

Job Report

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Project No: MF-R-4 Date: July 25, 1963
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: September 1, 1961 through December 31, 1962 Job No: 4

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

Abstract: Fish sampling data seems to indicate a decrease in numbers of Speckled Trout during the study period with an accompany increase of Redfish and Black Drum. Flounder appear to remain unchanged in population density.

A total of 399 fish were tagged during the study period. Numbers of each species tagged were 52 Speckled Trout, 214 Redfish, 119 Black Drum, and 14 Flounder. There was 20 tag returns.

The two most abundant of the forage species were croaker and anchovies.

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 1,200 feet long and 40 inches deep. The inner mesh is three inches stretched and the outer mesh is twelve 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 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 1 1/4 inches stretched. The pocket of the trawl contained a liner, the mesh of which measured 1/2 inch stretched. Collections with the trawl were of fifteen minutes duration. All forage species collected were weighed and counted, and the rough average size of each species was determined.

The above mentioned collections, plus special collections, were made in order to capture fish for tagging purposes. The information gained from the tag returns was used to study migration patterns and growth rate.

The data gathered from this job is here evaluated and compiled into a job report.

Findings: The four trammel net stations in the San Antonio Bay area are shown in Figure 1. These stations were selected to represent widely varying habitat conditions. Each trammel net sample represents about 1.2 acres of bay area sampled. The four sampling stations represent about 4.8 acres sampled each month during the study period.

During the sixteen month study period a total of 444 food fish were taken in the trammel net samples with a total weight of 865.95 pounds. This is an average of 11.27 pounds of fish per acre per month. Each fish taken averaged 1.95 pounds per fish.

A further breakdown into the four species studied gives these results: Speckled Trout 2.88 pounds per acre per month, average weight of 1.73 pounds per fish; Redfish 6.42 pounds per acre per month, average weight of 2.6 pounds per fish; Black Drum 1.79 pounds per acre per month, average weight of 1.22 pounds per fish; and Flounder 0.18 pounds per acre per month, average weight per fish of 1.06 pounds. Table 1 shows numbers of fish taken and total weight of each months samples.

Table 2 shows the numbers and average size in mm of the juvenile game fish taken in 60 foot seine samples. Figure 1 shows seine sampling stations.

All juvenile of the game fish taken were not sufficient in numbers to produce significant results. Random seine samples may show a need to shift the location of seine stations.

Four 10 foot trawl samples for forage fish were taken twice monthly, when possible, throughout the study period. Figure 1 shows the locations of these stations. Additional forage fish samples were taken at random with a 20 foot trawl. These samples were figured into the total of the forage fish taken in the area.

During the study period a total 3,741 croakers, 615 spot croakers, 3,635 anchovies, and 36 pinfish were taken. These forage fish sample results are presented in Table 3. Total numbers at all sampling stations per month are shown, and the average size in millimeters.

The most abundant of the forage fish sampled were croakers and anchovies. Probably more important than the forage fish present as food for the game fish are the shrimp. The presence and abundance of shrimp are reported in Project MS-R-4, Job No. 5.

Table 6 shows the four sampling station catches for each month of the study period with a breakdown by species. Trammel net sampling station No. 1 is located at a point between Swan Point and Mosquito Point along the shore. Here samples are taken on a hard sand bottom with widely scattered grass spots.

Trammel net sampling station No. 2 is located between two islands adjacent to Steamboat Pass. Here the water depth is three feet. It is a brown mud bottom covered with grass and some live oyster shell.

Trammel net sampling station No. 3 is located at South Pass between San Antonio and Espiritu Santo Bays. The samples are taken on Horseshoe Reef. Here the bottom is live oyster shell. Water depth is 2 to 4 feet.

Trammel net sampling station No. 4 is located in Panther Point Lake. Here the bottom type ranges from live oyster shell to brown mud bottom with grass. Water depth ranges from 1 foot to 5 feet.

From Table 6 it can readily be seen that trammel net station No. 2 located at Steamboat Pass is by far the most productive.

Table 7 gives a breakdown by species and sampling station the four most important of the forage species found in this area. Figure 1 shows the location of these sampling stations. Of the forage stations No. 3 and 4, ICW MK. 21 and Hynes Bay, are the most productive. These two areas both have considerable fresh water influx from the Guadalupe River which could account for the productivity, in part.

In order to study growth rate and movement of Speckled Trout, Redfish, Black Drum, and Flounder these species were tagged and released when possible. Most of the fish taken in the regular monthly trammel net samples were tagged.

