

STATE Texas
PROJECT NO. F-5-R-1, Job B-4
PERIOD June 22, 1953 - June 22, 1954

Segment Completion Report

by

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TITLE

Inventory of species present in Oak Creek Reservoir at Blackwell, Texas.

OBJECTIVES

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

PROCEDURE

Sixty-six gill net collections were made at twelve netting stations in Oak Creek Reservoir. 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.

Twenty-three seining collections were made at eleven seining stations in the reservoir. In nearly all collections, both 26 ft. $\frac{1}{2}$ inch 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. $\frac{1}{4}$ " mesh 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 of fishes. For this latter work, four ft. common sense seines with $\frac{1}{2}$ " mesh and others with 1/16" mesh were used.

Water analysis for dissolved carbon dioxide and oxygen content was taken each month and surface temperature, pH and climatic conditions were recorded for each netting and seining collection. Turbidity was taken for six collections.

The netting collection samples for principal species were weighed, measured and sexed in the field. A sample of each individual's scales was saved and stomachs containing food were preserved for laboratory study. Similar work for seining collections included identification and counting only and where the identity of an individual was questionable, the fish were preserved in 10% formalin.

FINDING

Oak Creek Reservoir is located approximately three miles southeast of Blackwell, Texas. The impoundment creating the reservoir is about six miles east of the confluence of Bushy and Oak Creeks. The dam is 3,800 ft. long, earth fill construction, and was completed in 1952 by Campbell Construction for the municipalities of Sweetwater, Bronte and Blackwell. The impounded water is conserved for the municipal and industrial consumption of those cities.

When at emergency ^{spillway} level, the lake will have 1,500 surface acres and will store about 52,900 feet of water. At that elevation the reservoir will have about twenty miles of shoreline.

The contributing watershed of 222 square miles is primarily San Angelo sandstone formation and top soils are usually Frio clays, black lime sands and sandy loams. Climate for the watershed is semi-arid, having an average rainfall of 24.35 inches. Reliable information pertaining to the average annual discharge of Oak Creek was not available. However, there is no permanent stream flow above the reservoir and run-off is extremely variable. Vegetative cover for the contributing area is predominantly mesquite-grassland association and the area is employed for farming and ranching.

The lake's water is clear to slightly turbid. A maximum turbidity of 5 was recorded in May 1954. Maximum carbon dioxide recorded for the period was 12 ppm and a minimum dissolved oxygen content of 4 ppm was recorded at that time. Dissolved carbon dioxide is usually about 8 to 11 ppm and dissolved oxygen about 6 to 8 ppm. Maximum surface temperature recorded was 76 degrees F. and a minimum of 49 degrees F. was taken. pH was 8.2 - 8.4.

FINDING

Excepting algae and a few concentrations of pond weeds (*Potamogeton natans*) there is no aquatic vegetation in the lake. Willows (*Salix niger*) and pecan (*Hicoria sp.*) are numerous near the mouth of Bushy Creek. The remaining shore vegetation is mesquite (*Prosopis juliflora*.)

Gill Netting Collections

Only three-hundred individuals of eleven species were taken in sixty-six experimental gill net sets, average of .0029 fish per ft. net. In Table 1, netting collections indicate that the largemouth black bass population may be increasing gradually or at least maintaining itself and that bullheads (*Ameiurus natalis*), river carpsucker (*Carpodes carpio*) and white crappie (*Pomoxis annularis*) appear to be increasing more rapidly. However, there is no obvious trend toward dominance by any species and since the average catch was only one fish per 286 ft. of net, it is concluded that the sites selected for netting were not representative of the lake and/or there are so few individuals of the species named present that the lake may be considered to be under populated. Oak Creek has been increased by a series of rain from 8,000 acre feet in August 1953 to 32,000 acre feet in June 1954. However, as shown in Table 1, the number of individuals taken in each collection have increased for the last half of the year.

Seining Collections

Twenty-three seining collections captured 1,732 individuals of fifteen species. Because greater confidence is usually expected in a larger sample, it is believed that the percentages for smaller forage fishes (*Gambusia*, *Notropis* and *Pimephales*) may be more accurate within that group than percentages for other species. Numerical increases in largemouth black bass (*Micropterus salmoides*) and white crappie (*Pomoxis annularis*) taken by seining during the last quarter, indicate successful 1953 spawns by those fishes and although not shown in Table III tabulations, largemouth black bass and river carpsucker fry (*Carpodes carpio*) were taken with a fry seine in June 1954.

REMARKS

It is apparent that sampling has been insufficient to indicate fish populations in this lake. For that reason and because the lake has increased to four times the original body to be surveyed, it is necessary that at least twelve months additional work be done before the inventory can be completed.

Checklist of Fish Species for Oak Creek Reservoir

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. River carpsucker	<i>Carpiodes carpio</i>
5. Carp	<i>Cyprinus carpio</i>
6. Blacktail shiner	<i>Notropis venustus</i>
7. Red shiner	<i>Notropis lutrensis</i>
8. Parrot minnow	<i>Pimephales vigilax</i>
9. Southern channel catfish	<i>Ictalurus punctatus</i>
10. Yellow bullhead	<i>Ameiurus natalis</i>
11. Common mosquitofish	<i>Gambusia affinis</i>
12. Largemouth black bass	<i>Micropterus salmoides</i>
13. Warmouth bass	<i>Chaenobryttus coronarius</i>
14. Green sunfish	<i>Lepomis cyanellus</i>
15. Redear sunfish	<i>Lepomis microlophus</i>
16. Spotted sunfish	<i>Lepomis punctatus</i>
17. Bluegill	<i>Lepomis macrochirus</i>
18. Western longear sunfish	<i>Lepomis megalotis</i>
19. Freshwater drum	<i>Aplodinotus grunniens</i>

SUMMARY

1. Sixty-six gill net collections were made at 12 netting stations in the reservoir.
2. Twenty-three seining collections were made at 11 seining stations.
3. Water analysis was taken each month and climatic conditions recorded.
4. All fish taken by netting were identified and counted, and in all seining except where fry seines were used, the catch was identified and counted.
5. Only three hundred individuals of eleven species were taken by netting and 1,732 individuals were taken by seining.
6. Apparently sampling has been insufficient to indicate fish populations in the lake. For that reason and because the lake has increased to four times the original body to be surveyed it is necessary that at least another twelve months work be done before the inventory can be completed.

