

JOB DESCRIPTION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-4-R-8

Fisheries Investigations and Surveys of

the Waters of Region 4-B

Job No. B-28 Resurvey of Lake Waco

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Date December 8, 1961

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FEDERAL AID TO FISH AND WILDLIFE RESTORATION ACT

ABSTRACT

A total of 5400 feet of gill net was used to sample the fish population of Lake Waco near Waco, McLennan County, Texas. The data collected is compared with data collected during the first inventory made in 1956-57. During this segment of work, nineteen species of fish were collected with gill nets. The abundance of freshwater drum (Aplodinotus grunniens) has decreased. The numbers and percentages of all other species remained relatively stable. Six new species were netted during the resurvey that were not netted during the original survey.

Seine samples were inadequate for comparison due to the heavy emergent vegetation (Scirpus validus) and (Typha latifolia) along the shore line and Nelumbo sp and Potamo-
genton sp which made seining difficult.

Recommendation is made that the lake be checked under the reconnaissance job.

Project leader

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Job Completion Report

State of Texas

Project No. F-4-R-8

Name: Fisheries Investigations and Surveys of
the Waters of Region 4-B

Job No. B-28

Title: Resurvey of Lake Waco.

Period Covered:

November 1, 1960 - October 31, 1961

OBJECTIVES

To conduct investigations to obtain current information concerning the fish population and factors influencing the population.

HISTORY

Lake Waco is located in McLennan County, Texas. The dam is six miles west of the city of Waco. Due to siltation the present lake has an average depth of approximately feet. The lake was surveyed during 1956-57 (Project No. F-4-R-4, Job B-18) when the lake was very low. The city of Waco is building a new dam just below the old dam which is almost half completed at this writing. When the dam is completed the water level will inundate the present dam and the lake's depth will be greater by about 20 feet.

PROCEDURE

Gill nets, 100 feet long by eight feet deep with $1\frac{1}{2}$ inch square mesh, were used to collect samples of the fish population. Net stations established and used under Job B-18 of Project F-4-R-4 could not be used during this study because the water level was much higher than in 1956-57. The new stations were selected to sample the various environmental areas of the lake. These samplings were made at bimonthly intervals.

Nets were set in the afternoon, left overnight and run on the following morning. The nets were left in the lake during the following day and night and again run in the morning. All fish were weighed, measured and examined to determine sex and sexual development. Stomachs were examined for all recognizable materials. All field data were recorded on standardized forms for use in reports.

Due to heavy siltation and aquatic vegetation, seining was very difficult, being restricted to places that had been cleared for launching boats.

Rotenone samples were not taken from Lake Waco because it is a source of public drinking water for the City of Waco and approval by the health department must be obtained.

FINDINGS

A total of 5400 feet of gill net was used in sampling the fish population of Lake Waco. Gizzard shad accounted for over one half (52.85 percent) of the fish taken in gill nets. Table 1 gives the tabulated data from the gill net collections. The next most netted fish is the white crappie, 17.64 percent of the total number, followed by channel catfish, bluegill sunfish, spotted gar, redear sunfish and largemouth bass with 8.07, 7.19, 4.73, 2.81, and 2.15 percent respectively.

The gill net collections are comparable with those made during 1956-57 (Job B-18) with the exception of the freshwater drum. The prior survey yielded 16.42 percent drum while the present survey yielded only 1.15 percent. Due to the low water in 1956-57, nets were able to take this bottom feeder. Some larger mesh nets were also used in the previous survey.

Spotted gar continue to be more abundant than longnose gar and appear to have increased in numbers. River carpsucker and smallmouth buffalo show a fair representation. Channel catfish, largemouth bass, and redear sunfish show an increase in number. The increase in abundance of these fish reflects the improvement in habitat conditions since the recent drouth years. Some species were taken that were not taken in gill nets during the previous work thus giving a better species representation of this lake.

The single flathead catfish given in Table 1 represents only 0.04 percent of the total catch, but large flathead catfish were caught by commercial fishermen using larger mesh gill nets.

In the 1956-57 survey, rough fish accounted for 76.36 percent and game fish accounted for 23.64 percent of the total number caught. Rough fish are defined as those considered undesirable or not normally sought by sport fishermen. During this survey, rough fish accounted for 61.88 percent and game fish accounted for 38.12 percent of the total number taken.

