

ANGELINA RIVER  
JOB COMPLETION REPORT

STATE OF TEXAS

Project No. F3R4 Name Fisheries Investigations and Surveys of the Waters of Region 5-B.

Job No. B-10 Title Basic Survey and Inventory of Species in the Angelina River and its Watershed and in the Attoyac Bayou and its Watershed.

Period Covered: March 1, 1956 - February 28, 1957

ABSTRACT

1. This report concerns a basic survey and inventory of species on the Angelina River Drainage including the Attoyac Bayou Drainage in Region 5-B. The area worked covers portions of eight counties in East Texas. (Figures 1 and 3)

2. The soils found in this area are light colored, acid sandy loams and sands and clays, with native vegetation consisting of pines and various hardwoods.

3. The fairly high turbidity of the streams limit the amounts of aquatic vegetation to isolated growths.

4. The Angelina and Attoyac Drainages are treated as two separate but related subjects in this report.

5. A combined total of 93 water analyses was made and show that the waters of the tributaries are slightly acid while those of the river proper are slightly alkaline.

6. No active pollution in the sense that fish were being killed was encountered but evidence of industrial effluents were found on the drainage.

7. A combined total of 116 collections yielded a total of 73 species representing 13 families. This includes 49 species common to both drainages.

8. The game-forage-rough fish populations are in good proportions in both drainages with forage fish maintaining an excellent population.

9. The coefficient of condition data for most of the gill netted specimens is shown in Tables 5 and 11.

10. Recommendations for a follow up basic survey on McGee Bend Reservoir upon its completion is made.

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.

PROCEDURE

There were three methods of collection employed in making this study. By far the most common method was by seining with either a  $\frac{1}{4}$ -inch mesh, 26 by 6 foot bag seine or either a cotton or nylon common sense minnow seine, depending upon the size and depth of

the water. Usually only one or two drags were made with the seine. Some times as many as six drags were required to collect only one specimen. Gill nets of 3/4 to 3-inch bar mesh were used in the more open and deeper waters of the river. Hoop nets of various mesh sizes were used on two occasions. There were no rotenone collections made due to adverse public opinion of using poison in public waters.

Lake Tyler, in Smith County, is the only major impoundment on the watershed and it was reported previously under F3R1, Job B-4.

All seined specimens were preserved in ten percent formalin and brought to the laboratory for identification. Specimens from gill and hoop nets were identified, counted and weighed in the field. A record was kept of the length and weight of each fish and the coefficient of condition was determined on all netted specimens.

Ecological data included water and air temperature, weather conditions, surrounding vegetation types, description of the stream, turbidity, and color of the water. Analysis of the water included pH, methal orange alkalinity and chlorides. Water samples were taken at every station, with a few exceptions, and brought back to the laboratory for analysis. Dissolved oxygen was determined when pollution was suspected.

### FINDINGS

A total of 116 collections was made on both the Angelina and Attoyac Drainages. These collections yielded 73 species representing 13 families. Forty-nine species were common to both drainages while the Angelina Drainage listed 11 species not found in the Attoyac. On the other hand, the Attoyac Drainage lists 13 species not found in the Angelina (See Table 1).

In addition there were 93 water analyses made on both drainages.

Because of the sizes of the streams involved, the Angelina River and the Attoyac Bayou were treated as separate but related surveys and shall be treated as such in this report although remaining under the same job. These shall be mentioned separately as the Angelina Drainage and the Attoyac Drainage.

### ANGELINA RIVER AND ITS DRAINAGE

The Angelina River Drainage consists of approximately 3300 square miles, including the Attoyac Drainage, in Smith, Rusk, Shelby, Cherokee, Nacogdoches, Angelina, Jasper, Sabine and San Augustine Counties in East Texas. The river proper heads in southern Rusk County and flows in a generally southeast direction until it empties some 170 miles downstream into the Neches River at the head of Dam "B" Reservoir in Jasper County. A 25-year average discharge at US 59 bridge crossing north of Lufkin is 1341 cubic feet per second (cfs). A major portion of the tributary streams are permanent or intermittent spring-fed streams.

The soils found in this area are generally light colored, acid sandy loams and sands in the uplands, and darker colored, acid sandy loams and clays in the bottomlands. Native vegetation in the uplands include loblolly and shortleaf pines and various hardwoods such as oak, gum and hickory. In the lowlands hardwoods are prevalent with some cypress. Most of the land is used for timber and pasture with some truck crops. The famed East Texas Oil Field takes in the western portion of Rusk County and the southeast corner of Smith County. A major tributary of this area is Striker Creek on which a 2,300 surface acre reservoir is nearing completion.

Isolated to moderate growths of aquatic vegetation were found along the shores and banks of some of the waters of this drainage. These included willow (Salix nigra), saw grass (Zizaniopsis milacea), various sedges (Cyperaceae), smartweed (Polygonum), pondweed (Potamogeton sp.), duck potato (Sagittaria sp.) and various algae including Chara sp. which were found in quiet pools and clear water.

Practically the entire Angelina River is characterized by huge trees that have fallen into the river either all the way across, in the upper sections, or partially blocking the river in the lower reaches where it widens out. This has been caused by undermining of the tree's root system by the river in many cases. Also it has been reported that the path of a tornado followed the river several years ago thereby felling many trees. This fact, along with low water levels due to drought conditions, makes the more desirable method of collecting by boat very impractical. As an indication of this, this writer and one field assistant covered only approximately six river miles in some eight and one-half hours due to the fact that we had to either push or lift the boat over or under tree trunks or through tree tops. This resulted in many blisters, barked shins, sore muscles and very few collections. The lower reaches of the river is navigable with a little effort during low water to draw over sand bars and rocky shoals.

#### WATER QUALITY

Routine water analyses were made for nearly every collecting station in order to determine the water quality (Table 2). Additional tests were made in areas where pollution was suspected. In all, 71 analyses were made on the Angelina Drainage during this study. The turbidity of the water in the river proper was considered to be from very to moderately turbid while the waters of the tributaries, most of which were spring-fed, were slightly turbid to clear. Water surface temperature varied from a low of 54°F in March to a high of 94°F in August. Generally the spring-fed streams were much cooler in the summer months than the run-off fed streams. The pH varied from below 6.0 (our indicators only went to 6.0) to 7.6. Here, the river tended to be more on the alkaline side (7.2 - 7.6) than the tributaries. The total chloride content varied widely from 13 p.p.m. to 780 p.p.m. but followed no definite pattern. The extreme high chloride contents were found in the oil field drainage, Striker Creek. The methal orange alkalinity varied along the same trend as the pH, ranging from 4 p.p.m. to 110 p.p.m. Dissolved oxygen tests were run in suspected polluted areas and they ranged from 0.0 p.p.m. to 4.8 p.p.m.

#### COLLECTION STATIONS

A total of 72 collecting stations including 63 seining, 2 gill netting and 7 pollution stations were established and visited at least once during this survey. Table 3 gives the geographical location of each station. Figure 1 show the locations in relation to each other. As can be seen from the map the majority of these stations were located at road crossings due to the before mentioned fact that most of the river was unnavigable.

#### SPECIES PRESENT

A total of 60 species representing 13 families was collected in the waters of the Angelina Drainage. This yield was from a total of 66 collections. Table 4 lists each species phylogenetically and by family. The specific names are from Hubbs, A CHECK-LIST OF TEXAS FRESHWATER FISHES, dated February 1957. Table 5 lists the relative abundance of each species as determined from actual collected specimens and field observations.

It should be noted that the Angelina Drainage has an excellent population of forage fish, especially of Notropis sp. Of all specimens collected Notropis sp. made up 51.24% of the total by count. All forage fish collected composed approximately 65% of the total population. Game fish, principally spotted bass, bluegill sunfish and white crappie made up some 10% of the population. Topminnows made up some 22% of the population and rough fish and miscellaneous species fill in the remainder. All of the above quoted percentages are from actual collected and counted specimens and only give an indication as to the population of species present in the drainage.

Two gill net collections were made in the Angelina River, one collection made with two experimental nets yielded only 3 species (4 specimens), and the other made with four experimental nets yielded 10 species and 90 specimens. The numbers in ( ) recorded in Table 5 are the numbers of that species caught in gill nets. Table 6 gives the length-weight data and the coefficients of condition. At the time of the gill net collection G-2, the gates at Dam "B" had been opened allowing the waters to escape permitting rice farmers to flood their fields downstream. This caused a large number of fish to ascend both the Neches and Angelina Rivers. This is the apparent reason for the large number of white crappie and gizzard shad to be found at that time. It should be noted that the water in this section of the river (west of Jasper) had an excellent plankton bloom at the time and all the fish collected were in good condition.

