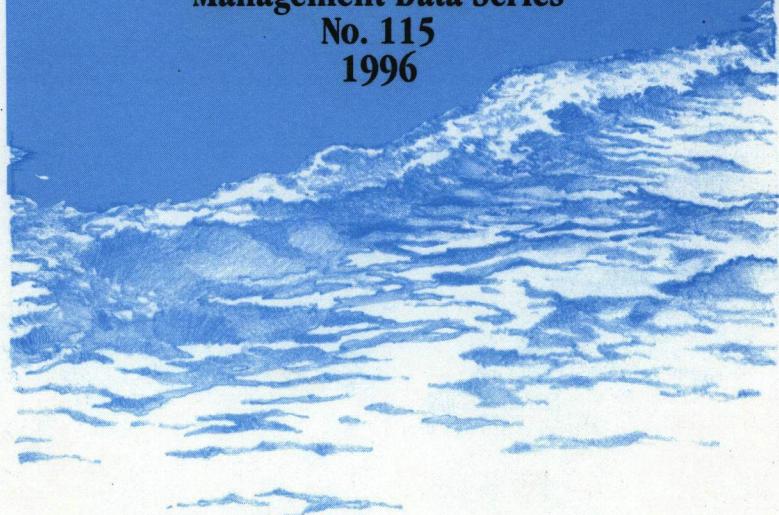


**Trends in Relative Abundance
and Size of Selected Finfishes and
Shellfishes Along the Texas Coast:
November 1975–December 1993**

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/ha; 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 ≤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. Mean catch rates (No./h) and mean total lengths (mm) of selected fishes and blue crab caught with gill nets (all meshes combined) by bay system during spring 1976-93. Blank indicates no measurement taken; ND = no data.

Species	Year	Sabine Lake No./h Length	Galveston No./h Length	Matagorda No./h Length	East No./h Length	Mata Gorda No./h Length	San Antonio No./h Length	Aransas No./h Length	Corpus Christi No./h Length	Upper Laguna Madre No./h Length	Lower Laguna Madre No./h Length	Coastwide No./h Length	
Red drum	1976	ND	0.1	310	ND	1.0	429	1.0	410	1.0	451	0.6	412
	1977	ND	0.3	450	0.2	418	0.1	467	0.3	380	0.4	401	0.1
	1978	ND	0.1	394	0.4	429	0.5	485	0.2	400	0.2	444	0.5
	1979	ND	0.2	480	0.1	466	0.2	414	0.2	421	0.4	423	0.3
	1980	ND	0.9	449	0.4	451	1.1	387	0.7	400	0.4	373	0.3
	1981	ND	0.3	431	0.2	465	0.2	408	0.6	396	0.4	399	0.3
	1982	ND	0.9	474	0.4	436	0.5	425	0.4	408	0.4	430	0.3
	1983	ND	0.9	474	1.0	475	0.6	411	0.7	402	0.5	385	0.4
	1984	ND	0.9	482	0.7	446	0.1	430	0.2	513	0.3	419	0.8
	1985	ND	0.6	538	0.5	514	0.2	457	0.2	465	0.4	463	0.6
	1986	0.4	520	1.4	497	0.8	456	0.8	463	0.6	395	0.7	463
	1987	0.2	516	0.6	497	0.6	501	0.9	465	0.7	451	0.6	459
	1988	0.3	498	0.7	492	0.9	473	0.7	434	0.5	470	0.5	436
	1989	0.5	480	0.7	478	1.7	492	0.6	452	0.7	438	0.5	469
	1990	0.5	509	0.5	529	0.8	568	0.4	483	0.3	474	0.5	494
	1991	0.5	581	0.3	548	0.5	532	0.3	495	0.3	447	0.4	472
	1992	0.7	470	1.2	465	2.1	456	1.3	397	1.3	429	1.6	402
	1993	0.4	529	1.2	544	2.6	514	0.9	426	1.6	429	0.5	462
Spotted seatrout	1976	ND	<1	530	ND	0.3	422	0.5	382	0.3	465	0.4	365
	1977	ND	0.2	516	2.0	434	0.2	381	0.9	392	1.0	422	0.4
	1978	ND	0.2	523	0.4	441	0.6	409	1.4	408	0.1	435	0.5
	1979	ND	0.2	515	0.4	426	0.3	490	0.1	436	0.4	507	0.3
	1980	ND	0.1	419	0.8	402	0.6	426	0.9	402	0.2	465	0.3
	1981	ND	0.4	483	1.8	416	0.4	406	0.7	453	0.8	468	0.5
	1982	ND	0.4	491	0.9	454	0.5	456	0.8	440	0.7	435	0.8
	1983	ND	0.4	510	1.7	441	0.7	452	0.7	444	0.6	447	0.7
	1984	ND	0.3	498	0.7	468	0.3	439	0.3	483	0.2	435	0.2
	1985	ND	0.5	505	0.6	467	0.3	424	0.3	457	0.4	430	0.4
	1986	0.3	460	0.5	449	1.0	432	0.5	441	0.4	426	0.4	430
	1987	0.2	339	0.6	449	0.7	436	0.4	434	0.4	447	0.4	447
	1988	0.2	386	0.7	459	0.8	456	0.5	430	0.5	458	0.8	478
	1989	0.2	441	0.6	481	0.5	494	0.5	428	0.6	459	0.6	463
	1990	0.1	461	0.5	457	0.6	510	0.3	432	0.6	480	0.5	442
	1991	0.1	467	0.5	449	0.3	498	0.4	440	0.5	440	0.5	467
	1992	0.2	406	0.7	446	0.4	511	0.4	440	0.4	449	0.7	443
	1993	0.3	415	0.5	461	0.5	501	0.6	428	0.7	477	0.2	456
Black drum	1976	ND	0.2	290	ND	0.8	418	1.0	306	0.9	389	0.6	360
	1977	ND	0.4	388	0.3	262	0.5	349	1.2	314	1.2	316	0.5
	1978	ND	0.2	439	0.4	345	0.2	300	0.1	304	0.4	358	0.1
	1979	ND	0.3	292	0.7	328	0.5	415	<1	370	0.3	323	0.1
	1980	ND	0.4	314	1.0	272	0.9	355	0.5	263	1.0	320	0.3
	1981	ND	0.8	418	0.8	312	0.3	301	0.4	352	0.8	362	0.1
	1982	ND	0.6	343	0.8	294	0.8	363	0.7	317	1.1	300	0.4
	1983	ND	0.9	337	2.7	365	0.5	355	0.6	323	1.2	340	0.9
	1984	ND	0.6	373	1.0	391	0.2	368	0.2	460	0.1	559	0.5
	1985	ND	0.3	346	0.4	313	0.2	476	0.1	426	0.2	396	0.2
	1986	0.3	399	0.5	411	0.8	320	0.4	402	0.1	313	0.4	316
	1987	0.1	386	0.5	368	0.6	320	0.4	366	0.2	392	0.5	382
	1988	0.1	410	0.4	380	0.7	376	0.4	390	0.4	339	0.4	375
	1989	0.2	326	0.6	350	1.8	378	0.4	412	0.3	363	0.6	406
	1990	0.2	378	0.5	372	1.5	393	0.8	341	0.3	350	0.7	411
	1991	0.3	318	0.6	356	1.4	347	0.8	354	0.5	308	0.4	366
	1992	0.2	366	0.5	370	1.3	391	0.4	339	0.8	374	0.3	349
	1993	0.3	360	0.4	380	0.4	345	0.4	374	0.7	417	1.3	400
Sheeps- head	1976	ND	0.0	338	<1	338	ND	<1	338	0.1	308	0.2	380
	1977	ND	0.0	0.0	<1	338	ND	<1	338	0.1	280	0.1	380

Table 1. (Cont'd.)

Species	Year	Sabine	Lake	Galveston	East	Matacorda	Matacorda	San Antonio	Aranas	Christi	Corpus	Upper Laguna	Lower Laguna	Madre	Coastwide		
		No./h Length															
Sheepshead (Cont'd.)	1978	ND	0.0	0.4	296	<.1	278	0.1	313	0.2	354	0.2	356	0.2	358	0.1	
	1979	ND	<.1	305	0.1	297	<.1	391	<.1	402	0.1	320	0.5	340	0.1		
	1980	ND	<.1	353	0.3	347	0.1	334	0.1	453	0.2	352	0.2	343	0.2		
	1981	ND	<.1	393	0.2	326	0.1	326	0.1	335	0.6	349	0.3	325	0.2		
	1982	ND	<.1	332	0.0	332	0.1	330	0.2	354	<.1	326	0.2	326	0.2		
	1983	ND	<.1	313	0.4	311	0.1	373	0.2	372	0.1	349	0.3	392	0.4		
	1984	ND	<.1	351	0.1	354	0.3	387	0.2	398	<.1	401	0.2	348	0.1		
	1985	ND	<.1	352	0.2	372	<.1	337	<.1	409	<.1	382	0.1	353	0.1		
	1986	<.1	372	0.2	356	<.1	369	<.1	417	<.1	347	<.1	427	0.1	370	<.1	
	1987	<.1	364	<.1	361	0.2	314	0.1	340	0.1	447	<.1	342	<.1	372	0.1	
	1988	0.0	0.0	405	0.1	350	<.1	357	<.1	342	0.1	348	0.1	403	0.2		
	1989	<.1	529	0.1	384	0.3	324	<.1	371	<.1	379	<.1	412	<.1	371	0.2	
	1990	<.1	364	<.1	378	0.3	364	0.1	400	<.1	444	<.1	372	0.2	388	0.1	
	1991	<.1	354	<.1	381	0.2	343	<.1	359	<.1	491	<.1	304	<.1	406	0.1	
	1992	<.1	278	<.1	346	0.1	356	0.1	367	0.1	415	<.1	436	0.1	434	0.2	
	1993	<.1	343	<.1	376	0.2	360	0.1	408	0.1	355	<.1	408	0.1	427	<.1	
Southern flounder	1976	ND	0.0														
	1977	ND	<.1	351	0.1	358	<.1	328	<.1	205	0.1	358	<.1	430	0.0		
	1978	ND	<.1	249	0.1	352	<.1	330	0.1	279	<.1	338	<.1	345	<.1		
	1979	ND	<.1	451	0.1	348	<.1	290	0.1	388	<.1	291	0.1	320	0.1		
	1980	ND	<.1	344	0.1	325	<.1	307	0.1	292	0.1	292	0.1	366	0.1		
	1981	ND	<.1	244	<.1	340	<.1	270	<.1	291	<.1	368	<.1	364	0.1		
	1982	ND	<.1	343	<.1	319	<.1	319	<.1	301	<.1	299	0.1	332	0.1		
	1983	ND	<.1	366	0.1	318	0.1	327	<.1	333	<.1	329	0.1	344	<.1		
	1984	ND	<.1	338	0.1	388	<.1	317	<.1	321	<.1	310	0.1	371	0.1		
	1985	ND	<.1	349	0.1	349	<.1	346	<.1	346	<.1	347	0.1	353	0.1		
Atlantic croaker	1986	<.1	294	<.1	345	0.2	329	<.1	358	<.1	316	<.1	357	<.1	354	0.1	
	1987	<.1	364	<.1	338	0.1	330	0.1	304	0.1	345	<.1	336	<.1	407	0.1	
	1988	<.1	292	<.1	367	0.1	349	<.1	330	<.1	354	<.1	334	<.1	401	<.1	
	1989	<.1	288	<.1	347	0.1	362	<.1	318	<.1	317	<.1	340	<.1	402	<.1	
	1990	<.1	309	<.1	351	0.1	360	<.1	354	<.1	350	<.1	347	<.1	333	0.1	
	1991	<.1	329	0.1	322	0.1	365	<.1	322	<.1	348	<.1	326	0.1	363	0.1	
	1992	<.1	319	0.1	371	0.1	366	<.1	346	<.1	373	<.1	355	<.1	343	0.1	
	1993	<.1	364	<.1	360	0.1	395	<.1	369	<.1	357	<.1	377	<.1	398	<.1	
	1976	ND	0.2	298	ND	0.1	255	<.1	293	<.1	276	<.1	289	0.1	285	1.0	
	1977	ND	0.3	268	0.1	270	<.1	250	<.1	257	<.1	254	<.1	240	0.1	264	0.4
Gafftop- sail catfish	1978	ND	0.1	247	0.1	260	<.1	263	0.0	250	<.1	276	<.1	281	0.1	297	0.2
	1979	ND	0.2	260	<.1	257	<.1	263	0.0	250	<.1	254	<.1	265	0.1	298	0.2
	1980	ND	0.1	268	0.1	250	<.1	276	0.0	250	<.1	289	0.1	272	0.2	308	0.1
	1981	ND	0.1	264	0.1	254	<.1	268	0.1	250	<.1	276	<.1	272	0.1	286	0.1
	1982	ND	0.2	268	0.1	258	<.1	270	<.1	265	<.1	286	<.1	285	<.1	312	0.1
	1983	ND	0.3	268	0.1	278	<.1	273	<.1	278	<.1	286	<.1	294	<.1	313	0.4
	1984	ND	0.1	265	<.1	322	<.1	225	<.1	298	<.1	260	<.1	304	<.1	289	0.4
	1985	ND	0.2	273	<.1	318	<.1	260	<.1	184	<.1	215	<.1	265	0.2	267	0.1
	1986	0.1	259	0.4	271	0.1	250	<.1	245	<.1	250	<.1	292	<.1	255	0.3	
	1987	<.1	263	0.2	260	<.1	242	<.1	236	<.1	268	<.1	246	<.1	282	<.1	
Gafftop- sail catfish	1988	0.1	259	0.1	265	<.1	226	<.1	278	0.0	260	<.1	261	<.1	337	<.1	
	1989	0.1	268	0.1	264	<.1	250	0.0	250	<.1	286	<.1	284	<.1	342	<.1	
	1990	<.1	278	0.1	269	0.1	264	<.1	268	<.1	276	<.1	267	<.1	245	<.1	
	1991	0.1	297	0.1	262	<.1	256	<.1	237	<.1	239	<.1	252	<.1	269	<.1	
	1992	0.1	263	0.2	253	0.2	270	0.1	257	0.0	232	<.1	204	<.1	290	0.1	
Gafftop- sail catfish	1993	0.1	286	0.1	259	0.1	237	<.1	277	<.1	277	<.1	267	0.1	265	0.1	
	1976	ND	6.4	504	ND	0.4	506	0.5	494	2.3	456	0.0	0.0	0.0	496	1.8	
	1977	ND	0.2	480	0.1	539	0.1	546	3.3	556	0.9	506	0.0	506	0.0	524	1.0
	1978	ND	0.3	520	0.3	520	0.5	534	1.4	546	1.1	545	0.1	436	0.0	521	0.5
	1979	ND	0.3	520	0.3	520	0.5	534	0.4	553	0.4	553	0.5	544	0.2	539	0.3

Table 1. (Cont'd.)

Species	Year	Sabine	Lake	Galveston	East	Matacorda	Matacorda	San Antonio	Aransas	Corpus	Upper Laguna	Lower Laguna	Coastwide								
		No./h Length																			
Gafftop-sail	1980	ND	0.2	566	0.5	554	1.2	547	0.4	552	0.1	598	0.3								
catfish	1981	ND	0.2	514	0.3	480	0.8	541	1.4	541	0.1	521	0.4								
(Cont'd.)	1982	ND	0.4	513	0.2	496	0.4	544	1.4	540	0.9	542	0.5								
	1983	ND	0.2	544	<1	475	0.3	537	2.0	530	0.9	537	0.5								
	1984	ND	0.2	527	<1	580	1.0	529	1.1	530	0.6	550	0.2								
	1985	ND	0.3	532	<1	467	0.4	517	0.8	537	0.1	557	<1								
	1986	0.2	490	0.4	515	0.3	468	0.4	533	0.5	554	0.4	529	0.3							
	1987	<1	509	0.4	552	0.1	507	0.2	539	0.1	567	0.2	550	0.2							
	1988	0.2	538	0.2	511	0.1	530	0.5	531	0.3	563	0.2	562	0.2							
	1989	<1	494	0.3	536	0.2	535	0.6	530	0.4	557	0.1	533	0.2							
	1990	<1	518	0.8	528	0.2	460	0.8	534	0.6	555	0.4	554	0.2							
	1991	<1	520	0.2	504	0.2	528	0.5	531	0.7	527	0.4	565	0.4							
	1992	<1	519	0.1	521	0.2	556	0.3	530	0.6	578	0.1	559	0.2							
	1993	<1	457	0.5	503	0.2	581	0.5	543	0.8	563	0.1	576	0.2							
Gulf menhaden	1976	ND	0.2	261	ND	0.1	250	0.1	275	0.0	275	0.0	0.0	0.1							
	1977	ND	2.5	251	0.7	299	0.1	245	0.1	233	0.3	247	0.0	282	0.9						
	1978	ND	0.3	242	<1	194	0.2	245	1.2	258	0.0	255	0.2	264	<1						
	1979	ND	1.2	251	0.0	0.1	251	<1	132	<1	241	0.1	255	0.2							
	1980	ND	<1	193	0.0	0.0	<1	252	0.1	287	<1	271	<1	269	0.6						
	1981	ND	0.4	260	0.0	0.0	<1	254	0.1	252	0.2	243	0.1	244	0.2						
	1982	ND	0.4	254	0.0	0.0	<1	248	0.3	252	0.1	249	<1	268	0.1						
	1983	ND	0.8	252	0.0	0.0	<1	251	0.2	243	0.1	244	0.1	303	0.2						
	1984	ND	0.5	254	0.0	0.0	<1	251	0.2	279	0.2	246	0.1	304	0.3						
	1985	ND	0.8	253	<1	281	0.5	242	0.3	243	0.4	250	0.6	257	<1						
	1986	0.1	279	1.3	251	<1	226	0.1	242	0.1	244	0.2	245	0.4	260	0.5					
	1987	<1	348	1.2	245	<1	227	<1	241	0.1	226	0.0	242	<1	252	0.4					
	1988	<1	278	0.1	244	0.0	0.2	244	<1	278	<1	236	0.1	240	0.1	253	0.3				
	1989	<1	269	1.4	249	0.0	0.0	232	<1	226	0.0	187	0.1	257	<1	290	0.1				
	1990	<1	270	1.6	242	<1	237	0.1	216	<1	263	<1	235	0.0	239	0.3	249	0.8			
	1991	<1	253	0.3	252	<1	226	0.1	207	<1	239	<1	281	0.1	251	0.0	241	0.1			
	1992	<1	266	0.7	257	0.0	0.0	257	<1	245	0.1	256	0.1	275	<1	252	0.2				
	1993	<1	256	1.5	247	0.0	0.1	257	<1	277	0.1	242	<1	312	<1	282	<1				
Striped mullet	1976	ND	0.1	385	ND	0.2	322	0.0	0.2	322	0.2	338	0.6	366	0.0	375	0.2				
	1977	ND	0.2	322	0.0	0.1	327	0.4	314	0.9	317	0.8	319	0.1	368	0.2	345	0.3			
	1978	ND	0.0	320	0.1	336	0.2	341	0.7	334	0.2	327	<1	328	0.1	354	0.2	338	0.1		
	1979	ND	0.2	343	<1	338	0.4	335	0.2	328	0.1	339	0.1	333	0.1	404	0.1	356	0.2		
	1980	ND	<1	318	0.1	345	<1	336	<1	341	0.1	337	0.1	320	0.2	341	0.1	343	0.2		
	1981	ND	<1	344	0.2	295	0.2	326	0.2	340	0.2	336	0.1	321	0.2	353	0.1	344	0.2		
	1982	ND	0.2	350	0.1	346	0.1	346	0.2	346	0.2	333	0.2	344	0.1	359	0.3	357	0.2		
	1983	ND	0.2	344	0.2	340	0.2	340	0.3	337	0.2	341	0.1	351	0.2	361	0.2	352	0.2		
	1984	ND	0.2	344	0.2	340	0.2	340	0.3	328	0.2	337	0.1	336	0.6	352	0.5	342	0.3		
	1985	ND	0.2	340	0.2	321	0.2	330	0.1	328	0.1	339	0.1	320	0.1	340	0.1	339	0.2		
	1986	<1	326	0.2	366	0.1	319	0.2	343	0.2	348	0.2	336	0.1	340	0.1	341	0.1	340	0.2	
	1987	<1	312	0.2	344	0.2	333	0.1	323	0.2	348	0.2	343	0.1	350	0.1	402	0.2	359	0.2	
	1988	<1	327	0.1	344	0.2	348	0.4	339	0.2	356	0.2	348	0.2	371	0.1	364	0.2	357	0.2	
	1989	<1	323	0.2	325	0.2	341	0.3	342	0.2	357	0.2	340	0.2	344	0.1	372	0.2	354	0.2	
	1990	<1	325	0.2	347	0.2	341	0.2	347	0.2	343	0.2	335	0.1	343	0.4	389	0.4	353	0.3	
	1991	<1	325	0.1	310	0.1	352	0.3	341	0.2	342	0.4	352	0.2	344	0.2	386	0.2	377	0.2	
	1992	<1	310	0.1	331	0.1	357	0.3	371	0.2	347	0.2	356	0.2	355	0.2	389	0.2	374	0.2	
	1993	<1	331	0.1	331	0.1	357	0.3	371	0.2	333	0.3	347	0.2	379	0.1	354	0.2	353	0.2	
Total finfishes	1976	ND	11.1	429	ND	5.2	394	7.6	391	9.5	415	6.2	332	1.1	378	7.1	419	7.3	408	7.3	
	1977	ND	8.8	316	4.3	395	5.9	442	8.2	428	8.1	437	7.4	388	3.8	366	4.3	395	6.7	377	6.7
	1978	ND	5.0	357	2.4	359	4.8	437	7.0	409	7.7	406	3.4	343	2.0	365	4.6	406	4.6	390	4.6
	1979	ND	6.8	345	2.5	396	3.4	343	7.2	453	3.2	433	2.7	393	2.2	360	3.2	411	3.8	387	3.8
	1980	ND	5.0	380	4.2	347	5.4	428	5.2	422	3.1	405	2.8	387	3.5	368	3.5	419	4.3	400	4.3
	1981	ND	4.6	369	5.1	363	5.3	408	4.1	417	6.1	432	6.0	634	5.5	406	5.2	433	5.5	406	5.2

Table 1. (Cont'd.)

Species	Year	Sabine	Lake	Galveston	East	Matacorda	Matagorda	San Antonio	Aranas	Corpus	Upper Laguna	Lower Laguna	Coastwide	
		No./h Length												
Total finfishes (Cont'd.)	1982	ND	8.1	378	4.7	368	5.3	435	6.8	411	5.8	417	4.6	
	1983	ND	9.0	369	7.6	384	4.5	417	7.2	422	5.5	404	5.5	
	1984	ND	6.2	389	3.7	408	4.3	449	5.6	431	3.9	397	5.0	
	1985	ND	7.6	381	3.8	408	5.2	446	4.1	479	3.6	432	4.8	
	1986	4.9	432	9.3	377	5.4	381	5.0	425	3.5	422	3.2	452	5.0
	1987	2.0	517	8.7	373	4.3	384	4.0	430	2.9	420	3.4	418	5.7
	1988	2.5	472	6.7	385	4.6	401	4.5	411	4.7	444	3.0	431	3.8
	1989	2.6	474	9.0	365	7.4	396	5.1	428	6.4	437	4.2	403	4.4
	1990	2.5	485	10.5	367	8.2	403	6.6	432	6.1	448	5.1	410	6.8
	1991	3.1	474	6.9	367	11.7	358	6.4	415	6.1	437	6.0	400	5.8
	1992	2.6	445	8.4	395	8.8	423	6.3	407	5.9	448	7.1	412	7.0
	1993	2.4	480	9.8	390	8.7	459	7.0	424	8.6	467	2.9	453	9.5
Blue crab	1983	ND	0.2	151	0.3	154	0.1	151	0.2	142	0.3	142	0.2	142
	1984	ND	0.3	150	0.4	135	0.1	143	0.2	137	0.2	142	0.3	141
	1985	ND	0.3	149	0.5	151	0.2	144	0.3	136	0.2	141	0.2	149
	1986	0.2	146	0.3	151	0.6	133	0.2	140	0.1	135	0.1	144	0.1
	1987	0.3	152	0.3	139	0.3	138	0.1	138	0.2	140	0.1	155	0.1
	1988	0.3	154	0.1	148	0.1	159	<.1	135	<.1	141	<.1	147	0.1
	1989	0.2	157	0.1	137	0.4	128	<.1	136	<.1	128	<.1	149	<.1
	1990	0.2	154	0.2	141	0.2	129	<.1	138	0.2	135	0.1	140	0.2
	1991	0.1	141	0.2	132	0.4	135	0.2	144	0.1	136	0.1	144	0.1
	1992	0.1	151	0.2	153	0.1	135	<.1	144	0.1	133	<.1	142	0.3
	1993	0.2	161	0.1	146	0.2	162	0.1	155	0.1	148	<.1	149	0.1

Table 2. Mean catch rates (No./h) and mean total lengths (mm) of selected fishes and blue crab caught with gill nets (all meshes combined) by bay system during fall 1975-93. Blank indicates no measurement taken; ND = no data.

