Recreational and Commercial Finfish Catch Statistics for Texas Bay Systems September 1977 – August 1978

by Lawrence W. McEachron

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Texas Parks and Wildlife Department
Coastal Fisheries Branch

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EXECUTIVE SUMMARY

From September 1977 through August 1978 weekend sport boat fishermen and weekday commercial fishermen were surveyed in Galveston, Matagorda (including East Matagorda), San Antonio, Aransas, Corpus Christi, upper Laguna Madre and lower Laguna Madre Bay systems. Estimates of harvest, sizes of fishes captured, method of capture and catch per unit effort were determined for fishes taken by both groups of fishermen.

A roving clerk traveled through each bay system at a constant rate on randomly selected weekend days counting boat trailers to obtain fishing pressure estimates. On the same day, creel interviewers were stationed at boat ramps to collect daily catch per unit effort information from boat fishing parties when they completed a trip. Creel personnel interviewed commercial fishermen at fish houses on randomly selected weekdays.

During this period 3,004,100 man-h were expended by sport fishermen to catch 1,622,822 lb of finfish. Spotted seatrout constituted 36% of the landings with 584,000 lb and red drum constituted 9% of the landings with 153,000 lb; all other species landings each constituted $\leq$ 13% of the total.

On an annual basis, catch rates (no/man-h) for sport fishermen ranged from 0.28 to 0.32 fish/man-h in upper Laguna Madre and San Antonio Bay; from 0.41 to 0.44 in Aransas, lower Laguna Madre and Matagorda Bays and from 0.62 to 0.69 in Corpus Christi and Galveston Bays. Spotted seatrout annual catch rates ranged from 0.07 to 0.33 fish/man-h and were the highest of any species in all bays except Galveston; red drum catch rates ranged from 0.00 to 0.03 in all bays except in San Antonio and Aransas Bays where it was 0.08 and 0.05, respectively.

Commercial fishermen landed 4,159,241 lb of finfish from September 1977 through August 1978. Black drum constituted 36%, spotted seatrout 25% and red drum 18% of the total landings. Trammel nets, gill nets and trotlines were the major gears used by commercial fishermen. Rods and reels were used by commercial fishermen in Aransas Bay, Corpus Christi Bay and lower Laguna Madre.

Commercially caught red drum, spotted seatrout, sheepshead and southern flounder were generally larger than those caught by sport fishermen. Sport caught black drum were as large as or larger than those caught by commercial fishermen.

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ABSTRACT

From September 1977 through August 1978 weekend sport boat fishermen were surveyed in eight Texas bays. During this period 3,004,100 man-h were expended to catch 736,100 kg of finfish. Spotted seatrout constituted 36% of the landings while all other species landings each constituted $\leq$ 13% of the total.

Annual catch rates (kg/man-h) for weekend boat fishermen were low (0.16-0.20 kg/man-h) in the upper Laguna Madre, Aransas and San Antonio Bay areas; medium (0.26-0.28 kg/man-h) in the Matagorda, lower Laguna Madre and Galveston Bay areas; and high (0.38 kg/man-h) in the Corpus Christi Bay area.

Trammel nets, gill nets and trotlines were the major gear types used by commercial fishermen. Rods and reels were used by commercial fishermen in Aransas Bay, Corpus Christi Bay and lower Laguna Madre.

Commercially caught red drum (*Sciaenops ocellata*), spotted seatrout (*Cynoscion nebulosus*), sheepshead (*Archosargus probatocephalus*) and southern flounder (*Paralichthys lethostigma*) were generally larger than those caught by sport fishermen. Black drum (*Pogonias cromis*) caught by sport fishermen were as large as or larger than those caught by commercial fishermen.

INTRODUCTION

The first year of a 5-yr project entitled "Survey of Finfish Harvest in Texas Bays" was conducted from September 1977 through August 1978. Sampling occurred in the Galveston, East Matagorda, Matagorda, San Antonio, Aransas, Corpus Christi, upper Laguna Madre and lower Laguna Madre Bay systems. This report presents the results of the first year's study.

The objectives of this study were:

1) To determine the harvest of weekend sport boat fishermen of commercially important finfishes by species, size and method of capture in eight Texas bay systems.

2) To determine the catch per unit effort for those commercially important finfishes taken by sport fishermen.

3) To publish the results of the study in report form which will assist resource managers in effectively regulating the harvest of commercially important finfishes.

Data collected during this survey, in conjunction with the next 4 yr of data collected during Texas Parks and Wildlife Department (TPWD) creel surveys, will be used to estimate the total harvest from each bay system.

This project was jointly funded by the Texas Parks and Wildlife Department and the National Marine Fisheries Service utilizing PL 88-309 funds under the "Commercial Fisheries Research and Development Act."

MATERIALS AND METHODS

The same sampling design for sport fishermen described by Heffernan et al. (1976) and Green et al. (1978) was used in this study. A roving clerk traveled through each bay system at a constant rate on randomly selected weekend days and counted boat trailers to obtain fishing pressure estimates. On the same days, creel interviewers were stationed at boat ramps to collect daily catch per unit effort information from boat fishing parties when they completed a trip. Interview sites were selected at random but were weighted according to use data obtained during the 1974-76 creel surveys (TPWD, unpublished data). This resulted in boat ramps with high mean trailer counts being sampled more often than boat ramps with low mean trailer counts. The year was divided into four quarters--fall (September-November), winter (December-February), spring (March-May) and summer (June-August). Each bay was sampled 8 weekend days per quarter except Galveston Bay where sampling occurred on 16 weekend days. A total of 256 weekend days was sampled during the year. Roving counts were made from 0800 to 1600 CST and interviews were conducted from 1000 to 1600 CST. Evaluation of data obtained during the first 2 yr of study indicated that sampling during these time periods would increase the amount of data collected per unit of sampling effort.

