

Report of Fisheries Investigations

Inventory of Species Present in Lake Fort Phantom Hill
near Abilene, Texas

by

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Dingell-Johnson Project F-5-R-5, Job B-18
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JOB COMPLETION REPORT

State of TEXAS

Project No. F5R5

Name: Fisheries Investigations and Surveys of the Waters of Region 3-B.

Job No. B-18

Title: Inventory of Species Present in Lake Fort Phantom Hill near Abilene, Texas

Period Covered: April 16, 1956 to April 15, 1958

ABSTRACT:

Inventory during the year indicated a numerical dominance by gizzard shad (Dorosoma cepedianum) and there was evidence of an increase of this population during the period. Fort Phantom Hill is to be included in re-survey work for next year to determine if this species will become a fisheries problem.

OBJECTIVES:

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

PROCEDURE:

Twenty netting collections were obtained at ten locations in Lake Fort Phantom Hill. Experimental nylon gill nets, measuring 125 feet long by 8 feet in depth and made up in five, 25 foot sections were used. Mesh size of 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.

Five seining stations were seined twice, once during warm weather and once during cold weather, for a total of ten seining collections. Commonsense seines with one-fourth inch mesh were used for these collections. To estimate relative abundance a count was made of all individuals taken.

Samples from netting collections were weighed and measured in the field. Stomach contents and sexual maturity were also observed in an effort to obtain ecological information.

FINDINGS:

Description - Lake Fort Phantom Hill is located on Elm Creek, twelve miles northeast of Abilene in Jones County. It is one of three water supply lakes for the City of Abilene. Built in 1938 by the Freeze and Nichols Construction Company of Fort Worth, this lake has a dam 3,639 feet long with a height of 85 feet.

Besides receiving water from Elm Creek, Fort Phantom Hill also has Cedar Creek, Little Elm Creek, Deadman's Creek, Bull Creek and Rainy Creek in its watershed. these creeks

compose a watershed of 384 square miles. There is a pumping station on the Clear Fork of the Brazos River which supplies the lake with additional water. The Clear Fork of the Brazos River is only 150 feet away from the shores of Lake Fort Phantom Hill at this point. The drainage area of the Clear Fork above the pumping station is approximately 1,500 square miles.

The lake has a capacity of 76,680 acre feet (24 billion gallons) and during the period covered by this report fluctuated between approximately 60 and 99 percent full. At maximum capacity it covers an area of 3,950 acres, with a maximum depth of 65 feet and an average depth of 36 feet.

The water is slightly turbid and also slightly alkaline, having a pH ranging from 8.2 to 8.6. Most of the inundated area was not cleared of mesquite (Prosopis juliflora) prior to the impoundment of water and the silty sand bottom is covered with concentrations of the woody plants in various phases of decay. There are numerous live willows (Salix niger) in the lake arising from the inundated banks of the creek beds. The lake shore is irregularly shaped. The bottom slopes gradually to the old stream bed which runs an erratic path through the lake. No oxygen deficiencies of excessive dissolved carbon dioxide content were recorded during inventory work. Recorded temperatures of the water ranged between 53 and 84 degrees F.

Netting Results - Tables number 1 and number 2 present the statistical data obtained from the netting sample. Twelve species were obtained in the twenty netting collections made. Map number 1 shows the approximate location of the ten netting stations where the twenty collections were obtained. Each netting station was "worked" twice in the course of the survey. However, high winds and rough water prevented the netting of all ten of these stations at the same time except for the last visit to the lake when all ten stations were netted.

I. Observations in connection with table number 1 - Of the twelve different species shown in table number 1, six were game fish and the other six were rough species.

A. Game species - The two most abundant game species taken were channel catfish (Ictalurus punctatus) and the white bass (Roccus chrysops). Channel catfish of all sizes were obtained and it appears that this species has been successful in producing a good spawn each year. White bass were more uniform in size. Most of the 206 specimens obtained of this species were collected in one netting trip in early spring. The bulk of these were collected in nets set in the deeper cleared water close to the dam (netting stations 1, 2, 3, and 4 as shown on map number 1). Table number 1 shows the percentage by number and weight and other relative data for these two dominant species as well as for the other species collected.

Only one yellow catfish (Pylodictus olivaris) was obtained from the 800 individuals collected. However, this is not considered to be representative of the population since good catches of yellow catfish are reported taken from trotlines during the late spring of each year.