#### POLLUTION

While no active pollution, in the sense that fish were being killed, was encountered on the watershed during this period there does exist a situation which does affect normal fish life and propagation. The Southland Paper Mill at Herty, near Lufkin, Angelina County, discharges from its plant an effluent which is 106 F (a winter temperature reading), at a rate of 23,328,000 gallons 24 hours period. This effluent flows (See Figure 2) into a 50-acre lake where a large amount of paper pulp is recovered and the BOD is reduced by natural bio-chemical processes. From here the water leaves by an overflow and enters a second 50-acre lake and again the BOD is reduced. Here again the water leaves by an overflow apparatus and comes out of a conduit at the bottom of the dam where there is a layer of foam several feet thick on top of the water. This foam on the water extends for one to two hundred yards downstream into a stream known as a tributary to Willis Creek. Along the banks of this creek below the outfall at the dam there is also a fine powdery substance, a thickness of several inches. This stream runs into Willis Creek from where it flows on into the Angelina River some 12 miles below the outlet of the second dam. At times during the summer this effluent increases the normal stream flow by 100%. The color of the water varies from milky tan to coal black as it leaves the plant and enters the river. This color is due to sodium lignate in solution. At all times below the outfall from the second pond there is a very strong odor of sulfides. Water samples were taken at various locations along this waterway but analyses were impossible at times because of the color of the water. Dissolved oxygen is zero for several miles then picks up and increases as the effluent becomes further diluted with fresh water of the river. Refer to Table 2 for a record of the analyses. On the bottom of the river there is a soft black deposit varying in thickness from two or three feet, which makes seining impossible. Also netting was impossible because of inaccessibility by boat due to fallen trees and brush. Collections were made several miles downstream indicating that this effluent does not kill fish. However, this writer believes that this "black water" does keep fish from moving upstream and the deposits on the stream bottom do destroy spawning beds, and prevent sunlight from penetrating to aid in production of plankton. Another detriment is that it discourages the fisherman from fishing the river, thereby eliminating a once desirable fishing water.

According to plant officials there is no known economical method of treating the effluent for color or odor. The BOD is greatly reduced by their present treatment which is an improvement over no treatment at all.

Another potential source of pollution is on Striker Creek from the East Texas Oil Field region. At the time of collection the chlorides were over 700 p.p.m. (Table 2) which is not harmful to fish life.

#### PROPOSED RESERVOIRS

There are two major reservoirs either in the planning stage or under actual construction on the Angelina Drainage and oddly enough both are below the above mentioned areas of pollution. McGee Bend Reservoir is being planned on the Angelina River 25.2 river miles above its confluence with the Neches River (See Figure 1). It is to be 141,300 surface acres at flood-control pool elevation. Construction is to be initiated in the fiscal year 1957. This lake is a U. S. Corps of Engineers project.

Striker Creek Reservoir is to be a 2340 surface acre lake due for impoundment April 1957. This reservoir is to be near New Salem, in Cherokee and Rusk Counties. It is being built by the Angelina-Nacogdoches Counties Water Control and Improvement District Number One. (See Figure 1).

#### COMMERCIAL FISHING

Jasper County is the only county permitting commercial fishing on the drainage. Only about six gill nets were encountered on this survey. One commercial fisherman was seen and apparently was operating on only a small scale.

#### THE ATTOYAC BAYOU AND ITS DRAINAGE

The Attoyac Bayou Drainage consists of approximately 750 square miles in Shelby, Rusk, Nacogdoches and San Augustine Counties in East Texas. The bayou proper heads in southeastern Rusk County (Figure 3) and flows in a generally southern direction until it empties some 85 miles downstream into the Angelina River. The bayou forms the county line between Nacogdoches and San Augustine Counties. A 14-year average discharge at State Highway 21 bridge crossing, about two-thirds of the way downstream, is 539 cfs. A major portion of the tributary streams are spring-fed and flow the year around while many others dry completely up during the dry summer months.

The soils found in this area are generally the same as the Angelina Drainage, that is, light colored, acid sandy loams and sands in the uplands, and darker colored, acid sandy loams and clays in the bottomlands. The native vegetation includes loblolly and shortleaf pines and various hardwoods. The land is used primarily for timber, pasture and a few truck crops.

Growths of aquatic vegetation along the banks and shores are isolated with the exception of willow (Salix) and it is pretty well widespread. Other vegetation includes cattails (Typha sp.), various sedges (Cyperaceae) and lilies (Nymphaeaceae).

The Attoyac Bayou is characterized by having straight cut sandy loam banks with very heavy brush and timber growths. Navigation by boat was not feasible because

of the many snags and other natural barriers. There were also few access roads. The depth of the water at normal level probably averages four to six feet with deeper holes in places.

#### WATER QUALITY

Routine water analyses were made at least once at nearly every collection station in order to determine the water quality. In all 22 analyses were made during this study and are compiled in Table 7. The turbidity of the water in the bayou proper was considered to be from clear, in the upper reaches, to very turbid further downstream, depending upon the amount of runoff received due to rain. Most of the tributaries, which are spring-fed, were clear to moderately turbid. This is very much like the Angelina Drainage. The water surface temperatures varied from a low of 57°F in March to a high of 99°F in July. Again, like the Angelina Drainage, the spring-fed streams were much cooler in the summer than the run-off fed streams. The pH remained fairly well constantly acid, varying from 6.0 to 7.2. The average pH was 6.6. The total chloride content also remained fairly constant and low. It varied from 14 p.p.m. to 70 p.p.m. The methal orange alkalinity kept very much in line with the pH, ranging from 8 to 90 p.p.m. The average alkalinity was approximately 30 p.p.m.

#### COLLECTIONS STATIONS

A total of 26 collecting stations including 23 seining, 2 gill netting and one hoop netting stations were established and visited at least once and many three times during the survey. Table 8 gives the geographical locations of these stations and Figure 3 shows the locations in relation to each other. As can be seen from the map the biggest part of these stations were located on tributary streams because of the characteristics of the bayou and the few access roads.

#### SPECIES PRESENT

Fifty collections yielded a total of 62 species representing 13 families in the waters of the Attoyac Drainage. Table 9 lists each species phylogenetically and by family. The specific names are from Hubbs, A CHECKLIST OF TEXAS FRESH-WATER FISHES, dated February 1957. Table 10 lists the relative abundance of each species as determined from the actual collected specimens and field observations. Forage fish make up some 40% of the collected population while game fish make up only about 12%. Rough fish and miscellaneous species make up the remaining 48%. This figure definitely does not represent the entire drainage however, because 1538 out of the total of 1546 black bullheads, representing 34.50% of the total collected population, came from one small pothole subject to overflow. Also this pothole yielded 300 of the 498 golden shiners collected. Keeping this in consideration, the population is in fairly good game-forage-rough fish proportion.

Table 11 gives the results of the two gill net collections made near the mouth of the Attoyac Bayou. This method of collection yielded four species not collected by other methods.

Table 12 shows the results of eleven hoop net sets. This method yielded two additional species. Combined, these two methods produced seven species not collected by seining. As Table 12 indicates, the fish collected in the hoop nets were of good average size.

POLLUTION

There was no active pollution or any potential pollution encountered during this survey on the Attoyac Drainage.

COMMERCIAL FISHING

There is no commercial fishing permitted in Rusk, San Augustine and Nacogdoches Counties and there is insufficient water of the drainage in Shelby County to support commercial fishing. Therefore no commercial fishing was encountered during this survey. There is possibly some isolated "outlaw" fishing done on the bayou.

RECOMMENDATIONS

In view of the fact that McGee Bend Reservoir is going in on the lower Angelina River it is recommended that as a follow-up to this survey and upon completion of the reservoir, a basic survey be conducted on the reservoir. Factors to be determined would be the occurrence of additional species and changes in populations of game fish and rough fish. In addition the possible stocking of white bass (Roccus chrysops) should be considered.

A basic survey of Striker Creek Reservoir is already planned and will commence this year.

Prepared by John N. Dorchester  
Assistant Project Leader

Approved by

Marion Toole  
Chief Aquatic Biologist

Date May 14, 1957



Table 2. Ecological and Chemical Data on the Angelina Drainage.

