Report of Fisheries Investigations

Inventory of Species Present in Lake Sweetwater, near Sweetwater, Texas

by

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Dingell-Johnson Project F-5-R-5, Job B-21
April 16, 1957 - April 15, 1958

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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-21 Title: Inventory of Species Present in Lake Sweetwater near Sweetwater, Texas.

Period Covered: April 16, 1957 to April 15, 1958

ABSTRACT:

A basic survey and inventory of species in Lake Sweetwater was completed. Twenty-four species were recorded from the lake with gizzard shad being the dominant one. Rough fish composed 83.55% by number of the netting sample. The lake has had a tremendous increase in water level during the segment and it is recommended that periodic rechecks be made to determine the progress of the trend toward rough and forage fish over-abundance.

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 Sweetwater. 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.

Ten seining stations were seined one time each in the course of the survey. Five of these were seined during warm weather and the other five were seined during cool weather. 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 Sweetwater is one of three reservoirs owned by the City of Sweetwater and is used in conjunction with the others for municipal water supply. Lake Sweetwater and Lake Trammel are located within the Sweetwater Creek Basin on the Clear Fork of the Brazos Watershed. The other city reservoir is Oak Creek

Lake which is located on Oak Creek in the Upper Colorado River Watershed. Water is pumped from Oak Creek Reservoir over the divide and into Lake Trammel. Lake Sweetwater is located on the East Fork of Sweetwater Creek approximately 9.2 miles southwest of it's confluence with the West Fork of that stream. The dam is compacted earth-fill construction and at spillway elevation contains about 11,500 acre feet of water. During the inventory period Lake Sweetwater increased (due to the first significant run-off in eighteen months) from 1,000 acre feet volume to about 11,500 acre feet volume.

The lakes water had no recordable turbidity. Carbon dioxide excesses and oxygen deficiencies were not recorded. pH was from 7.6 to 7.4. Chemical analysis records indicated that total hardness was usually from about 1,100 ppm to a maximum of about 1,840 ppm. Chloride content included a 240 ppm to 2,720 ppm variation over a four month period.

Netting Results - Table Number 1 gives the relative information regarding the twenty netting collections obtained. It can be seen from this table that channel catfish (Ictalurus punctatus) and white crappie (Pomoxis annularis) are the dominant game species. Largemouth bass (Micropterus salmoides) are comparatively large in this lake but not particularly numerous.

Gizzard shad (Dorosoma cepedianum) are the dominant rough species. While this species is also one of the principal forage species in the lake it is believed to be considerably overabundant as it composed over 70% by number of the total netting collection. Other species of rough fish do not appear to be seriously abundant at the present time but the recent influx of water could change the situation in a short while.

Table Number 2 shows the percentage by weight and number of game to rough fish species. This indicates and overabundance of rough fish (primarily gizzard shad) in both number (83.55%) and weight (52.79%).

Seining Results - Ten seining collections were made at ten different locations. Three species dominated these collections. The following annotated check list is regarded as the most suitable expression of the data obtained seining.

Redhorse shiners (Notropis lutrensis) - The most common and widely distributed cyprinid in the reservoir. This species was taken in all seining localities and is probably one of the most important forage species in the lake.

Texas shiners (Notropis amabilis) - This species was found at only two stations but was abundant where taken.

Plains minnow (Hybognathus placita)- Common but not abundant.

Parrot minnow (Pimephales vigilax)- Common and probably the second most numerous of the cyprinids.

Carp (Cyprinus carpio)- Common although not numerous. It was more abundant in the upper portions of the reservoir than any other place.

Goldfish (Carassius auritus)- Taken in two collections. These fish are probably incapable of competing with native species.

Golden shiners (Notemigonus crysoleucas)- Common but not numerous in any one collection. These are believed to have been introduced by government agencies.

River carpsuckers (Carpiodes carpio)- Common but not numerous.

Gizzard shad (Dorosoma cepedianum) - The most numerous and common species in the reservoir, and regarded as a potential management problem.

Smallmouth buffalo (Ictiobus bubalus) - Rare and apparently unimportant at the time of inventory.

Black bullhead (Ictalurus melas) Found in collections following the increase in the reservoir these fish were obviously spawned during the summer of 1957 or early fall. They are apparently less dominant than yellow bullheads.

Yellow bullhead (Ictalurus natalis) - This species is common and abundant and evidently produced a large spawn during the last year.

Channel catfish (Ictalurus punctatus) - Common, and increasing numerically if not by ratio.

Flathead catfish (Pylodictus olivaris) - Rare.

