

JOB COMPLETION REPORT

Investigations Project

FILE

State of TEXAS

Project No. F2R5 Name: Fisheries Investigations and Surveys of the Waters of Region 6-B.

Job No. A-6 Title: A Basic Survey of the San Bernard River.

Period Covered: March 1, 1957 through July 31, 1957

ABSTRACT

A basic survey and inventory of the fish species was conducted on the San Bernard River. The entire stream, from its headwaters on the Austin-Colorado County line to its mouth in Brazoria County on the Gulf of Mexico, was included.

The stream lies entirely within the Coastal Plain, rising in the Post Oak Belt and flowing thence through the Coastal Prairie. The upper river is an often dry or intermittent sand bottom stream. The middle portion flows sluggishly between moderate to low steep-cut mud banks and the lower portion becomes brackish near West Columbia.

Twenty-five species of fresh water fishes were collected during the survey and several others, including some saltwater species, are known to exist in the river. Fishing in the upper and middle river is limited to catfish and several species of centrarchids. A significant fishery exists in the lower reaches of the river for marine species.

OBJECTIVES

To gather fundamental data on the San Bernard River in regard to its physical, chemical and biological aspects and to obtain a checklist of the freshwater fish species.

METHODS

Fish samples were obtained by means of small mesh seines at Station Number 4, 5, 7, 8, and 9 along the river (Figure 1.). Points of access by all weather roads were chosen for the survey stations. The collections were limited to stations within the freshwater portions of the stream. No collections were made in the brackish, or salt-water, portions.

All specimens taken were preserved for subsequent identification and frequency of occurrence analysis. In some cases, a dominant species was so abundant at a given locality that preservation of complete collections of the species was impracticable and under these conditions estimates of the abundance for this species were used. The identification of all fish specimens was verified by Dr. Clark Hubbs, Department of Zoology, University of Texas.

Ecological notes were made at each of nine stations and the data recorded included: bottom type, cover, vegetation, stream width, depth, relative turbidity, pH, velocity and volume of flow.

## PHYSICAL CHARACTERISTICS

The San Bernard River rises in Austin and Colorado Counties and is the boundary between these counties (Figure 1). The river flows in a southeasterly direction along this boundary and thence as the boundary between Wharton and Fort Bend Counties and Matagorda and Brazoria Counties. After flowing approximately 105 miles it empties into the Cedar Lake arm of the Gulf of Mexico. The stream originates in the Post Oak Belt near New Ulm at an elevation of approximately 250 feet above sea level, and flows parallel to and between the much larger Colorado and Brazos Rivers. The San Bernard drains a rather narrow area of approximately 1500 square miles in the counties mentioned above.

The entire stream length of the San Bernard is contained in the Coastal Plain. The headwaters lie in sandy and sand loam soils in the edge of the Post Oak Belt, where post oak is the principal vegetation of the rolling plain. In this region truck farming, cotton and peanut farming and grazing are the principal land uses.

Below Station No. 10, near New Ulm, the stream enters the coastal prairies where the soils are heavy clays which are largely grass covered. The stream in this region is bordered by hickory, ash, pecan, sycamore, cypress, and willow trees.

At most seasons of the year the upper stream is a dry sand bed from the headwaters area near New Ulm to a point between Stations 10 and 9. On June 7, 1957, a significant flow was encountered at Station 10 undoubtedly due to the unusually heavy rains and flooding which preceded this visit to the river. On July 24, however, the stream was dry at this point and only a small flow of approximately 5 c.f.s. was found downstream at Station No. 9. During dry seasons the upstream limit of flow is undoubtedly much farther downstream than this.

The stream above Station No. 7 (Figures 2 and 3) near the town of East Bernard, is a wide sand stream bed, sometimes contained between cut loam banks on one or both sides and at others, gently sloping from the surrounding pasture lands. The sand stream bed is as much as 100 years wide in many places.

At Station No. 7, the stream changes character completely and flows between low, steep cut clay banks (Figures 4 and 5). Stream width here was approximately 30 feet and did not increase or decrease significantly until a point was reached near the town of West Columbia, approximately 30 river miles from the coast. Brackish water was first encountered near West Columbia at Station No. 3, and several small tributaries enter the San Bernard near this point. (Figures 6 and 7)

Stream flow increased from zero at Station No. 10, near New Ulm, to 25 c.f.s. at Station No. 8, near Wallis, and 53 c.f.s. at Station No. 5, near Boling. Below Station No. 5 conditions were such that accurate estimates of flow were not possible and no permanent stream gauging exists in this portion of the river.

