

**A Summary of Fish Tagging
on the Texas Coast:
November 1975-
December 1999**

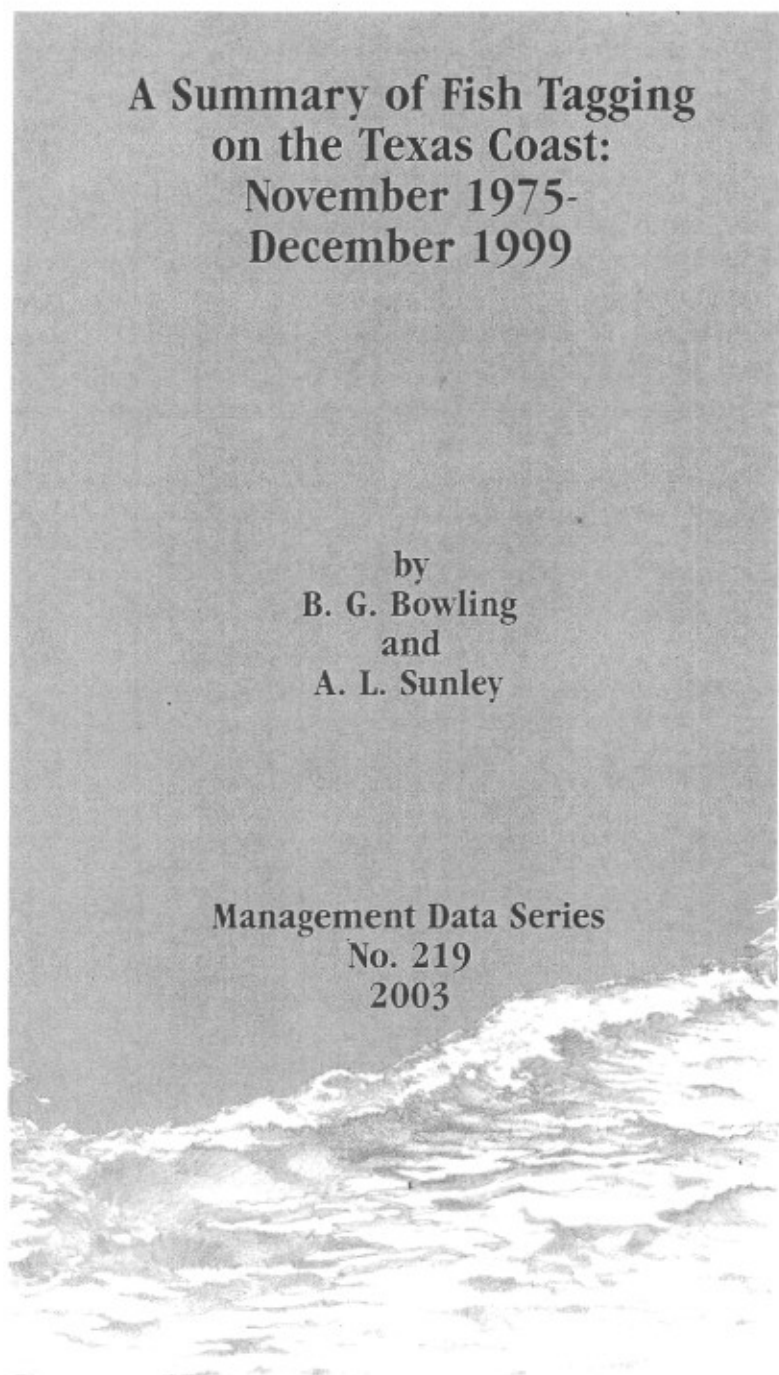
by
**B. G. Bowling
and
A. L. Sunley**

**Management Data Series
No. 219
2003**



COASTAL FISHERIES DIVISION

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During November 1975-December 1999, 151,890 fishes (77 species) were tagged in Texas bays and Texas state waters of the Gulf of Mexico. Major species tagged included red drum (*Sciaenops ocellatus*), spotted seatrout (*Cynoscion nebulosus*), black drum (*Pogonias cromis*), sheepshead (*Archosargus probatocephalus*) and southern flounder (*Paralichthys lethostigma*). Overall, 6.3% of tagged fishes were reported recaptured. Red drum had the highest recapture rate at 11.1%. Most recaptured fishes were caught in the same bay in which they were tagged and within 20 km of their release site. Sheepshead migrated the most, having the highest percentage of fishes that moved to other bay systems. They also traveled greater distances, on average, from their release sites than other species. Black drum were second to sheepshead in average distance traveled and movement to other bays, followed by spotted seatrout, southern flounder and red drum. All five major species and one minor species, Gulf flounder (*Paralichthys albigutta*), were documented moving from bays into the Gulf. Five fishes (two red drum, two spotted seatrout and one black drum) were documented traveling from the Gulf into the bays. No observable patterns in direction of movement within bay systems, between bay systems or within the Gulf were apparent for any species. Five fishes (two red drum, two black drum, and one spotted seatrout) were reported to have traveled into Mexican waters and nine (eight red drum and one southern flounder) into Louisiana waters. Seasonality of recaptures differed by species. All major species, except spotted seatrout, appeared to have a major or minor peak in recaptures during November. Spotted seatrout had a small peak in October.

Fish tagging on the Texas coast began in 1950 as a cooperative study between the Texas Game, Fish and Oyster Commission (presently the Texas Parks and Wildlife Department - TPWD) and the Copano Research Foundation (Simmons and Breuer 1982, Green 1986). Early tagging efforts occurred in all Texas bay systems and Texas state waters of the Gulf of Mexico. Fishes were marked with a variety of tags including monel strap tags, Peterson disc tags, Floy dart tags and internal abdominal anchor tags with attached streamers. Objectives of early tagging studies were to determine life history information of fishes, especially red drum (*Sciaenops ocellatus*) and spotted seatrout (*Cynoscion nebulosus*) and to track movement of fishes between the bay and Gulf of Mexico. From 1950-1975, 73,926 fishes were tagged, and 3,386 of those tagged fishes were reported recaptured through October 1982 (Green 1986).

In November 1975 TPWD expanded and intensified fish tagging efforts along the Texas coast. Tagging efforts focused on five major species of fishes: red drum, spotted seatrout, black drum (*Pogonias cromis*), sheepshead (*Archosargus probatocephalus*) and southern flounder (*Paralichthys lethostigma*). Occasional special studies targeted striped bass (*Morone saxatilis*) and red snapper (*Lutjanus campechanus*). Other species of fishes were tagged infrequently. In January 1998, tagging efforts decreased due to other priorities. However, tagging is still ongoing, focusing mainly on red drum, tarpon (*Megalops atlanticus*), snook (*Centropomus parallelus* and *C. undecimalis*) and striped bass.

The objective of the present study is to summarize information derived from fish tagging and tagged fish recaptures from November 1975-December 1999. Differences between this report and previous tagging reports are a result of updating the database. This report is considered the most accurate.

MATERIALS AND METHODS

Fishes for tagging were collected from November 1975-December 1999 from Sabine Lake, Galveston, East Matagorda, Matagorda, San Antonio, Aransas, Corpus Christi and upper and lower Laguna Madre bay systems; Brazos, San Bernard and Trinity Rivers; and the Gulf of Mexico (Figure 1). These fishes were obtained during TPWD routine and special sampling using rods and reels, gill nets, trammel nets, bag seines, beach seines, shrimp trawls, trotlines, longlines and fish traps. Procedures used for collecting fishes are described by Matlock and Weaver (1979), Hegen et al. (1984), Fuls (1991) and Hensley et al. (2000). Some stocked hatchery fishes (Dailey 1988) and fishes captured by electrofishing were also tagged prior to being released into Texas waters. Uniquely numbered internal abdominal anchor tags with external streamers were surgically inserted into the fish's abdominal cavity. Tags were made of rigid glossy blue, green or red-orange plastic (26 x 6 x 1 mm, 14 x 5 x 1 mm or 12 x 3 x 1 mm) with rounded corners. Bright yellow flexible plastic hollow tubing (approximately 50 mm long, O.D. = 2 mm, I.D. = 1 mm) extended from a single hole in the center of each tag. "TEXAS PWD ROCKPORT", "TEXAS PWD SEABROOK", or "TEX. PWD ROCKPORT" was printed on each tag along with a unique alphanumeric or numeric tag number. Only fishes judged to be healthy were tagged using the technique described by Moffett (1961). Date and location of release and length of each tagged fish were recorded. Prior to 1990, only fishes within 25 mm of legal sizes were tagged because the

printing on the tag was only on the internal anchor. Since 1990 tags with tag numbers imprinted additionally on the yellow streamers have been used to tag fishes regardless of size. These tags allow anglers to record tag numbers and then return fishes to the water with tags intact.

Originally, posters were placed in commercial fish houses, at recreational access points, in sporting goods stores and on fishing piers to publicize the tagging program. Information on the tagging program was presented on radio and television stations in cities adjacent to each bay system, in newspapers throughout Texas and in the TPWD magazine. Through the years, however, advertisements and information about TPWD tagging efforts have diminished as other TPWD projects have taken priority. Currently, the tagging program is publicized through a tagging pamphlet (PWD BR V3400-458) and a link on the TPWD internet site (www.tpwd.state.tx.us).

Anglers reporting recaptured tagged fishes were asked date, location of recapture, length and weight of fishes, if known. A letter was sent to each angler providing a tagging history of their tagged fish. A reward was paid for each tag returned by an angler regardless of information received. For every 100 tags released, there were two preselected \$25 rewards, five \$10 rewards, five \$5 rewards and 88 \$1 rewards. Rewards were paid by the National Marine Fisheries Service until November 1978 and by the Coastal Conservation Association since December 1978.

From information received from anglers, distance and direction traveled were determined for each tagged fish, assuming sufficient information was received on the recapture location. Originally, distance was determined from nautical charts as the minimum possible distance in kilometers by water between the release and the recapture sites. Beginning in 1995, the latitude and longitude of recapture sites were recorded, and in 1998 measurement of distance changed to reflect a straight line between release and recapture sites. Analyses indicated an average difference of less than two kilometers between the two methods of calculating distance. Since there were only two years of the newer method, distance measurements were considered without regard for how measurements were calculated. Fishes that traveled two or less kilometers were considered to have been recaptured at their release site. Direction of movement was determined from a straight line between release and recapture sites and was recorded in degrees.

Growth was calculated as the difference between recapture and release lengths. Recapture lengths reported as "estimates" were not used in growth calculations. Days free was considered to be the difference between recapture and release dates. Daily growth rate was calculated as growth divided by days free. For growth rate calculations, fishes recaptured on the same day as released were considered to have been free one day. Mean growth rates were adjusted by eliminating outliers following procedures used by Doerzbacher et al. (1988). Overall recapture rates for each species were calculated by dividing the number of recaptures by the number of releases for that species. Annual recapture rates represented the number of releases by year vs number of recaptures from those releases. Trends and correlations in number of releases, recaptures and recapture rates were analyzed using the SAS GLM and CORR procedures (SAS Institute Inc. 1987). Releases and recaptures of stocked fishes were eliminated from trend analyses as outliers because of the high number of releases (especially in 1987) and extremely low recapture rates. Fishes recaptured by TPWD personnel on the same day as released and fishes for which no release information was obtained were not included in analyses.

In Texas bays and offshore waters 151,890 fishes (77 species) were tagged from November 1975-December 1999 (Table 1). Red drum constituted 36.3%, black drum 30.7% and spotted seatrout 15.3% of the total fishes tagged. An average of 6,287 fishes was tagged annually from January 1976-December 1999. Annual number tagged ranged from 3,111 in 1984 to 10,917 in 1996. By bay system, total number of tagged fishes ranged from 2,675 in Cedar Lakes to 32,618 in Galveston Bay. In the Gulf of Mexico, 3,506 fishes were tagged (Tables 2-3).

From 1975-1980, trammel nets were the main gear used to capture fishes for tagging. Rods and reels became the main gear from 1981-1983. Since 1984 gill nets catches have provided the majority of fishes for tagging purposes.

Overall, 6.3% of tagged fishes were recaptured and reported to TPWD (Tables 4-6). Of 9,616 tags returned, 75.8% were returned by sport anglers, 16.3% by commercial fishers, 5.3% by TPWD personnel and 2.6% from unknown sources. Based on the actual year of recapture (not year reported), mean number of tags returned per year, (excluding 1975) was 370. The year with the most recaptures was 1980 with 821 tags returned; 1990 had the least recaptures with 133 tags returned. Aransas Bay had the highest number of recaptures (1,924) followed by Galveston Bay (1,382).

Fishes released from trammel nets had the highest recapture rate (14.9%), followed by trotlines (10.5%), fish traps (9.2%), rods and reels (7.2%) and gill nets (5.6%). Stocked fishes, mostly juvenile striped bass and red drum, provided the least number of recaptures (< 1.0%).

Regression analyses showed a significant decline ($p < 0.05$) in the number of recaptures per year and a non-significant increase in tagged releases from 1976-1999 (Figure 2). Number of reported recaptures increased to a high of 821 in 1980, decreased to a low of 133 in 1990 and steadily increased to 559 in 1997. In 1998 number of recaptures showed another steep decline. Recapture rates for major species and for all species combined declined significantly through time. (Releases from 1999 were excluded from analyses.) Spearman rank correlations and regressions were tested on releases vs. recaptures from the same year, recaptures the following year, recaptures same and following year combined and recaptures based on release year. All showed significant positive correlations with releases vs. recaptures the following year showing the highest correlation ($p < 0.0001$, $r^2 = 0.7616$).

Seasonality of recaptures differed by species (Figures 3-4). All species, except spotted seatrout, appeared to have a major or minor peak in recaptures during November. Spotted seatrout had a small peak in October.

Total monetary rewards paid for returned tags was \$18,384 (8,129 \$1 rewards, 416 \$5 rewards, 395 \$10 rewards, and 169 \$25 rewards). Mean annual payment, excluding 1975, was \$766. The greatest amount was paid in 1980 (\$1,605) and the least amount in 1990 (\$171).

Red Drum

A total of 55,090 red drum was tagged and released; 6,094 were recaptured for a recapture rate of 11.1%. Of those recaptured, 87.0% were caught in the same bay system in which tagged, 5.2% were recaptured in other bay systems (78.1% from an adjacent bay system), 4.1% released in bays were

recaptured in the Gulf of which 24 fish were returned from outside state waters (14 from the Exclusive Economic Zone, eight from Louisiana waters and two from Mexican waters) and <1.0% were both released and recaptured in the Gulf. Two Gulf released fish were recaptured in the bays.

