

Job Report

James R. Stevens
Marine Biologist

Project No. M-1-R-1 Date February 1, 1960.
Project Name: Fisheries Survey of Area M-1.
Period Covered: February 1, 1959 to January 31, 1960. Job No. A-2

Checklist of the Fishes of Area M-1

Objectives: To determine the fish present in the area, their relative abundance, distribution, life histories and movements as correlated with seasons, tides, temperature and salinity.

Procedure: Thirteen collecting stations were set up in Sabine Lake for the collection of data concerning fish. (See Figure 1) Collections were made at these stations with an otter trawl which measured 10 feet along the lead line. It was constructed of netting which measured 1.5 inches stretch measurement and was spread by trawl doors which measured 17 by 20 inches. No liner was used on the pocket.

Collections were made once a month when possible. At each collection, the trawl was pulled for 10 minutes at a standard rate of 1300 rpms by the Boat Drum. The speed in miles per hour is not known.

At each collection, the time, surface water temperature, atmospheric temperature, tide and general weather conditions were noted. A water sample was also taken from the surface for salinity determination.

Occasional collections were made with rod and reel, cast net, minnow seine and trammel net, but no permanent stations were set up for these methods.

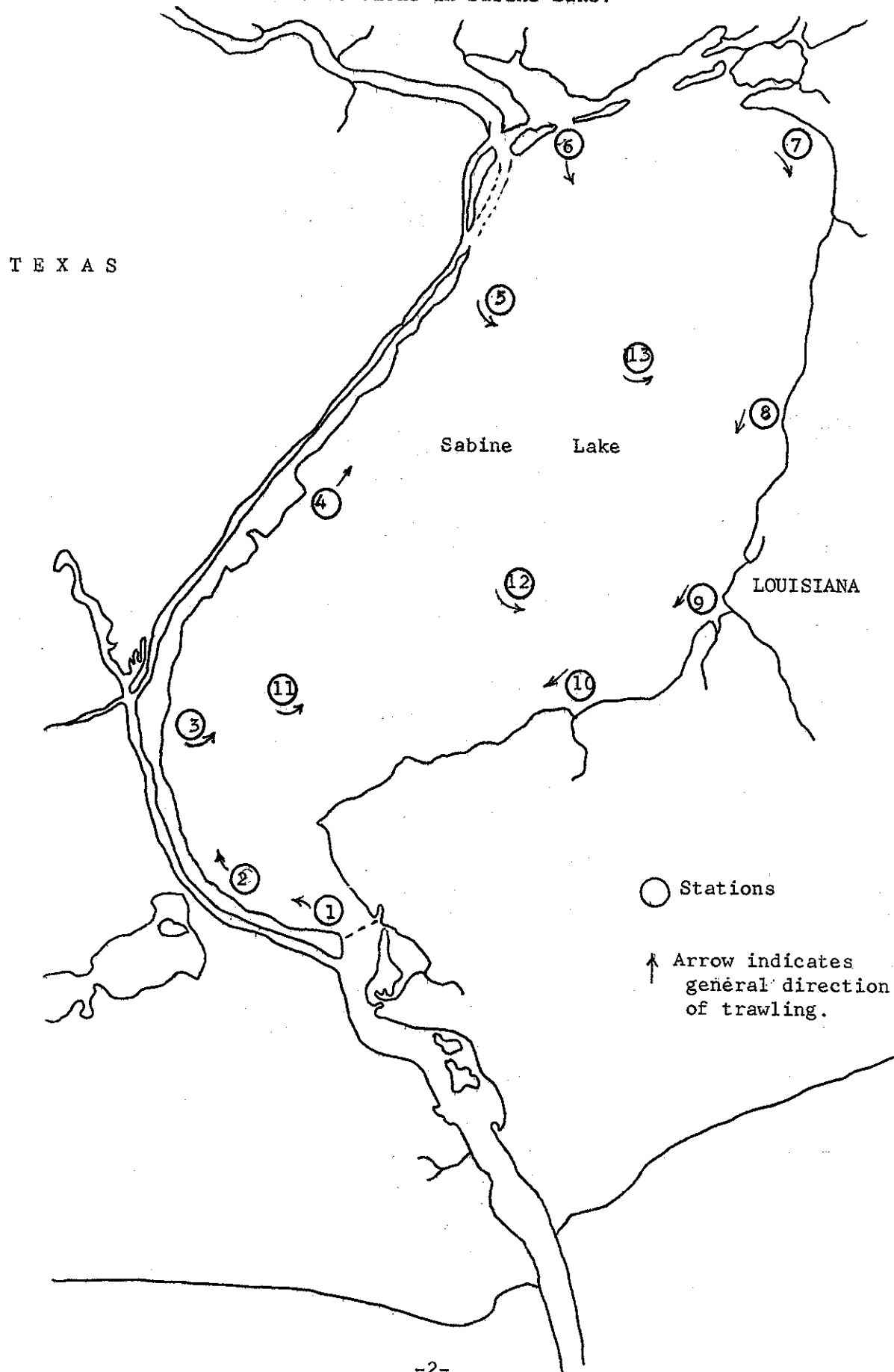
All fish collected were measured in standard length to the nearest millimeter, except in cases where extremely large numbers of the same fish were taken. In this case, a sample taken at random was measured and the remainder counted.

