Report of Fisheries Investigations

Inventory of Species Present in Lake Abilene near Abilene, Texas

by

Lawrence Campbell
Project Leader

Dingell-Johnson Project F-5-R-6, Job B-23
April 16, 1958 - April 16, 1959

H. D. Dodgen - Executive Secretary

Texas Game and Fish Commission
Austin, Texas

Marion Toole
Coordinator

Kenneth C. Jurgens & William H. Brown
Assistant Coordinators

Job Completion Report

State of TEXAS

Project No. F-5-R-6 Name: Fisheries Investigations and Surveys of the Waters of Region 3-B.

Job No. B-23 Title: Inventory of Species Present in Lake Abilene near Abilene, Texas.

Period Covered: April 16, 1958 - April 16, 1959

Abstract:

Game fish populations in Lake Abilene are dominant, have favorable physical condition, and provide excellent fishing. Undesired species are at present relatively unimportant. This lake, however, should be resurveyed periodically in order to maintain an accurate knowledge of future populations and their trends.

Objectives:

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

Procedure:

Twenty-four netting collections were obtained at ten locations in the lake. Experimental nylon gill nets, measuring 125 feet long by 8 feet in depth and made up in five, 25 foot sections were used. Mesh sizes of these nets increased progressively in each following section at one-half inch intervals, beginning with one-inch square mesh and terminating with a section of three-inch square mesh.

Five seining stations were seined on two occasions. Common-sense 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 Abilene is one of three city owned reservoirs, and since the construction of Ft. Phantom Hill Reservoir is used only as a secondary source for municipal and industrial water. No water is sold for irrigation and for these reasons the reservoir has a relatively stable water level. The reservoir was created by a compacted earth fill dam on Elm Creek, about ten miles southwest of the City of Abilene. The dam is 3,400 feet long

and has a maximum height of 51 feet. Maximum capacity is 9,977 acre feet and the surface area at that elevation is 635 acres. The reservoir is about twenty-eight years old having impounded its first water in 1921. The reservoir's drainage area, a portion of the Clear Fork of the Brazos watershed, includes about 110 square miles.

Hydrology and Water Quality

Because of its present use as an emergency or reserve water supply, the lake is relatively stable and fluctuations during the inventory did not exceed 0.8 feet. Run-off records indicate that the watershed is sufficiently large to maintain the reservoir at a relatively constant level from year to year. The lake's waters are clear. Red soil on the watershed, however, cause run-off to be highly turbid. The water is relatively pure and low in salinity. No potential sources of contamination were located on the contributing watershed. Only one water analysis was made during the inventory. At that time dissolved oxygen was recorded at 7 ppm, dissolved carbon dioxide at 0 ppm, and the pH was 7.6.

Fish Populations

Analysis of Netting Collections: As shown in the accompanying charts, the reservoir's fish population is dominated by game species by a four to one ratio over rough fish or 80.71 percent to 19.29 percent. White crappie were regarded as too numerous, and the possible build up of bullhead catfish may have future significance. Seining indicated that carp may be of a greater importance than indicated by netting collections, and although river carpsuckers are not as yet excessive, past experience indicates that these fish will become a future fishery problem.

Seining Results: Five seining stations were checked on two occasions. In view of the limited results of this type of work it is deemed that counts actually taken will not contribute to accurate information pretaining to the lake's fish populations. For that reason relative abundance and distribution of species as indicated by seining will be included only as a part of the annotated checklist of species.

Annotated Checklist of Species of Fish in Lake Abilene

Lepisosteidae (gars)

Lepisosteus osseus (longnose gar) - taken in seining collections only, not numerous but apparently a sufficient number for control of overabundant gizzard shad.

Clupeidae (herrings and shad)

Dorosoma cepedianum (gizzard shad) - abundant but not as yet excessively so. In utilizable form; i.e. of a size normally taken as food by game species.

Catostomidae (suckers and buffalofishes)

Ictiobus bubalus (smallmouth buffalo) - rare, not actually taken from the reservoir by seining but taken from the contributing watershed.

Carpiodes carpio (river carpsucker) - rare in seining collections, no small fish taken.

Cyprinidae (shiners and minnows)

Cyprinus carpio (carp) - common and fairly abundant. Many small carp were taken at one seining station but only on one occasion. The first attempt at seining in this location did not result in the capture of any carp.

