

STATE Texas

PROJECT F-3-R-1, Job B-4

PERIOD July 1953 - May 1954

Job Completion Report

by

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TITLE

Inventory of Species Present in Tyler City Lake.

OBJECTIVES

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

HISTORY OF LAKE

Tyler City Lake was formed in January 1949 on completion of the dam. The lake is approximately eight air miles southeast of Tyler. It was built by the City of Tyler for their public water supply. Several hundred lake shore lots are now privately owned and many lake homes have been built. An estimated 2,000 boats are now located on Lake Tyler. Many boats are used by fishermen to put very heavy fishing pressure on the lake.

PHYSICAL CHARACTERISTICS

Lake Tyler is located on Prairie Creek, which drains into Mud Creek and eventually into the Angelina River. The lake covers an area of 2,500 acres and contains 42,500 acre feet of water. The watershed covers 45 square miles. Besides Prairie Creek, the lake is fed by Gilly and Hill Creeks.

The average annual rainfall for Tyler is 40.2 inches. Even though city water is heavily used, the lake level does not fluctuate over four feet.

The soil of the Lake Tyler watershed in order of predominance is:

1. Bowie F. S. L. Deep Phase
2. Norfolk F. S.
3. Bowie F. S. L.
4. Ironton F. S. L.
5. Kirvin F. S. L.
6. Nacogdoches

Land use of the watershed is:

1. Pasture, 40%
2. Cultivation, 40% (corn, cotton, roses and tomatoes)
3. Timber, 20% (3/4 hardwood and 1/4 pine)

The lake has a maximum depth of 45 feet with an average depth of over 20 feet. The bottom is mostly sand and clay, with a few places in the Creek areas with soft silt bottom.

The water is very clear except in the upper ends of the three "fingers" of the lake. In these areas after heavy rains turbidity may read 30 ppm on a Jackson turbidimeter.

#### CHEMICAL CHARACTERISTICS

Due to the lack of equipment, water analyses were run only during the last phase of this study. The pH range from January through April was 7.0 to 7.3. However, pH records taken by the city show an annual pH range of 6.8 to 8.3. The dissolved oxygen content was from 8.8 to 10.4 ppm. Carbon dioxide ran from 5 to 5.5 ppm.

City records show total hardness to vary from 48 to 67 ppm and total alkalinity from 40 to 60 ppm.

#### AQUATIC VEGETATION

A number of aquatic plants were found in Lake Tyler, some of which may prove to be a nuisance.

The two most common submerged species were Najas flexilis, the bushy pond weed and Chara sp., a musk grass.

The emergent vegetation includes the following:

Nuphar variegatum - the yellow waterlily

Zizaniopsis miliacea - Saw grass

Typha latifolia - Common cattail

Polygonum densiflorum - Smartweed

Cephalanthus occidentalis - Button bush

Eleocharis sp. - Spike Rush

Carex sp. - Sedge

Cyperus erythrorhizos - Sedge

Scirpus validus - Softstem Bulrush

All of the plants listed here are only the more common species found in Lake Tyler. There are doubtless many others of lesser importance found there.

#### COLLECTING METHODS

Random sampling of the fish population by gill nets and seines was conducted from July 1953 through April 1954. The gill nets were 3 inch mesh, 2 inch mesh and 1½ inch mesh which were 8 feet deep and 100 feet long. Some nets were experimental type with 25 foot sections of mesh from one to three inches in diameter. These nets were 8 feet deep and 125 feet long. Seining collections were made with a 26 x 6 ft. bag seine with a ¼" inch mesh.

Scale samples were taken from all game fish taken in gill nets. Annuli were read and this data will be compared with similar data from other sections of the State. Stomachs of game species were taken in nets, preserved and later examined in the laboratory.

Table No. 1 records the checklist of 31 species collected by the above methods. However, the spotted bass, included on the check list, was only taken by hook and line, never netted or seined.

#### SEINING COLLECTION RESULTS

Even though the lake level fluctuation was comparatively slight, a rise or drop of a foot or so often made stations unusable. For this reason, seining was pretty much at random, depending entirely on which locations could be used at the time of the collection.

Eighteen seining collections were made on the lake between July 1953 and April 1954. No collections were made from November 1953 through March 1954 due to the lack of waders. These collections yielded 1,407 specimens, including 16 different species. The results of these collections by number and percent are found in Table No. 2.