Findings: Lepisosteus osseus Linnaeus - Longnose Gar - Two longnose gar were taken during this study. One was taken by trammel net in a salinity of 5.9 ppt in July. The other was taken in a trawl in May in fresh water.

Lepisosteus productus Cope-Spotted Gar - This species was more abundant than L. osseus and was taken in salinities as high as 8.3 ppt.

Lepisosteus spatula - Lacepede - Alligator Gar - Large numbers of alligator gar were present in Sabine Lake throughout the year. In the winter months, they were common in trawl samples, and in summer they became a nuisance in netting operations. The largest specimen taken measured 950 mm. This species is more tolerant of salinity than the other 2 species of gar that were taken. One large specimen was observed by the author on the Gulf beach near Sabine in the summer of 1957.

FIGURE I
Trawl Stations in Sabine Lake.



Elops saurus Linnaeus - Skipjack - One skipjack was taken by minnow seine and several by rod and reel. This limited data does not indicate the true abundance, however, since they were observed in large numbers.

Harengula pensacolae Goode and Bean - Pilchard - One H. pensacolae was taken at Station #3 (see Figure 1) on August 13, 1959. It measured 61 mm and was taken in a salinity of 5.4 ppt.

Opisthonema oglinum (Le Sueur) - Threadherring - The thread herring was not common in Sabine Lake. Only three were taken. They occurred as follows:

<u>Station No.</u>	<u>Date</u>	<u>Length</u>	<u>Salinity</u>
4	February 16, 1959	61 mm	no record
11	May 15, 1959	118 mm	0 ppt
6	July 7, 1959	80 mm	4.6 ppt

Brevoortia patronus Goode - Gulf Menhaden - The menhaden is an important commercial species in this area. Texas' only two menhaden plants are located in Sabine. The plants' boats seek the menhaden offshore.

A total of 670 menhaden were taken with individuals taken in every month except February, 1959. Heaviest catches were made in November and December. The largest single catch occurred in November when 279 were taken at Station #4 in a salinity of 7.8 ppt.

No other quantitative figures are presented since they would be highly misleading. Large schools were observed during the summer months, but few were taken in the trawl at this time. The larger catches in the colder months were probably due to sluggishness brought on by the low water temperatures.

Dorosoma petenense (Gunther) - Threadfin Shad - Forty-nine threadfin shad were taken with an average length of 68.9 mm. The largest measured 115 mm and the smallest 53 mm. They were first taken in July and were present every month thereafter during the study period. They were taken in salinities ranging from 0.6 ppt to 9.8 ppt.

