

STATE Texas
PROJECT F-5-R-1, Job B-5
PERIOD June 22, 1953 - June
22, 1954

Job Completion Report

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FILE

TITLE

Inventory of Species Present in Lake Brownwood, Brownwood, Texas.

OBJECTIVES

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

PROCEDURE

One hundred and sixteen gill nets were set for twenty-nine collections from Lake Brownwood. Experimental nylon gill nets, measuring 125 ft. long x 8 ft. in depth, and made up in five, 25 ft. sections were used. Mesh size for these nets increased progressively in each following section at one-half inch intervals beginning with one-inch mesh and terminating with a three-inch mesh section.

Forty-three seining collections were made at sixteen seining stations in the reservoir. In nearly all collections both 26 ft. $\frac{1}{4}$ " mesh bag seines and 15 ft. $\frac{1}{4}$ " common sense seines were used. To estimate relative abundance a count was made of all individuals taken in two hauls with a 26 ft. $\frac{1}{4}$ " bag seine for each collection. In addition to that work other seining collections were made to determine seasonal distribution of species and to secure samples of fry after the spring spawning season for fishes. For this latter work 4 ft. common sense with meshes of $\frac{1}{4}$ inch and $1/16$ inch were used.

Water analysis to determine dissolved carbon dioxide and oxygen content was taken for each collection and surface temperature, pH and the climatic conditions were recorded for each netting and seining collection. Turbidity was taken on four occasions.

In netting collections samples from each collection for each species were weighed, measured and sexed in the field. A scale sample was taken and stomachs containing food were preserved for laboratory study. Similar work for seining collections included identification and counting only and where identity of an individual was questioned the fish was preserved in 10% formalin.

FINDING

Lake Brownwood is located approximately 8.5 miles north of the City of Brownwood. The dam creating the reservoir is located about one-half mile below the confluence of Jim Ned Creek and Pecan Bayou, is earth fill construction and 1,580 ft. long. The reservoir was constructed by Brown County Water Improvement District and the impounded water is primarily for the municipal and industrial consumption of Brownwood, Coleman and Bangs. However, about five thousand acres are irrigated either directly or by sub-surface seepage from the reservoir. When at emergency spillway level, the lake has 8,000 surface acres and contains an estimated 137,300 acre feet of water. When filled the lake has about 95 miles of shoreline.

The contributing watershed of 1,535 square miles is Coleman, Breckenridge and Capps limestone formation and top soils are usually alluvial deposits near streamways various clays, loams and sands on higher ground. There are fifty different soil types in the county. Vegetative cover for the watershed is predominantly oak-grassland association, and the area is currently employed for farming with a lesser acreage for ranching. Climate for the watershed is semi-arid. The average annual rainfall is 27.44 inches, and the average annual discharge for Pecan Bayou and Jim Ned Creek is 166 c. f. s. A maximum discharge of 52,700 c. f. s. was recorded in October 1930 and recent averages were 20.8 c. f. s. for 1953 and 4.96 c. f. s. for 1952.

The lake's water is clear, 0.0 turbidity. The maximum surface temperature recorded was 84 degrees F. and a minimum of 41 degrees F. was recorded. pH was 8.4 - 8.5. Maximum carbon dioxide registered 18 ppm and the minimum oxygen recorded at that time was 2.5 ppm. Dissolved carbon dioxide was usually about 11 - 12 ppm and oxygen usually about 5 - 8 ppm.

Principal species of aquatic vegetation in the upper lake shallow flats are bull-rushes (*Scirpus* sp.) and along the south shore arrowheads (*Sagittaria latifolia* and *S. platyphylla*) and pondweeds (*Potamogeton natans* and *P. spirillus*) are present in depths to eight feet. In several small protected areas, mainly boat docks, parrot feather (*Myriophyllum* sp.) and muskgrass (*Chara* sp.) occur. However, because of semi-annual fluctuations in the lake level dense concentrations of aquatics are rare and usually semi-permanent.

Netting Results

14,500 ft. of experimental gill nets were set at 18 different stations and caught 1,971 individuals of eleven genera. As shown in Table 1, white bass (*Morone chrysops*) andizzard shad (*Dorosoma cepedianum*) are probably dominant species for Lake Brownwood. However a combined total for all types sampling indicate largemouth black bass (*Micropterus salmoides*) and white crappie (*Pomoxis annularis*) may be increasing and river carpsuckers (*Carpionodes carpio*), carp (*Cyprinus carpio*) and smallmouth buffalo (*Ictiobus bubalus*) populations may be declining. It is considered likely that the percentage by weight figures presented in Table 11 are more accurate in representing the importance of the latter species. Thirteen species were taken and the average catch was .135 fish per foot experimental net set. Table 11 may be more accurate in illustrating the importance of flathead catfish (*Pilodictus olivaris*).

