

Job Report

U. R. Childress
Marine Biologist

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Project Name: Analysis of Populations of Sports and Commercial Fin-Fish
and of Factors Which Affect These Populations in the
Coastal Bays of Texas
Period Covered: January 1, 1963 to December 31, 1963 Job No. 4

Population Studies of the Sports and Commercial Fin-Fish and Forage Species of the San Antonio Bay System

Abstract: In 1963, trammel nets used to sample adult game fish caught an average of 2.5 pounds per acre compared to 4.8 pounds per acre in 1962. Red-fish were caught at only two stations. Peak months of abundance were September and November. In 1963, 86.3 pounds were caught as compared to 434.9 pounds in 1962. The catch per effort also declined.

Speckled trout were taken at all stations. They were found most abundant in May through November. The total catch was up slightly, from the 1962 total of 117.6 pounds, to a total of 130.1 pounds in 1963. The catch per effort, however, declined sharply.

Drum were taken at all stations. Peak catch months were March and November. Catch was up from 120.3 pounds in 1962 to 144.6 pounds in 1963.

Flounder were caught at Stations 1, 2, and 4. The peak month of catch was July. Total catch for the year was 11.8 pounds, compared to 7.3 pounds in 1962. This catch per effort also declined sharply.

Average monthly catch, all species, varied from 1.0 pounds per acre to 3.9 pounds per acre.

Only 22 juvenile game fish were taken, and 14 of these were speckled trout. In 1962, 88 juvenile game fish were taken.

The total poundage of forage species caught was considerably less than in 1962. Significant numbers were taken at only four stations. Those stations located in Espiritu Santo Bay did not yield appreciable numbers.

A total of 646 fish was tagged and released. There were 13 tags returned. This compares to 360 fish tagged in 1962, and 20 returns.

Objectives: To determine population fluctuations of the food and game fish and forage species of the San Antonio Bay System.

Procedures: Collections were taken with trammel net, minnow seine, and otter trawl. These collections were made at fixed stations in widely scattered areas of the bays so that all habitat types present were sampled.

Four collections were made each month with trammel nets when weather permitted. This net is 1200 feet long and 40 inches deep. The inner mesh is 3 inches stretched, and the outer mesh is 12 inches stretched. The net was struck, and the fish were driven into the net. All game fish collected were measured, weighed, and counted.

Four collections were made each month with a minnow seine. This seine was 60 feet long and 6 feet deep. The mesh measured three-fourths of an inch stretched. The seine was pulled, and the area sampled was calculated. All juvenile game fish collected were measured and counted.

Four collections were made each month with a 10-foot otter trawl. The mesh measured 1½ inch stretched. The pocket of the trawl contained a liner, the mesh of which measured one-half of an inch stretched. Collections with the trawl were of fifteen minutes duration. All forage species collected were weighed and counted, and rough average size of each species was determined.

The above mentioned collections, plus special collections, were made in order to capture fish for a pounds per acre evaluation and for tagging purposes. The information gained from the tag returns were used to study migration patterns and growth rate, if sufficient data were received.

Each trammel net station provides about 3.7 acres of bay bottom sampling area, or 14.8 acres for all stations each month.

Findings and

Discussion: Table 1 shows the numbers and weight of game fish caught each month in trammel net samples, and average pounds per acre each month of all species.

Table 2 shows juvenile game fish caught in monthly seine samples.

Table 3 shows forage species caught each month in twice monthly trawl samples. Numbers and average size are shown.

Table 4 presents fish tagging and tag return data. Also shown are points of release and capture.

Table 5 shows fish tagged during the study, numbers are shown by month and species.

Table 6 shows weight of adult game fish taken by station, species, and month.

Figure 1 is a map showing the locations of the various sample stations used in this study.

Adult Game Fish

Redfish, Sciaenops ocellata, were taken at only 2 of the 4 stations sampled. Samples contained 37.5 pounds and 48.8 pounds, respectively, at Stations 1 and 2. At Station 1 most of these fish were caught in November (33.5 pounds), while most were caught at Station 2 in September (37.3 pounds). Redfish caught at all stations amounted to 86.3 pounds.