Dorosoma cepedianum (Le Sueur) - Gizzard Shad - Uncommon in Sabine Lake. Of the 38 captured, all were adult. First taken in July and were present in January. Taken in salinities to 7.9 ppt.

Anchoa hepsetus (Linnaeus) - Striped Anchovy - Only 9 specimens of the striped anchovy were taken, and all were taken during July, August and September of 1959. Size ranged from 62 to 74 mm. Salinity ranged from 2 ppt to 8.4 ppt.

Anchoa mitchilli (Valenciennes) - Anchovy - Very abundant throughout the year. Since no liner was used on the pocket of the trawl, little information was gathered concerning the abundance and size distribution of this anchovy. Few were taken smaller than 30 mm although many smaller ones were observed passing from the pocket as the trawl was taken in.

Bagre marina (Mitchill) - Gafftopsail Catfish - The abundance of this species is uncertain. It was taken infrequently in trawl samples from July to the middle of October. Twenty-nine were taken by trawl during this period. The largest measured 295 mm and the smallest measured 39 mm. The average length of these was 84.5 mm. Larger gafftopsails (300-400 mm) were taken during the same period of time by rod and reel. Recorded in salinities as low as 1.9 ppt.

Galeichthys felis (Linnaeus) - Hardhead - The hardhead did not reach a great abundance in Sabine Lake during the study. Only 94 were taken beginning in March and disappearing in October. Ripe females and adult males carrying unhatched eggs were observed during June and July. During August, juveniles were taken measuring 40 to 60 mm. In September only one juvenile measuring 66 mm was taken. Two juveniles which measured 70 and 71 mm were taken in October.

Ictalurus punctatus (Rafinesque) - Channel Catfish - This freshwater fish was uncommon in Sabine Lake. Six were taken ranging from 112 mm to 268 mm. All were taken near the mouth of the Sabine and Neches Rivers, in salinities of less than 1 ppt except the largest which was taken in a salinity of 7 ppt.

Strongylura marina (Walbaum) - Atlantic Needlefish - This species was only noted visually. None were taken.

Hippocampus sp. - Seahorse - One seahorse was found on the sea wall at the Pleasure Island Pier. It had probably been taken by a cast net fisherman. It had been out of the water for some time and was badly mutilated.

Fundulus grandis Baird and Girard - Gulf Killifish -

Fundulus similis (Baird and Girard) - Longnose Killifish -

Cyprinodon variegatus Lacepede - Variegated Cyprinodon -

Gambusia affinis (Baird and Girard) - Common Mosquitofish -

Mollienesia latipinna Le Sueur - Sailfin Molly -

These forms were common in the shallow grassy flats and the marsh areas surrounding Sabine Lake throughout the study. All were taken by cast net or seine.

Mugil cephalus Linnaeus - Striped Mullet - This was an abundant species throughout the study. Few were actually taken by trawl or seine but large schools were observed traveling the shoreline. The largest single catch was made by trawl at Station 3 on November 9th following a severe cold spell that dropped the water temperature to 9.4° C.

Mugil curema Valenciennes - White Mullet - Uncommon. This species only recorded from the boat launching area at the Pleasure Island Marina. Taken by cast net.

Membras martinica (Valenciennes) - Rough Silverside - Only one silverside was found. It was taken in August in the boat basin at the Pleasure Island Marina by cast net.

Polydactylus octonemus (Girard) - Threadfin - A total of 15 threadfins were taken from May to September. They were all taken at Stations 1, 2, 3 and 11 in salinities ranging from 0 ppt to 15.2 ppt. The largest taken measured 105 mm (standard length) and the smallest measured 61 mm. The mean length was 83.9 mm.

Pomatomus saltatrix (Linnaeus) - Bluefish - Three juvenile bluefish were taken in May and June, at Stations 1 and 3 in salinities from 0 ppt to 12.2 ppt.