Station Number	Name of Water	Date	Temperature Air	Surface	Turbidity	Color	pH	M.O. Alk p.p.m.	Chlorides p.p.m.	Dis. O p.p.m.
1	Brumley Creek	3/12/56	51	55			6.2	18	13.184	-
2	Scobber Creek	3/12/56	50	55		Brown	6.4	14	21.276	-
3	Johnson Creek	3/12/56	50	55	Clear		7.0	50	35.460	-
4	Mud Creek	3/12/56	53	54			6.6	26	21.276	-
5	Caney Creek	3/12/56	50	55		Greenish	6.2	13	35.460	-
6	Twin Creek	3/12/56	50	57		Greenish-blue	6.0	4	35.460	-
7	Angelina River	6/25/56	94	84	Very	Tannish	6.7	25	179.290	-
8	Angelina River	6/25/56	94	84	Very	Tannish	6.6	22	179.290	-
9	Angelina River	6/25/56	94	84	Very	Tannish	6.6	10	141.840	-
10	Angelina River	6/26/56	85	84	Moderate	Green	6.6	50	49.634	-
11	Angelina River	6/26/56	89	87	Very	Tannish	6.6	48	84.104	-
12	Angelina River	6/27/56	83	84	Moderate	Blackish-brown	6.8			-
13	Angelina River	6/27/56	83	84	Moderate	Dark brown	6.8	43	84.104	-
14	Angelina River	6/27/56	90	86	Very	Milky brown	6.7	43	84.104	-
15	Angelina River	6/27/56	93	85	Moderate	Milky brown	6.9	43	84.104	-
16	Angelina River	6/27/56	88	86	Moderate	Milky tan	6.6	100+	21.276	-
17	Angelina River	6/27/56	99	86	Moderate	Brownish-green	7.2	100+	21.276	-
18	Jarrell Creek	8/2/56			Clear	Green				-
19	Ham Creek	8/2/56								-
20	Trib. E. Fork	8/2/56								-
21	Angelina River	8/2/56			Very	Milky tan	6.6	100+	21.276	-
22	E. Fork Angelina	8/2/56			Moderate	Brown	6.8	100+	21.276	-
23	E. Fork Angelina	8/2/56			Moderate	Green	7.6	100+	35.460	-
24	Trib. Angelina R.	8/2/56			Very	Green	7.2	80	49.634	-
25	Angelina River	8/2/56			Very	Milky tan	6.2	35	184.382	-
26	Mud Creek	8/2/56			Very	Milky brown	7.2	90	14.184	-
27	Angelina River	8/2/56			Moderate	Milky tan	7.2	45	120.554	-
28	Angelina River	8/2/56			Very	Brownish-green	7.2	42	92.196	-
29	Angelina River	8/2/56				Milky tan	7.0			-
30	Aylish Bayou	8/9/56	92	78	Clear	None	6.0	30	21.276	-
31	Aylish Bayou	8/9/56	92	79	Very	Brown	6.2	20	141.840	-
32	Trib. to Aylish B.	8/9/56	94	84	Very	Brown	6.4	32	21.276	-
33	Aylish Bayou	8/9/56	94	92	Very	Milky brown	7.4	150	35.460	-
34	Trib to Aylish B.	8/9/56	94	90	Very	Greenish-brown	6.6	50	21.276	-
35	Bear Creek	8/9/56	104	84	Moderate	Greenish-brown	6.8	68	35.460	-
36	Bear Creek	8/9/56	104	88	Moderate	Grayish-green	7.0	25	14.184	-

Table 2. (Continued).

37	Ayish Bayou	8/9/56	104	88	Moderate	Greenish-brown	7.2	95	35.460	-
38	Angelina River	8/9/56	100	94	Very	Blackish-brown	7.2	125	127.656	-
40	Rocky Creek	8/10/56	90	79	Very	Milky brown	6.6	59	42.552	-
41	Angelina River	8/10/56	97	92	Very	Tan	6.4	69	78.012	-
41a		8/29/56				Dark tan	7.0	110	127.656	-
42	Indian Creek	8/10/56	97	78	Clear	None	6.2	19	21.276	-
43	Angelina River	8/10/56	94	90	Very	Reddish-tan	7.1	80	85.104	-
44	Angelina River	8/28/56	88	84	Very	Dark brown stain	7.4	110	127.656	-
45	Angelina River	8/28/56	88	82	Very	Dark brown stain	7.4	110	127.656	-
46	Angelina River	8/28/56	78	82	Very	Dark brown stain	7.4	110	127.656	-
47	Angelina River	8/28/56	85	82	Very	Milky brown	7.4	110	127.656	-
48	Angelina River	8/28/56	83	82	Very	Milky brown	7.4	110	127.656	-
49	Angelina River	8/29/56	82	84	Very	Milky brown	7.4	110	127.656	-
50	Angelina River	8/29/56	78	82	Very	Dark tan	7.0	95	85.104	-
51	Angelina River	8/29/56	76	80	Very	Dark tan	7.2	95	85.104	-
52	Angelina River	8/29/56	78	80	Very	Dark tan	7.2	110	127.656	-
53	Shawnee Creek	12/6/56	82	62	Moderate	Brown stain	6.8	58	35.460	-
54	Barnhardt Creek	12/6/56	82	64	Clear	Brown stain	6.8	17	35.460	-
55	Barnhardt Creek	12/6/56	83	61	Slight	Brown stain	7.0	43	35.460	-
56	Shawnee Creek	12/6/56	84	72	Clear	Black stain	6.8	53	35.460	-
57	Angelina River	12/6/56	83	60	Slight	Brown stain	7.0	47	35.460	-
58	Striker Creek	12/6/56	84	67	Clear	Dark stain	*6.0	9	709.200	-
59	Striker Creek	12/6/56	85	68	Clear	None	*6.0	5	709.200	-
60	Beaver Run	12/6/56	85	68	Clear	Green	6.8	49	780.120	-
61	Gilley Creek	2/25/57	85	65	Very	Milky tan	6.4	26	141.840	-
62	Mud Creek	2/25/57	67	59	Moderate	Greenish-tan	6.4	26	141.840	-
63	West Mud Creek	2/25/57	67	58	Moderate	Tannish	6.4	32	638.280	-
64	Shakleford Creek	2/25/57	67	59	Very	Light brown	6.5	25	354.600	-
G-1	Angelina River	8/9/56	85	85	Very	Black	7.2	93	141.840	-
G-2	Angelina River	8/29/56	82	82	Very	Dark tan	7.2	42	127.656	-
P-1	Plant outlet	12/12/56	80	106	Very	Tan	6.1	26	est141.64	-
P-2	Trlb. Willis Ck.	8/3/56				Blackish-gray	6.6		198.567	0.0
P-3	Willis Creek	8/3/56				Brownish-gray	7.6	220	21.276	3.4
P-4	Angelina River	8/3/56			Very	Black	7.2		177.300	0.0
P-5	Angelina River	7/11/56				Brownish-black	6.6			1.8
P-6	Angelina River	8/3/56				Black	7.1			0.8
P-7	Angelina River	7/10/56				Brownish-black	7.2		est177.300	0.0
P-7	Angelina River	8/3/56				Brown	7.2			4.8

\*Believed to be less than 6.0.

Table 3. Location of Collecting Stations on the Angelina Drainage.

Station Number	County	Name of Water	Location
1	Rusk	Brumley Creek	3 mi SW Henderson on US 79
2	Rusk	Scoober Creek	7 mi SW Henderson on US 79
3	Rusk	Johnson Creek	10 mi SW Henderson on US 79
4	Cherokee	Mud Creek	3 mi SW Troup on FM 347
5	Cherokee	Caney Creek	3 mi S Troup on SH 110
6	Cherokee	Twin Creek	2½ mi N New Summerfield on SH 110
7	Cherokee	Angelina River	1 mi downstream from SH 204
8	Cherokee	Angelina River	1½ mi downstream from SH 204
9	Cherokee	Angelina River	2 mi downstream from SH 204
10	Nacogdoches	Angelina River	9 mi E Alto on SH 21
11	Angelina	Angelina River	9 mi N Lufkin on US 59
12	Angelina	Angelina River	14 mi E Lufkin, ¼ mi downstream from SH 103
13	Nacogdoches	Angelina River	14 mi E Lufkin, ¾ mi downstream from SH 103
14	Nacogdoches	Angelina River	14 mi E Lufkin, 3 mi downstream from SH 103
15	Angelina	Angelina River	14 mi E Lufkin, 4 mi downstream from SH 103
16	Angelina	Angelina River	14 mi E Lufkin, 5 mi downstream from SH 103
17	Angelina	Angelina River	14 mi E Lufkin, 6 mi downstream from SH 103
18	Angelina	Angelina River	14 mi E Lufkin, 8 mi downstream from SH 103
19	Rusk	Jarrell Creek	8 mi SE Henderson on SH 26
20	Rusk	Ham Creek	3½ mi NE Mount Enterprise on SH 26
21	Rusk	Trib. E. Fork Ang.	4 mi SW Mount Enterprise on County Road
22	Rusk	E. Fork Angelina R.	3 mi N Cushing on FM 225
23	Rusk	E. Fork Angelina R.	6 mi NW Cushing on County Road
24	Rusk	Trib. to Angelina	3½ mi E Reklaw on US 84
25	Rusk	Angelina River	3 mi E Reklaw on US 84
26	Cherokee	Mud Creek	1 mi SW Reklaw on US 84
27	Cherokee	Angelina River	12 mi E Rusk on FM 343
28	Cherokee	Angelina River	7½ mi NE Wells on County Road
29	Angelina	Angelina River	16 mi NW Lufkin on SH 7
30	San Augustine	Ayish Bayou	4 mi N San Augustine on County Road
31	San Augustine	Ayish Bayou	1½ mi N San Augustine on County Road
32	San Augustine	Trib. Ayish Bayou	8½ mi SSW San Augustine on FM 705
33	San Augustine	Ayish Bayou	10 mi SSW San Augustine on SH 103
34	San Augustine	Trib. Ayish Bayou	9 mi W Pineland on County Road
35	Sabine	Bear Creek	3 mi WNW Pineland on County Road
36	Sabine	Bear Creek	3 mi WSW Brookland on County Road
37	San Augustine	Ayish Bayou	5 mi WSW Brookland on County Road
38	San Augustine	Angelina River	8 mi WSW Brookland on County Road
40	Angelina	Rocky Creek	6 mi NE Zavalla on County Road
41	Jasper	Angelina River	10 mi W Jasper, 1 mi downstream from SH 63
42	Jasper	Indian Creek	7½ mi W Jasper on SH 63
43	Jasper	Angelina River	9 mi W Jasper on FM 1745
44	Jasper	Angelina River	12 mi NW Jasper, 1 mi upstream from Ayish Bayou
45	Jasper	Angelina River	11 mi NW Jasper, mouth of Ayish Bayou
46	Jasper	Angelina River	9 mi NW Jasper, 2 mi downstream from Ayish Bayou

Table 3 (Continued).

