

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

## Job Completion Report

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### TITLE

Inventory of Species Present in Lake Nasworthy.

### OBJECTIVES

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

### PROCEDURE

Forty-eight gill nets were set for twelve collections. Experimental nylon gill nets measuring 125 ft. long by eight ft. deep and made up in five, 25 ft. sections were used. Mesh size for these nets increased progressively in each following section at half inch intervals beginning with a one-inch mesh section and terminating with a three-inch mesh section.

Twenty-four seining collections were made at eight 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. In addition to this work, collections with 4 ft. common sense  $1/16$ " mesh fry seines were taken.

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

In netting collections, samples from each collection and for each species were weighed, measured and sexed. This work was done in the field. A scale sample was taken from a sample number of individuals for each species and stomachs containing food were preserved for laboratory analysis. Similar work for seining collections included identification, weighing and measuring and the preservation of all individuals whose identification was questionable in 10% formalin.

### FINDING

Lake Nasworthy is located approximately 6.5 miles southwest of the City of San Angelo. The dam creating this reservoir is one-fourth mile below the confluence of the Middle and South Concho Rivers, is an earth fill construction with concrete retaining gates and is 5,480 feet long. The reservoir was created by the Upper Colorado River Authority and has been sold to the City of San Angelo. The impounded water is used exclusively for municipal and industrial consumption. When the lake is at emergency spillway level it has about 1,300 surface acres and contains about 14,040 acre feet of water. At that elevation the lake has about 28 miles of shoreline.

The contributing watershed of 2,659 square miles is San Angelo Sandstone formation and top soils are usually Abeliene sand or Frio clays and loams. The vegetative cover

is mesquite-grassland association and the area is currently employed in farming and ranching. The climate is semi-arid, having annual average rainfall of 19.7 inches. The average annual discharge for the South and Middle Concho Rivers is 162 c. f. s.; however, a maximum flow of 230,000 c. f. s. was recorded in September, 1936 and recent annual discharges have been 1.62 c. f. s. in 1952 and 50.1 c. f. s. in 1953.

The lake's water is usually turbid (12 to 18); the maximum carbon dioxide content recorded was 14 ppm and the minimum dissolved oxygen content recorded at that time was 3 ppm. Dissolved carbon dioxide was usually about 8 - 11 ppm and oxygen was usually about 5 to 8 ppm. pH for the reservoir was from 8.2 to 8.5.

#### NETTING RESULTS

Forty-eight experimental gill net sets resulted in the capture of 1,351 individuals of 16 species. In Table 11, the numerical and weight dominance of river carp suckers (*Carpoides carpio*), gizzard shad (*Dorosoma cepedianum*), carp (*Cyprinus carpio*) and long-nose gar (*Lepisosteus osseus*) is adequately demonstrated. However, the latter species may be less numerous than indicated. White bass (*Morone chrysops*) and southern channel catfish (*Ictalurus punctatus*) appear to be dominant game species. In Table 1, failure of netting to indicate significant population fluctuations for most species is interpreted as a possible indication that little change in ratios has occurred during the study period and that under the conditions now existing the lake may be regarded as balanced.

#### SEINING RESULTS

Twenty-four seining collections were used in compiling the data for Table 111. Fifteen species and 2,553 individuals were captured. In addition to that data, several other species were taken in other collections where relative abundance estimation was not attempted. Since Lake Nasworthy was not adequately cleared of woody vegetation prior to inundation, seining stations were difficult to establish and rapid growth of bullrushes (*Scirpus* sp.) and cattails (*Typha latifolia*) made reclearing necessary at some seining stations. For those reasons percentages for some species may be erroneous, however apparent trends toward increases in white bass, largemouth black bass (*Micropterus salmoides*) and shiners (*Notropis*) may be indicative of gradual improvement in the lake condition.

## SUMMARY

1. Forty-eight gill net sets were made at twelve locations. One thousand, three hundred and fifty-one individuals of sixteen species were captured.
2. Twenty-four seining collections captured 2,553 individuals of fifteen species, and additional species were obtained where relative abundance data was not taken.
3. Water analysis showed dissolved carbon dioxide content to be from 9 to 14 ppm and dissolved oxygen to be from 3 to 11 ppm. pH was from 8.2 to 8.5, and turbidity 12 to 18.
4. Dense aquatic vegetation in the upper lake and near the mouth of the South Concho River has extremely rapid growth on shallow flats. This vegetation is primarily bullrushes (*Scirpus* sp.), pondweeds (*Potamogeton natans* and *P. spirillus*) and cattails (*Typha latifolia*).
5. It is concluded that netting results may error in actual percentages but the dominance of the lake by river carp suckers, carp, gizzard shad and longnose gar is adequately demonstrated.
6. Seining results may error in the percentages for some species but trends indicate a general improvement in the lake condition.