Caranx hippos (Linnaeus) - Common Jack - Juveniles of the common jack were first taken on July 7, and were not taken later than September 3. In this period 27 were taken ranging in size from 39 mm to 112 mm with an average length of 60 mm. They occurred in salinities of 1.9 ppt to 15.2 ppt.

Hemicaranx amblyrhynchus (Cuvier) - Blunt-nosed Jack - One of this species was taken at station 11. It measured 57 mm and was taken on September 11, in water with a salinity of 15.6 ppt.

Chloroscombrus chrysurus (Linnaeus) - Bumper - One hundred thirty one bumpers were taken during August, September, October and November. None were taken during any other months. The size distribution for each of the four months is shown below.

Month	Size in mm					
	30-39	40-49	50-59	60-69	70-79	80-89
August		5	16	11	1	
September	12	43	21	17	5	
October		6		2		1
November				2		

Vomer setapinnis (Mitchill) - Moonfish - The moonfish was found to be present from the last of August until the middle of November. A total of 23 was taken in this period. The largest measured 67 mm, the smallest 39 mm. The average length was 53.5 mm. None was taken in salinities below 4.2 ppt.

Selene vomer (Linnaeus) - Lookdown - Only two of this species were recorded during this study. One was taken in September and the other in October. They measured 43 and 41 mm.

Eucinostomus argenteus Baird and Girard - Mojarra - Uncommon. Taken only by cast net at the boat launching area at the Pleasure Island Marina.

Chaenobryttus coronarius (Bartram) - Warmouth -

Lepomis macrochirus Rafinesque - Bluegill -

Lepomis symmetricus Forbes - Small Sunfish -

These three species of freshwater fish were stragglers in Sabine Lake. Those collected came from stations adjacent to the Louisiana shoreline near the mouths of bayous which emptied fresh water into the Lake. Two bluegill, one warmouth and one small sunfish were collected.

Stellifer lanceolatus (Holbrook) - Star Drum - Fifty-two star drum were taken. They were present from September until the middle of November. None were taken in salinities below 6.2 ppt. They were captured from all areas of the Lake. The largest measured 85 mm and the smallest measured 27 mm. The average length was 55.8 mm.

Sciaenops ocellata (Linnaeus) - Redfish - Three redfish were taken during the study. All were tagged and released. They were taken by trammel net in June on the Louisiana shoreline near Johnson's Bayou. The three measured 172 mm, 392 mm and 415 mm. This species is sought commercially in Louisiana's portion of the Lake and by sportsmen on the Texas side. Best catches by sportsmen were reported in the fall from the shallow flats between Stations 4 and 6. Few good catches were reported during the study either by commercial fishermen or sportsmen, however. Their numbers appeared to be few.

Leiostomus xanthurus Lacepede - Spot Croaker - A total of 737 spot croakers were recorded from Sabine Lake. They were present every month of the study. As the length frequency table shows, their greatest abundance occurred in the summer months. See Table 1

Table 1

Leiostomus xanthurus

Month	Length in mm													Total
	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-109	110-119	120-129	130-139			
<u>1959</u>														
February				2	2	1	1	1						7
March							1		1	1	1			4
April	1	3	1	1			3	7	2					18
May	12	31	28	13	4			2			1			91
June		47	86	72	15									220
July		1	27	61	32	6								127
August			11	29	23	6								69
September			2	14	26	10	1							53
October				2	6	6	2	1	1					18
November					4	16	10	1	1					32
December					8	11	7							26
<u>1960</u>														
January					12	39	17	4						72

Micropogon undulatus (Linnaeus) - Atlantic Croaker - The croaker was by far the most plentiful fish taken in the trawl samples. In 143 collections made by trawl, 3,542 croakers were taken with an average of 24.7 per collection. Croakers were present in 86.1% of the samples taken by trawl. See Table 2.

Menticirrhus americanus (Linnaeus) - Southern Kingfish - This species was recorded only once. One specimen of 107 mm was taken on September 24 at Station 1 from water with a salinity of 18.9 ppt.

