

PERFORMANCE REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

Federal Aid Project F-30-R-5

Statewide Fishery Management Recommendations

Job A: Existing Reservoir and Stream Management Recommendations  
Sabine River

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September 24, 1980

Performance Report  
Job A, District IV-A

Objective: To recommend habitat improvement, fisherman information, fish population manipulation, vegetation control, pollution control, fisherman access and facility development, and fishing regulations for existing and proposed public waters of Texas.

I. Summary:

During 1979 the Sabine River and its tributaries in Texas were surveyed according to the Texas Parks and Wildlife Management Manual to identify areas where fishing recreation could be increased by applying fisheries management techniques. The ease with which white crappie, channel catfish, and largemouth bass were collected suggests that there were good populations of these fish in the Sabine River. Similar information suggests that the tributaries generally had good populations of bluegill and redear sunfish with the larger tributaries having an adequate presence of largemouth bass. Sixty-five species were collected by all sample methods. Species observed, but not collected during this segment, were striped bass and American eel. Species on the endangered or threatened list in the river were the blue sucker (collected by electrofishing) and probably the paddlefish. (A photograph was seen of one specimen reportedly taken by a trotline fishermen just below the Toledo Bend Dam tailrace.)

Management recommendations are as follows: 1) There should be more information made available to the public on the stream fisheries, river flow and access points. 2) Boat ramps should be installed at the tailrace area and on State Highway 63. 3) The effects of any new paper mill should be monitored to determine its influence on the river.

II. Significant Deviations:

Unbaited hoop nets were set for a total of six nights in the river and no fish were collected. No seine collections were made in the main river due to high water during most of this segment.

III. Cost: \$30,000

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Date: September 24, 1980

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## DESCRIPTION OF STUDY AREA

The study area consisted of that segment of the Sabine River located from Toledo Bend Dam in Newton County downstream to about where Sabine Lake begins in Orange County (147 river miles) and all its tributaries on the Texas side of the river. Most of the river is located in the East Texas Timberlands land resource area except for the southernmost portion which is located in the Coast Marsh land resource area.

The river is generally characterized by high water levels during the period from March through October produced by a combination of rainfall and releases from Toledo Bend Dam for power generation (Figure 1). During these months, daily fluctuations are common due to the length of releases from the dam. These fluctuations are severe, 4 to 10 feet in a 24-hour period, in the upper half of this river segment. The dam is controlled by the Sabine River Authority of Texas and the Sabine River Authority of Louisiana. The electricity is produced for Gulf States Utilities. The water in the river is generally quite clear, particularly during the power producing season. Pollution in the river is minimal at this time with the main problems arising from two paper mills whose effluents give the river a black color during periods of low flow.

The Sabine River is fairly large with its channel width ranging from 75 yards to more than a quarter of a mile near Sabine Lake. Water depths are quite variable, ranging from 1 foot to 75 feet. Since there is little or no gravel or rock in the river, no riffles are present and there are no obstruction to fish movement in this segment. The stream bottom is composed primarily of sand with some of the shallow areas swept clean down to the hard clay substrate. Fish habitat in the river consists primarily of fallen timber and undercut banks.

The topography of the watershed in this segment of the river consists of heavily wooded hills in the upper half and heavily wooded level areas in the lower half. Associated vegetation is principally pine uplands and mixed pine-hardwoods bottomlands. Large cypress swamps are found primarily at the lowermost portion of the river.

Channel, blue, and flathead catfish, crappie and largemouth bass are the major components of this fishery. Hoop nets are legal on the Louisiana side of the river, but not on the Texas side; therefore, some buffalo are also probably taken. Estuarine species, such as flounder, redfish and seatrout, enter the fisheries in the lower portion of the river near Sabine Lake.

Many tributaries are clear, cool streams with heavily vegetated banks. The smaller streams support primarily sunfish while the larger streams produce more bass, crappie and catfish. Coastal streams are wide, sluggish bayous with dark murky water, and these produce some estuarine species in addition to the freshwater fish.

## MATERIALS AND METHODS

Data from Sabine River Authority water quality sampling stations on the main river were used in this report (Table 1). Additional water quality analyses were made on five tributary streams (Table 1). Temperature, dissolved oxygen, pH, conductivity, and total alkalinity, turbidity and chlorides were determined using portable, direct reading meters and a portable Hach Model DR-EL Engineer's Laboratory.

Fish habitat improvement needs were determined by visual inspections. Species composition and distribution of aquatic vegetation was determined for the river during August and September.

Seining was conducted at 43 stations on the tributary streams from August through October (Figures 2 and 3). Samples were taken using whatever size seine best suited the situation. Straight seines with 1/8 inch mesh were used in the following sizes: 10 feet long by 4 feet deep and 20 feet long by 6 feet deep. Generally three to six drags of various lengths were made at each stations.

Seven gill net sampling stations were sampled during June, August and September (Figures 2 and 3). Five stations were sampled with six gill nets and two stations were sampled with twelve gill nets. Generally each station covered two to four river miles. Gill nets used were constructed of monofilament and multifilament nylon and measured 200 feet long and 8 feet deep. Mesh sizes increased by 1/2 inch increments from 1/2 to 4 inch bar mesh at 25 feet intervals. The 1/2 inch panel was the only part that was made of multifilament nylon. Nets were set late in the afternoon and ran before noon the following day.

Samples were taken with the boom type electrofishing boat during August and October (Figures 2 and 3). The boat was equipped with a 3,000 watt portable generator capable of producing 120 volts alternating current. Most collections were made using alternating current because the transformer-pulsator part of the unit burned out during August. The Sabine River was sampled at five sites, Adams Bayou and Cow Bayou were each sampled at one site. Each sample period consisted of one hour actual shocking time.

Samples were taken with the back-pack electrofishing unit during November (Figures 2 and 3). One site on Davis Creek and two sites on Nichols Creek were sampled. Each sample site was subjected to four 15-minute collecting periods. The unit used was a Smith-Root Type VII-A Electrofisher powered by a 12 bolt battery.

All common and scientific names used in this report are in accordance with A List of Common and Scientific Names of Fishes from the United States and Canada, American Fisheries Society Special Publication, No. 6.

