall | Spring | Fall | Spring | Fall | Spring | Fall |
| Jackson Turbidity Units | | | | | | | | | | | | | | | | | | |
| 1975 | ND | ND | 53 | ND | ND | ND | 30 | ND | 42 | ND | 24 | 27 | ND | 42 | ND | 28 | ND | 37 |
| 1976 | ND | ND | 52 | ND | 157 | ND | 33 | ND | 25 | ND | 63 | 60 | 24 | 51 | ND | 38 | 79 | 50 |
| 1977 | ND | ND | 75 | 118 | 46 | 48 | 67 | 48 | 13 | 41 | 52 | 169 | 47 | 39 | 40 | 31 | 64 | 50 |
| 1978 | ND | ND | 44 | 36 | 15 | 68 | 74 | 55 | 20 | 55 | 50 | 61 | 47 | 66 | 37 | 39 | 54 | 48 |
| 1979 | ND | ND | 72 | 38 | 28 | 74 | 66 | 80 | 22 | 70 | 42 | 51 | 39 | 32 | 34 | 83 | 80 | 55 |
| 1980 | ND | ND | 69 | 67 | 49 | 74 | 33 | 17 | 19 | 53 | 40 | 36 | 57 | 55 | 64 | 71 | 64 | 48 |
| 1981 | ND | ND | 68 | 62 | 64 | 82 | 64 | 81 | 21 | 43 | 58 | 39 | 185 | 45 | 87 | 66 | 84 | 55 |
| 1982 | ND | ND | 66 | 82 | 55 | 75 | 47 | 35 | 27 | 91 | 33 | 38 | 63 | 32 | 113 | 79 | 72 | 47 |
| 1983 | ND | ND | 57 | 61 | 27 | 50 | 40 | 41 | 32 | 49 | 38 | 41 | 50 | 40 | 59 | 72 | 51 | 48 |
| 1984 | ND | ND | 43 | 27 | 25 | 35 | 44 | 47 | 40 | 40 | 39 | 47 | 69 | 56 | 113 | 90 | 54 | 47 |
| 1985 | ND | ND | 26 | 59 | 37 | 52 | 51 | 57 | 49 | 46 | 39 | 41 | 72 | 41 | 98 | 56 | 55 | 42 |
| 1986 | 43 | 28 | 32 | 64 | 37 | 60 | 31 | 46 | 32 | 38 | 41 | 26 | 61 | 85 | 53 | 59 | 48 | 43 |
| Nephelometric Units | | | | | | | | | | | | | | | | | | |
| 1987 | 30 | 18 | 17 | 42 | 19 | 28 | 19 | 26 | 15 | 10 | 7 | 7 | 14 | 11 | 23 | 13 | 21 | 14 |
| 1988 | 21 | 11 | 16 | 29 | 19 | 16 | 19 | 22 | 21 | 13 | 15 | 24 | 18 | 14 | 26 | 29 | 19 | 17 |
| 1989 | 25 | 9 | 12 | 9 | 22 | 36 | 15 | 30 | 12 | 22 | 8 | 18 | 12 | 9 | 45 | 13 | 24 | 11 |
| 1990 | 16 | 8 | 13 | 23 | 13 | 26 | 15 | 38 | 15 | 21 | 13 | 16 | 24 | 11 | 29 | 14 | 22 | 13 |
| 1991 | 15 | 6 | 20 | 52 | 21 | 29 | 15 | 19 | 13 | 23 | 13 | 13 | 25 | 18 | 13 | 10 | 21 | 12 |
| 1992 | 20 | 10 | 21 | 22 | 13 | 46 | 17 | 52 | 14 | 41 | 14 | 23 | 25 | 12 | 22 | 16 | 32 | 13 |
| 1993 | 24 | 11 | 26 | 33 | 15 | 46 | 16 | 29 | 11 | 24 | 15 | 17 | 18 | 15 | 23 | 14 | 27 | 14 |

Table B.4. Annual mean surface salinity (o/oo) at sampled bag seine sites by bay system during 1977-93. ND = no data.

| Year | East | | | | | Corpus Christi | | Upper | | Lower | |
|------|-------------|-----------|-----------|-----------|-------------|----------------|---------|--------------|-----------|--------------|-----------|
| | Sabine Lake | Galveston | Matagorda | Matagorda | San Antonio | Aransas | Christi | Laguna Madre | Coastwide | Laguna Madre | Coastwide |
| 1977 | ND | 21.9 | ND | 17.6 | 17.7 | 20.9 | 33.8 | 39.8 | 33.0 | 33.0 | 25.4 |
| 1978 | ND | 21.8 | ND | 19.7 | 20.6 | 19.9 | 29.5 | 39.6 | 29.2 | 29.2 | 25.0 |
| 1979 | ND | 12.2 | ND | 11.4 | 11.8 | 11.1 | 23.9 | 31.9 | 27.3 | 27.3 | 17.4 |
| 1980 | ND | 20.9 | ND | 19.9 | 21.0 | 19.8 | 28.1 | 29.6 | 28.8 | 28.8 | 23.4 |
| 1981 | ND | 18.2 | ND | 19.2 | 15.6 | 12.1 | 25.0 | 26.0 | 28.3 | 28.3 | 20.1 |
| 1982 | ND | 15.9 | ND | 18.2 | 17.0 | 17.6 | 27.6 | 29.8 | 29.7 | 29.7 | 21.3 |
| 1983 | ND | 12.2 | 15.4 | 16.5 | 17.3 | 16.8 | 27.5 | 36.4 | 31.7 | 31.7 | 21.5 |
| 1984 | ND | 19.5 | 17.8 | 21.6 | 23.2 | 22.6 | 31.8 | 39.5 | 29.9 | 29.9 | 25.2 |
| 1985 | ND | 17.0 | 16.9 | 19.7 | 17.5 | 19.7 | 28.1 | 36.7 | 32.1 | 32.1 | 23.2 |
| 1986 | 10.1 | 16.1 | 20.1 | 19.8 | 17.0 | 23.5 | 32.6 | 39.7 | 34.9 | 34.9 | 24.2 |
| 1987 | 7.6 | 18.1 | 15.3 | 15.4 | 10.8 | 13.7 | 28.7 | 31.4 | 31.5 | 31.5 | 19.9 |
| 1988 | 7.7 | 20.2 | 26.5 | 27.4 | 22.6 | 24.3 | 35.2 | 44.9 | 31.9 | 31.9 | 27.4 |
| 1989 | 6.6 | 15.1 | 26.9 | 27.4 | 27.4 | 26.7 | 35.6 | 48.6 | 34.2 | 34.2 | 28.5 |
| 1990 | 6.4 | 16.9 | 23.6 | 24.8 | 23.6 | 26.7 | 32.4 | 47.7 | 35.8 | 35.8 | 27.2 |
| 1991 | 2.6 | 12.4 | 17.3 | 16.7 | 19.3 | 17.7 | 30.8 | 40.0 | 28.8 | 28.8 | 21.1 |
| 1992 | 5.3 | 5.2 | 15.4 | 13.5 | 9.4 | 10.7 | 22.4 | 25.3 | 28.7 | 28.7 | 16.8 |
| 1993 | 4.3 | 12.6 | 18.2 | 17.1 | 13.9 | 13.8 | 27.6 | 27.7 | 27.5 | 27.5 | 18.3 |