Pogonias cromis (Linnaeus) - Black Drum - Six drum were recorded by trawl sample between August and January. They ranged in size from 109 mm to 175 mm and were recorded in salinities down to 0.2 ppt. Good catches were reported by sportsmen during the same period from the upper portion of the Lake.

Cynoscion arenarius Ginsburg - Sand Trout - This species was present in the summer months in large numbers as indicated by the length frequency chart. A total of 913 were collected with 403 of these being taken in June. None of sufficient size to be of interest to sportsmen were taken. See Table 3.

Cynoscion nebulosus (Cuvier) - Speckled Trout - Three speckled trout were collected by trawl. They ranged in size from 55 mm to 265 mm. One juvenile was taken by cast net in the boat basin at the Pleasure Island Marina. None were taken by trammel net, seine, or rod and reel. This species appeared to be uncommon and does not support either a commercial or sport fishery.

Cynoscion nothus (Holbrook) - Silver Trout - Little was learned of this fish's actual abundance since no effort was made to separate this species from the sand trout. One specimen was keyed to this species to confirm its presence.

Lagodon rhomboides (Linnaeus) - Pinfish - Ten pinfish were collected, all by trawl and from all portions of the Lake from June until October. They ranged in size from 43 mm to 118 mm and were found in salinities as low as 1.0 ppt.

Archosargus probatocephalus (Walbaum) - Sheepshead - Six specimens of sheepshead were collected. They were collected in all seasons. Size range was 202 mm to 470 mm.

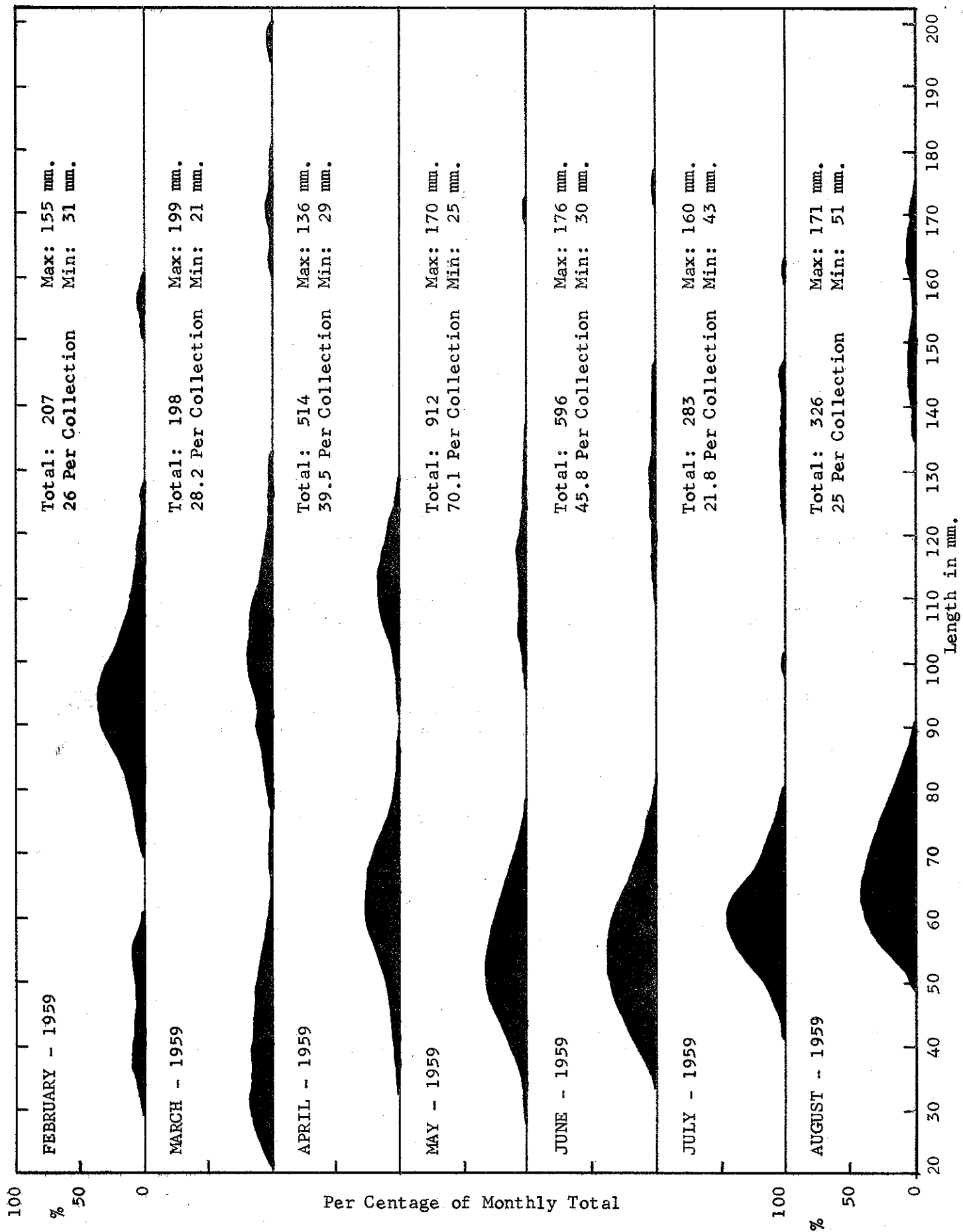
Chaetodipterus faber (Broussonet) - Spadefish - Juveniles of this species entered Sabine Lake in July and left in November. The largest numbers seem to have been present in October when 9 of the total 13 collected were taken. Size ranged from 23 mm to 80 mm with an average of 47.9 mm. Recorded in salinities as low as 4.7 ppt.