Species	Year	Sabine Lake	Galveston	Matacanda	San Antonio	Aransas	Corpus Christi	Upper Laguna Madre	Lower Laguna Madre	Coastwide												
		No./h Length	No./h Length	No./h Length	No./h Length																	
Red drum	1975	0.8	382	1.1	403	ND	337	0.9	326	1.1	339	0.4	330	0.3	424	0.7	474	0.9	373			
	1976	ND	1.0	509	1.1	487	0.5	415	1.6	406	0.5	395	0.5	460	0.4	442	1.3	465	0.9	452		
	1977	ND	0.6	445	0.9	390	0.8	435	1.0	386	0.6	392	0.5	427	0.2	364	1.4	448	0.6	416		
	1978	ND	0.3	429	0.7	376	1.1	395	0.6	384	1.0	401	0.4	429	0.3	455	0.4	493	0.6	412		
	1979	ND	0.8	386	0.7	403	1.6	353	1.9	376	1.9	387	0.8	352	0.5	454	0.7	449	1.0	378		
	1980	ND	0.5	436	0.8	473	0.6	434	0.9	411	1.1	386	0.7	370	0.5	454	0.7	449	0.7	419		
	1981	ND	0.5	429	0.7	405	0.6	390	0.7	373	0.8	403	0.6	396	0.3	515	0.8	488	0.6	422		
	1982	ND	0.6	440	0.9	401	0.5	394	0.6	360	0.4	386	0.4	417	0.2	456	0.5	440	0.5	412		
	1983	ND	0.6	436	0.8	394	0.5	418	0.6	407	0.4	410	0.3	448	0.2	486	0.7	509	0.5	440		
	1984	ND	0.9	451	1.1	551	0.4	381	0.6	383	0.5	377	0.8	400	0.7	457	0.7	472	0.7	433		
	1985	ND	0.9	421	1.3	420	0.8	394	1.3	385	0.9	427	0.7	436	0.3	460	0.9	478	0.7	423		
	1986	0.4	481	0.7	468	0.9	453	0.8	403	1.2	441	0.9	454	0.5	450	0.4	486	0.9	495	0.8	456	
	1987	0.4	449	0.5	459	0.9	446	0.8	372	1.0	473	0.6	459	0.4	424	0.3	527	1.5	532	0.7	467	
	1988	0.5	399	0.8	437	1.5	486	0.9	418	1.1	457	0.9	520	0.5	458	0.3	522	1.3	463	0.8	463	
	1989	0.4	461	0.6	479	1.1	511	0.9	402	1.1	468	0.7	423	0.6	476	0.3	533	1.1	521	0.7	475	
	1990	0.4	500	0.3	488	0.8	497	0.5	408	1.1	458	1.0	477	0.8	432	0.7	553	1.0	534	0.7	482	
	1991	1.1	412	0.5	393	0.9	380	0.6	402	1.3	375	1.0	442	1.5	451	0.6	517	1.5	514	0.9	441	
	1992	0.5	531	0.7	482	2.0	494	0.8	419	0.7	453	1.4	435	1.0	477	0.7	502	1.3	479	0.9	465	
	1993	0.3	484	0.4	482	1.9	526	0.9	439	1.6	480	1.7	490	1.0	500	0.7	555	1.3	531	1.0	496	
Spotted seatrout	1975	0.1	413	0.2	447	ND	451	0.6	419	1.0	389	0.6	474	0.4	479	0.2	455	0.8	413	0.5	428	
	1976	ND	0.3	463	0.9	ND	0.3	461	0.4	437	0.7	427	0.2	448	0.6	483	0.3	455	2.4	431	0.7	433
	1977	ND	0.3	501	0.3	400	0.3	460	0.5	387	0.1	485	0.6	412	0.8	464	0.4	437	0.4	432		
	1978	ND	0.3	544	0.3	400	0.8	406	0.5	387	0.1	383	0.2	417	0.4	431	0.5	434	0.4	438		
	1979	ND	0.2	449	0.1	385	0.6	418	0.2	439	0.1	476	0.2	413	0.1	434	0.5	472	0.2	433		
	1980	ND	0.4	476	0.2	418	0.3	406	0.3	435	0.2	446	0.3	465	0.2	434	0.5	490	0.3	458		
	1981	ND	0.3	483	0.8	419	0.4	437	0.3	428	0.2	442	0.4	437	0.2	469	0.7	486	0.4	457		
	1982	ND	0.3	456	0.4	468	0.3	430	0.4	428	0.2	456	0.2	458	0.3	435	0.5	453	0.3	445		
	1983	ND	0.3	464	0.5	420	0.3	438	0.2	425	0.2	459	0.3	435	0.3	476	0.6	476	0.4	452		
	1984	ND	0.4	465	0.3	459	0.2	430	0.2	420	0.1	453	0.2	467	0.1	400	0.4	458	0.3	453		
	1985	ND	0.3	470	0.3	418	0.4	439	0.2	430	0.2	438	0.4	432	0.2	443	0.6	475	0.4	453		
	1986	0.2	395	0.4	438	0.4	444	0.5	418	0.4	432	0.3	442	0.4	464	0.4	437	0.3	472	0.4	446	
	1987	0.1	410	0.2	459	0.5	425	0.6	425	0.3	422	0.3	452	0.5	461	0.2	456	0.7	461	0.4	446	
	1988	0.1	420	0.4	444	0.7	432	0.3	439	0.4	438	0.3	430	0.4	475	0.2	428	0.9	479	0.4	449	
	1989	0.1	430	0.3	441	0.4	447	0.2	435	0.3	457	0.3	446	0.4	475	0.1	464	0.6	460	0.3	453	
	1990	<1	399	0.2	460	0.5	461	0.2	427	0.2	479	0.3	459	0.5	474	0.1	505	0.5	477	0.3	467	
	1991	0.1	378	0.2	442	0.3	473	0.5	406	0.4	415	0.3	436	0.6	449	0.4	482	0.8	466	0.4	443	
	1992	0.1	392	0.3	418	0.5	452	0.4	427	0.4	436	0.4	457	0.6	463	0.6	508	0.8	443	0.4	448	
	1993	0.1	450	0.3	446	0.9	472	0.3	427	0.4	430	0.3	441	0.9	427	0.5	468	0.6	447	0.4	444	
Black drum	1975	0.5	294	0.4	366	ND	0.9	326	0.5	315	0.8	290	0.4	358	1.2	422	1.0	454	0.7	367		
	1976	ND	0.3	337	0.7	305	0.5	371	0.5	325	1.2	344	0.6	325	0.6	366	0.3	419	0.9	388		
	1977	ND	0.4	384	0.5	346	0.5	383	0.3	336	0.7	341	0.4	306	0.5	406	0.2	410	0.7	383		
	1978	ND	0.4	383	1.0	398	0.6	404	0.2	361	0.5	311	0.1	383	0.8	425	0.4	377	0.5	372		
	1979	ND	0.2	379	0.1	391	0.9	341	0.7	306	1.2	298	0.9	380	0.4	308	0.6	423	0.3	387		
	1980	ND	0.3	408	0.4	343	0.4	383	0.5	315	0.5	341	0.4	357	0.5	365	1.0	400	0.8	395		
	1981	ND	0.6	355	2.4	346	0.6	375	1.0	296	1.1	337	0.6	369	0.9	388	1.9	384	0.5	369		
	1982	ND	0.2	381	1.0	361	0.6	375	0.6	328	0.6	328	0.6	345	0.7	337	1.4	373	1.3	388		
	1983	ND	0.5	405	0.7	348	0.2	386	0.3	269	0.2	329	0.2	406	0.5	422	0.9	418	0.6	388		
	1984	ND	0.8	379	0.6	363	0.4	357	0.3	295	0.4	325	0.4	383	0.5	425	0.4	442	0.3	389		
	1985	ND	0.4	360	0.7	380	0.6	351	0.4	342	0.5	357	0.3	388	0.5	435	0.4	433	0.5	372		
	1986	0.4	347	0.4	375	0.8	368	0.6	362	1.0	298	1.0	334	0.6	398	1.0	431	0.4	423	0.8	377	
	1987	0.3	378	0.4	387	1.2	339	0.4	346	1.0	337	1.4	373	1.3	416	0.7	321	0.9	359	1.8	361	
	1988	0.2	355	0.5	384	1.4	338	0.8	351	1.0	337	1.4	373	1.3	416	1.2	401	1.3	421	0.7	421	
	1989	0.5	324	2.0	355	0.5	384	1.4	338	0.8	351	1.0	337	1.4	373	1.3	416	1.2	401	1.3	421	
	1990	0.3	342	0.4	375	0.8	368	0.6	362	1.0	298	1.0	334	0.6	398	1.0	431	0.4	423	0.8	377	
	1991	0.3	347	0.5	402	1.1	364	0.6	375	1.3	321	0.7	372	0.8	372	1.4	363	2.2	366	0.9	375	
	1992	0.4	373	0.5	400	1.0	360	0.7	394	0.7	352	0.9	439	1.0	449	1.6	424	2.7	403	1.6	421	
	1993	0.3	372	0.6	400	1.0	456	0.8	430	1.0	360	0.7	376	0.3	366	0.4	422	0.8	388	0.9	421	

Table 2. (Cont'd.)

Species	Year	Sabine Lake	Galveston	East	Matacorna	Matagorda	San Antonio	Aransas	Corpus	Upper Laguna	Lower Laguna	Madre	Coastwide	
		No./h Length												
Sheepshead	1975 0,0	<.1	362 ND	0,1	316	0,2	291	1,1	296	0,3	409	0,1	352 0,3	
	1976 ND	<.1	331	0,2	308	0,4	329	1,0	255	0,2	328	0,4	341 0,3	
	1977 ND	<.1	342	0,3	316	0,2	314	0,2	321	0,5	267	0,2	360 0,2	
	1978 ND	<.1	308	0,2	307	0,1	342	0,5	371	0,6	306	0,2	335 0,2	
	1979 ND	<.1	335	0,2	352	0,1	312	0,4	362	0,8	318	0,2	361 0,2	
	1980 ND	<.1	283	0,1	309	<.1	353	0,7	296	0,6	307	0,2	361 0,2	
	1981 ND	<.1	321	0,1	277	0,2	292	0,3	335	0,2	322	0,1	343 0,2	
	1982 ND	<.1	330	0,3	392	0,1	313	0,1	296	0,2	350	0,1	383 0,3	
	1983 ND	<.1	342	0,5	345	0,1	338	0,2	302	0,1	355	0,1	361 0,2	
	1984 ND	<.1	369	0,3	383	<.1	369	<.1	427	<.1	436	<.1	417 0,1	
	1985 ND	<.1	380	0,2	379	<.1	374	<.1	362	<.1	326	<.1	435 0,1	
	1986 <.1	359	0,1	297	0,1	336	0,1	329	0,1	304	0,1	359 <.1	407 0,1	
	1987 <.1	402	0,1	381	0,1	366	0,1	352	0,1	371	0,2	360 <.1	342 0,1	
	1988 0,0	<.1	368	0,1	340	<.1	358	0,1	346	0,1	304	<.1	354 0,2	
	1989 <.1	299	0,1	371	0,2	343	<.1	324	0,2	341	0,1	329	0,1	422 0,2
	1990 <.1	303	<.1	418	0,3	354	<.1	417	<.1	360	<.1	367 <.1	371 0,1	
	1991 <.1	336	0,1	392	0,1	392	<.1	359	<.1	365	<.1	413 <.1	422 0,1	
	1992 <.1	373	<.1	402	0,1	422	0,2	394	<.1	352	0,1	372 <.1	446 0,1	
	1993 <.1	329	<.1	372	0,2	389	0,1	363	0,1	328	0,1	315 <.1	384 <.1	
Southern flounder	1975 0,1	337	<.1	317	ND	0,1	323	0,1	250	0,1	309	0,2	380 0,1	
	1976 ND	<.1	365	0,5	321	<.1	296	0,2	363	0,1	304	0,2	351 0,1	
	1977 ND	0,2	331	0,5	342	<.1	322	0,2	312	0,1	368	0,1	383 <.1	
	1978 ND	0,1	359	0,1	354	<.1	310	0,1	310	0,1	377	0,2	372 <.1	
	1979 ND	<.1	348	0,1	331	0,1	338	0,2	388	0,1	336	0,1	391 <.1	
	1980 ND	0,1	345	0,3	369	0,2	330	0,1	325	0,1	359	0,2	366 <.1	
	1981 ND	0,2	326	0,1	351	0,1	335	0,1	311	0,1	356	0,1	363 <.1	
	1982 ND	0,2	354	0,3	354	0,1	350	0,2	311	0,1	360	0,1	387 <.1	
	1983 ND	0,1	345	0,2	350	0,1	324	<.1	342	0,1	335	0,1	349 <.1	
	1984 ND	0,1	341	0,2	364	<.1	328	0,1	322	0,1	323	0,1	367 <.1	
	1985 ND	0,1	340	0,2	370	0,1	333	0,1	330	0,1	337	0,1	347 <.1	
	1986 0,1	299	0,1	363	0,1	376	0,1	346	0,1	377	0,1	368 0,1	363 <.1	
	1987 0,1	335	0,1	336	0,1	350	0,1	308	0,1	345	0,1	394 <.1	381 0,1	
	1988 <.1	346	<.1	350	0,2	353	0,1	365	0,1	342	0,1	372 <.1	402 0,1	
	1989 <.1	324	0,1	349	0,2	362	0,1	328	0,1	353	0,1	336 <.1	358 0,1	
	1990 <.1	325	0,1	326	0,2	340	0,1	326	0,1	324	0,1	344 <.1	382 0,1	
	1991 <.1	313	<.1	354	0,1	371	0,1	332	0,1	352	0,1	333 <.1	340 0,1	
	1992 <.1	330	0,1	356	0,3	375	0,1	352	<.1	370	0,1	385 <.1	365 0,1	
	1993 <.1	350	0,1	379	0,2	426	0,1	364	0,1	395	0,1	411 <.1	377 <.1	
Atlantic croaker	1975 0,0	<.1	245	ND	0,0	0,1	248	0,3	263	0,4	312	0,2	338 0,4	
	1976 ND	0,2	262	0,1	275	0,1	274	0,2	296	0,2	314	0,6	320 0,5	
	1977 ND	0,1	291	0,1	274	0,1	248	0,2	255	0,1	242	0,5	350 0,7	
	1978 ND	0,1	271	0,2	281	0,1	287	0,2	270	0,2	303	0,4	296 0,4	
	1979 ND	0,2	284	0,1	261	0,2	261	0,1	264	0,2	320	0,7	326 0,2	
	1980 ND	0,2	279	0,1	254	0,1	273	0,2	268	0,7	328	0,8	320 0,4	
	1981 ND	0,4	282	0,4	256	0,1	277	0,2	278	0,4	328	0,7	327 0,3	
	1982 ND	0,3	275	0,4	261	0,1	263	0,5	263	0,5	301	0,3	330 0,4	
	1983 ND	0,2	274	0,2	259	0,2	254	0,1	261	0,1	261	0,5	317 <.1	
	1984 ND	0,6	272	0,4	258	0,1	261	0,2	253	0,2	283	0,2	317 <.1	
	1985 ND	0,2	281	0,1	261	0,2	261	0,1	264	0,3	280	1,4	279 <.1	
	1986 0,2	287	0,8	288	0,1	252	0,3	253	<.1	253	0,2	283	0,4	322 0,3
	1987 0,1	281	0,4	281	0,1	267	0,2	255	0,3	255	0,2	265	0,3	321 0,3
	1988 0,2	276	0,6	291	0,1	257	0,2	257	0,2	255	0,2	266	0,3	318 0,4
	1989 0,1	284	0,6	271	0,2	259	0,2	259	0,2	252	0,1	260	0,2	314 0,3
	1990 0,2	283	0,4	286	0,2	270	0,1	261	0,1	261	0,3	261	0,4	264 0,3
	1991 0,1	271	0,2	274	0,1	290	0,2	260	0,2	258	0,1	278	1,4	279 0,3
	1992 0,2	293	0,4	269	0,1	278	0,1	268	0,1	268	0,3	278 0,1	299 0,3	
	1993 0,1	286	1,4	273	0,2	276	0,1	265	0,2	267	0,1	281 0,1	306 0,3	

Table 2. (Cont'd.)

Species	Year	Sabine	Lake	Galveston	East	Matacorda	Matagorda	San Antonio	Corpus	Upper Laguna	Lower Laguna	Madre	Coastwide
		No./h Length											
Gafftop-sail catfish	1975	<1	530	0.1	482	0.0	0.2	571	<1	552	0.0	0.0	<1
	1976	ND	<1	516	0.0	<1	526	0.4	498	<1	475	0.0	509
	1977	ND	<1	492	0.0	<1	499	0.2	526	<1	500	0.0	516
	1978	ND	0.0	542	0.2	542	<1	514	<1	533	0.0	0.0	534
	1979	ND	0.0	550	0.0	<1	478	0.3	509	<1	517	0.0	511
	1980	ND	0.1	492	0.0	<1	505	0.1	542	0.1	523	0.0	525
	1981	ND	0.1	423	<1	616	<1	520	0.3	527	<1	541	<1
	1982	ND	<1	492	0.1	473	<1	498	0.3	514	0.1	408	0.1
	1983	ND	<1	517	0.1	474	0.1	510	0.3	507	0.1	315	0.1
	1984	ND	0.1	525	0.1	482	<1	498	0.1	546	0.1	511	0.1
	1985	ND	0.1	462	<1	521	<1	473	<1	474	0.2	556	<1
	1986	0.1	<1	423	0.1	491	0.1	527	<1	512	0.1	528	<1
	1987	<1	370	<1	515	<1	534	0.2	521	<1	521	<1	390
	1988	<1	321	<1	480	<1	485	0.2	509	0.1	547	0.1	325
	1989	<1	465	0.1	504	0.1	499	0.2	509	0.1	583	0.0	358
	1990	<1	469	<1	502	0.1	518	<1	476	<1	562	0.1	429
	1991	<1	464	0.1	444	0.1	556	0.1	519	0.1	565	<1	299
	1992	<1	464	0.1	513	0.1	566	0.1	501	0.3	538	<1	406
	1993	0.0	<1	493	0.1	513	0.1	513	0.1	513	0.1	495	<1
Gulf menhaden	1975	0.0	0.5	272	ND	<1	270	1.7	302	0.4	221	0.2	307
	1976	ND	2.7	240	<1	246	0.3	246	0.2	275	0.5	284	0.3
	1977	ND	3.0	246	<1	248	0.2	244	0.1	240	<1	237	0.2
	1978	ND	0.6	249	0.5	249	<1	241	0.1	239	0.6	242	1.4
	1979	ND	0.1	249	0.1	249	<1	251	0.1	251	0.3	251	0.1
	1980	ND	0.3	253	0.0	<1	250	0.1	255	0.1	245	<1	243
	1981	ND	0.7	259	<1	260	<1	246	0.1	246	<1	238	0.3
	1982	ND	0.6	251	<1	310	<1	246	0.1	243	<1	264	0.7
	1983	ND	1.7	257	0.1	248	<1	249	0.2	239	0.2	290	<1
	1984	ND	1.0	256	0.2	255	0.4	248	0.4	246	0.2	258	<1
	1985	ND	1.5	249	0.1	253	0.1	254	0.1	246	0.6	251	0.2
	1986	0.2	246	1.5	244	0.1	233	0.3	239	0.1	244	0.1	263
	1987	0.1	244	1.8	250	0.0	244	0.1	244	0.1	250	0.2	273
	1988	0.2	268	0.8	244	<1	206	0.2	233	0.1	241	0.1	264
	1989	0.2	253	0.8	245	<1	236	0.2	231	<1	240	<1	249
	1990	0.1	256	1.3	253	<1	253	0.6	247	0.6	251	<1	252
	1991	0.3	255	1.4	257	<1	217	<1	217	<1	239	<1	276
	1992	<1	299	1.3	257	<1	232	0.1	239	0.1	245	<1	256
	1993	0.4	283	1.0	254	<1	255	0.2	269	<1	300	0.0	239
Striped mullet	1975	<1	390	0.3	331	ND	0.2	320	0.4	347	0.6	328	2.5
	1976	ND	0.2	345	0.2	346	0.3	330	0.4	349	1.6	322	2.5
	1977	ND	0.2	423	0.6	330	0.6	342	0.5	322	0.9	360	1.0
	1978	ND	0.1	351	0.1	338	0.1	340	0.7	322	0.1	336	0.1
	1979	ND	0.2	363	<1	319	0.2	343	0.6	344	0.7	357	0.6
	1980	ND	0.1	395	0.1	349	0.1	332	0.6	357	0.6	340	0.3
	1981	ND	0.2	376	0.4	329	0.3	330	0.4	341	0.5	334	0.3
	1982	ND	0.2	370	0.2	335	0.2	339	0.4	341	0.8	331	0.2
	1983	ND	0.2	362	0.7	328	0.2	331	0.3	350	0.5	345	0.1
	1984	ND	0.4	338	0.2	328	0.2	323	0.5	350	0.6	342	0.4
	1985	ND	0.2	338	0.2	326	0.2	323	0.5	355	0.3	371	0.3
	1986	<1	377	0.3	328	0.1	337	0.4	369	0.2	356	0.2	358
	1987	<1	325	0.2	333	0.4	344	0.4	319	0.1	348	0.3	338
	1988	<1	331	0.2	362	0.4	344	0.4	326	0.4	365	0.3	370
	1989	<1	329	0.2	349	0.2	334	0.2	328	0.3	350	0.4	348
	1990	0.1	334	0.4	341	0.3	368	0.2	344	0.8	369	0.7	394
	1991	0.1	331	0.2	333	0.6	366	0.1	343	0.8	358	0.5	387
	1992	<1	328	0.3	376	0.3	387	0.4	330	0.2	368	0.3	363
	1993	0.6	328	0.9	364	0.7	352	0.7	352	0.9	364	0.4	402

Table 2. (Cont'd.)

Species	Year	Sabine	Lake	Galveston	East	Matacorda	Matacorda	San Antonio	Aransas	Corpus	Upper Laguna	Lower Laguna	Madre	Coastwide
		No./h Length												
Total finfishes	1975	3.0	383	5.1	396	ND	385	6.9	355	4.9	339	7.9	345	5.7
	1976	ND	7.2	334	4.0	362	5.4	389	9.1	365	5.0	363	5.0	343
	1977	ND	6.2	334	3.2	342	4.0	342	5.0	348	3.6	344	5.8	374
	1978	ND	4.0	342	4.0	325	5.0	359	5.1	383	5.2	326	5.2	383
	1979	ND	3.5	367	2.0	372	4.3	350	5.6	368	3.8	341	3.8	322
	1980	ND	4.0	371	2.9	375	3.3	346	6.1	342	4.8	350	5.0	327
	1981	ND	4.2	357	3.3	355	3.0	384	4.8	358	4.4	375	4.8	364
	1982	ND	6.2	346	6.2	354	3.7	372	5.1	360	4.5	366	5.1	338
	1983	ND	6.0	350	6.2	341	4.0	378	5.3	352	3.9	396	5.8	356
	1984	ND	6.5	364	5.7	379	4.4	369	3.9	362	3.8	347	4.2	373
	1985	ND	7.1	335	4.5	366	3.7	380	4.2	376	3.3	396	4.0	358
	1986	2.6	395	6.0	349	4.4	390	4.6	379	4.7	408	4.0	378	5.3
	1987	2.2	430	5.8	334	4.7	390	5.0	323	5.2	428	3.3	391	4.9
	1988	2.5	371	6.2	346	6.5	398	5.5	361	5.8	393	4.3	382	5.0
	1989	2.2	394	6.8	363	5.2	387	4.3	361	5.6	402	4.7	374	5.4
	1990	2.4	401	5.2	343	4.9	345	4.2	345	5.5	399	4.5	398	2.9
	1991	3.1	389	5.4	341	5.4	376	4.9	362	6.5	389	4.9	373	6.3
	1992	2.7	439	6.1	356	6.1	439	5.6	366	2.8	408	6.2	419	5.8
	1993	2.7	379	6.8	347	7.1	457	5.8	380	7.6	430	6.4	455	7.3
Blue crab	1983	ND	0.1	136	0.3	153	0.1	151	0.1	138	0.2	146	0.2	146
	1984	ND	0.1	151	0.1	140	<.1	147	0.1	147	0.2	141	0.2	148
	1985	ND	<.1	149	0.1	154	<.1	142	0.1	139	0.1	141	0.1	143
	1986	0.2	150	<.1	146	<.1	144	<.1	161	0.1	146	<.1	138	0.1
	1987	0.2	154	0.1	140	0.1	158	0.2	154	0.3	153	<.1	158	0.1
	1988	0.2	155	0.1	144	0.2	150	<.1	137	0.1	138	0.1	145	0.1
	1989	0.1	157	<.1	136	<.1	144	<.1	139	<.1	133	<.1	148	<.1
	1990	0.2	146	0.1	149	0.1	144	0.2	144	0.1	144	<.1	149	0.1
	1991	0.1	152	<.1	151	0.1	152	0.1	131	0.1	150	<.1	136	0.1
	1992	0.1	161	<.1	143	0.1	156	0.1	153	<.1	136	<.1	140	0.1
	1993	0.1	169	<.1	145	0.1	150	<.1	156	<.1	146	<.1	155	<.1

Table 3. Annual mean catch rates (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 indicates no measurement taken; ND = no data.

