

Job Report

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Project Name: Fisheries Investigations in the Aransas-Copano Bay System
Period Covered: February 1, 1961 to December 31, 1961 Job No. A-1

A Survey of Adult Game and Food Fish

Abstract: Redfish, trout, drum, sheepshead, and flounder were captured with trammel nets, gill nets, seines, and hooks and lines. They were then tagged with monel maxillary tags or Peterson disc tags and released. Redfish yielded 14.65 per cent return; trout, 2.67 per cent; drum, 1.42 per cent, and sheepshead 1.30 per cent.

Data were too meager to allow valid comparison between struck and pulled trammel nets or to allow computations of populations.

Objectives: To sample food and game fish populations, to tag and release food and game fish in order to assist in determining migratory routes, to determine harvest ratio of these fish, and to evaluate sampling techniques.

Procedure: Two full-time stations were established in the Aransas-Copano Bay system. Monthly sampling of adult game and food fish was also done by means of trammel net, gill net, and rod and reel at other locations (Figure 1).

The trammel net was 1,200 feet long and 4 feet deep with 3 1/2-inch inside mesh and 12-inch brales.

Gill nets were 600 feet long, 4 feet deep, and 3 1/2-inch stretch mesh.

The hook and line method was used mainly in the summer months for catching and tagging trout, Cynoscion nebulosus.

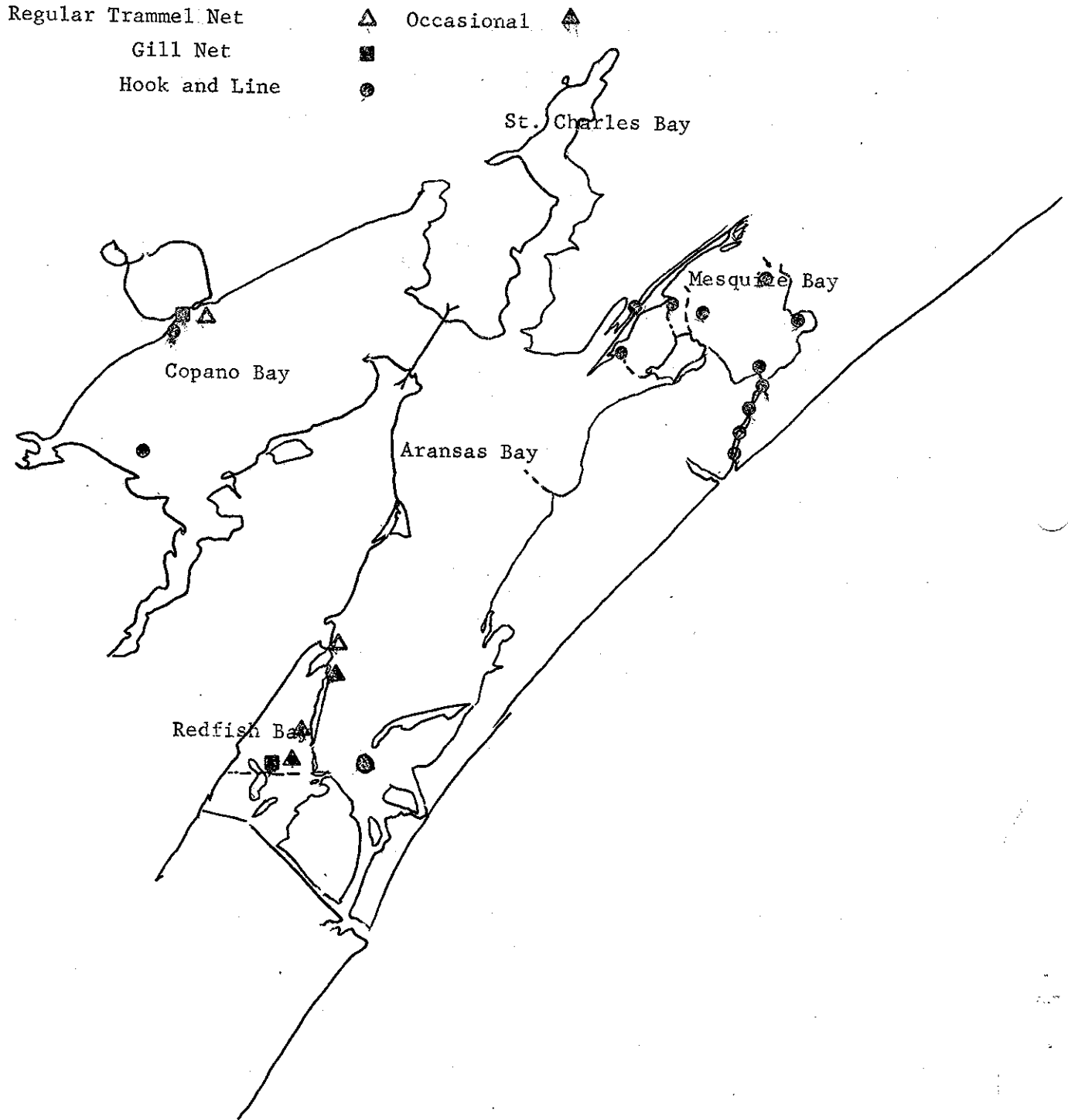
Trammel nets were used in three ways. The first way of setting the net was in the shape of a rectangle, 300 by 600 feet, one 600-foot side being the shore line. Included in this rectangle was an area of 180,000 square feet or slightly more than four acres. After the net was set in this manner, it was pulled into shore, taking all fish in the encircled area which were large enough to be caught in the net.