This is considerably below the 1962 sample catch of 434.9 pounds. Stations 1 and 2, in 1962, produced the most fish, as in 1963. However, peak months of production in 1962 were evident at only Station 2 (September through December). The high month was November (108.3 pounds).

Speckled trout, Cynoscion nebulosus, were taken in samples at all stations. They were found most abundant at Stations 1 and 3. A total of 38.1 pounds was taken at Station 1, and 49.2 pounds at Station 3. Speckled trout were most abundant at Station 1 in November (21.5 pounds). At Station 2, they were found in abundance in May (12 pounds), August (12 pounds), and November (15.8 pounds).

In 1962, the most speckled trout were taken at Stations 2 and 3. At Station 2, 16.8 pounds were taken in July, and 11.7 pounds in October. Station 3 produced 20.0 pounds in July, and 31.5 pounds in November.

During 1962, 117.6 pounds of speckled trout were taken at all stations as compared to 130.1 pounds in 1963. The catch per effort, however, declined in 1963.

Drum or black drum, Pogonias cromis, were the most abundant of the game species sampled (144.6 pounds) and were taken in samples at all stations.

The most pounds of this species were taken at Stations 1 and 2. They produced 87.3 pounds and 28.5 pounds, respectively.

In 1962, 120.3 pounds of drum were taken at all stations. Station 1 and 3 had the highest catch. The most fish were caught at Station 1, in October and November, and in October at Station 3.

Flounder, Paralichthys lethostigma, were taken at Stations 1, 2, and 4. Total for the year, at all stations, was 11.8 pounds. The most flounder were taken at Station 4. The peak month was July with 4 pounds.

In 1962, 7.3 pounds of flounder were taken in all samples. Station 2, in November, produced 2 pounds, for the high sample of the year.

The catch of game fish in samples was slightly higher than in 1962, with the exception of redfish which was approximately 75 per cent less. However, the catch per unit effort decreased for all species.

Commercial catches seem to indicate that redfish may have moved to less saline waters near the mouth of the Guadalupe River. This could have been in search of a better food supply rather than to find less saline waters. During the summer and fall, blue crabs, Callinectes sapidus, were not caught in samples, except near the mouth of the Guadalupe River. These crabs constitute a portion of the food supply of redfish.

A total of 375 game fish was taken in the trammel net samples. These fish weighed 446 pounds, or about 1.2 pounds per fish. In 1962, this figure was 1.95 pounds per fish. This is an average of 31 fish taken per month. Data shows this would be 36.9 pounds of fish per month out of four samples, or 9.2 pounds per sample taken for an annual average.

Considering each sample to be 3.7 acres, the average catch would be 2.5 pounds of game fish per acre. In 1962, this average was 4.8 pounds per acre (Table 1).

Juvenile Game Fish

Only 22 juvenile game fish were taken in samples. There were 14 speckled trout, 4 redfish, 2 drum, and 2 flounder.

Eleven of the 14 speckled trout were taken in one seine sample, in October, and the remaining 3 in August, all at Panther Point.

In 1962, 57 speckled trout, 20 drum, and 11 flounder were taken. Speckled trout were most abundant in June, drum in December, and flounder in June.

Forage Fish

Four species of forage fish were considered of major importance. They were croaker, Micropogon undulatus, spot croaker, Leiostomus xanthurus, anchovy, Anchoa mitchilli, and pinfish, Lagodon rhomboides. The order of abundance is anchovy, 2,639; croaker, 746; spot croaker, 72; and pinfish, 22.

Stations 2 and 3 were practically devoid of forage fish species. Forage species were normally caught in about equal numbers at the remaining stations (1, 4, 5, and 6).

Croakers were most abundant in April, spot croakers in April and December, anchovies in July, and pinfish in January (Table 3).

In 1962, croakers were the most abundant species (3,741), anchovies second (3,635), spot croakers third (615), and pinfish fourth (36). The

month of peak abundance was March for croakers, May for spot croakers, June for anchovies, and November for pinfish.

All of the forage species sampled were less abundant than in 1962.

