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Report of Fisheries Investigations
Inventory of Species Present in Lake J. B. Thomas
Near Snyder, Texas.

by

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Dingell-Johnson Project F-5-R-4, Job B-10
May 1, 1956 - April 16, 1957

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Job Completion Report

State of TEXAS

Project No. F-5-R-4

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

Job No. B-10

Title: Inventory of Species Present in Lake J.
B. Thomas near Snyder, Texas.

Period Covered:

May 1, 1956 - April 16, 1957

ABSTRACT:

From a fisheries standpoint Lake J. B. Thomas, a 220,000 acre foot, storage reservoir, has developed from a virtually unproductive body of water into the most productive public reservoir within Region 3-B. Most notable of the population trends included tremendous increases in the flathead catfish, white bass, largemouth bass and white crappie populations. Corresponding decreases in yellow bullhead and freshwater drum occurred. Data obtained indicated probable inter-specific influences by yellow bullheads on the increase of flathead catfish and by gizzard shad on the increase of white bass. No management or development program is considered necessary at this time.

OBJECTIVES:

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

PROCEDURE:

During the final segment, 39 gill nets were set at seven locations in the reservoir. Experimental nylon gill nets, measuring 125 feet long by eight feet deep and made up in five, 25 foot sections, were used. Mesh sizes 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.

Sixteen seining collections were made at five seining stations in the reservoir. In nearly all collections, both 26 foot, $\frac{1}{4}$ inch mesh bag seines and 15 foot, $\frac{1}{4}$ inch mesh, common sense seines were used. To estimate relative abundance a count was made of all individuals taken in two hauls with a 26 foot, $\frac{1}{4}$ inch mesh bag seine. In addition to this work, collections, with a 4 foot, $\frac{1}{16}$ inch mesh, common sense fry seines, were taken.

Water analysis to determine dissolved oxygen content and the quantity of dissolved carbon dioxide was taken periodically. Surface temperature, pH, and weather conditions were recorded for each netting and seining collection. Turbidity was measured on two occasions.

In netting collections, samples from each collection and for each species were weighed, measured and sexed. This work was done in the field. Stomachs containing food were preserved for laboratory examination. Similar work for seining collections in-

cluded identification, weighing and measuring. Individual specimens not readily identifiable were preserved in a 10 percent solution of formalin. These were later identified in the laboratory.

FINDINGS:

Lake J. B. Thomas is located approximately 10 miles west of Ira, Texas. The earthen dam impounds the Colorado River and Bull Creek approximately 2.5 miles above their confluence. The structure was completed in September 1951 by Freeze and Nichols Construction Company of Dallas, Texas, for the Upper Colorado River Municipal Water District. The reservoir impounded its first water, about 4,000 acre feet, in August 1952, and by July 1953 about 11,000 acre feet of water were in storage. When work was initiated on this job, in July 1954, the lake had increased to about 47,890 acre feet. Since that time the lake has continued to increase in volume from 134,480 acre feet in May 1955, to 180,000 acre feet November of the same year, and had 163,800 acre feet volume in April 1956 when the first year's work was completed. The included chart on hydrology and fluctuation provides more detailed data on the reservoir. The influences on fish populations will be discussed under that heading. The maximum storage capacity for Lake J. B. Thomas is 220,000 acre feet and the reservoir has flood control potential for 255,000 acre feet. All impounded water is owned by the Colorado River Municipal Water District and is to be used to fulfill the municipal and the industrial requirements for Big Spring, Odessa, and Snyder, Texas. The contributing watershed of approximately 751 square miles is exclusively within the Permian Basin, and soil types are generally sands and red or brown sandy loams. The average annual rainfall is 21.15 inches, average maximum temperature is 82°F, and average minimum is 42°F. Most of the watershed is utilized for ranching; however, in the north-western "Lamesa" area irrigated and "dryland" farming is extensive. Four oil wells were surrounded by the lake; however, these wells are adequately protected and no evidence of pollution has been discovered. Drilling activity has increased the original number to seven wells now producing in the inundatable area, and exploration continues. During the year no recordable turbidity was observed, total solids were about 150 ppm and pH ranged from 8.3 to 8.4. Minimum dissolved oxygen content recorded was 7.2 ppm, and the maximum carbon dioxide content recorded was 8 ppm.