Table B.5. Annual mean surface temperature (C) at sampled bag seine sites by bay system during 1977-93. ND = no data.

| Year | East | | | | | Corpus Christi | | Upper | | Lower | |
|------|-------------|-----------|-----------|-----------|-------------|----------------|---------|--------------|-----------|--------------|-----------|
| | Sabine Lake | Galveston | Matagorda | Matagorda | San Antonio | Aransas | Christi | Laguna Madre | Coastwide | Laguna Madre | Coastwide |
| 1977 | ND | 20.3 | ND | 20.9 | 21.7 | 20.8 | 20.4 | 20.6 | 20.5 | 20.5 | 20.7 |
| 1978 | ND | 21.4 | ND | 20.2 | 21.6 | 22.3 | 21.3 | 22.3 | 22.4 | 22.4 | 21.6 |
| 1979 | ND | 22.8 | ND | 22.8 | 23.3 | 23.2 | 23.6 | 21.8 | 23.1 | 23.1 | 22.9 |
| 1980 | ND | 23.9 | ND | 21.9 | 23.2 | 23.6 | 23.4 | 24.6 | 24.3 | 24.3 | 23.5 |
| 1981 | ND | 22.5 | ND | 21.5 | 22.4 | 23.7 | 22.6 | 24.1 | 24.6 | 24.6 | 23.0 |
| 1982 | ND | 23.9 | ND | 23.3 | 23.1 | 24.2 | 23.4 | 24.1 | 23.9 | 23.9 | 23.7 |
| 1983 | ND | 24.0 | 23.6 | 23.3 | 21.7 | 24.3 | 24.3 | 25.4 | 24.9 | 24.9 | 23.8 |
| 1984 | ND | 23.9 | 22.3 | 22.5 | 21.9 | 24.0 | 23.3 | 24.0 | 24.2 | 24.2 | 23.4 |
| 1985 | ND | 24.4 | 24.1 | 23.5 | 24.0 | 23.9 | 23.5 | 23.5 | 24.4 | 24.4 | 24.0 |
| 1986 | 23.7 | 24.2 | 23.4 | 23.3 | 22.2 | 25.2 | 23.6 | 24.5 | 25.0 | 25.0 | 24.2 |
| 1987 | 22.0 | 22.8 | 23.8 | 23.4 | 22.2 | 23.1 | 24.1 | 24.2 | 23.8 | 23.8 | 23.2 |
| 1988 | 21.7 | 23.4 | 23.9 | 23.4 | 21.1 | 23.3 | 23.3 | 23.9 | 25.1 | 25.1 | 23.5 |
| 1989 | 21.4 | 23.1 | 22.9 | 22.3 | 23.0 | 22.8 | 24.3 | 25.0 | 25.0 | 25.0 | 23.4 |
| 1990 | 21.7 | 22.6 | 24.7 | 23.6 | 24.9 | 24.4 | 24.9 | 24.9 | 25.5 | 25.5 | 23.9 |
| 1991 | 22.9 | 22.3 | 24.5 | 22.2 | 23.2 | 23.1 | 24.8 | 25.0 | 25.4 | 25.4 | 23.5 |
| 1992 | 22.2 | 21.7 | 22.2 | 21.4 | 23.3 | 22.6 | 23.4 | 24.3 | 25.9 | 25.9 | 23.0 |
| 1993 | 22.4 | 22.2 | 24.3 | 22.9 | 22.5 | 23.9 | 23.6 | 23.4 | 25.1 | 25.1 | 23.2 |

Table B.6. Annual mean surface turbidity at sampled bag seine sites by bay system during 1977-93. ND = no data.

| Year | East | | | | | | | | | |
|-------------------------|-------------|-----------|-----------|-----------|-------------|---------|----------------|--------------------|--------------------|-----------|
| | Sabine Lake | Galveston | Matagorda | Matagorda | San Antonio | Aransas | Corpus Christi | Upper Laguna Madre | Lower Laguna Madre | Coastwide |
| Jackson Turbidity Units | | | | | | | | | | |
| 1977 | ND | 94 | ND | 60 | 27 | 50 | 40 | 50 | 30 | 55 |
| 1978 | ND | 78 | ND | 55 | 33 | 41 | 43 | 51 | 34 | 51 |
| 1979 | ND | 90 | ND | 70 | 31 | 53 | 44 | 47 | 59 | 60 |
| 1980 | ND | 90 | ND | 42 | 24 | 47 | 52 | 75 | 73 | 61 |
| 1981 | ND | 87 | ND | 54 | 25 | 65 | 44 | 107 | 95 | 71 |
| 1982 | ND | 105 | ND | 50 | 31 | 60 | 46 | 69 | 87 | 69 |
| 1983 | ND | 96 | ND | 54 | 30 | 51 | 46 | 57 | 48 | 58 |
| 1984 | ND | 79 | 42 | 41 | 36 | 48 | 41 | 82 | 61 | 57 |
| 1985 | ND | 52 | 67 | 45 | 54 | 47 | 40 | 108 | 68 | 59 |
| 1986 | 46 | 84 | 59 | 46 | 51 | 46 | 44 | 60 | 80 | 61 |
| Nephelometric Units | | | | | | | | | | |
| 1987 | 24 | 28 | 39 | 36 | 32 | 9 | 26 | 15 | 17 | 24 |
| 1988 | 26 | 26 | 28 | 29 | 29 | 28 | 20 | 22 | 24 | 26 |
| 1989 | 25 | 29 | 26 | 25 | 40 | 22 | 20 | 22 | 22 | 26 |
| 1990 | 21 | 29 | 26 | 30 | 31 | 23 | 21 | 20 | 23 | 26 |
| 1991 | 28 | 25 | 32 | 33 | 42 | 25 | 17 | 21 | 15 | 26 |
| 1992 | 24 | 23 | 34 | 41 | 43 | 31 | 21 | 17 | 25 | 29 |
| 1993 | 21 | 30 | 27 | 38 | 24 | 30 | 23 | 26 | 36 | 30 |