In addition to these fish, fish caught by hook and line, gill nets, drag seine, and frequent trammel net sets were also tagged and released. Information as to release site, date of tagging, weight, and length were recorded to be used in conjunction with tag return data.

During the sixteen months study period a total of 399 fish were tagged and released. Those tagged were 52 Speckled Trout, 214 Redfish, 119 Black Drum, and 14 Flounder. For this information see Table 4.

A total of 20 tags were returned during the study period. All of these were from Redfish. Fish tagging and return data is listed in Table 5. The most distance traveled by any fish returned was the recovery of a Redfish tagged at Seadrift and recovered at Four Bluff (near Corpus Christi), with a time lapse of only nine days.

Although the total number of fish tagged was not large, the per cent of returns increased over the per cent of returns of previous study periods. This increase in percentage of tag returns I attribute to better cooperation of fishermen and the dissemination of information of the tagging program to the fishermen.

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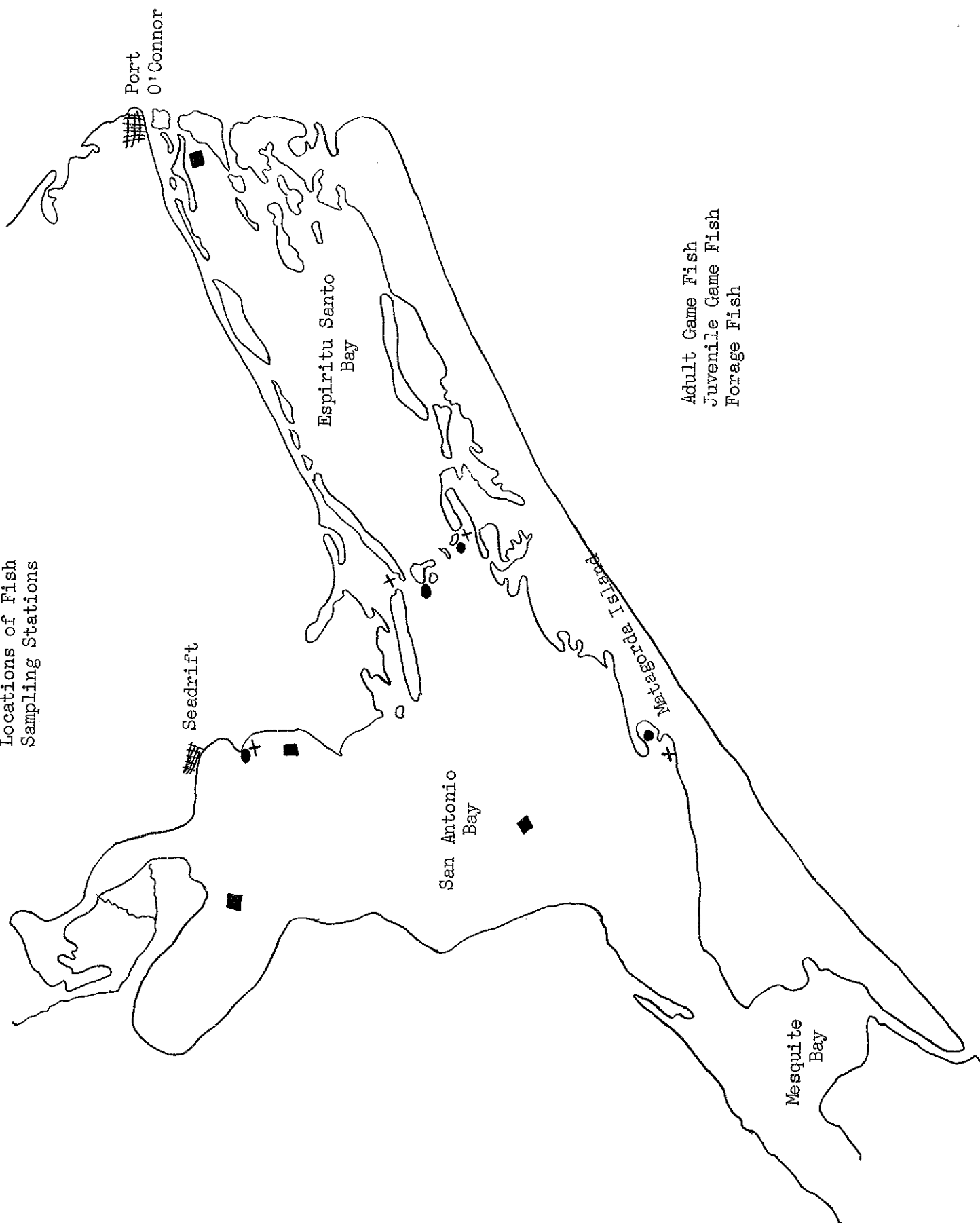
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Guadalupe
River