The majority (83.1%) of recaptured red drum were recovered within 20 km of their release site. Longest distance traveled was 626 km from Matagorda Bay to East Timbalier Island, Louisiana. Another red drum, released in Galveston Bay, traveled 472 km and was recaptured east of Grand Isle, Louisiana. Two red drum, both released in lower Laguna Madre, moved into the Gulf off of Mexico traveling distances of 13 and 60 km. Average distance traveled by recaptured red drum was 12 km.

Recaptured red drum averaged 222 days free. The maximum number of days free was 6,763 days. This fish was tagged in July 1980 off Rockport in Aransas Bay and was recaptured 18.5 years later in January 1999 approximately one kilometer from its release site. No recapture length was recorded. Another red drum spent nearly 15 years free, traveling from Nueces Bay (Corpus Christi Bay) to the south jetties off Galveston. The fish grew 340 mm TL (from 625 to 965 mm TL) while free. One red drum was recaptured after 11 years at large, and three were recaptured after five years. The majority (81.3%) of recaptured red drum were caught within a year after release. Red drum traveled an average of 0.2 km/day with a maximum speed of 23:0 km/day.

Red drum had the highest percentage (43.7%) of recaptures at the site of release (among the five major species). Days free for these red drum averaged 198 days with a maximum of 6,763 days free. Reported sizes at recapture ranged from 229 to 993 mm TL with a mean of 558 mm TL.

Bay recaptures of red drum were lowest during the month of February. After February, recaptures steadily increased through November before declining. Recaptures from the Gulf of Mexico occurred during all months with a peak in November.

Sizes of red drum at release ranged from 86 to 1,205 mm TL (\bar{X} = 488 mm TL). Reported sizes at recapture ranged from 229 to 1,041 mm TL (\bar{X} = 570 mm TL). After elimination of outliers, reported growth of recaptured red drum ranged from -152 to 610 mm TL. Growth rates ranged from -1.19 to 1.89 mm TL/day (\bar{X} = 0.36 mm TL/day).

Spotted Seatrout

Spotted seatrout had a recapture rate of 6.2% with 23,213 releases and 1,433 recaptures. Of the recaptures, 83.3% were caught in the same bay where released, 8.6% were recaptured in another bay system (89.3% from an adjacent bay and one from inshore Mexico), 5.3% released in the bays were recaptured in the Gulf and 1.2% were both released and recaptured in the Gulf. Two fish tagged in the Gulf were recaptured in the bays. One of these was released at the Galveston jetties and recaptured in Sabine Lake. The other was released off Matagorda Island and recaptured in Caney Creek (East Matagorda Bay). The fish that moved to Mexico was released in lower Laguna Madre and recaptured in Laguna Madre de Tamaulipas, Mexico (exact location unknown).

The majority of spotted seatrout (72.6%) were recaptured within 20 km of their release site (\bar{X} = 16 km). Longest distance traveled (219 km) was from the Tres Palacios River (Matagorda Bay) to the Texas City Dike (Galveston Bay).

The most number of days free for a recaptured spotted seatrout was 1,895 days. The fish was released in Galveston Bay and recaptured in the same bay 37 km from its release site. Four spotted seatrout were free between four and five years. All but one were recaptured in the same bay system as released; none were caught more than 26 km from their release site. Average days free for spotted seatrout was 220 days; 80.9% were recaptured within a year of their release. Average speed was 0.2 km/day with a maximum speed of 14.0 km/day.

One-third (33.3%) of spotted seatrout were recaptured at the release site, averaging 171 days free with a maximum days free of 1,179. Reported sizes of these fish at recapture ranged from 254 to 711 mm TL with a mean of 405 mm TL.

Bay recaptures of spotted seatrout were highest during June-August declining (with a small peak in October) to a low in February. The majority of recaptures from the Gulf of Mexico were from May-September with a peak in July.

Sizes of all spotted seatrout at release ranged from 115 to 830 mm TL (\bar{X} = 378 mm TL). Reported sizes at recapture ranged from 246 to 775 mm TL (\bar{X} = 423 mm TL). After elimination of outliers, growth of recaptured spotted seatrout ranged from -134 to 393 mm TL. Growth rates ranged from -1.15 to 1.62 mm TL/day (\bar{X} = 0.23 mm TL/day).

Black Drum

Black drum recapture rate was 3.0% with 46,580 releases and 1,413 recaptures. Of those recaptured, 79.6% were caught in the same bay where released, 12.7% were recaptured in a different bay system (77.1% from adjacent bay systems) and 2.4% were tagged in the bays and recaptured in the Gulf (two from outside state waters). One black drum released in the Gulf was recaptured in a bay. Eleven black drum were both released and recaptured in the Gulf. Two black drum were recaptured in Mexican waters. Both were released in lower Laguna Madre.

Recaptured black drum traveled from 0 to 379 km, averaging 24 km. Most (68.6%) were recovered within 20 km of the release site. Five traveled >300 km. One traveled 330 km from Powderhorn Lake (Matagorda Bay) to South Bay (lower Laguna Madre). Another traveled the opposite direction, leaving lower Laguna Madre to be recaptured near the Colorado River (Matagorda Bay). Another black drum traveled 315 km from lower Laguna Madre to the Gulf off Soto La Marina, Mexico. The other two black drum traveled 313 and 302 km, from Nueces Bay (Corpus Christi Bay) to San Luis Pass (Galveston Bay) and from Mesquite Bay (Aransas Bay) to Rollover Pass (Galveston Bay), respectively. Greatest distance traveled by a black drum may have been from Mo'ses Lake (Galveston Bay) to lower Laguna Madre, but the exact location of recapture and distance traveled is unknown.

Recaptured black drum were free from 0 to 6,309 days. Average days free was 271, and 75.1% were returned within one year of release. Three black drum were recaptured after being at large for more than ten years. One black drum, released in Corpus Christi Bay at 430 mm TL, was recaptured over 17 years later, 20 km away in the same bay system. Another black drum was also released and recaptured in Corpus Christi Bay, after nearly 17 years (6,179 days) at large. This black drum was released at 963 mm TL and recaptured at 1,063 mm TL. The third black drum traveled from Mesquite Bay (Aransas Bay) to

San Luis Pass (Galveston Bay). It was at large for 11.5 years (4,213 days) and grew from 485 to 762 mm TL. Black drum average speed was 0.4 km/day with a maximum speed of 16.0 km/day.

Black drum had the lowest percentage (21.6%) of fishes recaptured at the release site. These fish averaged 213 days at large with a maximum 1,607 days free. Reported sizes ranged from 279 to 688 mm TL with a mean of 462 mm TL.

Black drum recaptures from bays peaked in January, May and November. Highest percentage of recaptures appears to be from January-May with a secondary surge from October-November. Recaptures from the Gulf of Mexico occurred during all months, except July. The highest percentage occurred in November.

Black drum sizes at release ranged from 108 to 1,665 mm TL (\bar{X} = 432 mm TL). Reported recapture sizes ranged from 179 to 1,063 mm TL (\bar{X} = 475 mm TL). After elimination of outliers, growth of recaptured black drum ranged from -155 to 362 mm TL. Growth rates ranged from -1.33 to 1.71 mm TL/day (\bar{X} = 0.19 mm TL/day).

Sheepshead

Of 6,977 sheepshead tagged, 164 were recaptured for a recapture rate of 2.4%. Of the recaptures, 63.6% were caught in the same bay as their release, 18.2% were caught in another bay system (73.3% to adjacent bay systems) and 17.0% were released in the bays and recaptured in the Gulf (one of which was recaptured outside state waters). No sheepshead were tagged in the Gulf.

Recaptured sheepshead traveled 0 to 315 km from the site of release. Average distance traveled was 27 km. Longest distance traveled by a recaptured sheepshead was 315 km from Three Islands in lower Laguna Madre to East Matagorda Bay. The majority (63.6%) of sheepshead were recaptured within 20 km of the release site.

Recaptured sheepshead averaged 199 days free with 82.9% being recaptured within the first year after release. Days free ranged from 2 to 1,711 days. Three sheepshead were recaptured between two and three years after release. Only one sheepshead was at large longer than three years. Unfortunately, no recapture length was recorded for this fish. Sheepshead averaged 0.4 km/day with a maximum speed of 7.5 km/day.

Just over 24.0% of recaptured sheepshead were recaptured at the release sites. These sheepshead were at large for an average of 140 days with a maximum of 830 days free. Reported sizes ranged from 182 to 483 mm TL and averaged 359 mm TL.

Sheepshead recaptures from bays were highest from November-March with the least percentage recaptured during August-October. Recaptures from the Gulf occurred from November-April, peaking in March.

Release sizes ranged from 160 to 657 mm TL (\bar{X} = 376 mm TL). Reported recapture sizes ranged from 182 to 573 mm TL (\bar{X} = 388 mm TL). After elimination of outliers, growth ranged from -110 to 202 mm TL. Growth rates ranged from -1.64 to 1.67 TL/day. The mean growth rate showed negative growth and, hence, will not be presented.

Southern Flounder

A total of 4,439 southern flounder was tagged, and 230 were recaptured for a recapture rate of 5.2%. Of those recaptured 82.6% were recaptured in the same bay as their release, 10.4% were recaptured in another bay system (69.6% in an adjacent bay system) and 1.7% tagged in the bays were recaptured in the Gulf. Two southern flounder were both released and recaptured in the Gulf. One southern flounder released in the bay was recaptured in a Louisiana bay. None released in the Gulf were recaptured in the bays.

Southern flounder traveled an average of 15 km from their release site. Most southern flounder (74.4%) were recaptured within 20 km of the release site. Longest distance traveled was 182 km from Rahal Bayou (San Antonio Bay) to Chocolate Bayou (Matagorda Bay). One southern flounder traveled 167 km from Trinity Bay (Galveston Bay) to Big Lake near Hackberry, Louisiana. Another traveled 120 km from Baffin Bay (upper Laguna Madre) to Copano Bay (Aransas Bay). All other southern flounder traveled < 90 km from their release sites.

Average days free for recaptured southern flounder was 171 days. Days free ranged from 0 to 1,114 days with 89.1% returned within a year of their release. Only one southern flounder was at large for more than two years. It was caught four kilometers from its release site in East Matagorda Bay after three years at large. Average speed was 0.3 km/day with a maximum speed of 4.3 km/day.

Southern flounder had the second highest percentage (42.6%) of fishes recaptured at the release site. Days free for these fish averaged 143 with a maximum days free of 568. Reported recapture sizes ranged from 254 to 575 mm TL with an average of 401 mm TL.

Southern flounder recaptures from bays were low during most months with the majority of southern flounder being recaptured in November. Seven recaptures from the Gulf of Mexico occurred from June-December, except in the month of October, with a peak in November.

Release sizes ranged from 192 to 660 mm TL (\bar{X} = 366 mm TL). Reported recapture sizes ranged from 254 to 610 mm TL (\bar{X} = 410 mm TL). After elimination of outliers, growth ranged from -96 to 240 mm TL. Growth rates ranged from -1.79 to 1.75 mm TL/day (\bar{X} = 0.26 mm TL/day).

Striped Bass

Nearly 85% of the 11,219 striped bass tagged and released were hatchery-raised fish or brood stock from state and federal hatcheries. They were released into four bay systems: Sabine Lake (780 fish), Galveston Bay (7,582 fish), Cedar Lakes (1,098 fish) and Matagorda Bay (4 fish). Another 14% were caught using electrofishing methods and released in the Trinity River (just below the Lake Livingston Dam) which empties into Galveston Bay. Of 189 fish that were caught, tagged and released in a major bay system, all but one were released into Galveston Bay. Overall recapture rate for striped bass was 0.7% with 82 recaptures. Recapture rate was 0.1% for stocked fish, 3.8% for electroshocked fish, and 4.9% for all other gears. All fish were recaptured in the same bay system as released, with the Trinity River being considered part of Galveston Bay. Eighty recaptures were from Galveston Bay, and two recaptures were from the Cedar Lakes area.

Sixty recaptured striped bass were released at the Lake Livingston dam, and 50 of those fish were recaptured at the dam. The other 10 fish traveled down the Trinity River. Two were recaptured in the lower part of the river, two were caught 161 km south of the dam at the mouth of the river and six were recaptured 167 km away at the Reliant Energy cooling pond outfall in Trinity Bay. Days free for those released at the dam ranged from 15 to 1,164 days (\bar{X} = 195 days). The majority (84.1%) were recaptured within a year of release. Only two fish were free more than two years.

Nine recaptured striped bass were tagged and released into Galveston Bay proper. All were tagged at the Reliant Energy's cooling pond outfall in Trinity Bay. All but one were recaptured at the release site. One fish traveled up the Trinity River and was caught at the Lake Livingston dam. All were recaptured within one year of release, the longest days free being 222 days.

Thirteen striped bass recaptures were from stocked fish. Two were released and recaptured in the Brazos River. Eleven were released in the Trinity River between Lake Livingston and Trinity Bay. Of those 11 fish, six traveled upstream and were recaptured below Lake Livingston dam. Three traveled downstream and were recaptured in Trinity Bay. The other two were recaptured in the river between the dam and the bay. Average distance traveled was 66 km. Recaptured stocked fish were free from 30 to 1,176 days, averaging 365 days free. Nine (69.2%) were recaptured within one year of release.

After elimination of outliers, growth rate of recaptured striped bass averaged 0.28 mm TL/day, ranging from -0.16 to 1.72 mm TL/day. Mean growth rate was 0.35 mm TL/day for fish released at Lake Livingston dam, 0.45 mm TL/day for stocked fish, and 0.14 mm TL/day for all other fish.

Red Snapper

About 85% of red snapper were tagged and released on TPWD Artificial Reef Liberty Ship complexes. The remainder were collected through incidental catches in trawls, longlines and on rods and reels at various sites in the Gulf. Days free for recaptured red snapper ranged from one to 1,184. Over 98.0% of red snapper were recaptured in the same vicinity as released. Two red snapper traveled from the George Vancouver Liberty Ship to an oil platform 42 km south. One red snapper was reported to have traveled 212 km from Boatman's Reef off Port Aransas to a ditch 14 km up the Brazos River, but this report is believed to be erroneous since red snapper generally do not travel up rivers. Forty-eight red snapper, all juveniles (most less than 200 mm TL), were tagged and released from trawl samples off Port Aransas between 1990 and 1992. No recaptures have been reported from this group.