Heffernan et al. (1976) described the estimating procedure for harvest, catch rates and species composition for weekend boat fishermen. Green et al. (1978) described the following changes in those procedures: "the change in the roving count procedure required modifications to the pressure estimate calculation. A correction factor for adjusting the upward bias caused by having the roving counter survey during the high use period was estimated by conducting trailer count diurnals at randomly picked sites. The correction factor was calculated by dividing the sum of the hourly counts from dawn to dusk by the sum of the hourly counts made from 1000 to 1800 CST from all surveyed ramps. The product of this factor, the 8-h sample period and the mean trailer counts yielded pressure estimates comparable to estimates that would have been obtained had the survey period been from dawn to dusk." Therefore, this survey was comparable to previous surveys. The change in time during which interviews were conducted did not require any changes in the method of calculating catch rates as mean rates but did require the consideration of two assumptions when making comparisons from year to year. The first was that the mean catch rate and mean fish size for parties returning before or after the interview period was the same as that found for parties returning during the interview period. The second was that the mean catch rate or mean fish size was not correlated with the use experienced at the boat ramp.

Commercial landings were obtained from Texas Parks and Wildlife Project No. 2-311-R which was jointly funded by the National Marine Fisheries Service and TPWD. The landings stated in this report came from the same areas as those where weekend boat fishermen were surveyed. Creel personnel interviewed commercial fishermen at fish houses and in the field to obtain catch per effort, size of fish and species composition of commercial catches. In each bay system 13 days per quarter were randomly selected during which commercial fishermen were interviewed.

Sport and commercially caught fish were measured (total length) to the nearest mm in order to compare fish caught by the two fisheries.

RESULTS

During the project year 3,004,100 man-h (Table 1) were expended by weekend sport boat fishermen to catch an estimated 736,100 kg (Table 2) of finfish. Total landings ranged from 39,100 kg in San Antonio Bay to 272,300 kg in Galveston Bay. Estimated landings were lowest during winter in all bay systems except Galveston and San Antonio. Spotted seatrout (*Cynoscion nebulosus*) constituted approximately 36% of the landings; all other species each constituted $\leq$ 13% of the total landings.

Annual catch rates (kg/man-h) for all species combined were low (0.16-0.20 kg/man-h) in upper Laguna Madre, Aransas and San Antonio Bays (Table 3); medium (0.26-0.28 kg/man-h) in Matagorda, lower Laguna Madre and Galveston Bays and high (0.38 kg/man-h) in Corpus Christi Bay. Catch rates for all species varied between bay systems but the family Sciaenidae dominated the landings.

On an annual basis catch rates (no/man-h) were low (0.28-0.32 fish/man-h) in upper Laguna Madre and San Antonio Bay (Table 4); medium (0.41-0.44 fish/man-h) in Aransas, lower Laguna Madre and Matagorda Bays and high (0.62-0.69 fish/man-h) in Corpus Christi and Galveston Bays. Catch rates (no/man-h) for spotted seatrout were highest in all systems except Galveston where Atlantic croaker (Micropogon undulatus) and sand seatrout (C. arenarius) had the highest catch rates.

Atlantic croaker had the lowest average weight (kg) of all fishes landed by sportsmen in all bay systems except upper Laguna Madre (Table 5). Black drum (Pogonias cromis) was the heaviest fish recorded in all bay systems except Matagorda and Aransas where gafftopsail catfish (Bagre marinus) was the heaviest species landed.

Commercial fishermen landed 1,886,600 kg of finfish from September 1977 through August 1978 (Table 6). Black drum, spotted seatrout and red drum dominated the coastwide landings. Highest landings were reported in upper Laguna Madre and lowest landings in East Matagorda and Matagorda Bays.

Generally, commercial fishermen caught larger spotted seatrout, red drum (Sciaenops ocellata), sheepshead (Archosargus probatocephalus) and southern flounder (Paralichthys lethostigma) than sport fishermen (Table 7). Sport fishermen generally caught black drum that were as large as or larger than those caught by commercial fishermen.

Strike-trammel nets, set-trammel nets, trotlines, gill nets and rods and reels were the gear types most commonly used by commercial fishermen in Texas (Tables 8-15). Spotted seatrout were most often caught with set-trammel nets, strike-trammel nets and rods and reels. Red drum were most often caught with trotlines, strike-trammel nets and gill nets. Black drum were most often caught with gill nets and trotlines. Southern flounder were most often caught with gigs.

LITERATURE CITED

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Heffernan, T. L., A. W. Green, L. W. McEachron, M. G. Weixelman, P. C. Hammerschmidt and R. A. Harrington. 1976. Survey of finfish harvest in selected Texas bays. Texas Pks. & Wildl. Dept., Coastal Fish. Branch Proj. Rept. No. 2-231-R-1. 116 p.

Table 1. Total pressure estimates in man-h (x 1000) for weekend boat fishing by season and year in seven Texas bay systems (Sept. 1977-Aug. 1978).