Trichiurus lepturus (Linnaeus) - Atlantic Cutlassfish - One cutlassfish was taken in June and five were taken in October. All were taken at stations near the entrance of Sabine Lake into the ship channel. Recorded in salinities as low as 6.5 ppt.

Scomberomorus maculatus (Mitchill) - Spanish Mackerel - Seven mackerel were recorded at Stations 7 and 10 in salinities of 3.1 ppt or higher. Largest specimen was 96 mm.

Peprilus paru (Linnaeus) - Harvestfish - This species was taken in small numbers between June 30 and September 24. A total of 9 was taken with an average length of 45 mm. Recorded from all portions of the Lake.

Table 2 - Micropogon undulatus



Micropogon undulatus (Continued)

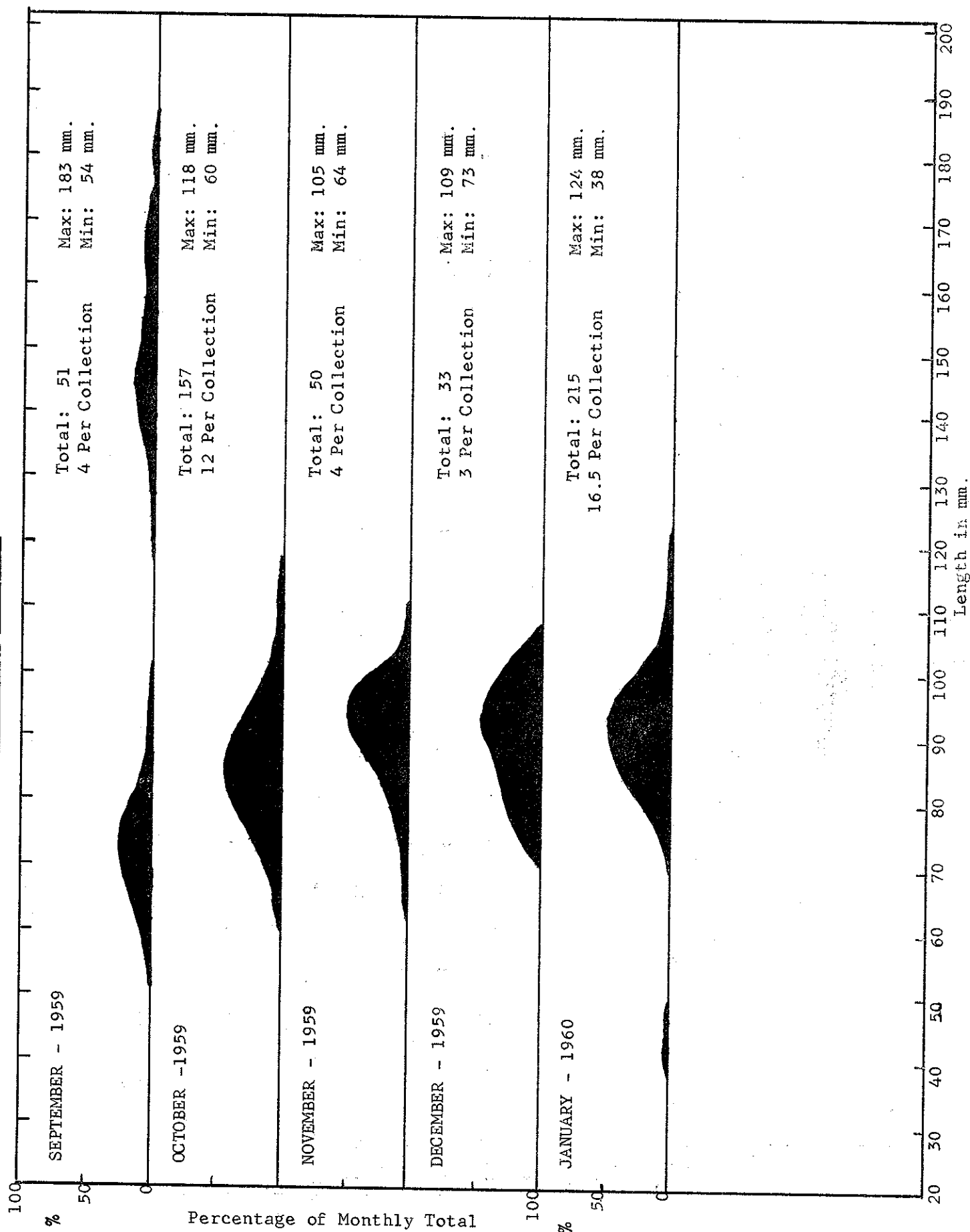


Table 3

Cynoscion arenarius

Month	Length in mm																Total	No. per collection
	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-109	110-119	120-129	130-139	140-149	150-159	160-169	170-179			
1959																		
February																		
March	2				2											4	.57	
April																		
May	5	5	3	2			1	1	2	1	1					21	1.5	
June	18	33	56	48	45	18	8	1		1						403	31	
July	3	4	14	39	42	44	29	13	3			1				216	16.6	
August		3	7	16	14	23	18	22	11	6	2					122	9.3	
September				3	16	11	9	12	4	5		2				62	4.8	
October	1			4	5	4	6	12	11	3	14	6	5	1	1	73	5.6	
November				2	3	1	1		1	1		1				10	.8	
December																7	.63	
1960																		
January																		

Poronotus triacanthus (Peck) - Butterfish - A total of two butterfish were recorded. Both were taken December 17, at Station 12 in a salinity of 10.0 ppt. The two measured 32 mm and 33 mm.

Dormitator maculatus (Bloch) - Fat Sleeper - This species was recorded only once during the study. One specimen, 72 mm long, was taken at Station 3 on November 9. Salinity was 9.4 ppt.

Gobionellus boleosoma (Jordan and Gilbert) - Darting Goby - One specimen which measured 61 mm was taken at Station 1 on April 28. The water from which it was taken was fresh (0.0 ppt).