Aquatic vegetation was limited to periphyton algae, filamentous algae and spatterdock (Nuphar advena). In the clear waters above Station No. 7 algae growths ranged from sparse to abundant and in the more turbid water downstream they ranged from sparse to absent.

At Station No. 6, near Kendleton, a limited growth of spatterdock or yellow water lily was found. No other rooted aquatic vegetation was found.

### CHEMICAL CHARACTERISTICS

Water quality in the San Bernard was found to be satisfactory for diversified aquatic life at all points. The stream is clear in its upper reaches and grows more murky through the middle reaches. The pH range in the stream is from pH 9.2 in the upstream section to pH 8.5 in the middle and lower sections of the river.

No pollution was found during the survey of the river and only one potential source of pollution was found on the lower river. The sulphur plant, above Churchill Bridge, is locally believed to occasionally pollute the river, however, at the time of the survey, no direct evidence of such pollution could be found.

### FISH COLLECTIONS

Seining collections were made in the upper and middle portions of the San Bernard River at Stations 4, 5, 7, 8, and 9. (Figure 1). No collections were made in the lower river sections where brackish water was encountered.

Twenty-five freshwater species were collected at the five stations listed above and an additional nine fresh and saltwater species are assumed to exist in the river on the basis of reports from Dr. Clark Hubbs, local fishermen and resort owners. The names of these species are presented in Table 1, and their distribution is given in Figure 8.

The results of the fish collections indicate a limited freshwater fishery in the upper and middle reaches of the river. Sport species in these waters are limited to the channel catfish, yellow bullhead, largemouth bass, green sunfish, longear sunfish, and white crappie. The abundance of the more desirable sport species such as the largemouth bass and white crappie appears to be limited. The white crappie (Pomoxis annularis) was taken in only one collection and the largemouth bass (Micropterus salmoides) also is present in very limited numbers. Green and longear sunfish, on the other hand, appear to be a significant part of the freshwater fishery of this stream.

The individual species most frequently collected and therefore assumed to be most widely distributed in the San Bernard are the common mosquitofish (Gambusia affinis), the green sunfish (Lepomis cyanellus), and the red fin or redhorse shiner (Notropis lutrensis).

### FAMILY LEPISOSTEIDAE

Though only a single species of gar was collected during the survey work on the San Bernard River, and that is the longnose gar, Lepisosteus osseus, there is reason to believe that the alligator gar, Lepisosteus spatula, and the spotted gar, Lepisosteus productus, also occur in the river. According to Dr. Clark Hubbs of the University of Texas, it is probable that these two additional species are present in the stream.

### FAMILY CLUPEIDAE

The gizzard shad, Dorosoma cepedianum, though collected only at upstream collection points, very likely is widely distributed throughout the length of the freshwater portions of the San Bernard River.

FAMILY CATOSTOMIDAE

Large schools of river carpsucker young-of-the-year, Carpionodes carpio, were collected at Station No. 8, near Wallis, in the upstream portion of the river. This tends to indicate that the species is present in abundance and most likely occurs throughout the length of the river.

FAMILY CYPRINIDAE

As was expected, this family was represented by more species in the collections than any other family. Twelve cyprinid species are known from the San Bernard. Ten of these were collected by survey personnel and two others are reported to occur in the river by Dr. Clark Hubbs. The localities from which these species were collected are shown in the accompanying maps in Figure 8. The redbin or redhorse shiner, Notropis lutrensis, was the most frequently taken minnow in the collections and the golden shiner, Notemigonus crysoleucas, was represented in the collections by only a single specimen.

FAMILY AMEIURIDAE

Ameiurid species in the San Bernard River as in so many of the other small streams of Texas represent the major fishery potential for freshwater species. The channel catfish, Ictalurus punctatus, and the yellow bullhead, Ictalurus natalis, were taken at upstream stations and probably occur throughout the length of the stream. It is known that, where the stream is wide enough, there is a limited amount of trotline fishing done.