#### NETTING COLLECTION RESULTS

One hundred and forty-eight gill net were set on Lake Tyler from July 1953 through April 1954. These nets caught 2,553 fish, weighing a total of 2,537.44 pounds. Table No. 3 records the numbers, weights and percentages of total number and weight of each species.

It should be noted that the game species (Centrarchids and channel cat) made up only 11.7% of the total number and 5.05% of the total weight. The sucker type fishes made up 49.6% by number and 68.5% by weight. Bullheads made up 36.5% of the total number and 21.4% of the total weight.

#### DISCUSSION

There is obviously a serious overpopulation of rough species in Lake Tyler. The black bullhead was the most abundant single species by number and may be a direct cause of the depletion of the crappie. Repeated observation of the east Texas area has shown that where bullheads are present in appreciable numbers, the crappie are almost certain to be few in number.

The spotted sucker, which made up slightly more than half the total weight of the netting collections, may be at its peak population. No young spotted suckers were taken during the survey; all specimens weighed at least a pound and a quarter. The chub sucker, however, were found in all size groups and may be increasing in numbers.

From observations, largemouth bass were very numerous and catches by fishermen good. However, there are many small bass and their condition was comparatively poor. This is seen in Table No. 4 which gives length, weight and coefficient of condition of the game species collected in Lake Tyler. The poor condition of the small bass may be due to the absence of shad as a forage species. This has possibly affected crappie as well.

The bluegill and redear were both in good condition, but have not reached a maximum size. This is probably due to too much competition for the available food supply.

#### RECOMMENDATIONS

1. Stock an appreciable number of adult Opelousas (flathead cat) and/or blue channel catfish. They are very good predators and enough of them would help keep suckers and bullheads under control.
2. Increase sport fishing pressure on bullheads and sunfish (bream). This might be helped by advertising campaign or fishing contest.
3. Close crappie fishing from February 15 through May 15 to give remaining crappie a better chance to spawn.
4. Stock channel cat 9 inches or longer. The building, by the City of Tyler, of rearing pond to feed channel cat is a step in the right direction. Stocking with channel cat fingerlings is useless until the bullhead population is reduced.
5. Placing of crocks, tile pipe, kegs, etc. in lake as spawning devices for channel cat.
6. Experimental stocking of threadfin shad as forage species. They are more desirable than gizzard shad since they do not get too large.

#### SUMMARY

1. Lake Tyler is a 2,500 acre lake located eight miles southeast of Tyler. It is owned by the City of Tyler and is that city's public water supply.
2. The water is very clear and varies from slightly acid to very alkaline.
3. The most common aquatic plants found were Najas flexilis (bushy pond weed), Chara sp. (musk grass), Nupher variegatum (yellow water lily) and Zizaniopsis millicacea (saw grass.)
4. There were 31 species of fish collected by netting, seining, and hook or line.
5. Bass and sunfish made up approximately one fourth of the seining collections. Forage species (minnows, darters, etc.) made up the remainder of the seining collections.
6. Game species made up only 11.7% by number and 5.05% by weight of the netting collections.
  - Sucker-type fishes made up 49.6% by number and 68.5% by weight of the collections.
  - Bullheads made up 36.5% of the total number and 21.4% of the total weight of the netting collections.
7. Collection records and poor fishing results by fishermen resulted in the following recommendations:
  - a. Stock large number of adult Opelousas and/or blue catfish.

- b. Increase fishing pressure on bullheads and sunfish.
- c. Close crappie season from February 15 to May 15.
- d. Stock channel cat of 9 inches in length, or longer.
- e. Place spawning devices for channel cat in the lake.
- f. Stock with threadfin shad as a forage species for game fish.