Table B.7. Annual mean bottom salinity (o/oo) at sampled oyster dredge "reef" sites in Texas bay systems from 1984-93. ND = no data.

| Year | East | | | | |
|------|-----------|-----------|-------------|---------|-----------|
| | Galveston | Matagorda | San Antonio | Aransas | Coastwide |
| 1984 | 16.7 | ND | ND | ND | 16.7 |
| 1985 | 17.6 | ND | ND | ND | 17.6 |
| 1986 | 15.5 | 22.0 | 18.2 | 21.0 | 18.9 |
| 1987 | 16.3 | 16.6 | 10.9 | 14.2 | 14.5 |
| 1988 | 19.6 | 28.1 | 22.9 | 25.0 | 23.7 |
| 1989 | 16.0 | 29.2 | 27.9 | 29.7 | 25.1 |
| 1990 | 16.0 | 24.4 | 24.1 | 26.2 | 22.3 |
| 1991 | 12.3 | 17.4 | 19.5 | 18.6 | 16.7 |
| 1992 | 14.9 | 11.8 | 9.2 | 8.7 | 11.4 |
| 1993 | 13.5 | 15.9 | 13.2 | 14.5 | 14.2 |

Table B.8. Annual mean bottom temperature (C) at sampled oyster dredge "reef" sites in Texas bay systems from 1984-93. ND = no data

| Year | Galveston | Matagorda | San Antonio | Aransas | Coastwide |
|------|-----------|-----------|-------------|---------|-----------|
| 1984 | 21.0 | ND | ND | ND | 20.9 |
| 1985 | 22.0 | ND | ND | ND | 22.0 |
| 1986 | 22.8 | 22.4 | 22.3 | 22.1 | 22.4 |
| 1987 | 21.2 | 22.2 | 21.4 | 19.9 | 21.3 |
| 1988 | 21.6 | 21.8 | 21.6 | 22.0 | 21.7 |
| 1989 | 20.9 | 20.8 | 21.6 | 20.4 | 21.0 |
| 1990 | 21.7 | 22.6 | 22.6 | 23.0 | 22.4 |
| 1991 | 21.6 | 21.9 | 21.8 | 21.3 | 21.7 |
| 1992 | 21.8 | 20.8 | 22.6 | 21.4 | 21.7 |
| 1993 | 21.4 | 22.2 | 21.9 | 21.0 | 21.6 |

Table B.9. Annual mean bottom turbidity at sampled oyster dredge "reef" sites in Texas bay systems from 1984-93. ND = no data.

| Year | Galveston | Matagorda | San Antonio | Aransas | Coastwide |
|-------------------------|-----------|-----------|-------------|---------|-----------|
| Jackson Turbidity Units | | | | | |
| 1984 | 25 | ND | ND | ND | 25 |
| 1985 | 47 | ND | ND | ND | 47 |
| 1986 | 40 | 51 | 48 | 37 | 45 |
| Nephelometric Units | | | | | |
| 1987 | 14 | 22 | 30 | 8 | 20 |
| 1988 | 15 | 21 | 16 | 16 | 17 |
| 1989 | 19 | 20 | 27 | 16 | 21 |
| 1990 | 14 | 22 | 26 | 16 | 20 |
| 1991 | 16 | 23 | 23 | 20 | 21 |
| 1992 | 15 | 32 | 37 | 31 | 26 |
| 1993 | 21 | 24 | 20 | 22 | 22 |

Table B.10. Annual mean bottom salinity (o/oo) at sampled bay trawl sites in Texas bay systems from 1977-93. ND = no data.

| Year | East | | | | | Upper | | | | | Lower | | | | |
|------|-------------|-----------|-----------|-----------|-------------|----------|---------|--------------|--------------|-----------|---------|--------------|--------------|-----------|--|
| | Sabine Lake | Galveston | Matagorda | Matagorda | San Antonio | Arkansas | Christi | Laguna Madre | Laguna Madre | Coastwide | Christi | Laguna Madre | Laguna Madre | Coastwide | |
| 1977 | ND | 20.5 | ND | 17.9 | 13.9 | 19.5 | ND | ND | ND | 18.5 | ND | ND | ND | 18.5 | |
| 1978 | ND | 20.1 | ND | 19.3 | 14.7 | 20.6 | ND | ND | ND | 19.0 | ND | ND | ND | 19.0 | |
| 1979 | ND | 9.0 | ND | 10.3 | 5.7 | ND | ND | ND | ND | 8.8 | ND | ND | ND | 8.8 | |
| 1980 | ND | 22.8 | ND | ND | ND | ND | ND | ND | ND | 22.8 | ND | ND | ND | 22.8 | |
| 1981 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| 1982 | ND | 16.0 | ND | 22.4 | 16.3 | 19.2 | 30.3 | 34.1 | 35.8 | 21.3 | 35.8 | 33.0 | 33.0 | 21.3 | |
| 1983 | ND | 10.7 | ND | 20.4 | 16.9 | 19.6 | 29.8 | 36.9 | 33.0 | 19.1 | 36.9 | 33.0 | 31.0 | 19.1 | |
| 1984 | ND | 18.5 | ND | 25.2 | 22.9 | 25.2 | 32.5 | 40.0 | 31.0 | 24.6 | 40.0 | 31.0 | 31.0 | 24.6 | |
| 1985 | ND | 17.0 | ND | 21.0 | 16.2 | 21.2 | 29.8 | 37.3 | 33.1 | 21.5 | 37.3 | 33.1 | 33.1 | 21.5 | |
| 1986 | 7.8 | 14.8 | ND | 24.5 | 17.3 | 22.7 | 31.1 | 39.6 | 36.1 | 21.6 | 39.6 | 36.1 | 36.1 | 21.6 | |
| 1987 | 7.3 | 15.1 | 16.7 | 20.6 | 9.9 | 18.1 | 27.5 | 31.9 | 33.3 | 18.6 | 31.9 | 33.3 | 33.3 | 18.6 | |
| 1988 | 7.8 | 19.2 | 28.7 | 29.6 | 21.7 | 25.7 | 34.9 | 45.0 | 34.8 | 25.6 | 45.0 | 34.8 | 34.8 | 25.6 | |
| 1989 | 6.2 | 16.4 | 27.6 | 30.2 | 26.8 | 30.4 | 35.4 | 49.3 | 35.9 | 26.1 | 49.3 | 35.9 | 35.9 | 26.1 | |
| 1990 | 5.7 | 15.1 | 25.8 | 26.1 | 21.6 | 27.0 | 32.0 | 48.6 | 36.3 | 23.4 | 48.6 | 36.3 | 36.3 | 23.4 | |
| 1991 | 2.2 | 11.9 | 18.7 | 20.4 | 17.7 | 20.0 | 29.9 | 41.4 | 31.5 | 19.2 | 41.4 | 31.5 | 31.5 | 19.2 | |
| 1992 | 5.5 | 13.6 | 16.6 | 15.0 | 7.9 | 10.7 | 22.9 | 24.6 | 30.7 | 15.0 | 24.6 | 30.7 | 30.7 | 15.0 | |
| 1993 | 3.1 | 13.8 | 18.9 | 18.5 | 12.4 | 16.9 | 28.6 | 28.0 | 30.9 | 17.6 | 28.0 | 30.9 | 30.9 | 17.6 | |