Scale samples were collected from some of the largemouth bass, spotted bass, white and black crappie. Impressions of the scales were made on clear plastic slides and these were analyzed to estimate lengths at earlier periods of life. The length-weight relationship was expressed as  $\log W = \log a + b \log L$  where  $W$  = weight in grams,  $L$  = length in millimeters,  $a$  = a constant and  $b$  the slope of the length-weight regression. A value of  $b$  over 3 indicates that the weight increased at a faster rate than the length. The plumpness of the fishes was expressed as  $K = W \times 10^3 \times 1/L^3$  where  $K$  = the index of plumpness or condition,  $W$  = the weight in grams,  $L$  = length in millimeters. In the case of largemouth bass, the technique of Anderson (1978) was used as a measure of condition as well. Bass collected in June were not used. Bass weighing over 800 grams were not used because the accuracy of scales measuring weights heavier than this are probably not accurate to within one per cent of the true body weight, which is the required accuracy for this technique.

Public access and fisherman information needs were evaluated by determining if existing access facilities and sources of information were adequate to promote optimum utilization of the fishing resource.

Fisheries surveys information was used to determine needs for changes in harvest regulations. Public hearings concerning proposed regulations were attended and justification for these proposals with the attending public.

## RESULTS AND DISCUSSION

### Physicochemical Characteristics

Water quality in the river and tributary streams was generally good (Table 1). The main stream was generally slightly acid to neutral while the tributaries were very acid (pH 5.8 or less). It was not possible to measure the pH in Dempsey and Quicksand Creeks with the method used. Oxygen in the river was adequate for aquatic life. Turbidity was low in the river primarily because the main source of water from February through October was from surface water released through the power plant at Toledo Bend Dam (Figure 1). During extended periods of low releases from the dam, the water in the river below the confluence of Anacocoa Bayou becomes quite black in color due to the presence of paper mill effluent from the Boise Southern Paper Mill in Anacocoa, Louisiana.

Except during periods of heavy rainfall, most of the tributaries are clear, cool, shallow streams. The coastal bayous are deep, sluggish streams with dark colored waters which become estuarine in nature as they near their confluence with the Sabine River.

### Fish Habitat

Good spawning and nursery areas are available for maintaining sport fish populations in the Sabine River. Spawning areas include protected backwaters,

old sloughs and creeks. Cover is limited primarily to fallen trees, stumps, log jams and undercut banks.

Aquatic vegetation in the river itself is quite limited due to the wide fluctuations in water level and high current speeds. Near the headwaters of Sabine Lake, the current becomes quite sluggish. At this point the vegetation includes pondweed, water hyacinths, duckweed, fanwort, coontail and bushy pondweed. Most of the remaining aquatic vegetation is emergent vegetation, including bald cypress, black willow, buttonbush, smartweed, common and narrowleaf cattails, bulrush, water pennywort, water celery, sedge, and arrowhead. During this survey no problems with aquatic vegetation were observed.

#### Fish Community

Forage Fishes: Gill net and electrofishing samples (Tables 2 and 3) indicate that gizzard shad, threadfin shad, sunfish and striped mullet were probably the primary forage fishes present in the river. Several black-tail shiners were also collected by these methods suggesting a good population was present. The gizzard shad was by far the most frequently collected and widespread of the forage fishes.

Sport Fishes: Largemouth bass, spotted bass, white crappie, black crappie and channel catfish were the most frequently collected species from the river (Tables 2 and 3) using gill nets and electrofishing. Blue catfish, flathead catfish, bluegill, redear and warmouth were also commonly collected. Good reproduction was suggested for these species by the variation in sizes of captured specimen. No striped bass were collected during the survey; however, during striped bass hatchery work in April, many stripers were collected in the tailrace area below the Toledo Bend Lake dam. These fish ranged in size from 15 to 30 pounds. A fisherman caught a 12-pound striped bass-white bass hybrid in this same area during December. Six sexually mature white bass were collected from the tailrace by State personnel with rod and reel April 9, 1980. Sport fish population appears adequate to support additional fishing pressure.

Sheepshead, flounder and seatrout enter the picture as the river becomes more estuarine in nature. Other estuarine species, such as redfish, probably also occur.

Rough Fishes: Spotted gar, longnose gar, ladyfish, smallmouth buffalo, river carpsucker, carp and blacktail redhorse were the most frequently collected rough fishes in the river using gill nets and electrofishing (Tables 2 and 3). No rough species appeared to be problematical.

Endangered Populations: Only one species on the State's threatened species list was collected during this segment. One specimen of blue sucker was taken by electrofishing (Table 3). This specimen was small, weighing only 0.1 pound. Three large specimen were observed, but not collected, during electrofishing. These fish appeared to weigh approximately 5 pounds. The one small specimen indicated at least some reproduction.

One 45-pound paddlefish was reportedly caught by a fisherman just below the tailrace area in the spring of 1977. This fisherman had a photograph

to substantiate his story. Another 25-pound paddlefish was reportedly taken in the same area in early 1978.

Age. Growth and Condition Analysis: Due to the small sample sizes of the different species examined, conclusions drawn from the following results are tentative.

The growth rate of the largemouth bass from the Sabine River (Table 4) was slow compared to reservoirs located on the Sabine-Sulphur-Cypress-Neches river systems and compared to reservoirs located in the Pineywoods ecological region of Texas (Prentice and Durocher, 1978). The Sabine River bass reached the legal length of 10 inches in their second or third year and weighed 1.0 to 1.5 pounds in their fourth year. However, their growth rate was similar to that of nearby reservoirs (Table 5), at least the first three years. The data for Table 5 were collected with other data for the studies of Seidensticker and Helton, 1976; Seidensticker, 1977; and Seidensticker, 1978; however, these data did not appear in the reports of these studies, although some other growth data did. In the case of Dam B, the data used is in the appendix of the report. Oklahoma data reported by Heidinger (1976) indicates that the growth rate of largemouth bass is a function of the type of water where they are found. Therefore, it is doubtful that Texas reservoir data can be used to make a judgement about the quality of the Sabine River as river habitat for bass. There is little growth rate data from rivers for largemouth bass (Carlander, 1977), and it is nonexistent for Texas. The growth rate is similar to the average growth rate of three Oklahoma rivers (Carlander, 1977) so at least the Sabine River compares well with these rivers.

The slope of the length-weight regression was not significantly different than three at the 0.05 level. This indicates that the bass gained weight at about the same rate as they increased in length. There are many values reported by Carlander (1977) that are near three and one would expect that many are not significantly different from three; however, no mention is made of a test for significance. Prentice and Durocher (1978) reported slopes of 3 and 3.1 for the Sabine-Sulphur-Cypress-Neches river systems and the Pineywoods ecological area respectively. Therefore, this value is acceptable.