Bay System	Fall	Winter	Spring	Summer	Total
Galveston	303.0	47.6	144.7	465.8	961.1
Matagorda	178.6	5.2	39.8	116.6	340.2
San Antonio	62.2	15.8	46.8	71.0	195.8
Aransas	96.8	11.1	69.7	130.5	308.1
Corpus Christi	58.9	18.5	32.5	59.7	169.6
Upper Laguna Madre	84.3	95.7	183.0	228.1	591.1
Lower Laguna Madre	98.8	19.8	125.1	194.5	438.2
TOTAL	882.6	213.7	641.6	1266.2	3004.1

Table 2. Weekend sport boat finfish landings (kg x 1000) estimated for seven Texas bays by species and season (Sept. 1977-Aug. 1978). Blanks = no data; 0.0 indicates landings < 0.1.

Bay system	Spotted seatrout	Red drum	Black drum	Southern flounder	Sheepshead	Atlantic croaker	Sand seatrout	Gafftopsail catfish	Other	All[a] species combined
Galveston										
Fall	15.3	10.2	13.8	5.5	12.3	38.4	29.2	0.2	1.9	126.7
Winter	2.1	1.0	3.4	0.4	6.0	0.9	8.0		4.9	26.6
Spring	4.1	1.5	11.7	1.7	1.1	1.4	0.0	1.6	0.5	23.7
Summer	24.6	3.4	6.4	5.2	3.0	25.3	8.6	5.0	13.6	95.3
Annual	46.1	16.1	35.3	12.8	22.4	65.0	45.8	6.8	20.9	272.3
Matagorda										
Fall	19.0	4.6	3.8	3.4	6.4	0.4	3.0	3.6	4.5	48.7
Winter	4.8	0.7		0.2						5.7
Spring	0.4	1.1	1.8	0.3	0.3	0.0		3.8	0.7	8.5
Summer	9.5	2.6	1.0	1.8	0.9	0.9	0.2	8.8	1.3	27.0
Annual	33.7	8.9	6.6	5.7	7.6	1.3	3.2	16.2	6.5	89.9
San Antonio										
Fall	6.5	6.9	1.1	2.9	2.9	0.1	0.1		1.2	21.8
Winter	0.8	3.9	0.5	0.1	0.9	0.0			0.3	6.5
Spring	1.1	0.5	1.0	0.1	0.1			0.9	0.4	4.3
Summer	3.5	0.5	0.0	0.9	0.1	0.0	0.0	0.8	0.5	6.5
Annual	11.9	11.8	2.7	4.0	4.0	0.1	0.1	1.7	2.4	39.1
Aransas										
Fall	11.0	9.3	0.7	2.5	1.0	0.5	0.7		0.1	26.0
Winter	2.1	1.7	0.6	0.1	0.5		0.0		0.0	5.2
Spring	1.7	1.8		0.5	0.9		0.4	2.5	0.4	8.2
Summer	11.3	1.0		1.3	0.5	0.1	0.8	0.1	0.8	16.0
Annual	26.1	13.8	1.3	4.4	2.9	0.7	1.9	2.6	1.3	55.4

Table 2. (Cont'd).

Bay system	Spotted seatrout	Red drum	Black drum	Southern flounder	Sheepshead	Atlantic croaker	Sand seatrout	Gafftopsail catfish	Other	All[a] species combined
Corpus Christi										
Fall	10.7	2.3	1.0	1.5	1.5	0.9	7.2		0.2	25.2
Winter	1.5	0.1		0.1	0.2		2.7		0.1	4.8
Spring	1.2	0.4	15.5	0.0	0.1	0.3		0.6	0.4	18.5
Summer	7.3	1.1	0.2	2.1	0.4	1.2	2.6	1.6	0.0	16.5
Annual	20.7	3.9	16.7	3.7	2.2	2.4	12.5	2.2	0.7	65.0
Upper Laguna Madre										
Fall	17.2	1.2	2.6	1.0	1.1	3.8	2.5		0.6	29.9
Winter	3.9	0.2	1.8	0.2	0.9	0.4	0.1			7.4
Spring	9.4	2.5	1.4	0.4	0.9	0.2			0.1	15.0
Summer	28.2	1.6	3.6	0.7	0.2	5.1	1.2	0.6		41.5
Annual	58.7	5.5	9.4	2.3	3.1	9.5	3.8	0.6	0.7	93.8
Lower Laguna Madre										
Fall	23.4	4.1	0.6	3.2	1.0	0.7	5.0		0.2	38.2
Winter	1.3	1.1	2.1	0.2	1.2	0.0	0.0			6.0
Spring	7.9	1.3	19.9	0.4	1.3	0.2	0.0		0.3	31.3
Summer	35.2	3.8	1.7	2.6	0.2	0.4	0.5	0.3	0.5	45.1
Annual	67.8	10.3	24.3	6.4	3.7	1.3	5.5	0.3	1.0	120.6
Coastwide total										
Fall	103.1	38.6	23.6	20.0	26.2	44.9	47.7	3.8	8.7	316.5
Winter	16.5	8.7	8.5	1.3	9.7	1.3	10.8		5.3	62.2
Spring	25.8	9.1	51.3	3.4	4.7	2.1	0.4	9.4	2.8	109.5
Summer	119.6	14.0	12.9	14.6	5.3	33.0	14.3	17.2	16.7	247.9
Grand total	265.0	69.5	96.3	39.3	45.9	81.3	73.2	30.1	33.5	736.1

[a]Due to rounding of numbers these totals may not equal exactly individual species totals.