Figure 1
Locations of Fish
Sampling Stations



Adult Game Fish
Juvenile Game Fish
Forage Fish

Table 1

Game Fish Caught in Regular Monthly Trammel Net Stations
All Stations of Each Months Samples Cover 4.8 Acres

Species	Speckled Trout		Redfish		Black Drum		Flounder	
Months	Number	Weight	Number	Weight	Number	Weight	Number	Weight
Sept., 1961	11	14.25	7	8.0	5	8.25	1	2.5
Nov.	2	4.5	30	44.33	5	7.0	2	4.0
Dec.	15	25.0	5	6.0	7	2.25	0	0
Feb., 1962	0	0	0	0	0	0.5	0	0
March	5	5.75	0	0	0	0	0	0
May	12	29.5	0	0	4	11.0	0	0
June	13	29.5	0	0	0	0	1	0.5
July	21	36.75	0	0	2	50.5	0	0
August	4	6.87	0	0	0	0	3	1.5
Sept.	13	16.5	17	72.25	9	11.25	2	1.25
Oct.	12	15.75	29	144.25	25	9.0	1	0.75
Nov.	18	34.5	38	108.25	10	4.5	2	2.0
Dec.	2	2.5	64	110.0	45	33.5	1	1.25
Totals	128	221.37	190	493.08	113	137.75	13	13.75

Table 2

Juvenile Game Fish Caught in Monthly Seine Samples

Species	Speckled Trout		Redfish		Black Drum		Flounder	
Months	Numbers	Aver. Size	Numbers	Aver. Size	Numbers	Aver. Size	Numbers	Aver. Size
Sept., 1961	0	0	3	221 mm	0	0	5	124 mm
Dec.	8	89	0	0	0	0	0	0
Feb., 1962	0	0	0	0	0	0	1	170
April	0	0	0	0	0	0	2	180
May	1	70	0	0	0	0	2	53
June	29	104	0	0	0	0	3	95
July	1	175	0	0	3	102	0	0
August	9	93	0	0	1	122	1	190
Sept.	1	135	0	0	0	0	0	0
Oct.	1	120	0	0	0	0	1	230
Nov.	6	80	0	0	0	0	1	190
Dec.	1	240	0	0	16	130	0	0
Totals	57		3		20		16	

Table 3

Forage Fish Species Caught in Twice Monthly
Trawl Sampling Most Abundant Species Shown

Species	Croaker		Spot		Anchovies		Pinfish	
Months	Numbers	Aver. Size	Numbers	Aver. Size	Numbers	Aver. Size	Numbers	Aver. Size
Oct., 1961	15	50 mm	0	0	75	50 mm	0	0
Dec.	78	82	15	83 mm	359	41	18	69 mm
Jan., 1962	17	33	5	70	45	50	0	0
Feb.	186	30	2	80	405	32	0	0
March	1,155	42	1	150	242	36	0	0
April	596	52	68	49	315	31	0	0
May	990	60	277	48	81	39	0	0
June	562	81	54	114	537	43	0	0
July	108	104	162	90	321	43	1	70
Aug.	18	95	8	88	142	38	0	0
Sept.	3	75	0	0	395	46	0	0
Oct.	2	127	3	125	265	45	2	73
Nov.	1	115	18	112	360	45	8	70
Dec.	10	30	2	190	93	44	7	70
Totals	3,741		615		3,635		36	

Table 4

Fish Tagged During Study Period

	<u>C.</u> <u>Nebulosus</u>	<u>S.</u> <u>Ocellata</u>	<u>P.</u> <u>Lethostigma</u>	<u>P.</u> <u>Cromis</u>
	Trout	Redfish	Black Drum	Flounder
December, 1961	11	24	4	0
April, 1962	1	8	2	1
June	27	16	17	0
July	0	0	1	1
August	1	4	0	2
September	5	11	10	2
October	0	20	14	1
November	5	44	16	5
<u>December</u>	<u>2</u>	<u>87</u>	<u>55</u>	<u>2</u>
Total - All Species 399	52	214	119	14