Fish Tagging Results

During the course of sampling and study, adult game fish were tagged and released. In addition to the trammel net samples, random gill net and hook and line catches were made for tagging fish. A total of 646 fish was tagged and released. This is shown in Table 5 by species and month. Table 4 shows tagging data and tag return data on all fish tags returned. The per cent of fish tags returned decreased from the 1962 figure of 5 per cent to 1.7 per cent in 1963. In 1963, 13 tags were returned; 20 were returned in 1962. All tags returned in 1962 were from redfish. In 1963, 4 redfish and 9 drum tags were returned.

In 1962, 360 fish were tagged; 41 speckled trout, 190 redfish, 115 drum, and 14 flounder. Those tagged in 1963 were 46 speckled trout, 134 redfish, 460 drum, and 6 flounder. These total 646 fish.

Comments: An increase in salinities to over 40 parts per thousand in part of San Antonio Bay was probably one factor involved in the reduced catch. Large amounts of several species of jellyfish clogging nets reduced the effectiveness of sampling gear at times.

Prepared by: Ray Childress
Marine Biologist

Joseph P. Breuer
Project Leader

James R. Stevens
Regional Supervisor

Approved by: Terrance R. Kearney
Coordinator

Table 1
Gamefish Caught in Regular Monthly Trammel Net Samples

<u>Species</u> <u>Months</u>	<u>Speckled Trout</u>		<u>Redfish</u>		<u>Black Drum</u>		<u>Flounder</u>		<u>Pounds</u> <u>Per Acre</u>
	<u>Number</u>	<u>Weight</u>	<u>Number</u>	<u>Weight</u>	<u>Number</u>	<u>Weight</u>	<u>Number</u>	<u>Weight</u>	<u>Per Month</u>
Jan. 1963	0	0.00	0	0.00	0	0.00	0	0.00	0.00
Feb. 1963	0	0.00	0	0.00	0	0.00	0	0.00	0.00
March 1963	3	4.50	0	0.00	36	19.75	1	1.50	2.34
April 1963	3	5.00	0	0.00	4	2.25	0	0.00	1.00
May 1963	7	16.25	0	0.00	11	6.91	2	1.00	2.20
June 1963	2	5.25	1	1.50	17	8.00	1	1.25	1.10
July 1963	4	8.50	2	7.00	25	14.00	4	5.00	2.30
Aug. 1963	11	13.50	0	0.00	14	10.00	2	1.50	2.30
Sept. 1963	1	2.00	19	34.50	9	7.00	0	0.00	3.90
Oct. 1963	11	18.25	0	0.00	4	2.25	3	1.75	2.00
Nov. 1963	24	46.75	26	42.00	111	139.75	3	4.00	10.50
Dec. 1963	<u>6</u>	<u>9.25</u>	<u>4</u>	<u>4.00</u>	<u>4</u>	<u>2.00</u>	<u>0</u>	<u>0.00</u>	<u>1.40</u>
TOTALS	72	129.25	52	89.00	235	211.91	16	16.00	Avg. 2.45

Table 2
Juvenile Game Fish Caught in Monthly Seine Samples

<u>Species</u> <u>Months</u>	<u>Speckled Trout</u>		<u>Redfish</u>		<u>Black Drum</u>		<u>Flounder</u>	
	<u>Numbers</u>	<u>Avg. Size</u>	<u>Numbers</u>	<u>Avg. Size</u>	<u>Numbers</u>	<u>Avg. Size</u>	<u>Numbers</u>	<u>Avg. Size</u>
Jan. 1963	0	0	0	0	0	0	0	0
Feb. 1963	0	0	0	0	0	0	0	0
March 1963	0	0	0	0	0	0	0	0
April 1963	0	0	0	0	0	0	0	0
May 1963	0	0	0	0	0	0	0	0
June 1963	0	0	3	162 mm	2	204 mm	1	168 mm
July 1963	0	0	1	166 mm	0	0	0	0
August 1963	3	77 mm	0	0	0	0	0	0
Sept. 1963	0	0	0	0	0	0	0	0
October 1963	11	34 mm	0	0	0	0	1	92 mm
Nov. 1963	0	0	0	0	0	0	0	0
Dec. 1963	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
TOTALS	14		4		2		2	

