

Job Completion Report

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Project Leader

TITLE

Basic Survey and Inventory of Fish Species in Those Portions of the Sabine River and Its Watershed from and Including Sabine County to Its Mouth on the Gulf Coast, Texas.

OBJECTIVES

To gather fundamental data on the above waters in regard to their physical, chemical and biological aspects. To determine the distribution of fish species present, their relative abundance and the ecological factors influencing their distribution.

METHODS

Because of limited access roads on the Sabine River, this survey was made by boat, working from one bridge crossing to the next. Forty seining stations were established on the Sabine River and visited three times during the period. Seining collections were made each time the stations were visited. Water samples were analysed one time at each station. In addition to the above, ecological notes were taken at each station.

Sixty-two additional collections were made on the tributaries of the Sabine. These stations were visited only one time.

Hoop and gill nets were used at random locations to obtain samples of the larger fish. Hoop nets proved to be the best method for this purpose. Rotenone collections were not made due to adverse public opinion in the area.

ACKNOWLEDGMENTS

Credit is due Mr. Robert J. Kemp who was Project Leader at the time this job was initiated and who did a great deal of the field work before transferring to the Coastal Fisheries Division. We are indebted to Dr. Clark Hubbs, Zoology Department, University of Texas who identified several doubtful specimens. We are also grateful to members of the Warden force who helped us to find access roads in some of the more remote country.

PHYSICAL CHARACTERISTICS

The Sabine River rises in the blackland prairie soils in Hunt County, Texas,

flowing southward through five general soil types and draining over 10,000 square miles of Texas and Louisiana before reaching the Gulf of Mexico approximately 360 miles downstream. At a point approximately five miles above the city of Logansport, Louisiana, it becomes the boundary line between Texas and Louisiana and serves as such from there on to the Gulf of Mexico. Reports have been previously submitted on surveys covering the Sabine from its source down to Sabine County. This report covers the river from and including Sabine County to the Gulf of Mexico, or about 200 miles of river channel. Tributary streams were sampled only on the West or Texas side of the river.

In Sabine County, and through approximately the upper one-half of Newton County, the river flows through the Norfolk - Ruston Soil area of the Red and Yellow Podzolic Soils group. From there it traverses a belt of Caddo - Beauregard Soil of the same group. At this point it enters a belt of Lake Charles - Crowley Soil of the Wiessenboden, Half Bog Soils group which extends for some fifty miles to the lower Newton County line. Near the Orange County line, the river enters the Coastal Marshland where it remains for the rest of its course.

In general the entire watershed included in this study is in woodland, woodland pasture, open pasture, and small crop farms.

Recent studies by the U. S. Soil Conservation Service show that during the last few years much of the cultivated land in the area has been put into woodland, woodland pasture and pasture. This is probably a result of proper land use and conservation education and if the trend continues it should have a beneficial effect upon siltation and flood control in the Sabine River. Principal native vegetation consists of pine, blackjack, post and white oaks, with some dogwood, sweetgum and hickory on well drained areas; in poorly drained situations gums and cypress predominate. Grasses present are, in general, tall bunch grasses and coarse grasses of various genera. Bermuda grass and legumes are in widespread use on improved pastures.

The riverbed is variable with sand, sandy silt and sandy clay predominating. There are occasional rock outcroppings that form shoals and falls with deep cut rock cliffs forming the banks. Stream width varies from approximately 75 feet in some of the narrow deep pools to an estimated six or seven hundred feet near its entrance into Sabine Lake on the Gulf. From the City of Orange down to Sabine Lake, silt deposits that have been periodically stirred by dredging operations, have formed a silty muck bottom several feet deep. This condition made seining operations practically impossible on that part of the river.

This study does not include Sabine Lake since one of the marine biologist is now engaged in a study of that area.

CHEMICAL CHARACTERISTICS

The pH in this portion of the river varied from 6.2 to 7.0 with an average of around 6.6. The effects of lime deposits in the blackland prairie on the extreme upper drainage are hardly evident this far down except during periods of heavy runoff on the upper drainage only. So for fishery purposes, it can be stated that this portion of the river is acid.

Total alkalinity ranged from 23 to 46 ppm which is about normal for waters of this area. The highest water temperature recorded was 88°F. The lowest recorded was 66°F. This low figure undoubtedly does not represent the extreme low because for obvious reasons, boat trips were made during more favorable weather whenever possible.

Chlorides ranged from 14 to 326 ppm, the higher figure being taken from that portion of river near Sabine Lake where tidal action affects the salinity. No salt-water pollution was found during the study. Results of water analysis are shown in Table 1.