Table 3. Catch rates (kg/man-h) estimated for weekend sport boat fishermen in seven Texas bays by species and season (Sept. 1977-Aug. 1978). Blanks = no data; 0.00 indicates catch rates < 0.01.

Bay system	Spotted seatrout	Red drum	Black drum	Southern flounder	Sheepshead	Atlantic croaker	Sand seatrout	Gafftopsail catfish	Other	All[a] species combined
Galveston										
Fall	0.05	0.03	0.05	0.02	0.04	0.12	0.09		0.02	0.42
Winter	0.05	0.02	0.07	0.01	0.12	0.02	0.16		0.21	0.56
Spring	0.02	0.01	0.08	0.01	0.00	0.01	0.00	0.01	0.00	0.25
Summer	0.06	0.01	0.01	0.01	0.00	0.05	0.02	0.01	0.03	0.20
Annual	0.05	0.02	0.04	0.02	0.02	0.07	0.05	0.00	0.03	0.28
Matagorda										
Fall	0.11	0.03	0.02	0.02	0.04	0.00	0.02	0.02	0.03	0.27
Winter	0.92	0.13		0.03						1.09
Spring	0.01	0.03	0.04	0.01	0.01			0.10	0.02	0.21
Summer	0.10	0.02	0.01	0.01	0.01	0.01		0.07	0.01	0.24
Annual	0.10	0.03	0.02	0.01	0.02	0.00	0.01	0.04	0.02	0.26
San Antonio										
Fall	0.10	0.11	0.02	0.05	0.05		0.00		0.02	0.35
Winter	0.05	0.25	0.04	0.01	0.05				0.01	0.41
Spring	0.02	0.01	0.02	0.00	0.00			0.02	0.01	0.09
Summer	0.05	0.01		0.01				0.01	0.00	0.09
Annual	0.06	0.06	0.01	0.02	0.02		0.00	0.01	0.01	0.20
Aransas										
Fall	0.11	0.10	0.01	0.03	0.01	0.00	0.01			0.27
Winter	0.19	0.15	0.05	0.00	0.05				0.00	0.46
Spring	0.02	0.03		0.01	0.01		0.00	0.04	0.00	0.12
Summer	0.09	0.01		0.01	0.00		0.00		0.00	0.12
Annual	0.09	0.05	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.18

Table 3. (Cont'd).

Bay system	Spotted seatrout	Red drum	Black drum	Southern flounder	Sheepshead	Atlantic croaker	Sand seatrout	Gafftopsail catfish	Other	All[a] species combined
Corpus Christi										
Fall	0.18	0.04	0.02	0.02	0.03	0.01	0.12		0.00	0.43
Winter	0.09	0.00		0.00	0.01		0.15		0.00	0.26
Spring	0.04	0.01	0.48		0.00	0.01		0.02	0.01	0.57
Summer	0.12	0.02	0.00	0.04	0.00	0.02	0.05	0.03		0.28
Annual	0.12	0.02	0.10	0.02	0.01	0.01	0.07	0.01	0.00	0.38
Upper Laguna Madre										
Fall	0.20	0.01	0.03	0.01	0.01	0.05	0.03	0.03	0.01	0.35
Winter	0.04	0.00	0.02		0.01	0.00				0.08
Spring	0.05	0.01	0.01		0.00					0.08
Summer	0.12	0.01	0.01	0.00		0.02	0.00	0.00		0.18
Annual	0.10	0.01	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.16
Lower Laguna Madre										
Fall	0.25	0.04	0.00	0.03	0.01	0.00	0.05			0.39
Winter	0.05	0.05	0.15	0.01	0.05					0.30
Spring	0.06	0.01	0.16	0.00	0.01					0.25
Summer	0.18	0.02	0.01	0.01			0.00	0.00	0.00	0.23
Annual	0.15	0.02	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.28

[a]Due to rounding of numbers these totals may not equal exactly individual species totals.

Table 4. Catch rates (no/man-h) estimated for weekend sport boat fishermen in seven Texas bays by species and season (Sept. 1977-Aug. 1978). Blanks = no data; 0.00 equals catches < 0.01.