Table 5

Fish Tags Returned and Tagging Data

Species	Standard Length	Weight	Tagging Location & Date	Date Tag Returned	Catch Location & Sport or Comm.	Standard Length	Weight
Redfish	285 mm	1 lb.	Seadrift 12-13-61	2-6-62	Lavaca Bay - Sport	285 mm	1 lb.
Redfish	340	2	Seadrift 12-15-61	12-25-61	½ mi. W. Seadrift - Comm.	340	2
Redfish	300	1½	Seadrift 12-18-61	7-10-62	Panther Point - Comm	340	2
Redfish	315	1½	Seadrift 12-18-61	2-4-62	Port O'Connor - Sport	315	1½
Redfish	285	1	Seadrift 12-18-61	3-21-62	St. Charles Bay - Sport	300	1¼
Redfish	220	½	Victoria Canal 8-30-62	9-15-62	Victoria Canal - Sport	220	½
Redfish	250	¾	Victoria Canal 8-30-62	9-23-62	Victoria Canal - Sport	265	1
Redfish	270	1	Steamboat Pass 9-12-62	12-4-62	Steamboat Pass - Biologist	275	1
Redfish	250	¾	Steamboat Pass 10-9-62	11-5-62	Steamboat Pass - Biologist	250	¾
Redfish	255	¾	Steamboat Pass 10-9-62	11-5-62	Steamboat Pass - Biologist	255	¾
Redfish	305	1¼	Steamboat Pass 10-9-62	12-4-62	Steamboat Pass - Biologist	305	1¼
Redfish	320	1½	Steamboat Pass 11-5-62	12-4-62	Steamboat Pass - Biologist	320	1½
Redfish	280	1	Steamboat Pass 11-5-62	12-4-62	Steamboat Pass - Biologist	280	1
Redfish	260	¾	Steamboat Pass 11-5-62	11-29-62	Steamboat Pass - Sport	260	¾
Redfish	290	1¼	Steamboat Pass 11-5-62	11-30-62	Guadalupe Bay - Sport	290	1¼
Redfish	500	5½	Seadrift 11-19-62	11-28-62	Flour Bluff - Sport	500	5
Redfish	525	7	Seadrift 11-19-62	12-19-62	Bray's Cove - Comm.	525	7
Redfish	325	1½	Steamboat Pass 12-10-62	12-31-62	Hynes Bay - Comm.	325	1½
Redfish	325	¾	Steamboat Pass 11-5-62	11-10-62	Steamboat Pass - Sport	255	¾
Redfish	330	1 ¾	Seadrift 12-15-62	12-19-62	Swan Point - Sport	330	1 ¾

Catch of Adult Game Fish by Station, Species, and Month

MONTH	FISH	TRAMMEL NET STATIONS			
		#1	#2	#3	#4
September 1961	Redfish	-0-	-0-	4	-0-
	Trout	3	-0-	5	4
	Drum	3	1	2	-0-
	Flounder	-0-	1	-0-	-0-
October 1961	Redfish	-0-	-0-	-0-	-0-
	Trout	-0-	-0-	-0-	-0-
	Drum	-0-	-0-	-0-	-0-
	Flounder	-0-	-0-	-0-	-0-
November 1961	Redfish	-0-	-0-	-0-	-0-
	Trout	-0-	-0-	-0-	-0-
	Drum	1	-0-	-0-	-0-
	Flounder	-0-	-0-	-0-	-0-
December 1961	Redfish	-0-	-0-	-0-	-0-
	Trout	2	7	2	-0-
	Drum	4	-0-	-0-	-0-
	Flounder	-0-	-0-	-0-	-0-
January 1962	Redfish	-0-	-0-	-0-	-0-
	Trout	-0-	-0-	-0-	-0-
	Drum	-0-	-0-	-0-	-0-
	Flounder	-0-	-0-	-0-	-0-
February 1962	Redfish	-0-	-0-	-0-	-0-
	Trout	-0-	-0-	-0-	-0-
	Drum	1	-0-	-0-	-0-
	Flounder	-0-	-0-	-0-	-0-
March 1962	Redfish	-0-	-0-	-0-	-0-
	Trout	1	-0-	4	-0-
	Drum	-0-	-0-	-0-	-0-
	Flounder	-0-	-0-	-0-	-0-
April 1962	Redfish	-0-	-0-	-0-	-0-
	Trout	-0-	-0-	-0-	-0-
	Drum	-0-	-0-	-0-	-0-
	Flounder	-0-	-0-	-0-	-0-