POLLUTION

There are no large cities nor large industries situated on this portion of the Sabine River, excepting the City of Orange, so consequently there is very little pollution originating in this area. There is some municipal and industrial pollution in the area around Orange but officials of the Coastal Fisheries Division are taking steps to determine the sources and place responsibility.

Silt pollution is present but localized. Suspended clays give the water a reddish brown color. Turbidity, as measured with a Jackson Turbidimeter, never exceeded 75 ppm when the river was near flood stage. At normal water level, turbidity was less than 25 ppm.

FISH COLLECTIONS

Sixty-two seining collections were made on the tributaries of the Sabine and 120 collections on the river itself. Collections were preserved in formalin and brought back to the laboratory for identification and counting. Large fish were weighed and measured in the field and their stomachs preserved for later analysis.

Table 2 is a key to the seining stations which may be located on the attached map of the study area. Table 3 shows seining collection results in the Sabine River and Table 4 shows the results in tributary streams. Since there is no standard scale for relative abundance, actual numbers are shown in the tables. Due to the many variables in seining techniques these figures do not give an accurate relative abundance picture, but a glance at the total figure for Notropis lutrensis, for example, will indicate that this shiner is very abundant in the Sabine River.

Hoop net and gill net collections were used for stomach analysis and coefficient of condition data. Coefficient of condition data is shown in Table 5 and stomach analysis data is recorded in Table 6. Table 7 is a complete checklist of fish collected by all methods during this study.

FAMILY LEPISOSTEIDAE

All four species of gars were taken during the study and although widespread and common they are not abundant.

FAMILY AMIIDAE

The bowfin or grindle was not found in any great numbers in the streams or the river but they are very common and even abundant in some of the lakes on the watershed.

FAMILY ESOCIDAE

This family was represented only by Esox vermiculatus. If Esox niger occurs on this drainage, it was not discovered nor heard of during this study.

FAMILY CATOSTOMIDAE

Ictiobus bubalus, Carpiodes carpio and Moxostoma poecilurum were found in the river while the tributary streams produced Ictiobus bubalus, Moxostoma poecilurum, Minytrema melanops, Erimyzon sucetta and Erimyzon oblongus.

FAMILY CYPRINIDAE

Twenty-three species of Cyprinids were collected during the study. In the Sabine River, Notropis lutrensis was by far the most abundant. This shiner is an important forage fish in the river and is also prized as the most desirable bait shiner in the area. While making collections trips down the river, the writer observed many bait dealers with hundreds of minnow jugs set on the sandbars at almost every bend in the river. These minnow fishermen undoubtedly take millions of the redhorse shiners from the Sabine in a single year. Even so, the supply seems to be adequate to satisfy the demand thus far. Notropis atherinoides, Notropis sabine, Notropis venustus, Pimephales vigilax and Hybognathus nuchalis were also found in good numbers. In the tributary streams, Notropis venustus far outnumbered any other species. These were found to be especially abundant in the cool clear running streams.

FAMILY ARIIDAE

Galeichthys felis, the sea catfish or hardhead was found near the mouth of the river where tides influenced the salinity.

FAMILY AMEUERIDAE

A glance at the collection results would indicate that this group was somewhat scarce. The best time to collect species of this group is a short period following a rise in the river. We were never able to time collection trips to coincide with best conditions. However it is common knowledge that there are many commercial fishermen operating on the river who depend a great deal on Ictalurus punctatus, Ictalurus furcatus, and Pilodictus olivaris. Some of these fishermen have complained to the writer that illegal electrical devices or "telephones" have seriously curtailed the catfish population in the river. Concrete evidence of this would depend upon former abundance records and as far as the writer can determine no such records are available. Heavy commercial fishing pressure has no doubt served to keep the catfish population somewhat curtailed, and in local situations the "telephones" could have a devastating effect on these species. Recent legislation imposing heavy penalties upon violators has no doubt greatly discouraged the use of these devices.

FAMILY CYPRIDODONTIDAE

Four species of topminnows were taken during the study. Fundulus notatus and Fundulus olivaceus were fairly common and widespread. Fundulus notti and Fundulus chrysotus were more scarce and localized.

FAMILY POECILIIDAE

This family is represented only by Gambusia affinis which is common and widespread.

FAMILY APHREDODERIDAE

Aphredoderus sayanus was found in six of the tributary streams but was not found

in the Sabine River.

FAMILY MUGILIDAE

Mugil cephalus is present in larger numbers than the table of seining results indicates. During seining hauls, many mullet were observed jumping over or escaping around the ends of the seine.