Other Species

Other recaptured species included alligator gar (*Lepisosteus spatula*), Atlantic croaker (*Micropogonias undulatus*), Atlantic stingray (*Dasyatis sabina*), blue catfish (*Ictalurus furcatus*), bull shark (*Carcharhinus leucus*), Florida pompano (*Trachinotus carolinus*), Gulf flounder (*P. albigutta*), Gulf kingfish (*Menticirrhus littoralis*), hardhead catfish (*Arius felis*), tarpon (*Megalops atlanticus*) and yellowedged grouper (*Epinephelus flavolimbatus*). All were recaptured within a year of their release except the alligator gar (430 days free) and the Gulf kingfish (608 days free). Most were recaptured in the same bay or area of release with the following exceptions. The

recaptured tarpon was tagged from a TPWD gill net sample in Copano Bay (Aransas Bay). Twenty days later the tarpon was recaptured in a TPWD gill net near Swan Point (San Antonio Bay), traveling a distance of 53 km. One Gulf flounder released in lower Laguna Madre was recaptured in the Gulf at oil platform 42 km off Port Aransas. The Florida pompano moved 140 km from Laguna Salada in upper Laguna Madre to the surf off South Padre Island. One Atlantic croaker, one blue catfish and a bull shark moved into adjacent bay systems from their release sites.

DISCUSSION

The success of any tagging program depends on the number of recaptures that are reported to the tagging entity and the accuracy of the data reported. The incentive to report a recaptured tagged fish depends on the angler's awareness of the tagging program, knowledge of how and to whom to report information and the angler's trust in the tagging entity. In a TPWD study (Matlock 1981) tags were secretly inserted in fishes at creel surveys and anglers later contacted. The major reason given for not reporting a recaptured fish was the failure to find the tag indicating that visibility (or recognizability) of the tag is extremely important. Rawston (1971) and Matlock (1981) reported that high monetary rewards increase reporting rates by anglers. When rewards as high as \$10,000 were offered to Florida anglers, over 50% of the tagged red drum released were reported (Beaumariage 1969). Beaumariage and Wittich (1966) reported that recaptures decreased sharply after the high rewards were withdrawn. Extensive publicity may also affect recapture rates if anglers actively seek tagged fishes or have privileged knowledge of when and where fishes were released (Ingle et al. 1962, Matlock 1981). Any use of recapture data to estimate exploitation rates and population sizes, etc. should consider the biases that may influence reporting rates (Ingle et al. 1962, Matlock 1981).

Table 7 summarizes recapture rates presented in this study and those of previous studies. High Florida recapture rates were probably influenced by extensive publicity and payment of high monetary rewards (Matlock and Weaver 1979). The extremely low recapture rate for stocked fishes, the majority of which were striped bass, suggests that these fishes may not be good candidates for tagging, possibly due to their small size or the method of handling. Texas does not have an extensive striped bass fishery in coastal waters and directed efforts to catch striped bass are concentrated almost entirely at the Lake Livingston dam and Reliant Energy's cooling pond outfall in Galveston Bay (TPWD unpublished data). Lack of a directed fishery in areas where stocked striped bass are released may also account for the low recapture rate. Absence of recaptures from other species is likely due to the low number of those species tagged (Beaumariage and Wittich 1966). Simmons and Breuer (1982) suggest that survival of tagged fishes and, thus, recapture rates depend on several factors: 1) method of capture, 2) shock and stress during handling, 3) the type of tag used and the skill of the person tagging the fishes, 4) tag shedding rates, 5) natural mortality and 6) fishing mortality. Green (1986) states that mass tagging at single sites yields fewer recaptures than scattered tagging or tagging of smaller groups over a time period. The decline in TPWD recapture rates through time is probably, in most part, due to the decline in publicity of the tagging program.

General movement patterns were discernable in the data. Most recapture fishes were caught in the same bay where tagged and within 20 km from the release site. This corresponds with previous findings (Matlock and Weaver 1979, Osburn et al. 1982, Osburn and Matlock 1984, Marwitz 1989, Bowling

1996). Red drum were most likely to be recaptured in the same area as released, even after a considerable time at large. Sheepshead showed the most movement, having the highest percentage of fish moving to other bay systems and to the Gulf. They also traveled greater distances, on average, from their release sites than the other major species. Black drum were second to sheepshead in average distance traveled and movement to other bays, followed by spotted seatrout, southern flounder and red drum. In contrast, Green (1986) found that black drum traveled greater distances than other fishes, and southern flounder were most likely to move out of the bay of release. In that study 88.1% of sheepshead remained in the same bay as release compared to 63.6% in this study. All five major species and one minor species, Gulf flounder, were documented moving from bays into the Gulf. Five fishes (two red drum, two spotted seatrout and one black drum) were documented traveling from the Gulf into the bays. No observable patterns in direction of movement within bay systems were apparent for any species, except striped bass which showed downstream and upstream movement within the Trinity River. Most species showed no observable patterns in direction of movement between bay systems or within the Gulf. Previous studies have documented movement patterns related to seasons and water temperatures (Stokes 1977, Ross et al. 1982, Baker et al. 1986). Some seasonality of recaptures was apparent in the present data. These trends may be indicative of seasonal fishing pressure on each species. However, because of the vast amount of data, most patterns in movement were blurred or muted. Future analyses should include evaluation on a smaller scale (e.g., a shorter time period and/or individual location), to tease out specific movement patterns.

Five fishes (two red drum, two black drum and one spotted seatrout) were reported to have traveled into Mexican waters and nine (eight red drum and one southern flounder) into Louisiana waters. Simmons and Bréuer (1982) documented a red drum released in San Antonio Bay and recovered in Tampa Bay, Florida. They also recorded several black drum that were released in lower Laguna Madre and recaptured in Mexican waters. The percentage of fishes traversing state and international borders is probably higher than suggested by this study. Language barriers and political distrust, along with lack of publicity about the tagging program, have most likely hampered reporting rates from Mexico. Lack of publicity may also affect reporting rates from other states. To what extent fishes leave state waters will be hard to determine. However, the fact that some fishes do travel outside Texas waters indicates that bordering countries' and states' fishery management programs may have some effect, though possibly small and localized, on fish populations in Texas waters.

Although growth and growth rates are reported in this paper, the data should be used with caution due to the variability of reported recapture lengths. Over 13% of reported recapture lengths showed negative growth, with growth rates (before elimination of outliers) ranging from -114 to 105 mm TL/day. Although some shrinkage in length is possible from starvation, desiccation or freezing, reported mean shrinkages have not exceeded 12 mm (Ingle et al. 1962, Rice et al. 1989, Topp 1963). Any difference greater than this would be considered suspect, due to erroneous release or recapture measurements, estimated lengths reported as accurate lengths or possibly errors in the reported tag numbers. Ferguson et al. (1984) reported that anglers tended to round measurements to the nearest whole English unit which could cause measurement errors up to ± 12.7 mm. Green et al. (1983) found that the differences between TPWD measurements and anglers' measurements showed a mean of -4 ± 5 mm and ranged between ± 76 mm. Elimination of some outliers is possible, but there is no guarantee that the rest of the measurements are more accurate or precise than the obvious outliers. Growth data from this study may be used to show general trends in growth over time

and estimates of longevity, but more detailed analyses would require more precise methods of measurements (Ferguson et al. 1984). Wittich (1966) and Ferguson et al. (1984) suggested obtaining age and growth information only from fishes that have been free for a reasonable period (such as a year or more). Better estimates could be obtained if age and growth data were available to fishes that had been free for a minimum amount of time. Age and growth were measured by TPWD staff at recapture.

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Table 1. Number of releases, recaptures and recapture rates by species for fishes tagged and released into Texas bays and offshore waters by TPWD from November 1975-December 1999.

| Common name | Scientific name | Releases | Recaptures | Recapture Rate |
|--------------------------|------------------------------------|----------|------------|----------------|
| Alligator gar | <i>Lepisosteus spatula</i> | 15 | 1 | 6.7% |
| Almaco jack | <i>Seriola rivoliana</i> | 1 | | |
| Atlantic croaker | <i>Micropogonias undulatus</i> | 544 | 5 | 0.9% |
| Atlantic sharpnose shark | <i>Rhizoprionodon terraenovae</i> | 5 | | |
| Atlantic spadefish | <i>Chaetodipterus faber</i> | 84 | | |
| Atlantic stingray | <i>Dasyatis sabina</i> | 6 | 1 | 16.7% |
| Bighead searobin | <i>Prionotus tribulus</i> | 2 | | |
| Black drum | <i>Pogonias cromis</i> | 46,580 | 1,413 | 3.0% |
| Black durgon | <i>Melichthys niger</i> | 1 | | |
| Blacktip shark | <i>Carcharhinus limbatus</i> | 1 | | |
| Blue catfish | <i>Ictalurus furcatus</i> | 95 | 2 | 2.1% |
| Bluefish | <i>Pomatomus saltatrix</i> | 5 | | |
| Bonnethead | <i>Sphyrna tiburo</i> | 7 | | |
| Bull shark | <i>Carcharhinus leucas</i> | 41 | 3 | 7.3% |
| Channel catfish | <i>Ictalurus punctatus</i> | 1 | | |
| Cobia | <i>Rachycentron canadum</i> | 1 | | |
| Common carp | <i>Cyprinus carpio</i> | 14 | | |
| Common snook | <i>Centropomus undecimalis</i> | 324 | | |
| Cownose ray | <i>Rhinoptera bonasus</i> | 23 | | |
| Crevalle jack | <i>Caranx hippos</i> | 14 | | |
| Fat snook | <i>Centropomus parallelus</i> | 3 | | |
| Pinescale menhaden | <i>Brevoortia gunteri</i> | 1 | | |
| Finetooth shark | <i>Carcharhinus isodon</i> | 1 | | |
| Flathead catfish | <i>Pylodictis olivaris</i> | 7 | | |
| Florida pompano | <i>Trachinotus carolinus</i> | 145 | 1 | 0.7% |
| Gafftopsail catfish | <i>Bagre marinus</i> | 303 | | |
| Gag | <i>Mycteroperca microlepis</i> | 1 | | |
| Gizzard shad | <i>Dorosoma cepedianum</i> | 9 | | |
| Gray snapper | <i>Lutjanus griseus</i> | 55 | | |
| Gray triggerfish | <i>Balistes capriscus</i> | 19 | | |
| Great hammerhead | <i>Sphyrna mokarran</i> | 1 | | |
| Greater amberjack | <i>Seriola dumerili</i> | 3 | | |
| Gulf flounder | <i>Paralichthys albigutta</i> | 357 | 13 | 3.6% |
| Gulf kingfish | <i>Menticirrhus littoralis</i> | 81 | 1 | 1.2% |
| Gulf menhaden | <i>Brevoortia patonus</i> | 6 | | |
| Gulf toadfish | <i>Opsanus beta</i> | 1 | | |
| Hardhead catfish | <i>Arius felis</i> | 70 | 2 | 2.9% |
| Hybrid bass | <i>Morone saxatilis x chrysops</i> | 3 | | |
| King mackerel | <i>Scomberomorus cavalla</i> | 6 | | |
| Ladyfish | <i>Elops saurus</i> | 1 | | |
| Lane snapper | <i>Lutjanus synagris</i> | 10 | | |
| Largemouth bass | <i>Micropterus salmoides</i> | 6 | | |
| Lemon shark | <i>Negaprion brevirostris</i> | 3 | | |
| Ocellated flounder | <i>Ancylopsetta quadrocellata</i> | 6 | | |
| Palometa | <i>Trachinotus goodei</i> | 5 | | |
| Permit | <i>Trachinotus falcatus</i> | 1 | | |
| Pigfish | <i>Orthopristis chrysoptera</i> | 41 | | |
| Pinfish | <i>Lagodon rhomboides</i> | 17 | | |
| Red drum | <i>Sciaenops ocellatus</i> | 55,091 | 6,094 | 11.1% |
| Red snapper | <i>Lutjanus campechanus</i> | 1505 | 166 | 11.0% |

Table 1. (Cont'd)

| Common name | Scientific name | Releases | Recaptures | Recapture Rate |
|------------------------|-----------------------------------|----------|------------|----------------|
| Remora | <i>Remora remora</i> | 1 | | |
| Rock hind | <i>Epinephelus adscensionis</i> | 1 | | |
| Sand seatrout | <i>Cynoscion arenarius</i> | 27 | | |
| Sharksucker | <i>Echeneis naucrates</i> | 5 | | |
| Sheepshead | <i>Archsargus probatocephalus</i> | 6,977 | 165 | 2.4% |
| Silver seatrout | <i>Cynoscion nothus</i> | 5 | | |
| Smallmouth buffalo | <i>Ictiobus bubalus</i> | 18 | | |
| Southern flounder | <i>Paralichthys lethostigma</i> | 4,439 | 230 | 5.2% |
| Southern kingfish | <i>Menticirrhus americanus</i> | 28 | | |
| Southern stargazer | <i>Astroscopus y-graecum</i> | 4 | | |
| Southern stingray | <i>Dasyatis americana</i> | 2 | | |
| Spanish mackerel | <i>Scomberomorus maculatus</i> | 1 | | |
| Spinner shark | <i>Carcharhinus brevipinna</i> | 2 | | |
| Spot | <i>Leiostomus xanthurus</i> | 143 | | |
| Spotted gar | <i>Lepisosteus oculatus</i> | 3 | | |
| Spotted seatrout | <i>Cynoscion nebulosus</i> | 23,213 | 1,434 | 6.2% |
| Squirrelfish | <i>Holocentrus adscensionis</i> | 1 | | |
| Striped bass | <i>Morone saxatilis</i> | 11,264 | 83 | 0.7% |
| Striped mullet | <i>Mugil cephalus</i> | 125 | | |
| Tarpon | <i>Megalops atlanticus</i> | 56 | 1 | 1.8% |
| Tomate | <i>Haemulon aurolineatum</i> | 11 | | |
| Tripletail | <i>Lobotes surinamensis</i> | 32 | | |
| White bass | <i>Morone chrysops</i> | 6 | | |
| White spotted soapfish | <i>Rypticus maculatus</i> | 2 | | |
| Yellow bass | <i>Morone mississippiensis</i> | 1 | | |
| Yellowedge grouper | <i>Epinephelus flavolimbatus</i> | 1 | 1 | 100.0% |
| | Total | 151,890 | 9,616 | 6.3% |

Table 2. Number of fishes tagged by TPWD in Texas bays and offshore waters by bay system and year from November 1975-December 1999. (Trinity River releases are included in the Galveston Bay System. Brazos and San Bernard Rivers releases are included in the Cedar Lakes area).