Checklist of Species of Fish from Lake Nasworthy  
June 22, 1952 to June 22, 1954

Common Name	Scientific Name
1. Longnose gar	<i>Lepisosteus osseus</i>
2. Gizzard shad	<i>Dorosoma cepedianum</i>
3. River carpsucker	<i>Carpionodes carpio</i>
4. German carp	<i>Cyprinus carpio</i>
5. Gray redhorse sucker	<i>Moxostoma congestum</i>
6. Golden shiner	<i>Notemigonus crysoleucas</i>
7. Blacktail shiner	<i>Notropis venustus</i>
8. Red shiner	<i>Notropis lutrensis</i>
9. Texas shiner	<i>Notropis amabilis</i>
10. Parrot minnow	<i>Pimephales vigilax</i>
11. Southern channel catfish	<i>Ictalurus punctatus</i>
12. Flathead catfish	<i>Pilodictus olivaris</i>
13. Common mosquitofish	<i>Gambusia affinis</i>
14. Largemouth black bass	<i>Micropterus salmoides</i>
15. Warmouth bass	<i>Chaenobryttus coronarius</i>
16. Green sunfish	<i>Lepomis cyanellus</i>
17. Spotted sunfish	<i>Lepomis punctatus</i>
18. Redear sunfish	<i>Lepomis microlophus</i>
19. Bluegill	<i>Lepomis macrochirus</i>
20. Orange spotted sunfish	<i>Lepomis humilis</i>
21. Yellowbelly sunfish	<i>Lepomis auritus</i>
22. Western longear sunfish	<i>Lepomis megalotis</i>
23. White crappie	<i>Pomoxis annularis</i>
24. Logperch	<i>Percina caprodes</i>
25. Freshwater drum	<i>Aplodinotus grunniens</i>

Table 7  
Netting Collections

Species	Aug. 78	Sept. 31	Oct. 12	Nov. 40	Dec. 18	Jan. 134	Feb. 10	Mar. 105	Apr. 9	May 56	June 38	Total	Percent
<i>Dorosoma cepedianum</i>	No. 39.2	43.7	21.4	54.0	51.5	35.6	23.8	46.0	22.7	71.0	26.2		
	%												39.20
<i>Carpionodes carpio</i>	No. 51	11	21	14	4	120	15	69	5	16	38	364	
	%	25.6	15.5	18.9	11.5	31.8	35.7	30.3	11.2	20.2	26.2	46	26.9
<i>Cyprinus carpio</i>	No. 11	4	2	0	0	6	0	5	5	1	12		
	%	5.5	5.6	3.5	0	1.6	0	2.2	11.2	1.2	8.3	88	3.40
<i>Lepisosteus osseus</i>	No. 6	0	4	0	0	51	0	4	16	0	7		
	%	3.0	0	7.1	0	13.5	0	1.7	36.4	0	4.8	16	6.50
<i>Moxostoma congestum</i>	No. 7	0	0	0	0	0	0	0	0	0	9		
	%	3.5	0	0	0	0	0	0	0	0	6.2	21	1.20
<i>Aplodinotus grunniens</i>	No. 0	2	0	0	0	4	1	4	0	2	8		
	%	0	2.8	0	0	1.0	2.4	1.7	0	2.5	5.5	2	1.50
<i>Ameiurus netalis</i>	No. 0	0	0	0	0	0	0	0	0	0	2		
	%	0	0	0	0	0	0	0	0	0	1.4	3	.10
<i>Pilodictus olivaris</i>	No. 1	0	0	0	0	0	0	0	0	1	1		
	%	.50	0	0	0	0	0	0	0	1.2	.70	174	.20
<i>Morone chrysops</i>	No. 31	18	11	12	9	34	10	37	3	0	9		
	%	15.6	25.4	19.6	16.2	25.9	9.0	23.8	16.2	6.7	6.2	2	12.80
<i>Micropterus salmoides</i>	No. 0	0	0	0	2	0	0	0	0	0	0		
	%	0	0	0	0	5.7	0	0	0	0	0	56	.10
<i>Ictalurus punctatus</i>	No. 8	3	6	2	12	15	2	2	6	3	7		
	%	4.0	4.2	10.7	2.7	5.7	4.0	4.7	.8	13.4	3.8	37	4.10
<i>Pomoxis annularis</i>	No. 4	2	0	4	0	11	4	1	0	0	11		
	%	2.0	2.8	0	5.4	0	2.9	9.5	.40	0	7.6	11	2.70
Sunfishes	No. 2	0	0	2	0	3	0	1	0	0	3		
	%	2.0	0	0	2.7	0	.80	0	.40	0	2.0	1,351	.80
Total Number	199	71	56	74	35	377	42	228	44	79	145	1,351	99.5