Black bass (Micropterus salmoides) were not particularly numerous but did appear to be in excellent condition. Their average "K" factor was 3.13 and their average weight was two pounds and six ounces. The present high level of the lake is expected to be a favorable condition for the propagation of this species during the next few years.

Sunfish and white crappie (Pomoxis annularis) were very small in general. White crappie were, however, the fourth most dominant species taken in the netting sample. Most of these fish were taken from nets set close to willow trees in moderately deep water (netting stations 8, 9, and 10 as shown on map number 1).

B. Rough species - The dominant rough fish species were the gizzard shad (Dorosoma cepedianum) with 271 specimens. Since this species also appears to be the dominant forage fish (as determined by stomach analysis of game fish specimens) it can not be considered detrimental to the condition of the larger game fish. It can be considered to be somewhat detrimental, however, to the smaller fish since it competes with them for food and space and to the angler because it competes with his lure on the larger game fishes' diet.

The river carpsucker (Carpiodes carpio) does not appear to have become the problem it is in many West Texas lakes but it did compose 6.25 percent by number and 9.62 percent by weight of the total netting collection.

Only one European carp (Cyprinus carpio) was obtained from the 800 specimens collected in nets, but this is not considered to be representative as schools of spawning carp were observed rolling in the shallows during the spring of the year.

II. Observations in connection with table number 2. - Table number 2 shows a comparison by number and by weight between game and rough fish species. The netting sample indicates that game fish are slightly dominant over rough species in number and hold a considerable advantage in weight over the rough species. Gizzard shad make up the majority of these rough fish as previously discussed. The 45% by number of rough fish to 55% by number of game fish is not a surprisingly bad relationship for one of the older West Texas lakes.

Seining Results - the following remarks are considered the best evaluation of the apparent importance of species taken by seining at five locations.

Gizzard shad (Dorosoma cepedianum) - although these fish are relatively difficult to capture by seining they were possibly the most numerous of any fish obtained by that method; however their relatively small size indicated that they were of potential importance as food.

River carpsuckers (Carpiodes carpio) - numerous in the upper portions of the lake; however, their importance is not clearly established at this time.

Carp (Cyprinus carpio) - rare, taken at one location only.

Mosquitofish (Gambusia sp.) - common and apparently dominate extreme shallow areas that are protected from wave action.

Redhorse shiner (Notropis lutrensis) - common and widely distributed, the most numerous Notropis in the reservoir.

Parrot minnows (Pimephales sp.) - common near the dam and on the east shoreline.

The following species were also taken by seining but were not sufficiently numerous to appear to be of any particular importance from a fishery management point of view. Plains shiner (Notropis percobromus), spottail shiner (Notropis venustus), and golden shiner (Notemigonus chrysoleucas). This last species may have been introduced by

state fish hatcheries or by commercial fishermen as that practice is common.

Game fish taken by seining - Virtually all game fish taken by seining were either green sunfish (Lepomis cyanellus) or bluegill sunfish (Lepomis macrochirus); however several largemouth bass fingerling were taken and several white bass were also captured.

SUMMARY AND RECOMMENDATION:

Although the data obtained during the year study at Lake Fort Phantom Hill is admittedly insufficient for a final appraisal of the fishery problems for that reservoir the obvious trend toward an extreme population dominance by gizzard shad is deemed of importance from a future fishery management standpoint. For that reason it is considered desirable to discontinue study at this time and include this reservoir under re-survey work to be done during the next year. If a natural control, (as an increase in the white bass population) does not check the trend it may be recommended that a selective kill may be employed at a future date to curb the increase of that species.