Species Year	Sabine Lake			Galveston			East			Matagorda			San Antonio			Corpus Christi			Upper Laguna			Lower Laguna			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	No./ha Length																
FINFISHES																											
Red drum	ND	20	35	ND	62	59	ND	52	4	51	92	67	5	51	14	44	1	41	0	1	39	18	46	46	46		
1977*	ND	3	67	ND	59	74	ND	52	ND	8	68	28	50	5	51	14	94	3	67	11	58	52	7	58			
1978	ND	17	62	ND	52	52	ND	53	9	86	29	53	30	5	51	13	92	18	85	27	64	14	70				
1979	ND	26	52	ND	62	62	ND	53	9	76	19	102	26	103	21	40	38	46	4	82	15	72	23	70			
1980	ND	53	67	ND	67	67	ND	66	4	70	7	99	12	98	2	62	1	55	5	46	45	56	26	52			
1981	ND	11*	66	ND	66	66	ND	66	6	105	12	100	4	100	4	100	4	80	2	59	41	92	24	76			
1982	ND	13	66	ND	66	66	ND	66	6	105	12	56	4	100	4	100	4	80	2	52	41	92	20*	78			
1983	ND	13	131	ND	10	106	ND	106	7	114	19	82	9	114	7	114	19	82	9	67	1	61	17	69			
1984	ND	13	131	ND	10	106	ND	106	7	114	19	82	9	114	7	114	19	82	9	67	1	61	17	69			
1985	ND	3	131	ND	10	106	ND	106	7	114	19	82	9	114	7	114	19	82	9	67	1	61	17	69			
1986	ND	19	66	ND	7	87	ND	86	8	105	6	105	1	117	4	98	3	84	22	94	7	90	7	90			
1987	ND	6	99	ND	45	58	ND	47	61	16	88	15	89	9	79	7	71	2	117	32	63	21	66				
1988	ND	13	78	ND	8	78	ND	27	79	3	114	6	89	10	78	9	49	4	66	21	63	10	73				
1989	ND	61	44	ND	3	59	ND	24	47	4	102	10	82	8	65	4	83	1	54	18	69	9	63				
1990	ND	5	62	ND	17	53	ND	27	50	14	51	19	50	40	20	57	4	32	25	30	20	46	20				
1991	ND	6	97	ND	14	73	ND	30	53	30	81	36	79	25	61	28	72	5	88	43	61	24	71				
1992	ND	5	71	ND	9	85	ND	23	56	15	77	22	84	23	83	7	74	14	51	13	70	14	76				
1993	ND	11	73	ND	28	58	ND	40	48	11	66	17	58	13	60	12	73	9	53	23	62	18	60				
Spotted seatrout	ND	34	87	ND	35	52	ND	37	79	ND	3	83	11	70	7	68	12	53	13	80	2	86	14	82			
1977*	ND	1978	ND	17	72	ND	17	85	ND	3	84	21	71	11	74	11	79	3	56	<1	60	10	73				
1979	ND	16	85	ND	37	82	ND	4*	101	7	110	9	68	13	70	12	65	4	73	6	84	10	80				
1980	ND	16	85	ND	37	82	ND	4*	101	7	73	8	62	15	76	4	79	5	78	3	76	15	79				
1981	ND	26	84	ND	7	71	ND	2	85	3	77	1	83	10	74	1	54	1	88	5	98	4	77				
1982	ND	26	84	ND	7	71	ND	2	85	3	77	1	83	10	74	1	54	1	88	5	98	4	77				
1983	ND	5	80	ND	24	73	ND	11	87	4	64	24	61	3	50	9	70	2	78	9	70	2	78				
1984	ND	67	2	85	17	66	ND	15	71	5	78	12	60	4	68	1	72	2	58	5	68	11	72				
1985	ND	2	92	ND	22	73	ND	14	68	3	82	19	70	13	69	10	76	1	104	3	63	11	72				
1986	ND	7	88	ND	6	88	ND	14	75	5	96	7	67	28	68	17	65	5	105	3	87	9	74				
1987	ND	5	63	ND	6	79	ND	14	80	6	69	20	61	16	71	6	71	4	50	2	56	8	68				
1988	ND	3	69	ND	5	56	ND	10	74	8	66	8	61	14	61	13	65	2	54	<1	86	7	63				
1989	ND	1	67	ND	16	63	ND	13	71	15	70	34	59	20	65	12	63	6	63	14	54	12	58				
1990	ND	2	73	ND	6	73	ND	14	82	10	59	42	52	12	64	8	69	18	50	2	54	9	61				
1991	ND	5	84	ND	6	61	ND	19	71	6	62	15	54	15	68	7	69	14	59	7	49	9	61				
1992	ND	5	84	ND	6	61	ND	19	71	6	62	15	54	15	68	7	69	14	59	7	49	9	61				
1993	ND	5	84	ND	6	61	ND	19	71	6	62	15	54	15	68	7	69	14	59	7	49	9	61				
Black drum	ND	0	95	ND	36	83	ND	141	3	108	1	103	3	156	0	147	6	179	1	142	1	150	0	156			
1977*	ND	ND	40	83	ND	12	106	ND	4	107	5	85	22	110	5	147	1	122	4	106	0	13	102				
1978	ND	4	93	ND	12	122	ND	11	110	0	102	2	141	5	103	2	100	2	89	6	98	15	92				
1979	ND	4	93	ND	12	124	ND	12	110	5	138	9	90	7	94	1	109	1	95	3	142	2	97				
1980	ND	4	93	ND	12	124	ND	12	110	5	138	9	90	7	94	1	109	1	95	3	142	2	97				
1981	ND	4	93	ND	12	124	ND	12	110	5	138	9	90	7	94	1	109	1	95	3	142	2	97				
1982	ND	4	93	ND	12	124	ND	12	110	5	138	9	90	7	94	1	109	1	95	3	142	2	97				
1983	ND	23	91	ND	123	123	ND	123	3	118	1	132	2	145	2	108	2	107	<1	155	2	117	4	110			
1984	ND	8	108	ND	1	103	ND	103	3	118	0	156	1	140	1	140	0	108	2	107	<1	141	2	115			
1985	ND	4	141	ND	2	107	ND	107	5	85	0	106	5	97	0	124	1	122	4	106	0	13	102				
1986	ND	2	141	ND	1	106	ND	107	0	106	4	130	1	149	0	124	1	122	4	106	0	13	102				
1987	ND	0	146	ND	5	107	ND	107	5	94	6	126	2	132	2	128	2	112	8	145	1	110					
1988	ND	2	146	ND	4	124	ND	124	8	87	3	109	1	132	2	128	2	112	8	145	1	110					
1989	ND	0	146	ND	4	124	ND	124	8	87	3	109	1	132	2	128	2	112	8	145	1	110					
1990	ND	3	128	ND	4	99	ND	99	14	75	1	117	6	123	2	127	1	116	1	110	1	110					
1991	ND	1	123	ND	3	111	ND	111	10	99	7	155	2	113	<1	174	1	112	6	126	4	108					
1992	ND	<1	123	ND	3	114	ND	114	1	146	3	109	0	146	3	123	0	112	6	126	4	108					
1993	ND	2	129	ND	1	109	ND	109	3	99	<1	122	0	122	<1	158	0	99	1	118	2	103					

Table 3 (Cont'd.)

Species Year	Sabine No./ha Length	Lake No./ha Length	Galveston No./ha Length	Matagorda No./ha Length	Matagorda No./ha Length	San Antonio No./ha Length	Aransas No./ha Length	Corpus Christi No./ha Length	Lower Laguna No./ha Length	Upper Laguna No./ha Length	Madre No./ha Length	Coastwide No./ha Length
Sheepshead 1977, 1978	ND	0	66	<1	128	0	0	54	0	122	1	128
1979	ND	0	114	1	163	1	68	1	59	1	61	70
1980	ND	15	114	1	163	1	63	3	56	13	50	61
1981	ND	1	158	ND	2	68	0	41	0	0	1	86
1982	ND	1	174	<1 ^b	93	<1	50	1	62	<1	0	101
1983	ND	1	23	<1	178	<1	50	1	67	<1	3	90
1984	ND	0	20	1	157	1	102	1	99	0	0	52
1985	ND	2	114	<1	32	1	157	3	36	<1	0	43
1986	0	<1	114	<1	203	1	203	1	39	1	2	80
1987	0	<1	114	<1	94	<1	94	1	50	0	1	80
1988	0	<1	60	1	91	<1	124	2	58	1	73	64
1989	1	<1	59	1	35	1	116	25	40	0	<1	43
1990	<1	153	<1	126	<1	36	<1	79	<1	115	0	1
1991	<1	146	0	55	0	1	<1	101	1	29	0	43
1992	<1	97	0	1	33	1	36	5	39	<1	4	69
1993	<1	50	<1	147	<1	47	0	1	98	<1	45	49
Southern Flounder 1977, 1978	ND	0	40	ND	ND	1	171	0	98	0	0	171
1979	ND	9	85	ND	<1	135	2	85	<1	44	<1	42
1980	ND	10	54	ND	<1	38	2	55	0	122	1	71
1981	ND	15	57	ND	7	79	2	53	2	90	1	51
1982	ND	9	67	ND	3	82	6	56	18	37	1	64
1983	ND	9	46	1 ^b	75	2	54	3	58	6	13	46
1984	ND	2	83	2	69	1	78	1	67	3	2	69
1985	ND	4	58	5	78	2	112	1	43	7	1	64
1986	2	83	6	70	19	66	2	78	4	64	2	63
1987	2	47	21	51	9	54	3	44	1	103	1	53
1988	15	66	14	61	3	76	3	69	5	48	1	63
1989	10	74	3	62	10	60	3	67	10	51	2	62
1990	12	68	22	59	12	55	11	50	24	38	8	7
1991	7	58	5	34	7	56	3	53	1	55	12	54
1992	7	66	3	41	3	67	2	46	1	41	2	49
1993	4	95	6	56	5	45	6	46	3	47	2	46
Atlantic croaker 1977, 1978	ND	20	96	ND	0	59	10	100	37	73	1	83
1979	ND	320	61	ND	239	74	52	49	7	76	1	38
1980	ND	1,463	52	ND	109	69	17	89	16	25	1	61
1981	ND	1,085	55	ND	82	94	26	26	42	20	55	53
1982	ND	528	57	ND	24	94	67	67	142	61	1	44
1983	ND	1,812	61	ND	165	74	66	67	80	32	54	53
1984	ND	888	55	56 ^b	79	236	66	67	63	62	0	471
1985	ND	815	59	210	64	483	60	25	83	155	61	60
1986	ND	242	64	121	63	299	72	13	88	46	1,160	58
1987	74	148	77	198	68	2,138	52	17	99	12	78	46
1988	79	335	54	110	56	207	78	33	47	9	<1	61
1989	154	485	53	160	51	60	80	13	66	3	60	62
1990	111	56	36	77	190	45	22	56	9	49	10	56
1991	97	67	316	51	117	46	82	68	24	32	58	59
1992	225	56	635	52	343	47	1,035	58	156	63	66	55
1993	232	64	358	50	450	47	626	48	430	47	215	47
Sand seatrout 1977, 1978	ND	0	ND	13	58	ND	11	61	59	0	<1	61

Table 3 (Cont'd.)

Species Year	Sabine Lake		Galveston		East		Matagorda		San Antonio		Corpus Christi		Upper Laguna		Lower Laguna		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	No./ha Length	No./ha Length	No./ha Length	No./ha Length	No./ha Length	No./ha Length	No./ha Length	No./ha Length
Sand seatrout (Cont'd.)																		
1979	ND	35	58	ND	14	70	2	75	<1	33	1	77	0	0	0	0	10	61
1980	ND	8	61	ND	7	82	<1	64	<1	89	0	0	0	0	0	3	69	
1981	ND	21	60	ND	2	72	<1	35	<1	76	1	76	0	<1	78	5	61	
1982	ND	47	53	10 ^b	59	30	64	<1	47	1	70	2	53	0	0	65	13	58
1983	ND	47	53	10 ^b	7	66	22	54	0	<1	67	0	0	0	0	15 ^b	56	
1984	ND	49	55	7	59	12	71	0	0	<1	67	1	82	0	<1	41	15	
1985	ND	11	60	8	59	12	60	9	64	0	<1	57	0	0	0	60	5	65
1986	6	71	9	50	4	60	14	65	1	61	0	0	0	0	0	3	57	
1987	4	63	16	53	38	40	6	66	<1	69	0	0	0	0	0	6	61	
1988	5	54	43	55	7	66	4	68	<1	31	0	<1	106	0	0	0	3	52
1989	9	54	43	55	7	59	13	56	<1	36	0	0	0	0	0	10	56	
1990	24	52	75	46	10	59	13	56	<1	76	3	50	2	42	0	65	47	
1991	7	48	76	55	25	59	39	56	<1	81	1	61	0	0	0	23	55	
1992	7	54	30	53	10	52	36	54	0	0	<1	96	1	57	0	12	53	
1993	7	58	53	48	19	53	88	53	4	64	<1	96	1	57	0	26	51	
Gulf menhaden																		
1977*	ND	21	76	ND	0	0	0	0	0	0	0	0	0	0	0	0	5	76
1978	ND	533	31	ND	3,963	47	169	64	3,310	44	3,310	1	41	44	42	71	29	1,249
1979	ND	122	53	ND	867	43	0	817	38	335	38	38	6	37	31	3,312	41	
1980	ND	14,717	46	ND	115	50	24	52	48	30	7	49	4	40	54	31	3,343	46
1981	ND	4,196	45	ND	348	51	52	41	355	48	8	41	721	42	11	38	246	45
1982	ND	4,788	66	1,324 ^b	44	820	44	1,008	37	137	33	1,068	36	9	31	32	1,466	47
1983	ND	4,971	66	1,324 ^b	44	809	44	67	42	116	34	619	33	2	30	5	47	62
1984	ND	1,839	44	44	48	1,260	45	1,084	42	866	39	553	52	128	49	69	56	928
1985	ND	486	42	243	43	3,819	50	868	45	48	39	122	37	62	44	20	49	48
1986	3,049	48	3,024	38	1,076	53	612	36	27	34	11	46	36	44	12	36	2,333	48
1987	633	47	2,264	50	755	49	3,550	60	35	40	68	36	11	34	32	18	27	637
1988	600	40	2,625	45	438	45	363	60	<1	43	80	30	<1	44	14	31	81	45
1989	526	48	781	42	388	51	187	45	53	37	43	37	11	43	2	45	71	245
1990	774	49	5,106	43	640	44	527	56	797	71	943	35	869	32	21	38	<1	38
1991	270	41	4,298	40	1,258	42	3,044	42	296	42	569	41	244	38	123	36	0	1,533
1992	593	45	6,025	37	1,291	36	1,919	38	1,810	35	259	33	43	46	4	30	21	40
1993	1,878	48	7,341	40	509	36	4,922	46	1,910	38	634	66	158	38	13	39	108	35
Pinfish																		
1977*	ND	0	ND	32	114	24	105	22	105	22	105	66	93	167	102	13	101	39
1978	ND	116	55	ND	24	61	77	54	74	133	69	141	84	122	1	64	65	
1979	ND	73	75	ND	43	79	60	363	57	167	66	250	61	17	122	1	107	77
1980	ND	151	38	ND	16	50	69	131	70	107	85	267	67	40	88	153	59	152
1981	ND	270	55	ND	68	69	131	55	448	67	265	62	100	73	132	75	151	66
1982	ND	144	67	ND	34	66	590	55	448	67	265	62	100	73	349	57	260	61
1983	ND	138	65	61 ^b	79	115	80	510	49	642	68	533	66	25	211	68	279 ^b	64
1984	ND	247	59	180	64	107	71	172	66	471	62	214	54	146	79	120	74	214
1985	ND	362	55	401	65	209	71	396	55	274	66	234	67	133	68	261	62	280
1986	64	74	183	61	676	64	227	57	46	61	696	59	304	58	245	62	329	63
1987	8	72	50	64	442	44	68	442	63	321	67	463	58	42	56	339	64	206
1988	7	84	128	61	373	62	43	77	246	63	589	62	983	54	312	59	660	60
1989	24	75	182	62	359	58	208	53	607	61	300	63	361	57	60	251	61	254
1990	37	75	138	58	307	60	39	52	609	55	566	57	392	62	660	60	415	58
1991	8	79	138	58	371	67	49	431	53	545	59	435	63	240	69	696	57	243
1992	12	73	96	46	139	59	150	53	368	60	564	56	482	54	174	59	531	58
1993	27	78	309	49	139	59	150	53	368	60	564	56	482	54	307	59	344	56
Spot																		
1977*	ND	56	100	ND	23	118	0	0	2	170	12	0	0	0	0	1	125	18
1978	ND	407	52	ND	182	49	361	48	80	55	310	47	227	59	149	52	253	51
1979	ND	352	42	ND	21	64	201	44	58	60	210	55	103	70	57	59	156	49
1980	ND	269	57	ND	76	56	256	51	101	58	95	58	101	58	59	165	48	160

Table 3 (Cont'd.)

Species Year	Sabine No./ha	Lake Length	Galveston No./ha Length	Matagorda No./ha Length	Mata No./ha Length	Corpus Christi No./ha Length	Aransas No./ha Length	San Antonio No./ha Length	Lower Laguna Madre No./ha Length	Upper Laguna Madre No./ha Length	Coastwide No./ha Length	
Spot (Cont'd.)												
1981	ND	331	52	ND	154	57	135	64	97	54	121	61
1982	ND	404	62	ND	143	58	467	52	623	54	225	60
1983	ND	459	57	50 ^b	64	95	58	169	51	55	55	180
1984	ND	238	53	96	61	146	58	247	46	659	56	526
1985	ND	179	62	158	59	216	59	274	44	254	64	493
1986	118	65	135	68	825	51	102	51	238	51	227	55
1987	119	80	264	60	383	60	83	58	203	49	160	60
1988	44	82	229	69	210	66	116	64	132	54	359	49
1989	96	52	1989	63	256	58	173	59	264	62	361	59
1990	16	70	222	62	525	54	330	57	691	51	253	53
1991	22	65	270	56	304	59	131	49	198	69	566	52
1992	27	70	211	55	89	61	63	53	194	59	295	53
1993	35	80	164	56	288	55	123	53	149	50	185	59
Striped mullet	ND	31	140	ND	129	106	129	117	27	132	179	156
1977*	ND	56	120	ND	26	124	126	66	68	103	121	158
1978	ND	135	89	ND	93	99	273	66	152	103	202	135
1979	ND	90	117	ND	15	107	41	121	61	102	49	88
1980	ND	229	57	ND	553	92	249	84	205	81	77	85
1981	ND	128	66	ND	118	118	179	77	177	85	110	110
1982	ND	85	94	62 ^b	104	26	136	57	64	110	106	37
1983	ND	52	95	33	95	34	53	69	73	102	57	142
1984	ND	75	110	199	89	92	22	134	95	58	22	52
1985	ND	34	134	20	144	23	86	37	93	22	91	62
1986	84	103	244	75	89	33	96	63	115	127	73	141
1987	48	80	115	69	90	44	64	16	116	84	50	189
1988	42	61	196	40	61	24	82	10	147	77	47	131
1989	61	68	194	71	151	81	21	71	47	100	156	41
1990	43	88	78	234	80	162	60	79	65	97	40	88
1991	83	94	149	79	97	78	52	78	72	81	132	41
1992	23	94	105	83	84	74	41	77	62	71	67	41
1993	74	84	105	83	84	74	77	74	86	86	133	49
Total finfishes	ND	959	59	ND	4,855	67	1,671	65	1,383	64	2,788	64
1977*	ND	4,103	53	ND	1,635	71	3,335	57	3,038	64	1,515	66
1978	ND	3,149	60	ND	632	77	1,879	67	3,096	60	2,191	70
1979	ND	18,543	86	ND	1,093	83	1,781	61	4,407	68	1,407	68
1980	ND	3,334	63	ND	9,007	2,077	78	4,321	55	2,020	66	2,213
1981	ND	9,007	68	ND	8,075	80	1,857	80	1,059	57	2,021	66
1982	ND	8,225	71	2,078 ^b	63	2,078 ^b	63	2,157	80	1,781	57	2,157
1983	ND	4,644	59	1,617	66	2,625	62	2,687	58	3,059	63	2,353
1984	ND	1,995	63	1,921	68	5,152	82	2,200	65	2,514	62	3,353
1985	ND	3,776	69	3,329	63	14,493	73	1,849	60	2,294	57	1,334
1986	ND	1,153	67	2,231	64	2,484	63	4,312	79	1,344	65	1,203
1987	ND	1,153	62	4,347	71	2,024	63	9,913	83	1,391	58	2,024
1988	ND	1,243	62	2,157	67	2,097	59	1,362	69	1,997	62	2,271
1989	ND	1,243	67	7,186	58	2,951	59	2,106	68	3,410	57	2,360
1990	ND	1,319	67	7,525	62	3,452	63	4,982	69	3,090	57	3,913
1991	ND	1,719	62	7,886	54	3,424	57	4,687	53	2,622	57	2,273
1992	ND	1,143	56	7,886	64	2,536	54	2,284	54	2,839	65	2,373
1993	ND	2,526	62	9,393	64	1,700	54	1,700	60	2,284	53	2,393
SHELLFISHES												
Blue crab	ND	103	43	ND	31	46	51	57	62	33	56	58
1977*	ND	66	52	ND	10	38	51	49	62	43	38	63
1978	ND	106	52	ND	27	51	76	45	56	43	48	55
1979	ND	122	54	ND	24	56	119	65	52	80	40	51
1980	ND	122	54	ND	ND	ND	ND	ND	ND	ND	ND	48

Table 3 (Cont'd.)

Species Year	East			Matagorda			San Antonio			Aransas			Upper Laguna			Lower Laguna					
	Sabine Lake No./ha Length	Galveston No./ha Length	Matagorda No./ha Length	No./ha Length	Matagorda No./ha Length	San Antonio No./ha Length	Aransas No./ha Length	Christi No./ha Length	Madre No./ha Length	Upper Laguna No./ha Length	Lower Laguna No./ha Length	Coastwide No./ha Length	Corpus Christi No./ha Length	Upper Laguna No./ha Length	Lower Laguna No./ha Length	Coastwide No./ha Length					
Blue crab (Cont'd.)																					
1981	ND	58	53	ND	43	44	51	54	85	45	86	40	42	58	167	35	74	44			
1982	ND	101	48	ND	31	51	107	42	193	48	52	49	35	54	175	33	102	46			
1983	ND	148	43	15	77	35	34	105	40	145	43	48	40	36	59	112	43	94	41		
1984	ND	88	58	58	58	42	42	46	63	50	62	42	37	73	52	152	34	64	51		
1985	ND	144	49	54	56	55	57	53	62	41	42	141	38	184	37	23	45	113	42		
1986	37	79	90	55	86	55	57	53	62	46	39	48	77	40	23	45	91	63	49		
1987	23	68	163	41	87	38	36	51	64	55	35	35	80	47	50	59	72	44	77	45	
1988	44	64	160	46	138	31	29	36	48	31	56	34	89	44	38	43	78	37	78	42	
1989	50	45	85	48	121	30	45	25	74	31	56	34	72	43	22	41	31	35	59	38	
1990	67	47	141	44	94	46	75	31	98	30	83	35	150	42	37	51	68	40	94	39	
1991	46	56	165	47	92	44	58	37	198	38	107	40	158	40	49	107	43	117	42	117	
1992	36	55	90	36	54	37	45	26	117	30	140	34	164	38	105	58	129	35	103	37	
1993	36	59	116	35	89	27	51	23	89	35	652	41	176	42	67	55	78	36	166	39	
Brown shrimp																					
1977*	ND	139	46	ND	64	52	200	49	229	54	99	58	58	56	188	9	63	200	53	137	51
1978	ND	540	50	ND	167	63	102	63	152	63	438	63	499	61	53	68	60	53	245	56	
1979	ND	482	58	ND	194	66	69	63	53	60	386	60	183	62	64	59	155	59	285	61	
1980	ND	495	52	ND	143	68	53	53	60	355	60	644	60	679	53	102	64	234	56	314	58
1981	ND	719	57	ND	157	74	310	64	355	64	505	54	428	57	62	63	1,008	58	490	59	
1982	ND	915	64	ND	207	64	599	76	248	66	310	57	530	60	295	56	65	565	61	510	60
1983	ND	484	60	99	294	65	197	56	244	66	740	66	291	58	82	61	532	50	360	58	
1984	ND	628	64	ND	413	59	364	63	306	56	755	61	370	55	288	70	1,007	56	525	59	
1985	ND	522	60	ND	522	60	166	58	558	63	524	67	137	65	231	63	204	58	66	318	62
1986	74	166	58	387	56	445	64	158	60	464	62	293	60	417	56	961	58	610	59	616	63
1987	401	1,162	58	570	57	208	61	206	61	357	58	394	64	756	73	461	62	493	56	493	56
1988	248	61	516	62	519	59	889	56	739	54	726	55	522	54	167	58	77	2,128	59	694	61
1989	70	110	69	356	56	723	61	477	61	482	60	1,005	60	592	62	660	70	248	56	63	591
1990	110	14	68	601	57	790	61	624	56	1,511	67	624	56	629	58	328	62	926	55	565	57
1991	14	245	71	708	57	455	55	270	52	455	52	321	54	568	64	636	58	279	62	891	59
1992	102	63	541	58	560	54	232	55	321	54	568	54	568	64	636	58	279	62	891	59	
1993	102	63	541	58	560	54	568	54	568	54	568	54	568	64	636	58	279	62	891	59	
Pink shrimp																					
1977*	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	
1978	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	
1979	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	
1980	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	
1981	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	
1982	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	
1983	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	
1984	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	
1985	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	ND	0	
1986	0	73	0	<1	32	0	<1	32	0	0	1	38	0	135	49	106	50	14	55	6	
1987	0	0	0	0	0	0	0	0	0	0	1	52	45	42	64	46	20	59	0	54	
1988	0	0	0	0	0	0	0	0	0	0	1	36	99	49	106	48	4	48	15	51	
1989	0	0	0	0	0	0	0	0	0	0	1	110	61	52	25	46	31	42	15	52	
1990	0	0	0	0	0	0	0	0	0	0	1	440	32	53	77	54	38	55	176	59	
1991	0	0	0	0	0	0	0	0	0	0	1	44	58	47	53	50	32	55	140	56	
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
White shrimp																					
1977*	ND	1,586	55	ND	1,054	102	115	47	26	63	84	57	36	85	23	57	553	69	553	69	
1978	ND	1,858	66	ND	554	70	130	61	92	49	62	52	21	55	130	53	335	65	335	65	
1979	ND	1,720	61	ND	543	70	212	56	99	64	81	52	5	53	143	47	608	61	608	61	
1980	ND	1,571	64	ND	522	68	133	61	57	141	69	141	51	71	18	45	288	64	288	64	
1981	ND	1,393	62	ND	805	59	64	183	50	173	51	19	56	61	264	61	527	60	527	60	
1982	ND	3,560	58	ND	1,750	64	650	51	297	43	369	54	14	51	326	50	1,276	58	1,276	58	

Table 3 (Cont'd.)