Aquatic Vegetation

Bull rushes are established in the upper reservoir areas and muskgrass, although not dense in any particular area, is present on many of the shallow, sandy beaches.

Fish Populations

A. Relative Abundance

The following charts present the netting and seining data obtained during the survey and are arranged in such a manner as to best illustrate the population trends that are to be discussed later in the report. This data is entirely for comparative purposes. Distribution of species is included under a different heading.

Hydrology and Water Level Fluctuation Data for Lake J. B. Thomas for the Period
From October 1955, through September 1957.

Month	Max. El.	Min. El.	Avg.	Fluctuation	Avg. Acre Feet
October - 1955	55.7	53.8	54.75	1.9	179,100
November	54.9	54.2	54.55	0.7	177,500
December	54.2	53.8	54.0	0.4	173,600
January - 1956	53.8	53.4	53.6	0.4	170,750
February	53.4	53.0	53.2	0.4	167,900
March	53.0	52.3	52.65	0.7	164,150
April	52.3	51.8	52.25	0.5	160,100
May	52.6	53.5	53.05	0.9	166,900
June	53.7	52.8	53.25	0.9	168,300
July	53.2	52.2	52.7	1.0	164,500
August	52.2	51.1	51.65	1.1	157,450
September	51.1	50.2	50.65	0.9	150,900
October	50.2	49.8	50.0	0.4	146,750
November	49.8	49.1	49.45	0.7	143,300
December	49.1	48.7	48.9	0.4	139,900
January - 1957	48.7	48.3	48.5	0.4	137,500
February	49.3	48.2	48.75	1.1	139,050
March	49.1	48.5	48.8	0.6	139,300
April	48.8	48.0	48.4	0.8	136,900
May	54.0	48.8	51.4	5.2	155,800
June	55.5	54.6	55.25	0.9	181,000
July	55.3	54.6	54.95	0.7	180,400
August	54.6	53.6	54.1	1.0	174,300
September	53.7	52.9	53.3	0.8	168,600
Averages	55.7	48.0	51.85	0.8	*160,250

* Maximum volume was 186,000 acre feet in October, 1955
Minimum volume was 134,500 acre feet in April, 1957

Netting Collections From Lake J. B. Thomas May 1, 1955 through April 31, 1956

Species	July No. %	October No. %	January No. %	March No. %	Total Percent
<u>Lepisosteus osseus</u>	0 0.00	2 1.33	2 2.00	0 0.00	4 0.64
<u>Dorosoma cepedianum</u>	61 32.10	48 32.00	36 36.00	98 55.69	243 39.45
<u>Carpionodes carpio</u>	24 12.64	18 12.00	13 13.00	12 6.82	67 10.90
<u>Moxostoma congestum</u>	0 0.00	0 0.00	0 0.00	1 0.57	1 0.16
<u>Cyprinus carpio</u>	1 0.53	0 0.00	0 0.00	3 1.71	4 0.64
<u>Ictalurus punctatus</u>	21 11.05	13 8.67	4 4.00	16 9.10	54 8.76
<u>Ictalurus natalis</u>	32 16.84	10 6.66	0 0.00	2 1.14	44 7.17
<u>Pylodictus oliveris</u>	0 0.00	4 2.67	4 4.00	3 1.69	11 1.78
<u>Roccus chrysops</u>	21 11.05	0 0.00	2 2.00	0 0.00	23 3.73
<u>Micropterus salmoides</u>	3 1.56	4 2.67	7 7.00	5 2.81	19 3.08
<u>Chaenobryttus coronarius</u>	4 2.12	3 2.00	0 0.00	18 10.23	25 4.05
<u>Lepomis (sunfishes)</u>	21 11.05	48 32.00	32 32.00	16 9.10	117 18.99
<u>Pomoxis annularis</u>	2 1.06	0 0.00	0 0.00	2 1.14	4 0.64
Totals	190 100.00	150 100.00	100 100.00	176 100.00	616 100.00