FAMILY ATHERINIDAE

Labidesthes sicculus was the only member of this family taken during the study, occurring in the Sabine River and in three of the tributaries.

FAMILY SERRANIDAE

Morone interrupta was found to be present but apparently is very scarce. One was taken in the river and one in Cow Bayou.

FAMILY CENTRARCHIDAE

This family is well represented in both the Sabine River and the tributary streams with sixteen species being taken during the study. Both Micropterus punctulatus and Micropterus salmoides are fairly abundant with Micropterus punctulatus far outnumbering any other species in this family. Fingerling spotted bass were taken in nearly every seining haul. A number of sportsmen have become interested in float trips down the Sabine since this study was initiated and those who have made these trips report excellent bass fishing when the water is clear enough to use artificial lures. The writer's experience and reports of these fishermen indicate that the bass do not attain as large a size as those in lakes of the area, but these "stream" bass make up for their small size by their fighting ability in the running water.

Both Pomoxis annularis and Pomoxis nigro-maculatus occur in good numbers with the black crappie outnumbering the white in both the river and the tributary streams.

FAMILY PERCIDAE

Ten species of darters were collected during the study. Selective and more intensive seining would no doubt uncover other species of this group.

FAMILIES CARANGIDAE, SCIAENIDAE, SPARIDAE, PLEURONECTIDAE AND ACHIRIDAE

Except for Aplodinotus grunniens, the remainder of the fish representing the above families are saltwater forms which were taken near the mouth of the river. Their upstream migration is apparently limited by the upstream boundary of tidal saltwater influence.

Table 1. Results of Water Analysis Stations on Sabine River. (Sabine, Newton and Orange Counties, Texas).

Station Number	Date	Air Temp °F.	Water Temp. °F.	pH	Total Alk. ppm.	Chlorides	Location of Station
S-1	6-13-55	87	87	6.6	46	85.104	5 mi E of Sexton
S-2	6-13-55	90	88	6.6	46	99.288	7 $\frac{1}{2}$ mi ESE of Sexton
S-5	8-16-55			6.4	30	70.92	8 $\frac{1}{2}$ mi ENE of Willam
S-7	10-4-55			6.8	27	14.184	10 $\frac{1}{2}$ mi ENE of Hemphill
S-9	6-14-55	84	82	7.0	46	106.38	10 mi ESE of Hemphill
S-10	10-4-55			6.8	28	141.84	3 3/4 mi NE of Fairdale
S-11	8-16-55			6.6	26	56.736	4 $\frac{1}{2}$ mi E of Fairdale
M-1	6-14-55	87	83	6.6	33	56.736	6 $\frac{1}{4}$ mi ESE of Fairdale
M-2	10-4-55			7.0	32	141.84	9 $\frac{1}{2}$ mi ESE of Fairdale
M-4	8-16-55			6.6	25	49.644	11 mi SE of Fairdale
M-5	7-26-55	87	86	6.6	27	56.736	9 $\frac{1}{4}$ mi NE of Burkeville
M-6	8-17-55			6.6	2	49.644	9 $\frac{1}{4}$ mi ENE of Burkeville
M-7	10-5-55			6.9	30	70.92	5 3/4 mi ENE of Burkeville
M-8	7-26-55			6.6	25	56.736	5 3/4 mi ESE of Burkeville
M-10	8-17-55			6.4	23	35.552	9 3/4 mi SE of Burkeville
M-11	7-26-55			6.6	30	56.736	10 $\frac{1}{4}$ mi SSE of Burkeville
M-13	10-5-55			6.8	35	70.92	10 3/4 mi ESE Newton
M-14	7-26-55	84	86	6.8	28	56.736	10 $\frac{1}{2}$ mi SE Newton
M-15	8-17-55			6.2	25	35.460	12 mi SSE of Newton
M-16	7-27-55			6.8	27	56.736	12 $\frac{1}{2}$ mi NE of Call
M-18	10-6-55			6.8	35	70.92	8 3/4 mi ESE of Call
M-19	7-27-55			6.6	27	56.736	2 $\frac{1}{2}$ mi ESE of Salem
M-21	10-4-55			6.8	30	70.92	8 mi SE of Salem
M-24	10-25-55	49	67	6.6	30	49.644	1 $\frac{1}{4}$ mi ENE of Deweyville
M-25	10-25-55	50	67	6.6	30	49.644	2 $\frac{1}{2}$ mi SE of Deweyville
M-26	10-25-55	52	66	6.6	30	49.644	4 mi SSE of Deweyville
O-1	10-25-55	71	67	6.6	30	49.644	5 mi. SSE of Deweyville
O-2	9-14-55			6.6	27	70.92	6 mi. of Orange
O-3	9-14-55			6.6	28	326.232	2 $\frac{1}{2}$ mi ENE of Orange