Table 3
Forage Fish Species Caught in Twice Monthly Trawl Samples

<u>Species</u> <u>Months</u>	<u>Croaker</u>		<u>Spot</u>		<u>Anchovy</u>		<u>Pinfish</u>	
	<u>Numbers</u>	<u>Avg. Size</u>	<u>Numbers</u>	<u>Avg. Size</u>	<u>Numbers</u>	<u>Avg. Size</u>	<u>Numbers</u>	<u>Avg. Size</u>
Jan. 1963	2	70 mm	10	120 mm	366	48 mm	18	58 mm
Feb. 1963	39	33 mm	0	0	35	35 mm	0	0
March 1963	132	42 mm	0	0	92	40 mm	0	0
April 1963	323	69 mm	18	49 mm	209	45 mm	0	0
May 1963	97	79 mm	14	63 mm	217	45 mm	0	0
June 1963	104	83 mm	2	64 mm	284	42 mm	0	0
July 1963	36	94 mm	5	77 mm	889	40 mm	1	83 mm
August 1963	4	101 mm	3	92 mm	465	39 mm	1	81 mm
Sept. 1963	3	111 mm	0	0	35	40 mm	0	0
October 1963	4	160 mm	0	0	30	43 mm	0	0
Nov. 1963	2	81 mm	0	0	3	52 mm	0	0
Dec. 1963	<u>0</u>	0	<u>20</u>	117 mm	<u>14</u>	48 mm	<u>2</u>	70 mm
TOTALS	746		72		2,639		22	

Table 4
Fish Tags Returned and Tagging Data

<u>Species</u>	<u>Standard Length</u>	<u>Weight</u>	<u>Tagging Location</u>	<u>Date</u>	<u>Date Tag Returned</u>	<u>Catch Location</u>	<u>Sport or Commercial</u>	<u>Standard Length</u>	<u>Weight</u>
Black Drum	245 mm	1 lb.	Seadrift	1/ 8/63	2/10/63	Victoria Canal Highway 35	Sport	250 mm	1 lb.
Black Drum	255 mm	1 lb.	Seadrift	1/17/63	3/31/63	San Antonio Bay near ICW Mk 69	Commercial	260 mm	1 lb.
Black Drum	180 mm	$\frac{1}{2}$ lb.	Seadrift	1/22/63	9/ 2/63	San Antonio Bay near ICW Mk 51	Sport	300 mm	3 lb.
Black Drum	210 mm	$\frac{1}{2}$ lb.	Seadrift	2/ 1/63	4/18/63	Victoria Canal	Sport	265 mm	1 $\frac{1}{4}$ lb.
Black Drum	210 mm	$\frac{1}{2}$ lb.	Steamboat Pass	3/12/63	12/31/63	Steamboat Pass	Commercial	225 mm	3/4 lb.
Black Drum	180 mm	$\frac{1}{4}$ lb.	Swan Point	3/13/63	10/21/63	Victoria Canal 2 mi. S. Hwy 35	Sport	240 mm	1 lb.
Black Drum	170 mm	$\frac{1}{4}$ lb.	Panther Point	6/13/63	11/ 4/63	Victoria Canal Union Carbide Dock	Sport	223 mm	$\frac{1}{2}$ lb.
Redfish	180 mm	$\frac{1}{4}$ lb.	Swan Point	7/18/63	10/27/63	Victoria Canal 2 mi. S. Hwy 35	Sport	300 mm	1 lb.
Black Drum	212 mm	3/4 lb.	Boot Reef	8/ 8/63	10/19/63	Swan Point	Sport	255 mm	2 $\frac{1}{2}$ lb.
Black Drum	240 mm	3/4 lb.	Turnstake Island Lagoon	11/19/63	12/11/63	Entrance to Victoria Canal	Sport	240 mm	3/4 lb.
Redfish	512 mm	6 lb.	Turnstake Island Lagoon	11/19/63	11/25/63	Turnstake Island Lagoon	Sport	512 mm	6 lb.
Redfish	340 mm	1 $\frac{1}{4}$ lb.	Seadrift	12/19/63	1/22/64	Hynes Bay	Commercial	340 mm	1 $\frac{1}{4}$ lb.
Redfish	285 mm	1 lb.	Seadrift	12/19/63	1/21/64	Hynes Bay	Commercial	285 mm	1 lb.