Netting Collections from Lake J. B. Thomas
April 16, 1956 thru April 16, 1957

Species	July	September	November	January	March	April	Total	Percentage
Longnose gar	3	6	2	9	1	0	21	1.60
Gizzard shad	126	31	112	114	28	86	497	35.75
River carp suckers	4	3	8	2	6	4	27	1.93
Redhorse suckers	3	1	1	1	0	0	6	0.43
Carp	2	0	0	2	1	0	5	0.35
Channel catfish	26	31	62	29	38	16	202	14.49
Flathead catfish	1	0	16	38	29	18	102	7.37
Yellow bullheads	16	11	2	0	0	0	29	2.08
White bass	16	28	54	27	6	13	144	10.42
Largemouth bass	0	2	0	11	19	20	52	3.73
Sunfishes	3	2	1	5	2	2	15	0.76
White crappie	12	30	37	104	72	39	294	21.09
Total	212	145	295	342	202	198	1394	100.00

Results of Gill Netting Collections taken from Lake J. B. Thomas from
May 1, 1955 through April 16, 1957.

Species	No.	Percent by No.	Average Wt. (ounces)	Percent by Wt.	Average "K"
Longnose gar	25	1.22	47	4.11	0.32
Gizzard shad	740	36.23	3.5	9.06	1.80
River carpsuckers	94	4.60	18	5.93	2.39
Redhorse suckers	7	0.34	12	0.29	2.40
Carp	5	0.24	38	0.66	2.53
Channel catfish	256	12.54	29	25.98	2.20
Flathead catfish	113	5.56	57	22.53	2.58
Yellow bullheads	79	3.86	3.5	0.96	2.47
White bass	167	8.17	12	7.03	2.10
Largemouth bass	71	3.47	26	6.45	2.36
Sunfishes	158	7.76	3.5	1.93	4.12
White crappie	298	14.59	13	13.55	3.68
Freshwater drum	29	1.42	15	1.52	2.14
Total	2,042	100.00		100.00	

Seining Collections from Lake J. B. Thomas May 1, 1955 through April 31, 1956.

Species	July	October	January	March	April	Total	Percentage
<u>Dorosoma cepedianum</u>	0	4	4	0	2	10	0.76
<u>Carpides carpio</u>	2	4	9	0	0	15	1.14
<u>Notropis lutrensis</u>	201	100	100	150	84	635	48.40
<u>Hybognathus placitus</u>	8	16	24	24	24	96	7.32
<u>Pimephales vigilax</u>	21	50	50	50	50	221	16.84
<u>Ictalurus punctatus</u>	0	2	7	0	13	22	1.68
<u>Ictalurus natalis</u>	21	12	0	12	8	53	4.04
<u>Roccus chrysops</u>	0	0	8	12	7	27	2.06
<u>Micropterus salmoides</u>	2	8	5	0	1	16	1.22
<u>Chaenobryttus coronarius</u>	2	0	3	4	0	9	0.69
<u>Lepomis cyanellus</u>	0	6	2	5	11	24	1.83
<u>Lepomis microlophus</u>	0	2	1	2	2	7	0.53
<u>Lepomis macrochirus</u>	14	24	36	18	20	112	8.54
<u>Lepomis auritus</u>	0	2	1	3	3	9	0.68
<u>Pomoxis annularis</u>	8	12	17	5	4	46	3.51
<u>Aplodinotus grunniens</u>	0	2	2	0	6	10	0.76
Totals	279	244	269	285	235	1,312	100.00

Seining Collections from Lake J. B. Thomas
 April 16, 1956 through April 16, 1957