47	Jasper	Angelina River	11 mi NW Jasper, 2 mi ENE Ebernezer Road
48	Jasper	Angelina River	10 mi NW Jasper, 1½ mi S Ebernezer Road
49	Jasper	Angelina River	12 mi WNW Jasper, ½ mi upstream from SH 63
50	Jasper	Angelina River	10 mi W Jasper, 1 mi below FM 1745
51	Jasper	Angelina River	9 mi W Jasper, 2 mi upstream from FM 1745
52	Jasper	Angelina River	11 mi W Jasper, half way between FM 1745 and SH 63
53	Rusk	Shawnee Creek	6 mi S Henderson, ¾ mi W FM 225
54	Rusk	Barnhardt Creek	7 mi S Henderson on FM 225
55	Rusk	Barnhardt Creek	3 mi NW Laneville on County Road
56	Rusk	Shawnee Creek	3½ mi NE Laneville on County Road
57	Rusk	Angelina River	5 mi SW Laneville on FM 1662
58	Rusk	Striker Creek	1 mi SW New Salem on FM 839
59	Cherokee	Striker Creek	6 mi E New Summerfield on US 79
60	Rusk	Beaver Run	2 ¾ mi SW Carliele on FM 13
61	Smith	Gilley Creek	9 mi W Troup on FM 848
62	Smith	Mud Creek	3 mi W Troup on SH 110
63	Smith	West Mud Creek	3½ mi NE Bullard on FM 344
64	Smith	Shakleford Creek	4 ¾ mi NNE Bullard on FM 346
G-1	San Augustine	Angelina River	8 mi NE Zavalla on SH 147
G-2	Jasper	Angelina River	9 mi W Jasper on SH 63
P-1	Angelina	Plant outlet	Southland Paper Mill at Herty
P-2	Angelina	Trib. to Willis	1 mi W Moffett on FM 842
P-3	Angelina	Willis Creek	1 mi W Moffett on FM 842
P-4	Angelina	Angelina River	2½ mi NNE Moffett below Mill Creek
P-5	Angelina	Angelina River	14 mi E Lufkin on SH 103
P-6	San Augustine	Angelina River	8 mi NE Zavalla on SH 147
P-7	Angelina	Angelina River	4 mi N Moffett above Mill Creek

Table 4. A Checklist of Angelina Drainage Fishes.

- I. Family: LEPISOSTEIDAE
1. Lepisosteus productus - spotted gar
  2. L. osseus - longnose gar
- II. Family: CLUPEIDAE
3. Dorosoma cepedianum - gizzard shad
- III. Family: ESOCIDAE
4. Esox americanus - grass pickeral
- IV. Family: CATOSTOMIDAE
5. Ictiobus bubalus - smallmouth buffalo
  6. Moxostoma congestum - gray redhorse
  7. M. poecilurum - blacktail redhorse
  8. Minytrema melanops - spotted sucker
  9. Erimyzon sucetta - lake chubsucker
  10. E. oblongus - creek chubsucker
- V. Family: CYPRINIDAE
11. Notemigonus crysoleucas - golden shiner
  12. Semotilus atromaculatus - creek chub
  13. Opsopoeodus emiliae - pugnose minnow
  14. Hybopsis aestivalis - speckled chub
  15. Notropis atherinoides - emerald shiner
  16. N. amabilis - Texas shiner
  17. N. fumeus - ribbon shiner
  18. N. brazosensis - Brazos river shiner
  19. N. roseus - central weed shiner
  20. N. potteri - broadhead shiner
  21. N. sabiniae - longnose shiner
  22. N. annis - pallid shiner
  23. N. venustus - blacktail shiner
  24. N. lutrensis - red shiner
  25. N. deliciosus - sand shiner
  26. N. atrocaudalis - blackspot shiner
  27. N. volucellus - mimic shiner
  28. Hybognathus nuchalis - silvery minnow
  29. Pimephales vigilax - parrot minnow
- VI. Family: AMEIURIDAE
30. Ictalurus punctatus - Southern channel catfish
  31. I. natalis - yellow bullhead
  32. Pygodictus olivaris - flathead catfish
  33. Schilbeodes gyrinus - tadpole madtom
  34. S. nocturnus - freckled madtom

VII. Family: CYPRINODONTIDAE

- 35. Fundulus chrysotus - redspot topminnow
- 36. F. olivaceus - blackspot topminnow

VIII. Family: POECILIIDAE

- 37. Gambusia affinis - common mosquitofish

IX. Family: APHREDODERIDAE

- 38. Aphredoderus sayanus - pirate perch

X. Family: ATHERINIDAE

- 39. Labidesthes sicculus - brook silversides

XI. Family: CENTRARCHIDAE

- 40. Micropterus punctulatus - spotted bass
- 41. Chaenobryttus gulosus - warmouth
- 42. Lepomis cyanellus - green sunfish
- 43. L. punctatus - spotted sunfish
- 44. L. microlophus - redear sunfish
- 45. L. macrochirus - bluegill sunfish
- 46. L. humilis - orangespotted sunfish
- 47. L. megalotis - longear sunfish
- 48. Pomoxis annularis - white crappie
- 49. P. nigromaculatus - black crappie
- 50. Elassoma zonatum - banded pigmy sunfish

XII. Family: PERCIDAE

- 51. Hadropterus maculatus - blackside darter
- 52. H. shumardi - river darter
- 53. Percina caprodes - logperch
- 54. Ammocrypta vivax - Arkansas sand darter
- 55. A. clara - western sand darter
- 56. Etheostoma chlorosomum - bluntnose darter
- 57. E. gracilie - western swamp darter
- 58. E. grahami - redspot darter
- 59. E. fonticola - fountain darter

XIII. Family: SCIAENIDAE

- 60. Aplodinotus grunniens - freshwater drum

Table 5. Relative Abundance of Species in the Angelina Drainage.

Species	# in River	# in Trib.	Total	% of Total	Relative abundance
<u>Lepisosteus productus</u>	1 (1)*	0	2	0.04	Rare
<u>Lepisosteus osseus</u>	0 (14)	0	14	0.33	Frequent
<u>Dorosoma cepedianum</u>	228 (25)	7	260	6.23	Abundant
<u>Esox americanus</u>	1	11	12	0.29	Frequent
<u>Ictiobus bubalus</u>	13	0	13	0.31	Frequent
<u>Moxostoma congestum</u>	25	0	25	0.59	Common
<u>Moxostoma poecilurum</u>	2	3	5	0.12	Rare
<u>Minytrema melanops</u>	2	0	2	0.04	Rare
<u>Erimyzon sucetta</u>	0	6	6	0.14	Rare
<u>Erimyzon oblongus</u>	0	1	1	0.02	Rare
<u>Notemigonus crysoleucas</u>	27	20	47	1.12	Common
<u>Semotilus atromaculatus</u>	0	1	1	0.02	Rare
<u>Opsopoeodus emiliae</u>	10	20	30	0.72	Common
<u>Hybopsis aestivalis</u>	38	0	38	0.91	Common
<u>Notropis atherinoides</u>	27	28	55	1.32	Common
<u>Notropis amabilis</u>	0	1	1	0.02	Rare
<u>Notropis fumeus</u>	367	262	629	15.09	Very abundant
<u>Notropis brazosensis</u>	13	0	13	0.31	Frequent
<u>Notropis roseus</u>	1	36	37	0.89	Common
<u>Notropis potteri</u>	62	0	62	1.48	Common
<u>Notropis sabiniae</u>	6	0	6	0.14	Rare
<u>Notropis amnis</u>	186	7	193	4.63	Abundant
<u>Notropis venustus</u>	234	31	265	6.35	Abundant
<u>Notropis lutrensis</u>	8	0	8	0.19	Rare
<u>Notropis deliciosus</u>	75	165	240	5.75	Abundant
<u>Notropis atrocaudalis</u>	132	247	379	9.93	Abundant
<u>Notropis volucellus</u>	215	28	243	5.87	Abundant
<u>Hybognathus nuchalis</u>	8	9	17	0.40	Frequent
<u>Pimephales vigilax</u>	124	26	150	3.59	Abundant
<u>Ictalurus punctatus</u>	7 (3)	0	10	0.24	Frequent
<u>Ictalurus natalis</u>	0	2	2	0.04	Rare
<u>Pylodictus olivaris</u>	1	0	1	0.02	Rare
<u>Schilbeodes gyrinus</u>	1	0	1	0.02	Rare
<u>Schilbeodes nocturnus</u>	1	2	3	0.07	Rare
<u>Fundulus chrysotus</u>	0	189	189	5.34	Abundant
<u>Fundulus olivaceus</u>	126	283	409	9.81	Very abundant
<u>Gambusia affinis</u>	81	176	257	6.15	Abundant
<u>Aphredoderus sayanus</u>	1	0	1	0.02	Rare
<u>Labidesthes sicculus</u>	46	29	75	1.79	Common
<u>Micropterus punctulatus</u>	80	10	90	2.16	Common
<u>Chaenobryttus gulosus</u>	2 (1)	0	3	0.07	Rare
<u>Lepomis cyanellus</u>	0	1	1	0.02	Rare
<u>Lepomis punctatus</u>	48	0	48	1.15	Common
<u>Lepomis microlophus</u>	4	2	6	0.14	Rare
<u>Lepomis macrochirus</u>	62 (2)	43	107	2.56	Abundant
<u>Lepomis humilis</u>	0	1	1	0.02	Rare
<u>Lepomis megalotis</u>	1	6	7	0.16	Rare
<u>Pomoxis annularis</u>	65 (18)	2	85	2.04	Common
<u>Pomoxis nigromaculatus</u>	20 (3)	0	23	0.55	Common
<u>Elassoma zonatum</u>	0	11	11	0.26	Frequent