Table 2. Key to Collection Stations on Sabine River and Its Watershed.
(Sabine, Newton, and Orange Counties, Texas)

Sabine County:

1. Sabine River 5 miles E of Sexton
2. Sabine River $7\frac{1}{2}$ miles ESE of Sexton
3. Sabine River $11\frac{3}{4}$ miles ESE of Sexton
4. Sabine River $6\frac{3}{4}$ miles NE of Milam
5. Sabine River $8\frac{1}{2}$ miles ENE of Milam
6. Sabine River $8\frac{3}{4}$ miles ESE of Milam
7. Sabine River $10\frac{1}{2}$ miles ENE of Hemphill
8. Sabine River 10 miles E of Hemphill
9. Sabine River 10 miles ESE of Hemphill
10. Sabine River $3\frac{3}{4}$ miles NE of Fairdale
11. Sabine River $4\frac{1}{2}$ miles E of Fairdale
12. Colorow Creek Hwy 87 1 mile E of Sexton
13. Reeves Creek Hwy 87 4 miles SE of Sexton
14. Carassee Creek Hwy 21 $4\frac{1}{4}$ miles ENE of Milam
15. Borgas Creek Hwy 21 $\frac{1}{2}$ mile W of Milam
16. Tebo Creek Farm road 184 $8\frac{1}{2}$ WSW of Milam
17. Palo Goucho Bayou off road 3 miles SSW of Milam
18. Borgas Creek off road 3 miles S of Milam
19. Palo Goucho Bayou Hwy. 87 $3\frac{1}{2}$ miles S of Milam
20. Palo Goucho Bayou off road 6 miles SE of Milam
21. Housen Bayou Hwy 83 $2\frac{1}{2}$ miles SW of Hemphill
22. Housen Bayou Hwy. 87 $2\frac{1}{2}$ miles S of Hemphill
23. Bull Creek 944 (Hwy.) 7 miles SE of Hemphill
24. Housen Bayou off road $8\frac{1}{2}$ miles SE of Hemphill
25. Six Mile Creek Hwy. 87 $4\frac{1}{2}$ miles SSE of Yellow Pine
26. Sandy Creek Hwy 87 $4\frac{1}{2}$ WSW of Fairdale
27. Sandy Creek (south prong) Hwy. 87 $4\frac{1}{2}$ SW of Fairdale
28. Six Mile Creek off road $1\frac{1}{2}$ miles N of Fairdale
29. Aurelie Creek off road $2\frac{3}{4}$ miles SW of Fairdale

Newton County

1. Sabine River $6\frac{1}{2}$ miles ESE of Fairdale
2. Sabine River $9\frac{1}{2}$ miles ESE of Fairdale
3. Sabine River $10\frac{1}{4}$ miles SE of Fairdale
4. Sabine River 11 miles SE of Fairdale
5. Sabine River $9\frac{1}{2}$ miles NE of Burkeville
6. Sabine River $9\frac{1}{4}$ ENE of Burkeville
7. Sabine River $5\frac{3}{4}$ miles ENE of Burkeville
8. Sabine River $5\frac{3}{4}$ ESE of Burkeville
9. Sabine River $9\frac{1}{4}$ miles ESE of Burkeville
10. Sabine River $9\frac{3}{4}$ miles SE of Burkeville
11. Sabine River $10\frac{1}{2}$ miles SSE of Burkeville
12. Sabine River $11\frac{1}{2}$ miles E of Newton
13. Sabine River $10\frac{3}{4}$ ESE of Newton
14. Sabine River $10\frac{1}{2}$ miles SE of Newton
15. Sabine River 12 miles SSE of Newton
16. Sabine River $12\frac{1}{2}$ miles NE of Call
17. Sabine River 11 miles E of Call
18. Sabine River $8\frac{3}{4}$ miles ESE of Call
19. Sabine River $2\frac{1}{2}$ miles ESE of Salem

Table 2. (Continued).