FAMILY CYPRINODONTIDAE

The blackstripe topminnow, Fundulus notatus, was taken at two of the upstream stations and was observed at several of the downstream stations. This indicates that the species is generally distributed over most of the stream.

FAMILY POECILIIDAE

As in most streams in this area, the common mosquitofish, Gambusia affinis, was found to be very abundant in the San Bernard. It was present in every collection made.

FAMILY CENTRARCHIDAE

Largemouth bass fingerlings were relatively abundant at Station No. 9, at the time of the June collection. At the time of the July visit to the river this station was a dry stream bed. Though not taken in large numbers, largemouth bass are probably widely distributed throughout the middle reaches of the river.

Both the green sunfish, Lepomis cyanellus, and the longear sunfish, Lepomis megalotis, were found to be widely distributed in the freshwater portions of the San Bernard. These two species possibly are of importance in the fishery to the pole and line fishermen.

A single white crappie, Pomoxis annularis, was taken in the June collections at Station No. 9. It is possible that this specimen was a chance occurrence accounted for by the recent floods, since none were taken in the July collections. However, the species may be present in some of the deeper holes in the middle reaches of the river.

FAMILY PERCIDAE

Two darters, the slough darter, Etheostoma gracile, and the bluntnose darter, Etheostoma chlorosomum, were taken in the upper and middle portions of the river. They compose a very small part of the total population in each case.

FAMILY MUGILIDAE

The striped mullet, Mugil cephalus, is known from an observation of several dozen found dead along the river bank, apparently the result of bait seining. It is believed that the species is abundant throughout the lower and middle portions of the river.

FAMILY SCIAENIDAE

Although no collections were made in the saltwater of the lower river, several species of fish are known to occur there from the reports of fishermen and resort owners.

Freshwater drum, Aplodinotus grunniens, redfish or red drum, Sciaenops ocellata, croaker, Micropogon undulatus, and speckled trout, Cynoscion nebulosus, were all reported as contributing to the fishery in the saltwater portion of the lower river at Stations 1 and 2.

CONCLUSIONS

The lower 30 river miles of the San Bernard supports a significant fishery for marine species and supports several commercial docks at Churchill Bridge.

A potential source of pollution is the sulphur plant above Churchill Bridge which local fishermen consider to be an occasional source of pollution. However, there is no evidence available at present to support this charge.

Upstream through the middle portions of the river there are indications of moderately heavy fishing pressure for catfish, largemouth bass and sunfish. Channel catfish apparently are the most sought after species in the stream and are fished for primarily with trotlines.

Above Station No. 7, in the vicinity of East Bernard, the stream is of little significant fishery potential due to intermittent and seasonal water conditions.

Vegetation was sparse except in the shallow upper reaches of the river where algae growths were abundant.

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Date August 27, 1957

Table 1. Checklist of Fishes Known or Reported to Occur in the San Bernard River.

Scientific Name	Common Name
Family LEPISOSTEIDAE	
<u>Lepisosteus osseus</u>	longnose gar
Family CLUPEIDAE	
<u>Dorosoma cepedianum</u>	gizzard shad
Family CATOSTOMIDAE	
<u>Carpionotus carpio</u>	river carpsucker
Family CYPRINIDAE	
<u>Notemigonus crysoleucas</u>	golden shiner
<u>Opsopoeodus emiliae</u>	pugnose minnow
<u>Hybopsis aestivalis</u> (Reported by Hubbs)	speckled dace
<u>Notropis roseus</u>	weed shiner
<u>Notropis venustus</u>	spottail shiner
<u>Notropis atherinoides</u>	emerald shiner
<u>Notropis fumeus</u>	ribbon shiner
<u>Notropis amnis</u>	pallid shiner
<u>Notropis volucellus</u>	mimic shiner
<u>Notropis lutrensis</u>	redhorse shiner
<u>Notropis brazosensis</u> (Reported by Hubbs)	Brazos River shiner
<u>Pimephales vigilax</u>	parrot minnow
Family AMEIURIDAE	
<u>Ictalurus punctatus</u>	channel catfish
<u>Ictalurus natalis</u>	yellow bullhead
<u>Schilbeodes gyrinus</u>	tadpole madtom
Family CYPRINODONTIDAE	
<u>Fundulus notatus</u>	blackstripe topminnow
Family POECILIIDAE	
<u>Gambusia affinis</u>	common mosquitofish
Family CENTRARCHIDAE	
<u>Micropterus salmoides</u>	largemouth bass
<u>Lepomis cyanellus</u>	green sunfish
<u>Lepomis megalotis</u>	longear sunfish
<u>Pomoxis annularis</u>	white crappie
Family PERCIDAE	
<u>Etheostoma gracile</u>	slough darter
<u>Etheostoma chlorosomum</u>	bluntnose darter