Species Year	Sabine	Lake	Galveston	East	Matagorda	Matagorda	San Antonio	Aransas	Corpus	Upper Laguna	Lower Laguna	Coastwide
	No./ha Length	Christi	Madre	Madre	No./ha Length							
<i>White shrimp (Cont'd.)</i>												
1983	1,524	50	348	70	394	65	135	64	129	53	135	42
1984	ND	59	409	65	1,438	71	166	56	415	53	311	17
1985	ND	307	61	552	61	584	63	37	239	44	33	6
1986	308	73	1,389	62	173	65	675	66	140	66	287	44
1987	682	68	972	53	577	61	579	67	90	54	111	65
1988	796	63	482	66	429	66	341	68	168	52	425	47
1989	615	61	559	55	76	59	384	78	145	52	631	59
1990	425	65	1,698	54	690	57	451	63	335	58	821	50
1991	385	71	1,723	50	273	51	624	58	236	55	361	71
1992	463	68	924	54	264	62	643	60	115	68	211	71
1993	324	68	526	56	449	62	585	61	132	68	96	56
									876	69	137	58
										750		60

^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. Annual mean catch rate (No./h) and mean total lengths (mm) of selected fishes and shellfishes caught with 6.1-m trawls in Texas bay systems during 1982-93. Blank indicates no measurement taken; ND = no data.

Species	Year	Sabine Lake		Galveston		East		Matagorda		San Antonio		Aranas		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	
Atlantic croaker	1982*	ND	43	ND	131	ND	102	ND	10	ND	87	75	110	ND	37	ND	28	ND	62	75		
	1983	ND	30	ND	126	ND	31	ND	117	18	44	106	43	149	15	157	32	154	30	127		
	1984	ND	15	ND	124	ND	30	ND	104	22	87	52	83	120	15	137	44	138	35	112		
	1985	ND	20	ND	123	ND	41	ND	110	17	105	33	101	42	138	13	151	24	148	27	119	
	1986	10	157	ND	117	ND	52	ND	114	44	146	57	96	83	125	14	139	43	153	43	117	
	1987	25	139	26	117	ND	17c	133	126	103	146	96	87	100	50	129	7	152	44	122	70	106
	1988	45	135	56	98	13	131	43	121	90	109	100	102	38	125	5	137	21	138	55	109	
	1989	45	145	36	116	4	98	75	120	88	102	71	99	40	127	2	158	19	131	52	115	
	1990	40	113	36	109	12	113	79	118	50	97	45	92	55	125	12	129	66	123	50	112	
	1991	31	115	41	106	8	120	135	106	175	93	223	93	74	125	14	127	34	132	94	103	
	1992	40	139	54	107	4	120	211	100	155	93	238	87	54	114	17	140	37	140	112	98	
	1993	70	131	90	104	15	128	120	104	48	104	123	98	36	131	2	141	27	141	79	106	
Black drum	1982*	ND	<1	259	ND	0	<1	199	<1	199	<1	221	<1	166	2	235	<1	264	0	<1	238	
	1983	ND	<1	274	ND	<1	168	ND	0	0	<1	192	<1	251	<1	247	<1	266	<1	283		
	1984	ND	<1	242	ND	<1	233	ND	0	0	<1	403	<1	341	<1	202	<1	202	<1	258		
	1985	ND	<1	226	ND	<1	246	0c	0	0	<1	200	0	403	<1	280	0	0	<1	258		
	1986	<1	278	<1	192	<1	192	192	0	0	<1	170	<1	204	<1	170	<1	170	<1	268		
	1987	<1	271	<1	271	<1	274	192	0	0	<1	267	<1	173	<1	173	<1	173	<1	250		
	1988	1	260	<1	192	<1	146	146	<1	930	<1	114	<1	194	<1	247	<1	170	<1	231		
	1989	2	272	<1	254	<1	313	1	218	0	<1	218	<1	212	<1	186	<1	197	<1	256		
	1990	1	268	<1	313	<1	210	235	0	<1	212	<1	183	<1	236	<1	183	<1	183	<1	258	
	1991	2	320	<1	285	<1	309	0	<1	285	<1	282	<1	223	<1	235	<1	225	<1	229	<1	236
	1992	2	283	<1	309	<1	309	0	<1	309	<1	282	<1	223	<1	235	<1	225	<1	233	<1	236
	1993	3	283	<1	285	<1	309	0	<1	309	<1	282	<1	223	<1	235	<1	225	<1	233	<1	236
Gafftop-sail catfish	1982*	ND	<1	ND	137	ND	4	ND	3	ND	3	ND	1	138	1	193	0	0	2	141		
	1983	ND	<1	139	ND	1	144	5	121	2	109	2	135	1	175	0	0	1	133			
	1984	ND	<1	154	ND	1	154	ND	2	137	2	128	1	128	1	150	0	0	1	126		
	1985	ND	<1	126	ND	1	145	1c	143	2	134	5	128	2	121	<1	196	0	0	1	134	
	1986	0	1	174	<1	149	1	135	3	138	9	122	2	124	2	124	<1	175	2	127		
	1987	<1	299	<1	126	<1	139	1	134	4	136	4	136	4	139	<1	14	0	0	1	124	
	1988	0	1	218	1	127	1	137	4	130	2	145	5	127	3	143	<1	173	0	0	1	137
	1989	0	1	145	1	142	2	128	2	125	5	132	10	117	1	126	0	0	1	159		
	1990	0	1	1992	<1	161	<1	128	2	145	4	123	4	141	<1	206	0	0	1	237		
	1991	0	1	144	<1	139	<1	118	2	145	2	118	4	118	<1	183	0	0	1	237		
	1992	0	1	144	<1	139	<1	118	2	145	2	118	4	118	<1	183	0	0	1	237		
	1993	0	1	144	<1	139	<1	118	2	145	2	118	4	118	<1	183	0	0	1	237		
Gulf menhaden	1982*	ND	12	ND	103	ND	10	ND	109	17	76	3	89	3	104	<1	ND	10	ND	8	96	
	1983	ND	7	ND	98	ND	3	ND	93	23	58	45	44	4	82	6	76	<1	59	9	61	
	1984	ND	3	ND	112	ND	10	ND	109	27	79	12	92	2	119	4	106	0	14	101		
	1985	ND	18	ND	95	ND	4	ND	79	18	64	8	55	1	156	<1	49	0	9	84		
	1986	<1	121	17	95	ND	20	95	15c	84	12	101	34	77	22	62	1	92	0	0	16	
	1987	3	101	20	95	ND	20	80	1	96	16	96	11	99	4	106	1	124	<1	110	13	
	1988	3	94	22	107	7	97	3	111	21	103	3	65	7	115	<1	60	<1	78	9	105	
	1989	3	79	14	107	7	94	4	121	24	85	19	102	2	97	2	85	<1	111	10	119	
	1990	5	68	11	94	2	94	4	121	24	85	19	102	2	97	2	85	<1	111	10	119	
	1991	6	83	21	87	4	82	17	98	34	92	16	68	2	128	1	73	<1	98	17	113	
	1992	2	95	22	103	7	71	31	103	17	94	38	87	3	102	1	108	1	107	20	100	
	1993	2	79	39	84	5	44	10	104	12	68	16	78	4	98	<1	119	<1	136	18	113	
Pinfish	1982*	ND	1	ND	7	ND	5	ND	2	ND	85	2	ND	44	ND	44	ND	39	ND	19		
	1983	ND	1	121	ND	6	110	14	106	17	107	7	96	25	113	67	108	20	133	24	119	
	1984	ND	1	121	ND	6	107	14	106	17	107	7	96	25	113	67	108	20	133	24	119	
	1985	ND	1	120	ND	9	111	23	104	13	104	10	53	110	48	118	18	133	48	110		
	1986	4	117	2	118	ND	10	101	18	103	17	98	55	103	100	116	32	109	27	109		
	1987	<1	126	1	122	5c	113	13	103	32	91	31	83	91	106	130	121	131	32	113		

Table 4. (Cont'd.)

Species	Year	Sabine Lake	East Galveston	Matacgorde	San Antonio	Aransas	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
Pinfish (Cont'd.)	1988	4	126	2	114	5	107	18	111	92
	1989	1	117	2	121	9	98	16	113	53
	1990	3	109	5	107	5	103	34	109	64
	1991	1	111	4	120	8	100	6	116	101
	1992	1	98	2	127	1	112	5	102	23
	1993	3	119	4	114	3	110	5	103	23
Red drum	1982*	ND	0	ND	<1	ND	<1	230	<1	102
	1983	ND	0	ND	0	ND	<1	319	<1	224
	1984	ND	<1	583	ND	<1	344	<1	142	<1
	1985	ND	0	ND	0	<1	56	0	54	<1
	1986	<1	212	0	34	0	0	<1	78	0
	1987	<1	405	<1	53	0	0	<1	23	0
	1988	<1	272	<1	44	0	<1	42	0	<1
	1989	<1	254	<1	44	0	<1	42	0	<1
	1990	0	<1	320	0	0	<1	53	0	<1
	1991	0	<1	135	0	0	<1	75	0	<1
	1992	0	<1	197	0	<1	63	<1	349	<1
	1993	<1	575	0	<1	360	0	<1	250	<1
Sand seatrout	1982*	ND	4	ND	5	185	<1	141	3	126
	1983	ND	3	134	ND	4	132	<1	108	3
	1984	ND	2	147	ND	3	126	<1	115	1
	1985	ND	4	127	ND	2	117	<1	115	1
	1986	1	152	3	141	ND	2	112	<1	133
	1987	2	121	2	110	2	112	<1	114	1
	1988	1	140	3	107	1	117	2	126	<1
	1989	2	102	10	96	<1	81	3	111	1
	1990	1	110	5	109	1	96	3	119	<1
	1991	1	118	7	130	1	103	2	123	1
	1992	2	113	6	113	<1	150	6	113	2
	1993	6	108	6	110	3	107	4	119	1
Sheepshead	1982*	ND	<1	295	ND	0	<1	119	<1	85
	1983	ND	<1	344	ND	0	<1	113	<1	138
	1984	ND	<1	339	ND	<1	147	0	<1	157
	1985	ND	<1	341	ND	<1	102	<1	112	<1
	1986	1	215	<1	451	ND	0	<1	111	<1
	1987	<1	279	<1	356	0	<1	111	<1	124
	1988	<1	332	<1	423	0	<1	112	<1	80
	1989	1	252	<1	253	<1	104	0	120	<1
	1990	3	248	<1	343	0	<1	120	<1	89
	1991	2	300	<1	339	<1	192	0	<1	145
	1992	3	267	<1	354	0	<1	65	1	121
	1993	5	257	<1	311	1	286	0	1	134
Southern flounder	1982*	ND	<1	158	ND	<1	169	1	155	1
	1983	ND	<1	175	ND	<1	196	<1	120	1
	1984	ND	<1	193	ND	<1	194	<1	153	2
	1985	ND	<1	234	ND	<1	202	1	147	1
	1986	<1	141	1	161	ND	<1	165	1	141
	1987	1	168	<1	231	<1	154	<1	191	1
	1988	1	144	<1	195	<1	132	<1	148	1
	1989	2	173	<1	166	<1	181	<1	174	<1
	1990	2	119	<1	174	<1	161	<1	166	2
	1991	1	152	<1	160	<1	147	<1	242	1
	1992	1	185	<1	184	<1	186	<1	210	1
	1993	1	198	<1	198	<1	177	<1	142	<1

Table 4. (Cont'd.)

Table 4. (Cont'd.)

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

^aValues include May-Dec only.^b1986 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		Port Aransas		Port Isabel		Coastwide	
		No./h	Length	No./h	Length	No./h	Length	No./h	Length	No./h	Length	No./h	Length
FINNFISHES													
Atlantic croaker	1985 ^a	ND ^b	134	22	145	42	139	17	145	9	149	23	142
1986	44	114	45	126	98	136	43	130	9	132	49	132	132
1987	9	114	110	119	65	131	28	134	<1	157	44	124	124
1988	79	122	78	118	89	132	23	130	2	128	55	125	125
1989	64	115	117	117	75	128	28	128	6	137	60	121	121
1990	175	117	139	111	69	135	65	131	4	119	91	119	119
1991	272	111	153	114	201	121	87	129	4	162	145	117	117
1992	229	110	228	116	153	116	81	106	6	126	142	113	113
1993	437	111	200	110	74	123	91	121	10	144	162	113	113
Black drum	1985 ^a	ND ^b	0	0	<1	0	<1	825	0	<1	825	<1	825
1986	0	851	<1	760	<1	680	<1	680	0	0	0	<1	900
1987	<1	698	<1	752	<1	506	<1	506	0	0	0	<1	741
1988	0	0	<1	528	0	0	<1	528	0	0	0	<1	752
1989	0	0	<1	970	0	<1	889	0	<1	889	<1	889	631
1990	0	0	<1	825	0	<1	0	<1	780	0	<1	780	631
1991	0	0	<1	0	0	<1	0	<1	0	0	<1	0	118
1992	0	0	<1	146	<1	165	<1	156	<1	136	0	<1	160
1993	<1	0	<1	0	118	<1	118	<1	115	<1	176	0	<1
Gafftopsail catfish	1985 ^a	ND ^b	13	121	<1	116	<1	116	<1	134	0	<1	121
1986	3	116	0	0	<1	169	<1	168	0	<1	180	<1	126
1987	3	116	0	0	<1	123	<1	546	<1	187	<1	143	143
1988	2	118	<1	144	<1	170	<1	181	<1	178	<1	150	150
1989	2	118	<1	119	<1	123	0	0	<1	209	0	<1	127
1990	3	119	<1	145	<1	125	<1	148	<1	145	0	<1	127
1991	1	145	<1	125	<1	123	<1	129	<1	182	<1	129	127
1992	12	125	<1	123	<1	123	<1	150	<1	159	1	<1	127
1993	6	123	<1	0	0	0	0	0	<1	0	0	<1	889
Gulf menhaden	1985 ^a	ND ^b	4	125	2	150	1	159	1	151	0	1	152
1986	4	132	5	135	1	147	<1	180	<1	197	0	1	135
1987	3	132	5	124	10	144	<1	146	<1	159	0	2	136
1988	5	124	6	124	57	144	<1	107	<1	122	0	4	87
1989	1	137	1	137	1	144	<1	131	<1	177	<1	51	51
1990	2	133	4	133	4	136	1	122	<1	162	0	1	138
1991	7	134	1	134	1	144	1	122	<1	148	0	1	134
1992	4	141	14	116	1	116	1	139	1	148	0	2	135
1993	8	142	<1	129	<1	129	<1	159	0	145	0	2	141
King mackerel	1985 ^a	ND ^b	0	<1	173	0	<1	124	0	0	0	<1	142
1986	0	0	<1	159	0	<1	120	<1	200	0	0	<1	159
1987	0	0	0	0	0	<1	0	161	<1	164	0	0	131
1988	0	0	0	0	0	<1	201	<1	223	0	0	<1	162
1989	0	0	<1	0	0	<1	172	<1	157	<1	99	0	132
1990	0	0	<1	0	0	<1	149	<1	152	<1	136	0	141
1991	0	0	<1	0	0	<1	0	<1	169	0	0	<1	144
1992	0	0	<1	0	0	<1	0	<1	0	0	0	<1	169
1993	0	0	<1	0	0	<1	0	<1	0	0	0	<1	169
Pinfish	1985 ^a	ND ^b	<1	98	<1	124	3	109	4	110	1	135	2
1986	<1	98	<1	104	2	105	2	105	4	107	2	103	2
1987	0	93	<1	100	3	111	3	111	3	115	<1	112	1
1988	<1	93	<1	112	8	105	8	110	3	105	4	107	1
1989	<1	100	<1	108	3	116	7	110	6	105	3	109	3
1990	<1	86	1	111	4	110	18	105	2	98	5	105	5
1991	<1	121	1	132	2	116	18	113	3	118	4	114	4
1992	<1	115	2	121	3	110	6	103	3	107	3	108	3
1993	2	115	<1	121	3	110	6	103	2	107	3	108	3

Table 5. (Cont'd.)

Species	Year	No./h	Sabine Length	No./h	Galveston Length	No./h	Port O'Connor Length	No./h	Port Aransas Length	No./h	Port Isabel Length	No./h	Coastwide Length	No./h			
Red drum	1985 ^a	ND ^b	0	0	<1	84	0	0	<1	42	<1	84	<1	84			
	1986	0	0	<1	948	0	0	0	<1	0	<1	520	<1	520			
	1987	0	0	<1	0	0	0	0	<1	0	<1	1,110	<1	1,110			
	1988	0	0	<1	1,110	0	0	0	<1	0	<1	61	<1	61			
	1989	0	0	<1	61	0	0	0	<1	0	<1	1,013	<1	1,013			
	1990	0	0	<1	0	0	0	0	<1	95	<1	95	<1	95			
	1991	0	0	<1	1,013	0	0	0	<1	0	<1	1,013	<1	1,013			
	1992	0	0	<1	0	0	0	0	<1	95	<1	95	<1	95			
	1993	0	0	<1	0	0	0	0	<1	0	<1	0	<1	0			
Red snapper	1985 ^a	ND ^b	0	0	<1	152	2	85	7	89	2	88	<1	88			
	1986	0	0	<1	68	1	88	1	122	<1	83	<1	100	<1	100		
	1987	0	0	<1	74	2	87	4	87	3	106	<1	109	<1	109		
	1988	0	0	<1	0	<1	94	3	105	2	90	2	88	1	88		
	1989	0	0	<1	0	0	9	80	2	105	2	106	1	106			
	1990	0	0	<1	0	0	2	79	6	77	2	106	2	84			
	1991	0	0	<1	0	0	2	79	6	77	2	106	2	84			
	1992	0	0	<1	0	0	2	79	6	77	2	106	2	84			
	1993	0	0	<1	126	1	76	2	77	3	98	1	88	<1	88		
Sand seatrout	1985 ^a	ND ^b	164	10	141	6	168	3	140	<1	221	5	150	3	154		
	1986	5	164	14	141	3	151	1	174	0	108	4	135	4	135		
	1987	7	131	6	133	5	134	2	162	<1	137	4	130	4	130		
	1988	3	148	5	114	11	129	1	184	2	123	18	122	18	122		
	1989	22	133	41	110	16	127	7	155	2	130	1	118	14	135		
	1990	50	136	8	126	7	139	2	146	12	129	1	153	12	135		
	1991	28	130	12	143	7	148	5	155	1	161	13	135	13	135		
	1992	41	132	11	138	6	148	15	166	10	112	2	121	16	124		
	1993	45	129	7	131	15	151	10	116	10	112	2	121	16	124		
Southern flounder	1985 ^a	ND ^b	0	<1	280	<1	280	<1	137	0	<1	199	<1	199			
	1986	1	162	<1	255	<1	184	<1	311	0	<1	173	<1	173			
	1987	<1	256	<1	197	0	<1	<1	179	<1	168	<1	191	<1	191		
	1988	<1	204	0	<1	<1	214	<1	225	0	<1	214	<1	214			
	1989	0	<1	0	<1	<1	210	<1	225	0	<1	239	<1	239			
	1990	<1	187	0	<1	<1	212	<1	298	0	<1	250	<1	250			
	1991	<1	286	<1	260	<1	194	<1	164	<1	164	<1	220	<1	220		
	1992	<1	143	<1	240	0	<1	<1	188	0	<1	418	<1	270			
	1993	<1	124	0	0	<1	284	<1	284	0	<1	201	<1	201			
Spanish mackerel	1985 ^a	ND ^b	200	0	0	0	0	0	0	0	0	0	0	0			
	1986	<1	93	<1	183	<1	183	<1	258	0	<1	203	<1	203			
	1987	<1	166	<1	178	<1	182	<1	110	<1	168	<1	180	<1	180		
	1988	<1	206	<1	206	<1	172	<1	175	<1	192	<1	182	<1	182		
	1989	<1	174	1	176	<1	176	<1	225	<1	192	<1	180	<1	180		
	1990	1	184	1	163	<1	163	<1	144	<1	134	<1	168	<1	168		
	1991	1	184	1	163	<1	163	<1	181	<1	164	<1	168	<1	168		
	1992	<1	158	<1	175	<1	175	<1	181	<1	164	<1	190	<1	190		
	1993	1	167	<1	188	0	<1	<1	237	0	<1	190	<1	190			
Spot	1985 ^a	ND ^b	3	124	8	128	7	124	21	141	1	142	11	136			
	1986	3	140	9	126	4	125	25	123	2	125	9	124	9	124		
	1987	5	115	7	27	116	23	125	22	129	<1	170	8	129	8	129	
	1988	4	120	25	108	18	124	23	128	23	122	3	110	12	123	12	123
	1989	6	123	17	121	102	125	48	121	4	112	4	112	4	112		
	1990	9	117	4	67	122	37	127	122	10	126	1	126	26	125		
	1991	18	127	12	126	119	14	126	126	19	126	14	126	9	125		
	1992	5	122	7	122	14	122	14	126	14	126	7	126	4	124		
	1993	7	122	14	122	14	122	14	126	14	126	14	126	14	124		

Table 5. (Cont'd.)

Species	Year	Sabine No./h Length	Galveston No./h Length	Port O'Connor No./h Length	Port Aransas No./h Length	Port Isabel No./h Length	Coastwide No./h Length
Spotted seatout							
1986	<1	163	<1	172	0	140	<1
1987	<1	178	0	0	0	0	<1
1988	0	<1	65	<1	0	0	<1
1989	<1	98	0	<1	0	0	<1
1990	<1	110	<1	160	<1	144	<1
1991	0	0	0	<1	0	0	<1
1992	<1	112	0	<1	160	0	<1
1993	0	0	0	<1	160	0	<1
Total finfishes	1985^a	ND^b	148	119	188	118	227
1986	159	122	207	118	215	123	292
1987	158	98	289	111	229	118	114
1988	153	120	273	104	379	114	80
1989	178	114	301	111	350	118	52
1990	477	121	355	113	464	138	354
1991	427	117	322	125	666	115	113
1992	524	115	499	116	523	111	458
1993	666	117	324	116	376	102	332
SEELFISHES	1985^a	ND^b	96	<1	105	105	127
Blue crab	1986	4	96	6	105	1	<1
	1987	3	96	1	112	1	144
	1988	2	85	<1	104	2	145
	1989	4	61	2	72	1	142
	1990	15	80	4	63	1	128
	1991	19	72	6	58	1	131
	1992	7	58	1	104	1	130
	1993	5	78	1	83	2	113
Brown shrimp	1986	ND ^b	10	107	7	103	7
	1987	7	104	13	99	6	141
	1988	15	102	24	104	9	105
	1989	33	103	50	96	24	113
	1990	34	101	10	108	56	103
	1991	12	90	2	102	12	140
	1992	9	91	20	103	4	95
	1993	23	100	21	97	13	105
Pink shrimp	1985 ^a	ND ^b	<1	120	<1	130	1
	1986	0	<1	124	2	110	4
	1987	0	0	0	1	114	5
	1988	<1	87	0	1	108	7
	1989	0	<1	105	1	103	7
	1990	0	<1	104	1	101	2
	1991	<1	101	<1	111	2	100
	1992	<1	88	<1	99	6	112
	1993	0	<1	104	4	102	5

Table 5. (Cont'd.)

