

JOB COMPLETION REPORT

State of TEXAS

Project No. F4R4 Name: Fisheries Investigations and Surveys of the Waters of Region 4-B.

Job No. B-18 Title: Inventory of Species Present in Lake Waco.

Period Covered: November 1, 1956 - October 31, 1957

ABSTRACT:

Lake Waco is a dingy, moderately old impoundment located on the Bosque River six miles west of Waco in McLennan County. The lake is 28 years old and contains a large amount of silt. The impoundment contained very little water during the winter months of the first part of the survey but was severely flooded the following spring.

The lake was sampled with 3700 feet of gill net between November 1956 and October 1957. White crappie, catfish, shad and drum are abundant in the lake, while carp, carpsucker and the lesser sunfishes are scarce. A small population of largemouth bass is present.

Recommendations are made for the improvement of fishing by a selective kill with chemicals and the planting of suitable vegetation during periods of water drawdown.

OBJECTIVES:

To determine the species present and their relative abundance and to determine the ecological factors influencing their distribution.

HISTORY OF LAKE:

Lake Waco is located in McLennan County. The dam is six miles west of the city of Waco, and controls the run-off from the Bosque watershed, an area of approximately 1650 square miles. The Lake Waco Dam was constructed in 1929 and impounds a reservoir of 2800 surface acres with a 11.5 mile shoreline. The original volume of Lake Waco was 38,100 acre feet but excessive siltation has reduced the volume to the present capacity of 15,500 acre feet. An evaluation of the above figures reveals that 59 percent of the total volume of the lake has silted in during the 28 years of its existence. The present average depth is $5\frac{1}{2}$ feet when the lake is full. The shoreline is composed primarily of gently sloping mud flats interspaced with a few gravel beaches. There are a number of homes and a few businesses located on the lake shore.

Aquatic vegetation is present in a few sheltered areas of the lake. Nelumbo sp. and Potamogeton sp. being the dominant plants in a few areas.

Lake Waco was almost dry when we began the fisheries survey in November 1956. The lake continued to shrink in size until it covered an area of about 300 surface acres during the remaining winter months. A large rainfall in March nearly filled the

lake. Exceptionally heavy rainfall during the following spring and summer months kept the lake filled and allowed a great amount of water to flow through the lake. The lake was not much more than a large mud puddle during the drought period. Very little of the lake was deep enough to navigate a boat. An area next to the dam and a small portion of the original river channel that extended up lake from the dam was the only part of the lake that could be netted during the first few months of the fisheries survey. The water was very muddy and quite crowded with fish at that time. Many of the fish could be seen topping the surface as if they were trying to obtain an additional supply of oxygen. If the adverse environmental conditions had continued into the warm months a large number of fish would have surely died from suffocation. Fishing was not productive during the period of low water but excellent catches were reported by fishermen after the lake refilled.

COLLECTING METHODS:

Gill nets were used to collect random samples of the fish population. The nets were 100 or 125 feet long and varied in mesh sizes from 1 to 3-inches measured on the square. A major part of the netting was done with nets composed of meshes $1\frac{1}{2}$ -inches in size. All nets were eight feet deep. Netting stations of various ecological types were selected in order to sample the different environmental areas of the lake. Many of the stations were netted a number of times in an effort to obtain information regarding the runs of various species of fish over selected areas at different seasons of the year. Data taken from the netted fish included their length, weight, sex and degree of gonadal development. The stomachs were examined in the field and materials of microscopic size were listed. Notes were made of any fungus or parasites found on the fish. Sampling was also done with minnow seines when the condition of the lake shore would allow such activities. The shoreline was too muddy to allow seining during the periods of low water and too congested with drift wood and debris following the spring floods.

RESULTS OF THE GILL NET COLLECTIONS:

A total of 3700 feet of gill net was used to sample the fish population from 16 stations. Thirteen species were collected in the nets. Table 1 is a tabulation of data from the gill net collections. Gizzard shad accounted for over half the fish netted. A good population of white crappie and channel catfish are present and their abundance are reflected in the fishermen's creel. About 16 percent of the net collections were drum which have been listed as a game fish in compiling the data for this report in order to be consistent with previous reports of other lakes in the region. But biologically they should be considered as a rough fish due to their limitation in size, infrequency of harvest by sport fishermen and unpopular food value.

Some gar are present with the abundance of the spotted gar leading that of the longnose gar about eight to one. Carp, carpsucker and sunfishes are scarce. A small population of largemouth bass are present and a fair representation of smallmouth buffalo were netted. A few flathead catfish were caught and encouraging reports on the harvest of this species was received from fishermen. Kentucky spotted bass, white bass and black crappie are not present in the lake. In general, the fish population of Lake Waco is quite comparable to that of Lake Worth (report of F4R3, Job B-15, November 1955 - October 1956). Both lakes are old, murky, shallow and highly silted. The higher percentage of shad found in Lake Waco as compared with other similar lakes of this region may be due to the absence of white bass in that impoundment.

It is suggested that technical help be offered the fishermen in the use of experimental gear and that data such as photograph and biological information be shared with the netter when they can be used effectively to harvest more rough fish.

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Table 1. A Comparison of the Effectiveness of Capture by Hoop Nets and Gill Nets on Four Species of Fish, Lake Whitney, Texas, November 1956 - October 1957.

Species	Hoop Nets		Gill Nets	
	Number	Percent	Number	Percent
Buffalo	3,270	32.38	15,828	92.62
Carp	6,644	65.79	1,099	6.43
Carpsucker	185	1.83	1	
Gar			161	0.94
Total	10,099		17,089	

Table 2. Number of Each Species Caught and the Percentage of the Entire Catch that they Represent. Lake Whitney, Texas, November 1956 - October 1957.

Species	Total No. Caught	Percentage by No.	Percentage by Weight
Carp	7,743	28.48	21.55
Buffalo	19,098	70.24	77.74
Carp sucker	186	.69	.38
Gar	161	.59	.33
Total	27,188	100.00	100.00

Table 3. Pounds of Harvest and Wholesale Market Value of Fish Caught by Commercial Fishermen. Lake Whitney, Texas - November 1956 through October 1957.

Species	Total Pounds Caught	Wholesale Price per Pound	Total Value
Carp	20,459	0.10	\$ 2,045.90
Buffalo	73,797	0.22	16,235.34
Carp sucker	359	0.10	35.90
Gar	317	No Value	
Total	94,932		\$ 18,317.14

FIGURE 1
**THE HARVEST OF ROUGH FISH PER SURFACE ACRE FROM LAKE WHITNEY,
 TEXAS, NOVEMBER 1956 THROUGH OCTOBER 1957**