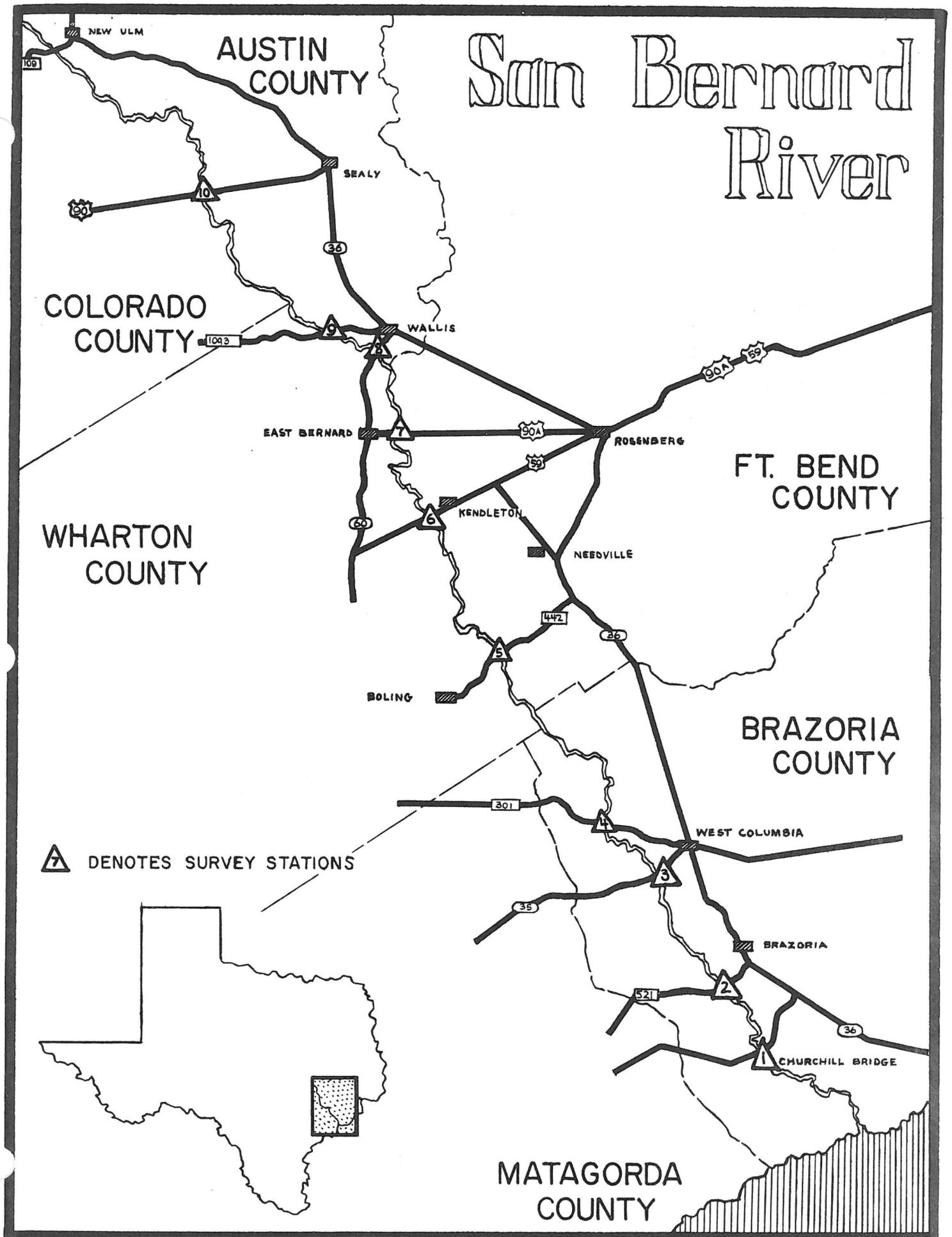


Figure 1. Map of San Bernard River showing survey stations.