Bay system	Spotted seatrout	Red drum	Black drum	Southern flounder	Sheepshead	Atlantic croaker	Sand seatrout	Gafftopsail catfish	Other	All[a] species combined
Galveston										
Fall	0.07	0.03	0.05	0.03	0.05	0.58	0.24	0.00	0.02	1.07
Winter	0.06	0.02	0.08	0.02	0.13	0.07	0.49		0.21	1.07
Spring	0.03	0.01	0.02	0.02	0.01	0.05	0.00	0.01	0.01	0.16
Summer	0.08	0.01	0.02	0.02	0.01	0.31	0.08	0.01	0.04	0.57
Annual	0.07	0.02	0.03	0.02	0.03	0.36	0.14	0.01	0.04	0.69
Matagorda										
Fall	0.26	0.03	0.04	0.03	0.06	0.01	0.07	0.01	0.01	0.51
Winter	0.98	0.08		0.04						1.10
Spring	0.02	0.02	0.01	0.02	0.02	0.01		0.08	0.02	0.19
Summer	0.19	0.02	0.01	0.02	0.02	0.06	0.01	0.05	0.02	0.40
Annual	0.21	0.03	0.03	0.03	0.04	0.03	0.04	0.03	0.01	0.44
San Antonio										
Fall	0.21	0.15	0.02	0.07	0.06	0.00	0.01		0.01	0.53
Winter	0.09	0.35	0.06	0.01	0.10	0.00			0.06	0.66
Spring	0.05	0.01	0.01	0.01	0.00		0.01	0.02	0.02	0.13
Summer	0.14	0.01	0.00	0.02	0.00	0.00	0.00	0.02	0.01	0.20
Annual	0.14	0.08	0.01	0.03	0.03	0.00	0.01	0.01	0.02	0.32
Aransas										
Fall	0.33	0.10	0.01	0.04	0.03	0.02	0.02		0.01	0.55
Winter	0.37	0.23	0.05	0.01	0.10		0.01		0.02	0.79
Spring	0.06	0.03		0.01	0.01		0.01	0.03	0.02	0.18
Summer	0.31	0.01		0.03	0.01	0.01	0.02	0.00	0.01	0.39
Annual	0.26	0.05	0.00	0.03	0.02	0.01	0.02	0.01	0.01	0.41

Table 4. (Cont'd).

Bay system	Spotted seatrout	Red drum	Black drum	Southern flounder	Sheepshead	Atlantic croaker	Sand seatrout	Gafftopsail catfish	Other	All[a] species combined
Corpus Christi										
Fall	0.37	0.03	0.02	0.03	0.04	0.05	0.30		0.01	0.86
Winter	0.20	0.01		0.02	0.01		0.18		0.04	0.45
Spring	0.05	0.02	0.07	0.00	0.00	0.04		0.02	0.04	0.23
Summer	0.28	0.01	0.01	0.06	0.01	0.09	0.16	0.02	0.00	0.64
Annual	0.26	0.02	0.02	0.03	0.02	0.06	0.18	0.01	0.02	0.62
Upper Laguna Madre										
Fall	0.41	0.01	0.03	0.01	0.01	0.15	0.06		0.03	0.72
Winter	0.09	0.00	0.03	0.00	0.01	0.01	0.00			0.15
Spring	0.10	0.01	0.00	0.00	0.01	0.00			0.00	0.12
Summer	0.22	0.00	0.01	0.00	0.00	0.06	0.01	0.00		0.31
Annual	0.19	0.00	0.01	0.00	0.01	0.05	0.01	0.00	0.00	0.28
Lower Laguna Madre										
Fall	0.46	0.04	0.01	0.03	0.01	0.02	0.15		0.01	0.72
Winter	0.11	0.06	0.07	0.01	0.05	0.00	0.00			0.30
Spring	0.12	0.01	0.01	0.01	0.02	0.01	0.00		0.01	0.18
Summer	0.42	0.01	0.01	0.03	0.00	0.01	0.01	0.00	0.00	0.49
Annual	0.33	0.02	0.01	0.02	0.01	0.01	0.04	0.00	0.00	0.44

[a]Due to rounding of numbers these totals may not equal exactly individual species totals.

Table 5. Average weight (kg) of sport caught finfish by species and season for weekend boat fishermen in seven Texas bays (Sept. 1977-Aug. 1978). Blanks = no data.

Bay system	Spotted seatrout	Red drum	Black drum	Southern flounder	Sheepshead	Atlantic croaker	Sand seatrout	Gafftopsail catfish	Other
Galveston									
Fall	0.65	1.02	0.85	0.84	0.83	0.21	0.39	0.70	0.91
Winter	0.79	1.18	0.83	0.36	0.95	0.26	0.33		0.55
Spring	0.96	0.94	3.83	0.55	0.86	0.21	0.31	1.31	0.35
Summer	0.70	1.41	0.83	0.72	0.64	0.17	0.22	1.24	0.90
Annual Average	0.70	1.09	1.14	0.72	0.82	0.19	0.33	1.23	0.77
Matagorda									
Fall	0.42	0.88	0.51	0.58	0.64	0.20	0.25	1.75	1.74
Winter	0.94	1.64		0.76					
Spring	0.55	1.21	3.84	0.41	0.40	0.25		1.28	1.09
Summer	0.43	1.36	1.41	0.65	0.35	0.13	0.17	1.47	0.51
Annual Average	0.46	0.96	0.75	0.60	0.57	0.15	0.24	1.47	1.13
San Antonio									
Fall	0.51	0.75	0.79	0.64	0.84	0.54	0.29		3.64
Winter	0.56	0.71	0.61	0.78	0.55	0.23			0.28
Spring	0.44	0.79	3.10	0.59	0.70			1.21	0.33
Summer	0.36	1.14	0.71	0.60	0.96	0.15	0.45	0.77	0.75
Annual Average	0.45	0.75	0.98	0.64	0.75	0.25	0.32	0.94	0.74
Aransas									
Fall	0.35	0.98	0.62	0.67	0.41	0.36	0.43		0.12
Winter	0.52	0.66	1.03	0.65	0.45		0.23		0.32
Spring	0.39	0.83		0.53	0.97		0.42	1.31	0.36
Summer	0.28	1.22		0.39	0.67	0.11	0.32	0.53	0.50
Annual Average	0.32	0.91	0.76	0.54	0.54	0.28	0.37	1.24	0.30

Table 5. (Cont'd).