White bass (Roccus crysops)- Status doubtful from evidence obtained by seining, and reproduction not clearly successful. It is considered of primary importance to determine during re-survey work whether this species may have any tendency to check or reduce the gizzard shad population.

Largemouth bass (Micropterus salmoides) - Common but not abundant. There was evidence of some reproduction within this population; however, either this species did not reproduce extensively or the spawns did not have a high ratio of survival.

Green sunfish (Lepomis cyanellus) - Common and abundant.

Bluegill (Lepomis macrochirus)- Common and abundant.

Longear sunfish (Lepomis megalotis)- Common but not as abundant as bluegill or green sunfish.

Redear (Lepomis microlophus)- Rare.

White crappie (Pomoxis annularis) - Common and abundant at two locations. Spawning was apparently highly successful.

Black crappie (Pomoxis nigromaculatus) - Rare and probably introduced by fish hatcheries.

Logperch (Percina caprodes)- Rare; represented by a single specimen.

Freshwater drum (Aplodinotus grunniens)- Rare.

CONCLUSIONS AND RECOMMENDATIONS:

Due to the tremendous increase in reservoir volume from about 1,000 acre feet to approximately 11,000 acre feet during inventory and because of insufficient evidence obtained regarding the success or failure in spawning of several of the more important species; the status of the fishery populations in this reservoir is not accurately known.

However, it can be concluded that the rough fish population and in particular the gizzard shad population is relatively high, and that bullheads are increasing their numbers following the recent influx of water. It is recommended that the lake be rechecked and closely observed during the coming year in order to ascertain whether or not this trend of over dominance by rough and forage species continues. If so, managerial procedures can be recommended at that time.

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Approved by: Marion Toole
Chief Aquatic Biologist

Date: August 8, 1958

Table Number 1. Information from netting collections obtained April 16, 1957 to April 15, 1958 in Lake Sweetwater.

Species	Number	Percent by Number	Avg. Wt. lbs.	Avg. Wt. ozs.	Total Wt. lbs.	Total Wt. ozs.	Percent by Weight	K Range		Avg. K
Gizzard shad	337	70.06	-	2	42	2	20.52	.68	1.41	1.14
River carpsucker	26	5.41	1	8	39	-	18.99	1.02	3.15	2.16
Carp	11	2.29	1	4	13	12	6.70	2.18	2.84	2.52
Golden shiner	8	1.66	-	2	1	-	.49	1.39	1.47	1.43
Channel catfish	45	9.35	1	4	56	4	27.40	1.35	2.01	1.53
Yellow bullheads	20	4.16	-	10	12	8	6.09	2.26	2.68	2.42
Largemouth bass	8	1.66	3	10	29	-	14.12	2.18	3.55	2.92
Bluegill sunfish	1	.21	-	3	-	3	.09	----------		3.87
White crappie	23	4.78	-	7	10	-	4.87	1.83	3.01	2.51
Black crappie	2	.42	-	12	1	8	.73	2.79	3.11	2.95
Totals	481	100.00			205	5	100.00			

Table Number 2. A comparison of rough and game fish species taken in netting collections April 16, 1957 to April 15, 1958 in Lake Sweetwater.

	Number	Percent by Number	Weight	Percent by Weight
ROUGH AND FORAGE SPECIES (shad, suckers, carp, bullheads, and golden shiners)	402	83.58	108 - 6	52.79
GAME SPECIES(black bass, bluegills, crappie and catfish	79	16.42	96 -15	47.21
Totals	481	100.00	205 - 5	100.00

Table Number 3. Checklist of species form Lake Sweetwater

Common Name	Scientific Name
Gizzard shad	Dorosoma cepedianum
Smallmouth buffalo	Ictiobus bubalus
River carpsucker	Carpiodes carpio
Carp	Cyprinus carpio
Golden shiner	Notemigonus crysoleucas
Redhorse shiner	Notropis lutrensis
Texas shiner	Notropis amabilis
Plains minnow	Hybognathus placita
Parrot minnow	Pimephales vigilax
Black bullhead	Ictalurus melas
Yellow bullhead	Ictalurus natalis
Channel catfish	Ictalurus punctatus
Flathead catfish	Pylodictus olivaris
White bass	Roccus crysops
Largemouth bass	Micropterus salmoides
Green sunfish	Lepomis cyanellus
Bluegill sunfish	Lepomis macrochirus
Longear sunfish	Lepomis megalotis
Redear sunfish	Lepomis microlophus
White crappie	Pomoxis annularis
Black crappie	Pomoxis nigromaculatus
Logperch	Percina caprodes
Freshwater drum	Aplodinotus grunniens