Table No. 1

## Lake Tyler Species Checklist

## Family Amiidae

1. Amia calva - Bowfin

## Family Catostomidae

2. Moxostoma poecilurum - blacktail redhorse
3. Minytrema melanops - spotted sucker
4. Erimyzon sucetta - lake chubsucker

## Family Cyprinidae

5. Cyprinus carpio - carp
6. Notemigonus crysoleucas - golden shiner
7. Opsopoeodus emiliae - pugnose minnow
8. Notropis atherinoides - emerald shiner
9. Notropis roseus - central weed shiner
10. Notropis venustus - blacktail shiner
11. Notropis lutrensis - red shiner
12. Notropis atrocaudalis - blackspot shiner
13. Pimephales vigilax - parrot minnow

## Family Ameiuridae

14. Ictalurus punctatus - southern channel catfish
15. Ameiurus melas - black bullhead
16. Ameiurus natalis - yellow bullhead

## Family Cyprinodontidae

17. Fundulus notti - starhead topminnow
18. Fundulus notatus - blackstripe topminnow

## Family Poeciliidae

19. Gambusia affinis - mosquitofish

## Family Atherinidae

20. Labidesthes sicculus - brook silversides

## Family Centrarchidae

21. Micropterus punctulatus - spotted black bass
22. Micropterus salmoides - largemouth black bass
23. Chaenobryttus coronarius - Warmouth bass
24. Lepomis punctatus - western spotted sunfish
25. Lepomis microlophus - redear sunfish
26. Lepomis macrochirus - bluegill sunfish
27. Lepomis auritus - redbreast sunfish
28. Pomoxis annularis - white crappie
29. Pomoxis nigromaculatus - black crappie
30. Centrarchus macropterus - flier

## Family Percidae

31. Etheostoma gracile - western swamp darter

Table No. 2

## Seining Collections

Species	Number	% of Total No.
1. <u>Notropis venustus</u>	134	09.4%
2. <u>Notropis lutrensis</u>	299	20.9%
3. <u>Notropis atrocaudalis</u>	9	00.6
4. <u>Notropis roseus</u>	117	08.2
5. <u>Notropis atherinoides</u>	5	00.3
6. <u>O. emiliae</u>	1	00.1
7. <u>Pimephales vigilax</u>	339	23.1
8. <u>Labidesthes sicculus</u>	76	05.3
9. <u>Micropterus salmoides</u>	22	01.5
10. <u>Lepomis macrochirus</u>	309	21.6
11. <u>Lepomis microlophus</u>	37	04.0
12. <u>Lepomis punctatus</u>	12	00.8
13. <u>Lepomis auritus</u>	5	00.3
14. <u>Fundulus notatus</u>	15	00.9
15. <u>Fundulus dispar</u>	5	00.3
16. <u>Etheostoma gracile</u>	2	00.1
17. <u>Gambusia affinis</u>	17	01.1
Totals	1,424	98.5%