Table 5. (Continued).

<u>Hadropterus maculatus</u>	1	4	5	0.12	Rare
<u>Hadropterus shumardi</u>	3	1	4	0.09	Rare
<u>Percina caprodes</u>	1	0	1	0.02	Rare
<u>Ammocrypta vivax</u>	45	0	45	1.08	Common
<u>Ammocrypta clara</u>	1	3	4	0.09	Rare
<u>Etheostoma chlorosomum</u>	4	15	19	0.45	Frequent
<u>Etheostoma gracilie</u>	3	13	16	0.38	Frequent
<u>Etheostoma grahami</u>	0	1	1	0.02	Rare
<u>Etheostoma fonticola</u>	0	3	3	0.07	Rare
<u>Aplodinotus grunniens</u>	2 (14)	0	16	0.38	Frequent
<b>Total</b>	<b>2492</b>	<b>1706</b>	<b>4198</b>		

\* - ( ) Number of specimens taken in gill nets.

Table 6. Results of Two Gill Net Collections (6 sets) on the Angelina River.

Species	Number Caught	Total Weight Lbs.	Number Worked	Range Weight gms	Average Weight gms	Range Length* mm	Average Length* mm	Range "K"	Average "K"
<u>Lepisosteus productus</u>	1	2.06	1	340-6804	936	470-1050	535	0.3-0.3	0.6
<u>Lepisosteus osseus</u>	14	52.50	12	57-539	1942	127-300	728	1.7-2.8	0.3
<u>Dorosoma cepedianum</u>	25	15.56	24	454-2240	280	232-390	239	3.3-4.1	2.0
<u>Ictalobus bubalus</u>	13	32.81	13	255-567	1145	243-320	304	1.6-1.8	3.7
<u>Ictalurus punctatus</u>	3	2.69	3	28-28	406	90-93	285	3.6-4.0	1.7
<u>Chaenobrythus gulosus</u>	1	0.37	1	28-624	170	91-263	160	2.7-3.8	4.2
<u>Lepomis macrochirus</u>	2	0.19	2	28-312	287	90-210	195	3.4-4.0	3.8
<u>Pomoxis annularis</u>	18	11.37	18	28-737	170	83-302	156	2.6-3.3	3.2
<u>Pomoxis nigromaculatus</u>	3	1.19	3		379		222		3.6
<u>Aplodinotus grunniens</u>	14	12.94	13						3.1

\* - Standard length

Table 7. Ecological and Chemical Data on the Attoyac Drainage.

Collection Number	Name of Water	Date	Temperature Air	Temperature Surface	Turbidity	Color	pH	M.O. Alk. p.p.m.	Cl p.p.m.
At-R-1 1a	Attoyac Bayou	3/12/56	77	57	Very	Reddish-brown	6.6	10	14.184
1b		5/17/56	99	62		Brownish-yellow			
At-R-2	Golondrino Creek	7/10/56		85					
At-R-3	Golondrino Creek	3/12/56		57	Clear	Green	6.8	9	14.184
		5/17/56	79	57	Slight	Brown	6.8	8	14.184
At-R-4 4a	Attoyac Bayou	3/12/56		68		Brown	6.8	8	14.184
4b		5/17/56	80	57	Clear	Brown	6.9	15	14.184
At-Sh-1 1a	Attoyac Bayou	7/10/56	95	73		Brownish-yellow	6.8	10	14.184
1b		3/12/56	86	79	Moderate	Brown			
At-Sh-2 2a	Sandy Creek	5/17/56	99	62		Brownish-yellow	6.4	21	14.184
2b		7/10/56	98	57	Very	Tan			
At-N-1 1a	No-Named Creek	3/12/56		75		Black			
1b		5/17/56	80	73	Slight	Dark brown	6.6	70.920	
At-N-2	Neconiche Creek	7/10/56	100	87		Brown			
At-N-3	Barrow ditch	5/12/56		57	Clear	Brownish-green	6.7	22	21.276
3a		3/12/56	78	57	Very	Milky brown	7.2	80	56.736
3b		5/17/56	95	76		Brownish-yellow			
At-N-4	Neconiche Creek	7/10/56		99		Brown			
4a		3/12/56		57	Clear	Blackish-brown	6.6	55	21.186
4b		5/17/56	95	80		Brown			
At-N-5	Unnamed Creek	7/10/56	80	57	Clear	Brown	7.0	60	42.550
5a		5/17/56	105	62					
5b		7/10/56		94					
At-N-6 6a	Turkey Creek	3/12/56		57	Very	Brown	6.6	10	14.184
6b		5/17/56	98	63		Brownish-yellow			
At-N-7 7a	Attoyac Bayou	7/10/56		86	Moderate	Light brown	6.7	90	21.276
7b		3/12/56	84	57		Brown			
At-N-8 8a	Bar Ditch	5/17/56	98	76					
8b	Polly Creek	7/10/56		96	Moderate	Brown	6.0	16	21.276
		3/13/56	98	57	Clear	Greenish-red			
		5/17/56		86					
		7/10/56							

Table 7. (Continued).

At-N-9	Tandakee Creek	3/13/56	57	Very	Brown	6.3	21	14.184
At-N-10	Alamodares Creek	5/17/56	70	Clear	Brown	7.0	28	21.186
At-N-11	Attoyac Bayou	7/10/56	88	Very	Grayish-green			
At-SA-1	Tributary Creek	3/13/56	57	Very	Light brown	6.2	32	14.184
1a		5/17/56	72		Brown			
1b		7/11/56	90					
At-SA-2	Attoyac Bayou	3/13/56	57	Very	Brown	6.9	42	21.276
At-SA-3	Prairie Creek	4/5/56	63	Very	Grayish			
At-SA-6	Spear Creek	4/18/56	57	Very	Brownish			
At-SA-7	Arenosa Creek	4/18/56	57	Very	Greenish-brown	6.5	27	21.276
At-SA-7a		5/17/56	65		Greenish-brown			
At-SA-7b		7/11/56	79					
At-SA-H-1	Attoyac Bayou	3/28/56	64	Moderate	Brown	6.8	25	28.368
At-SA-G-1	Attoyac Bayou	4/18/56	75	Very	Brownish-green	6.3	27	21.276
At-SA-G-2	Attoyac Bayou	4/18/56	75	Moderate	Brown	6.3	25	21.276

Station number

Date of report

Number

Notes: 1. All samples were collected on the same day.

Table 8. Locations of Collections on the Attoyac Drainage.