Species	July	October	January	March	Total	Numerical		
						Percent	Total for 36 Months	
Gizzard shad	2	0	0	12	14	2.76	24	1.32
River carpsuckers	0	0	2	2	4	0.79	19	1.05
Plains shiners	8	2	0	14	24	4.72	120	6.59
Redhorse shiners	39	28	6	13	86	16.93	721	39.63
Parrot minnows	3	12	4	21	40	7.87	261	14.34
Channel catfish	0	0	0	0	-	-	22	1.21
Yellow bullheads	0	0	0	0	-	-	53	2.92
Gambusia	88	19	6	18	131	25.78	131	7.19
White bass	1	0	12	7	20	3.95	47	2.58
Largemouth bass	2	11	6	21	40	7.87	56	3.07
Warmouth bass	0	0	0	0	-	-	9	0.49
Green sunfish	7	13	0	2	22	4.33	46	2.52
Redear sunfish	0	0	0	0	-	-	7	0.39
Bluegill sunfish	13	11	20	26	70	13.78	182	10.00
Longear sunfish	2	9	2	6	19	3.74	28	1.54
White crappie	8	11	3	16	38	7.48	84	4.62
Freshwater drum	0	0	0	0	0	-	10	0.54
Totals	173	116	61	158	508	100.00	1,820	100.00

Trends and Influences in the Principal Fish Populations

Gizzard shad - Although these fish remained relatively constant in ratio to other species; the stomach contents of white bass contained shad only, and a marked uniformity in size in this species indicated that virtually all of these fish were in utilizable form. (i.e. they were small enough to be taken for food by the principal game species).

River carpsuckers - As shown in the included charts; this is the only lake surveyed thus far that this species does not present an existing fishery management problem. However, maintaining data on this population will be the primary purpose of future resurvey work.

Freshwater drum - The most notable evidence indicating the importance of this species is the lack of their occurrence during the last year of inventory.

Flathead catfish - As shown in the included charts the increase in channel and flathead catfish is almost correlational with the decline in yellow bullheads. This, with stomach analysis data that indicated bullheads were of primary dietary importance for these species, is considered sufficient to establish that a relationship occurred in this specific instance.

Channel catfish - Although there was a slight decrease in the average co-efficient of condition for this species during the last twelve months that the survey was conducted; this is believed to be a result from a natural loss of condition in the population brought about by a greater number of mature fish, that have spawned, being taken during sampling. The numerical increase from 9.10 percent to 14.49 percent is regarded as more indicative of the importance of this population.

Largemouth bass - The numerical increase indicated by seining and netting collections are known to be insufficient for this species. Bass fry secured in seining collections were not taken into consideration in computing the included data. As observed and as shown in the hydrological table; spawning conditions were favorable and many fry were present.

White crappie - The increase in this population is regarded as less favorable than that for other game species. Although there was a numerical increase from about 0.5 percent to about 21 percent; the condition and size of the individuals taken in sampling indicated that at least in specific areas of the reservoir there may be a "stunted" population in the process of developing. For that reason this population will be given special consideration when resurvey work is done.

White bass - White bass increased from less than 4 percent to over 10 percent, and all observations would indicate that the species could increase proportionately for at least another year. Since conditional increases accompanied the numerical increase there is at present no known reason to doubt the desirability of this condition.

C. Species Present and Their Distribution.

Twenty-seven species of ten families were captured and identified during the inventory period. The distribution and other aspects pertaining to the individual species are discussed in the following annotated checklist.

Annotated Checklist of Species of Fish in Lake J. B. Thomas

Lepisosteidae (gars)

Lepisosteus osseus (longnose gar) - rare and concentrated in the upper reservoir areas.

Clupeidae (shad and herrings)

Dorosoma cepedianum (gizzard shad) - usually abundant throughout the reservoir; however, there is some evidence that there is a spring concentration (at least on a locality basis) apparently caused by run-off water entering the lake and probably providing spawning stimulus.

Characidae (tetras)

Astyanax fasciatus (mexican jumper) - represented by a single individual captured in the vicinity of a concession - presumably released bait.

Catostomidae (suckers)

Carpionotus carpio (river carpsucker) - taken in all reservoir areas, high coefficient of condition, and presumably increasing rapidly.

Moxostoma congestum (gray redhorse sucker) - common but restricted to the mouth of contributing streams.

Cyprinidae (minnows)

Cyprinus carpio (carp) - common but not yet numerous. There were few adults taken.

Notropis percobromus (plains shiner) - although there is actually some question as to whether this species should be included in the reservoir populations, because it was obtained in and about the headwaters only, it is included on the presumption that if it occurs there it should also be in the reservoir.

Notropis venustus (spottail) - abundant but decreasing. Apparently this is a stream species that is introduced in great numbers when a reservoir fills and then reduces as dominance is gained by a more adaptable species.