Bay system	Spotted seatrout	Red drum	Black drum	Southern flounder	Sheepshead	Atlantic croaker	Sand seatrout	Gafftopsail catfish	Other
Corpus Christi									
Fall	0.49	1.17	1.05	0.71	0.61	0.29	0.40		0.34
Winter	0.43	0.68		0.32	1.70		0.80		0.17
Spring	0.79	0.70	6.98	0.40	0.68	0.27		1.15	0.30
Summer	0.44	1.98	0.65	0.62	0.73	0.22	0.26	1.34	0.42
Annual Average	0.47	1.21	4.86	0.63	0.66	0.25	0.40	1.28	0.28
Upper Laguna Madre									
Fall	0.50	1.09	1.11	0.76	1.15	0.30	0.46		0.25
Winter	0.48	0.60	0.63	0.68	0.92	0.29	0.40		
Spring	0.52	1.24	3.99	0.60	0.86	0.30			0.60
Summer	0.57	1.56	2.05	1.02	1.36	0.36	0.42	2.42	
Annual Average	0.53	1.23	1.27	0.78	0.97	0.33	0.45	2.42	0.26
Lower Laguna Madre									
Fall	0.53	1.17	0.79	0.98	0.68	0.25	0.32		0.31
Winter	0.45	0.71	2.29	0.63	1.04	0.17	0.34		
Spring	0.54	1.21	10.69	0.48	0.65	0.19	0.28		0.22
Summer	0.43	1.60	1.35	0.50	1.45	0.25	0.20	0.83	0.55
Annual Average	0.51	1.20	4.61	0.68	0.77	0.24	0.30	0.83	0.34

Table 6. Commercial harvest (kg x 1000), by species, in eight Texas bays (Sept. 1977-Aug. 1978). Blanks = no reported landings; 0.00 = catches < 0.1.

Species	Galveston	East Matagorda	Matagorda	San Antonio	Aransas	Corpus Christi	Upper Laguna Madre	Lower Laguna Madre	Total
Spotted seatrout	145.6	10.8	9.3	10.0	64.0	77.5	48.1	112.3	477.6
Red drum	7.5	8.8	8.5	35.7	60.8	41.7	34.8	149.6	347.4
Black drum	76.4	3.3	5.7	18.1	39.7	171.1	214.8	207.8	736.9
Southern flounder	8.7	1.4	7.7	6.8	28.7	28.1	2.0	13.6	97.0
Sheepshead	22.4	0.6	0.5	3.9	15.9	55.9	9.4	18.2	126.8
Atlantic croaker	3.9	0.0	0.2		1.6	1.3	0.0	6.6	13.6
Sand seatrout	0.6			0.0	2.3	0.4			3.3
Gafftopsail catfish	14.2		1.5	0.5	2.6	2.1	0.0	0.0	20.9
Other[a]	47.5		0.7	0.3	1.5	0.1	0.0	13.0	63.1
Total	326.8	24.9	34.1	75.3	217.1	378.2	309.1	521.1	1886.6

[a]These totals include unclassified food and scrap fish.

Table 7. Mean total length (mm) of fish caught by weekend sport boat fishermen and commercial fishermen in eight Texas bays (Sept. 1977-Aug. 1978). All lengths were taken from measurements in the field. Blanks = no data.

Species	Galveston	East Matagorda	Matagorda	San Antonio	Aransas[a]	Corpus Christi	Upper Laguna Madre	Lower Laguna Madre
SPORT								
Spotted seatrout	384	305	356	356	305	356	376	378
Red drum	452		483	406		457	465	419
Black drum	528	279	330	356		584	478	528
Southern flounder	340		330	356	305	356	381	361
Sheepshead	315		279	330			345	338
Atlantic croaker	236		229			254	244	269
Sand seatrout	251		279	279		330	361	257
Gafftopsail catfish	488		533	432				
COMMERCIAL								
Spotted seatrout	505	432	432	457	432	432	467	450
Red drum	516	584	533	483	457	483	546	531
Black drum	424	381	381	356	406	457	439	485
Southern flounder	356	381	356	356	381	356	460	396
Sheepshead	330	330	356	330	330	406		373
Atlantic croaker								
Sand seatrout	371							
Gafftopsail catfish	536							

[a]All data recorded during summer (June-Aug.).

Table 8. Commercial catch by set-trammel nets (kg/100 ft of net/h), gill nets (kg/100 ft of net/h), trotlines (kg/100 hook-h) and gigs (kg/gig-h), by season and species, in Galveston Bay (Sept. 1977-Aug. 1978). Number in parenthesis = number of interviews conducted. Blanks = no data; 0.00 = catches < 0.01.