The average condition factor was 1.531. This is larger than most of the values listed by Carlander (1977); however, it is less than any of the values listed by Prentice and Durocher (1978) for any place in Texas. I conclude from this that 1.531 is acceptable even though it is low for this State. Condition was also evaluated using the method recommended by Anderson (1978). Using this method, condition is expressed in terms of relative weight. The desirable values for relative weight are those from 95 through 100. The Three length groups: less than 8 inches, 8 inches to

less than 12 inches, and 12 inches and larger had relative weight values of 91, 93 and 110 respectively. The number of fish involved in the calculations for each length class was 3, 6 and 8. These data suggest that smaller bass do not do as well as larger bass. Perhaps an insufficient amount of small forage was the cause of this.

The Sabine River spotted bass reached catchable size about the time they started their third year (Table 6). This is somewhat longer than was required for largemouth bass to reach catchable size; however, since the spotted bass does not grow as large, this slower growth is expected.

Carlander (1977) stated that the growth rate of spotted bass in reservoirs is generally faster than that of spotted bass in streams and that the growth rate of these fish seems to be faster in rivers than in their tributaries. Using data compiled by Carlander (1977), the average growth rate of spotted bass from three Oklahoma lakes were calculated as was that of three Oklahoma rivers. The average growth rate for the lakes was greater than that of the rivers at every age. The above information suggests that the growth rate of spotted bass is a function of the kind of water they came from. Therefore, in order to evaluate the Sabine River as habitat for spotted bass, it is probably necessary to have river data to compare it with. There is no river data for Texas. Compared to the growth rates reported for three Oklahoma Rivers (Carlander, 1977), the Sabine River fish averaged two inches longer at age one than the average length of the spotted bass from any of the Oklahoma rivers. In subsequent years, the Sabine River spotted bass grew about as fast as the fastest growing Oklahoma fish. This suggests that the Sabine River is good river habitat for spotted bass. The fact that Sabine River spotted bass grew faster than Sabine River largemouth bass their first year and faster the first two years of life than spotted bass collected in Sam Rayburn (Seidensticker, 1977) also suggests that conditions for spotted bass are good in the Sabine River, since this was not what would be expected from Oklahoma data (Carlander, 1977).

The slope of the length-weight regression, 3.497, is significantly greater than three at the 0.05 level. This indicates that as these fish grew older their weight increased at a faster rate than their length. The slope values compiled by Carlander (1977) are surprisingly variable and there is no mention of testing to determine if any of them are significantly different from three. However, the 3.497 value from the Sabine River is larger than the nine values that are listed. The slope of the length-weight regression for Sam Rayburn was 3.296 and it was also significantly greater than three of the 0.05 level. The average condition factor was 1.409. The amount of data compiled by Carlander (1977) is limited and highly variable; however, this value does compare well with the Sam Rayburn value of 1.343. More data are needed to evaluate these values.

White crappie probably did not enter the fisherman's creel until their third year when they reached 8.5 inches total length (Table 7). The state average growth rate (Table 5) calculated from data given in D.J. reports (Bamberg, 1979; Bonn, 1977; Hysmith and Moczygamba, 1978a, 1978b, 1979; Inman, 1978; Kraai, 1977, 1978a, 1978b; Smith, 1977a, 1977b) was slower than that of the Sabine River fish every year where comparison is

possible except the first year. Therefore, compared to the rest of the State, the Sabine River white crappie have a reasonable growth rate.

Apparently white crappie growth is a function of the type of water where they are found (Carlander, 1977). Therefore, in order to evaluate the Sabine River as river habitat for white crappie, it is necessary to have other river data. Unfortunately, such data does not exist for Texas. The average growth of Sabine River white crappie is similar to that of five rivers in Oklahoma, except for the first year where Sabine River white crappie average about an inch longer than the Oklahoma fish. This suggest that the Sabine River is suitable river habitat for white crappie at least if Oklahoma rivers are used as a standard.

The slope of the length-weight regression was not significantly different than three at the 0.05 level. It is not possible to tell from the data compiled by Carlander (1977) or Texas D.J. reports whether or not this is the usual situation.

The average condition factor was 1.540. This compares well with data compiled by Carlander (1977), which suggests that this is an acceptable value. Little condition data have been reported in Texas; therefore, no comparison with State data is possible.

The growth rate of black crappie was similar to white crappie (Table 8). They probably did not enter the fisherman's creel until their third year when they reached 8.5 inches total length. Unfortunately, there is not enough statewide data for a state average to mean anything. The growth rate was somewhat slower than that of Toledo Bend (Table 5) after the first year and faster than the Oklahoma average (Carlander, 1977) until the fifth year. (The Toledo Bend data were collected during the study of that reservoir (Seidensticker and Helton, 1976); however, it never appeared in the report.) There is not enough information to know whether under these conditions, this is a reasonable growth rate. There is nothing in the data compiled by Carlander (1977) to suggest whether the growth rate of black crappie is or is not a function of the type of water where they are found.

The slope of the length-weight regression was not significantly different than three at the 0.05 level. This was also the case for Toledo Bend; however, it is not possible to tell from the data compiled by Carlander (1977) whether or not this is the usual situation.

The average condition factor was 1.403. This compares well with Toledo Bend (1.1698) and values reported by Carlander (1977), which suggests that this is an acceptable value. There is not enough data from the rest of the State to many any further comparison.

Tributary Fishes: Samples from the tributaries in the East Texas Timberlands land resource area produced primarily minnows and sunfishes (Tables 9 and 10). These streams contained a good variety of species, but most of the fish collected were small since most of the creeks were small and generally shallow. Most of the tributaries provide fishing primarily for

sunfish, small bass and bullhead catfish. However, Big Cow Creek has a reputation for producing good catches of channel and flathead catfish although neither of these species were collected by seining. Trout Creek is reported to be a good bass producing stream.

Samples from the larger coastal streams, Adams and Cow Bayous, indicated fish populations similar to the main river. Several estuarine species, including sheepshead and finescale menhaden, were also taken. Fishing in these tributaries is reported to be most productive for largemouth bass, crappie, sunfish and some estuarine species.

Fish Community Overview: Sixty-five species were collected from the Sabine River and its Texas tributaries (Table 11). One specimen of American eel was observed, but not collected, during electrofishing in the river. Striped bass were collected during hatchery work in April, but not during the management survey. It seems likely that one specimen of paddlefish was taken from the river by a fisherman. A wide variety of species, as was found in this survey, is indicative of a fish community that is in good condition. Seine collections from the main river would probably have added more species, but high water levels prohibited seining during this segment. Blacktail shiner, ironcolor shiner and striped mullet were the most abundant species. Channel catfish, largemouth bass, white crappie and black crappie were the most abundant sport fishes. It may be that wide fluctuations in water levels and flow reduced the number of suitable size forage fish which in turn slowed the growth of the sport fishes.