Table B.11. Annual mean bottom temperature (C) at sampled bay trawl sites in Texas bay systems from 1977-93. ND = no data.

| Year | East | | | | | Upper | | | | | Lower | | | | |
|------|-------------|-----------|-----------|-----------|-------------|----------|---------|--------------|--------------|-----------|---------|--------------|--------------|-----------|--|
| | Sabine Lake | Galveston | Matagorda | Matagorda | San Antonio | Arkansas | Christi | Laguna Madre | Laguna Madre | Coastwide | Christi | Laguna Madre | Laguna Madre | Coastwide | |
| 1977 | ND | 18.7 | ND | 17.9 | 21.1 | 17.8 | ND | ND | ND | 18.8 | ND | ND | ND | 18.8 | |
| 1978 | ND | 21.6 | ND | 23.5 | 24.2 | 24.8 | ND | ND | ND | 22.9 | ND | ND | ND | 22.9 | |
| 1979 | ND | 22.5 | ND | 21.6 | 25.5 | ND | ND | ND | ND | 22.8 | ND | ND | ND | 22.8 | |
| 1980 | ND | 23.8 | ND | ND | ND | ND | ND | ND | ND | 23.8 | ND | ND | ND | 23.8 | |
| 1981 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| 1982 | ND | 21.8 | ND | 24.8 | 23.3 | 23.1 | 25.0 | 26.1 | 25.1 | 23.5 | 26.1 | 25.1 | 25.1 | 23.5 | |
| 1983 | ND | 21.5 | ND | 21.7 | 21.7 | 22.3 | 22.2 | 21.8 | 22.7 | 21.8 | 21.8 | 22.7 | 22.7 | 21.8 | |
| 1984 | ND | 22.2 | ND | 22.8 | 21.6 | 23.4 | 21.8 | 22.0 | 22.8 | 22.3 | 22.0 | 22.8 | 22.8 | 22.3 | |
| 1985 | ND | 21.9 | ND | 22.5 | 22.5 | 21.7 | 21.9 | 23.0 | 22.8 | 22.2 | 23.0 | 22.8 | 22.8 | 22.2 | |
| 1986 | 22.1 | 22.2 | ND | 23.3 | 23.1 | 22.1 | 22.5 | 23.3 | 22.5 | 22.6 | 23.3 | 22.5 | 22.5 | 22.6 | |
| 1987 | 20.0 | 21.5 | 24.3 | 23.3 | 23.1 | 22.1 | 22.1 | 22.1 | 22.6 | 21.6 | 22.1 | 22.6 | 22.6 | 21.6 | |
| 1988 | 21.8 | 21.8 | 21.1 | 21.9 | 21.8 | 21.3 | 21.1 | 22.2 | 22.6 | 21.6 | 22.2 | 22.6 | 22.6 | 21.6 | |
| 1989 | 20.8 | 20.4 | 21.0 | 20.2 | 22.1 | 20.5 | 21.8 | 23.8 | 24.5 | 21.0 | 23.8 | 24.5 | 24.5 | 21.0 | |
| 1990 | 21.2 | 21.4 | 22.7 | 22.6 | 21.9 | 22.6 | 23.4 | 23.8 | 24.2 | 22.3 | 23.8 | 24.2 | 24.2 | 22.3 | |
| 1991 | 21.7 | 21.5 | 22.0 | 21.5 | 22.2 | 21.7 | 22.8 | 23.4 | 23.4 | 21.9 | 23.4 | 23.4 | 23.4 | 21.9 | |
| 1992 | 20.7 | 21.6 | 22.0 | 21.1 | 22.2 | 21.4 | 21.4 | 22.9 | 23.2 | 21.7 | 22.9 | 23.2 | 23.2 | 21.7 | |
| 1993 | 20.9 | 20.9 | 22.2 | 22.2 | 22.5 | 21.8 | 22.1 | 21.3 | 23.7 | 21.3 | 21.3 | 23.7 | 23.7 | 21.3 | |

Table B.12. Annual mean bottom turbidity at sampled bay trawl sites in Texas bay systems from 1983-93. ND = no data.