Species	Year	Sabine		Galveston		Port O'Connor		Port Aransas		Port Isabel		Coastwide Length No./h
		No./h	Length	No./h	Length	No./h	Length	No./h	Length	No./h	Length	
White shrimp	1985 ^a	ND ^b	101	53	110	26	124	11	126	1	105	24
	1986	41	105	53	101	15	120	8	124	2	137	24
	1987	26	105	14	109	16	112	8	119	1	121	13
	1988	14	105	17	100	19	110	9	116	<1	133	12
	1989	21	102	25	106	22	108	14	113	1	122	12
	1990	18	104	11	115	15	118	6	136	2	136	10
	1991	28	105	10	117	30	106	6	127	1	122	15
	1992	51	98	31	108	11	112	10	118	1	145	21
	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		Aransas		Coastwide	
		No./h	Length	No./h	Length	No./h	Length	No./h	Length	No./h	Length
Spat	1984	491	ND	ND	ND	ND	ND	ND	ND	491	ND
	1985	891	ND	ND	ND	ND	ND	ND	ND	891	ND
	1986	1,010	764	499	499	551	551	770	770	1,382	1,382
	1987	1,054	654	66	4,269	4,269	1,712	1,712	1,202	1,202	1,202
	1988	1,440	938	439	1,864	1,864	3,071	3,071	1,880	1,880	1,880
	1989	1,322	2,019	1,289	1,117	1,117	1,611	1,611	1,685	1,685	1,685
	1990	2,147	718	894	268	410	82	410	1,022	1,487	1,487
	1991	1,458	454	268	122	0	0	0	1,440	1,440	1,440
	1992	3,083	139	139	139	139	139	139	139	139	139
	1993	3,194	139	139	139	139	139	139	139	139	139
Small	1984	1,705	47	ND	ND	ND	ND	ND	ND	1,705	47
	1985	2,096	54	ND	ND	ND	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	ND	ND	ND	447	91
	1985	674	88	ND	ND	ND	ND	ND	ND	674	88
	1986	617	88	212	92	444	92	191	86	438	89
	1987	310	91	167	91	259	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

^aSpat (5-25 mm), small (26-75 mm), market (≥ 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	No./ha	Length	No./ha	Length		
FINFISHES																			
Atlantic croaker	1987*	2	267	<1	306	<1	239	0	0	0	0	<1	292	1	267	<1	262		
	1988	2	264	<1	252	<1	260	0	0	0	0	<1	270	1	255	<1	255		
	1989	2	257	<1	263	<1	205	0	0	0	0	<1	230	1	259	<1	259		
	1990	1	260	<1	250	0	0	0	0	0	0	<1	230	1	256	<1	256		
	1991	2	257	<1	224	<1	251	<1	238	0	0	<1	264	1	270	<1	270		
	1992	<1	307	<1	233	<1	255	0	0	0	0	<1	290	1	270	<1	270		
	1993	1	255	0	0	<1	289	<1	286	1	290	<1	270	1	293	<1	293		
Black drum	1987*	1	344	<1	215	1	281	<1	249	<1	249	<1	236	1	253	<1	253		
	1988	1	240	<1	226	2	249	1	236	<1	236	<1	216	2	256	<1	256		
	1989	1	286	4	262	2	300	2	276	1	280	2	292	2	292	<1	292		
	1990	2	318	3	243	2	257	1	240	1	233	3	245	3	245	<1	245		
	1991	3	264	3	231	1	305	2	287	<1	340	2	286	2	286	<1	286		
	1992	1	258	3	254	1	303	1	340	1	394	1	339	1	339	<1	339		
	1993	1	334	2	303	1	354	1	340	1	0	<1	198	0	0	<1	198		
Gulf menhaden	1987*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	1988	0	158	1	166	<1	197	<1	197	<1	226	2	159	2	159	<1	159		
	1989	0	0	<1	158	<1	63	0	0	<1	234	<1	69	<1	69	<1	69		
	1990	0	0	<1	214	0	0	<1	237	<1	234	<1	232	<1	232	<1	232		
	1991	0	0	<1	211	<1	187	<1	213	0	0	<1	206	<1	206	<1	206		
	1992	0	0	2	197	0	0	<1	0	<1	0	<1	197	1	197	<1	197		
	1993	0	0	<1	209	<1	161	0	0	<1	345	<1	338	<1	338	<1	338		
Red drum	1987*	0	0	<1	460	<1	324	<1	528	<1	305	<1	702	<1	459	<1	459		
	1988	<1	552	<1	501	<1	370	<1	547	<1	352	<1	485	<1	485	<1	485		
	1989	0	0	<1	321	<1	320	<1	391	<1	344	<1	356	<1	384	<1	384		
	1990	0	0	<1	436	<1	496	<1	317	<1	318	<1	375	2	320	<1	320		
	1991	4	321	<1	337	<1	415	<1	395	<1	365	1	417	<1	417	<1	417		
	1992	<1	436	<1	496	<1	498	1	330	<1	330	<1	397	<1	397	<1	397		
	1993	<1	438	<1	337	<1	415	<1	395	<1	365	1	397	<1	397	<1	397		
Sand seatrout	1987*	1	328	0	0	<1	276	<1	298	0	0	<1	286	<1	328	<1	328		
	1988	<1	322	<1	353	0	0	<1	287	0	0	<1	287	<1	297	<1	297		
	1989	0	0	<1	291	<1	284	<1	319	0	0	<1	307	<1	307	<1	307		
	1990	<1	290	<1	251	<1	301	0	0	<1	360	0	0	<1	301	<1	301		
	1991	0	0	<1	301	<1	301	0	0	<1	360	0	0	<1	360	<1	360		
	1992	0	0	<1	361	<1	361	<1	413	0	0	<1	372	<1	353	<1	353		
	1993	0	0	<1	416	<1	445	<1	292	<1	288	0	0	0	366	<1	366		
Sheepshead	1987*	0	0	<1	291	<1	261	<1	288	0	0	<1	370	<1	370	<1	370		
	1988	0	0	0	375	<1	312	<1	322	<1	298	<1	434	<1	434	<1	434		
	1989	0	0	<1	270	<1	328	0	0	<1	460	<1	319	<1	319	<1	319		
	1990	0	0	<1	458	<1	327	<1	307	<1	441	<1	231	<1	231	<1	231		
	1991	0	0	<1	361	<1	413	0	0	<1	372	<1	279	<1	279	<1	279		
	1992	0	0	<1	465	<1	338	<1	324	0	0	<1	303	<1	303	<1	303		
	1993	0	0	<1	381	1	338	<1	324	0	0	<1	347	<1	347	<1	347		
Southern flounder	1987*	0	0	1	250	0	0	<1	313	0	0	<1	434	<1	434	<1	434		
	1988	<1	279	<1	261	<1	203	<1	207	<1	270	0	0	<1	370	<1	370		
	1989	<1	375	<1	276	0	0	<1	193	<1	193	<1	217	<1	217	<1	217		
	1990	<1	264	1	220	<1	226	<1	265	0	0	<1	441	<1	314	<1	314		
	1991	<1	308	1	267	<1	307	<1	309	<1	192	<1	382	<1	382	<1	382		
	1992	<1	465	<1	270	<1	307	<1	309	<1	177	<1	303	<1	303	<1	303		
	1993	<1	381	1	338	<1	324	0	0	<1	392	<1	392	<1	392	<1	392		
Spanish mackerel	1987*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	1988	0	0	0	0	<1	606	0	0	0	0	<1	606	0	0	<1	606		
	1989	0	0	<1	0	<1	0	<1	0	<1	0	<1	0	0	<1	0	<1		

Table 7. (Cont'd.)

Species	Year	Gulf-17 No./ha	Gulf-18 Length	No./ha	Gulf-19 Length	No./ha	Gulf-20 Length	No./ha	Gulf-21 Length	No./ha	Gulfwide Length	No./ha
Spanish mackerel (Cont'd.)	1990	0	<1	264	<1	315	<1	477	<1	521	<1	486
	1991	0	<1	0	<1	353	0	0	<1	518	<1	303
	1992	0	<1	415	<1	54	0	0	<1	135	<1	209
	1993	0	<1			143	0	0	<1			
Spot	1987*	2	244	2	248	<1	248	2	214	0	1	235
	1988	3	245	1	235	<1	225	1	243	<1	1	242
	1989	<1	210	1	230	<1	277	<1	230	2	236	<1
	1990	<1	319	<1	224	<1	246	1	212	1	238	<1
	1991	<1	238	1	231	<1	210	1	217	<1	230	<1
	1992	<1	231	1	235	<1	227	1	241	<1	237	<1
	1993	1	229	<1	228	<1	231	2	229	2	257	<1
											236	<1
											240	<1
Spotted seatrout	1987*	<1	408	<1	403	<1	397	<1	516	0	<1	417
	1988	3	410	2	431	1	397	<1	440	<1	469	2
	1989	1	419	3	431	1	419	1	428	<1	445	1
	1990	2	440	2	417	<1	431	<1	457	1	426	1
	1991	3	406	2	441	1	421	1	399	<1	473	1
	1992	<1	432	2	428	2	423	1	431	<1	424	1
	1993	1	430	1	432	1	447	1	420	<1	499	1
Striped mullet	1987*	13	393	5	358	1	351	5	343	17	349	7
	1988	19	362	32	342	7	344	14	356	5	346	14
	1989	39	370	28	344	3	334	1	360	8	341	15
	1990	46	350	52	336	5	333	6	349	6	376	15
	1991	23	345	65	338	34	320	25	326	13	326	32
	1992	34	343	51	341	42	341	25	355	10	344	34
	1993	22	350	24	341	14	334	10	357	13	355	16
Total finfishes	1987*	23	327	9	305	6	266	10	295	18	332	12
	1988	54	322	44	326	43	141	40	189	11	343	41
	1989	52	341	48	288	20	218	39	100	15	298	34
	1990	59	337	63	314	16	309	18	269	13	323	32
	1991	50	322	80	309	45	293	46	284	20	324	48
	1992	37	338	65	316	55	322	35	316	13	334	44
	1993	30	338	32	324	21	326	22	283	23	314	25
SHELLFISHES												
Blue crab	1987*	<1	118	<1	159	0	137	<1	138	0	<1	129
	1988	2	117	<1	143	<1	140	0	<1	126	1	125
	1989	2	137	2	135	<1	136	<1	129	<1	153	1
	1990	5	139	7	136	<1	129	<1	132	<1	128	2
	1991	7	143	20	137	5	127	1	123	1	131	6
	1992	3	133	3	126	2	142	<1	88	1	132	2
	1993	1	133	3	132	1	136	<1	132	<1	127	1

*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		Gulf-22		Coastwide		
		No./ha	Length	No./ha	Length											
FINFISHES																
Atlantic croaker	1987 ^a	0	37	0	62	0	64	0	64	0	64	0	64	0	7	39
	1988	30	32	1	84	0	<1	22	0	2	157	1	32	1	32	
	1989	3	171	1	91	1	150	5	0	0	13	1	127	1	127	
	1990	1	31	0	113	0	61	0	0	2	25	1	119	1	119	
	1991	50	31	0	104	<1	168	0	0	0	182	<1	132	<1	132	
	1992	0	111	1	104	0	114	0	0	0	0	0	0	2	170	
	1993	1	193	4	113	0	142	1	193	0	0	0	0	1	70	
Black drum	1987 ^a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1988	1	111	1	104	<1	168	0	0	0	182	<1	132	<1	132	
	1989	2	170	0	104	0	114	0	0	0	0	0	0	2	170	
	1990	4	154	6	142	1	142	1	193	0	0	0	0	1	143	
	1991	3	151	2	151	0	151	0	0	0	0	0	0	1	162	
	1992	4	159	1	179	0	179	0	0	0	0	0	0	1	160	
	1993	2	122	0	0	0	0	0	0	0	0	0	0	1	122	
Gulf menhaden	1987 ^a	0	0	0	0	4	48	0	0	0	0	0	0	1	48	
	1988	2	93	22	87	5	87	28	37	0	0	0	0	10	63	
	1989	2	86	6	76	9	100	0	2	74	5	81	5	92		
	1990	3	59	0	59	5	57	1	83	17	5	5	1	68		
	1991	0	0	3	46	2	71	0	0	0	0	1	62	1	62	
	1992	1	91	9	72	4	50	0	0	0	0	3	3	3	63	
	1993	13	39	9	87	7	70	0	0	0	0	7	59	0	59	
King mackerel	1987 ^a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1993	0	0	0	0	<1	45	0	0	0	0	0	0	<1	45	
Pinfish	1987 ^a	0	0	1	100	1	85	0	0	0	0	103	105	<1	85	
	1988	0	0	0	0	<1	122	0	0	0	0	0	105	12	105	
	1989	0	0	0	0	<1	69	<1	97	2	133	1	69	<1	69	
	1990	0	0	0	0	1	97	1	52	27	67	1	101	1	101	
	1991	0	0	2	98	26	71	0	55	21	62	1	70	1	70	
	1992	1	68	1	125	0	127	0	0	6	79	2	77	1	77	
	1993	1	66	5	89	1	127	0	0	0	0	6	79	2	88	
Sand seatrout	1987 ^a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1988	0	12	48	1	61	1	61	0	0	0	0	0	2	50	
	1989	11	44	0	0	<1	124	0	0	0	0	0	3	44	3	
	1990	0	0	0	0	<1	124	0	0	0	0	0	<1	124	<1	
	1991	5	31	2	40	6	86	0	0	0	0	0	3	64	3	
	1992	2	34	<1	42	0	0	0	0	0	0	0	1	35	1	
	1993	74	65	0	<1	96	0	0	0	0	0	0	17	65	17	
Southern flounder	1987 ^a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1988	0	0	5	107	1	126	0	0	0	0	0	0	1	112	
	1989	1	114	10	91	0	183	0	0	0	0	0	0	2	95	
	1990	0	0	2	107	1	183	0	0	0	0	0	0	1	151	
	1991	0	0	0	0	0	0	0	0	0	0	0	0	<1	102	
	1992	1	134	11	120	0	4	90	2	162	3	116	2	116	2	
	1993	4	135	11	110	0	0	0	0	0	0	0	0	1	119	
Spanish mackerel	1987 ^a	41	50	0	59	2	53	0	0	0	0	2	110	9	50	
	1988	0	0	1	59	0	0	0	0	0	0	0	0	1	64	

Table 8. (Cont'd.)

Species	Year	Gulf-17 No./ha Length	Gulf-18 No./ha Length	Gulf-19 No./ha Length	Gulf-20 No./ha Length	Gulf-21 No./ha Length	Coastwide No./ha Length
Spanish mackerel (Cont'd.)	1989	0	6	37	0	8	60
	1990	0	1	25	2	0	0
	1991	0	<1	40	0	0	<1
	1992	0	0	0	1	55	40
	1993	0	0	1	54	25	55
						0	3
Spot	1987 ^a	0	0	0	0	52	51
	1988	0	1	80	0	2	34
	1989	0	0	1	78	0	0
	1990	1	182	0	<1	66	<1
	1991	0	<1	182	0	64	119
	1992	1	109	0	<1	26	122
	1993	0	0	9	0	0	3
Striped mullet	1987 ^a	7	26	0	2	100	87
	1988	50	97	36	22	10	81
	1989	253	86	42	15	31	81
	1990	49	66	86	79	1	81
	1991	18	173	141	130	93	81
	1992	11	70	10	138	1	81
	1993	5	160	5	62	4	81
Total finfishes	1987 ^a	344	66	449	60	475	66
	1988	1,046	65	6,271	96	2,351	58
	1989	2,113	95	2,794	75	3,590	1,702
	1990	1,168	76	1,125	71	1,292	9,527
	1991	1,140	84	1,625	83	4,006	55
	1992	1,112	84	1,029	65	1,090	3,075
	1993	1,545	82	4,223	51	2,267	64
						0	4
SHELLFISHES							
Blue crab	1987 ^a	0	0	0	0	0	0
	1988	14	101	1	25	4	3
	1989	33	95	65	34	2	22
	1990	11	85	52	90	1	<1
	1991	42	107	72	69	11	5
	1992	30	92	49	84	11	17
	1993	20	104	26	85	9	17
Brown shrimp	1987 ^a	0	0	0	0	0	0
	1988	7	52	0	0	0	0
	1989	7	56	0	3	76	0
	1990	0	47	76	0	0	0
	1991	9	44	1	<1	58	0
	1992	27	66	10	52	0	0
	1993	13	59	1	39	1	0
White shrimp	1987 ^a	11	78	16	71	69	0
	1988	35	64	6	77	2	29
	1989	38	58	4	70	61	10
	1990	8	75	9	57	20	65
	1991	664	53	4	70	0	16
	1992	685	75	12	86	1	61
	1993	49	57	7	61	0	33

^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		Corpus		Upper Laguna		Lower Laguna		Coastwide	
		No./h Length																	
FINFISHES																			
Atlantic croaker	1992	88	133	306	125	38	109	130	96	1,181	83	684	82	26	114	27	119	45	241
Black drum	1992	1	234	<1	250	1	180	0	0	0	0	0	0	0	<1	240	5	134	97
Gafftop-sail catfish	1992	32	110	11	153	2	151	8	129	81	135	44	130	<1	176	0	<1	264	130
Gulf menhaden	1992	1	120	5	93	5	89	13	113	19	90	25	102	1	138	<1	119	1	122
Pinfish	1992	0	117	2	142	1	121	6	106	5	95	31	113	206	105	57	119	18	112
Red drum	1992	0	0	<1	81	0	0	0	0	0	0	0	0	0	0	0	0	1	101
Sand seatrout	1992	9	113	17	127	4	134	4	110	32	114	12	133	4	149	1	138	11	126
Sheepshead	1992	<1	160	<1	155	<1	132	<1	137	<1	96	<1	96	<1	121	<1	119	1	94
Southern flounder	1992	1	256	5	239	1	220	3	209	1	211	1	193	<1	198	<1	197	19	108
Spot	1992	3	134	149	124	10	122	44	110	150	102	55	103	38	111	12	148	112	113
Spotted seatrout	1992	<1	184	3	144	2	145	<1	165	3	115	5	120	<1	158	2	204	2	230
Striped mullet	1992	<1	136	3	183	1	159	4	169	2	154	2	138	1	125	<1	217	3	123
Total finfish	1992	291	131	585	125	83	115	322	98	1,670	94	972	94	333	111	157	119	200	461
SHELLFISHES																			
Blue crab	1992	40	74	67	73	64	78	41	62	222	55	238	57	14	94	66	95	26	77
Brown shrimp	1992	44	79	209	79	21	84	19	84	269	81	340	82	34	83	92	99	33	81
Pink shrimp	1992	0	81	74	84	<1	91	<1	87	2	74	40	73	18	86	48	104	48	83
White shrimp	1992	35	100	77	90	8	82	5	92	28	85	42	91	5	94	4	104	50	85
White shrimp	1993	75	85	28	91	62	89	50	86	26	85	30	88	3	107	12	102	15	88

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

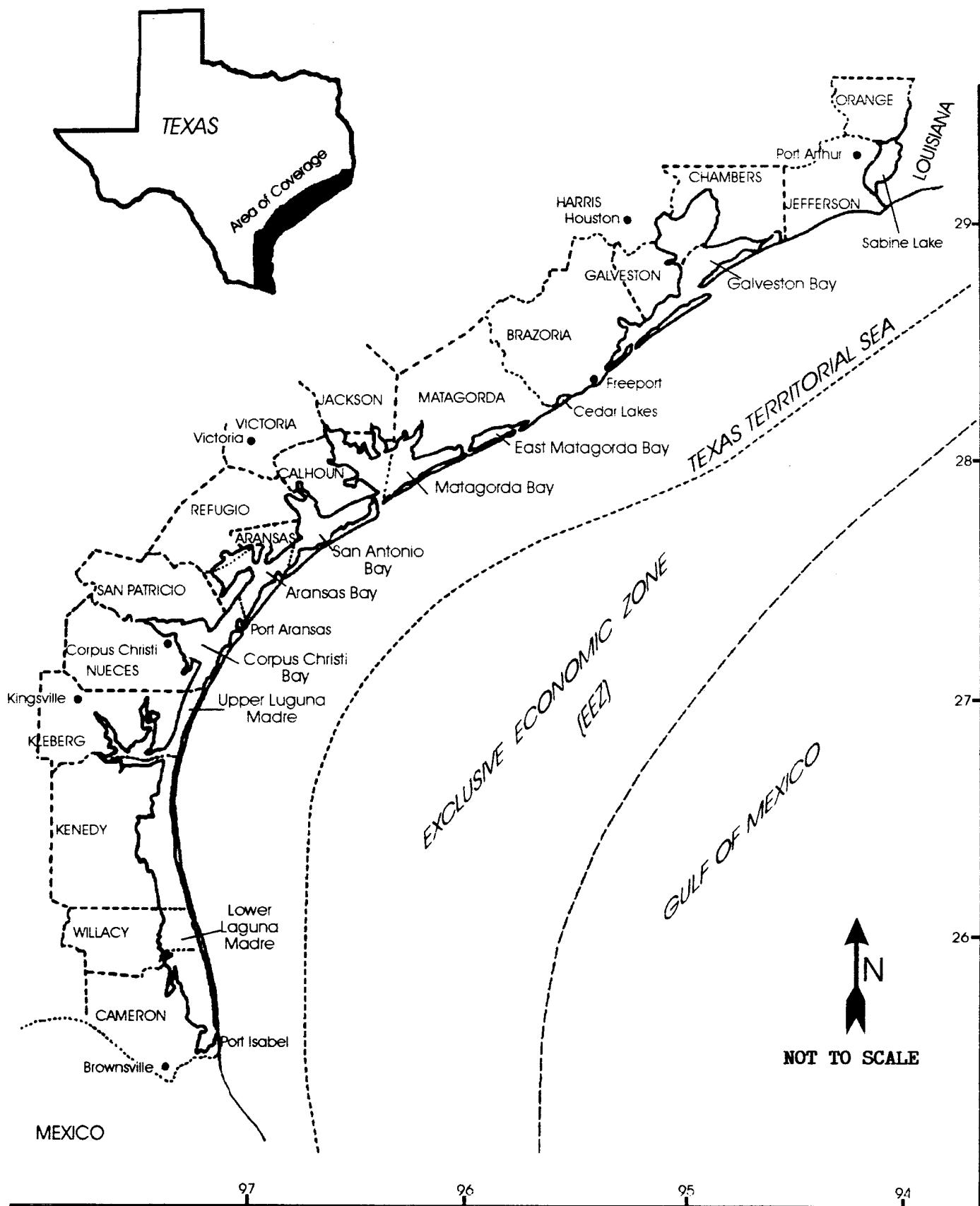


Figure 2. Spring gill net mean catch rates (No./h \pm 1SE) for red drum, black drum, spotted seatrout and Atlantic croaker during 1976-93.

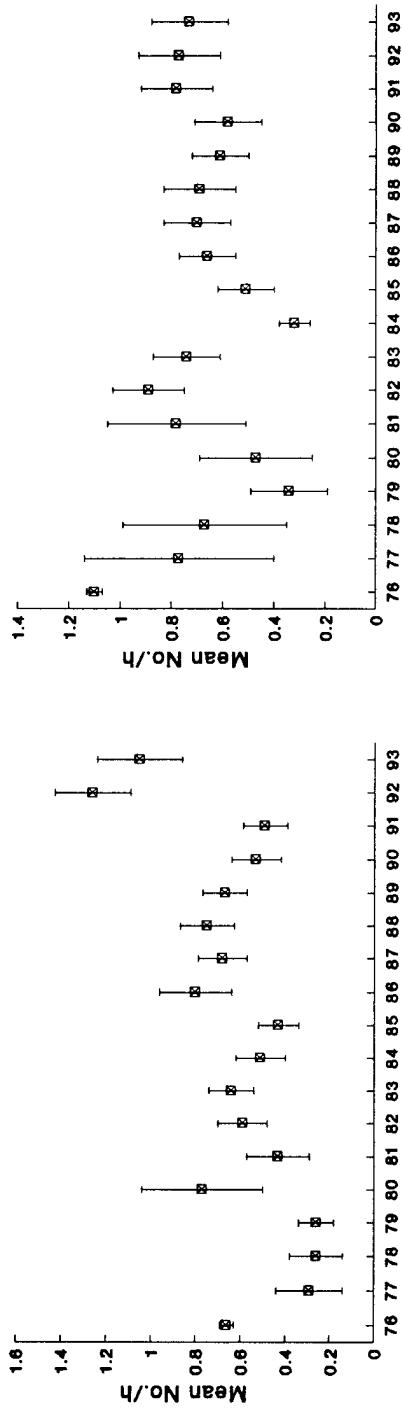
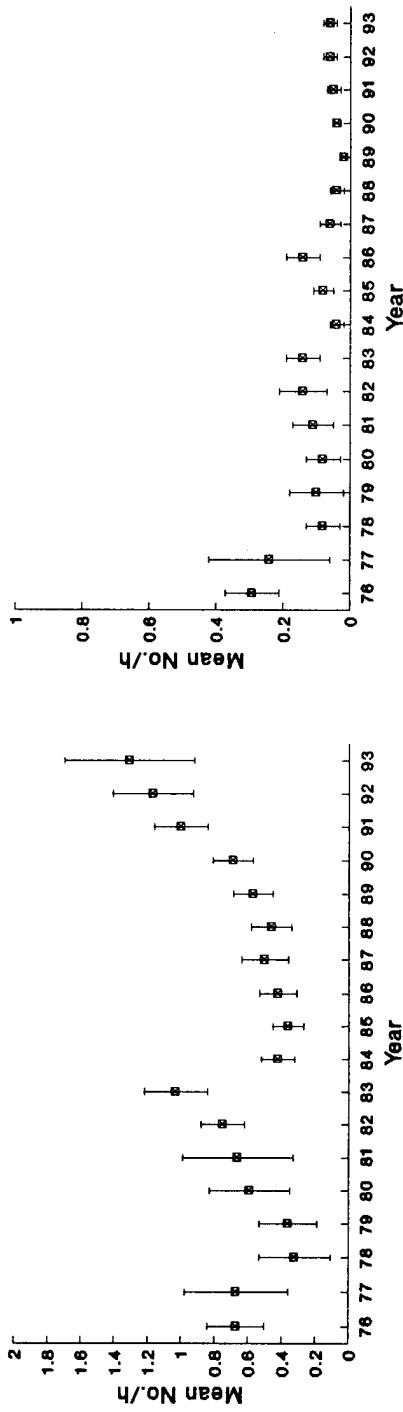
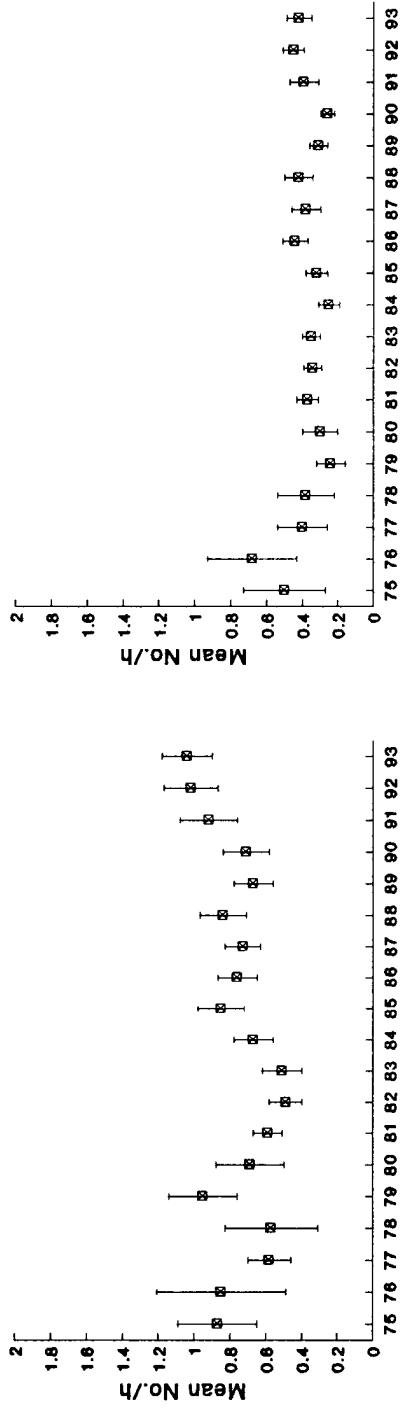
Spotted Seatrout**Red Drum****Atlantic Croaker****Black Drum**

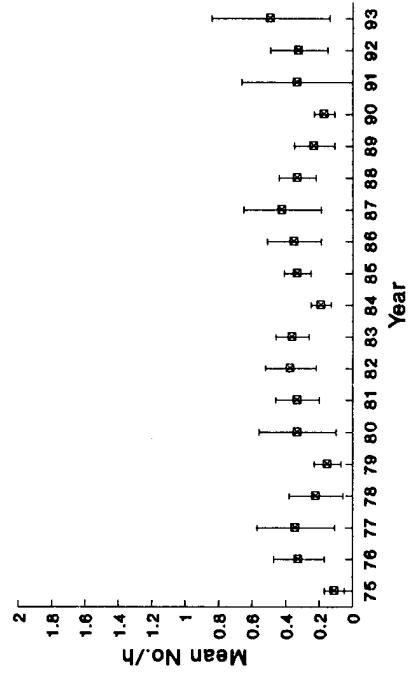
Figure 3. Fall gill net mean catch rates (No./h \pm 1SE) for red drum, black drum, spotted seatrout and Atlantic croaker during 1975-93.