Notropis lutrensis (redhorse shiner) - possibly the dominant and certainly the most important forage species of this group at the time the inventory was completed.

Hybognathus placita (plains minnow) - common but seldom numerous as compared to redhorse or spottail shiners.

Pimephales vigilax (parrot minnow) - common and uniform in distribution but apparently never concentrated as are the other important minnows and shiners.

Ameiuridae (catfishes)

Ictalurus melas (black bullhead) - this may be a mistake of identification; however, regardless of this possibility the population of this species if it actually exists is relatively unimportant and is definitely sub-dominant to yellow bullheads.

Ictalurus natalis (yellow bullhead) - although there is doubt as to the utility of this species for forage; it is concluded that, at least in this specific instance, the species has value as forage for flathead and channel catfish as discussed under those species. The yellow bullhead population, although apparently decreasing rapidly, is distributed uniformly throughout the reservoir.

Ictalurus punctatus (channel catfish) - uniformly distributed and in excellent conditions.

Pylodictus olivaris (flathead catfish) - as discussed under Trends and Influences. Concentrated near the dam and about the protecting rip rap for the oil well.

Cyprinodontidae (killifishes and topminnows)

Fundulus kansae (plains killifish) - common, but abundant only at the beginning of the survey. Apparently this population had its origin in the stream pools that existed prior to significant impoundment of water. With the capture of sizable quantities of runoff and a resulting loss of salinity these species were no longer capable of sustaining themselves.

Gambusia affinis (mosquitofish) - abundant in all areas where protection was afforded.

Serranidae (basses)

Roccus chrysops (white or striped bass) - common with some evidence of an annual migration route.

Centrarchidae (black basses and sunfish)

Micropterus salmoides (largemouth bass) - common and if fluctuation conditions continue as they have to date there is reason to believe that this population may continue to hold its own.

Chaenobryttus gulosus (warmouth bass) - rare and apparently unimportant.

Lepomis cyanellus (green sunfish) - common and distributed throughout the reservoir. Unimportant as a game species; however, there is evidence that they are utilized as forage.

Lepomis macrochirus (bluegill) - the dominant species of sunfish in the reservoir. This species is uniform of distribution, has an extremely limited utilization for sport and is of questionable utility for forage.

Lepomis microlophus (reardear sunfish) - uniform in distribution, common but never numerous. This species provides more sport than all other sunfishes combined.

Lepomis megalotis (longear sunfish) - common but never numerous. Found in the area about the dam only.

Pomoxis annularis (white crappie) - abundant but localized in distribution. Other pertinent data as discussed under principal fish population.

Percidae (perches and darters)

Percina caprodes (logperch) - rare in and about the river mouth only.

Scianidae (drum)

Aplodinotus grunniens (freshwater drum) - during the first year of inventory this species was found near the dam. It should be regarded as relatively rare since that time.

SUMMARY:

1. Lake J. B. Thomas is a 220,000 acre foot storage reservoir near Ira, Texas, that has developed into the most productive public water for region 3-b.

2. Flathead catfish, channel catfish, white crappie, and largemouth bass increased at a tremendous rate during the period of inventory.

3. Yellow bullheads and freshwater drum decreased during inventory, and there was evidence that bullheads were extremely important in the development and increase of the flathead and channel catfish populations.

4. The reservoir has what is regarded as a desirable gizzard shad population and there is as yet little evidence of a significant increase in river carp suckers or carp.

5. Game fish make up about 52.59% numerically and 75.54% by weight of the entire populations. 3,862 individuals of 10 families and 27 species were included in sampling.

6. Although the reservoir is subject to considerable fluctuation in the lake level at times; to date these fluctuations have not prevented successful spawning activity of the principal game species.

7. Although vegetation is not at present a fishery management problem, muskgrass and bullrushes occur in the reservoir and may present a future problem.

RECOMMENDATION:

Since the reservoir has excellent game fish populations and apparently no current fishery problems; no recommendation for corrective management is required, however, it is recommended that this reservoir be re-surveyed each year to keep an up to date account of the fishery populations in order that a basis for management may be maintained.

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