| Release Location | Year | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|------------------|-------|----------|------------------|------------|-------------|-------------------|---------------|-------------|
| Sabine Lake | 1975 | 5 | 0 | 2 | 0 | 0 | 0 | 7 |
| | 1976 | 5 | 0 | 8 | 0 | 0 | 0 | 13 |
| | 1986 | 105 | 17 | 150 | 0 | 36 | 4 | 312 |
| | 1987 | 92 | 5 | 90 | 0 | 20 | 1 | 208 |
| | 1988 | 77 | 4 | 51 | 6 | 4 | 3 | 145 |
| | 1989 | 79 | 1 | 50 | 3 | 5 | 0 | 138 |
| | 1990 | 61 | 0 | 19 | 3 | 3 | 0 | 86 |
| | 1991 | 36 | 1 | 26 | 5 | 1 | 790 | 859 |
| | 1992 | 351 | 1 | 30 | 1 | 1 | 3 | 387 |
| | 1993 | 118 | 1 | 52 | 10 | 6 | 11 | 198 |
| | 1994 | 13 | 0 | 51 | 2 | 2 | 0 | 68 |
| | 1995 | 117 | 1 | 86 | 7 | 2 | 11 | 224 |
| | 1996 | 429 | 20 | 140 | 21 | 18 | 4 | 632 |
| | 1997 | 181 | 17 | 65 | 3 | 9 | 0 | 275 |
| | 1998 | 132 | 7 | 40 | 6 | 21 | 0 | 206 |
| | 1999 | 117 | 5 | 35 | 1 | 1 | 0 | 159 |
| | Total | 1,918 | 80 | 895 | 68 | 129 | 827 | 3,917 |
| Galveston Bay | 1975 | 80 | 0 | 47 | 8 | 2 | 0 | 137 |
| | 1976 | 248 | 572 | 335 | 27 | 47 | 61 | 1,290 |
| | 1977 | 160 | 65 | 192 | 26 | 41 | 0 | 484 |
| | 1978 | 302 | 133 | 284 | 70 | 86 | 1 | 876 |
| | 1979 | 260 | 227 | 173 | 37 | 33 | 1 | 731 |
| | 1980 | 241 | 803 | 11 | 17 | 19 | 0 | 1,091 |
| | 1981 | 126 | 762 | 109 | 25 | 14 | 0 | 1,036 |
| | 1982 | 210 | 869 | 43 | 11 | 5 | 0 | 1,138 |
| | 1983 | 1,682 | 703 | 94 | 11 | 3 | 8 | 2,501 |
| | 1984 | 850 | 164 | 141 | 34 | 33 | 5 | 1,227 |
| | 1985 | 1,425 | 300 | 218 | 20 | 47 | 40 | 2,050 |
| | 1986 | 678 | 59 | 136 | 1 | 6 | 93 | 973 |
| | 1987 | 252 | 51 | 199 | 0 | 37 | 7,118 | 7,657 |
| | 1988 | 206 | 53 | 217 | 2 | 37 | 444 | 959 |
| | 1989 | 139 | 54 | 216 | 23 | 20 | 176 | 628 |
| | 1990 | 360 | 103 | 209 | 7 | 29 | 26 | 734 |
| | 1991 | 57 | 46 | 278 | 17 | 22 | 412 | 832 |
| | 1992 | 563 | 128 | 288 | 14 | 42 | 973 | 2,008 |
| 1993 | 629 | 80 | 317 | 18 | 30 | 159 | 1,233 | |
| 1994 | 522 | 94 | 296 | 61 | 21 | 57 | 1,051 | |
| 1995 | 218 | 21 | 390 | 19 | 10 | 76 | 734 | |

Table 2. (Cont'd)

| Release Location | Year | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|--------------------|-------|----------|------------------|------------|-------------|-------------------|---------------|-------------|
| Cedar Lakes area | 1984 | 10 | 137 | 0 | 0 | 3 | 0 | 150 |
| | 1988 | 0 | 0 | 0 | 0 | 0 | 408 | 408 |
| | 1989 | 101 | 0 | 0 | 0 | 0 | 115 | 216 |
| | 1990 | 57 | 4 | 0 | 0 | 0 | 575 | 636 |
| | 1991 | 13 | 0 | 1 | 0 | 0 | 0 | 14 |
| | 1996 | 301 | 1 | 79 | 5 | 37 | 4 | 427 |
| | 1997 | 282 | 3 | 55 | 0 | 20 | 0 | 360 |
| | 1998 | 167 | 0 | 18 | 1 | 5 | 0 | 191 |
| | 1999 | 271 | 0 | 2 | 0 | 0 | 0 | 273 |
| | Total | 1,202 | 145 | 155 | 6 | 65 | 1,102 | 2,675 |
| East Matagorda Bay | 1976 | 78 | 0 | 216 | 13 | 47 | 0 | 354 |
| | 1977 | 73 | 0 | 143 | 78 | 67 | 0 | 361 |
| | 1978 | 79 | 0 | 96 | 56 | 22 | 0 | 253 |
| | 1979 | 53 | 0 | 45 | 4 | 10 | 0 | 112 |
| | 1980 | 102 | 0 | 47 | 30 | 2 | 0 | 181 |
| | 1981 | 37 | 327 | 27 | 13 | 4 | 0 | 408 |
| | 1982 | 83 | 453 | 106 | 27 | 11 | 0 | 680 |
| | 1983 | 102 | 605 | 110 | 95 | 8 | 0 | 920 |
| | 1984 | 108 | 35 | 63 | 33 | 17 | 0 | 256 |
| | 1985 | 42 | 0 | 76 | 25 | 3 | 0 | 146 |
| | 1986 | 792 | 0 | 44 | 33 | 38 | 0 | 907 |
| | 1987 | 487 | 0 | 65 | 2 | 14 | 0 | 568 |
| | 1988 | 91 | 1 | 80 | 12 | 17 | 4 | 205 |
| | 1989 | 112 | 2 | 148 | 28 | 19 | 6 | 315 |
| | 1990 | 100 | 11 | 77 | 54 | 30 | 1 | 273 |
| | 1991 | 62 | 0 | 74 | 33 | 18 | 0 | 187 |
| | 1992 | 119 | 5 | 176 | 28 | 20 | 0 | 348 |
| | 1993 | 367 | 31 | 188 | 52 | 29 | 1 | 668 |
| | 1994 | 269 | 3 | 58 | 59 | 42 | 1 | 432 |
| | 1995 | 277 | 8 | 42 | 46 | 25 | 0 | 398 |
| 1996 | 577 | 4 | 60 | 66 | 21 | 7 | 735 | |
| 1997 | 346 | 13 | 35 | 5 | 3 | 0 | 402 | |
| 1998 | 283 | 15 | 43 | 21 | 31 | 0 | 393 | |
| 1999 | 283 | 8 | 21 | 24 | 2 | 2 | 340 | |
| Total | 4,922 | 1,521 | 2,040 | 837 | 500 | 22 | 9,842 | |
| Matagorda Bay | 1975 | 74 | 0 | 29 | | 11 | 0 | 114 |
| | 1976 | 462 | 1 | 323 | 36 | 58 | 5 | 885 |
| | 1977 | 539 | 0 | 479 | 80 | 28 | 2 | 1,128 |
| | 1978 | 519 | 217 | 268 | 79 | 27 | 0 | 1,110 |
| | 1979 | 771 | 0 | 155 | 60 | 18 | 5 | 1,009 |
| | 1980 | 285 | 0 | 63 | 10 | 8 | 0 | 366 |
| | 1981 | 121 | 405 | 22 | 8 | 3 | 0 | 559 |
| | 1982 | 72 | 633 | 67 | 10 | 4 | 0 | 786 |
| | 1983 | 166 | 626 | 100 | 30 | 16 | 45 | 983 |
| | 1984 | 46 | 305 | 60 | 33 | 3 | 4 | 451 |
| | 1985 | 64 | 0 | 107 | 15 | 12 | 0 | 198 |
| | 1986 | 200 | 0 | 133 | 35 | 24 | 0 | 392 |
| | 1987 | 139 | 0 | 93 | 10 | 19 | 0 | 261 |
| | 1988 | 118 | 1 | 98 | 14 | 12 | 0 | 243 |
| | 1989 | 61 | 1 | 141 | 10 | 22 | 0 | 235 |
| 1990 | 122 | 0 | 102 | 17 | 12 | 1 | 254 | |

Table 2. (Cont'd)

| Release Location | Year | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|---------------------------|-------|----------|------------------|------------|-------------|-------------------|---------------|-------------|
| Matagorda Bay (cont'd) | 1991 | 76 | 3 | 65 | 5 | 7 | 0 | 156 |
| | 1992 | 33 | 1 | 72 | 27 | 4 | 0 | 137 |
| | 1993 | 112 | 8 | 202 | 41 | 13 | 1 | 377 |
| | 1994 | 209 | 1 | 241 | 42 | 29 | 5 | 527 |
| | 1995 | 125 | 8 | 201 | 60 | 32 | 8 | 434 |
| | 1996 | 182 | 3 | 233 | 65 | 11 | 2 | 496 |
| | 1997 | 105 | 3 | 174 | 19 | 3 | 5 | 309 |
| | 1998 | 111 | 4 | 138 | 43 | 23 | 1 | 320 |
| | 1999 | 63 | 0 | 47 | 19 | 4 | 0 | 133 |
| | Total | 4,775 | 2,220 | 3,613 | 768 | 403 | 84 | 11,863 |
| San Antonio Bay | 1975 | 96 | 0 | 76 | 0 | 6 | 0 | 178 |
| | 1976 | 532 | 1 | 186 | 95 | 40 | 20 | 874 |
| | 1977 | 180 | 0 | 106 | 70 | 21 | 11 | 388 |
| | 1978 | 276 | 66 | 103 | 40 | 47 | 2 | 534 |
| | 1979 | 676 | 0 | 154 | 179 | 73 | 8 | 1,090 |
| | 1980 | 278 | 0 | 179 | 80 | 14 | 2 | 553 |
| | 1981 | 143 | 343 | 132 | 128 | 20 | 3 | 769 |
| | 1982 | 50 | 637 | 47 | 2 | 4 | 0 | 740 |
| | 1983 | 60 | 616 | 51 | 3 | 26 | 0 | 756 |
| | 1984 | 83 | 23 | 28 | 3 | 28 | 1 | 166 |
| | 1985 | 62 | 0 | 64 | 11 | 45 | 0 | 182 |
| | 1986 | 169 | 0 | 65 | 5 | 48 | 1 | 288 |
| | 1987 | 212 | 42 | 127 | 8 | 44 | 1 | 434 |
| | 1988 | 156 | 6 | 112 | 14 | 7 | 4 | 299 |
| | 1989 | 153 | 35 | 126 | 25 | 11 | 2 | 352 |
| | 1990 | 88 | 7 | 81 | 37 | 26 | 60 | 299 |
| | 1991 | 58 | 7 | 99 | 26 | 30 | 62 | 282 |
| | 1992 | 219 | 8 | 314 | 43 | 44 | 153 | 781 |
| | 1993 | 185 | 24 | 462 | 33 | 29 | 55 | 788 |
| | 1994 | 116 | 17 | 338 | 77 | 52 | 45 | 645 |
| 1995 | 139 | 23 | 190 | 90 | 20 | 46 | 508 | |
| 1996 | 295 | 13 | 267 | 166 | 14 | 7 | 762 | |
| 1997 | 563 | 140 | 830 | 228 | 24 | 19 | 1,804 | |
| 1998 | 491 | 41 | 153 | 143 | 21 | 4 | 853 | |
| 1999 | 396 | 14 | 210 | 145 | 47 | 0 | 812 | |
| Total | 5,676 | 2,063 | 4,500 | 1,651 | 741 | 506 | 15,137 | |
| Aransas Bay | 1975 | 36 | 0 | 61 | 0 | 3 | 0 | 100 |
| | 1976 | 345 | 23 | 412 | 240 | 38 | 34 | 1,092 |
| | 1977 | 147 | 0 | 135 | 38 | 28 | 2 | 350 |
| | 1978 | 409 | 73 | 238 | 110 | 33 | 8 | 871 |
| | 1979 | 443 | 164 | 226 | 157 | 46 | 7 | 1,043 |
| | 1980 | 1,194 | 219 | 188 | 98 | 51 | 4 | 1,754 |
| | 1981 | 692 | 703 | 150 | 104 | 44 | 4 | 1,697 |
| | 1982 | 296 | 760 | 297 | 70 | 50 | 2 | 1,475 |
| | 1983 | 131 | 686 | 209 | 49 | 30 | 0 | 1,105 |
| | 1984 | 63 | 34 | 74 | 24 | 36 | 2 | 233 |
| | 1985 | 122 | 9 | 61 | 12 | 31 | 280 | 515 |
| | 1986 | 127 | 2 | 87 | 4 | 14 | 1 | 235 |
| | 1987 | 79 | 4 | 79 | 4 | 3 | 1 | 170 |
| | 1988 | 90 | 11 | 97 | 3 | 10 | 2 | 213 |
| | 1989 | 92 | 26 | 260 | 17 | 31 | 0 | 426 |