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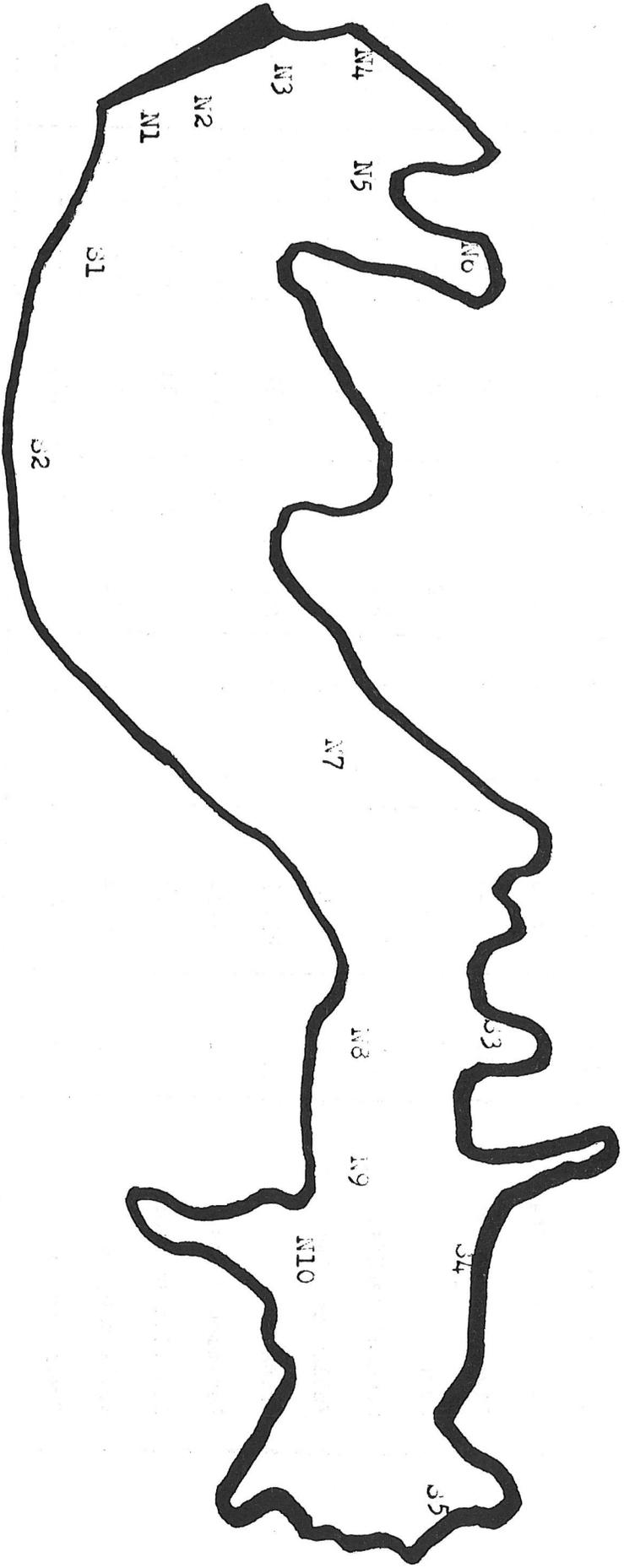
Date: August 7, 1958

Table Number 1. Information from netting collections obtained April 16, 1956 to April 15, 1958 in Lake Fort Phantom Hill

Species	Number	Percent by		Total Wt. lbs. - ozs.	Percent by Weight	K Range	Avg. K
		Number	Avg. Wt. lbs. - ozs.				
Longnose gar	2	.25	7	10	1.35	0.34 0.36	.35
Gizzard shad	271	33.88	5	84	10.43	1.80 2.58	2.28
Smallmouth buffalo	34	4.25	8	51	6.28	2.47 3.82	3.30
River carpsucker	50	6.25	9	78	9.62	1.63 3.01	2.44
Carp	1	.12	6	2	.29	-----	2.17
Channel catfish	142	17.75	14	266	32.80	1.53 2.32	1.99
Yellow catfish	1	.12	12	1	.22	-----	1.77
White bass	206	25.75	4	257	31.72	2.23 3.24	2.71
Largemouth bass	11	1.38	6	26	3.22	2.00 4.39	3.13
Bluegill sunfish	7	.88	2	14	.11	2.68 4.20	3.44
White crappie	73	9.12	7	31	3.92	2.13 3.79	2.79
Freshwater drum	2	.25	2	4	.03	-----	1.81
Totals	800	100.00		811	12	100.00	

Table Number 2. A comparison of rough and game fish species taken in netting collections April 16, 1956 to April 15, 1958 in Lake Fort Phantom Hill.

	Percent by		Percent by	
	Number	Weight lbs. ozs.	Number	Weight lbs. ozs.
ROUGH FISH (gar, shad, suckers, carp and drum)	360	227	45.00	6
GAME FISH (white bass, black bass, sunfish, crappie and catfish)	440	584	55.00	6
Totals	800	811	100.00	12
				100.00



LAKE FORT PHANTOM HILL

N denotes Netting Station

S denotes Seining Station