20. Sabine River 5 miles SE of Salem
21. Sabine River 8 miles SE of Salem
22. Sabine River 8 3/4 SSE of Salem
23. Sabine River 11 3/4 mi. S of Salem
24. Sabine River 1 1/4 mi. ENE of Deweyville
25. Sabine River 2 1/2 mi. SE Deweyville
26. Sabine River 4 mi. SSE of Deweyville
27. Big Cow Creek 8 3/4 mi. WSW of Burkeville on Farm RD. 1416
28. Beekham Creek 10 1/4 mi. WSW of Burkeville on Hwy. 63
29. Beekham Creek 11 mi. WSW of Burkeville on Hwy. 63
30. Cat Creek 3 3/4 mi. WSW of Burkeville on Hwy. 63
31. Little Cow Bayou 1 mi. SW of Burkeville on Hwy. 63
32. McGray Creek 1 mi. NE of Burkeville on Hwy. 63
33. Little Cow Creek 1 3/4 mi. SE of Burkeville
34. Yellow Bayou 3 mi. SSE of Burkeville
35. Big Cow Creek 10 3/4 mi. SW of Burkeville
36. Yellow Bayou 3 mi. SE of Burkeville
37. Little Cow Bayou 5 mi. ESE of Burkeville
38. Big Cow Creek 2 1/2 mi. NW of Newton
39. Quicksand Creek 4 mi. NE of Newton
40. Morey Branch 5 1/2 mi. ENE of Newton
41. Little Quicksand Creek 6 1/4 mi. ENE of Newton
42. Underwood Creek 7 3/4 mi. ENE of Newton
43. Miller Creek 4 3/4 mi. NNE of Armstrong Lake
44. Big Cow Creek 2 mi. SW of Newton
45. Quicksand Creek 8 3/4 mi. ESE of Newton
46. Caney Creek 2 1/2 mi. NE of Bon Wier
47. Caney Creek 1/2 mi. W of Bon Wier
48. Davis Creek 3 1/2 mi. WSW of Bon Wier
49. Davis Creek 1 3/4 mi. SSW of Bon Wier
50. Davis Creek 4 mi. SSW of Bon Wier
51. White Oak Creek 10 1/2 mi. WSW of Bon Wier
52. Thickety Creek 12 mi. SSW of Bon Wier
53. Dempsey Creek 5 mi SSW of Bon Wier
54. Church House Creek 6 mi. SSW of Bon Wier
55. Arch Creek 8 mi. SSW of Bon Wier
56. Trout Creek 6 mi. NNE of Call
57. Trout Creek 3 3/4 mi. ENE of Call
58. Big Cow Creek 4 3/4 mi. E of Call
59. Big Cow Creek North Fork 6 3/4 mi. E of Call
60. Nichols Creek 4 1/4 mi. SSE of Call
61. Slayboms Creek 2 mi. WNW of Salem
62. Nichols Creek 5 mi. SSW of Salem
63. Big Cypress Creek 8 1/2 mi. SSW of Salem
64. Big Cypress Creek 5 mi. NW of Deweyville
65. San Slough North Fork 1 mi. WSW of Deweyville

Orange County:

1. Sabine River 5 mi. SSE of Deweyville
2. Sabine River 6 mi. NNE of Orange
3. Sabine River 2 1/2 mi. ENE of Orange
4. Cow Bayou 2 1/2 mi. NW of Mauriceville
5. Cow Bayou 2 1/2 mi. SSW of Mauriceville
6. Little Cypress Bayou 7 mi. SE of Mauriceville
7. Adams Bayou 5 mi. NW of Orange
8. Cow Bayou 1/2 mi. NE of Orangefield