#### Public Access and Facilities

Public access to the Sabine River was found to be fair. Boat ramps are available at road crossings on U.S. 190, State Highway 12 and I.H. 10. Access to the Toledo Bend tailrace is good; however, no fishing is allowed for approximately 1,000 feet downstream from the dam and no improved boat ramp is available. The area closed to fishing is the area which normally provides the best tailrace fishing.

Although the river and land between the cut banks are open to the public, most of the land surrounding the river is privately owned and posted. No picnic or camping facilities are available at any point on this section of river. The long distances between public boat ramps inhibits fishermen from making float trips.

#### Fisherman Information

Existing sources of fisherman information are adequate for promoting recreational use of the Sabine River. However, more information needs to be publicized regarding public access to the stream, water releases from Toledo Bend Dam and the type of fisheries available.

#### Fish Harvest Regulations

Existing regulations are adequate to protect the fishery resources of the Sabine River. If fishing pressure for largemouth bass becomes heavy, some

restrictions may be needed in the future to protect this slow-growing population.

#### MANAGEMENT RECOMMENDATIONS

##### Physiochemical Characteristics

Intensive monitoring of the two paper mills present on the watershed is needed to determine what effects their effluents have on the river, particularly during periods of low flow. Two additional paper mills are in the planning stages now for this stream segment and some thought must be given to the possible cumulative effects of all the effluents on the water quality of the river. Waste water treatment at the new mills should be extremely rigid and treatment at the present mills should be upgraded.

##### Fish Habitat

Existing habitat is adequate to sustain the fishery; therefore, no recommendations are made.

##### Fish Community

Sport fish populations are adequate to provide good fishing and no rough fish problems were indicated; therefore, no recommendations are made.

##### Public Access and Facilities

The tailrace of Toledo Bend Dam should be opened to fishermen as far up as the wing walls below the stilling basin. Concrete walkways and railings should be installed along the tailrace to provide safe areas for fishermen. Improved boat ramps should be constructed in the tailrace area and at State Highway 63 to provide better access to the river. The purchase of small tracts of land along the river between the main road crossings should be considered. These areas could provide additional access points as well as picnic and camping facilities for fishermen, canoeists and others.

##### Fisherman Information

The public should be better informed on the types of fishing available in the river and how to get to it. Information should be released regarding access points and water releases from Toledo Bend Dam, which influence water levels, currents and access.

##### Fish Harvest Regulations

Existing regulations are adequate to protect the fishery resources of the Sabine River; therefore, no recommendations are made.

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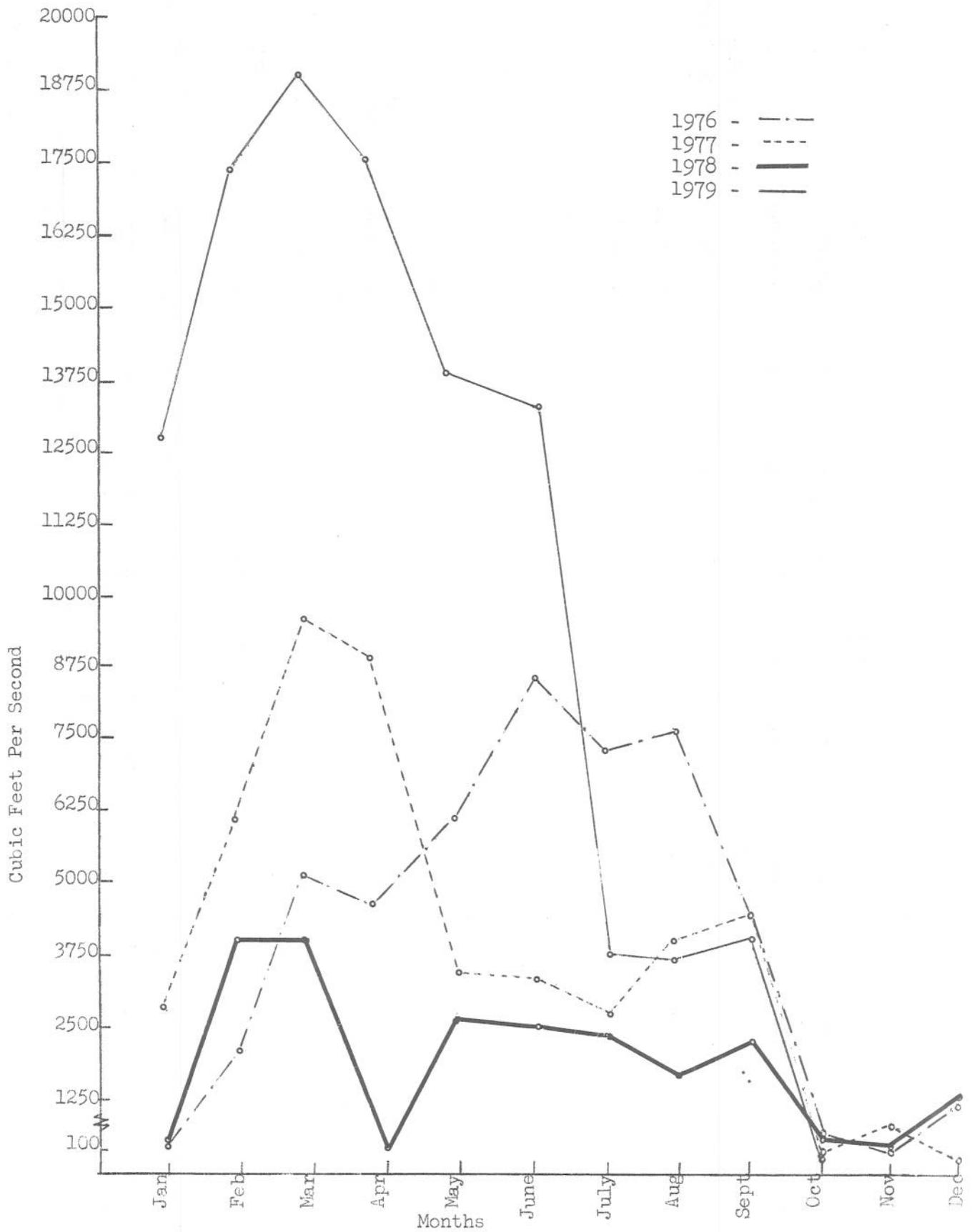


Figure 1. Mean monthly water releases from Toledo Bend Dam, 1976-1979.