Table 1

## Netting Collections

Species	Pop. Sample	Avg. Wt. gms.	Tot. Wt. (1000 gms)	% by Weight	% by Number	K Range	Avg. K.
Dorosoma cepedianum	Avg. of 39	226	120.90	22.2	39.20	1.53 - 2.10	1.61
Carpoides carpio	Avg. of 47	629	229.00	42.20	26.90	2.28 - 2.73	2.51
Cyprinus carpio	Avg. of 46	567	26.10	4.80	3.40	2.21 - 2.73	2.47
Lepisosteus osseus	Avg. of 36	822	72.40	13.20	6.50	2.40 - 3.61	2.53
Moxostoma congestum	Avg. of 16	720	11.50	2.10	1.20	2.21 - 2.60	2.26
Aplodinotus grunniens	Avg. of 21	161	3.30	.60	1.50	2.09 - 2.50	2.21
Ameiurus natalis	Avg. of 2	491	.90	.10	.10	2.22 - 2.61	2.41
Pilodictus olivaris	Avg. of 3	2418	7.20	1.30	.20	2.18 - 2.40	2.28
Ictalurus punctatus	Avg. of 56	611	34.20	6.30	4.10	1.78 - 2.17	1.87
Morone chrysops	Avg. of 174	188	32.70	6.00	12.80	1.48 - 3.24	2.38
Micropterus salmoides	Avg. of 2	1217	2.40	.400	.10	2.18 - 4.25	2.71
Pomoxis annularis	Avg. of 37	240	.80	.10	2.70	2.80 - 4.61	2.99
Sunfishes	Avg. of 10	211	2.30	.40	.80	3.80 - 6.05	3.05
Totals			543.70	99.50	99.70		

Table 11.

## Seining Collections

Species	June	July	Aug.	Sept.	Oct.	Jan.	Feb.	Mar.	Apr.	May	June	Total	Percent
<i>Gambusia affinis</i>	82	71	13	18	0	0	21	101	116	101	42	565	21.10
<i>Notropis lutrensis</i>	0	0	10	0	0	0	31	19	71	11	15	157	6.10
<i>Notropis venustus</i>	18	0	11	7	0	0	0	17	0	101	81	235	9.20
<i>Notemigonus crysoleucas</i>	0	0	0	5	81	50	28	0	0	9	38	211	10.20
<i>Pimephales vigilax</i>	31	0	0	0	0	0	0	0	13	0	12	56	2.2
<i>Micropterus salmoides</i>	4	2	12	0	4	0	9	2	7	18	4	62	2.40
<i>Morone chrysops</i>	4	9	3	0	2	0	0	28	17	5	8	76	2.90
<i>Pomoxis annularis</i>	21	16	12	2	5	4	0	6	38	14	5	123	4.80
<i>Lepomis cyanellus</i>	21	11	11	3	12	11	8	2	11	31	24	145	5.70
<i>Lepomis megalotis</i>	5	8	14	2	7	0	9	4	1	12	16	78	3.00
<i>Lepomis macrochirus</i>	31	27	21	17	33	14	16	41	13	7	60	280	11.00
<i>Lepomis microlophus</i>	8	4	0	0	4	1	0	21	0	0	5	43	1.70
<i>Lepomis auritus</i>	0	0	7	0	0	0	0	0	0	0	0	7	.30
<i>Cariodes carpio</i>	0	0	0	21	2	16	0	0	8	4	3	54	2.10
<i>Dorosoma cepedianum</i>	121	70	21	40	3	7	5	0	12	80	17	376	14.70
	346	218	185	115	153	103	127	241	307	393	330	2,468	99.00

# LAKE NASWORTHY