Table 1 (Continued).

Scientific Name	Common Name
Family MUGILIDAE	
<u>Mugil cephalus</u>	striped mullet
Family LEPISOSTEIDAE	
<u>Lepisosteus spatula</u> *	alligator gar
<u>Lepisosteus productus</u> *	spotted gar
Family SCIAENIDAE	
<u>Aplodinotus grunniens</u> **	freshwater drum
<u>Sciaenops ocellata</u> **	red fish or red drum
<u>Micropogon undulatus</u> **	croaker
<u>Cynoscion nebulosus</u> **	speckled trout
Family SPARIDAE	
<u>Archosargus probatocephalus</u> **	sheepshead

\* Considered as probable in this drainage by Dr. Clark Hubbs.

\*\* Reported to occur in saltwater portion of stream by fishermen and resort operators.



Figure 2. Station No. 8 at Highway 60.



Figure 3. Station No. 10 at Highway 90.



Figure 4. Station No. 4 at Farm Road 1301.



Figure 5. Station No. 5 at Farm Road 442.

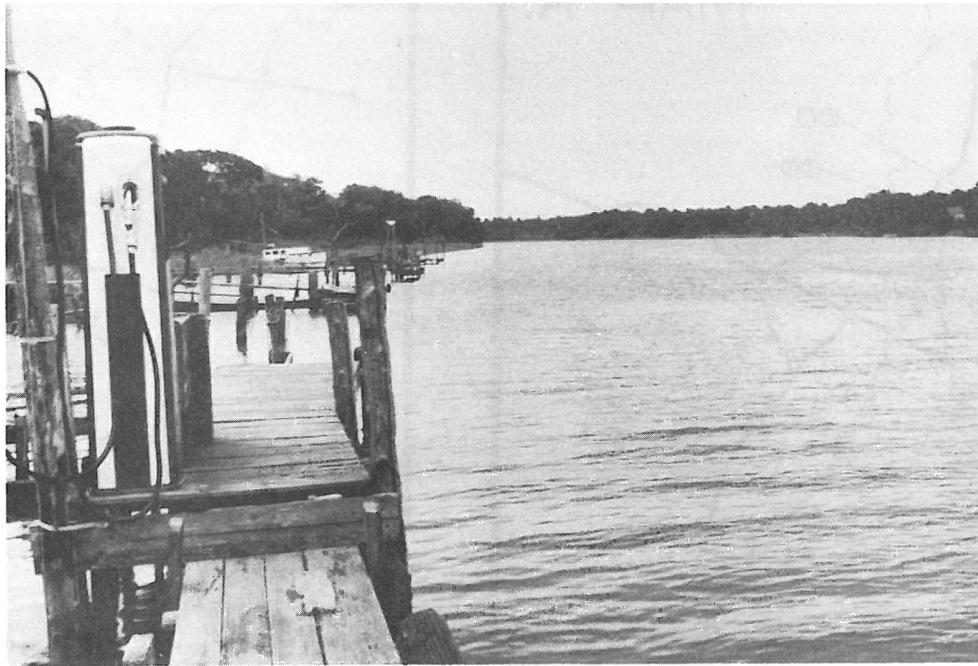
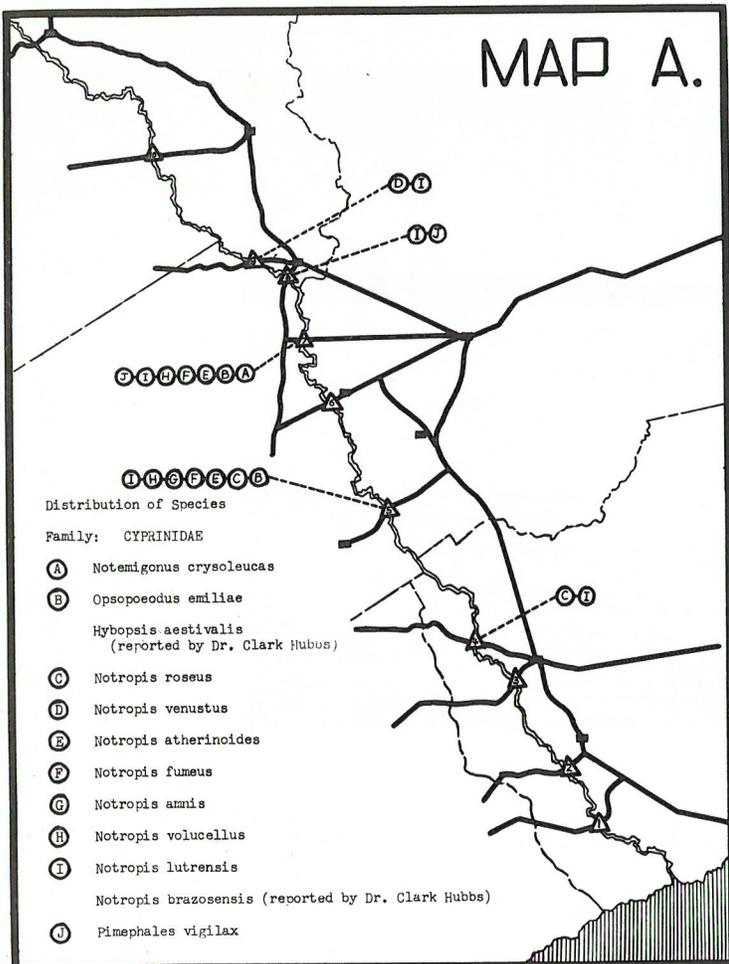