	Set-trammel net					Gill net				
Species	Fall (0)	Winter (13)	Spring (15)	Summer (1)	Annual mean	Fall (0)	Winter (1)	Spring (6)	Summer (0)	Annual mean
Spotted seatrout		0.75	0.14	0.23	0.52		0.17	0.02		0.03
Red drum		0.00	0.01		0.00		0.01			
Black drum		0.19	0.65	0.67	0.36		0.41	0.57		0.57
Southern flounder		0.00	0.03	0.01	0.01			0.00		0.00
Sheepshead		0.00	0.04	0.11	0.02			0.07		0.07
Atlantic croaker										
Sand seatrout		0.01			0.01					
Gafftopsail catfish			0.07		0.03			0.06		0.06

	Trotline					Gig				
Species	Fall (0)	Winter (1)	Spring (3)	Summer (3)	Annual mean	Fall (0)	Winter (0)	Spring (1)	Summer (0)	Annual mean
Spotted seatrout		0.00								
Red drum		0.00	0.46	0.24	0.35					
Black drum		0.00	0.01		0.00					
Southern flounder		0.00	0.06	0.02	0.04			3.07		3.07
Sheepshead		0.00		0.02	0.00					
Atlantic croaker		0.00	0.00	0.01						
Sand seatrout		0.00								
Gafftopsail catfish		0.00								

Table 9. Commercial catch by set-trammel net (kg/100 ft of net/h), strike-trammel net (kg/100 ft of net) and gill net (kg/100 ft of net/h), by species and season, in East Matagorda Bay (Sept. 1977-Aug. 1978). Number in parenthesis = number of interviews conducted. Blanks = no data; 0.00 = catches < 0.01.

Species	Set-trammel net					Strike-trammel Net				
	Fall (1)	Winter (6)	Spring (5)	Summer (0)	Annual mean	Fall (3)	Winter (6)	Spring (14)	Summer (4)	Annual mean
Spotted seatrout	0.00	0.09	0.01		0.04	5.25	7.75	1.15	0.45	2.74
Red drum	0.02	0.16	0.01		0.09	0.84	2.63	0.73	0.43	0.94
Black drum		0.16	0.05		0.09	0.10	1.47	0.37	0.26	0.43
Southern flounder	0.13	0.02	0.01		0.04			0.01	0.15	0.02
Sheepshead	0.06	0.07			0.04			0.53	0.07	0.28
Atlantic croaker										
Sand seatrout										
Gafftopsail catfish										

Species	Gill net				
	Fall (1)	Winter (0)	Spring (0)	Summer (0)	Annual mean
Spotted seatrout					
Red drum	0.13				0.13
Black drum	0.80				0.80
Southern flounder	0.13				0.13
Sheepshead					
Atlantic croaker					
Sand seatrout					
Gafftopsail catfish					

Table 10. Commercial catch by set-trammel net (kg/100 ft of net/h), strike-trammel net (kg/100 ft of net), gill net (kg/100 ft of net/h) and trotline (kg/100 hook-h) by species and season, in Matagorda Bay (Sept. 1977-Aug. 1978). Number in parenthesis = number of interviews conducted. Blanks = no data; 0.00 = catches < 0.01.

	Set-trammel net					Strike-trammel Net				
Species	Fall (1)	Winter (2)	Spring (0)	Summer (0)	Annual mean	Fall (1)	Winter (3)	Spring (11)	Summer (14)	Annual mean
Spotted seatrout	0.04	0.06			0.05		4.66	0.64	0.15	0.81
Red drum	0.06	0.14			0.11	7.27	5.99	0.69	0.60	1.10
Black drum		0.12			0.08		1.98	0.50	0.67	0.66
Southern flounder	0.01	0.01			0.01		0.03		0.09	0.01
Sheepshead		0.03			0.01			0.41	0.02	0.28
Atlantic croaker										
Sand seatrout										
Gafftopsail catfish										

	Gill net					Trotline				
Species	Fall (0)	Winter (5)	Spring (1)	Summer (2)	Annual mean	Fall (0)	Winter (0)	Spring (2)	Summer (0)	Annual mean
Spotted seatrout		0.24	0.01	0.10	0.16			0.15		0.15
Red drum		0.79	0.05	0.07	0.45			0.52		0.52
Black drum		0.41	0.01		0.22			0.14		0.14
Southern flounder		0.00	0.05		0.01			0.03		0.03
Sheepshead			0.02		0.00					
Atlantic croaker										
Sand seatrout										
Gafftopsail catfish										

Table 11. Commercial catch by gill net (kg/100 ft of net/h), trotline (kg/100 hook-h), hauling rig (kg/100 ft of net), and set-trammel net (kg/100 ft of net/h) by species and season, in San Antonio Bay (Sept. 1977-Aug. 1978). Number in parenthesis = number of interviews conducted. Blanks = no data; 0.00 = catches 0.01.

	Gill net					Trotline				
Species	Fall (13)	Winter (23)	Spring (9)	Summer (18)	Annual mean	Fall (6)	Winter (1)	Spring (1)	Summer (1)	Annual mean
Spotted seatrout	0.09	0.32	0.06	0.02	0.13					
Red drum	0.40	0.56	0.42	0.21	0.38	0.89	0.42	0.08	0.67	0.79
Black drum	0.18	0.83	0.25	0.07	0.35	0.05	0.08			0.04
Southern flounder	0.09	0.01	0.09	0.04	0.05				0.03	
Sheepshead	0.02		0.07	0.06	0.04					
Atlantic croaker										
Sand seatrout										
Gafftopsail catfish										

	Hauling rig					Set-trammel net				
Species	Fall (0)	Winter (2)	Spring (1)	Summer (0)	Annual mean	Fall (0)	Winter (0)	Spring (0)	Summer (1)	Annual mean
Spotted seatrout		5.27	5.76		5.38					
Red drum		2.60	1.05		2.26				0.63	0.63
Black drum			0.71		0.15				0.46	0.46
Southern flounder		0.05			0.02					
Sheepshead			2.78		0.06					
Atlantic croaker										
Sand seatrout										
Gafftopsail catfish										

Table 12. Commercial catch by strike-trammel net (kg/100 ft of net), gig (kg/gig-h), trotline (kg/100 hook-h), and rod and reel (kg/hook-h) by species and season, in Aransas Bay (Sept. 1977-Aug. 1978). Number in parenthesis = number of interviews conducted. Blanks = no data; 0.00 = catches < 0.01.