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Catch of Adult Game Fish by Station, Species, and Month

MONTH	FISH	TRAMMEL NET STATIONS			
		#1	#2	#3	#4
May 1962	Redfish	-0-	-0-	-0-	-0-
	Trout	-0-	-0-	10	-2-
	Drum	-0-	-0-	2	-2-
	Flounder	-0-	-0-	-0-	-0-
June 1962	Redfish	-0-	-0-	-0-	-0-
	Trout	2	1	10	-0-
	Drum	-0-	-0-	-0-	-0-
	Flounder	1	-0-	-0-	-0-
July 1962	Redfish	-0-	-0-	-0-	-0-
	Trout	-0-	9	12	-0-
	Drum	-0-	1	1	-0-
	Flounder	-0-	1	-0-	-0-
August 1962	Redfish	-0-	-0-	-0-	-0-
	Trout	-0-	-0-	4	-0-
	Drum	-0-	-0-	-0-	-0-
	Flounder	1	-0-	2	-0-
September 1962	Redfish	2	15	-0-	1
	Trout	-0-	2	-0-	2
	Drum	6	-0-	-0-	-0-
	Flounder	-0-	1	-0-	1
October 1962	Redfish	4	26	-0-	-0-
	Trout	1	9	3	-0-
	Drum	12	7	5	1
	Flounder	1	-0-	-0-	-0-
November 1962	Redfish	-0-	38	-0-	-0-
	Trout	2	1	15	-0-
	Drum	10	-0-	-0-	-0-
	Flounder	-0-	2	-0-	-0-
December 1962	Redfish				
	Trout				
	Drum				
	Flounder				

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Catch of Forage Fish by Station, Species, and Month

MONTH	FISH	Forage Fish Station			
		#1	#2	#3	#4
September 1961	Anchovies	-	-	-	-
	Croakers	-	-	-	-
	Spot	-	-	-	-
	Shrimp	-	-	-	-
October 1961	Anchovies	-	75	-	-
	Croakers	-	-	-	15
	Spot	-	-	-	-
	Shrimp	-	-	24	-
November 1961	Anchovies	-	-	-	-
	Croakers	-	-	-	-
	Spot	-	-	-	-
	Shrimp	-	-	-	-
December 1961	Anchovies	-	-	-	-
	Croakers	4	9	12	3
	Spot	3	2	4	3
	Shrimp	-	-	-	21
January 1962	Anchovies	30	-	15	-
	Croakers	-	-	17	-
	Spot	5	-	5	-
	Shrimp	-	-	4	-
February 1962	Anchovies	15	20	70	100
	Croakers	-	6	60	61
	Spot	1	-	1	-
	Shrimp	-0-	-0-	-0-	-0-
March 1962	Anchovies	40	250	22	40
	Croakers	104	225	550	276
	Spot	-	-	-	-
	Shrimp	-	-	-	-
April 1962	Anchovies	115	-	200	-
	Croakers	60	5	181	350
	Spot	55	-	13	-
	Shrimp	38	-	-	-

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Catch of Forage Fish by Station, Species, and Month

MONTH	FISH	Forage Fish Station			
		#1	#2	#3	#4
May 1962	Anchovies	-	2	53	-
	Croaker	216	31	423	320
	Spot	15	10	54	195
	Shrimp	210	73	121	87
June 1962	Anchovies	194	78	114	151
	Croakers	5	2	534	21
	Spot	1	-	53	-
	Shrimp	-	17	494	-
July 1962	Anchovies	46	112	112	51
	Croakers	1	1	92	14
	Spot	-	-	160	-
	Shrimp	28	5	87	-
August 1962	Anchovies	34	40	77	59
	Croakers	-	-	2	16
	Spot	-	-	8	-
	Shrimp	35	2	7	252
September 1962	Anchovies	-	-	-	-
	Croakers	-	-	-	-
	Spot	-	-	-	-
	Shrimp	-	-	-	-
October 1962	Anchovies	126	71	27	41
	Croakers	-	1	1	1
	Spot	-	-	3	3
	Shrimp	-	9	109	56
November 1962	Anchovies	169	63	138	-
	Croakers	-	-	-	-
	Spot	-	1	17	-
	Shrimp	5	21	228	4
December 1962	Anchovies	16	17	26	34
	Croakers	-	-	-	-
	Spot	-	-	2	-
	Shrimp	4	2	5	12