Table #4: SEINING COLLECTION RESULTS IN TRIBUTARY STREAMS OF SABINE RIVER IN TEXAS

NO.	SPECIES	LOCATION														TOTAL						
		Patroun Bayou	Omaha Bayou	Housan Bayou	Six Mile Creek	Amelle Creek	Little Cow Creek	Quadsand Creek	Caney Creek	Devils Creek	Dempsey Creek	Church House Creek	Big Cow Creek	Stuydent's Creek	Nichols Creek		Big Cypress	Sand Slough	Arch Creek	Little Cypress Creek	Adams Bayou	Cow Bayou
1.	<i>Lepisosteus spatula</i>																				1	1
2.	<i>Lepisosteus protractus</i>																				6	6
3.	<i>Lepisosteus osseus</i>																				8	8
4.	<i>Lepisosteus platostomus</i>																				2	2
5.	<i>Amia calva</i>																1					1
6.	<i>Dorosoma cepedianum</i>															2						2
7.	<i>Esox vermiculatus</i>		3	1					1	5	1	13			6	2						32
8.	<i>Ictalurus bubalus</i>																				1	1
9.	<i>Microstoma poecilurum</i>		2						1/2	1		19										26
10.	<i>Minytrema melanops</i>	4				2						5	2									13
11.	<i>Erimyzon sucetta</i>				11					7		29										57
12.	<i>Erimyzon oblongus</i>	5	2	1				16				2			1							27
13.	<i>Cyprinus carpio</i>																				1	1
14.	<i>Notemigonus crysoleucas</i>		4	3	4					16		6	6	21	8							74
15.	<i>Opsopoeodus emiliae</i>			7	2				3									17		9		38
16.	<i>Semotilus atromaculatus</i>	40	1																			41
17.	<i>Notropis atherinoides</i>		19	12								1										30
18.	<i>Notropis amabilis</i>																				41	41
19.	<i>Notropis fuerns</i>		8	18		1	1				3										11	42
20.	<i>Notropis umbretalis</i>	9	19	18	13	35	76	2				104										274
21.	<i>Notropis roseus</i>				1		1					1										3
22.	<i>Notropis sabinae</i>			2	4	3	103															112
23.	<i>Notropis venustus</i>	1	11	26	71	70	348	102	92	30	27	33	289							2		1102
24.	<i>Notropis lutrensis</i>	2	5	19	36	4						1									2	69
25.	<i>Notropis atrocaudalis</i>	9	7	6	4	2							2									30
26.	<i>Notropis volucellus</i>		1	2	24	9	38					89										134
27.	<i>Notropis buchmanii</i>				15	4						1										20
28.	<i>Pimephales vigilax</i>	1		3	6	1	1	2				1									1	16
29.	<i>Hybomathus nuchalis</i>		7	9				1				21										38
30.	<i>Ictalurus furcatus</i>																				4	4
31.	<i>Pilodictus olivaris</i>																				1	1
32.	<i>Ameiurus natalis</i>	4	1	1	11	1						2								2	1	23
33.	<i>Ameiurus melas</i>								150			1										151
34.	<i>Schilbeodes mollis</i>																				1	1
35.	<i>Schilbeodes nocturnus</i>						1															1
36.	<i>Fundulus notatus</i>														1						16	17

Table 5. Length, Weight and Coefficient of Condition of Species in Sabine River.

	Number of Specimens	Standard Length Range	Standard Length Average	Weight Range	Weight Average	"K" Range	"K" Average
Channel catfish	13	150 - 380mm	296mm	50 - 907 gm	466gm	1.29 - 1.72	1.52
Flathead catfish	1		245		215		1.46
White crappie	23	97 - 260	174	20 - 535	163	2.13 - 3.04	2.95
Warmouth	4	142 - 195	163	140 - 265	179	3.07 - 4.89	3.82
Bluegill	6	105 - 145	126	42 - 189	103	4.07 - 7.68	4.88
Drum	2	218 - 220	219	220 - 250	235	2.12 - 2.35	2.23
Black crappie	6	165 - 212	179	118 - 295	178	2.65 - 3.26	3.04
Blue catfish	2	290 - 343	316	340 - 595	467	1.39 - 1.47	1.43
Largemouth bass	1		335		1021		2.28
Spotted bass	1		225		272		2.39
Carp sucker	1		190		215		3.13
Smallmouth buffalo	1		242		470		2.32
Red breasted sunfish	1		136		125		4.96

Table 6. Stomach Analysis by Frequency of Food Types

Species	Number Stomachs Examined	Number Stomachs Empty	NUMBER STOMACHS CONTAINING:																	
			Ephemera Mayflies	Odonata Dragonflies	Hemiptera Waterbugs	Coleoptera Beetles	Molusca	Crustacea	Game Fish	Forage Fish	Detritus	Misc. No.	Miscellaneous Contents							
<u>Ictiobus bubalus</u>	1	1																		
<u>Carpilodes carpio</u>	1	1																		
<u>Ictalurus punctatus</u>	7	4																		
<u>Ictalurus furcatus</u>	1	1																		
<u>Micropterus salmoides</u>	1																			Frog
<u>Chaenobryttus coronarius</u>	4																			1
<u>Lepomis macrochirus</u>	4																			1
<u>Lepomis auritus</u>	1	1																		Caddis fly
<u>Pomoxis annularis</u>	20	7	2	1																
<u>Pomoxis nigro-maculatus</u>	5				2	1														
<u>Aplodinotus grunniens</u>	2	2																		Fish eggs