	Strike-trammel net					Gig				
Species	Fall (0)	Winter (8)	Spring (6)	Summer (0)	Annual mean	Fall (0)	Winter (0)	Spring (0)	Summer (2)	Annual mean
Spotted seatrout		0.06	0.66		0.35				0.91	0.91
Red drum		0.35	0.02		0.19				0.55	0.55
Black drum		0.03			0.01					
Southern flounder		0.01			0.00				2.02	2.02
Sheepshead		0.03	0.02		0.02				0.21	0.21
Atlantic croaker										
Sand seatrout										
Gafftopsail catfish										

	Trotline					Rod and Reel				
Species	Fall (0)	Winter (11)	Spring (5)	Summer (0)	Annual mean	Fall (0)	Winter (2)	Spring (2)	Summer (3)	Annual mean
Spotted seatrout		0.13	0.05		0.11		1.65	5.56	1.14	2.73
Red drum		0.70	0.40		0.63		2.45	1.35	2.10	1.89
Black drum		0.04			0.03		0.11	0.07	0.20	0.14
Southern flounder									0.23	0.10
Sheepshead									0.14	0.06
Atlantic croaker										
Sand seatrout										
Gafftopsail catfish										

Table 13. Commercial catch by strike-trammel net (kg/100 ft of net), gill net (kg/100 ft of net/h), rod and reel (kg/hook-h), and trotline (kg/100 hook-h), by species and season, in Corpus Christi Bay (Sept. 1977-Aug. 1978). Number in parenthesis = number of interviews conducted. Blanks = no data; 0.00 = catches $<$ 0.01.

	Strike-trammel net					Gill net				
Species	Fall (0)	Winter (0)	Spring (5)	Summer (1)	Annual mean	Fall (5)	Winter (15)	Spring (19)	Summer (8)	Annual mean
Spotted seatrout			1.80	0.21	1.30	0.01	0.11	0.01	0.00	0.04
Red drum			0.44		0.30	0.02	0.03	0.01	0.00	0.01
Black drum			0.05		0.03	0.05	0.11	0.06	0.10	0.08
Southern flounder			0.10		0.06					
Sheepshead			1.28		0.88	0.01	0.03	0.04	0.00	0.03
Atlantic croaker										
Sand seatrout										
Gafftopsail catfish										

	Trotline					Rod and Reel				
Species	Fall (0)	Winter (0)	Spring (7)	Summer (3)	Annual mean	Fall (0)	Winter (0)	Spring (5)	Summer (5)	Annual mean
Spotted seatrout			0.14	0.00	0.08			1.64	2.21	1.99
Red drum			0.55	0.07	0.26			0.02		0.01
Black drum			0.14	0.01	0.07					
Southern flounder										
Sheepshead			0.19		0.08					
Atlantic croaker										
Sand seatrout										
Gafftopsail catfish										

Table 14. Commercial catch by trotline (kg/100 hook-h) and rod and reel (kg/hook-h), by species and season, in upper Laguna Madre (Sept. 1977-Aug. 1978). Number in parenthesis = number of interviews conducted. Blanks = no data; 0.00 = catches < 0.01.

	Trotline					Rod and Reel				
Species	Fall (1)	Winter (3)	Spring (14)	Summer (21)	Annual mean	Fall (1)	Winter (0)	Spring (0)	Summer (2)	Annual mean
Spotted seatrout		0.05	0.03	0.09	0.06	1.25			1.22	1.23
Red drum	0.09	0.02	0.04	0.06	0.05					
Black drum		0.41	0.28	0.28	0.30					
Southern flounder		0.00	0.00		0.00					
Sheepshead			0.00		0.00					
Atlantic croaker										
Sand seatrout										
Gafftopsail catfish										

Table 15. Commercial catch by trotline (kg/100 hook-h), rod and reel (kg/hook-h) and gig (kg/gig-h), by species and season, in lower Laguna Madre (Sept. 1977-Aug. 1978). Number in parenthesis = number of interviews conducted. Blanks = no data; 0.00 = catches < 0.01.

	Trotline					Rod and Reel				
Species	Fall (0)	Winter (45)	Spring (32)	Summer (28)	Annual mean	Fall (0)	Winter (0)	Spring (18)	Summer (19)	Annual mean
Spotted seatrout		0.10	0.35	0.21	0.20			1.88	2.02	1.95
Red drum		0.44	0.33	0.46	0.40			0.09		0.05
Black drum		1.43	0.10	0.08	0.71			0.00		0.00
Southern flounder				0.01	0.00			0.02		0.01
Sheepshead		0.02	0.00	0.00	0.01					
Atlantic croaker										
Sand seatrout										
Gafftopsail catfish										

	Gig				
Species	Fall (0)	Winter (0)	Spring (0)	Summer (2)	Annual mean
Spotted seatrout					
Red drum					
Black drum					
Southern flounder				1.90	1.90
Sheepshead					
Atlantic croaker					
Sand seatrout					
Gafftopsail catfish					

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