Station Number	County	Name of Water	Location
At-Sh-1	Shelby	Attoyac Bayou	6 3/4 mi W. Timpson on US 84
At-Sh-2	Shelby	Sandy Creek	4 1/2 mi NE Martinsville on County Road
At-Sh-3	Shelby	Barrow Ditch	2 1/4 mi NE of Garrison on US 59
At-R-1	Rusk	Attoyac Bayou	1 1/2 mi N Calcedonia on County Road
At-R-2	Rusk	Golondrino Creek	2 1/2 mi SSE Concord on County Road off of FM 95
At-R-3	Rusk	Golondrino Creek	3 mi NNW Garrison on FM 95
At-R-4	Rusk	Attoyac Bayou	2 mi NE Garrison on US 59
At-N-1	Nacogdoches	NO-Named Creek	1 1/2 mi NE Garrison on US 59
At-N-2	Nacogdoches	Necolche Creek	5 1/2 mi S Garrison on County Rd W of FM 1274
At-N-3	Nacogdoches	Bar Ditch	5 mi SE Garrison on County Rd E of FM 1274
At-N-4	Nacogdoches	Necolche Creek	8 mi SSE Garrison on FM 1274 (3 bridges)
At-N-5	Nacogdoches	Un-named Creek	5 mi S Garrison on FM 1274
At-N-6	Nacogdoches	Turkey Creek	10 mi SSE Garrison on FM 1274
At-N-7	Nacogdoches	Attoyac Bayou	1 mi E Martinsville on SH 7
At-N-8	Nacogdoches	Polly Creek	2 1/2 mi SE Martinsville on FM 1274
At-N-9	Nacogdoches	Tandakee Creek	4 1/2 mi SE Martinsville on FM 1274
At-N-10	Nacogdoches	Alamodares Creek	2 mi N Chireno on FM 1274
At-N-11	Nacogdoches	Attoyac Bayou	7 mi SSE Chireno, 2 mi N SH 103 crossing
At-SA-1	San Augustine	Tributary Creek	3 mi E Chireno, 5 mi S SH 21 on FM 1196
At-SA-2	San Augustine	Attoyac Bayou	8 mi SSE Chireno on SH 103
At-SA-3	San Augustine	Prairie Creek	2 mi NE Broadus on County Road
At-SA-4	San Augustine	Spear Creek	3 1/2 mi S Denning on County Road
At-SA-5	San Augustine	Arenosa Creek	3 mi SSW Camp Worth on County Road
At-SA-G-1	San Augustine	Attoyac Bayou	1 mi upstream from mouth of bayou
At-SA-G-2	San Augustine	Attoyac Bayou	1 1/2 mi upstream from mouth of bayou
At-SA-H-1	San Augustine	Attoyac Bayou	Above and below SH 103 crossing
At-BV-1	Bartholme Creek		
At-BV-2	Bartholme Creek		
At-BV-3	Bartholme Creek		
At-BV-4	Bartholme Creek		
At-BV-5	Bartholme Creek		
At-BV-6	Bartholme Creek		
At-BV-7	Bartholme Creek		
At-BV-8	Bartholme Creek		
At-BV-9	Bartholme Creek		
At-BV-10	Bartholme Creek		
At-BV-11	Bartholme Creek		
At-BV-12	Bartholme Creek		
At-BV-13	Bartholme Creek		
At-BV-14	Bartholme Creek		
At-BV-15	Bartholme Creek		
At-BV-16	Bartholme Creek		
At-BV-17	Bartholme Creek		
At-BV-18	Bartholme Creek		
At-BV-19	Bartholme Creek		
At-BV-20	Bartholme Creek		
At-BV-21	Bartholme Creek		
At-BV-22	Bartholme Creek		
At-BV-23	Bartholme Creek		
At-BV-24	Bartholme Creek		
At-BV-25	Bartholme Creek		
At-BV-26	Bartholme Creek		
At-BV-27	Bartholme Creek		
At-BV-28	Bartholme Creek		
At-BV-29	Bartholme Creek		
At-BV-30	Bartholme Creek		
At-BV-31	Bartholme Creek		
At-BV-32	Bartholme Creek		
At-BV-33	Bartholme Creek		
At-BV-34	Bartholme Creek		
At-BV-35	Bartholme Creek		
At-BV-36	Bartholme Creek		
At-BV-37	Bartholme Creek		
At-BV-38	Bartholme Creek		
At-BV-39	Bartholme Creek		
At-BV-40	Bartholme Creek		
At-BV-41	Bartholme Creek		
At-BV-42	Bartholme Creek		
At-BV-43	Bartholme Creek		
At-BV-44	Bartholme Creek		
At-BV-45	Bartholme Creek		
At-BV-46	Bartholme Creek		
At-BV-47	Bartholme Creek		
At-BV-48	Bartholme Creek		
At-BV-49	Bartholme Creek		
At-BV-50	Bartholme Creek		
At-BV-51	Bartholme Creek		
At-BV-52	Bartholme Creek		
At-BV-53	Bartholme Creek		
At-BV-54	Bartholme Creek		
At-BV-55	Bartholme Creek		
At-BV-56	Bartholme Creek		
At-BV-57	Bartholme Creek		
At-BV-58	Bartholme Creek		
At-BV-59	Bartholme Creek		
At-BV-60	Bartholme Creek		
At-BV-61	Bartholme Creek		
At-BV-62	Bartholme Creek		
At-BV-63	Bartholme Creek		
At-BV-64	Bartholme Creek		
At-BV-65	Bartholme Creek		
At-BV-66	Bartholme Creek		
At-BV-67	Bartholme Creek		
At-BV-68	Bartholme Creek		
At-BV-69	Bartholme Creek		
At-BV-70	Bartholme Creek		
At-BV-71	Bartholme Creek		
At-BV-72	Bartholme Creek		
At-BV-73	Bartholme Creek		
At-BV-74	Bartholme Creek		
At-BV-75	Bartholme Creek		
At-BV-76	Bartholme Creek		
At-BV-77	Bartholme Creek		
At-BV-78	Bartholme Creek		
At-BV-79	Bartholme Creek		
At-BV-80	Bartholme Creek		
At-BV-81	Bartholme Creek		
At-BV-82	Bartholme Creek		
At-BV-83	Bartholme Creek		
At-BV-84	Bartholme Creek		
At-BV-85	Bartholme Creek		
At-BV-86	Bartholme Creek		
At-BV-87	Bartholme Creek		
At-BV-88	Bartholme Creek		
At-BV-89	Bartholme Creek		
At-BV-90	Bartholme Creek		
At-BV-91	Bartholme Creek		
At-BV-92	Bartholme Creek		
At-BV-93	Bartholme Creek		
At-BV-94	Bartholme Creek		
At-BV-95	Bartholme Creek		
At-BV-96	Bartholme Creek		
At-BV-97	Bartholme Creek		
At-BV-98	Bartholme Creek		
At-BV-99	Bartholme Creek		
At-BV-100	Bartholme Creek		

Table 1 (Continued)

Table 9. A Checklist of Attoyac Drainage Fishes.

I.	Family: <u>LEPISOSTEIDAE</u>		
	1. <u>Lepisosteus productus</u> - spotted gar		
	2. <u>L. osseus</u> - longnose gar		
II.	Family: <u>CLUPEIDAE</u>		
	3. <u>Dorosoma cepedianum</u> - gizzard shad		
III.	Family: <u>ESOCIDAE</u>		
	4. <u>Esox americanus</u> - grass pickerel		
IV.	Family: <u>CATOSTOMIDAE</u>		
	5. <u>Ictiobus bubalus</u> - smallmouth buffalo		
	6. <u>Carpiodes carpio</u> - river carpsucker		
	7. <u>Moxostoma congestum</u> - gray redhorse		
	8. <u>M. poecilurum</u> - blacktail redhorse		
	9. <u>Minytrema melanops</u> - spotted sucker		
	10. <u>Erismyzon sucetta</u> - lake chubsucker		
	11. <u>E. oblongus</u> - creek chubsucker		
V.	Family: <u>CYPRINIDAE</u>		
	12. <u>Notemigonus crysoleucas</u> - golden shiner		
	13. <u>Opsopoeodus emiliae</u> - pugnose minnow		
	14. <u>Hybopsis storeriana</u> - silver chub		
	15. <u>Notropis atherinoides</u> - emerald shiner		
	16. <u>N. jemezianus</u> - Rio Grande shiner		
	17. <u>N. amabilis</u> - Texas shiner		
	18. <u>N. fumeus</u> - ribbon shiner		
	19. <u>N. umbratilis</u> - redbfin shiner		
	20. <u>N. roseus</u> - weed shiner		
	21. <u>N. amnis</u> - pallid shiner		
	22. <u>N. venustus</u> - blacktail shiner		
	23. <u>N. lutrensis</u> - red shiner		
	24. <u>N. deliciosus</u> - sand shiner		
	25. <u>N. atrocaudalis</u> - blackspot shiner		
	26. <u>N. volucellus</u> - mimic shiner		
	27. <u>Hybognathus nuchalis</u> - silvery minnow		
	28. <u>H. placita</u> - plains minnow		
	29. <u>Pimephales vigilax</u> - parrot minnow		
	30. <u>P. promelas</u> - fathead minnow		
VI.	Family: <u>AMEIURIDAE</u>		
	31. <u>Ictalurus punctatus</u> - southern channel catfish		
	32. <u>I. furcatus</u> - blue catfish		
	33. <u>I. melas</u> - black bullhead		
	34. <u>Pylodictus olivaris</u> - flathead catfish		
	35. <u>Schilbeodes gyrinus</u> - tadpole madtom		

Table 9 (Continued).