Table No. 3

## Gill Netting Collections

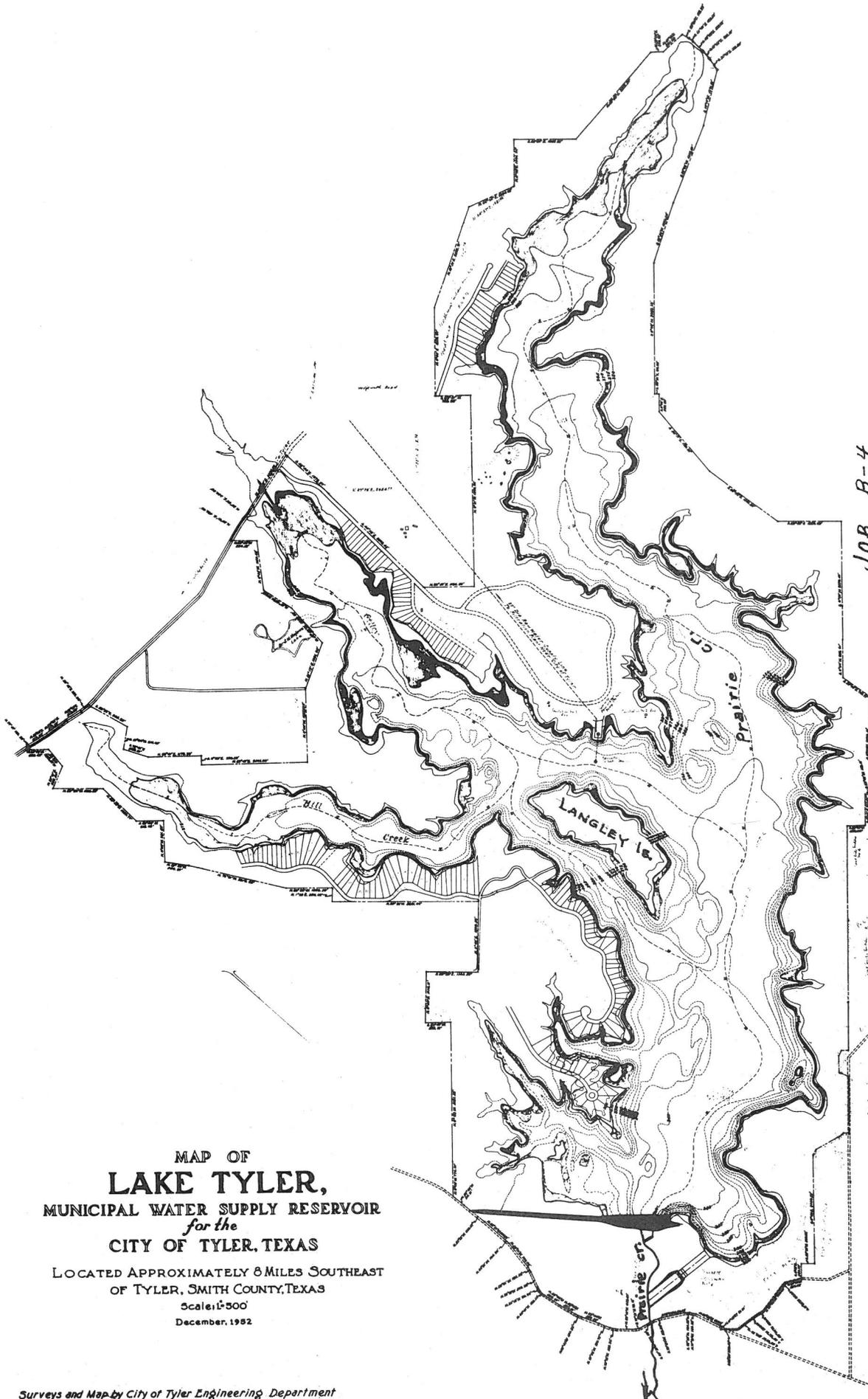
	Species	No.	% of Total Number	Weight	% of Total Weight
1.	Bowfin	20	00.8	93.17	03.7
2.	Chubsucker	602	23.6	401.26	15.8
3.	Spotted sucker	643	25.2	1309.24	51.6
4.	Blacktail redhorse	15	00.6	20.61	00.8
5.	Carp	5	00.2	7.37	00.3
6.	Golden shiner	35	01.4	7.05	00.3
7.	Black bullhead	897	35.1	504.72	19.9
8.	Yellow Bullhead	35	01.4	38.85	01.5
9.	Channel catfish	3	00.1	2.31	00.1
10.	Largemouth bass	52	02.0	65.05	02.5
11.	Warmouth	3	00.1	1.12	00.05
12.	Bluegill	126	04.9	30.88	01.2
13.	Redear	46	01.8	17.94	00.7
14.	White crappie	31	01.2	20.34	00.8
15.	Black crappie	34	01.4	38.85	01.5
16.	Flier	6	00.2	2.11	00.1
	Totals	2,553	100.0	2,537.44	99.9%

Table No. 4

Length, Weight and Coefficient of Condition of Game Species in Lake Tyler, Smith County Texas, 1953 - 1954

Species	Number of Specimens	Standard Length Range	Standard Length Average	Weight Range	Weight Average	"K" Range	"K" Average
Bluegill	40	97 - 153	137	28 - 143	104	3.49 - 4.93	3.99
Redear	30	142 - 193	159	115 - 274	152	3.01 - 4.16	3.66
Warmouth	2	163 - 164	164	164 - 165	165	3.72 - 3.18	3.76
Flier	5	138 - 150	142	99 - 134	118	3.53 - 4.58	4.09
Largemouth bass	46	177 - 450	251	85 - 2523	425	1.16 - 2.90	2.13
Black crappie	22	108- 225	177	33 - 370	177	2.57 - 3.57	3.07
White crappie	15	146 - 273	234	85 - 502	299	2.15 - 3.51	2.73

10.



JOB B-4

MAP OF  
**LAKE TYLER,**  
MUNICIPAL WATER SUPPLY RESERVOIR  
*for the*  
CITY OF TYLER, TEXAS

LOCATED APPROXIMATELY 8 MILES SOUTHEAST  
OF TYLER, SMITH COUNTY, TEXAS  
Scale: 1"=500'  
December, 1952