| Year | East | | | | | | Upper | | Lower | |
|-------------------------|-------------|-----------|-----------|-----------|-------------|---------|----------------|--------------|--------------|-----------|
| | Sabine Lake | Galveston | Matagorda | Matagorda | San Antonio | Aransas | Corpus Christi | Laguna Madre | Laguna Madre | Coastwide |
| Jackson Turbidity Units | | | | | | | | | | |
| 1983 | ND | 101 | ND | 25 | 26 | 105 | 77 | 76 | 38 | 67 |
| 1984 | ND | 75 | ND | 30 | 30 | 71 | 62 | 70 | 38 | 55 |
| 1985 | ND | 41 | ND | 33 | 55 | 42 | 32 | 52 | 59 | 41 |
| 1986 | 35 | 37 | ND | 45 | 53 | 41 | 42 | 49 | 67 | 43 |
| Nephelometric Units | | | | | | | | | | |
| 1987 | 15 | 17 | 19 | 22 | 29 | 7 | 13 | 15 | 12 | 18 |
| 1988 | 17 | 14 | 20 | 23 | 17 | 13 | 15 | 14 | 15 | 16 |
| 1989 | 16 | 18 | 27 | 19 | 22 | 19 | 15 | 12 | 14 | 18 |
| 1990 | 13 | 18 | 20 | 15 | 28 | 17 | 11 | 15 | 13 | 17 |
| 1991 | 18 | 16 | 22 | 19 | 22 | 19 | 10 | 10 | 8 | 17 |
| 1992 | 19 | 18 | 17 | 24 | 37 | 30 | 12 | 9 | 18 | 21 |
| 1993 | 16 | 24 | 17 | 19 | 19 | 22 | 13 | 13 | 47 | 21 |

Table B.13. Annual mean bottom salinity (o/oo) at sampled gulf trawl sites in the Texas Territorial Sea 1985-93. ND = no data.

| Year | Galveston | | Port O'Connor | | Port Aransas | | Port Isabel | | Coastwide | |
|------|-------------|-----------|---------------|---------------|--------------|--------------|-------------|-------------|-----------|-----------|
| | Sabine Lake | Galveston | Port O'Connor | Port O'Connor | Port Aransas | Port Aransas | Port Isabel | Port Isabel | Coastwide | Coastwide |
| 1985 | ND | 30.6 | 32.3 | 32.3 | 30.9 | 30.9 | 31.7 | 31.7 | 31.4 | 31.4 |
| 1986 | 29.1 | 29.7 | 32.4 | 32.4 | 30.5 | 30.5 | 32.7 | 32.7 | 30.9 | 30.9 |
| 1987 | 27.4 | 28.8 | 33.5 | 33.5 | 34.4 | 34.4 | 34.4 | 34.4 | 31.7 | 31.7 |
| 1988 | 27.3 | 28.3 | 30.7 | 30.7 | 32.4 | 32.4 | 35.0 | 35.0 | 30.7 | 30.7 |
| 1989 | 25.4 | 29.9 | 32.9 | 32.9 | 30.9 | 30.9 | 33.7 | 33.7 | 30.6 | 30.6 |
| 1990 | 25.3 | 29.5 | 30.5 | 30.5 | 32.4 | 32.4 | 33.9 | 33.9 | 30.3 | 30.3 |
| 1991 | 23.7 | 28.5 | 31.0 | 31.0 | 31.9 | 31.9 | 31.2 | 31.2 | 29.3 | 29.3 |
| 1992 | 26.5 | 29.4 | 31.5 | 31.5 | 32.4 | 32.4 | 30.7 | 30.7 | 30.1 | 30.1 |
| 1993 | 23.1 | 27.3 | 28.9 | 28.9 | 34.5 | 34.5 | 30.8 | 30.8 | 28.9 | 28.9 |

Table B.14. Annual mean bottom temperature (C) at sampled gulf trawl sites in the Texas Territorial Sea 1985-93. ND = no data.

| Year | Galveston | | Port O'Connor | | Port Aransas | | Port Isabel | | Coastwide | |
|------|-------------|-----------|---------------|---------------|--------------|--------------|-------------|-------------|-----------|-----------|
| | Sabine Lake | Galveston | Port O'Connor | Port O'Connor | Port Aransas | Port Aransas | Port Isabel | Port Isabel | Coastwide | Coastwide |
| 1985 | ND | 23.4 | 23.6 | 23.6 | 22.5 | 22.5 | 25.4 | 25.4 | 23.7 | 23.7 |
| 1986 | 25.6 | 22.0 | 22.8 | 22.8 | 22.3 | 22.3 | 22.7 | 22.7 | 23.1 | 23.1 |
| 1987 | 21.1 | 21.7 | 22.1 | 22.1 | 22.4 | 22.4 | 21.9 | 21.9 | 21.8 | 21.8 |
| 1988 | 21.1 | 21.6 | 21.2 | 21.2 | 22.2 | 22.2 | 21.8 | 21.8 | 21.6 | 21.6 |
| 1989 | 19.8 | 21.5 | 21.3 | 21.3 | 21.7 | 21.7 | 21.8 | 21.8 | 21.2 | 21.2 |
| 1990 | 21.3 | 21.9 | 21.8 | 21.8 | 22.2 | 22.2 | 21.8 | 21.8 | 21.8 | 21.8 |
| 1991 | 22.0 | 22.3 | 22.1 | 22.1 | 21.8 | 21.8 | 21.5 | 21.5 | 21.9 | 21.9 |
| 1992 | 19.9 | 21.5 | 20.9 | 20.9 | 22.5 | 22.5 | 20.9 | 20.9 | 21.1 | 21.1 |
| 1993 | 21.8 | 21.7 | 21.8 | 21.8 | 21.6 | 21.6 | 21.3 | 21.3 | 21.7 | 21.7 |

Table B.15. Annual mean bottom turbidity at sampled gulf trawl sites in the Texas Territorial Sea 1985-93. ND = no data.

| Year | Sabine Lake | Galveston | Fort O'Connor | Fort Aransas | Port Isabel | Coastwide |
|-------------------------|-------------|-----------|---------------|--------------|-------------|-----------|
| Jackson Turbidity Units | | | | | | |
| 1985 | ND | 31 | 37 | 25 | 24 | 30 |
| 1986 | 30 | 24 | 29 | 24 | 24 | 26 |
| Nephelometric Units | | | | | | |
| 1987 | 10 | 10 | 11 | 4 | 6 | 8 |
| 1988 | 6 | 9 | 10 | 4 | 4 | 7 |
| 1989 | 7 | 9 | 9 | 7 | 4 | 7 |
| 1990 | 9 | 11 | 7 | 8 | 3 | 8 |
| 1991 | 11 | 12 | 7 | 8 | 3 | 8 |
| 1992 | 13 | 10 | 10 | 10 | 4 | 9 |
| 1993 | 12 | 6 | 14 | 7 | 4 | 9 |