The second method of sampling was done by setting the net in a circle 1,200 feet in circumference covering an area of 2.63 acres. The net skiff was then moved about inside this circle to drive the enclosed fish into the net.

The third method was a combination of the first two. The net was set in a rectangle as described above and then a disturbance was created as in the second method to drive fish into the net. Gill nets were placed at points along the shore or in passes where it was thought that fish would probably be moving.

In all methods, fish captured were measured in millimeters for standard length and total length, were weighed when weights were needed, and were then tagged with either a monel maxillary tag or a Peterson disc tag.

Figure 1
 Net and Hook and Line
 Tagging Stations in the Aransas-Copano Area



The monel tag was placed in the right upper jaw of trout, Cynoscion nebulosus, redfish, Sciaenops ocellata, and drum, Pogonias cromis. The disc tag was placed just ventral to the spinous dorsal of the sheepshead, Archosargus probatocephalus, and in a similar position on the flounder, Paralichthys lethostigma.

Salinities, water temperatures and turbidities were recorded at each sample station.

Water temperature was measured in degrees Centigrade, turbidity was measured with a United States Biological Survey Turbidity Scale, and salinity was determined in the laboratory by the use of specific gravity hydrometers and Knudsens Hydrographic Tables.

Findings: Beginning in February 1961, the methods of sampling as described above were partially initiated but the main program of area sampling was not started until July 1961.

The results are shown in Tables 1, 2, and 3, and in Figures 2 and 3.

Table 1 contains a comparison between the first method and the second method of sampling with the trammel net. Table 2 gives the results of tagging in terms of per cent returns, time free, and distance traveled. Table 3 gives the percentage tag returns by month.

Figure 2 is a graphic illustration of the results of six months sampling by the pull method. In this area, Figure 3 shows the place of tagging of the various species, the approximate location of their recovery, and the possible migratory routes.

Discussion: The difference in results between the pull method and the strike method is not conclusive because, when the latter was started in November, no sheepshead or flounder were taken by either method. It is thought that additional sampling with both methods would be of value.

In Figure 2 the curve representing the sheepshead catch is striking from the standpoint of fluctuations. In August a peak of 10.42 pounds per acre of set of sheepshead was noted, followed by a drop in September and another peak in October. The catch dropped to zero in the remaining months. The last decrease of sheepshead is explained by, and corresponds to, their annual migration to the Gulf for spawning.

Following the curve representing the flounder, a gradual decline was noted until in November and December none were taken. This disappearance of flounder from the catch is also explained by spawning migrations to the Gulf.