Table 1. Water quality data from the Sabine River, Texas, and selected tributaries, 1979.

Location	Date	Depth	Temp. (°C.)	D. O. (ppm)	pH	Total Alk. (ppm)	Specific Conductance (umhos/cm)	Turbidity (JTU)	Chlorides (ppm)
Big Cow Creek Site 1	08-07-79	S	24	10.0	5.8	10	20		
Hunter Creek Site 2	08-07-79	S	28	8.0	5.8	10	25		
Davis Creek Site 3	08-08-79	S	24	10.0	5.8	0	25		
Dempsey Creek Site 4	08-08-79	S	24	9.0	-1	10	40		
Quicksand Creek Site 5	08-08-79	S	26	12.0	-1	0	40		
Sabine River Site 6	01-24-79	S	6	8.4	7.1	16	107	32	17
"	04-24-79	S	21	6.4	6.7	14	86	24	12
"	07-26-79	S	24	5.5	6.4	13	73	32	7
"	10-04-79	S	22	5.8	6.6	25	150	13	18
Sabine River Site 7	01-24-79	S	7	8.9	7.0	15	102	34	16
"	04-24-79	S	21	6.7	6.8	13	89	18	13
"	07-26-79	S	24	6.1	6.6	4	73	26	7
"	10-04-79	S	22	5.5	6.6	19	126	15	17

Table 1. cont'd

Location	Date	Depth	Temp. (°C.)	D.O. (ppm)	pH	Total Alk. (ppm)	Specific Conductance (umhos/cm)	Turbidity (JTU)	Chlorides (ppm)
Sabine River Site 8	01-24-79	S	10	10.1	7.1	18	157	22	27
"	04-24-79	S	21	8.5	6.7	17	129	16	20
"	07-26-79	S	25	6.8	6.5	10	89	46	9
"	10-04-79	S	22	6.2	6.9	35	186	8	20

1 - Readings were off the scale

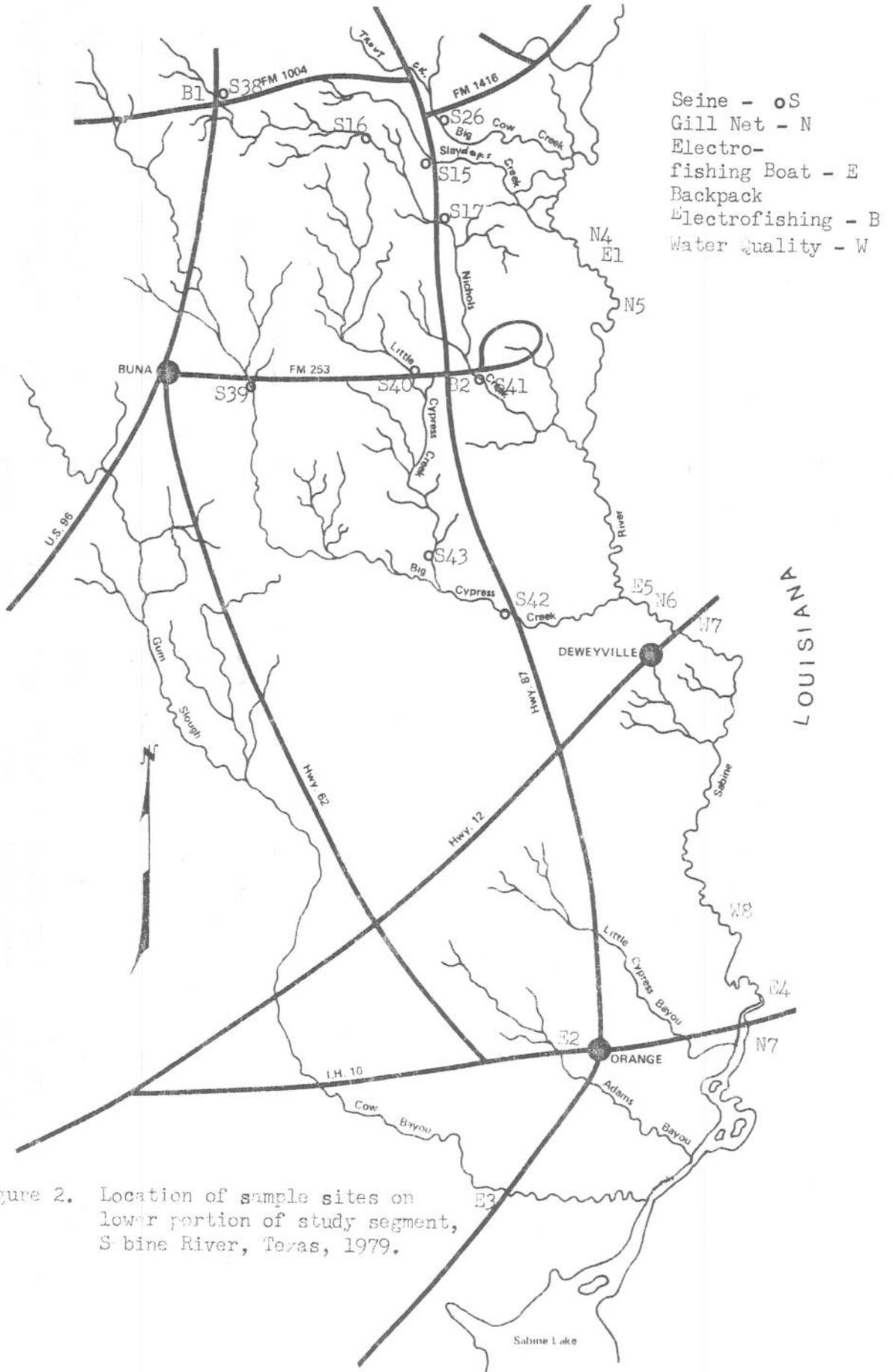


Figure 2. Location of sample sites on lower portion of study segment, Sabine River, Texas, 1979.

- Seine - ○ S
- Gill Net - N
- Electrofishing Boat - E
- Back pack Electrofishing - B
- Water Quality - W



LOUISIANA

Figure 3. Location of sample sites on upper portion of Sabino segment, Sabino River, 1972.