Table 2. (Cont'd)

| Release Location | Year | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|-------------------------|-------|----------|------------------|------------|-------------|-------------------|---------------|-------------|
| Aransas Bay (cont'd) | 1990 | 169 | 37 | 212 | 23 | 31 | 2 | 474 |
| | 1991 | 120 | 7 | 74 | 0 | 20 | 0 | 221 |
| | 1992 | 166 | 12 | 156 | 18 | 28 | 0 | 380 |
| | 1993 | 258 | 45 | 589 | 17 | 7 | 1 | 917 |
| | 1994 | 534 | 60 | 653 | 54 | 16 | 2 | 1,319 |
| | 1995 | 179 | 84 | 557 | 68 | 24 | 5 | 917 |
| | 1996 | 455 | 101 | 858 | 74 | 35 | 2 | 1,525 |
| | 1997 | 622 | 198 | 763 | 81 | 26 | 4 | 1,694 |
| | 1998 | 277 | 112 | 207 | 77 | 17 | 3 | 693 |
| | 1999 | 279 | 81 | 106 | 53 | 27 | 3 | 549 |
| | Total | 7,325 | 3,451 | 6,749 | 1,395 | 679 | 369 | 19,968 |
| Corpus Christi Bay | 1975 | 60 | 0 | 54 | 28 | 39 | 10 | 191 |
| | 1976 | 155 | 18 | 135 | 131 | 46 | 111 | 596 |
| | 1977 | 225 | 1 | 77 | 55 | 29 | 11 | 398 |
| | 1978 | 268 | 10 | 108 | 127 | 43 | 20 | 576 |
| | 1979 | 337 | 106 | 113 | 98 | 53 | 25 | 732 |
| | 1980 | 307 | 160 | 49 | 29 | 26 | 2 | 573 |
| | 1981 | 190 | 445 | 106 | 7 | 12 | 0 | 760 |
| | 1982 | 96 | 673 | 65 | 3 | 3 | 0 | 840 |
| | 1983 | 46 | 632 | 113 | 0 | 8 | 0 | 799 |
| | 1984 | 80 | 36 | 113 | 11 | 24 | 3 | 267 |
| | 1985 | 142 | 18 | 39 | 27 | 29 | 7 | 262 |
| | 1986 | 124 | 49 | 115 | 8 | 41 | 8 | 345 |
| | 1987 | 113 | 70 | 85 | 7 | 19 | 10 | 304 |
| | 1988 | 119 | 20 | 189 | 10 | 17 | 9 | 364 |
| | 1989 | 122 | 33 | 284 | 48 | 17 | 0 | 504 |
| | 1990 | 188 | 62 | 220 | 95 | 44 | 1 | 610 |
| | 1991 | 325 | 64 | 139 | 15 | 58 | 19 | 620 |
| | 1992 | 3,124 | 127 | 377 | 39 | 47 | 9 | 3,723 |
| | 1993 | 372 | 159 | 1,265 | 48 | 55 | 30 | 1,929 |
| | 1994 | 160 | 72 | 846 | 21 | 36 | 99 | 1,234 |
| | 1995 | 246 | 107 | 887 | 82 | 29 | 65 | 1,416 |
| 1996 | 490 | 63 | 1,153 | 109 | 24 | 73 | 1,912 | |
| 1997 | 532 | 104 | 501 | 4 | 21 | 34 | 1,196 | |
| 1998 | 343 | 51 | 24 | 8 | 19 | 11 | 456 | |
| 1999 | 233 | 49 | 1 | 1 | 8 | 16 | 308 | |
| Total | 8,397 | 3,129 | 7,058 | 1,011 | 747 | 573 | 20,915 | |
| Upper Laguna Madre | 1975 | 31 | 0 | 129 | 0 | 6 | 0 | 166 |
| | 1976 | 121 | 8 | 248 | 6 | 3 | 49 | 435 |
| | 1977 | 65 | 3 | 102 | 5 | 0 | 0 | 175 |
| | 1978 | 94 | 27 | 1,463 | 0 | 15 | 0 | 1,599 |
| | 1979 | 113 | 49 | 96 | 0 | 2 | 0 | 260 |
| | 1980 | 203 | 44 | 124 | 22 | 8 | 0 | 401 |
| | 1981 | 92 | 353 | 142 | 0 | 7 | 0 | 594 |
| | 1982 | 66 | 624 | 78 | 0 | 17 | 0 | 785 |
| | 1983 | 40 | 602 | 41 | 0 | 12 | 0 | 695 |
| | 1984 | 86 | 0 | 85 | 0 | 2 | 0 | 173 |
| | 1985 | 201 | 9 | 241 | 0 | 24 | 8 | 483 |
| | 1986 | 51 | 4 | 208 | 1 | 21 | 0 | 285 |
| | 1987 | 77 | 4 | 208 | 0 | 3 | 0 | 292 |
| 1988 | 73 | 1 | 285 | 3 | 5 | 2 | 369 | |

Table 2. (Cont'd)

| Release Location | Year | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|-----------------------------------|-------|----------|------------------|------------|-------------|-------------------|---------------|-------------|
| Upper Laguna Madre (cont'd) | 1989 | 28 | 14 | 544 | 7 | 3 | 3 | 599 |
| | 1990 | 50 | 1 | 290 | 23 | 4 | 10 | 378 |
| | 1991 | 986 | 26 | 255 | 10 | 46 | 1 | 1,324 |
| | 1992 | 112 | 63 | 323 | 18 | 9 | 7 | 532 |
| | 1993 | 179 | 17 | 547 | 13 | 6 | 7 | 769 |
| | 1994 | 134 | 17 | 724 | 6 | 11 | 10 | 902 |
| | 1995 | 187 | 27 | 2,085 | 9 | 7 | 28 | 2,343 |
| | 1996 | 228 | 52 | 2,095 | 20 | 3 | 4 | 2,402 |
| | 1997 | 264 | 83 | 858 | 41 | 17 | 24 | 1,287 |
| | 1998 | 223 | 64 | 54 | 16 | 17 | 13 | 387 |
| | 1999 | 202 | 52 | 14 | 18 | 0 | 10 | 296 |
| | Total | 3,906 | 2,144 | 11,239 | 218 | 248 | 176 | 17,931 |
| Lower Laguna Madre | 1975 | 32 | 0 | 72 | 0 | 13 | 0 | 117 |
| | 1976 | 199 | 16 | 209 | 20 | 15 | 181 | 640 |
| | 1977 | 139 | 2 | 285 | 10 | 11 | 0 | 447 |
| | 1978 | 421 | 174 | 481 | 242 | 31 | 6 | 1,355 |
| | 1979 | 183 | 57 | 140 | 75 | 21 | 25 | 501 |
| | 1980 | 218 | 53 | 90 | 8 | 6 | 3 | 378 |
| | 1981 | 298 | 467 | 54 | 10 | 4 | 3 | 836 |
| | 1982 | 185 | 637 | 38 | 0 | 2 | 0 | 862 |
| | 1983 | 98 | 612 | 7 | 0 | 5 | 1 | 723 |
| | 1984 | 160 | 21 | 7 | 0 | 0 | 0 | 188 |
| | 1985 | 349 | 11 | 153 | 0 | 1 | 1 | 515 |
| | 1986 | 133 | 0 | 163 | 1 | 23 | 1 | 321 |
| | 1987 | 82 | 3 | 168 | 2 | 20 | 5 | 280 |
| | 1988 | 109 | 2 | 146 | 0 | 6 | 1 | 264 |
| | 1989 | 116 | 6 | 106 | 0 | 1 | 0 | 229 |
| | 1990 | 201 | 8 | 263 | 0 | 2 | 1 | 475 |
| | 1991 | 270 | 15 | 65 | 0 | 25 | 3 | 378 |
| | 1992 | 464 | 26 | 128 | 1 | 8 | 4 | 631 |
| | 1993 | 400 | 39 | 389 | 29 | 4 | 8 | 869 |
| | 1994 | 411 | 15 | 362 | 5 | 0 | 5 | 798 |
| | 1995 | 255 | 2 | 507 | 21 | 1 | 11 | 797 |
| | 1996 | 173 | 19 | 456 | 33 | 7 | 20 | 708 |
| | 1997 | 310 | 2 | 241 | 6 | 6 | 7 | 572 |
| 1998 | 231 | 5 | 74 | 0 | 6 | 7 | 323 | |
| 1999 | 231 | 20 | 51 | 3 | 1 | 5 | 311 | |
| Total | 5,668 | 2,212 | 4,655 | 466 | 219 | 298 | 13,518 | |
| Gulf of Mexico off Sabine Lake | 1987 | 0 | 2 | 2 | 0 | 1 | 2 | 7 |
| | 1988 | 3 | 41 | 8 | 1 | 2 | 47 | 102 |
| | 1989 | 2 | 18 | 25 | 0 | 4 | 5 | 54 |
| | 1990 | 0 | 15 | 11 | 0 | 1 | 2 | 29 |
| | 1991 | 14 | 29 | 18 | 0 | 4 | 10 | 75 |
| | 1992 | 1 | 3 | 0 | 0 | 2 | 0 | 6 |
| | 1993 | 12 | 3 | 2 | 0 | 1 | 22 | 40 |
| | 1994 | 0 | 9 | 0 | 0 | 0 | 1 | 10 |
| | 1995 | 0 | 8 | 17 | 0 | 3 | 22 | 50 |
| | 1996 | 5 | 0 | 0 | 1 | 0 | 0 | 6 |
| | 1997 | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| | 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 37 | 129 | 83 | 3 | 18 | 111 | 381 | |

Table 2. (Cont'd)

| Release Location | Year | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|--|-------|----------|------------------|------------|-------------|-------------------|---------------|-------------|
| Gulf of Mexico off Galveston | 1976 | 9 | 0 | 0 | 0 | 0 | 0 | 9 |
| | 1977 | 8 | 0 | 0 | 0 | 0 | 0 | 8 |
| | 1987 | 0 | 3 | 0 | 0 | 1 | 0 | 4 |
| | 1988 | 2 | 59 | 6 | 1 | 7 | 28 | 103 |
| | 1989 | 4 | 49 | 6 | 0 | 4 | 0 | 63 |
| | 1990 | 1 | 32 | 3 | 2 | 0 | 3 | 41 |
| | 1991 | 3 | 29 | 3 | 1 | 12 | 5 | 53 |
| | 1992 | 3 | 37 | 3 | 2 | 4 | 1 | 50 |
| | 1993 | 1 | 31 | 31 | 4 | 5 | 2 | 74 |
| | 1994 | 7 | 20 | 15 | 3 | 3 | 6 | 54 |
| | 1995 | 0 | 8 | 8 | 0 | 3 | 253 | 272 |
| | 1996 | 1 | 0 | 0 | 0 | 0 | 681 | 682 |
| | 1997 | 0 | 0 | 0 | 0 | 0 | 86 | 86 |
| | 1998 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| | 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | | 39 | 268 | 75 | 13 | 39 | 1,067 | 1,501 |
| Gulf of Mexico off Matagorda Bay | 1981 | 7 | 0 | 0 | 0 | 0 | 0 | 7 |
| | 1982 | 3 | 0 | 0 | 0 | 0 | 0 | 3 |
| | 1987 | 4 | 11 | 8 | 0 | 0 | 3 | 26 |
| | 1988 | 7 | 50 | 9 | 1 | 0 | 7 | 74 |
| | 1989 | 3 | 26 | 15 | 1 | 0 | 3 | 48 |
| | 1990 | 5 | 12 | 26 | 0 | 0 | 11 | 54 |
| | 1991 | 19 | 17 | 9 | 2 | 0 | 10 | 57 |
| | 1992 | 28 | 33 | 33 | 3 | 3 | 15 | 115 |
| | 1993 | 1 | 4 | 11 | 0 | 0 | 15 | 31 |
| | 1994 | 1 | 0 | 0 | 0 | 0 | 10 | 11 |
| | 1995 | 4 | 6 | 3 | 2 | 1 | 5 | 21 |
| | 1996 | 0 | 1 | 1 | 2 | 0 | 0 | 4 |
| | 1997 | 0 | 0 | 0 | 0 | 0 | 17 | 17 |
| | 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1999 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| Total | | 82 | 160 | 115 | 11 | 4 | 100 | 472 |
| Gulf of Mexico off Corpus Christi Bay | 1979 | 0 | 0 | 0 | 0 | 0 | 270 | 270 |
| | 1987 | 0 | 5 | 3 | 0 | 2 | 0 | 10 |
| | 1988 | 1 | 8 | 5 | 1 | 0 | 9 | 24 |
| | 1989 | 6 | 16 | 35 | 1 | 2 | 15 | 75 |
| | 1990 | 12 | 16 | 27 | 1 | 3 | 31 | 90 |
| | 1991 | 41 | 15 | 43 | 0 | 3 | 22 | 124 |
| | 1992 | 15 | 8 | 3 | 0 | 1 | 19 | 46 |
| | 1993 | 70 | 2 | 2 | 0 | 1 | 2 | 77 |
| | 1994 | 15 | 11 | 3 | 0 | 0 | 84 | 113 |
| | 1995 | 5 | 21 | 2 | 0 | 0 | 162 | 190 |
| | 1996 | 2 | 0 | 0 | 0 | 0 | 11 | 13 |
| | 1997 | 0 | 0 | 1 | 0 | 0 | 10 | 11 |
| | 1998 | 26 | 0 | 0 | 0 | 0 | 1 | 27 |
| | 1999 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| | Total | | 203 | 102 | 124 | 3 | 12 | 636 |
| Gulf of Mexico off Laguna Madre | 1988 | 0 | 6 | 1 | 1 | 0 | 3 | 11 |
| | 1989 | 2 | 1 | 2 | 0 | 0 | 0 | 5 |
| | 1990 | 1 | 6 | 4 | 0 | 0 | 1 | 12 |
| | 1991 | 0 | 0 | 3 | 0 | 0 | 0 | 3 |
| | 1992 | 4 | 1 | 2 | 0 | 0 | 0 | 7 |

Table 2. (Cont'd)

| Release Location | Year | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|------------------|-------|----------|------------------|------------|-------------|-------------------|---------------|-------------|
| Gulf of Mexico | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| off Laguna Madre | 1994 | 0 | 2 | 0 | 0 | 0 | 1 | 3 |
| (cont'd) | 1995 | 0 | 0 | 8 | 1 | 0 | 22 | 31 |
| | 1996 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 7 | 16 | 20 | 2 | 0 | 27 | 72 |
| Coastwide | 1975 | 414 | 0 | 470 | 36 | 80 | 10 | 1,010 |
| | 1976 | 2,154 | 639 | 2,072 | 568 | 294 | 461 | 6,188 |
| | 1977 | 1,536 | 71 | 1,519 | 362 | 225 | 26 | 3,739 |
| | 1978 | 2,368 | 700 | 3,041 | 724 | 304 | 37 | 7,174 |
| | 1979 | 2,836 | 603 | 1,102 | 610 | 256 | 341 | 5,748 |
| | 1980 | 2,828 | 1,279 | 751 | 294 | 134 | 11 | 5,297 |
| | 1981 | 1,706 | 3,805 | 742 | 295 | 108 | 10 | 6,666 |
| | 1982 | 1,061 | 5,286 | 741 | 123 | 96 | 2 | 7,309 |
| | 1983 | 2,325 | 5,082 | 725 | 188 | 108 | 54 | 8,482 |
| | 1984 | 1,486 | 755 | 571 | 138 | 146 | 15 | 3,111 |
| | 1985 | 2,407 | 347 | 959 | 110 | 192 | 336 | 4,351 |
| | 1986 | 2,379 | 131 | 1,101 | 88 | 251 | 108 | 4,058 |
| | 1987 | 1,537 | 200 | 1,127 | 33 | 183 | 7,141 | 10,221 |
| | 1988 | 1,052 | 263 | 1,304 | 69 | 124 | 971 | 3,783 |
| | 1989 | 1,020 | 282 | 1,958 | 163 | 139 | 325 | 3,887 |
| | 1990 | 1,415 | 314 | 1,544 | 262 | 185 | 725 | 4,445 |
| | 1991 | 2,080 | 259 | 1,152 | 114 | 246 | 1,334 | 5,185 |
| | 1992 | 5,202 | 453 | 1,905 | 194 | 213 | 1,184 | 9,151 |
| | 1993 | 2,704 | 444 | 4,057 | 265 | 186 | 314 | 7,970 |
| | 1994 | 2,391 | 321 | 3,587 | 330 | 212 | 326 | 7,167 |
| | 1995 | 1,752 | 324 | 4,983 | 405 | 157 | 714 | 8,335 |
| | 1996 | 3,388 | 297 | 5,613 | 587 | 186 | 846 | 10,917 |
| | 1997 | 3,796 | 712 | 3,860 | 411 | 145 | 214 | 9,138 |
| | 1998 | 2,765 | 370 | 983 | 339 | 171 | 44 | 4,672 |
| | 1999 | 2,488 | 276 | 713 | 269 | 98 | 42 | 3,886 |
| | Total | 55,090 | 23,213 | 46,580 | 6,977 | 4,439 | 15,591 | 151,890 |