Figure 6. Station No. 1 near Churchill Crossing.

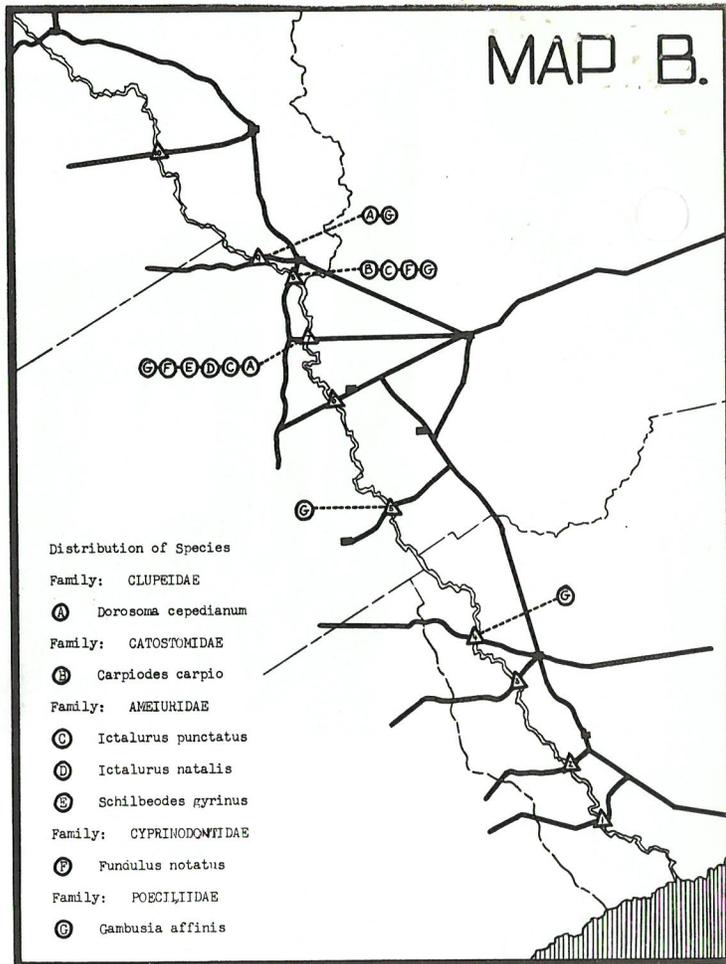


Figure 7. Station No. 3 at Highway 35 Bridge.