Table 2. Gill net sampling statistics, fifty-four net nights, Sabine River, Texas, June-September, 1979.

Species	Total Number	Number Per 200 ft of Net	Total Weight (lb)	Weight Per 200 ft of Net	Mean Weight (lb)
Alligator gar	1	0.02	80.0	1.48	80.00
Spotted gar	89	1.65	184.0	3.41	2.07
Longnose gar	19	0.35	69.1	1.28	3.64
Bowfin	7	0.13	41.0	0.76	5.86
Ladyfish	35	0.65	13.2	0.24	0.38
Finescale menhaden	1	0.02	0.1	t	0.10
Threadfin shad	46	0.85	1.2	0.02	0.03
Gizzard shad	55	1.02	34.5	0.64	0.63
Carp	5	0.09	36.4	0.67	7.28
Blacktail shiner	7	0.13	0.2	t	0.03
Smallmouth buffalo	15	0.28	35.7	0.66	2.38
River carpsucker	31	0.57	33.6	0.62	1.08
Blacktail redbhorse	8	0.15	5.7	0.11	0.71
Spotted sucker	1	0.02	1.3	0.02	1.30
Gafftopsail catfish*	2	0.04	0.3	0.01	0.15
Sea catfish	8	0.15	7.4	0.14	0.93
Channel catfish*	25	0.46	40.5	0.75	1.62

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Table 2. cont'd

Species	Total Number	Number Per 200 Ft of Net	Total Weight (lb)	Weight Per 200 Ft of Net	Mean Weight (lb)
Blue catfish*	6	0.11	14.9	0.28	2.48
Flathead catfish*	1	0.02	3.8	0.07	3.80
Pirate perch	1	0.02	t	t	t
Atlantic needlefish	1	0.02	0.1	t	0.10
Yellow bass*	7	0.13	1.8	0.03	0.26
Spotted bass*	7	0.13	2.9	0.05	0.41
Largemouth bass*	12	0.22	11.6	0.21	0.97
Warmouth*	4	0.07	0.8	0.01	0.20
Redear sunfish*	6	0.11	1.1	0.02	0.18
Bluegill*	9	0.17	0.7	0.01	0.08
Orangespotted sunfish*	3	0.06	0.1	t	0.03
Longear sunfish	6	0.11	0.8	0.01	0.13
White crappie*	38	0.70	11.3	0.21	0.30
Black crappie*	10	0.19	4.9	0.09	0.49
Freshwater drum	5	0.09	19.5	0.36	3.90
Sand seatrout*	168	3.11	7.3	0.14	0.04

Table 2. cont'd

Species	Total Number	Number Per 200 ft of Net	Total Weight (lb)	Weight Per 200 ft of Net	Mean Weight (lb)
Sheepshead*	2	0.04	3.9	0.07	1.95
Atlantic croaker*	15	0.28	1.0	0.02	0.07
Striped mullet	16	0.30	13.5	0.25	0.84
Southern flounder	4	0.07	6.5	0.12	1.63
Total	676	12.52	690.7	12.79	
*Game Fish	325	6.02	114.2	2.11	
Rough Fish	351	6.50	576.5	10.68	

Table 3. Summary of electrofishing boat collections, including twenty-eight 15-minute sampe periods from the Sabine River, Cow Bayou and Adams Bayou, Texas, August-October, 1979.

Species	Total Number	Number per 15 min	Total Weight (lb)	Weight per 15 min
Chestnut lamprey	1	0.04	0.1	t
Spotted gar	47	1.68	37.3	1.33
Longnose gar	1	0.04	2.0	0.07
Bowfin	20	0.71	69.0	2.46
Ladyfish	1	0.04	0.6	0.02
Finescale menhaden	23	0.82	0.5	0.02
Gizzard shad	73	2.61	9.2	0.33
Carp	8	0.29	48.0	1.71
Blacktail shiner	6	0.21	0.1	t
Blue sucker	1	0.04	0.2	0.01
Smallmouth buffalo	3	0.11	3.2	0.11
River carpsucker	1	0.04	0.9	0.03
Blacktail redhorse	7	0.25	4.1	0.15
Spotted sucker	5	0.18	6.1	0.22
Channel catfish	1	0.04	0.3	0.01
Yellow bullhead	2	0.07	2.7	0.10
Flathead catfish	3	0.11	1.8	0.06
Yellow bass	6	0.21	1.6	0.06
Spotted bass	13	0.46	6.2	0.22
Largemouth bass	54	1.93	68.7	2.45
Warmouth	13	0.46	1.5	0.05

Table 3. cont'd

Species	Total Number	Number per 15 min	Total Weight (lb)	Weight per 15 min
Spotted sunfish	8	0.29	0.6	0.02
Redear sunfish	44	1.57	3.2	0.11
Bluegill	94	3.36	3.1	0.11
Orangespotted sunfish	1	0.04	0.1	t
Longear sunfish	20	0.71	1.3	0.05
White crappie	6	0.21	1.5	0.05
Black crappie	14	0.50	4.3	0.15
Sheepshead	1	0.04	2.8	0.10
Striped mullet	191	6.82	110.2	3.94
Southern flounder	1	0.04	0.3	0.01
Total	669	23.89	391.5	13.98

Table 4. Calculated total length and increments at each annulus for largemouth bass from the Sabine River, Texas, 1979.

Age Group	Year Class	Number	Total Length at Year			
			1	2	3	4
0	1979	2				
1	1978	3	141.1			
2	1977	4	168.1	252.2		
3	1976	9	161.5	242.5	299.3	
4	1975	4	179.7	250.7	295.7	332.8
Grand ave-weighted		20	163.46	246.66	298.27	332.88
Average increments			163.46	83.20	51.61	34.61
Average annual incr.			163.46	79.26	53.33	37.11
Sum of annual incr.			163.46	242.72	296.05	333.16

Table 5. Comparisons of the growth rates of different species from different bodies of water.

Species	Body of Water	Grand Weighted Average in Millimeters at Annulus						
		1	2	3	4	5	6	7
Largemouth bass	Sabine River	163.5	246.7	298.3	332.9			
	B. A. Steinhagen (Dam B)	190.7	260.0	321.7				
	Sam Rayburn males	154.6	245.0	308.3				
	Sam Rayburn females	144.1	250.5	318.0				
	Toledo Bend males	124.4	224.7	356.8	415.6	470.6	521.0	
	Toledo Bend females	109.9	215.1	319.1	418.7	503.9		
Spotted bass	Sabine River	187.1	223.5	259.8	302.4	353.7		
	Sam Rayburn	163	216	282				
White crappie	Sabine River	94.2	167.8	216.7	275.9	304.9	375.9	
	State Average	108.3	162.8	192.7	233.9	281.9	292.3	231.9
Black crappie	Sabine River	157.7	197.3	220.4	236.4			
	Toledo Bend	155.9	220.26	255.4				

Table 6. Calculated total length and increments at each annulus for spotted bass from the Sabine River, Texas, 1979.