Table 3. Number of "other species" of fishes tagged by TPWD by bay system and year from November 1975-December 1999.

| Release Location | Year | Common Name | Number | Release Location | Year | Common name | Number |
|------------------|---------------------|--------------------------|-----------------------|---------------------------|-----------------------|------------------|--------|
| Sabine Lake | 1986 | Atlantic croaker | 4 | Galveston Bay (cont'd) | 1994 | Atlantic croaker | 1 |
| | 1987 | Yellow bass | 1 | | Blue catfish | 3 | |
| | 1988 | Atlantic croaker | 1 | | Gafftopsail catfish | 10 | |
| | | Gafftopsail catfish | 2 | | Gray snapper | 1 | |
| | 1991 | Atlantic croaker | 1 | | Striped bass | 41 | |
| | | Blue catfish | 5 | | Tripletail | 1 | |
| | | Striped bass | 784 | | Atlantic croaker | 11 | |
| | 1992 | Atlantic croaker | 1 | | Atlantic spadefish | 4 | |
| | | Blue catfish | 2 | | Blue catfish | 9 | |
| | 1993 | Atlantic croaker | 4 | | Bull shark | 1 | |
| | | Blue catfish | 4 | | Florida pompano | 1 | |
| | | Largemouth bass | 3 | | Gafftopsail catfish | 3 | |
| | 1995 | Blue catfish | 9 | | Gray snapper | 3 | |
| | | Largemouth bass | 2 | | Permit | 1 | |
| | 1996 | Atlantic croaker | 1 | | Spot | 42 | |
| Blue catfish | | 2 | Tarpon | 1 | | | |
| Tripletail | | 1 | 1996 Atlantic croaker | 15 | | | |
| Galveston Bay | 1976 | Atlantic croaker | 47 | Bull shark | 5 | | |
| | | Gizzard shad | 2 | Gafftopsail catfish | 8 | | |
| | | Hardhead catfish | 6 | Pigfish | 1 | | |
| | | Spot | 1 | Spot | 1 | | |
| | | Striped mullet | 4 | Tripletail | 1 | | |
| | 1978 | Tripletail | 1 | 1997 Bull shark | 2 | | |
| | | Gulf flounder | 1 | Gafftopsail catfish | 1 | | |
| | 1979 | Gulf flounder | 1 | Smallmouth buffalo | 4 | | |
| | 1983 | Atlantic croaker | 8 | Tripletail | 1 | | |
| | 1984 | Atlantic croaker | 5 | 1998 Atlantic croaker | 1 | | |
| | 1985 | Striped bass | 39 | Bull shark | 1 | | |
| | | Tarpon | 1 | 1999 Gafftopsail catfish | 1 | | |
| | 1986 | Striped bass | 91 | Cedar Lakes | 1988 Striped bass | 408 | |
| | | Tarpon | 2 | | 1989 Striped bass | 115 | |
| | 1987 | Striped bass | 7,11 | | 1990 Striped bass | 575 | |
| Atlantic croaker | | 7 | 1996 Atlantic croaker | | 3 | | |
| 1988 | Gizzard shad | 1 | Atlantic spadefish | | 1 | | |
| | Striped bass | 436 | East Matagorda Bay | | 1988 Hardhead catfish | 4 | |
| | Gafftopsail catfish | 3 | | | 1989 Hardhead catfish | 6 | |
| Sand seatrout | 1 | 1990 Tripletail | | | 1 | | |
| Striped bass | 172 | 1993 Gafftopsail catfish | | | 1 | | |
| 1990 | Gafftopsail catfish | 1 | | | 1994 Blue catfish | 1 | |
| | Striped bass | 24 | | 1996 Atlantic croaker | 7 | | |
| | Striped mullet | 1 | | 1999 Bighead searobin | 1 | | |
| 1991 | Atlantic croaker | 3 | | Gulf flounder | 1 | | |
| | Gafftopsail catfish | 16 | | Matagorda Bay | 1976 Gulf flounder | 2 | |
| | Striped bass | 393 | | | Hardhead catfish | 1 | |
| 1992 | Atlantic croaker | 4 | Southern kingfish | | 2 | | |
| | Blue catfish | 12 | 1977 Crevalle jack | | 1 | | |
| | Gafftopsail catfish | 23 | Gulf flounder | | 1 | | |
| | Gulf menhaden | 1 | 1979 Gulf flounder | | 5 | | |
| | Pigfish | 1 | 1983 Striped bass | | 1 | | |
| 1993 | Striped bass | 931 | Tarpon | | 44 | | |
| | Striped mullet | 1 | 1984 Striped bass | | 4 | | |
| | Atlantic croaker | 5 | 1990 Tripletail | | 1 | | |
| | Blue catfish | 6 | 1993 Gulf flounder | | 1 | | |
| | Bull shark | 1 | 1994 Bonnethead | | 1 | | |
| | Gafftopsail catfish | 13 | Tarpon | | 1 | | |
| | Hybrid bass | 2 | | | | | |
| | Striped bass | 132 | | | | | |

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Table 3. (Cont'd)

| Release Location | Year | Common Name | Number | Release Location | Year | Common name | Number |
|---------------------------|---------------------|---------------------|--------|-----------------------------|---------------------|---------------------|--------|
| Matagorda Bay (cont'd) | 1994 | Tripletail | 3 | San Antonio Bay (cont'd) | 1991 | Striped mullet | 3 |
| | 1995 | Blue catfish | 7 | | 1992 | Alligator gar | 7 |
| | | Tripletail | 1 | | | Atlantic croaker | 1 |
| | 1996 | Tripletail | 2 | | | Blue catfish | 5 |
| | 1997 | Blue catfish | 2 | | | Bluefish | 1 |
| | | Cownose ray | 1 | | | Bull shark | 4 |
| | | Florida pompano | 1 | | | Common carp | 2 |
| | | Tarpon | 1 | | | Florida pompano | 1 |
| | 1998 | Bull shark | 1 | | | Gafftopsail catfish | 118 |
| | | | | | | Gulf flounder | 5 |
| San Antonio Bay | 1976 | Atlantic spadefish | 2 | | Pinfish | 1 | |
| | | Florida pompano | 1 | | Sand seatrout | 1 | |
| | | Gulf flounder | 17 | | Smallmouth buffalo | 4 | |
| | 1977 | Gulf flounder | 11 | | Striped mullet | 3 | |
| | 1978 | Gulf flounder | 1 | 1993 | Atlantic croaker | 7 | |
| | | White bass | 1 | | Atlantic stingray | 1 | |
| | 1979 | Gulf flounder | 3 | | Bull shark | 6 | |
| | | White bass | 5 | | Common carp | 3 | |
| | 1980 | Gulf flounder | 1 | | Cownose ray | 4 | |
| | | Largemouth bass | 1 | | Florida pompano | 2 | |
| | 1981 | Gulf flounder | 3 | | Gafftopsail catfish | 25 | |
| | 1984 | Gulf flounder | 1 | | Gizzard shad | 1 | |
| | 1986 | Florida pompano | 1 | | Hardhead catfish | 3 | |
| | 1987 | Flathead catfish | 1 | | Southern kingfish | 2 | |
| | 1988 | Gulf flounder | 4 | | Tripletail | 1 | |
| | 1989 | Gafftopsail catfish | 1 | 1994 | Atlantic croaker | 5 | |
| | | Gulf flounder | 1 | | Atlantic spadefish | 1 | |
| | 1990 | Alligator gar | 1 | | Atlantic stingray | 1 | |
| | | Atlantic spadefish | 1 | | Bighead searobin | 1 | |
| | | Blue catfish | 1 | | Blue catfish | 13 | |
| | | Crevalle jack | 1 | | Bull shark | 4 | |
| | | Florida pompano | 3 | | Channel catfish | 1 | |
| | | Gafftopsail catfish | 40 | | Common carp | 3 | |
| | | Gulf flounder | 2 | | Cownose ray | 5 | |
| | | Hardhead catfish | 2 | | Florida pompano | 1 | |
| | | Lemon shark | 1 | | Gray snapper | 3 | |
| | | Smallmouth buffalo | 3 | | Hardhead catfish | 1 | |
| | | Spotted gar | 2 | | Ocellated flounder | 1 | |
| | | Striped mullet | 1 | | Smallmouth buffalo | 4 | |
| | | Tarpon | 1 | | Striped mullet | 1 | |
| | | Tripletail | 1 | 1995 | Atlantic croaker | 3 | |
| | 1991 | Alligator gar | 4 | | Atlantic spadefish | 1 | |
| | | Atlantic croaker | 1 | Atlantic stingray | 1 | | |
| | | Atlantic spadefish | 1 | | Blue catfish | 6 | |
| | | Atlantic stingray | 1 | | Bull shark | 1 | |
| | | Blue catfish | 3 | | Cownose ray | 7 | |
| | | Bluefish | 2 | | Flathead catfish | 6 | |
| | | Bull shark | 10 | | Florida pompano | 3 | |
| | | Common carp | 2 | | Gizzard shad | 1 | |
| | | Cownose ray | 1 | | Gulf flounder | 5 | |
| | Finescale menhaden | 1 | | Gulf menhaden | 4 | | |
| | Finetooth shark | 1 | | Ocellated flounder | 1 | | |
| | Gafftopsail catfish | 23 | | Pigfish | 1 | | |
| | Gizzard shad | 1 | | Pinfish | 1 | | |
| | Gulf flounder | 1 | | Spot | 1 | | |
| | Hardhead catfish | 4 | | Striped mullet | 4 | | |
| | Smallmouth buffalo | 1 | 1996 | Atlantic spadefish | 2 | | |
| | Spot | 1 | | Bull shark | 2 | | |
| | Spotted gar | 1 | | Gulf flounder | 2 | | |

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Table 3. (Cont'd)

| Release Location | Year | Common Name | Number | Release Location | Year | Common name | Number | | |
|-----------------------------|--------------------|---------------------|--------------------|-----------------------------|--------------------|--------------------|------------------|--------------------|---------------|
| Corpus Christi Bay (cont'd) | 1995 | Pinfish | 1 | Upper Laguna Madre (cont'd) | 1996 | Gulf flounder | 1 | | |
| | | Sand seatrout | 1 | | | Spot | 2 | | |
| | | Spot | 1 | | 1997 | Atlantic croaker | 19 | | |
| | | Tripletail | 2 | | | Cownose ray | 1 | | |
| | 1996 | Atlantic croaker | 33 | | | Florida pompano | 2 | | |
| | | Atlantic spadefish | 11 | | | Gulf flounder | 2 | | |
| | | Cownose ray | 1 | | 1998 | Atlantic croaker | 5 | | |
| | | Crevalle jack | 1 | | | Common snook | 1 | | |
| | | Florida pompano | 6 | | | Gray snapper | 1 | | |
| | | Gafftopsail catfish | 2 | | Gulf flounder | 5 | | | |
| | | Gray snapper | 3 | | Spot | 1 | | | |
| | | Gulf flounder | 12 | | 1999 | Atlantic croaker | 3 | | |
| | | Striped mullet | 1 | | | Atlantic spadefish | 1 | | |
| | | Tripletail | 3 | | | Common snook | 1 | | |
| | | 1997 | Atlantic croaker | | 1 | Florida pompano | 3 | | |
| | Atlantic spadefish | | 6 | | Gulf flounder | 2 | | | |
| | | Florida pompano | 17 | | Lower Laguna Madre | 1976 | Atlantic croaker | 57 | |
| | | Gafftopsail catfish | 2 | | | | Gulf flounder | 1 | |
| | | Gulf flounder | 7 | | | | Hardhead catfish | 23 | |
| | | Tripletail | 1 | | | | Pigfish | 3 | |
| | 1998 | Atlantic spadefish | 1 | | | | Pinfish | 3 | |
| | | Blue catfish | 1 | | | | Spot | 40 | |
| | | Gafftopsail catfish | 1 | | | | Striped mullet | 54 | |
| | | Gray snapper | 2 | | | | 1978 | Crevalle jack | 2 |
| | Gulf flounder | 5 | Gulf flounder | | | | | 4 | |
| | 1999 | Tripletail | 1 | | | | 1979 | Atlantic croaker | 21 |
| | | Atlantic croaker | 2 | | | | | Gulf flounder | 4 |
| | | Florida pompano | 2 | | | | 1980 | Gulf flounder | 3 |
| | Gulf flounder | 12 | Atlantic croaker | | | | | 2 | |
| Upper Laguna Madre | 1976 | Atlantic croaker | 29 | 1981 | | | Gulf flounder | 1 | |
| | | Gulf flounder | 6 | | | | 1983 | Common snook | 1 |
| | | Hardhead catfish | 8 | | | | 1985 | Common snook | 1 |
| | | Pinfish | 2 | | | | | 1986 | Common snook |
| | | Striped mullet | 4 | | | | 1987 | Common snook | 4 |
| | 1985 | Atlantic croaker | 8 | | | | | Fat snook | 1 |
| | | 1988 | Atlantic croaker | | | | 1 | 1988 | Gulf flounder |
| | Atlantic spadefish | | 1 | | | | 1990 | Common snook | 1 |
| | 1989 | Florida pompano | 1 | | | | 1991 | Gulf flounder | 3 |
| | | Gulf flounder | 2 | | | | 1992 | Gulf flounder | 4 |
| | 1990 | Atlantic spadefish | 1 | | | | 1993 | Atlantic croaker | 2 |
| | | Florida pompano | 7 | | | | | Common snook | 5 |
| | | Gulf flounder | 2 | | | | Florida pompano | 1 | |
| | 1991 | Gulf flounder | 1 | | | | 1994 | Atlantic spadefish | 2 |
| | | 1992 | Atlantic spadefish | | | | | 4 | Common snook |
| | Cownose ray | | 2 | | | | | Crevalle jack | 1 |
| | | Gulf flounder | 1 | | 1995 | Atlantic spadefish | 2 | | |
| | | 1993 | Common snook | | | 2 | Bonnethead | 2 | |
| | Florida pompano | | 4 | | | Common snook | 3 | | |
| | Striped mullet | 1 | Florida pompano | | 1 | | | | |
| | 1994 | Atlantic croaker | 1 | | Gulf flounder | 2 | | | |
| | | Atlantic spadefish | 2 | | Spot | 1 | | | |
| | | Florida pompano | 2 | | 1996 | Atlantic croaker | 2 | | |
| | Gulf flounder | 5 | Atlantic spadefish | | | 1 | | | |
| | 1995 | Atlantic croaker | 9 | | Common snook | 3 | | | |
| | | Atlantic spadefish | 1 | | Fat snook | 1 | | | |
| | | Florida pompano | 17 | | Florida pompano | 1 | | | |
| | | Spot | 1 | | Gray snapper | 10 | | | |
| | | 1996 | Common snook | | 1 | Gulf flounder | 1 | | |