Table B.16. Annual mean shoreline salinity (o/oo) at sampled 60.9-m beach seine sites in 5 Texas gulf areas 1987-93.

| Year | Gulf-17 | Gulf-18 | Gulf-19 | Gulf-20 | Gulf-21 | Coastwide |
|------|---------|---------|---------|---------|---------|-----------|
| 1987 | 28.0 | 29.8 | 30.7 | 32.9 | 33.5 | 30.7 |
| 1988 | 28.6 | 30.8 | 31.9 | 35.8 | 36.8 | 32.2 |
| 1989 | 22.6 | 25.3 | 31.3 | 32.9 | 32.9 | 28.9 |
| 1990 | 24.2 | 26.5 | 31.3 | 31.5 | 35.6 | 29.5 |
| 1991 | 24.1 | 26.1 | 28.2 | 30.9 | 31.5 | 27.8 |
| 1992 | 27.0 | 30.3 | 30.9 | 32.1 | 31.7 | 30.2 |
| 1993 | 23.4 | 27.5 | 28.6 | 32.3 | 32.5 | 28.3 |

Table B.17. Annual mean shoreline temperature (C) at sampled 60.9-m beach seine sites in 5 Texas gulf areas 1987-93.

| Year | Gulf-17 | Gulf-18 | Gulf-19 | Gulf-20 | Gulf-21 | Coastwide |
|------|---------|---------|---------|---------|---------|-----------|
| 1987 | 21.0 | 21.0 | 22.2 | 23.4 | 22.6 | 22.0 |
| 1988 | 26.7 | 26.5 | 26.9 | 27.5 | 26.5 | 26.8 |
| 1989 | 24.2 | 26.0 | 26.3 | 26.6 | 26.7 | 25.9 |
| 1990 | 26.1 | 26.4 | 26.3 | 26.9 | 27.1 | 26.5 |
| 1991 | 25.8 | 26.9 | 26.6 | 26.8 | 27.5 | 26.6 |
| 1992 | 26.5 | 26.0 | 25.1 | 25.9 | 26.6 | 25.9 |
| 1993 | 25.9 | 26.3 | 25.9 | 24.8 | 26.0 | 25.7 |

Table B.18. Annual mean shoreline turbidity (NTU) at sampled 60.9-m beach seine sites in 5 Texas gulf areas 1987-93.

| Year | Gulf-17 | Gulf-18 | Gulf-19 | Gulf-20 | Gulf-21 | Coastwide |
|------|---------|---------|---------|---------|---------|-----------|
| 1987 | 51 | 36 | 41 | 16 | 12 | 35 |
| 1988 | 43 | 30 | 30 | 9 | 10 | 26 |
| 1989 | 131 | 26 | 39 | 13 | 7 | 50 |
| 1990 | 48 | 31 | 28 | 14 | 10 | 28 |
| 1991 | 73 | 31 | 18 | 12 | 18 | 36 |
| 1992 | 71 | 22 | 35 | 18 | 22 | 37 |
| 1993 | 68 | 28 | 35 | 19 | 23 | 37 |

Table B.19. Annual mean shoreline salinity (o/oo) at sampled 18.3-m bag seine sites in 5 Texas gulf areas 1987-93.

| Year | Gulf-17 | Gulf-18 | Gulf-19 | Gulf-20 | Gulf-21 | Coastwide |
|------|---------|---------|---------|---------|---------|-----------|
| 1987 | 27.7 | 30.0 | 30.3 | 33.1 | 33.6 | 30.5 |
| 1988 | 28.6 | 30.8 | 31.9 | 35.8 | 36.8 | 32.3 |
| 1989 | 22.5 | 25.3 | 31.3 | 32.9 | 32.9 | 28.9 |
| 1990 | 25.2 | 26.6 | 31.1 | 32.2 | 35.5 | 29.8 |
| 1991 | 23.9 | 26.1 | 28.0 | 31.2 | 31.5 | 27.8 |
| 1992 | 27.2 | 30.0 | 30.9 | 32.0 | 31.7 | 30.2 |
| 1993 | 23.3 | 27.3 | 28.6 | 32.2 | 32.4 | 28.2 |

Table B.20. Annual mean shoreline temperature (C) at sampled 18.3-m bag seine sites in 5 Texas gulf areas 1987-93.

| Year | Gulf-17 | Gulf-18 | Gulf-19 | Gulf-20 | Gulf-21 | Coastwide |
|------|---------|---------|---------|---------|---------|-----------|
| 1987 | 21.9 | 21.2 | 22.3 | 23.8 | 22.6 | 22.4 |
| 1988 | 26.8 | 26.8 | 26.9 | 27.5 | 26.4 | 26.9 |
| 1989 | 24.3 | 26.2 | 26.4 | 26.6 | 26.7 | 26.0 |
| 1990 | 26.2 | 26.7 | 26.3 | 27.1 | 27.1 | 26.6 |
| 1991 | 25.8 | 27.3 | 26.7 | 26.9 | 27.5 | 26.7 |
| 1992 | 26.6 | 26.3 | 25.2 | 26.0 | 26.6 | 26.0 |
| 1993 | 25.8 | 26.3 | 25.8 | 24.8 | 26.2 | 25.8 |

Table B.21. Annual mean shoreline turbidity (NTU) at sampled 18.3-m bag seine sites in 5 Texas gulf areas 1987-93.

| Year | Gulf-17 | Gulf-18 | Gulf-19 | Gulf-20 | Gulf-21 | Coastwide |
|------|---------|---------|---------|---------|---------|-----------|
| 1987 | 56 | 41 | 45 | 16 | 12 | 38 |
| 1988 | 38 | 24 | 28 | 9 | 10 | 24 |
| 1989 | 134 | 29 | 37 | 13 | 7 | 51 |
| 1990 | 44 | 32 | 28 | 14 | 10 | 28 |
| 1991 | 73 | 31 | 31 | 12 | 18 | 36 |
| 1992 | 69 | 24 | 37 | 14 | 23 | 37 |
| 1993 | 92 | 30 | 36 | 21 | 26 | 44 |

Appendix C. Summary of SEAMAP samples by year and depth zone for brown shrimp, white shrimp, pink shrimp and blue crab collected off Texas during 1982-92.