Table 1

Netting Collections

Species	Aug.		Sept.		Nov.		Dec.		Jan.		Feb.		Mar.		Apr.		May		June		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Dorosoma cepedianum no. (%)	0	0	0	0	0	0	12	13.7	3	12.0	12	30.8	21	50.0	1	4.6	18	72.0	8	22.3	75	25.00
Carpionodes carpio no. (%)	4	50.0	2	50.0	1	9.1	19	21.6	11	44.0	4	10.3	5	11.0	4	18.2	0	0	12	33.3	62	20.30
Cyprinus carpio no. (%)	0	0	0	0	0	0	1	1.1	0	0	0	0	0	0	0	0	0	0	0	0	1	.30
Lepisosteus osseus no. (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2.7	1	.30
Aplodinotus grunniens no. (%)	0	0	0	0	0	0	4	4.6	0	0	0	0	0	0	0	0	0	0	0	0	4	1.30
Ameiurus natalis no. (%)	0	0	0	0	4	36.3	24	27.3	3	12.0	7	18.0	8	19.1	3	13.7	0	0	7	19.5	56	18.70
Ictalurus punctatus no. (%)	0	0	0	0	1	9.1	1	1.1	0	0	3	7.7	3	7.2	9	41.0	0	0	2	5.6	19	6.40
Micropterus salmoides no. (%)	4	50.0	1	25.0	5	45.4	17	19.4	4	16.0	5	12.9	3	7.2	4	18.2	2	8.0	1	2.7	46	15.30
Pomoxis annularis no. (%)	0	0	0	0	0	0	4	4.6	0	0	2	5.10	0	0	0	0	0	0	5	13.9	11	3.60
Sunfishes no. (%)	0	0	1	25.0	0	0	6	6.8	4	16.0	6	15.4	2	4.8	1	4.6	5	20.0	0	0	25	8.40

Table 11

Netting Collections

Species	Pop. Sample	Avg. Wt. gms.	Total Wt. 1000 gms.	% by Weight	% by Number	"K" Range	Average K
Dorosoma cepedianum	Avg. of 25	191	14.30	23.20	25.00	1.66 - 2.10	1.71
Carpoides carpio	Avg. of 25	533	33.00	52.70	20.30	1.97 - 2.29	2.03
Cyprinus carpio	Avg. of 1	822	.82	1.30	.30	2.42	2.42
Lepisosteus osseus	Avg. of 1	1118	1.71	2.70	.30	4.01	4.01
Ameiurus natalis	Avg. of 26	501	2.80	4.40	18.50	1.39 - 2.32	2.24
Ictalurus punctatus	Avg. of 19	511	.97	1.50	6.40	2.07 - 2.89	2.33
Aplodinotus grunniens	Avg. of 4	247	.98	1.50	1.30	2.11 - 2.17	2.13
Micropterus salmoides	Avg. of 46	305	1.40	2.20	15.30	2.32 - 2.70	2.60
Pomoxis annularis	Avg. of 11	298	3.28	5.20	3.60	3.05 - 3.60	3.12
Sunfishes	Avg. of 25	127	3.16	5.10	8.40	3.10 - 3.60	3.18
			62.62	99.7	99.6		

Table 111

Seining Collections

Species	June	July	Aug.	Sept.	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	Total	%
<i>Gambusia affinis</i>	21	43	112	38	17	0	0	0	12	116	100	459	26.40
<i>Notropis lutrensis</i>	138	121	38	0	21	0	18	31	21	39	25	452	26.00
<i>Notropis venustus</i>	0	0	8	21	5	9	31	0	21	0	20	115	6.60
<i>Pimephales vigilax</i>	0	0	0	0	0	0	0	4	0	11	12	33	1.90
<i>Micropterus salmoides</i>	2	8	7	3	0	0	4	21	16	14	12	87	5.00
<i>Pomoxis annularis</i>	2	3	0	6	0	0	0	6	2	3	11	33	1.90
<i>Lepomis cyanellus</i>	4	0	6	12	11	10	9	12	4	18	8	94	5.40
<i>Lepomis megalotis</i>	4	0	0	5	9	3	4	8	6	9	8	56	3.20
<i>Lepomis macrochirus</i>	10	28	21	22	13	8	7	2	5	21	14	151	8.70
<i>Lepomis microlophus</i>	0	0	0	2	0	4	0	4	0	12	9	31	1.80
<i>Lepomis auritus</i>	0	0	0	0	0	1	0	2	0	0	0	3	.10
<i>Lepomis punctatus</i>	1	0	0	2	0	0	0	7	0	11	13	37	2.10
<i>Lepomis humilis</i>	0	0	0	0	5	0	0	0	0	0	2	7	.40
	239	205	201	142	81	35	79	115	100	267	269	1733	99.80

OAK CREEK RESERVOIR