Red Drum



Spotted Seatrout

Atlantic Croaker



Black Drum

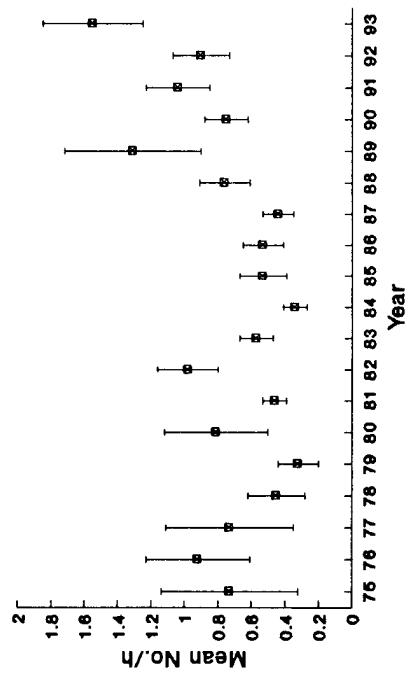


Figure 4. Spring gill net mean total lengths (mm \pm 1SE) for red drum, black drum, spotted seatrout and Atlantic croaker during 1976-93.

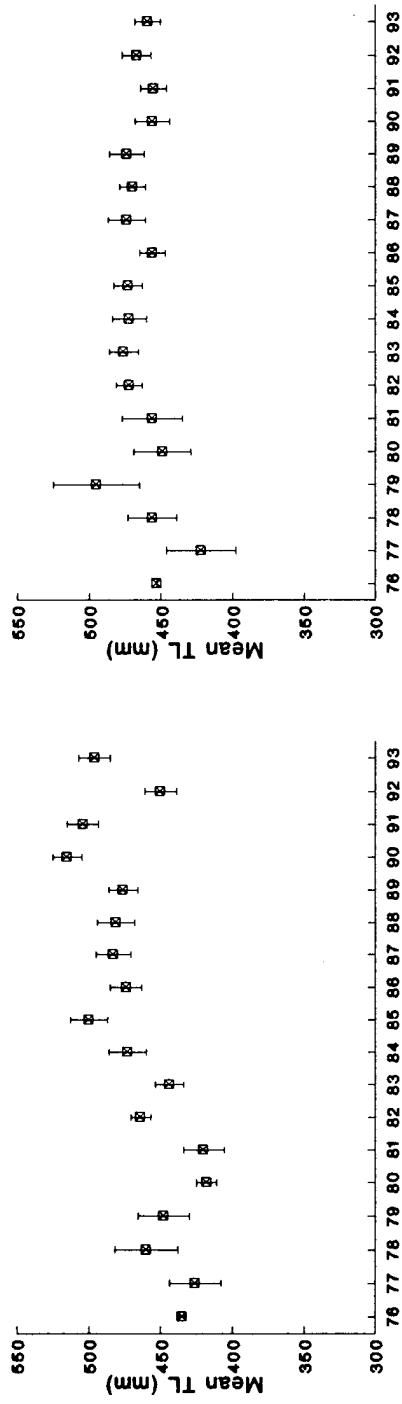
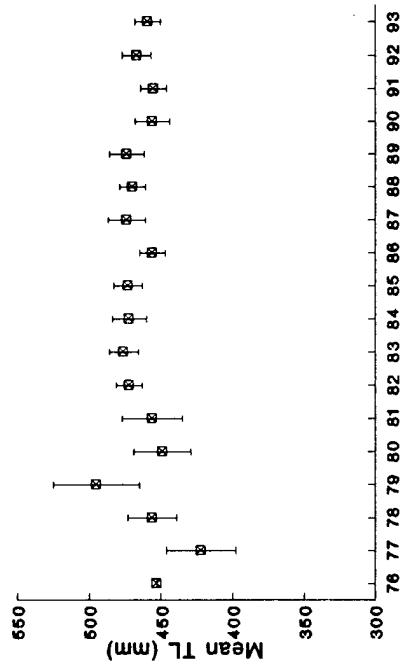
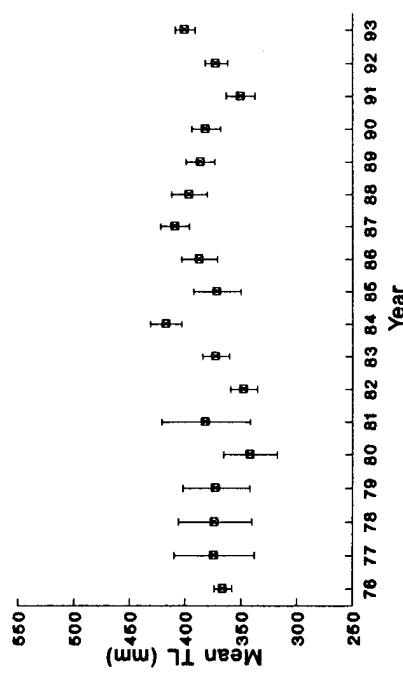
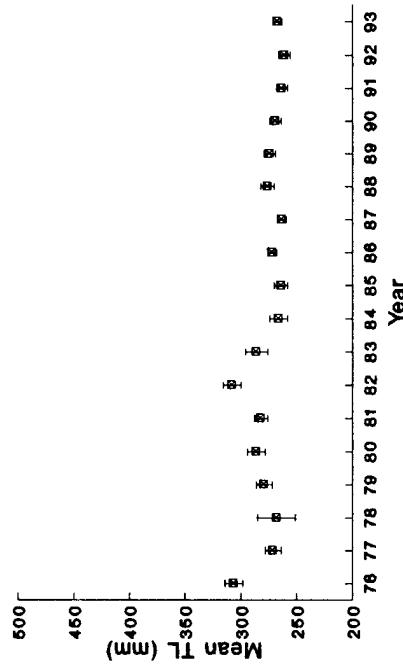
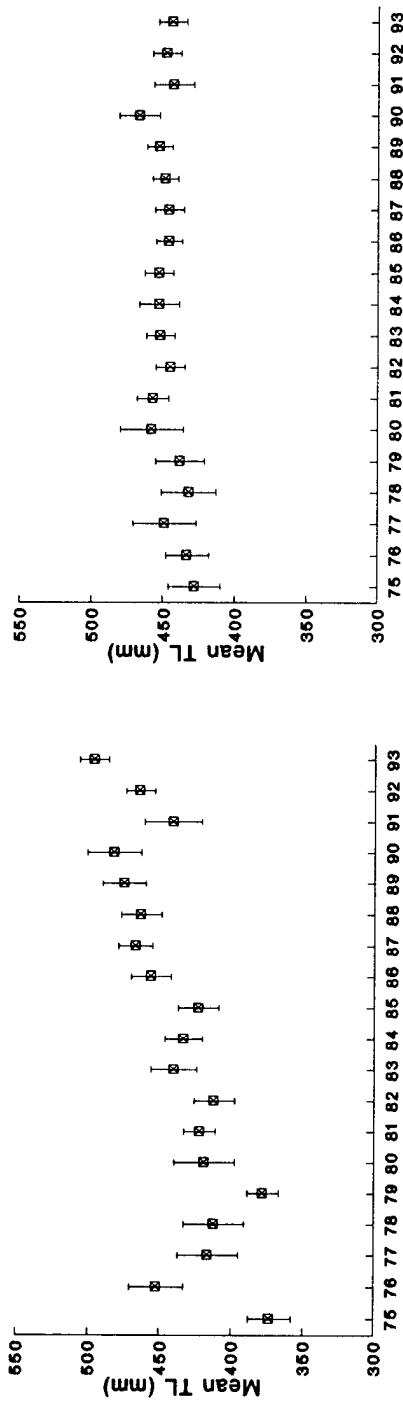
Red Drum**Spotted Seatrout****Black Drum****Atlantic Croaker**

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

Red Drum



Spotted Seatrout

Black Drum

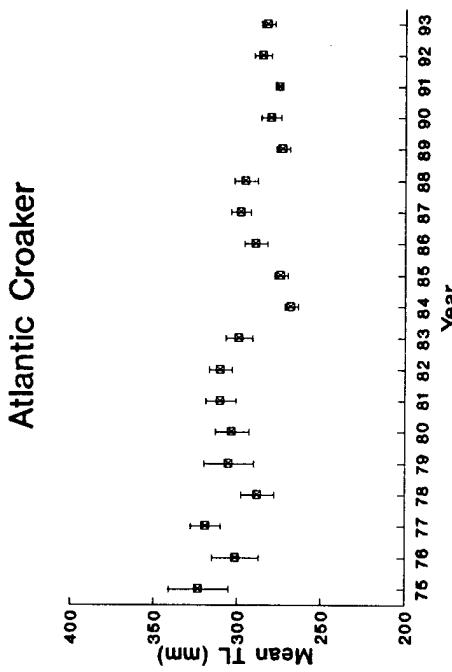
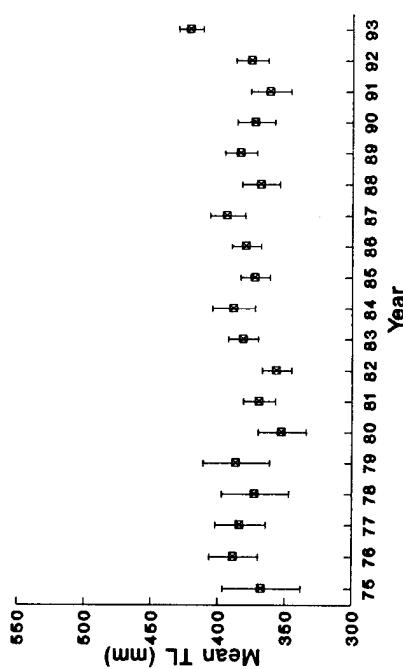


Figure 6. Seasonal bag seine mean catch rates (No./ha) for juvenile red drum (Nov-Mar), black drum (Jun-Jul), spotted seatrout (Jul-Nov) and Atlantic croaker (Feb-May) during 1978-93. Red drum 35-75 mm, spotted seatrout 20-75 mm, black drum 35-110 mm and Atlantic croaker 30-85 mm are considered to be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

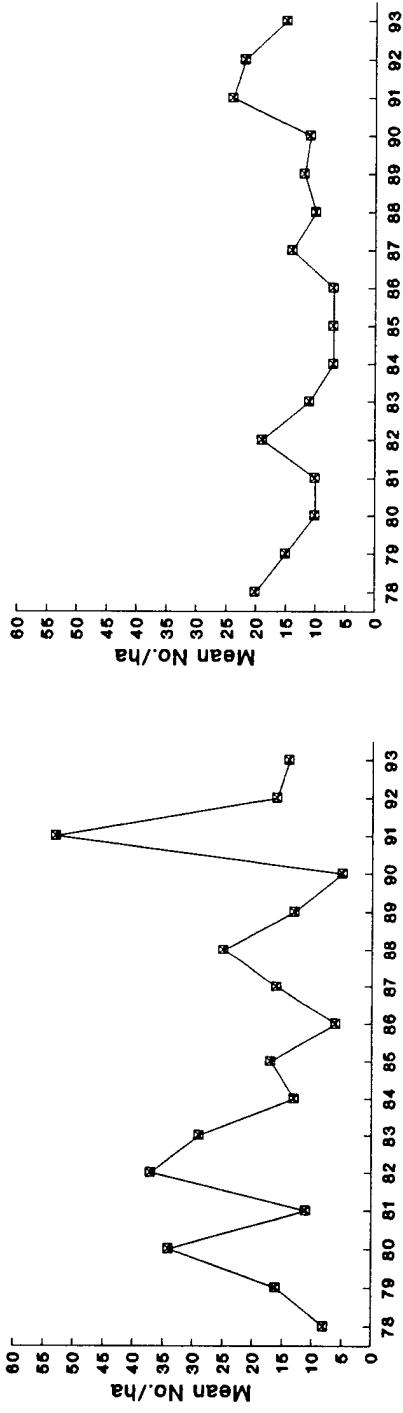
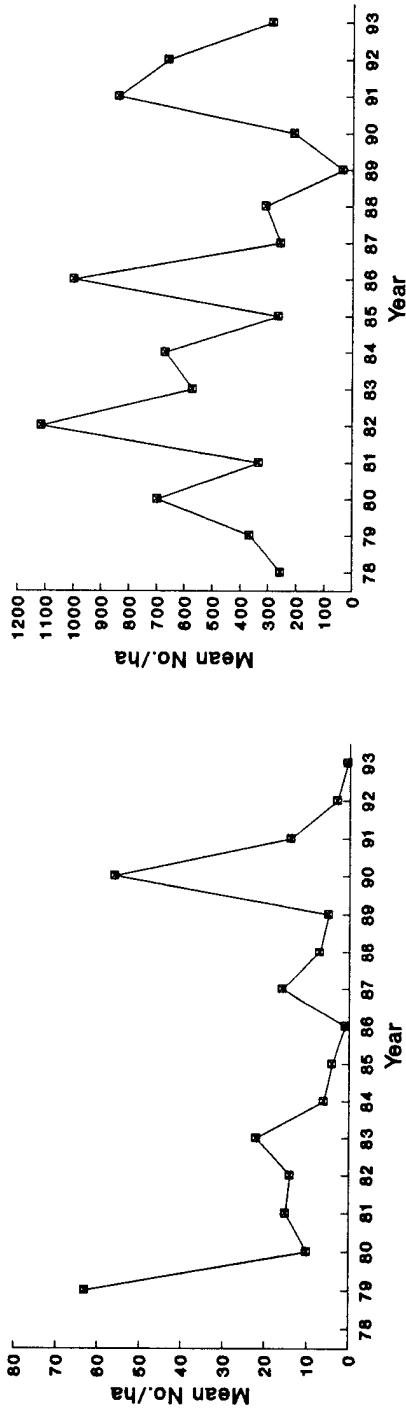
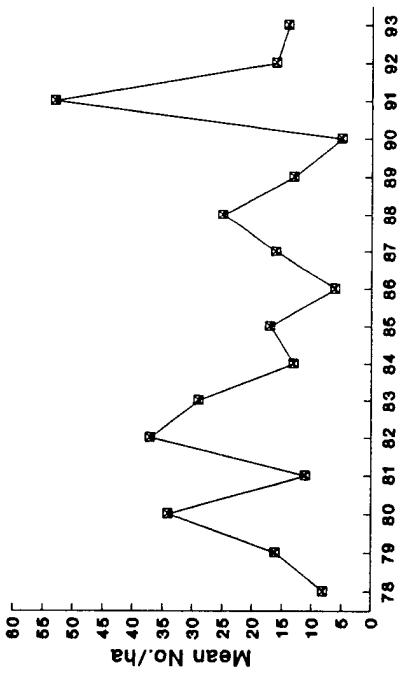
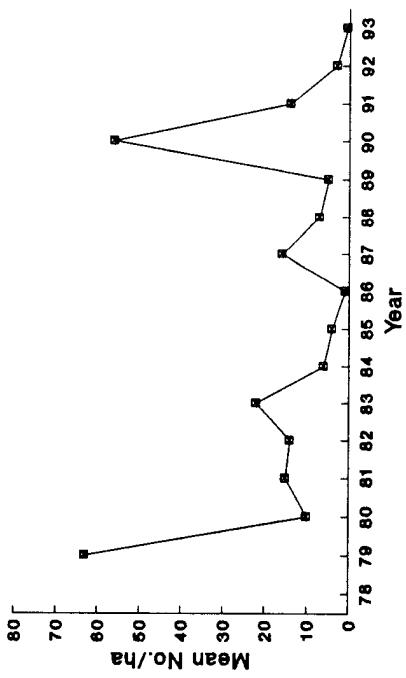
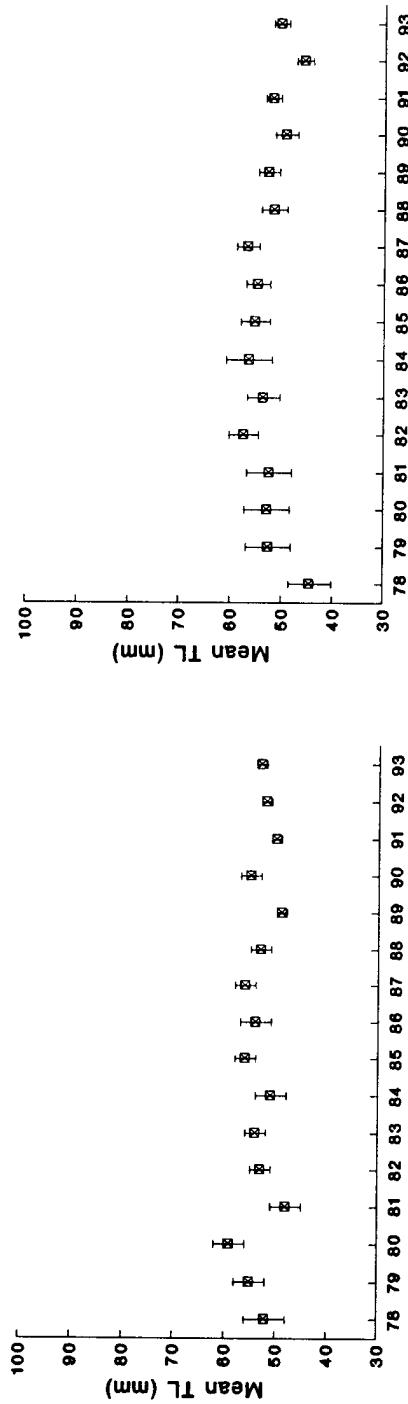
Spotted Seatrout**Atlantic Croaker****Red Drum****Black Drum**

Figure 7. Seasonal bag seine mean total lengths (mm \pm 1SE) 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.

Red Drum
Spotted Seatrout



Black Drum
Atlantic Croaker

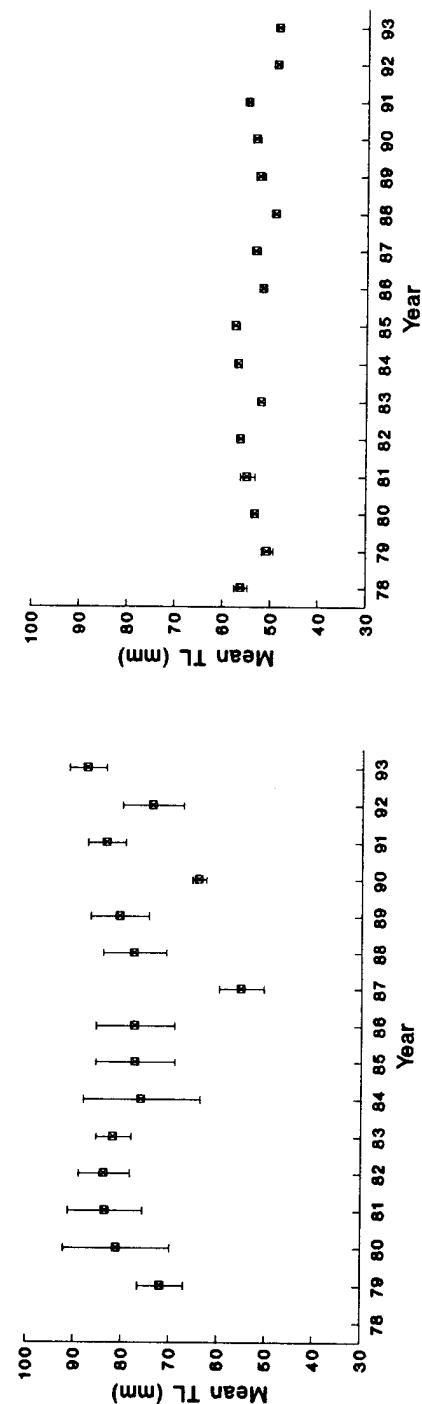


Figure 8. Seasonal bag seine mean catch rates (No./ha) for juvenile brown shrimp (Apr-Jul), white shrimp (Jul-Nov) and blue crab (Mar-Jun) during 1978-93. Brown and white shrimp 33-82 mm and blue crab 13-42 mm are considered to be young-of-the-year.

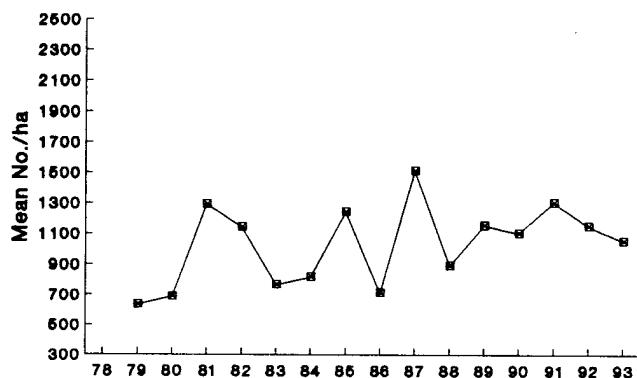
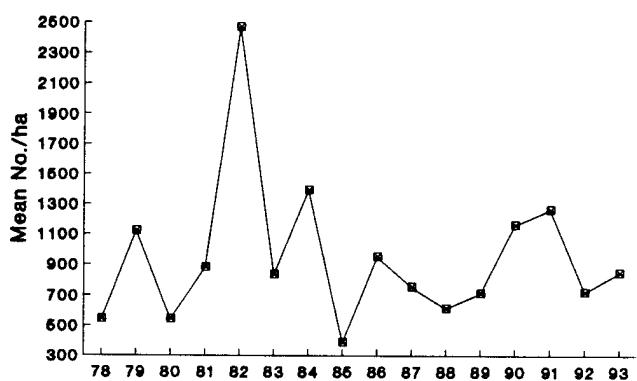
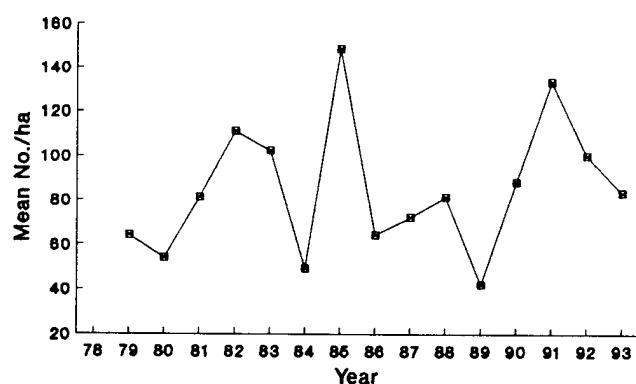
Brown Shrimp**White Shrimp****Blue Crab**

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.