Table C.1. Mean catch rates (No./h) and mean size (mm) of select shellfishes caught during SEAMAP sampling off Texas during June-July 1982-92. Blanks indicate no measurement taken.

| Year | Depth (m) | Samples (No.) | Brown Shrimp | | White Shrimp | | Pink Shrimp | | Blue Crab | |
|------|-----------|---------------|--------------|--------|--------------|--------|-------------|--------|-----------|--------|
| | | | No./h | Length | No./h | Length | No./h | Length | No./h | Length |
| 1982 | 0-18 | 22 | 1,222 | 108 | 15 | 173 | 161 | 136 | 8 | |
| | 19-37 | 50 | 1,427 | 115 | 0 | 0 | 20 | 138 | 1 | |
| | 38-55 | 29 | 138 | 145 | 0 | 0 | <1 | 126 | 0 | |
| | 56-73 | 5 | 117 | 179 | 0 | 0 | 0 | 0 | 0 | |
| | 74-91 | 3 | 79 | 182 | 0 | 0 | 0 | 0 | 0 | |
| 1983 | 0-18 | 28 | 254 | 99 | 20 | 153 | 195 | 127 | 8 | |
| | 19-37 | 47 | 1,445 | 119 | 1 | 167 | 87 | 121 | 4 | |
| | 38-55 | 24 | 304 | 132 | 0 | 0 | 1 | 118 | 1 | |
| | 56-73 | 8 | 66 | 156 | 0 | 0 | 0 | 0 | 0 | |
| | 74-91 | 2 | 71 | 168 | 0 | 0 | 0 | 0 | 0 | |
| 1984 | 0-18 | 16 | 733 | 116 | 30 | 174 | 4 | 151 | 6 | |
| | 19-37 | 40 | 1,594 | 116 | 1 | 168 | 3 | 150 | 0 | |
| | 38-55 | 16 | 544 | 131 | 0 | 0 | 0 | 0 | 0 | |
| | 56-73 | 12 | 194 | 138 | 0 | 0 | 0 | 0 | 0 | |
| | 74-91 | 5 | 86 | 151 | 0 | 0 | 0 | 0 | 0 | |
| 1985 | 0-18 | 30 | 450 | 98 | 41 | 168 | 15 | 135 | 20 | |
| | 19-37 | 40 | 1,362 | 112 | 2 | 167 | 10 | 131 | 4 | |
| | 38-55 | 14 | 150 | 127 | 0 | 0 | <1 | 127 | 0 | |
| | 56-73 | 5 | 154 | 144 | 0 | 0 | 0 | 0 | 0 | |
| | 74-91 | 1 | 36 | 179 | 0 | 0 | 0 | 0 | 0 | |
| 1986 | 0-18 | 35 | 250 | 98 | 33 | 165 | 18 | 116 | 11 | |
| | 19-37 | 43 | 809 | 108 | 0 | 0 | 42 | 130 | 10 | |
| | 38-55 | 10 | 311 | 124 | 0 | 0 | 0 | 0 | 0 | |
| | 56-73 | 5 | 176 | 136 | 0 | 0 | 0 | 0 | 0 | |
| | 74-91 | 3 | 49 | 147 | 0 | 0 | 0 | 0 | 0 | |
| 1987 | 0-18 | 74 | 189 | 103 | 15 | 159 | 24 | 115 | 3 | |
| | 19-37 | 56 | 606 | 107 | 3 | 162 | 19 | 108 | 7 | |
| | 38-55 | 17 | 26 | 142 | 0 | 0 | <1 | 180 | 2 | |
| | 56-73 | 8 | 16 | 177 | 0 | 0 | 0 | 0 | 1 | |
| | 74-91 | 7 | 11 | 177 | 0 | 0 | 0 | 0 | 0 | |
| 1988 | 0-18 | 75 | 227 | 106 | 4 | 166 | 22 | 110 | 5 | |
| | 19-37 | 50 | 309 | 113 | 0 | 0 | 2 | 127 | 2 | |
| | 38-55 | 17 | 18 | 126 | 0 | 0 | 0 | 0 | 0 | |
| | 56-73 | 7 | 4 | 180 | 0 | 0 | 0 | 0 | 0 | |
| | 74-91 | 7 | 3 | 198 | 0 | 0 | 0 | 0 | 0 | |
| 1989 | 0-18 | 85 | 556 | 101 | 16 | 167 | 51 | 116 | 6 | 111 |
| | 19-37 | 54 | 928 | 118 | 4 | 126 | 24 | 116 | 1 | 144 |
| | 38-55 | 12 | 212 | 129 | 0 | 0 | <1 | 135 | 0 | 0 |
| | 56-73 | 8 | 40 | 140 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 74-91 | 7 | 11 | 159 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1990 | 0-18 | 74 | 279 | 113 | 17 | 171 | 18 | 126 | 5 | 127 |
| | 19-37 | 48 | 850 | 123 | 1 | 156 | 62 | 122 | 2 | 81 |
| | 38-55 | 16 | 202 | 136 | 0 | 0 | <1 | 135 | 1 | 79 |
| | 56-73 | 10 | 76 | 140 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 74-91 | 8 | 16 | 154 | 0 | 0 | 0 | 0 | <1 | 164 |
| 1991 | 0-18 | 92 | 202 | 106 | 31 | 167 | 27 | 125 | 14 | 90 |
| | 19-37 | 51 | 1,153 | 125 | 7 | 173 | 64 | 136 | 4 | 143 |
| | 38-55 | 20 | 186 | 143 | 0 | 0 | <1 | 157 | 1 | 135 |
| | 56-73 | 10 | 76 | 171 | 0 | 0 | 0 | 0 | 1 | 96 |
| | 74-91 | 9 | 41 | 176 | 0 | 0 | 0 | 0 | 0 | 0 |

Table C.1. (Cont'd.)