Age Group	Year Class	Number	Total Length at Year					
			1	2	3	4	5	
0	1979							
1	1978	5	176.8					
2	1977	6	188.5	214.0				
3	1976	2	192.4	221.1	241.3			
4	1975	1	204.9	239.6	259.7	278.0		
5	1974	1	201.7	268.2	296.6	326.7	353.6	
Grand avg-weighted		15	187.13	223.45	259.78	302.40	353.68	
Average increments			187.13	36.32	36.33	42.62	51.28	
Average annual incr.			187.13	31.17	22.23	24.19	26.94	
Sum of annual incr.			187.13	218.30	240.53	264.72	291.66	

Table 7. Calculated total length and increments at each annulus for white crappie from the Sabine River, Texas, 1979.

Age Group	Year Class	Number	Total Length at Year						
			1	2	3	4	5	6	
0	19--								
1	1978	7	94.2						
2	1977	5	75.2	163.4					
3	1976	2	92.4	148.6	206.5				
4	1975	2	103.0	176.7	213.4	270.8			
5	1974	1	121.8	161.8	202.0	233.2	266.7		
6	1973	1	147.9	215.9	258.2	328.8	342.9	375.8	
Grand avg-weighted		18	94.24	167.80	216.73	275.94	304.85	375.88	
Average increments			94.24	73.56	48.93	59.21	28.91	71.03	
Average annual incr.			94.24	73.52	45.31	54.11	23.79	32.92	
Sum of annual incr.			94.24	167.76	213.07	267.18	290.97	323.89	

Table 8. Calculated total length and increments at each annulus for black crappie from the Sabine River, Texas, 1979.

Age Group	Year Class	Number	Total Length at Year			
			1	2	3	4
0	1979					
1	1978	3	148.4			
2	1977	6	157.6	196.8		
3	1976	6	158.5	199.5	224.0	
4	1975	5	162.5	195.2	216.0	236.4
Grand avg-weighted		20	157.74	197.32	220.42	236.40
Average increments			157.74	39.58	23.10	15.98
Average annual incr.			157.74	37.93	22.81	20.38
Sum of annual incr.			157.74	195.67	218.48	238.86

Table 9. Summary of seine collections from Sabine River tributaries, forty-three stations, August-October, 1979.

Species	Number Collected
Bowfin	1
Redfin pickerel	9
Golden shiner	70
Pugnose minnow	35
Ribbon shiner	102
Redfin shiner	187
Ironcolor shiner	386
Sabine shiner	26
Blacktail shiner	431
Red shiner	2
Taillight shiner	1
Silvery minnow	14
Bullhead minnow	2
Blacktail redhorse	3
Yellow bullhead	4
Freckled madtom	1
Pirate perch	5
Golden topminnow	6
Blackstriped topminnow	60
Mosquitofish	178
Brook silverside	88
Largemouth bass	10
Green sunfish	1

Table 9. cont'd

Species	Number Collected
Bantam sunfish	5
Redear sunfish	1
Bluegill	14
Longear sunfish	8
Flier	13
Banded Pygmy sunfish	2
Slough Darter	20
Total	1685



Table 10. Summary of backpack electrofishing samples from Nichols Creek (two sites) and Davis Creek (one site), Texas, November, 1979. There were four 15-minute collecting periods at each site.

Species	Number Collected	Number per 15 Minutes
Southern brook lamprey	3	0.25
Redfin pickerel	18	1.50
Ironcolor shiner	12	1.00
Blacktail redhorse	19	1.58
Black bullhead	1	0.08
Yellow bullhead	3	0.25
Pirate perch	55	4.58
Blackstripe topminnow	13	1.08
Mosquitofish	3	0.25
Spotted bass	1	0.08
Largemouth bass	13	1.08
Warmouth	18	1.50
Green sunfish	10	0.83
Spotted sunfish	30	2.50
Redear sunfish	3	0.25
Bluegill	46	3.83
Longear sunfish	48	4.00
Dollar sunfish	9	0.75
Flier	7	0.58
Slough Darter	4	0.33
Total	316	26.30



Table 11. Summary of species collected by all methods, Sabine River and tributaries, 1979.

Species	Number Collected by Each Method					Total Collected by all methods	Relative <sup>1</sup> Abundance
	Gill Net	Seine	Electrofishing Boat	Back-Pack Electrofishing			
Chestnut lamprey	-	-	1	-	-	1	0
Southern brook lamprey	-	-	-	-	3	3	0
Alligator gar	1	-	-	-	-	1	0
Spotted gar	89	-	47	-	-	136	A
Longnose gar	19	-	1	-	-	20	C
Bowfin	7	1	20	-	-	28	C
Ladyfish	35	-	1	-	-	36	C
Finescale menhaden	1	-	23	-	-	24	C <sup>4</sup>
Threadfin shad	46	-	-	-	-	46	C
Gizzard shad	55	-	73	-	-	128	A
Redfin pickerel	-	9	-	-	18	27	C
Carp	5	-	8	-	-	13	C
Golden shiner	-	70	-	-	-	70	C
Pugnose minnow	-	35	-	-	-	35	C
Ribbon shiner	-	102	-	-	-	102	A
Redfin shiner	-	187	-	-	-	187	A

Table 11. cont'd

Species	Number Collected by Each Method				Total Collected by all methods	Relative <sup>1</sup> Abundance
	Gill Net	Seine	Electrofishing Boat	Back-Pack Electrofishing		
Ironcolor shiner	-	386	-	12	398	VA
Sabine shiner	-	26	-	-	26	C
Blacktail shiner	7	431	6	-	444	VA
Red shiner	-	2	-	-	2	O
Taillight shiner	-	1	-	-	1	R
Silvery minnow	-	14	-	-	14	O
Bullhead minnow	-	2	-	-	2	O
Blue sucker	-	-	1	-	1	R
Smallmouth buffalo	15	-	3	-	18	C
River carpsucker	31	-	1	-	32	C
Blacktail redhorse	8	3	7	19	37	C
Spotted sucker	1	-	5	-	6	O
Gafftopsail catfish	2	-	-	-	2	O <sup>4</sup>
Sea catfish	8	-	-	-	8	O <sup>4</sup>
Channel catfish	25	-	1	-	26	C
Blue catfish	6	-	-	-	6	O