VII.	Family: <u>CYPRINODONTIDAE</u>	
	36. <u>Fundulus chrysotus</u> - redspot topminnow	
	37. <u>F. olivaceus</u> - blackspot topminnow	
VIII.	Family: <u>POECILIIDAE</u>	
	38. <u>Gambusia affinis</u> - common mosquitofish	
IX.	Family: <u>APHREDODERIDAE</u>	
	39. <u>Aphredoderus sayanus</u> - pirate perch	
X.	Family: <u>ATHERINIDAE</u>	
	40. <u>Labidesthes sicculus</u> - brook silversides	
XI.	Family: <u>CENTRARCHIDAE</u>	
	41. <u>Micropterus punctulatus</u> - spotted bass	
	42. <u>M. salmoides</u> - largemouth bass	
	43. <u>Chaenobryttus gulosus</u> - warmouth	
	44. <u>Lepomis cyanellus</u> - green sunfish	
	45. <u>L. punctatus</u> - spotted sunfish	
	46. <u>L. microlophus</u> - redear sunfish	
	47. <u>L. macrochirus</u> - bluegill	
	48. <u>L. humilis</u> - orangespotted sunfish	
	49. <u>L. auritus</u> - yellowbelly sunfish	
	50. <u>L. megalotis</u> - longear sunfish	
	51. <u>Pomoxis annularis</u> - white crappie	
	52. <u>P. nigromaculatus</u> - black crappie	
	53. <u>Centrarchus macropterus</u> - flier	
	54. <u>Elassoma zonatum</u> - banded pigmy sunfish	
XII.	Family: <u>PERCIDAE</u>	
	55. <u>Hdropterus maculatus</u> - blackside darter	
	56. <u>H. shumardi</u> - river darter	
	57. <u>Ammocrypta vivax</u> - Arkansas sand darter	
	58. <u>Etheostoma chlorosomum</u> - bluntnose darter	
	59. <u>E. histrio</u> - snubnose darter	
	60. <u>E. gracile</u> - western swamp darter	
	61. <u>E. proliare</u> - cypress darter	
XIII.	Family: <u>SCIAENIDAE</u>	
	62. <u>Aplodinotus grunniens</u> - freshwater drum	

Table 10. Relative Abundance of Species in the Attoyac Drainage. (Continued)

Species	Number Collected	% of Total	Relative Abundance
<u>Lepisosteus productus</u>	2	0.04*	Rare
<u>Lepisosteus osseus</u>	2	0.04*	Rare
<u>Dorosoma cepedianum</u>	158	3.52*	Abundant
<u>Esox americanus</u>	25	0.56	Frequent
<u>Ictiobus bubalus</u>	14	0.31* <sup>1</sup>	Frequent
<u>Carpionotus carpio</u>	8	0.18*	Rare
<u>Moxostoma congestum</u>	4	0.08	Rare
<u>Moxostoma poecilurum</u>	1	0.02	Rare
<u>Minytrema melanops</u>	1	0.02	Rare
<u>Erismyza sucetta</u>	4	0.08	Rare
<u>Erismyza oblongus</u>	49	1.09	Common
<u>Notemigonus crysoleucas</u>	498	11.11	Very abundant
<u>Opsopoeodus emiliae</u>	122	2.79	Abundant
<u>Hybopsis storeriana</u>	2	0.04	Rare
<u>Notropis atherinoides</u>	9	0.20	Rare
<u>Notropis fumeus</u>	22	0.49	Frequent
<u>Notropis amabilis</u>	14	0.31	Frequent
<u>Notropis fumeus</u>	206	4.82	Abundant
<u>Notropis umbratilis</u>	38	0.85	Common
<u>Notropis roseus</u>	11	0.24	Frequent
<u>Notropis amnis</u>	3	0.06	Rare
<u>Notropis venustus</u>	186	4.13	Abundant
<u>Notropis lutrensis</u>	5	0.11	Rare
<u>Notropis deliciosus</u>	81	1.80	Common
<u>Notropis atrocaudalis</u>	170	3.79	Abundant
<u>Notropis volucellus</u>	74	1.65	Common
<u>Hybognathus nuchalis</u>	50	1.12	Common
<u>Hybognathus placita</u>	38	0.85	Common
<u>Pimephales vigilax</u>	24	0.53	Common
<u>Pimephales promelas</u>	2	0.04	Rare
<u>Ictalurus punctatus</u>	2	0.04*	Rare
<u>Ictalurus furcatus</u>	1	0.02*	Rare
<u>Ictalurus melas</u>	1546	34.50	Very common
<u>Pylodictus olivaris</u>	1	0.02 <sup>1</sup>	Rare
<u>Schilbeodes gyrinus</u>	1	0.02	Rare
<u>Fundulus chrysotus</u>	9	0.20	Rare
<u>Fundulus olivaceus</u>	179	3.99	Abundant
<u>Gambusia affinis</u>	180	4.01	Abundant
<u>Aphredoderus sayanus</u>	16	0.35	Frequent
<u>Labidesthes sicculus</u>	36	0.81	Common
<u>Micropterus punctulatus</u>	33	0.75	Common
<u>Micropterus salmoides</u>	2	0.04	Rare
<u>Chaenobryttus gulosus</u>	8	0.18*	Rare
<u>Lepomis cyanellus</u>	32	0.73	Common
<u>Lepomis punctatus</u>	93	2.07	Common
<u>Lepomis microlophus</u>	46	1.02	Common
<u>Lepomis macrochirus</u>	183	4.07	Abundant

Table 10. (Continued).

<u>Lepomis humilis</u>	9	0.20	Rare
<u>Lepomis auritus</u>	2	0.04	Rare
<u>Lepomis megalotis</u>	72	1.61	Common
<u>Pomoxis annularis</u>	87	1.76*'	Common
<u>Pomoxis nigromaculatus</u>	31	0.69	Common
<u>Centrarchus macropterus</u>	1	0.02	Rare
<u>Elassoma zonatum</u>	39	0.87	Common
<u>Hadropterus maculatus</u>	1	0.02	Rare
<u>Hadropterus shumardi</u>	9	0.20	Rare
<u>Ammocrypta vivax</u>	11	0.24	Frequent
<u>Etheostoma chlorosomum</u>	59	1.31	Common
<u>Etheostoma histrio</u>	7	0.16	Rare
<u>Etheostoma gracile</u>	34	0.77	Common
<u>Etheostoma proliare</u>	1	0.02	Rare
<u>Aplodinotus grunniens</u>	2	0.04'	Rare
<b>Total</b>	<b>4517</b>		

\* includes or is gill net collection

' includes or is hoop net collection

\*' includes or is both hoop net and gill net collection



Table 11. Results of Two Gill Net Collections (4 sets) on the Attoyac Bayou.

Species	Number Caught	Total Weight lbs.	Number Worked	Range Weight gms	Average Weight gms	Range "K"	Average "K"
<u>Lepisosteus productus</u>	2	1.25	1	680-680	544	0.3-0.3	0.61
<u>Lepisosteus osseus</u>	2	3.00	2	340-340	587	2.05-2.05	0.30
<u>Dorosoma cepedianum</u>	2	1.50	2	145-907	257	2.50-3.70	2.05
<u>Ictalobus bubalus</u>	9	7.00	4	195-567	233	2.88-3.70	3.28
<u>Carpio carpio</u>	8	6.25	4		225		3.15
<u>Pomoxis annularis</u>	1	0.25	1		184		1.78
<u>Ictalurus punctatus</u>	1	1.00	1		280		2.05
<u>Ictalurus furcatus</u>	1	1.50	1		325		1.95
<u>Chaenobryttus gulosus</u>	1	0.12	1		123		2.88