| Year | Depth (m) | Samples (No.) | Brown Shrimp | | White Shrimp | | Pink Shrimp | | Blue Crab | |
|------|--------------|------------------|--------------|--------|--------------|--------|-------------|--------|-----------|--------|
| | | | No./h | Length | No./h | Length | No./h | Length | No./h | Length |
| 1992 | 0-18 | 85 | 234 | 100 | 36 | 166 | 15 | 112 | 4 | 114 |
| | 19-37 | 58 | 217 | 127 | <1 | 185 | 6 | 121 | 1 | 148 |
| | 38-55 | 17 | 22 | 158 | 0 | 0 | 0 | 0 | <1 | 248 |
| | 56-73 | 10 | 15 | 180 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 74-91 | 8 | 10 | 186 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993 | 0-18 | 89 | 121 | 104 | 16 | 171 | 23 | 122 | 10 | 120 |
| | 19-37 | 55 | 236 | 111 | 2 | 169 | 63 | 121 | 6 | 119 |
| | 38-55 | 22 | 69 | 139 | 0 | 176 | 19 | 122 | <1 | 152 |
| | 56-73 | 10 | 35 | 152 | 0 | 0 | 0 | 0 | <1 | 161 |
| | 74-91 | 2 | 34 | 169 | 0 | 0 | 0 | 0 | <1 | 140 |

*Data presented here were collected by R/V OREGON II (NMFS) in conjunction with TPWD research vessels. The data were made available by the Southeast Area Monitoring and Assessment Program (SEAMAP). Samples collected with 12.2-m trawl, except 6.1-m trawl by IPWD vessels since 1987. Data normalized to 12.2-m trawl by NMFS.

Table C-2. Mean catch rates (No./h) and mean size (mm) of select shellfishes caught during SEAMAP^a sampling off Texas during November 1986-92. Blanks indicate no measurement taken.

| Year | Depth (m) | Samples (No.) | Brown shrimp | | | White shrimp | | | Pink shrimp | | | Blue crab | | |
|------|-----------|---------------|--------------|--------|-------|--------------|-------|--------|-------------|--------|-------|-----------|-------|--------|
| | | | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length | No./h | Length |
| 1986 | 0-18 | 12 | 71 | | 77 | | 26 | | 0 | | 0 | | | |
| | 19-37 | 34 | 93 | | 15 | | 2 | | 1 | | 0 | | | |
| | 38-55 | 26 | 68 | | 0 | | 0 | | 0 | | 0 | | | |
| | 56-73 | 12 | 41 | | 0 | | 0 | | 0 | | 0 | | | |
| | 74-91 | 4 | 22 | | 0 | | 0 | | 0 | | 0 | | | |
| 1987 | 0-18 | 65 | 20 | | 89 | | 18 | | 0 | | 0 | | | |
| | 19-37 | 40 | 50 | | 7 | | 2 | | <1 | | <1 | | | |
| | 38-55 | 12 | 21 | | 0 | | 0 | | 0 | | 0 | | | |
| | 56-73 | 2 | 6 | | 0 | | 0 | | 0 | | 0 | | | |
| | 74-91 | 1 | 0 | | 0 | | 0 | | 0 | | 0 | | | |
| 1988 | 0-18 | 77 | 21 | | 98 | | 9 | | 0 | | 0 | | | |
| | 19-37 | 49 | 48 | | 15 | | 12 | | 0 | | 0 | | | |
| | 38-55 | 16 | 44 | | 0 | | 1 | | 0 | | 0 | | | |
| | 56-73 | 10 | 15 | | 0 | | 0 | | 0 | | 0 | | | |
| | 74-91 | 7 | 8 | | 0 | | 0 | | 0 | | 0 | | | |
| 1989 | 0-18 | 78 | 21 | 100 | 137 | 102 | 16 | 124 | 2 | 45 | | | | |
| | 19-37 | 60 | 68 | 140 | 23 | 117 | 10 | 123 | <1 | 83 | | | | |
| | 38-55 | 20 | 71 | 169 | <1 | | 1 | 124 | <1 | 94 | | | | |
| | 56-73 | 7 | 43 | 173 | 0 | | 0 | | <1 | 74 | | | | |
| | 74-91 | 9 | 5 | 185 | 0 | | 0 | | 0 | | | | | |
| 1990 | 0-18 | 64 | 18 | 105 | 56 | 129 | 11 | 137 | <1 | 70 | | | | |
| | 19-37 | 59 | 69 | 140 | 5 | 159 | 7 | 126 | <1 | 87 | | | | |
| | 38-55 | 22 | 60 | 168 | <1 | 185 | 1 | 129 | 1 | 75 | | | | |
| | 56-73 | 9 | 34 | 173 | 0 | | 0 | | 1 | 74 | | | | |
| | 74-91 | 6 | 7 | 190 | 0 | | 0 | | 0 | | | | | |
| 1991 | 0-18 | 88 | 28 | 107 | 31 | 124 | 14 | 108 | <1 | 52 | | | | |
| | 19-37 | 57 | 120 | 134 | 4 | 166 | 4 | 107 | <1 | 133 | | | | |
| | 38-55 | 20 | 65 | 161 | 0 | | 0 | | 1 | 135 | | | | |
| | 56-73 | 12 | 31 | 172 | 0 | | 0 | | 0 | | | | | |
| | 74-91 | 11 | 12 | 181 | 0 | | 0 | | 0 | | | | | |
| 1992 | 0-18 | 89 | 11 | 115 | 135 | 115 | 3 | 131 | <1 | 34 | | | | |
| | 19-37 | 55 | 80 | 135 | 8 | 157 | 1 | 122 | <1 | 141 | | | | |
| | 38-55 | 18 | 42 | 164 | 0 | | 0 | | <1 | 141 | | | | |
| | 56-73 | 8 | 49 | 172 | 0 | | 0 | | 0 | | | | | |
| | 74-91 | 4 | 33 | 176 | 0 | | 0 | | 0 | | | | | |
| 1993 | 0-18 | 88 | 11 | 126 | 160 | 119 | 31 | 95 | 3 | 160 | | | | |
| | 19-37 | 55 | 91 | 119 | 17 | 134 | 28 | 88 | 1 | 151 | | | | |
| | 38-55 | 17 | 60 | 93 | <1 | 109 | <1 | 76 | <1 | 108 | | | | |
| | 56-73 | 9 | 12 | 106 | <1 | 125 | <1 | 76 | 0 | | | | | |
| | 74-91 | 5 | 17 | 85 | <1 | 119 | <1 | 98 | <1 | 144 | | | | |

^aData presented here were collected with 12.2-m trawl by R/V OREGON II (NMFS) and with 6.1-m trawl by IPWD research vessels. The data were made available by the Southeast Area Monitoring and Assessment Program (SEAMAP). Data normalized to 12.2-m trawl by NMFS.

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