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Table 3. (Cont'd)

| Release Location | Year | Common Name | Number | Release Location | Year | Common name | Number |
|-------------------|------|--------------------------|--------|-------------------|------|--------------------------|--------|
| Lower Laguna | 1996 | Spot | 1 | Gulf of Mexico | 1995 | Southern kingfish | 4 |
| Madre (cont'd) | 1997 | Alligator gar | 1 | off Galveston Bay | 1996 | Atlantic croaker | 2 |
| | | Atlantic spadefish | 1 | (cont'd) | | Atlantic spadefish | 2 |
| | | Common snook | 2 | | | Gafftopsail catfish | 7 |
| | | Florida pompano | 1 | | | Gray triggerfish | 18 |
| | | Gulf flounder | 1 | | | Pigfish | 20 |
| | | Tripletail | 1 | | | Pinfish | 3 |
| | 1998 | Common snook | 5 | | | Red snapper | 623 |
| | | Gulf flounder | 2 | | | Sand seatrout | 2 |
| | 1999 | Common snook | 3 | | | Southern kingfish | 1 |
| | | Florida pompano | 1 | | | Spanish mackerel | 1 |
| | | Gulf flounder | 1 | | | Whitespotted soapfish | 2 |
| Gulf of Mexico | 1987 | Atlantic croaker | 1 | | 1997 | Almaco jack | 1 |
| off Sabine Lake | | Sand seatrout | 1 | | | Atlantic sharpnose shark | 1 |
| | 1988 | Atlantic croaker | 25 | | | Cobia | 1 |
| | | Bluefish | 1 | | | Gray triggerfish | 1 |
| | | Florida pompano | 3 | | | Red snapper | 70 |
| | | Sand seatrout | 2 | | | Sharksucker | 1 |
| | | Spot | 16 | | | Tomtate | 11 |
| | 1989 | Atlantic croaker | 1 | | 1998 | Black durgon | 1 |
| | | Striped mullet | 4 | | | Squirrelfish | 1 |
| | 1990 | Florida pompano | 2 | Gulf of Mexico | 1987 | Gulf kingfish | 3 |
| | 1991 | Atlantic croaker | 8 | off Matagorda | 1988 | Gulf kingfish | 6 |
| | | Atlantic spadefish | 1 | Bay | | Southern kingfish | 1 |
| | | Florida pompano | 1 | | 1989 | Gulf kingfish | 2 |
| | 1993 | Gulf kingfish | 1 | | | Southern kingfish | 1 |
| | | Spot | 4 | | 1990 | Blacktip shark | 1 |
| | | Striped mullet | 17 | | | Gulf kingfish | 8 |
| | 1994 | Gulf kingfish | 1 | | | Southern kingfish | 2 |
| | 1995 | Atlantic croaker | 1 | | 1991 | Atlantic croaker | 1 |
| | | Bonnethead | 1 | | | Bull shark | 1 |
| | | Red snapper | 20 | | | Florida pompano | 2 |
| Gulf of Mexico | 1988 | Atlantic croaker | 10 | | | Gulf kingfish | 3 |
| off Galveston Bay | | Sand seatrout | 7 | | | Sand seatrout | 1 |
| | | Spot | 11 | | | Southern kingfish | 1 |
| | 1990 | Florida pompano | 2 | | 1992 | Tarpon | 1 |
| | | Southern kingfish | 1 | | | Atlantic spadefish | 4 |
| | 1991 | Atlantic spadefish | 2 | | | Florida pompano | 2 |
| | | Atlantic stingray | 1 | | | Gulf kingfish | 1 |
| | | Florida pompano | 1 | | | Ladyfish | 1 |
| | | Sand seatrout | 1 | | | Lane snapper | 1 |
| | 1992 | Southern kingfish | 1 | | | Palometa | 1 |
| | 1993 | Gulf kingfish | 1 | | | Red snapper | 1 |
| | | Southern kingfish | 1 | | | Southern kingfish | 1 |
| | 1994 | Gulf kingfish | 5 | | 1993 | Southern stargazer | 3 |
| | | Sand seatrout | 1 | | | Florida pompano | 4 |
| | 1995 | Atlantic sharpnose shark | 1 | | | Gulf kingfish | 8 |
| | | Atlantic spadefish | 10 | | | Silver seatrout | 1 |
| | | Gulf toadfish | 1 | | | Southern kingfish | 1 |
| | | King mackerel | 3 | | 1994 | Striped mullet | 1 |
| | | Lane snapper | 1 | | | Gulf kingfish | 4 |
| | | Pigfish | 13 | | | Lemon shark | 1 |
| | | Red snapper | 207 | | | Sand seatrout | 1 |
| | | Rock hind | 1 | | | Southern stargazer | 1 |
| | | Sand seatrout | 4 | | | Striped mullet | 3 |
| | | Sharksucker | 1 | | 1995 | Gulf flounder | 1 |
| | | Silver seatrout | 4 | | | Gulf kingfish | 4 |
| | | | | | 1997 | Gulf kingfish | 1 |
| | | | | | | | |

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Table 3. (Cont'd)

| Release Location | Year | Common Name | Number |
|--------------------|------|--------------------------|--------|
| Gulf of Mexico | 1997 | Red snapper | 16 |
| off Matagorda | 1999 | Lane snapper | 4 |
| Bay (cont'd) | | | |
| Gulf of Mexico | 1979 | Greater amberjack | 3 |
| off Corpus Christi | | Lane snapper | 2 |
| Bay | | Red snapper | 265 |
| | 1988 | Gulf kingfish | 9 |
| | 1989 | Florida pompano | 2 |
| | | Gulf kingfish | 8 |
| | | Palometa | 4 |
| | | Spot | 1 |
| | 1990 | Gulf kingfish | 2 |
| | | Red snapper | 24 |
| | | Southern kingfish | 3 |
| | | Southern stingray | 1 |
| | | Spot | 1 |
| | 1991 | Atlantic croaker | 1 |
| | | Florida pompano | 1 |
| | | Gulf kingfish | 2 |
| | | Red snapper | 18 |
| | 1992 | Atlantic sharpnose shark | 1 |
| | | Crevalle jack | 5 |
| | | Great hammerhead | 1 |
| | | Gulf kingfish | 1 |
| | | King mackerel | 3 |
| | | Red snapper | 5 |
| | | Remora | 1 |
| | | Southern kingfish | 1 |
| | | Spinner shark | 1 |
| | 1993 | Gulf kingfish | 2 |
| | 1994 | Bluefish | 1 |
| | | Florida pompano | 19 |
| | | Red snapper | 64 |
| | 1995 | Atlantic spadefish | 1 |
| | | Gulf kingfish | 5 |
| | | Lane snapper | 2 |
| | | Red snapper | 152 |
| | | Southern kingfish | 1 |
| | | Yellowedge grouper | 1 |
| | 1996 | Red snapper | 11 |
| | 1997 | Red snapper | 10 |
| | 1998 | Red snapper | 1 |
| Gulf of Mexico | 1988 | Fat snook | 1 |
| off Laguna | | Florida pompano | 1 |
| Madre | | Spot | 1 |
| | 1990 | Common snook | 1 |
| | 1994 | Gulf kingfish | 1 |
| | 1995 | Common snook | 1 |
| | | Gulf kingfish | 3 |
| | | Pigfish | 1 |
| | | Red snapper | 17 |

Table 4. Number of tagged fishes recaptured, by release and recapture locations, from November 1975-December 1999.

| Release location | Recapture location | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|--------------------|---------------------------------------|----------|------------------|------------|-------------|-------------------|---------------|-------------|
| Sabine Lake | Unknown | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | Sabine Lake | 149 | 1 | 17 | 0 | 1 | 0 | 168 |
| | Galveston Bay | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | Gulf of Mexico off Sabine Lake | 3 | 0 | 1 | 0 | 1 | 0 | 5 |
| | Louisiana Waters | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Total | 153 | 1 | 20 | 0 | 2 | 0 | 176 |
| Galveston Bay | Unknown | 2 | 3 | 1 | 0 | 0 | 0 | 6 |
| | Sabine Lake | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Galveston Bay | 798 | 359 | 72 | 4 | 34 | 85 | 1437 |
| | Cedar Lakes | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| | East Matagorda Bay | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| | Matagorda Bay | 2 | 1 | 0 | 0 | 0 | 0 | 3 |
| | Lower Laguna Madre | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | Gulf of Mexico off Sabine Lake | 1 | 5 | 1 | 0 | 0 | 0 | 7 |
| | Gulf of Mexico off Galveston Bay | 62 | 40 | 2 | 0 | 1 | 0 | 105 |
| | Gulf of Mexico off Matagorda Bay | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| | Gulf of Mexico off Corpus Christi Bay | 1 | 0 | 1 | 0 | 0 | 0 | 2 |
| | Louisiana Waters | 1 | 0 | 0 | 0 | 1 | 0 | 2 |
| | Gulf of Mexico off Louisiana | 4 | 0 | 0 | 0 | 0 | 0 | 4 |
| | Total | 875 | 410 | 78 | 4 | 36 | 85 | 1573 |
| Cedar Lakes | Sabine Lake | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | Galveston Bay | 2 | 2 | 1 | 0 | 0 | 0 | 5 |
| | Cedar Lakes | 56 | 6 | 4 | 0 | 1 | 2 | 69 |
| | East Matagorda Bay | 2 | 3 | 0 | 0 | 0 | 0 | 5 |
| | Matagorda Bay | 2 | 2 | 0 | 0 | 1 | 0 | 5 |
| | Aransas Bay | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| | Gulf of Mexico off Galveston Bay | 9 | 2 | 0 | 0 | 0 | 0 | 11 |
| | Gulf of Mexico off Matagorda Bay | 4 | 1 | 0 | 0 | 0 | 0 | 5 |
| | Gulf of Mexico off Corpus Christi Bay | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Total | 77 | 17 | 6 | 0 | 2 | 2 | 104 |
| East Matagorda Bay | Unknown | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| | Galveston Bay | 12 | 1 | 1 | 0 | 0 | 0 | 14 |
| | Cedar Lakes | 8 | 5 | 0 | 2 | 3 | 0 | 18 |
| | East Matagorda Bay | 241 | 78 | 73 | 6 | 22 | 0 | 420 |
| | Matagorda Bay | 10 | 7 | 13 | 0 | 2 | 0 | 32 |
| | San Antonio Bay | 1 | 0 | 0 | 0 | 0 | 0 | 1 |

Table 4. (Cont'd)

| Release location | Recapture location | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|--------------------------------|---------------------------------------|----------|------------------|------------|-------------|-------------------|----------------|-------------|
| East Matagorda Bay (cont'd) | Upper Laguna Madre | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Gulf of Mexico off Sabine Lake | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Gulf of Mexico off Galveston Bay | 19 | 5 | 4 | 1 | 0 | 0 | 29 |
| | Gulf of Mexico off Matagorda Bay | 19 | 4 | 0 | 0 | 0 | 0 | 23 |
| | Gulf of Mexico off Louisiana | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Total | | 313 | 101 | 92 | 9 | 27 | 0 |
| Matagorda Bay | Unknown | 20 | 1 | 6 | 0 | 2 | 0 | 29 |
| | Galveston Bay | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| | Cedar Lakes | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| | East Matagorda Bay | 5 | 2 | 1 | 0 | 0 | 0 | 8 |
| | Matagorda Bay | 703 | 145 | 174 | 6 | 16 | 1 ^e | 1046 |
| | San Antonio Bay | 23 | 5 | 9 | 3 | 0 | 0 | 40 |
| | Aransas Bay | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| | Corpus Christi Bay | 1 | 1 | 2 | 0 | 0 | 0 | 4 |
| | Lower Laguna Madre | 1 | 0 | 1 | 0 | 0 | 0 | 2 |
| | Gulf of Mexico off Galveston Bay | 4 | 3 | 2 | 0 | 0 | 0 | 9 |
| | Gulf of Mexico off Matagorda Bay | 29 | 6 | 3 | 2 | 0 | 0 | 40 |
| | Gulf of Mexico off Corpus Christi Bay | 0 | 1 | 4 | 0 | 0 | 0 | 5 |
| | Gulf of Mexico off Louisiana | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Total | | 791 | 165 | 203 | 11 | 18 | 1 |
| San Antonio Bay | Unknown | 27 | 0 | 11 | 1 | 1 | 0 | 40 |
| | Sabine Lake | | | | | | | |

ole 4. (Cont'd)

| Release location | Recapture location | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|--------------------|---------------------------------------|----------|------------------|------------|-------------|-------------------|----------------|-------------|
| Aransas Bay | Unknown | 72 | 9 | 15 | 0 | 2 | 0 | 98 |
| | Galveston Bay | 2 | 0 | 2 | 0 | 0 | 0 | 4 |
| | East Matagorda Bay | 1 | 0 | 2 | 0 | 0 | 0 | 3 |
| | Matagorda Bay | 9 | 0 | 3 | 3 | 0 | 0 | 15 |
| | San Antonio Bay | 30 | 4 | 12 | 1 | 0 | 2 ^c | 49 |
| | Aransas Bay | 1262 | 186 | 251 | 42 | 22 | 3 ^g | 1766 |
| | Corpus Christi Bay | 11 | 13 | 13 | 5 | 3 | 0 | 45 |
| | Upper Laguna Madre | 1 | 1 | 2 | 0 | 0 | 0 | 4 |
| | Lower Laguna Madre | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Gulf of Mexico off Galveston Bay | 1 | 0 | 1 | 0 | 0 | 0 | 2 |
| | Gulf of Mexico off Matagorda Bay | 15 | 1 | 3 | 1 | 0 | 0 | 20 |
| | Gulf of Mexico off Corpus Christi Bay | 19 | 4 | 4 | 12 | 2 | 0 | 41 |
| | Gulf of Mexico off Laguna Madre | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Total | | 1425 | 218 | 308 | 64 | 29 | 5 |
| Corpus Christi Bay | Unknown | 63 | 6 | 4 | 1 | 5 | 1 ^h | 80 |
| | Galveston Bay | 3 | 0 | 0 | 0 | 0 | 0 | 3 |
| | Matagorda Bay | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| | San Antonio Bay | 1 | 0 | 0 | 0 | 1 | 0 | 2 |
| | Aransas Bay | 45 | 18 | 15 | 2 | 3 | 0 | 83 |
| | Corpus Christi Bay | 678 | 137 | 146 | 27 | 45 | 4 ⁱ | 1037 |
| | Upper Laguna Madre | 26 | 5 | 18 | 0 | 1 | 1 ^j | 51 |
| | Lower Laguna Madre | 2 | 0 | 3 | 0 | 0 | 0 | 5 |
| | Gulf of Mexico off Galveston Bay | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | Gulf of Mexico off Corpus Christi Bay | 19 | 2 | 2 | 5 | 0 | 0 | 28 |
| | Gulf of Mexico off Laguna Madre | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Total | | 838 | 169 | 190 | 35 | 55 | 6 | 1293 |
| Upper Laguna Madre | Unknown | 10 | 0 | 13 | 0 | 0 | 0 | 23 |
| | Matagorda Bay | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | San Antonio Bay | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| | Aransas Bay | 5 | 0 | 8 | 0 | 1 | 0 | 14 |
| | Corpus Christi Bay | 30 | 8 | 13 | 4 | 5 | 0 | 60 |
| | Upper Laguna Madre | 293 | 93 | 184 | 0 | 6 | 1 ^k | 577 |
| | Lower Laguna Madre | 10 | 3 | 6 | 1 | 0 | 0 | 20 |
| | Gulf of Mexico off Corpus Christi Bay | 5 | 0 | 1 | 1 | 0 | 0 | 7 |