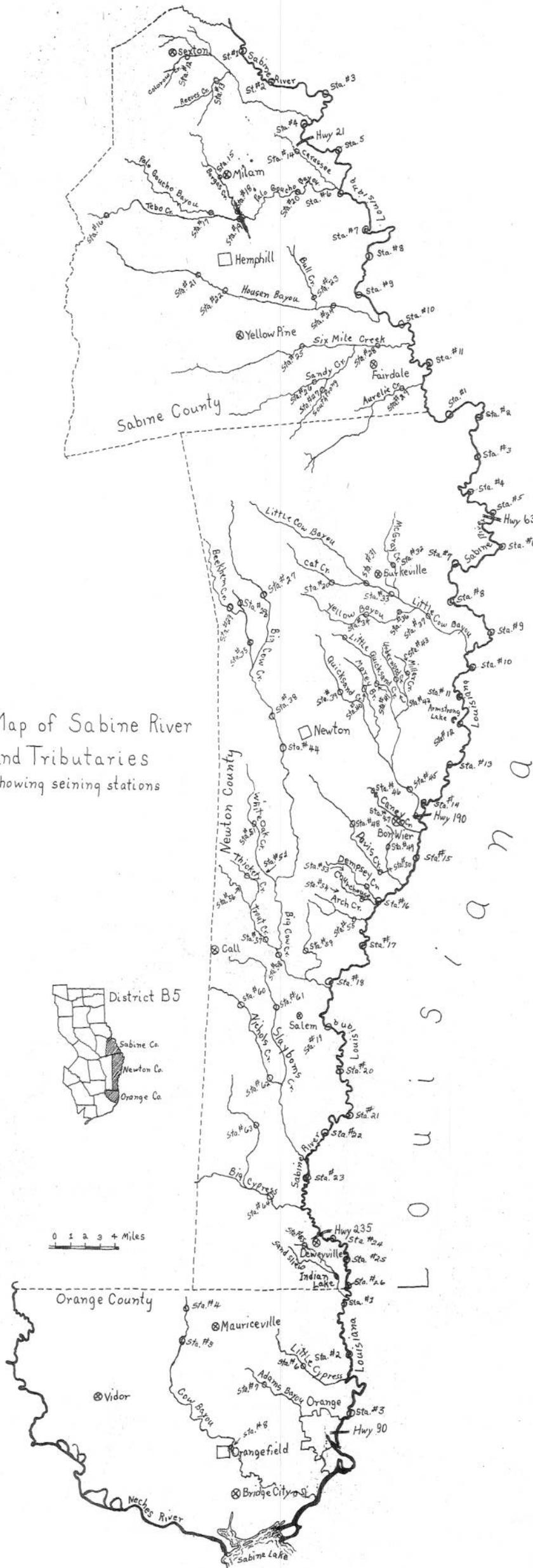
Figure 2. Location of stomachs containing food types in the stomachs of various species.

Table 7. Complete Checklist of Fish Collected During this Survey.

I. Family:	PETROMYZONIDAE---Lampreys	chestnut lamprey
	1. <u>Ichthyomyzon castaneus</u>	
II. Family:	LEPISOSTEIDAE---Gars	
	2. <u>Lepisosteus spatula</u>	alligator gar
	3. <u>Lepisosteus platostomus</u>	shortnose gar
	4. <u>Lepisosteus productus</u>	spotted gar
	5. <u>Lepisosteus osseus</u>	longnose gar
III. Family:	AMIIDAE---Bowfins	
	6. <u>Amia calva</u>	bowfin
IV. Family:	CLUPEIDAE---	
	7. <u>Alosa chrysochloris</u>	skipjack
	8. <u>Brevoortia gunteri</u>	bay menhaden
	9. <u>Dorosoma petenensis</u>	threadfin shad
	10. <u>Dorosoma cepedianum</u>	gizzard shad
V. Family:	ENGRAULIDAE---Anchovies	
	11. <u>Anchoa mitchilli</u>	bay anchovy
VI. Family:	ESOCIDAE---Pickerels	
	12. <u>Esox vermiculatus</u>	grass pickerel
VII. Family:	CATOSTOMIDAE---Suckers and Buffalofishes	
	13. <u>Ictiobus bubalus</u>	smallmouth buffalo
	14. <u>Carpiodes carpio</u>	river carpsucker
	15. <u>Moxostoma poecilurum</u>	blacktail redhorse
	16. <u>Minytrema melanops</u>	spotted sucker
	17. <u>Erimyzon sucetta</u>	lake chubsucker
	18. <u>Erimyzon oblongus</u>	creek chubsucker
VIII. Family:	CYPRINIDAE---Shiners and minnows	
	19. <u>Cyprinus carpio</u>	carp
	20. <u>Notemigonus crysoleucas</u>	golden shiner
	21. <u>Semotilus atromaculatus</u>	creek chub
	22. <u>Opsopoeodus emiliae</u>	pugnose minnow
	23. <u>Extrarius aestivalis</u>	speckled dace
	24. <u>Phenocobius mirabilis</u>	suckermouth minnow
	25. <u>Notropis atherinoides</u>	emerald shiner
	26. <u>Notropis amabilis</u>	Texas shiner
	27. <u>Notropis fumeus</u>	ribbon shiner
	28. <u>Notropis umbratilis</u>	redfin shiner
	29. <u>Notropis chalybeus</u>	ironcolor shiner
	30. <u>Notropis roseus</u>	central weed shiner
	31. <u>Notropis potteri</u>	broadhead shiner
	32. <u>Notropis sabiniae</u>	longnose shiner
	33. <u>Notropis amnis</u>	palid shiner
	34. <u>Notropis venustus</u>	blacktail shiner
	35. <u>Notropis lutrensis</u>	red shiner
	36. <u>Notropis deliciosus</u>	sand shiner
	37. <u>Notropis atrocaudalis</u>	blackspot shiner