Turning to the curve representing the catch of drum, it is apparent that drum production was very low during the first portion of the study, but increased rapidly toward the end of the sampling period. This increase can be explained by the fact that this fish spawns in the early spring in varied habitats (Pearson 1928) and a natural increase would be expected at the end of the year.

Trout also became more abundant toward the end of the sample period.

Redfish showed a slight peak in August and then a drop in September. This drop was followed by a sharp drop. Because the average weight of redfish taken during the study period was less than one pound and because this fish does not mature until it attains a weight of 12 to 15 pounds, migrations out of the bay for the purpose of spawning is not the reason for the declines in abundance. However, drum tend to displace redfish (Simmons 1961) and the curves show that when the drum were scarce in August, redfish were abundant and when the drum population increased to a high point in December, the redfish population dropped very rapidly.

Table 1

A Comparison Between the Pull Method and the Striking Method of Sampling Adult Game and Food Fish

		<u>Pull Method</u>						
		1	2	5	3	Total		
		Redfish	Drum	Flounder	Sheepshead	6.27	Area Sampled	
4	Trout	2.05	1.44	.24	1.84	6.27	180,000 sq. ft. or 4.1 acres	
	Average Number/Acre set							
	Average Pounds/Acre set	1.92	1.07	.18	1.84	5.89 lbs.		
		<u>Strike Method</u>						
		Redfish	Drum	Flounder	Sheepshead	Total	Area Sampled	
	Trout	1.09	.02	0	0	1.11	113,256 sq. ft. or 2.6 acres	
	Average Number/Acre set							
	Average Pounds/Acre set	.49	.02	0	0			

Table 2

Returns of Fish Tagged in the Aransas-Copano Bay System in 1961

<u>Species</u>	<u>Number Tagged</u>	<u>Returns</u>	<u>Per Cent Returns</u>	<u>Longest Dist. Mvd.</u>	<u>Shortest Dist. Mvd.</u>	<u>Longest Time Lps.</u>	<u>Shortest Time Lps.</u>
Trout	187	5	2.67%	20 Mi.	1 Mi.	124 days	6 days
Redfish	116	17	14.65%	57 Mi.	0 Mi.	275 days	2 days
Drum	70	1	1.42%	0 Mi.	0 Mi.	146 days	146 days
Flounder	12	0	0	0 Mi.	0 Mi.	0 days	0 days
Sheepshead	77	1	1.30%	1 Mi.	1 Mi.	60 days	60 days

Table 3

Accumulative Per Cent Tag Returns By Months From
Month of Tagging to End of Tagging Period

<u>Species</u>	<u>Month 1</u>	<u>Month 2</u>	<u>Month 3</u>	<u>Month 4</u>	<u>Month 5</u>	<u>Month 6</u>	<u>Month 7</u>	<u>Month 8</u>	<u>Month 9</u>	<u>Month 10</u>
Trout	.53%	1.60%	0	0	2.67%	0	0	0	0	0
Redfish	1.72%	4.31%	6.90%	8.62%	10.34%	12.93%	0	0	13.97%	14.65%
Drum	0	0	0	0	0	1.42%	0	0	0	0
Flounder	0	0	0	0	0	0	0	0	0	0
Sheepshead	0	0	1.30%	0	0	0	0	0	0	0