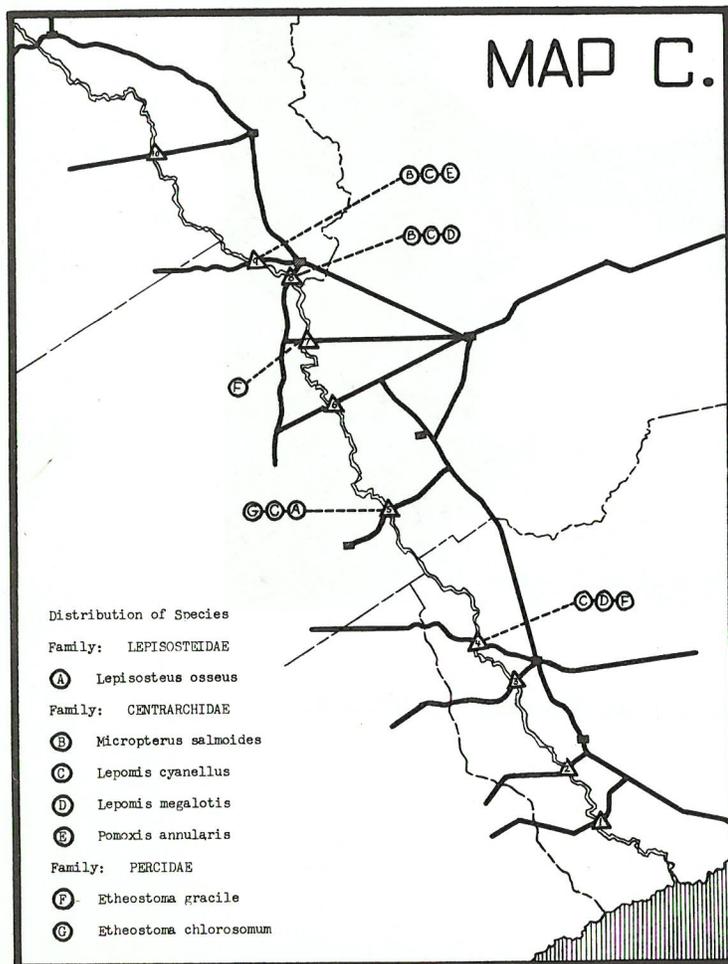
# MAP A.



# MAP B.



# MAP C.



# MAP D.

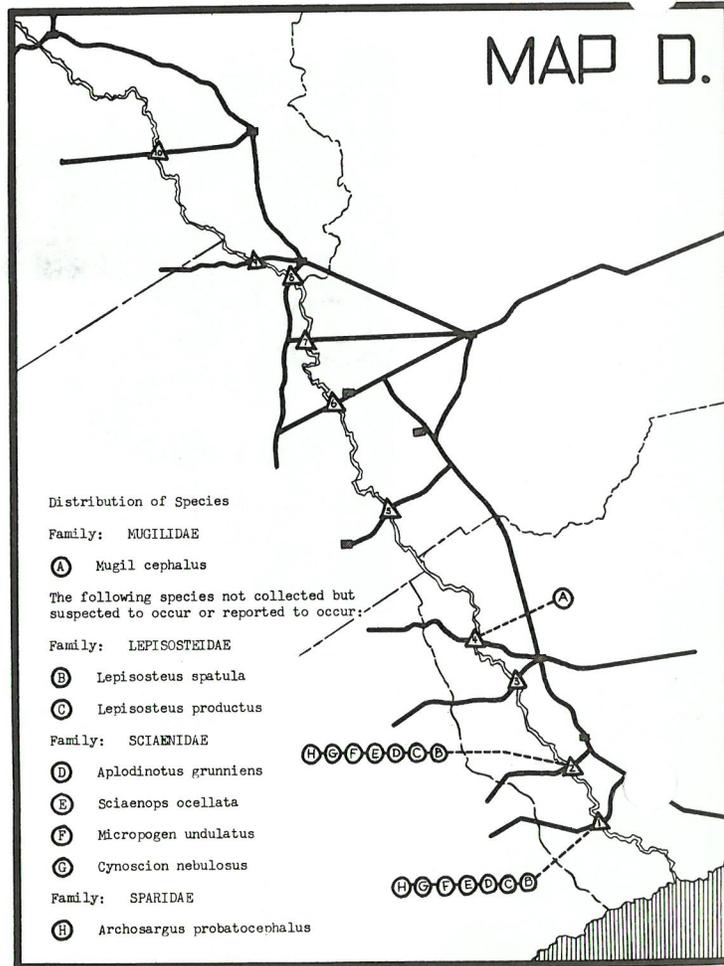


Figure 8. Distribution of species, San Bernard River.