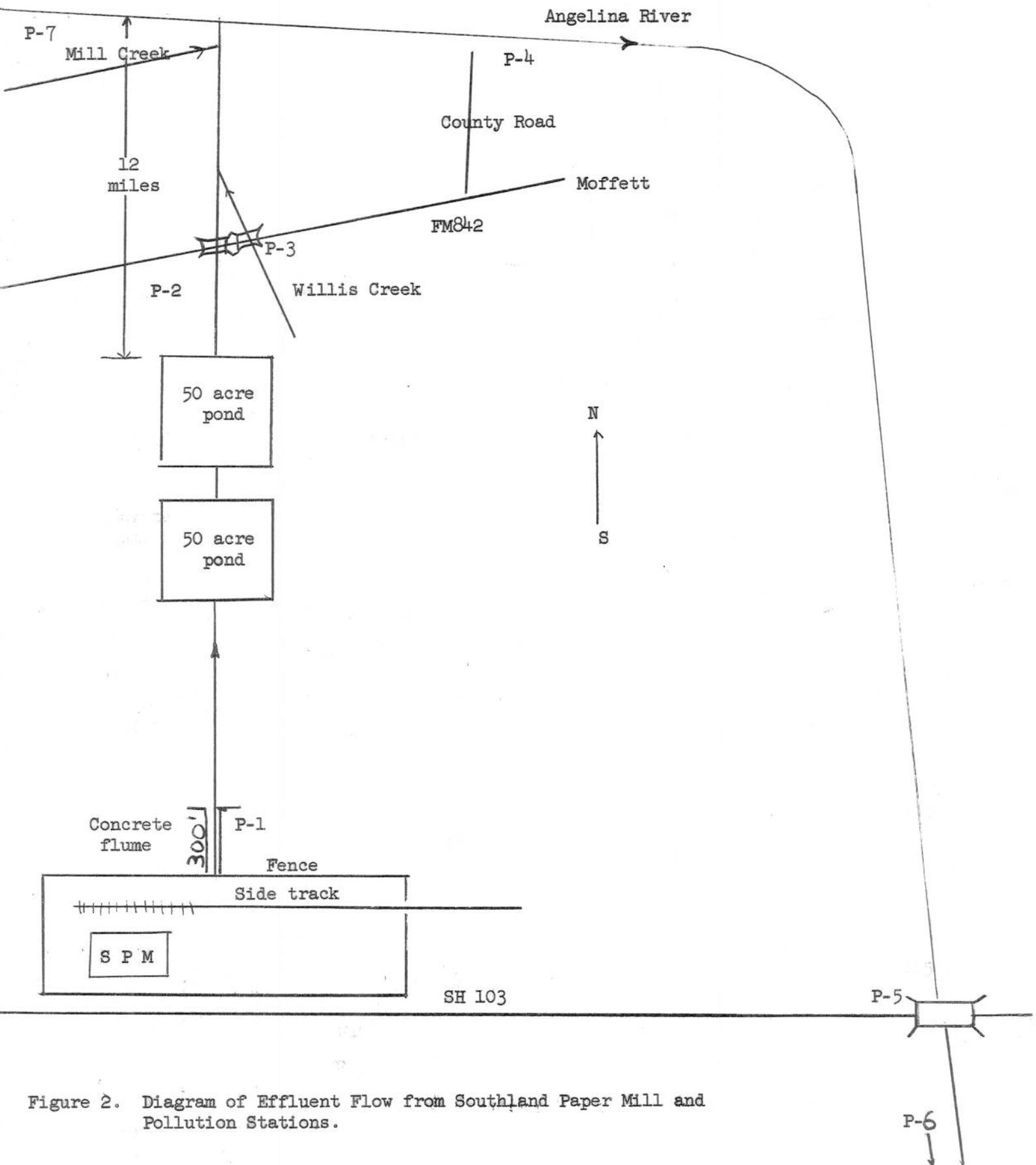


Figure 2. Diagram of Effluent Flow from Southland Paper Mill and Pollution Stations.



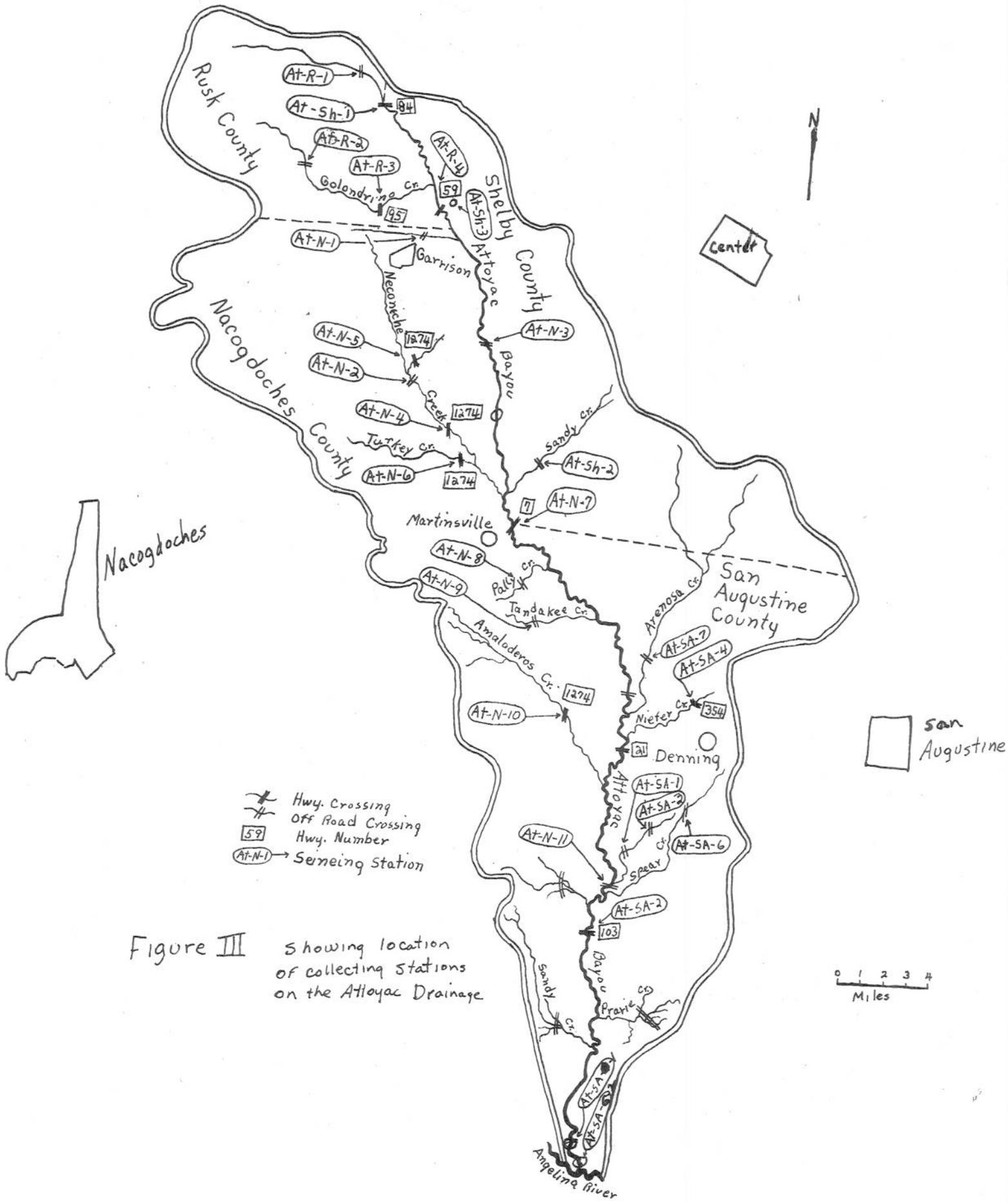
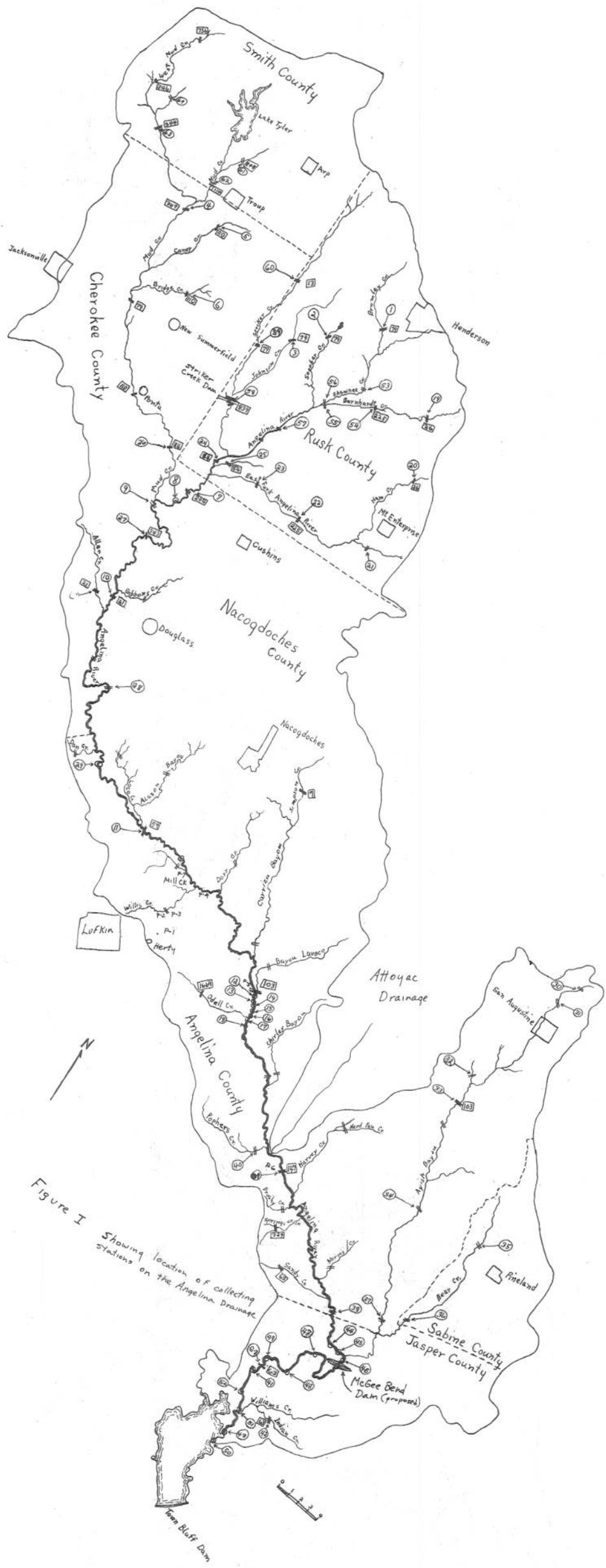


Figure III showing location of collecting stations on the Attoyac Drainage





- ▬ = hwy
- = road
- ① → = coll. stn.
- ② → = old wet str.

Figure I Showing location of collecting stations on the Angeline Drainage.