Figure 2
Average Catch in Pounds Per Acre

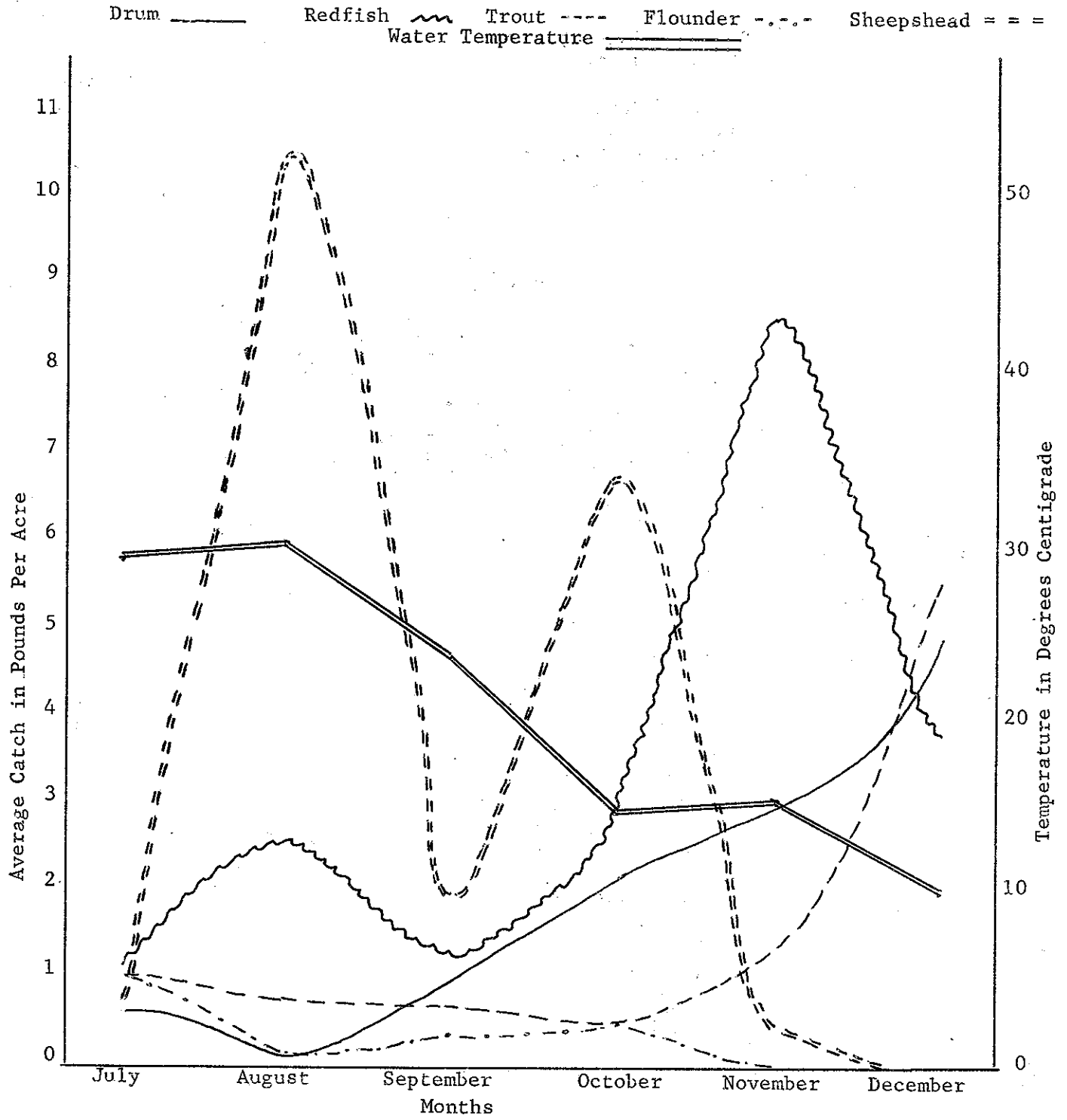


Figure 3
 Supposed Migration Routes of Tagged Fish
 in the Aransas-Copano Area

- Point of Tagging
- X Point of Recovery
- ← Route of Redfish
- Route of Trout
- Route of Sheephead
- ~~~~~ Route of Drum

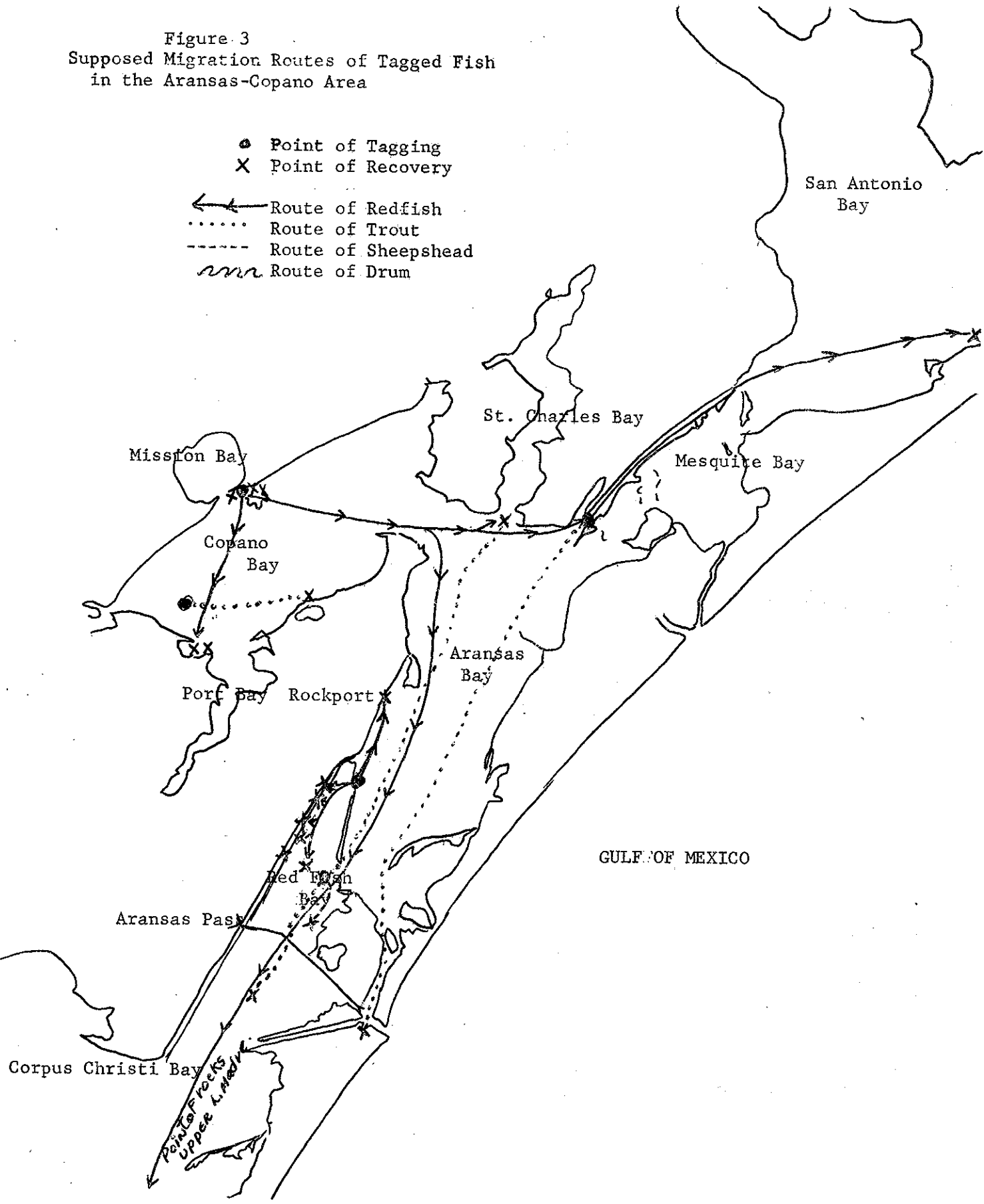


Table 2 contains the monthly percentage catch for all tagged fish and gives an idea of the distribution of recoveries from the time of tagging to the time of recovery.

Redfish had a total of 14.65 per cent tag return by the end of ten months. Eighty-seven per cent of those tag recoveries were made within six months after tagging.

Most recovered tagged trout were free less than five months and most drum less than seven months.

Table 3 shows the percentage of tagged fish recovered or reported caught by various methods of capture. Most trout and redfish tag returns came from fishermen using rod and reel, indicating more fish are harvested by rod and reel fishermen than by commercial net or trotline fishermen in this area.

In studying Figure 3, it was noted that most tagged fish were recovered near the site of tagging. Of the 62 fish tagged during the year, only 8.33 per cent of the recoveries were made outside of this area while 91.66 per cent were caught in the area.

Conclusions: Redfish were caught sooner after tagging than other species and a larger percentage was recovered.

Tagging needs to be continued so a ratio of commercial to sports fish harvest may be established.

More stations should be sampled and sampling frequency should be increased.

Additional data should be accumulated on the relative merits of sampling techniques.

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