Table 4. (Cont'd)

| Release location | Recapture location | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|---------------------------------------|---------------------------------------|----------|------------------|------------|-------------|-------------------|------------------|-------------|
| Lower Laguna Madre | Unknown | 7 | 2 | 9 | 0 | 0 | 0 | 18 |
| | East Matagorda Bay | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| | Matagorda Bay | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | San Antonio Bay | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| | Aransas Bay | 3 | 0 | 2 | 0 | 0 | 0 | 5 |
| | Corpus Christi Bay | 5 | 1 | 3 | 0 | 0 | 0 | 9 |
| | Upper Laguna Madre | 5 | 11 | 7 | 1 | 0 | 0 | 24 |
| | Lower Laguna Madre | 552 | 127 | 87 | 4 | 4 | 2 ⁿ | 776 |
| | Gulf of Mexico off Corpus Christi Bay | 3 | 0 | 0 | 0 | 0 | 1 ⁿ | 4 |
| | Gulf of Mexico off Laguna Madre | 8 | 0 | 1 | 1 | 0 | 0 | 10 |
| | Mexican Waters | 1 | 1 | 1 | 0 | 0 | 0 | 3 |
| | Gulf of Mexico off Mexico | 1 | 0 | 1 | 0 | 0 | 0 | 2 |
| Total | | 586 | 142 | 112 | 7 | 4 | 3 | 854 |
| Gulf of Mexico off Sabine Lake | Gulf of Mexico off Sabine Lake | 1 | 3 | 3 | 0 | 0 | 0 | 7 |
| | Gulf of Mexico off Louisiana | 0 | 0 | 0 | 0 | 0 | 1 ^o | 1 |
| | Total | 1 | 3 | 3 | 0 | 0 | 1 | 8 |
| Gulf of Mexico off Galveston Bay | Sabine Lake | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| | Gulf of Mexico off Galveston Bay | 5 | 12 | 3 | 0 | 2 | 107 ^p | 129 |
| | Gulf of Mexico off Matagorda Bay | 0 | 0 | 0 | 0 | 0 | 2 ^q | 2 |
| | Total | 5 | 13 | 3 | 0 | 2 | 109 | 132 |
| Gulf of Mexico off Matagorda Bay | Unknown | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | East Matagorda Bay | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| | San Antonio Bay | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| | Gulf of Mexico off Matagorda Bay | 10 | 1 | 2 | 0 | 0 | 0 | 13 |
| | Total | 12 | 2 | 3 | 0 | 0 | 0 | 17 |
| Gulf of Mexico off Corpus Christi Bay | Cedar Lakes | 0 | 0 | 0 | 0 | 0 | 1 ^r | 2 |
| | Aransas Bay | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | Gulf of Mexico off Corpus Christi Bay | 4 | 1 | 2 | 0 | 0 | 57 ^s | 64 |
| | Total | 4 | 1 | 3 | 0 | 0 | 58 | 65 |
| Gulf of Mexico off Laguna Madre | Gulf of Mexico off Laguna Madre | 1 | 0 | 1 | 0 | 0 | 1 ^t | 3 |
| | Total | 1 | 0 | 1 | 0 | 0 | 1 | 3 |

2 Atlantic croaker, 1 Blue catfish, 81 Striped bass, 1 Bull shark
 2 Striped bass
 1 Gulf flounder
 1 Bull shark, 3 Gulf flounder, 1 Alligator gar, 1 Atlantic stingray
 1 Bull shark
 1 Blue catfish, 1 Tarpon
 3 Gulf flounder
 1 Gulf flounder
 4 Gulf flounder
 1 Atlantic croaker
 1 Hardhead catfish

¹ Florida pompano
ⁿ 1 Atlantic croaker, 1 Hardhead catfish
^o 1 Gulf flounder
^p 1 Red snapper
^q 1 Atlantic croaker, 106 Red snapper
^r 2 Red snapper
^s 1 Red snapper
^t 1 Yellow-edged grouper, 55 Red snapper, 1 Gulf kingfish
^u 1 Red snapper

Table 5. Percent of recaptured tagged fishes grouped into intervals of distances traveled (km) from release to recapture location.

| Distance traveled | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|-------------------|----------|------------------|------------|-------------|-------------------|---------------|-------------|
| 0-10 | 71.4 | 54.6 | 50.4 | 42.2 | 65.4 | 84.7 | 65.7 |
| 11-20 | 11.7 | 18.0 | 18.2 | 21.4 | 9.0 | 2.9 | 13.4 |
| 21-30 | 6.3 | 10.3 | 10.7 | 5.8 | 10.9 | 1.1 | 7.5 |
| 31-40 | 3.0 | 6.9 | 5.5 | 9.1 | 4.7 | 0.7 | 4.0 |
| 41-50 | 2.4 | 5.1 | 3.8 | 5.8 | 4.3 | 0.7 | 3.1 |
| 51-60 | 1.4 | 1.9 | 2.0 | 3.9 | 1.4 | 0.7 | 1.6 |
| 61-70 | 0.8 | 0.8 | 2.0 | 2.6 | 0.9 | 0.7 | 1.0 |
| 71-80 | 0.5 | 0.4 | 0.9 | 1.3 | 0.5 | 0.0 | 0.6 |
| 81-90 | 0.4 | 0.3 | 1.6 | 1.9 | 0.9 | 3.3 | 0.7 |
| 91-100 | 0.5 | 0.4 | 0.8 | 0.6 | 0.0 | 0.0 | 0.5 |
| >100 | 1.6 | 1.3 | 4.1 | 5.2 | 1.9 | 5.1 | 2.0 |

Table 6. Percent of recaptured tagged fishes grouped into intervals of days free from release to recapture date.

| Days Free | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | Other species | All species |
|-----------|----------|------------------|------------|-------------|-------------------|---------------|-------------|
| 0-90 | 30.4 | 30.9 | 31.9 | 43.3 | 41.9 | 35.7 | 31.4 |
| 91-180 | 22.4 | 28.6 | 20.0 | 22.0 | 18.3 | 17.5 | 22.7 |
| 181-270 | 15.8 | 12.6 | 12.5 | 9.1 | 15.3 | 22.5 | 14.9 |
| 271-360 | 12.2 | 8.5 | 10.3 | 7.9 | 12.7 | 9.6 | 11.2 |
| 361-450 | 7.9 | 7.5 | 7.6 | 6.7 | 6.1 | 6.1 | 7.7 |
| 451-540 | 4.2 | 3.5 | 5.1 | 2.4 | 2.2 | 1.8 | 4.1 |
| 541-630 | 2.8 | 2.4 | 3.8 | 3.0 | 1.7 | 1.4 | 2.8 |
| 631-720 | 2.0 | 1.7 | 3.1 | 1.8 | 0.9 | 2.9 | 2.1 |
| 721-810 | 0.9 | 1.2 | 0.9 | 0.6 | 0.4 | 0.4 | 0.9 |
| 811-900 | 0.6 | 1.3 | 1.3 | 1.8 | 0.0 | 0.4 | 0.8 |
| 901-990 | 0.3 | 0.5 | 1.1 | 0.0 | 0.0 | 0.4 | 0.4 |
| 991-1080 | 0.2 | 0.2 | 0.2 | 0.6 | 0.0 | 0.4 | 0.2 |
| > 1080 | 0.4 | 1.1 | 2.2 | 0.6 | 0.4 | 1.1 | 0.8 |

Table 7. Summary of recapture rates (%) reported for tagged fishes from this study and from previous studies. NA=not available.

| Reference | Area and Dates of Study | | Recapture Rates | | | | | |
|------------------------------------|-------------------------|---------|-----------------|------------------|------------|-------------|-------------------|-------------|
| | State | Years | Red drum | Spotted seatrout | Black drum | Sheeps-head | Southern flounder | All species |
| Bowling and Sunley (present study) | Texas | 1975-99 | 11.1 | 6.2 | 3.0 | 2.4 | 5.2 | 6.3 |
| Bowling (1996) | Texas | 1975-93 | 11.9 | 8.4 | 3.7 | 2.7 | 5.3 | 6.9 |
| Bowling (1991) | Texas | 1975-90 | 14.7 | 6.8 | 4.5 | 2.9 | 6.0 | 7.9 |
| Marwitz (1989) | Texas | 1975-88 | 15.2 | 7.0 | 5.2 | 3.0 | 6.2 | 8.0 |
| Matlock and Weaver (1979) | Texas | 1975-76 | 11.6 | 2.3 | 3.4 | 2.9 | 4.5 | 6.4 |
| Green (1986) | Texas | 1950-75 | 11.9 | 4.0 | 3.0 | 1.7 | 2.5 | 4.6 |
| Beaumariage (1969) | Florida | 1961-65 | 47.5 | 13.6 | 37.0 | 34.7 | NA | 17.4 |

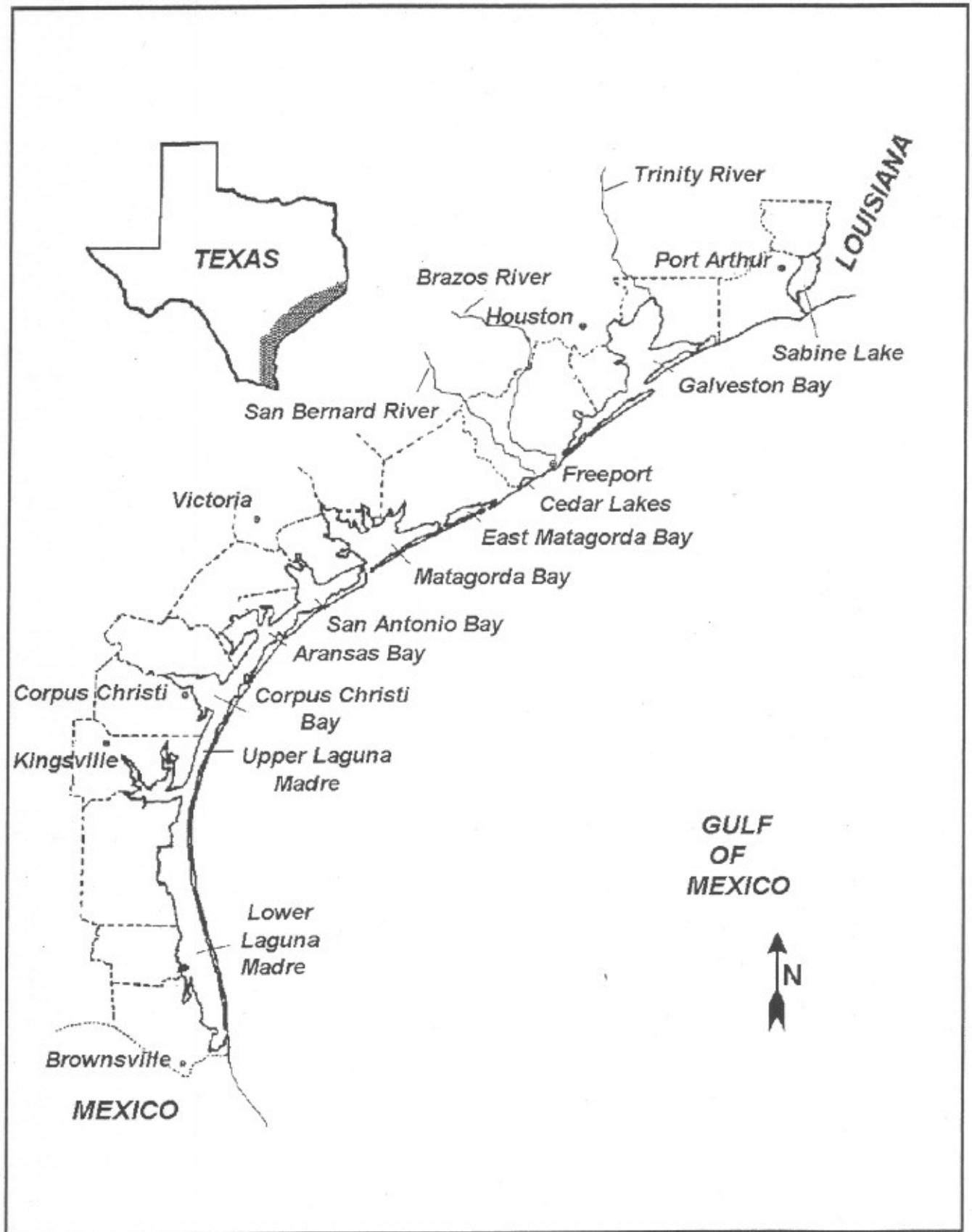


Figure 1. Texas bay systems.