Notemigonus crysoleucas (golden shiner) - common, probably introduced by hatcheries, in utilizable form.

Notropis lutrensis (redhorse shiner) - common, abundant, and widespread in their distribution. The most common and abundant shiner in the reservoir.

Notropis venustus (spottail shiner) - common, but not abundant. Found at two seining stations only.

Pimephales vigilax (parrot minnow) - common and numerous in the upper reservoir near the stream mouth.

Ameiuridae (catfishes)

Ictalurus punctatus (channel catfish) - common and abundant in all sizes and stages of development. Taken in all localities either seined or netted.

Ictalurus natalis (yellow bullhead) - taken by seining only, rare.

Ictalurus melas (black bullhead) - relatively abundant and widely distributed, but not yet sufficiently numerous to be considered a fishery problem.

Pylodictus olivaris (flathead catfish) - caught in seining only. Presumed to be relatively rare.

Centrarchidae (black basses and sunfishes)

Micropterus salmoides (largemouth bass) - common and relatively numerous in both seining and netting collections. Variation in sizes indicative of healthy population.

Pomoxis annularis (white crappie) - abundant and possibly too numerous. Found in all type of collections. Regarded as, at least potentially, a fishery problem.

Lepomis cyanellus (green sunfish) - common and abundant, but less numerous than bluegill.

Lepomis macrochirus (bluegill sunfish) - common and abundant, the most numerous sunfish in the reservoir.

Lepomis megalotis (longear sunfish) - common but never abundant, taken in seining collections only.

Percidae (perches and darters)

Percina caprodes (logperch) - common but not numerous. Found in two seining localities.

Sciaenidae (drum and weakfishes)

Aplodinotus grunniens (freshwater drum) - not actually taken in either seining or netting collections but observed in fishermen's creels. Apparently relatively unimportant.

Conclusion:

Lake Abilene is an excellent lake for fishing and may be expected to provide high fishery yields for some time to come because of the unusually high ratio of game species to rough species. However, evidence and past experience would indicate that several potential problems exist. There are an excessive population of white crappie, a significant and possibly dormant population of black bullheads, and the occurrence of carp and river carpsuckers.

Recommendation:

It is proposed to introduce flathead catfish in sufficient numbers should this prove practical while completing other survey work. This will be done to attempt to check any increase in the black bullhead population. Should a selective control for either carp or river carpsuckers be developed and perfected, it will be employed in the future. It is recommended that this lake be resurveyed to maintain a reliable record of any future trends by the game fish populations.

Prepared by Lawrence Campbell
Project Leader

Approved by Marion Toole
Director Inland Fisheries Division

Date September 11, 1959

Table 1. Results of Twenty-four Sets of 125 Foot Experimental Type Gill Net in Lake Abilene for the period April 16, 1958 through April 16, 1959.

Species	No.	Percent by No.	Average Weight (ozs.)	Percent by Wt.	Average K
Gizzard shad	20	3.79	2	0.45	1.62
River carpsucker	26	4.91	16	4.69	2.48
Carp	1	0.19	45	0.50	2.47
Golden shiner	2	0.38	3	0.07	1.92
Channel catfish	197	37.24	30	66.69	1.94
Black bullhead	51	9.64	4	2.32	2.44
Largemouth bass	8	1.51	42	3.79	4.30
Bluegill sunfish	18	3.40	3	0.60	3.77
Redear sunfish	1	0.19	5	0.06	4.01
White crappie	205	38.75	9	20.83	5.18
Totals	529	100.00		100.00	

Table 2. Comparative Data on Undesirable Fish and Game Species in Lake Abilene.

Species	No.	Percent by No.	Average Weight	Percent by Wt.
Rough Fish				
Gizzard shad	20	20.40	2	5.67
River carpsuckers	26	26.53	16	59.00
Bullheads	51	52.04	4	28.93
Carp	1	1.03	45	6.40
Total	98	100.00		100.00
Game Species				
Largemouth bass	8	1.95	42	0.47
White crappie	205	50.00	9	23.68
Channel catfish	197	48.05	30	75.85
Total	410	100.00		100.00

Table 3.	No.	%	Total Wt.	% by Wt.
Rough Fish	98	19.29	705	8.29
Game Fish	410	80.71	7,791	91.71
Total	508	100.00	8,496	100.00