Seining Results

Twenty species were taken in seining collections. Thirty-eight collections caught 1,471 individuals. The comparatively small number of individuals taken by seining as compared to other lakes is explained by a lack of suitable seining stations. However, Table 111 is probably more accurate in illustrating the importance of such species as mosquitofish (*Gambusia affinis*), plains minnow (*Hybognathus placitus*) and killifish, (*Fundulus* sp.)

REMARKS

Because of the apparent increases in largemouth black bass and white crappie and because it is believed that seining results are inadequate for accurate expression, it is recommended that this study be continued for another year.

Table 1

Netting Collections

Species	Aug.		Oct.		Dec.		Jan.		Feb.		Mar.		Apr.		June		Total	
	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%	No.	%
<i>Dorosoma cepedianum</i>	61	31.3	128	35.2	301	56.2	112	49.6	4	6.1	210	47.4	21	32.7	18	24.0	855	43.40
<i>Carpionodes carpio</i>	39	20.0	47	12.9	29	5.4	19	8.5	10	15.2	26	5.9	7	10.7	7	9.4	184	9.30
<i>Cyprinus carpio</i>	4	2.1	12	3.3	4	.7	0	0	0	0	3	.7	0	0	2	2.7	25	1.30
<i>Ictiobus bubalus</i>	12	6.2	18	5.0	21	3.9	12	5.3	2	3.1	11	2.5	3	4.7	0	0	79	4.00
<i>Lepisosteus osseus</i>	7	3.6	6	1.7	4	.70	0	0	1	1.5	8	1.7	0	0	1	0	27	1.40
<i>Morone chrysops</i>	51	26.2	81	22.2	137	25.6	61	27.0	23	34.9	111	25.0	14	21.8	28	37.4	506	25.70
<i>Pilodictus olivaris</i>	1	.50	0	0	2	.30	0	0	0	0	6	1.40	1	1.40	0	0	10	.50
<i>Ictalurus punctatus</i>	14	7.20	61	16.80	12	2.30	8	3.5	9	13.7	51	11.5	6	9.70	7	9.30	168	8.50
<i>Micropterus salmoides</i>	0	0	0	0	0	0	1	0.40	2	3.1	8	1.70	0	0	0	0	11	.60
<i>Pomoxis annularis</i>	4	2.1	9	2.5	14	2.6	13	5.6	15	22.70	7	1.60	12	19.4	12	16.0	86	4.30
Sunfishes	2	1.0	2	.60	12	2.3	0	0	0	0	0	.90	0	0	0	0	20	1.00

Table II

Netting Collections

Species	Pop. Sample	Avg. Wt. gms.	Total Wt. 1000 gms.	% by Wt.	% by No.	K Range	K Average
<i>Dorosoma cepedianum</i>	Avg. of 132	79	6.75	9.70	43.40	1.31-2.08	1.57
<i>Carpoides carpio</i>	Avg. of 60	597	110.0	15.70	9.30	2.20-2.69	2.38
<i>Cyprinus carpio</i>	Avg. of 25	925	23.20	3.30	1.30	2.60-3.10	2.54
<i>Ictiobus bubalus</i>	Avg. of 28	1287	101.50	14.50	4.00	2.58-3.66	3.01
<i>Lepisosteus osseus</i>	Avg. of 27	1965	52.70	7.50	1.40	2.39-4.57	3.73
<i>Morone chrysops</i>	Avg. of 228	531	269.00	38.60	25.70	1.65-3.46	2.47
<i>Pilodictus olivaris</i>	Avg. of 10	1644	16.40	2.30	.50	2.80-3.25	3.18
<i>Ictalurus punctatus</i>	Avg. of 168	811	13.60	1.90	8.50	1.68-1.98	1.82
<i>Micropterus salmoides</i>	Avg. of 11	1162	12.80	1.80	.60	2.25-2.73	2.61
<i>Pomoxis annularis</i>	Avg. of 53	340	29.80	4.30	4.30	2.89-4.94	3.23
Sunfishes	Avg. of 30	85	1.70	.20	1.00	4.42-6.65	4.80
			698.20	99.80	100.00		