38. Notropis volucellus mimic shiner
 39. Notropis buchanani ghost shiner
 40. Hybognathus muchalis silvery minnow
 41. Pimephales vigilax Parrot minnow
- IX. Family: ARIIDAE---Sea catfishes
 42. Galeichthys felis sea catfish
- X. Family: AMEIURIDAE---Freshwater catfish
 43. Ictalurus punctatus southern channel catfish
 44. Ictalurus furcatus blue catfish
 45. Ameiurus melas black bullhead
 46. Ameiurus natalis yellow bullhead
 47. Pilodictus olivaris flathead catfish
 48. Schilbeodes mollis tadpole madtom
 49. Schilbeodes nocturnus freckled madtom
- XI. Family: CYPRINODONTIDAE---Killifishes and topminnows
 50. Fundulus chrysotus redspot topminnow
 51. Fundulus notti starhead topminnow
 52. Fundulus olivaceus blackspot topminnow
 53. Fundulus notatus blackstripe topminnow
- XII. Family: POECILIIDAE---Mosquitofishes
 54. Gambusia affinis gambusia
- XIII. Family: APHREDODERIDAE---Pirate perch
 55. Aphredoderus sayanus pirate perch
- XIV. Family: MUGILIDAE---Mullet
 56. Mugil cephalus striped mullet
- XV. Family: ATHERINIDAE---Siversides
 57. Labidesthes sicculus brook silversides
- XVI. Family: SERRANIDAE---Basses
 58. Morone interrupta yellow bass
- XVII. Family: CENTRARCHIDAE---Black basses and sunfishes
 59. Micropterus punctulatus spotted black bass
 60. Micropterus salmoides largemouth black bass
 61. Chaenobryttus coronarius warmouth
 62. Lepomis cyanellus green sunfish
 63. Lepomis symmetricus small sunfish
 64. Lepomis punctatus spotted sunfish
 65. Lepomis microlophus redear sunfish
 66. Lepomis macrochirus bluegill
 67. Lepomis humilis orangespotted sunfish
 68. Lepomis auritus yellowbelly sunfish
 69. Lepomis megalotis longear sunfish
 70. Lepomis marginatus dollar sunfish
 71. Pomoxis annularis white crappie
 72. Pomoxis nigromaculatus black crappie

73. Centrarchus macropterus flier
 74. Elassoma zonatum banded pigmy sunfish
- XVIII. Family: PERCIDAE---Perches and Darters
75. Hadropterus scierus dusky darter
 76. Ammocrypta vivax Arkansas sand darter
 77. Ammocrypta clara western sand darter
 78. Etheostoma chlorosomum bluntnose darter
 79. Etheostoma gracile western swamp darter
 80. Etheostoma asprigenis mud darter
 81. Etheostoma parvipinne goldstripe darter
 82. Etheostoma whipplei western redbfin darter
 83. Etheostoma spectabile orangethroat darter
 84. Etheostoma fonticola large spring small darter
- XIX. Family CARANGIDAE---Jackfishes
85. Chloroscombrus chrysurus bumper
- XX. Family: SCIAENIDAE---Croakers, drum and weakfishes
86. Aplodinotus grunniens freshwater drum
 87. Sciaenops ocellata red drum
 88. Micropogon undulatus Atlantic croaker
 89. Pogonias cromis black drum
 90. Cynoscion arenarius sand squeteague
 91. Cynoscion nebulosus spotted squeteague
- XXI. Family: SPARIDAE
92. Archosargus probatocephalus sheephead
- XXII. Family: PLEURONECTIDAE---Flounders
93. Paralichtys lethostigma southern flounder
- XXIII. Family: ACHIRIDAE---Soles
94. Achirus maculatus hogchoker



Map of Sabine River and Tributaries showing seining stations



0 1 2 3 4 Miles