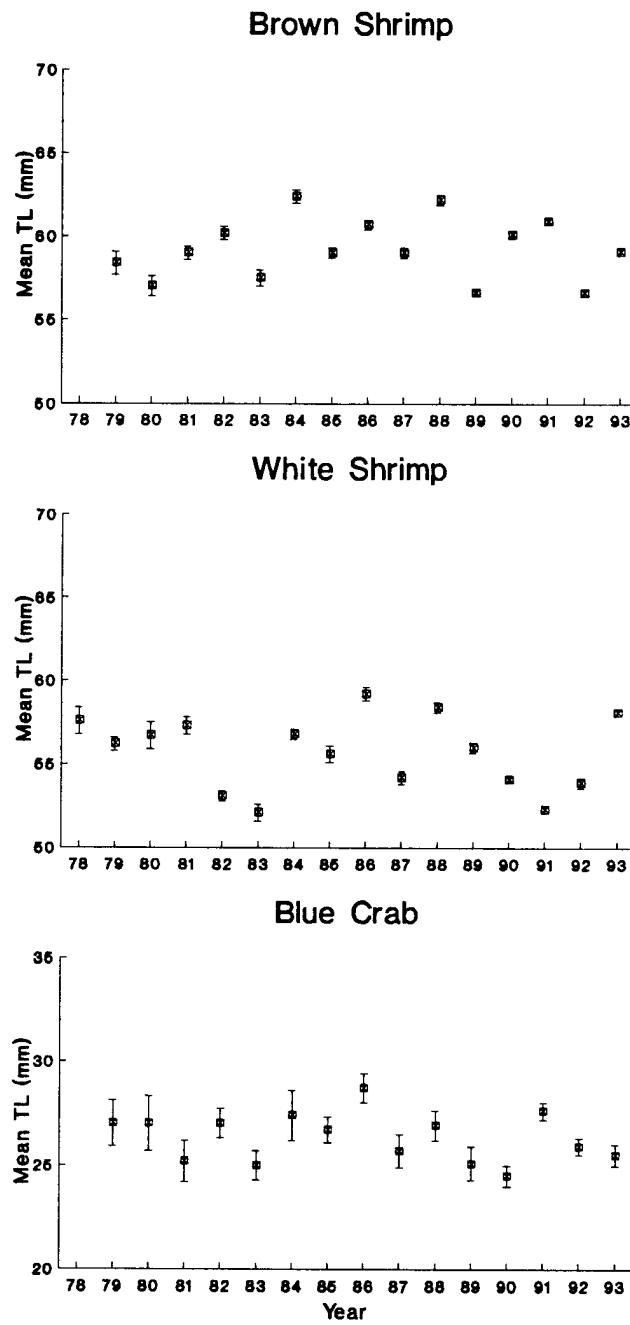


Figure 10. Annual bay trawl catch rates (No./h \pm 1SE) for brown shrimp, white shrimp, blue crab and Atlantic croaker during 1982-93.

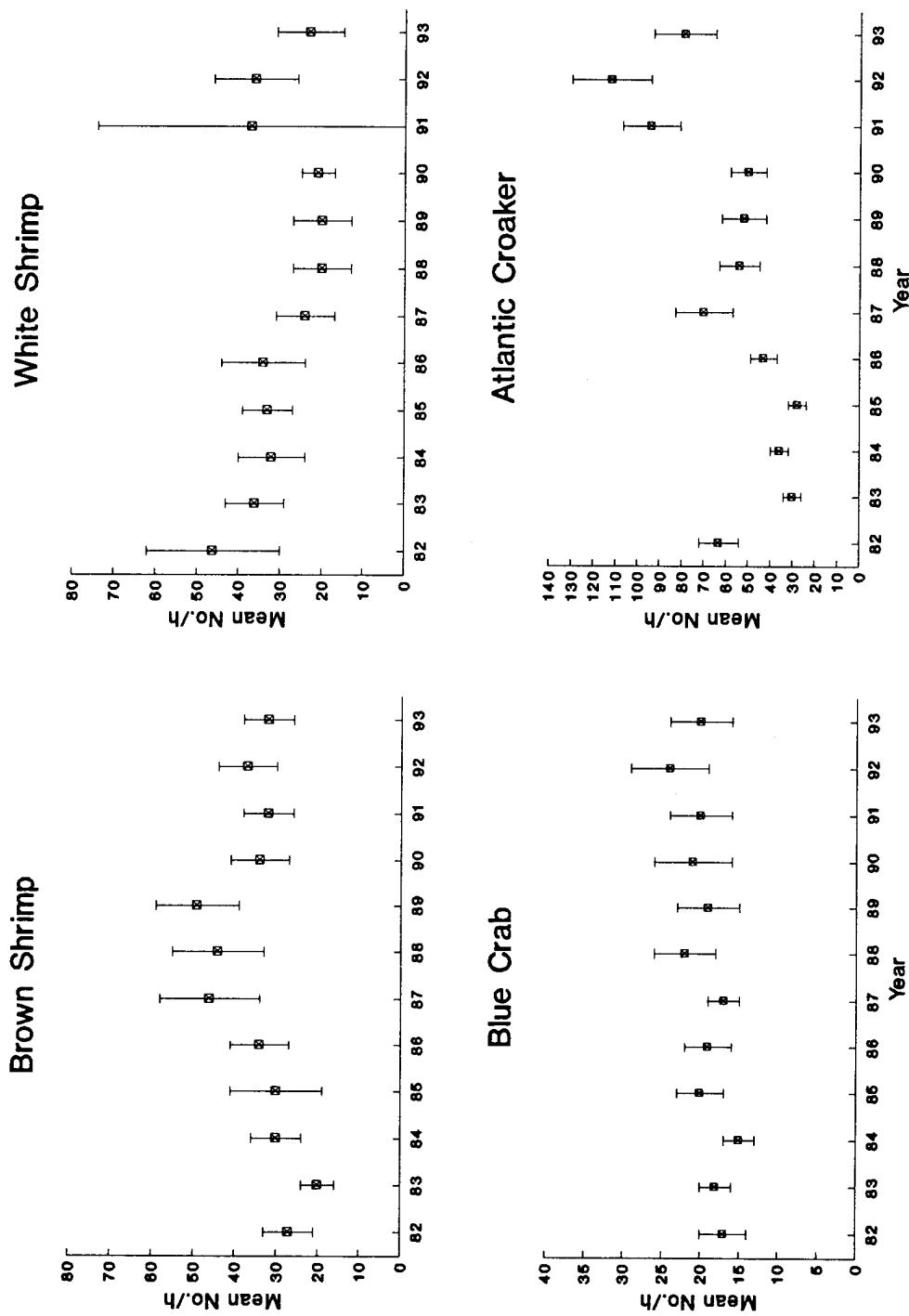


Figure 11. Annual bay trawl mean total lengths (mm \pm 1SE) for brown shrimp, white shrimp, blue crab and Atlantic croaker during 1982-93.

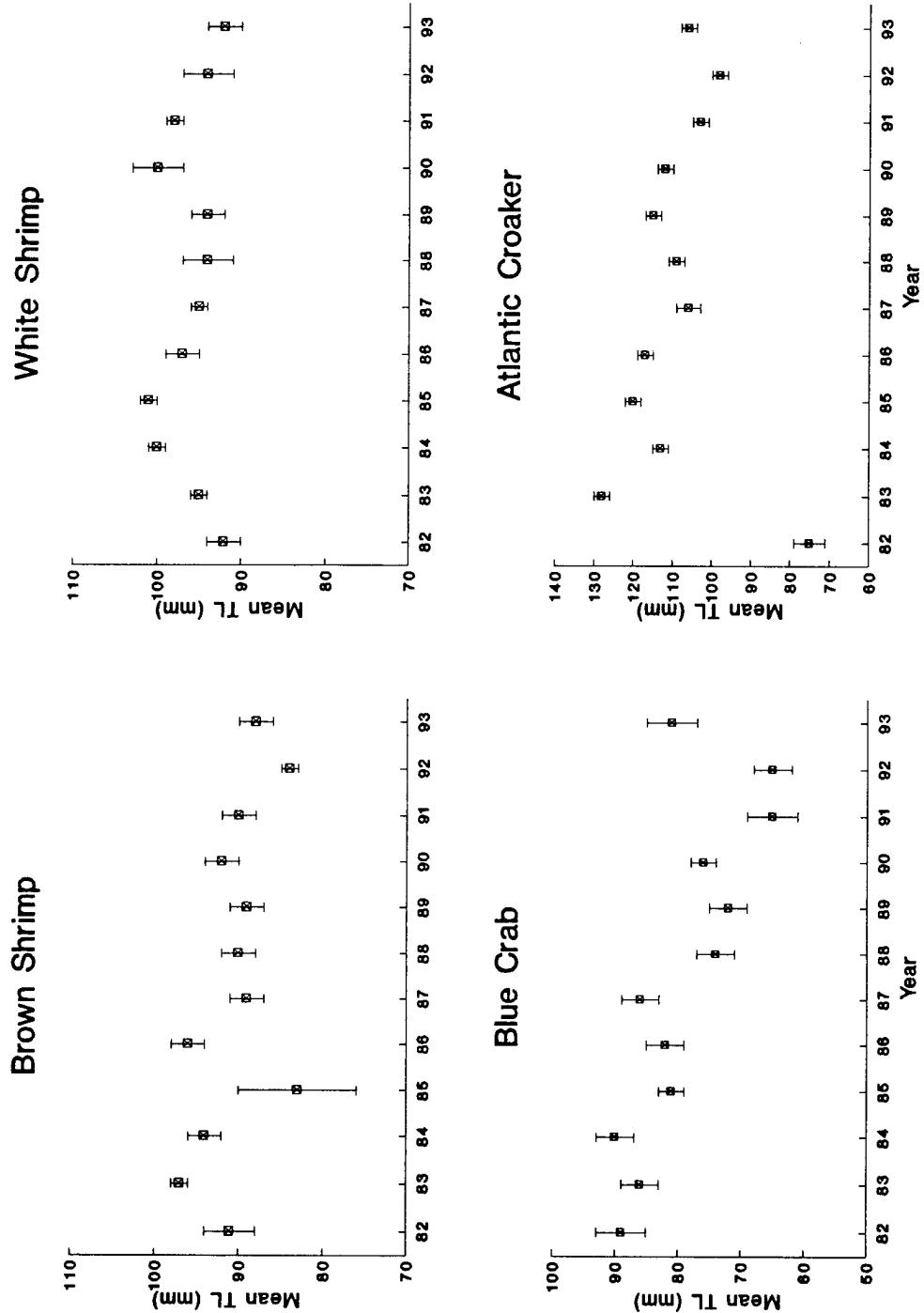
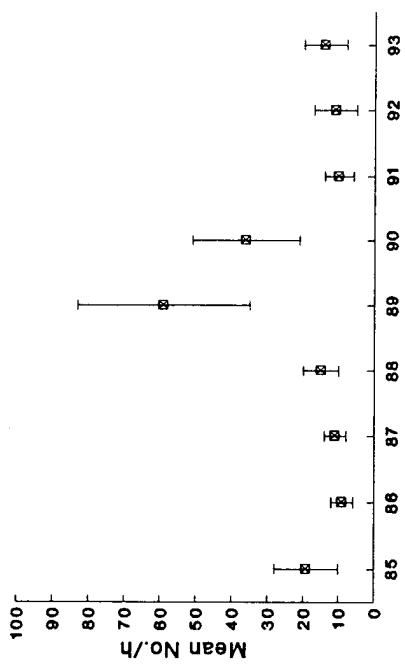
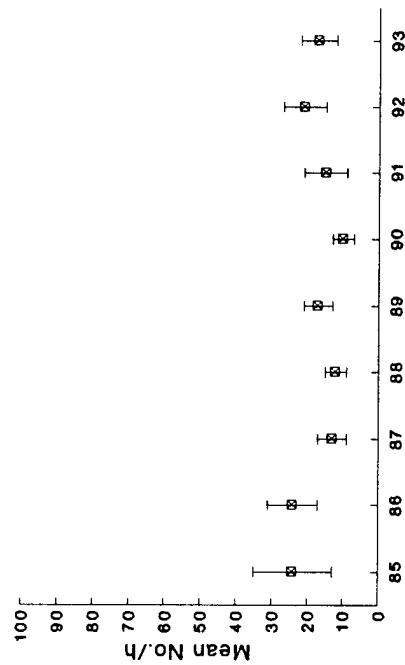


Figure 12. Annual gulf trawl mean catch rates (No./h \pm 1SE) for brown shrimp, white shrimp, blue crab and Atlantic croaker during 1982-93.

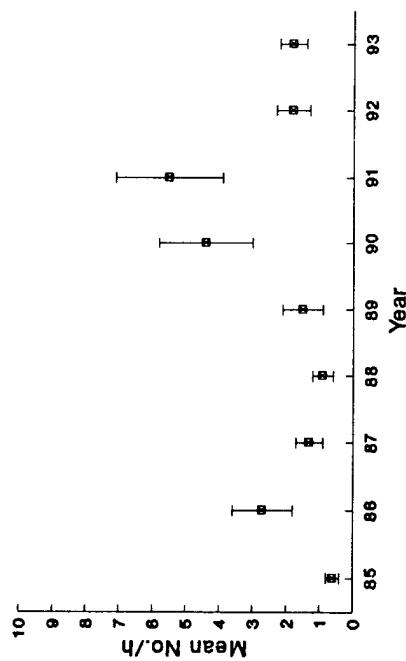
Brown Shrimp



White Shrimp



Blue Crab



Atlantic Croaker

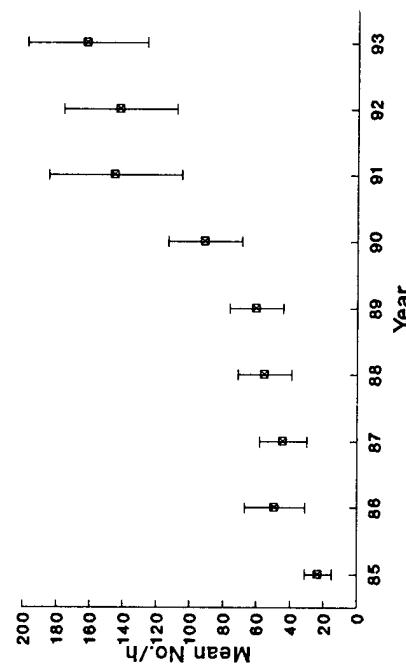


Figure 13. Annual gulf trawl mean total lengths (mm \pm 1SE) for brown shrimp, white shrimp, blue crab and Atlantic croaker during 1982-93.

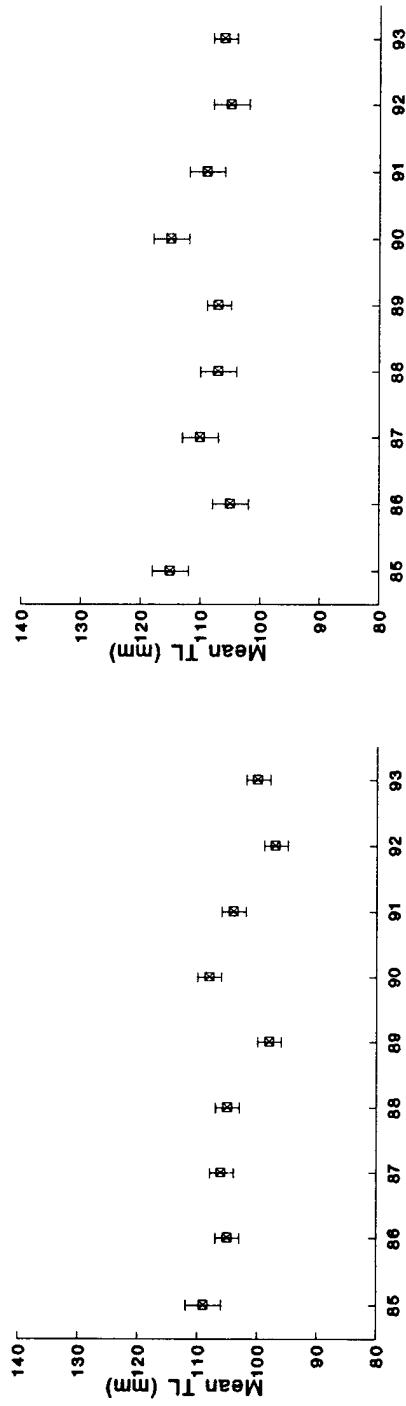
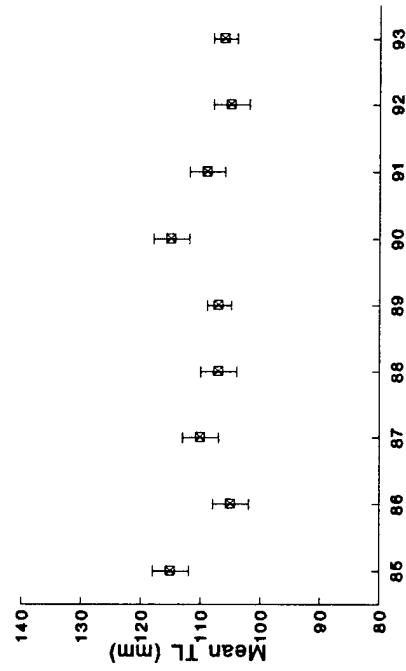
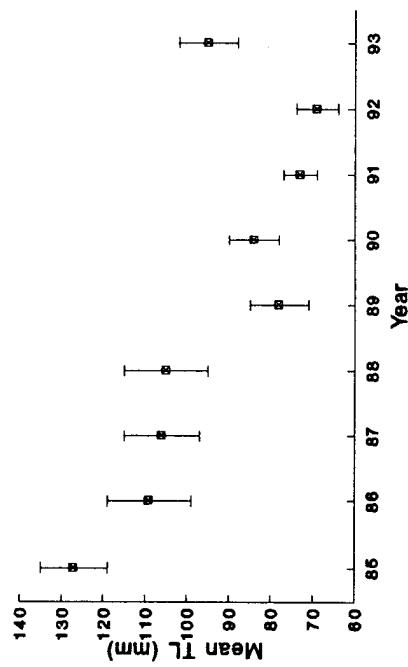
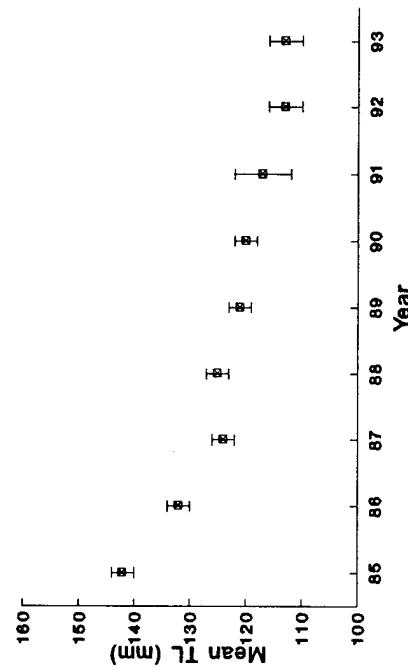
Brown Shrimp**White Shrimp****Blue Crab****Atlantic Croaker**

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.

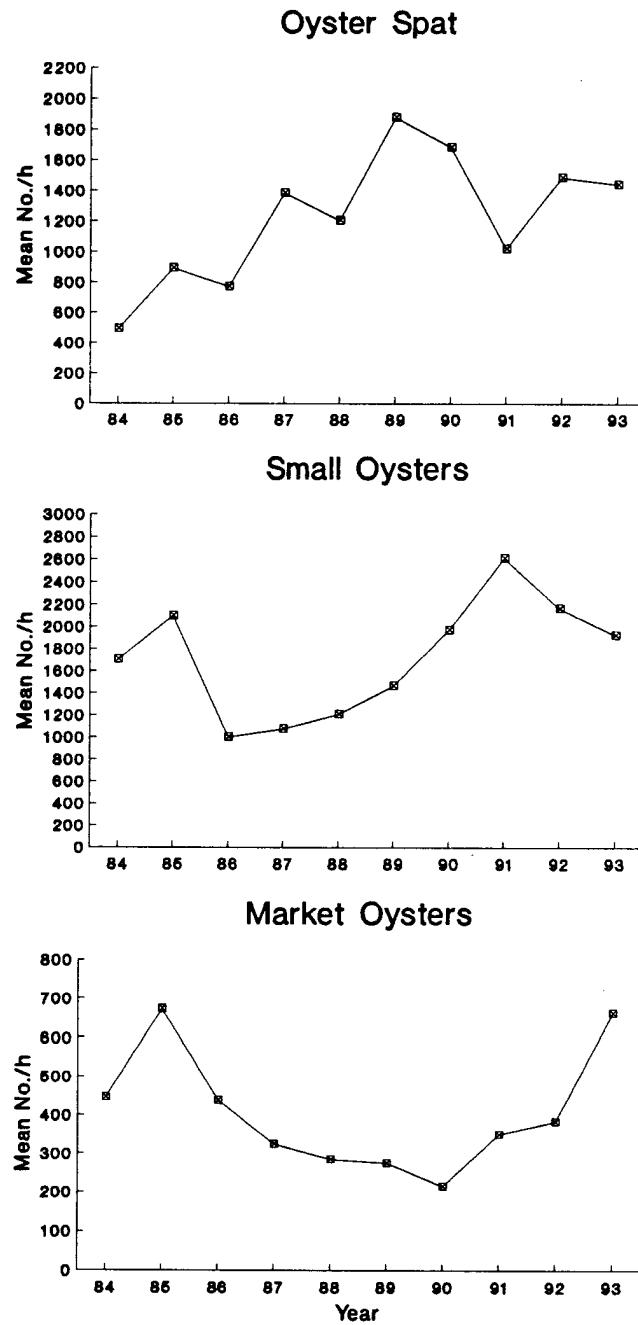
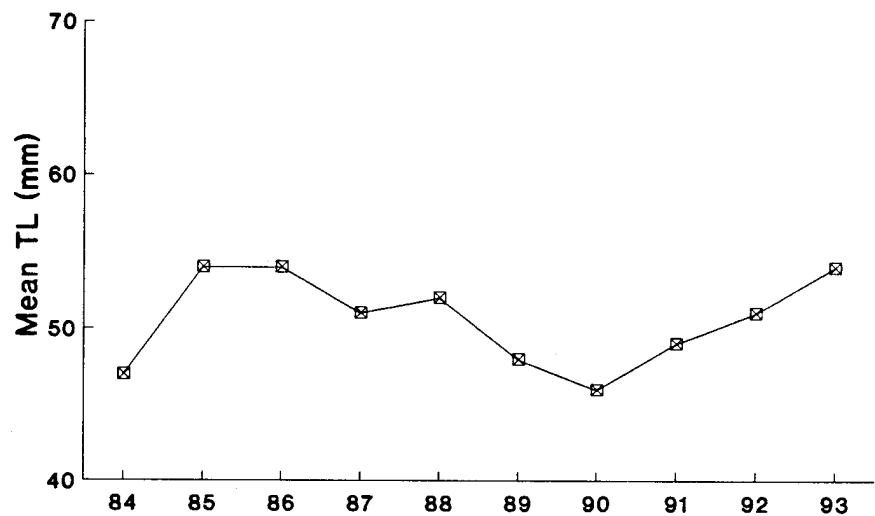
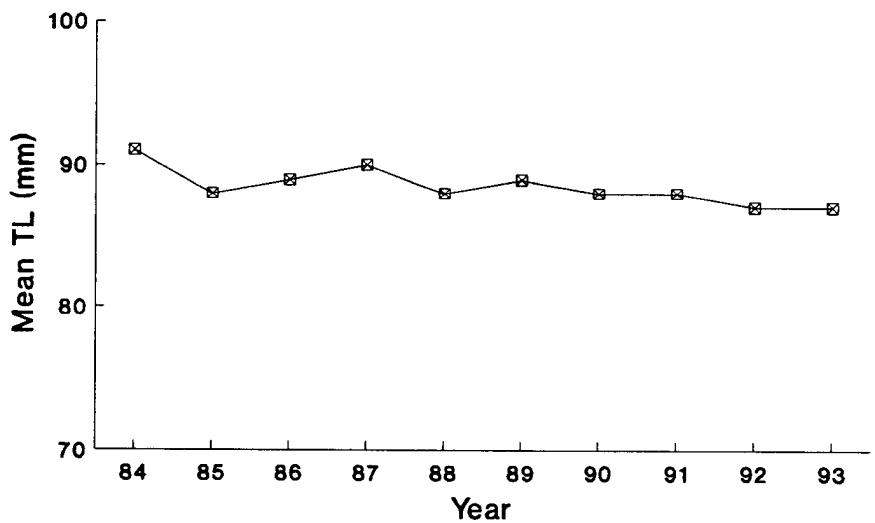


Figure 15. Annual mean total lengths (mm) for small and market Eastern oysters during 1984-93.

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.					
	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.					
LCWW 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.					
OYSTER REEF DREDGE	Jan. 1986-1991.	Jan. 1984-Present.	Not used.	Jan. 1986-Present.	Jan. 1986-Present.	Jan. 1986-1991.	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).</p> <p>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	Trawls have been systematically used in 5 gulf areas of Texas Territorial Seas since January 1986. Methods have not changed since the program began.
BAY TRAWLS	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.
ICWW TRAWLS	This program was initiated in 1992.

Table A.3. (Cont'd.)

BEACH SEINE	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.
BEACH BAG SEINE	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.
BAY BAG SEINE	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.

Table A.3. (Cont'd.)

OYSTER REEF DREDGE	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.
NON-REEF DREDGE	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.

Table A.4. Number of samples collected during routine monitoring, by bay, seasons/gear and year.

Table A.4. (Cont'd.)