Table 111

Seining Collections

Species	Aug.	Sept.	Oct.	Jan.	Feb.	Mar.	Apr.	June	Total	%
<i>Gambusia affinis</i>	21	50	0	11	0	17	23	31	153	10.40
<i>Notropis lutrensis</i>	11	0	12	0	110	3	9	0	145	9.80
<i>Notropis venustus</i>	0	12	0	0	0	2	11	12	37	2.50
<i>Notropis amabilis</i>	0	0	11	0	18	9	0	0	38	2.60
<i>Notemigonus chrysoleucas</i>	0	0	0	4	0	0	0	0	4	.20
<i>Pimephales vigilax</i>	0	0	21	0	11	18	17	0	67	4.50
<i>Fundulus speciosus</i>	31	14	3	0	0	8	0	2	58	3.90
<i>Hybognathus placitus</i>	0	0	0	62	18	0	0	11	91	6.20
<i>Micropterus salmoides</i>	4	0	0	0	3	0	4	6	17	1.10
<i>Morone chrysops</i>	4	18	9	28	2	32	20	11	124	8.50
<i>Dorosoma cepedianum</i>	38	37	10	0	128	154	12	0	379	25.80
<i>Lepomis cyanellus</i>	1	0	11	14	9	3	0	22	60	4.10
<i>Lepomis megalotis</i>	0	4	17	5	14	8	0	4	52	3.50
<i>Lepomis macrochirus</i>	12	8	0	28	31	4	14	31	128	8.70
<i>Lepomis microlophus</i>	2	0	0	9	2	6	0	4	23	1.50
<i>Lepomis auritus</i>	0	0	0	2	2	0	0	3	7	.40
<i>Lepomis punctatus</i>	0	0	0	2	0	0	0	7	9	.60
<i>Chaenobryttus coronarius</i>	2	2	1	6	4	1	1	4	21	1.40
<i>Pomoxis annularis</i>	7	2	5	11	0	4	9	10	48	3.30
	135	147	100	183	325	260	129	165	1,471	99.66

SUMMARY

1. 14,500 feet of gill net captured 1,971 individuals. White bass and gizzard shad apparently dominate much of the lake, however largemouth black bass and white crappie may be increasing.
2. Because of the difficulty in locating suitable seining stations it is concluded that the sample of 1,471 individuals taken in 38 collections is inadequate. However, trends indicated by seining results and increase in largemouth bass and white crappie may be important.
3. Because of the apparent increases in largemouth black bass and crappie and because it is believed that seining results are inadequate for accurate expression, it is recommended that this study be continued for another year.

Checklist of Species of Fish Taken from Lake Brownwood
June 22, 1953 to June 22, 1954

Common Name	Scientific Name
1. Longnose gar	<i>Lepisosteus osseus</i>
2. Gizzard shad	<i>Dorosoma cepedianum</i>
3. Smallmouth buffalo	<i>Ictiobus bubalus</i>
4. Black buffalo	<i>Ictiobus niger</i>
5. River carpsucker	<i>Carpionodes carpio</i>
6. Gray redhorse sucker	<i>Moxostoma congestum</i>
7. German carp	<i>Cyprinus carpio</i>
8. Plains shiner	<i>Notropis percobromus</i>
9. Red shiner	<i>Notropis lutrensis</i>
10. Blacktail shiner	<i>Notropis venustus</i>
11. Plains minnow	<i>Hybognathus placitus</i>
12. Parrot minnow	<i>Pimephales vigilax</i>
13. Banded killifish	<i>Fundulus notatus</i>
14. Southern channel catfish	<i>Ictalurus punctatus</i>
15. Flathead catfish	<i>Pilodictus olivaris</i>
16. Common mosquitofish	<i>Gambusia affinis</i>
17. White bass	<i>Morone chrysops</i>
18. Largemouth black bass	<i>Micropterus salmoides</i>
19. Warmouth bass	<i>Chaenobryttus coronarius</i>
20. Green sunfish	<i>Lepomis cyanellus</i>
21. Spotted sunfish	<i>Lepomis punctatus</i>
22. Redear sunfish	<i>Lepomis microlophus</i>
23. Bluegill	<i>Lepomis humilis</i>
24. Western longear sunfish	<i>Lepomis megalotis</i>
25. White crappie	<i>Pomoxis annularis</i>
26. Logperch	<i>Percina caprodes</i>
27. Freshwater drum	<i>Aplodinotus grunniens</i>



LAKE BROWNWOOD