Table 11. cont'd

Species	Number Collected by Each Method				Total Collected by all methods	Relative <sup>1</sup> Abundance
	Gill Net	Seine	Electrofishing Boat	Back-Pack Electrofishing		
Black bullhead	-	-	-	1	1	0
Yellow bullhead	-	4	2	3	9	C
Flathead catfish	1	-	3	-	4	C
Freckled madtom	-	1	-	-	1	R
American eel <sup>2</sup>	-	-	-	-	-	R
Pirate perch	1	5	-	55	61	C
Atlantic needlefish	1	-	-	-	1	0 <sup>4</sup>
Golden topminnow	-	6	-	-	6	O
Blackstripe topminnow	-	60	-	13	73	C
Mosquitofish	-	178	-	3	181	A
Brook silverside	-	88	-	-	88	C
Yellow bass	7	-	6	-	13	C
Striped bass <sup>3</sup>	-	-	-	-	-	R
Spotted bass	7	-	13	1	21	C
Largemouth bass	12	10	54	13	89	A
Warmouth	4	-	13	18	35	C

Table 11. cont'd

Species	Number Collected by Each Method				Total Collected by all methods	Relative Abundance
	Gill Net	Seine	Electrofishing Boat	Back-Pack Electrofishing		
Green sunfish	-	1	-	10	11	C
Bantam sunfish	-	5	-	-	5	O
Spotted sunfish	-	-	8	30	38	C
Redear sunfish	6	1	44	3	54	C
Bluegill	9	14	94	46	163	A
Orangespotted sunfish	3	-	1	-	4	O
Longear sunfish	6	8	20	48	82	A
Dollar sunfish	-	-	-	9	9	O
White crappie	38	-	6	-	44	C
Black crappie	10	-	14	-	24	C
Flier	-	13	-	7	20	C
Banded Pygmy sunfish	-	2	-	-	2	O
Slough Darter	-	20	-	4	24	C
Freshwater drum	5	-	-	-	5	C
Sand seatrout	168	-	-	-	168	A4
Sheepshead	2	-	1	-	3	O4

Table 11. cont'd

Species	Number Collected by Each Method				Total Collected by all methods	Relative <sup>1</sup> Abundance
	Gill Net	Seine	Electrofishing Boat	Back-Pack Electrofishing		
Atlantic croaker	15	-	-	-	15	C <sup>4</sup>
Striped mullet	16	-	191	-	207	VA
Southern flounder	4	-	1	-	5	O <sup>4</sup>
Total Number	676	1685	669	316		
Number Species Collected	37	30	30	20	65	

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1 The following categories are used in rating relative abundance:

VA - Very abundant

A - Abundant

C - Common

O - Occasional

R - Rare

2 Observed during collections with electrofishing boat.

3 Collected from tailrace during striped bass hatchery operations in April.

4 Collected only near salt water.

5-Year Management Plan for  
Sabine River  
1980-1984

I. River Description

The study area consisted of that segment of the Sabine River located from Toledo Bend Dam in Newton County downstream to the mouth of Sabine Lake in Orange County (147 river miles) and all its tributaries on the Texas side of the river. Most of the river is located in the East Texas Timberlands except for the southernmost portion located in the Coast Marsh resource area.

The river is generally characterized by high water levels during the period from March through October produced by a combination of rainfall and releases from Toledo Bend Dam for power generation. During these months, daily fluctuations are common due to the length of releases from the dam. These fluctuations are severe, 4 to 10 feet in a 24-hour period, in the upper half of this river segment. The dam is controlled by the Sabine River Authority of Texas and the Sabine River Authority of Louisiana. The electricity is produced for Gulf State Utilities. The water in the river is generally quite clear, particularly during the power-producing season. Pollution in the river is minimal at this time with the main problems arising from two paper mill effluents which give the river a black color during periods of low flow.

The Sabine River is fairly large with its channel width ranging from 75 yards to more than a quarter of a mile near Sabine Lake. Water depth is quite variable, ranging from 1 foot to 75 feet. Since there is little or no gravel or rock in the river, no riffles are present and there are no obstructions to fish movement in this segment. The stream bottom is composed primarily of sand, with some of the shallow areas swept clean to the hard clay substrate. Fish habitat in the river consists mainly of fallen timber and undercut banks.

The topography of the watershed in this segment of the river consists of heavily wooded hills in the upper half and heavily wooded level areas in the lower half. Associated vegetation is principally pine uplands and mixed pine-hardwood bottomlands. Large cypress swamps are found primarily at the lowermost portion of the river.

Primary fisheries in the river for channel, blue and flathead catfish, crappie, and largemouth bass. Hoop nets are legal on the Louisiana side of the river, but not on the Texas side and thus some buffalo are also probably taken. Some estuarine species, such as flounder, redfish and seatrout, enter the fisheries in the lower portion of the river near Sabine Lake.

The tributaries are generally clear, cool streams with heavily wooded banks. The smaller streams support primarily sunfish while the larger

streams produce more bass, crappie and catfish. However, the coastal streams are wide, sluggish bayous with dark, murky water and these produce some estuarine species in addition to the freshwater fish.

## II. Management Recommendations

Year	Activity	Man-Days
1980	1. Pollution Control - The Sabine River Authority should closely monitor the effluents of the two existing paper mills. The proposed paper mills should be carefully evaluated and restrictions placed on their proposed effluents.	8
	2. Public Access and Facilities - The tailrace at Toledo Bend Dam should be opened to fishermen up to the wing walls at the stilling basin. Plans should be started to construct concrete walkways and railings for fishermen in this area.  Plans should also be instigated to install improved boat ramps in the tailrace area and at S.H. 63. Discussions should be held with Parks personnel to determine the possibilities of purchasing several small tracts of land along the river to provide picnic and camping facilities for the public wishing to use the river.	20
	3. Arrangements should be made to provide the public with more information on the fisheries available in the Sabine River, access points and water releases from Toledo Bend Dam.	10

Year	Activity	Man-Days
1981-1984	1. Pollution Control - Determine effects of paper mill effluents on water quality in Sabine River.	20
	2. Public Access and Facilities - Install concrete walkways and railings at tailrace. Install boat ramps at tailrace and S.H. 63.	10
	3. Continue public information program for Sabine River.	20