	Sabine Lake	Galveston	East Matagorda	Matagorda	San Antonio	Aransas	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	7	8	8	7	59
	1979	0	18	9	17	17	16	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

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

	Galveston	Matagorda	San Antonio	Aransas	Coastwide
Oyster Reef Dredge	1984	240	0	0	240
	1985	959	0	0	959
	1986	672	312	312	1,968
	1987	672	312	312	1,968
	1988	672	312	312	1,968
	1989	672	312	312	1,968
	1990	672	312	312	1,968
	1991	672	312	312	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	1987	9	15	25	21	12	82
Seine	1988	28	56	101	67	42	294
	1989	29	55	91	74	42	291
	1990	30	54	98	70	42	294
	1991	26	58	97	71	42	294
	1992	27	57	84	42	42	252
	1993	28	56	84	42	42	252
Beach Seine	1987	9	15	26	22	12	84
	1988	28	56	100	68	42	294
	1989	29	55	91	74	42	291
	1990	30	54	98	70	42	294
	1991	26	58	97	71	42	294
	1992	27	57	84	42	42	252
	1993	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	1985	0	80	80	176	80
	1986	112	192	192	192	192
	1987	192	192	192	192	192
	1988	192	192	192	192	192
	1989	192	192	192	184	184
	1990	192	192	192	189	189
	1991	192	192	192	192	192
	1992	192	192	184	192	192
	1993	192	192	192	192	192

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 driftage	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	13.8		
Upper Laguna Madre	222.3	1,534	55.1		
Lower Laguna Madre	252.1	1,153	46.6		
Total	1,970.4	28,992	337.9		
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.

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 heudelotii</u>	Dotterel filefish
<u>Aluterus schoepfii</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 cryos</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>Centropristes oxyurus</u>	Bank sea bass
<u>Centropristes philadelphica</u>	Rock sea bass
<u>Chaetodipterus faber</u>	Atlantic spadefish
<u>Chaetodon ocellatus</u>	Spotfin butterflyfish
<u>Chasmodes bosquianus</u>	Striped blenny
<u>Chiloglanis 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>Dibranchus 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 intortus</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 broussonneti</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>Hyleurochilus 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 peninsulae</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>Ogcoccephalus nasutus</u>	Shortnose batfish
<u>Ogcoccephalus pantostictus</u>	Spotted batfish
<u>Ogcoccephalus parvus</u>	Roughback batfish
<u>Ogcoccephalus radiatus</u>	Polka-dot batfish
<u>Ogcoccephalus</u> sp.	(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 holbrooki</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 alboguttata</u>	Gulf flounder
<u>Paralichthys lethostigma</u>	Southern flounder
<u>Paralichthys</u> sp.	(Flounder-unidentified)
<u>Paralichthys squamilentus</u>	Broad flounder
<u>Parasudis truculenta</u>	Longnose greeneye
<u>Peprius alepidotus</u>	Harvestfish
<u>Peprius burti</u>	Gulf butterfish
<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 pectorodon</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>Serranilucus 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>Sphyraena lewini</u>	Scalloped hammerhead
<u>Sphyraena mokarran</u>	Great hammerhead
<u>Sphyraena tiburo</u>	Bonnethead
<u>Sphyraena 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>Syphurus civitatus</u>	Offshore tonguefish
<u>Syphurus diomedianus</u>	Spottedfin tonguefish
<u>Syphurus parvus</u>	Pygmy tonguefish
<u>Syphurus plagiusa</u>	Blackcheek tonguefish
<u>Syphurus 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 texanianum</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 (<i>Sargassum</i> crab)
<u>Callinectes marginatus</u>	Blue crab
<u>Callinectes sapidus</u>	Lesser blue crab
<u>Callinectes similis</u>	Common nutmeg
<u>Cancellaria reticulata</u>	Cancellate cantharus
<u>Cantharus cancellarius</u>	Roughwrist soft crab
<u>Chasmocarcinus mississippiensis</u>	Cross-barred venus
<u>Chione cancellata</u>	Clench venus
<u>Chione clenchii</u>	Lady-in-waiting venus
<u>Chione intapurpurea</u>	Sea wasp
<u>Chiropsalmus quadrumanus</u>	Sea nettle
<u>Chrysaora quinquecirrha</u>	Thinstripe hermit
<u>Clibanarius vittatus</u>	Eastern oyster
<u>Crassostrea virginica</u>	Convex slippersnail
<u>Crepidula convexa</u>	Common Atlantic slippersnail
<u>Crepidula fornicate</u>	Eastern white slippersnail
<u>Crepidula plana</u>	Thin cyclinella
<u>Cyclinella tenuis</u>	

Table A.9. (Contd.)

Scientific Name	Common Name
Invertebrates (Contd.)	
<u>Cyrtopleura costata</u>	Angelwing
<u>Dardanus fucusus</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 lilium lilium</u>	Banded tulip
<u>Glypturus acanthochirius</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>Macrocallysta 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>Metoporhaphis 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>Simnia laena 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 chydaea</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 rocksail
<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.1. Mean surface salinity (‰) at sampled gill net sites by bay system during spring and fall, 1975-93. ND = no data.

Year	Sabine	Lake	Galveston	East	Matacorda	Matagorda	San	Corpus	Upper	Lower	Coastwide
	Spring	Fall	Spring	Fall	Spring	Fall	Antonio	Christi	Laguna Madre	Laguna Madre	Spring Fall
1975	ND	ND	13.9	ND	22.2	ND	17.6	ND	20.0	ND	25.7
1976	ND	ND	19.6	ND	20.1	0.0	18.8	ND	35.5	ND	20.5
1977	ND	ND	23.2	14.2	18.6	19.2	14.3	17.9	14.9	32.2	12.5
1978	ND	ND	21.3	20.8	18.4	19.2	15.6	26.0	19.1	30.5	18.2
1979	ND	ND	13.3	14.0	11.6	11.8	11.1	9.6	12.5	26.5	24.5
1980	ND	ND	11.3	22.6	17.0	24.1	14.3	7.5	12.3	18.2	20.4
1981	ND	ND	25.8	20.5	26.8	17.5	23.4	20.8	18.2	23.4	16.1
1982	ND	ND	12.1	20.3	24.1	12.4	23.0	17.3	26.9	25.1	21.2
1983	ND	ND	14.8	11.4	17.5	13.4	20.1	12.7	19.5	21.6	27.8
1984	ND	ND	21.4	19.0	23.1	15.8	23.8	27.4	29.6	22.1	24.0
1985	ND	ND	18.0	22.0	23.3	14.7	23.5	11.0	23.3	22.4	18.4
1986	11.7	13.1	15.0	20.9	25.3	14.1	23.9	22.3	21.9	22.3	26.1
1987	8.2	14.3	19.7	21.5	15.8	12.3	16.1	12.3	16.1	17.4	27.0
1988	7.8	12.1	18.3	21.8	24.9	27.3	25.4	23.8	21.3	32.8	23.3
1989	5.5	8.7	15.9	14.8	26.0	26.3	28.4	26.5	29.9	34.2	30.4
1990	2.0	10.4	12.4	19.3	19.2	27.8	23.7	23.5	24.3	27.0	27.9
1991	0.2	5.4	9.4	17.4	11.7	19.4	11.2	19.5	16.3	21.0	18.3
1992	2.0	12.1	10.4	22.4	12.1	23.4	5.7	23.1	16.3	31.2	23.4
1993	2.1	8.3	12.0	21.2	11.4	26.0	10.8	24.5	17.5	20.9	11.0

Table B.2. Mean surface water temperature (°C) at sampled gill net sites by bay system during spring and fall, 1975-93. ND = no data.

Year	Sabine	Lake	Galveston	East	Matacorda	Matagorda	San	Corpus	Upper	Lower	Coastwide
	Spring	Fall	Spring	Fall	Spring	Fall	Antonio	Christi	Laguna Madre	Laguna Madre	Spring Fall
1975	ND	ND	20.7	ND	21.2	ND	22.4	ND	17.4	ND	23.0
1976	ND	ND	30.0	18.2	ND	14.5	ND	24.6	ND	24.0	ND
1977	ND	ND	24.9	20.6	25.0	21.3	25.2	25.6	22.7	25.5	29.0
1978	ND	ND	26.5	21.5	25.6	24.1	24.1	26.3	24.7	26.4	22.4
1979	ND	ND	25.9	24.4	27.4	23.4	27.3	24.2	26.8	27.3	24.5
1980	ND	ND	27.1	25.3	27.3	23.1	26.0	26.8	24.6	27.0	26.3
1981	ND	ND	26.1	24.6	26.9	25.1	26.0	27.4	24.7	27.2	25.5
1982	ND	ND	25.7	25.3	25.8	25.9	25.7	25.6	24.1	26.9	26.3
1983	ND	ND	26.7	25.3	25.8	25.9	25.0	25.6	26.2	27.3	24.8
1984	ND	ND	27.9	25.0	25.7	27.2	25.1	25.3	25.2	27.4	26.0
1985	ND	ND	27.9	25.5	28.6	25.6	26.0	25.8	25.2	27.3	25.5
1986	26.3	26.4	25.4	27.0	23.9	26.3	25.4	27.2	25.3	26.3	25.3
1987	25.7	24.0	26.4	24.5	27.1	24.5	26.4	24.8	26.3	27.6	25.4
1988	25.4	26.2	25.3	25.8	26.2	26.3	26.9	25.9	24.8	26.6	25.0
1989	25.0	24.8	25.7	24.0	28.7	25.6	24.3	24.1	26.6	27.4	24.9
1990	23.9	25.7	24.6	23.8	27.8	25.5	26.8	25.6	26.5	27.0	26.5
1991	27.0	24.9	24.3	23.8	27.8	24.1	26.5	25.6	26.3	27.7	25.3
1992	27.5	23.5	23.0	23.0	24.4	25.2	24.6	24.3	27.3	25.7	24.3
1993	25.9	23.2	25.7	22.4	24.8	26.5	24.8	24.0	25.8	24.8	23.8

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

Sabine		Galveston		Matagorda		San		Upper		Lower		Coastwide	
Year	Lake	Spring	Fall	Spring	Fall	Matagorda	Antonio	Aransas	Christi	Laguna	Madre	Spring	Fall
Jackson Turbidity Units													
1975	ND	ND	53	ND	ND	30	ND	42	ND	27	ND	42	ND
1976	ND	ND	109	52	ND	33	ND	25	ND	60	51	38	37
1977	ND	ND	80	75	118	46	67	48	13	41	169	47	34
1978	ND	ND	47	44	36	15	68	74	55	20	50	61	64
1979	ND	ND	153	72	38	28	74	66	80	22	70	47	66
1980	ND	ND	99	69	67	49	74	33	17	19	53	40	37
1981	ND	ND	68	68	62	64	82	81	21	43	58	67	39
1982	ND	ND	66	56	82	55	75	47	35	91	33	38	63
1983	ND	ND	57	63	61	27	50	40	41	32	49	41	40
1984	ND	ND	43	34	27	25	35	44	47	40	39	47	38
1985	ND	ND	26	28	59	37	52	51	57	49	46	39	41
1986	4.3	28	32	35	64	37	60	31	46	32	38	41	26
Nephelometric Units													
1987	30	18	18	17	42	19	28	19	26	15	10	7	14
1988	21	11	16	11	29	16	16	19	22	13	15	24	10
1989	9	12	9	16	16	22	36	15	30	12	22	8	18
1990	16	8	9	13	23	13	26	15	38	13	21	13	12
1991	15	6	20	8	52	21	29	15	13	23	13	11	12
1992	20	10	21	10	22	13	46	17	52	14	41	14	11
1993	24	11	26	16	33	15	46	16	29	11	24	15	11

Table B.4. Annual mean surface salinity (σ/σ_0) at sampled bag seine sites by bay system during 1977-93. ND = no data.

Year	Sabine Lake	Galveston	East Matagorda	Matagorda	San Antonio	Aransas	Corpus Christi	Upper Laguna Madre	Lower Laguna Madre	Coastwide
1977	ND	21.9	ND	17.6	17.7	20.9	33.8	39.8	33.0	25.4
1978	ND	21.8	ND	19.7	20.6	19.9	29.5	39.6	29.2	25.0
1979	ND	12.2	ND	11.4	11.8	11.1	23.9	31.9	27.3	17.4
1980	ND	20.9	ND	19.9	21.0	19.8	28.1	29.6	28.8	23.4
1981	ND	18.2	ND	19.2	15.6	12.1	25.0	26.0	28.3	20.1
1982	ND	15.9	ND	18.2	17.0	17.6	27.6	29.8	29.7	21.3
1983	ND	12.2	15.4	16.5	17.3	16.8	27.5	36.4	31.7	21.2
1984	ND	19.5	17.8	21.6	23.2	22.6	31.8	39.5	29.9	25.5
1985	ND	16.0	16.9	19.7	17.5	19.7	28.1	36.7	32.1	23.2
1986	10.1	18.1	20.1	19.8	17.0	23.5	32.6	39.7	34.9	24.2
1987	7.6	15.3	15.4	15.4	10.8	13.7	28.7	31.4	31.5	19.9
1988	7.7	20.2	26.5	27.4	22.6	24.3	31.4	44.9	31.9	28.4
1989	6.6	15.1	26.9	26.9	27.4	31.4	35.6	48.6	34.2	28.5
1990	6.4	16.9	23.6	24.8	23.6	26.7	32.4	47.7	35.8	27.2
1991	2.6	12.4	17.3	16.7	19.3	19.3	30.8	40.0	28.8	21.1
1992	5.3	5.2	15.4	13.7	9.4	10.7	22.4	25.3	28.7	16.8
1993	4.3	12.6	18.2	17.1	13.9	13.8	27.6	27.7	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	Sabine Lake	Galveston	East Matagorda	Matagorda	San Antonio	Aransas	Corpus Christi	Upper Laguna Madre	Lower Laguna Madre	Coastwide
1977	ND	20.3	ND	20.9	21.7	20.8	20.4	20.6	20.5	20.7
1978	ND	21.4	ND	21.2	21.6	22.3	22.3	22.3	22.4	21.6
1979	ND	22.8	ND	22.8	23.3	23.2	23.6	21.8	23.1	22.9
1980	ND	23.9	ND	21.9	23.2	23.6	23.4	24.6	24.3	23.5
1981	ND	22.5	ND	21.5	22.4	23.7	22.6	24.1	24.6	23.0
1982	ND	23.9	ND	23.3	23.1	24.2	23.4	24.1	23.9	23.7
1983	ND	24.0	23.6	21.9	21.7	24.3	24.3	25.4	24.9	23.8
1984	ND	23.9	22.3	22.5	21.9	24.0	23.3	24.0	24.2	23.4
1985	ND	24.4	24.1	23.5	24.0	23.9	23.5	23.5	24.4	24.0
1986	23.7	24.2	23.4	23.3	23.5	25.2	23.6	24.5	25.0	24.2
1987	22.0	22.8	23.4	23.4	22.2	23.1	24.1	24.2	23.8	23.2
1988	21.7	23.4	23.9	23.4	24.1	24.3	23.3	23.9	25.1	23.5
1989	21.4	23.1	22.9	22.3	23.0	22.8	24.3	25.0	22.0	23.4
1990	21.7	22.6	24.7	23.6	23.0	24.4	24.9	24.9	25.5	23.9
1991	22.9	22.3	24.5	22.2	23.2	23.1	24.8	25.0	25.4	23.5
1992	22.2	21.7	22.2	21.4	22.3	22.6	23.4	24.3	25.9	23.0
1993	22.4	22.2	24.3	22.9	22.9	23.9	23.6	23.4	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	Sabine	Lake	Galveston	East	Matagorda	Matagorda	San Antonio	Aransas	Corpus	Upper	Lower	Laguna Madre	Laguna Madre	Coastwide
Jackson Turbidity Units									Christi	Laguna Madre	Laguna Madre			
1977	ND	94	ND	60	27	50	40	50	50	30	55			
1978	ND	78	ND	55	33	41	43	51	51	34	51			
1979	ND	90	ND	70	31	53	44	47	59	59	60			
1980	ND	90	ND	42	24	47	52	75	75	73	61			
1981	ND	87	ND	54	25	65	44	107	95	95	71			
1982	ND	105	ND	50	31	60	46	69	69	87	69			
1983	ND	96	88	54	30	51	46	57	57	48	58			
1984	ND	79	42	41	36	48	41	82	82	61	57			
1985	ND	52	67	45	54	47	40	108	108	68	68			
1986	46	84	59	46	51	46	44	60	60	80	61			
Nephelometric Units														
1987	24	28	39	36	32	9	26	15	15	17	24			
1988	26	26	28	29	29	28	20	22	20	22	24			
1989	25	29	26	25	40	22	20	22	22	22	26			
1990	21	29	26	30	31	23	21	21	21	23	23			
1991	28	25	32	33	42	25	17	21	21	15	26			
1992	24	23	34	41	43	31	21	17	17	25	29			
1993	21	30	27	38	24	30	23	23	23	36	30			

Table B.7. Annual mean bottom salinity (σ/σ_0) at sampled oyster dredge "reef" sites in Texas bay systems from 1984-93. ND = no data.

Year	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	Mata Gorda	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	21.6	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	Mata Gorda	San Antonio	Aransas	Coastwide
<i>Jackson Turbidity Units</i>					
1984	25	ND	ND	ND	25
1985	47	ND	ND	ND	47
1986	40	51	48	37	45
<i>Nephelometric Units</i>					
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 (σ/σ_0) at sampled bay trawl sites in Texas bay systems from 1977-93. ND = no data.

Year	Sabine Lake	Galveston	East Matagorda	Matacorna	San Antonio	Aransas	Corpus Christi	Upper Laguna Madre	Lower Laguna Madre	Coastwide
1977	ND	20.5	ND	17.9	13.9	19.5	ND	ND	ND	18.5
1978	ND	20.1	ND	19.3	14.7	20.6	ND	ND	ND	19.0
1979	ND	9.0	ND	10.3	5.7	ND	ND	ND	ND	8.8
1980	ND	22.8	ND	ND	ND	ND	ND	ND	ND	22.8
1981	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1982	ND	16.0	ND	22.4	16.3	19.2	30.3	34.0	35.8	21.3
1983	ND	10.7	ND	20.4	16.9	19.6	29.8	36.9	33.0	19.1
1984	ND	18.5	ND	25.2	22.9	25.2	32.5	40.0	31.0	24.6
1985	ND	17.0	ND	21.0	16.2	21.2	29.8	37.3	33.1	21.5
1986	7.8	14.8	ND	24.5	17.3	22.7	31.1	39.6	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
1988	7.8	19.2	28.7	29.6	21.7	25.7	34.9	45.0	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
1990	5.7	15.1	25.8	26.1	21.6	27.0	32.0	48.6	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
1992	5.5	13.6	16.6	15.0	7.9	10.7	22.9	24.6	30.7	15.0
1993	3.1	13.8	18.9	18.5	12.4	16.9	28.6	32.0	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	Sabine Lake	Galveston	East Matagorda	Matacorna	San Antonio	Aransas	Corpus Christi	Upper Laguna Madre	Lower Laguna Madre	Coastwide
1977	ND	18.7	ND	17.9	21.1	17.8	ND	ND	ND	18.8
1978	ND	21.6	ND	23.5	24.2	24.8	ND	ND	ND	22.9
1979	ND	22.5	ND	21.6	25.5	ND	ND	ND	ND	22.8
1980	ND	23.8	ND	ND	ND	ND	ND	ND	ND	23.8
1981	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
1983	ND	21.5	ND	21.7	21.7	22.3	22.2	21.8	22.7	21.8
1984	ND	22.2	ND	22.8	21.6	23.4	21.8	22.0	22.8	22.3
1985	ND	21.9	ND	22.5	22.5	21.7	21.9	23.0	22.8	22.2
1986	22.1	22.2	ND	23.3	23.1	22.1	21.8	23.3	22.5	22.6
1987	20.0	21.5	24.3	23.9	21.8	21.3	21.1	22.3	22.6	21.6
1988	21.8	21.8	21.1	20.2	22.1	21.3	22.2	22.1	24.5	21.6
1989	20.8	20.4	21.0	20.5	21.1	20.5	21.8	23.8	23.6	21.0
1990	21.2	21.4	22.7	22.6	21.9	22.6	23.4	23.8	24.2	22.3
1991	21.7	21.5	22.0	21.5	22.2	21.7	22.8	23.4	23.2	21.9
1992	20.7	21.6	26.0	21.1	22.6	21.4	22.9	23.5	23.7	21.7
1993	20.9	20.9	22.2	22.2	22.5	21.8	22.1	23.7	23.7	21.7

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

Year	Sabine Lake	Galveston	East Matagorda	Matagorda	San Antonio	Aransas	Corpus Christi	Upper Laguna Madre	Lower 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 (σ/σ_0) at sampled gulf trawl sites in the Texas Territorial Sea 1985-93. ND = no data.

Year	Sabine Lake	Galveston	Port O'Connor	Port Aransas	Port Isabel	Coastwide
1985	ND	30.6	32.3	30.9	31.7	31.4
1986	29.1	29.7	32.4	30.5	32.7	30.9
1987	27.4	28.8	33.5	34.4	34.4	31.7
1988	27.3	28.3	30.7	32.4	35.0	30.6
1989	25.4	29.9	32.9	30.9	33.7	30.3
1990	25.3	29.5	30.5	32.4	33.9	30.3
1991	23.7	28.5	31.0	31.9	31.2	29.3
1992	26.5	29.4	31.5	32.4	30.7	30.1
1993	23.1	27.3	28.9	34.5	30.8	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	Sabine Lake	Galveston	Port O'Connor	Port Aransas	Port Isabel	Coastwide
1985	ND	23.4	23.6	22.5	25.4	23.7
1986	25.6	22.0	22.8	22.3	22.7	23.1
1987	21.1	21.7	22.1	22.4	21.9	21.8
1988	21.1	21.6	21.2	22.2	21.8	21.6
1989	19.8	21.5	21.3	21.7	21.8	21.2
1990	21.3	21.9	21.8	22.2	21.8	21.8
1991	22.0	22.3	22.1	21.8	22.5	21.9
1992	19.9	21.5	20.9	22.5	20.9	21.1
1993	21.8	21.7	21.8	21.6	21.3	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	Jackson Turbidity Units	Sabine Lake	Galveston	Port O'Connor	Port Aransas	Port Isabel	Coastwide
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 (σ_{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	Gulf-22	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	31.5	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	Gulf-22	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	23	30	9	10	26
1989	131	26	39	13	7	50
1990	48	31	28	14	10	28
1991	73	31	31	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	24.8	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 No./h	White Shrimp Length No./h	Pink Shrimp Length No./h	Blue Crab Length No./h
1982	0-18	22	1,222	108	15	136
	19-37	50	1,427	115	0	138
	38-55	29	138	0	<1	126
	56-73	5	145	0	0	0
1983	56-73	117	117	179	0	0
	74-91	3	117	0	0	0
	0-18	28	182	0	0	0
	19-37	47	254	99	20	127
1984	38-55	24	1,445	119	1	121
	56-73	8	304	132	0	4
	74-91	2	66	156	0	1
	0-18	16	71	168	0	0
1985	19-37	40	733	116	30	0
	38-55	16	1,594	116	1	0
	56-73	12	544	131	0	0
	74-91	5	194	138	0	0
1986	0-18	30	86	151	0	0
	19-37	40	450	98	41	151
	38-55	14	1,362	112	2	6
	56-73	5	150	127	0	0
1987	74-91	1	154	144	0	0
	0-18	35	36	179	0	0
	19-37	43	250	98	33	20
	38-55	10	609	108	0	4
1988	56-73	5	311	124	0	0
	74-91	3	176	136	0	0
	0-18	74	49	147	0	0
	19-37	56	189	103	15	116
1989	38-55	17	606	107	3	10
	56-73	8	26	142	0	0
	74-91	7	16	177	0	0
	0-18	75	11	177	0	0
1990	19-37	50	227	106	4	0
	38-55	17	309	113	0	0
	56-73	7	18	126	0	0
	74-91	7	4	180	0	0
1991	0-18	85	3	198	0	0
	19-37	54	556	101	16	0
	38-55	12	928	118	4	111
	56-73	8	212	129	0	144
1992	74-91	7	40	140	0	79
	0-18	74	11	159	0	0
	19-37	48	279	113	17	0
	38-55	16	850	123	1	0
1993	56-73	10	202	136	0	0
	74-91	8	76	140	0	0
	0-18	92	16	154	0	<1
	19-37	51	202	106	31	164
1994	38-55	16	1,153	125	7	14
	56-73	10	186	143	7	90
	74-91	9	186	171	0	143
	0-18	41	41	176	0	135

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
1993	74-91	8	10	186	0	0	0	0	0	0
	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
1994	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 TFMID 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 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
1986	0-18	12	71	77	15	26				0
	19-37	34	93	15	0	2				1
	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	18				0
	19-37	40	21	7	2	2				<1
	38-55	12	0	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	9				0
	19-37	49	48	15	12	12				0
	38-55	16	44	0	1	1				0
	56-73	10	15	0	0	0				0
	74-91	1	0	0	0	0				0
1989	0-18	78	21	137	102	16	124	2	45	
	19-37	60	68	23	117	10	123	<1	83	
	38-55	20	71	<1	1	1	124	<1	94	
	56-73	7	43	0	0	0		<1	74	
	74-91	9	5	185	0	0		0	0	
1990	0-18	64	18	56	129	11	137	<1	70	
	19-37	59	69	5	159	7	126	<1	87	
	38-55	22	60	<1	185	1	129	1	75	
	56-73	9	34	0	0	0		1	74	
	74-91	6	7	190	0	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	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 TPWD 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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