Table 2 records the results of gill net collections from Lake Waco, made from November, 1956 through October, 1957 (Project F-4-R-4, Job B-18) and is used as comparative data. Table 3 shows the size and condition of fish species netted during the 1960-61 survey.

Table 4 gives an analysis of the water from Lake Waco and was furnished by the Waco City Water Works. Slight changes are shown between the samples taken in 1956-57 and the samples taken in April of 1960.

A checklist of species from Lake Waco is included in the report.

The seine samples obtained were inadequate for a lake of this size, due to the heavy vegetation in shallow water. The two successful seine samples yielded 14 gizzard shad (Dorosoma cepedianum), one logperch (Percina caprodes), 26 purnose minnows (Opsopoeodus emiliae), 63 red shiners (Notropis lutrensis), and two bluegills (Lepomis macrochirus).

RECOMMENDATIONS

It is recommended that Lake Waco should be checked periodically under the reconnaissance job to obtain current information concerning gross changes in fishing conditions and factors influencing fish populations.

A selective fish kill, by the use or application of rotenone, would relieve the over abundance of rough fish. After the selective kill of the rough fish the lake should be stocked with game fish particularly white bass (Roccus chrysops).

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Approved by Marion Toole
Dir. Inland Fisheries

Date December 8, 1961

A checklist of fish species taken from Lake Waco, McLennan County, Texas, November, 1960 to October, 1961.

Common Name	Scientific Name
Spotted gar	<u>Lepisosteus oculatus</u>
Longnose gar	<u>Lepisosteus osseus</u>
Gizzard shad	<u>Dorosoma cepedianum</u>
Smallmouth buffalo	<u>Ictiobus bubalus</u>
River carpsucker	<u>Carpionodes carpio</u>
Grey redhorse	<u>Moxostoma congestum</u>
Lake chubsucker	<u>Erimyzon sucetta</u>
Carp	<u>Cyprinus carpio</u>
Pugnose minnow	<u>Opsopoeodus emiliae</u>
Red shiner	<u>Notropis lutrensis</u>
Channel catfish	<u>Ictalurus punctatus</u>
Black bullhead	<u>Ictalurus melas</u>
Yellow bullhead	<u>Ictalurus natalis</u>
Flathead catfish	<u>Pylodictis olivaris</u>
Largemouth bass	<u>Micropterus salmoides</u>
Warmouth	<u>Chaenobryttus gulosus</u>
Green sunfish	<u>Lepomis cyanellus</u>
Redear sunfish	<u>Lepomis microlophus</u>
Bluegill sunfish	<u>Lepomis macrochirus</u>
White crappie	<u>Pomoxis annularis</u>
Logperch	<u>Percina caprodes</u>
Freshwater drum	<u>Aplodinotus grunniens</u>

Table 1. Results of netting, Lake Waco, November 1960 to October, 1961

Species	Number of fish caught		Pounds of fish caught		Average weight	Catch per 100 feet of net	
	Total	Percent of total	Total	Percent of total		Number	Pounds
Spotted gar	108	4.73	174.25	15.50	1.61	2.00	3.23
Longnose gar	3	0.13	3.87	0.34	1.29	0.05	0.07
Gizzard shad	1205	52.85	432.93	38.52	0.36	22.32	8.02
Smallmouth buffalo	12	0.53	20.51	1.83	1.71	0.22	0.38
River carp sucker	47	2.06	49.77	4.43	1.06	0.87	0.92
Gray redbreast	2	0.09	1.26	0.11	0.63	0.04	0.02
Lake chubsucker	7	0.31	6.94	0.62	0.99	0.13	0.13
Carp	1	0.04	0.55	0.05	0.55	0.02	0.01
Channel catfish	184	8.07	160.26	14.25	0.87	3.41	2.97
Black bullhead	1	0.04	0.41	0.04	0.41	0.02	0.01
Yellow bullhead	1	0.04	0.66	0.06	0.66	0.02	0.01
Flathead catfish	1	0.04	0.39	0.03	0.39	0.02	0.01
Largemouth bass	49	2.15	33.15	2.95	0.68	0.91	0.61
Warmouth	2	0.09	0.61	0.06	0.31	0.04	0.01
Green sunfish	1	0.04	0.33	0.03	0.33	0.02	0.01
Redear sunfish	64	2.81	16.72	1.49	0.26	1.18	0.31
Bluegill sunfish	164	7.19	35.20	3.13	0.22	3.04	0.65
White crappie	402	17.64	172.49	15.34	0.43	7.44	3.19
Freshwater drum	26	1.15	13.60	1.22	0.52	0.48	0.25
Totals	2280	100.00	1123.90	100.00	0.49 (average)	42.23	20.81