Gobionellus hastatus Girard - Sharptail Goby - Three members of this species were collected. The facts concerning their capture are given below:

Date	Location	Length	Salinity
August 25	Station No. 10	60 mm	0.5 ppt
September 22	Station No. 10	79 mm	7.3 ppt
November 23	Station No. 1	100 mm	11.8 ppt

Prionotus tribulus (Cuvier) - Bighead Sea Robin - A total of 6 sea robins was collected. They were present in all seasons, but were collected only from stations located in the lower half of the Lake (portion nearest the Gulf). The following table gives date, location, size and the salinity from which each specimen was taken.

Date	Location	Length	Salinity
March 23	Station No. 2	38 mm	3.3 ppt
July 17	Station No. 10	30 mm	6.4 ppt
August 13	Station No. 3	42mm-43mm	5.4 ppt
November 23	Station No. 1	47 mm	11.8 ppt
December 17	Station No. 10	38 mm	9.3 ppt

Citharichthys spilopterus Gunther Only two of this species were collected. One measuring 45 mm was taken at Station 1 in May. The other measured 74 mm and was collected at Station 3 in August. Collected in salinities of 2.7 ppt or higher.

Etropus crossotus Jordan and Gilbert One specimen of this species taken October 19 at Station 3. The salinity was 11.3 ppt. It measured 68 mm.

Paralichthys lethostigmus Jordan and Gilbert - Southern Flounder - During the study a total of 21 flounder were collected. Length ranged from 57 mm to 306 mm with an average length of 165 mm. They were collected in all seasons and in salinities as low as 0.0 ppt.

Trinectes maculatus (Bloch) - Hog Choaker - A total of 156 hog choakers were collected during the study. They were present in all seasons with slightly larger catches in the winter months. Length ranged from 35 mm to 101 mm with an average 54.4 mm.

Achirus lineatus (Linnaeus) - Striped Sole - Five of this species were collected. The first collected in October and the last collected in January. They were taken from all portions of the Lake in salinities as low as 0.4 ppt. Average standard length was 43 mm.

Lagocephalus laevigatus (Linnaeus) - Smooth Puffer - One specimen was observed. It was caught by a fisherman at the seawall of the Pleasure Island Marina.

Sphoeroides nephalus (Goode and Bean) - Puffer - One puffer which measured 35 mm was collected by trawl on October 30 at Station 2. The salinity at the time of collection was 20.5 ppt.

Porichthys porosissimus (Valenciennes) - Midshipman - Only one midshipman was collected. It was collected October 19, at Station 6, in water with a salinity of 10.7 ppt. Standard length was 35 mm.

Prepared by : James R. Stevens

Accepted by

Howard T. Lee
Howard T. Lee

Marine Biologist.

Date

12 September 1960

LITERATURE CITED

- Berg, L.S. 1947. Classification of Fishes, both Recent and Fossil. Trayaux Inst. Zool. Acad. Sci. USSR, Moscow, tome V, livr. 2, published in Russian and English, Edwards Bros. Inc., Ann Arbor, Michigan.
- Breder, Charles M. 1948. Field Book of Marine Fishes of the Atlantic Coast. G.P. Putnam's Sons, New York and London.
- Hoes, Hinton D. Keys to the Flatfishes and Elasmobranchs of the Texas Coast. (unpublished)
- _____. 1958. A Partially Annotated Checklist of the Marine Fishes of Texas. Institute of Marine Science, Vol. V.
- Hubbs, Clark 1955. Key to the Fresh-Water Fishes of Texas. (unpublished)
- Hubbs, Carl L. and Lagler, Karl F. 1949. Fishes of the Great Lakes Region, Cranbrook Institute of Science, Bull. No. 26.
- Jurgens, Kenneth C. and Hubbs, Clark 1953. A Checklist of Texas Fresh-Water Fishes, Texas Game and Fish Magazine, March 1953.

In addition to the above sources, various keys compiled by members of the staff of the Marine Division were used in identifying the vertebrate forms.