Table 5
Fish Tagged During Study Period

1963 Month	<u>Trout</u>	<u>Redfish</u>	<u>Black Drum</u>	<u>Flounder</u>
January	3	19	157	1
February	0	3	2	0
March	2	0	26	0
April	0	0	4	0
June	0	3	20	2
July	0	3	46	1
August	2	3	10	0
October	2	0	3	0
November	14	25	105	1
December	<u>23</u>	<u>78</u>	<u>87</u>	<u>1</u>
TOTAL	46	134	460	6

All Species - 646

Table 6
Weight of Adult Game Fish by Station, Species, and Month

<u>1963</u>			<u>T R A M M E L</u>	<u>N E T</u>	<u>S T A T I O N S</u>	
<u>Month</u>	<u>Species</u>	<u>No. 1</u>	<u>No. 2</u>		<u>No. 3</u>	<u>No. 4</u>
January	Redfish	0.0	0.0		0.0	0.0
	Trout	0.0	0.0		0.0	0.0
	Drum	0.0	0.0		0.0	0.0
	Flounder	0.0	0.0		0.0	0.0
February	Redfish	0.0	0.0		0.0	0.0
	Trout	0.0	0.0		0.0	0.0
	Drum	0.0	0.0		0.0	0.0
	Flounder	0.0	0.0		0.0	0.0
March	Redfish	0.0	0.0		0.0	0.0
	Trout	0.0	2.0		1.2	0.0
	Drum	2.8	17.8		0.0	0.0
	Flounder	1.5	0.0		0.0	0.0
April	Redfish	0.0	0.0		0.0	0.0
	Trout	0.0	1.2		3.0	0.0
	Drum	0.0	1.5		0.0	0.0
	Flounder	0.0	0.0		0.0	0.0
May	Redfish	0.0	0.0		0.0	0.0
	Trout	2.8	5.0		12.0	1.3
	Drum	0.0	1.0		0.0	1.8
	Flounder	0.0	1.0		0.0	0.0
June	Redfish	0.0	1.5		0.0	0.0
	Trout	0.0	0.0		5.3	0.0
	Drum	0.0	2.5		0.5	4.5
	Flounder	0.0	0.0		0.0	0.5

Table 6--Continued

<u>1963</u> <u>Month</u>	<u>Species</u>	<u>No. 1</u>	<u>T R A M M E L</u> <u>No. 2</u>	<u>N E T</u>	<u>S T A T I O N S</u> <u>No. 3</u>	<u>No. 4</u>
July	Redfish	0.0	2.0		0.0	2.3
	Trout	4.5	0.0		0.0	3.0
	Drum	0.0	0.0		0.0	10.0
	Flounder	0.0	0.0		0.0	4.0
August	Redfish	0.0	0.0		0.0	0.0
	Trout	0.0	0.5		12.0	1.0
	Drum	0.0	0.0		4.0	3.8
	Flounder	0.0	0.0		0.0	1.3
September	Redfish	0.0	37.3		0.0	0.0
	Trout	0.0	2.0		0.0	0.0
	Drum	0.0	5.0		0.0	0.0
	Flounder	0.0	0.0		0.0	0.0
October	Redfish	0.0	0.0		0.0	0.0
	Trout	0.0	2.3		0.0	13.0
	Drum	0.0	0.8		0.0	1.5
	Flounder	0.0	0.8		0.0	1.0
November	Redfish	33.5	8.0		0.0	0.0
	Trout	21.5	11.5		15.8	0.0
	Drum	82.5	0.0		2.8	0.0
	Flounder	1.0	0.8		0.0	0.0
December	Redfish	4.0	0.0		0.0	0.0
	Trout	9.3	0.0		0.0	0.0
	Drum	2.0	0.0		0.0	0.0
	Flounder	0.0	0.0		0.0	0.0
TOTALS FOR YEAR	Redfish	37.5	48.8		0.0	0.0
	Trout	38.0	24.5		49.2	18.3
	Drum	87.3	28.5		7.2	21.6
	Flounder	2.5	2.5		0.0	6.8

FIGURE 1
LOCATIONS OF FISH
SAMPLING STATIONS