Table 2. Results of netting, Lake Waco, November 1956 to October, 1957

Species	Number of fish caught		Pounds of fish caught		Average weight	Catch per 100 feet of net	
	Total	Percent of total	Total	Percent of total		Number	Pounds
Spotted gar	55	2.66	103.86	8.53	1.89	1.49	2.81
Longnose gar	7	0.34	30.61	2.51	4.37	0.19	0.83
Gizzard shad	1107	53.63	502.38	41.24	0.45	29.92	13.58
Buffalo	46	2.23	63.15	5.18	1.37	1.24	1.71
Carp sucker	21	1.02	15.46	1.27	0.74	0.57	0.42
Carp	1	0.05	0.37	0.03	0.37	0.37	0.01
Channel catfish	138	6.69	134.09	11.01	0.97	3.73	3.62
Flathead catfish	3	0.15	4.26	0.35	1.42	0.08	0.12
Largemouth bass	39	1.89	27.24	2.24	0.70	1.05	0.74
Redear sunfish	2	0.09	0.59	0.05	0.30	0.05	0.02
Bluegill sunfish	3	0.15	0.67	0.05	0.22	0.08	0.02
White crappie	303	14.68	131.86	10.82	0.44	8.19	3.56
Freshwater drum	339	16.42	203.67	16.72	0.60	9.16	5.50
Totals	2064	100.00	1218.21	100.00	0.59 (average)	56.12	32.94

Table 3. Condition of fish netted at Lake Waco, November, 1960 to October, 1961

Species	Average Length (mm)	Length range (mm)	Weight range (gms.)	Range	Average
Spotted gar	487.4	320-660	250-2041	0.40-0.82	0.61
Longnose gar	500.0	500-500	567-624	0.45-0.49	0.46
Gizzard shad	214.6	165-310	90-370	1.25-3.50	1.78
Smallmouth buffalo	254.1	160-430	120-2608	2.20-3.70	2.89
River carpsucker	259.8	170-330	150-907	1.75-3.60	2.59
Gray redhorse	235.0	220-250	280-290	1.85-2.60	2.23
Lake chubsucker	257.1	220-300	280-907	1.75-3.00	2.22
Carp	220.0	220-220	250-250	2.30-2.30	2.30
Channel catfish	286.2	175-485	100-1758	0.95-2.70	1.60
Black bullhead	200.0	200-200	190-190	2.40-2.40	2.40
Yellow bullhead	240.0	240-240	300-300	2.20-2.20	2.20
Flathead catfish	160.0	160-160	175-175	4.30-4.30	4.30
Largemouth bass	240.0	200-280	180-680	1.45-3.50	2.20
Warmouth	150.0	150-150	135-145	3.90-4.20	4.05
Green sunfish	135.0	135-135	150-150	4.00-4.00	4.00
Redear sunfish	146.8	120-180	95-160	2.45-6.50	3.78
Bluegill sunfish	131.7	110-150	70-140	2.90-6.50	4.26
White crappie	193.9	120-420	40-567	1.25-4.20	2.60
Freewater drum	226.5	190-	155-370	1.50-2.45	2.02

Table 4. An analysis of the Waco Lake Water furnished by the Waco City Water Works.¹

	1956-57			April 25, 1960
	Average	Max.	Min.	
Total Solids	246.0	333.0	194.0	280.6
Total Alkalinity	133.0	145.0	125.0	139.0
Total Hardness	151.0	170.0	142.0	144.9
pH Value	7.6	8.1	7.3	7.0
Silica	6.6	11.1	4.7	10.0
Iron and Aluminum Oxides	3.3	6.2	0.5	2.3
Calcium Bicarbonate	215.0	235.0	201.0	197.6
Calcium Sulfate	12.2	18.4	0.0	13.6 ²
Magnesium Sulfate	20.1	34.7	25.2	7.2
Sodium Sulfate	16.6	41.2	0.8	22.4
Sodium Chloride	36.9	72.3	19.8	39.6
Fluoride	0.25	0.30	0.20	0.1

1. Parts per million

2. This reading taken January 9, 1961