Report of Fisheries Investigations

Resurvey of Waters of Region 1-B

by

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Dingell-Johnson Project F-7-R-6, Job B-14
June 1, 1958 - May 31, 1959

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Segment Completion Report

State of TEXAS

Project No. F-7-R-6 Name: Fisheries Investigations and Surveys of the Waters of Region 1-B.

Job No. B-14 Title: Resurvey of Waters of Region 1-B.

Period Covered: June 1, 1958 through May 31, 1959.

Abstract:

One stream and four lakes were resurveyed during this period of study in order to detect and record possible changes in any aspect of previous surveys.

An extensive pollution resurvey was conducted on the Canadian River. Industrial effluents in the vicinity of Borger are still seriously polluting the Canadian River with substances that are lethal to fishes and other aquatic life, and detrimental to wildlife that might otherwise drink the water. Final results of this work are pending collection of additional data which will be submitted at a later date, possibly in a joint report with the State Department of Public Health.

Buffalo Lake, near Umbarger, was resurveyed on 5 different occasions during this segment. Results of the final survey, which followed extensive freeze-kills in January and February 1959, revealed that only carp, goldfish, carpsucker, black bullhead catfish and a relatively small number of channel and flathead catfish survived. Depletion of game fish populations justified total eradication of the remaining population and restocking. A total-kill treatment with toxaphene was given in April 1959.

Resurveys of Rita Blanca Lake, near Dalhart, continued to show that the most outstanding problem affecting the fishery is the over-abundance of golden shiner and black bullhead catfish. An experimental management project has been initiated in an effort to control these species. This work is set up under F-7-R-7, Job B-16, and is effective June 1, 1959.

Lake Kemp was checked on several occasions during this period of study to determine the status of experimentally introduced redfish and speckled trout. Gill nets were also set to collect data for a resurvey. Rough fish in Lake Kemp still greatly outnumber game fish. Rough fish species increased from 76 percent to 91 percent of the total, and game fish species decreased from 24 percent to 9 percent of the total. One smallmouth buffalo was taken, which is the first of this species to be recorded from Lake Kemp. Gill netting and seining failed to produce redfish and speckled trout of any size.

Lakes Eddleman and Graham were resurveyed to determine results of selective-kill treatments. Results of this survey are given in the Job Completion Report, F-14-D-3, Job 16a-14.

Objectives:

To resurvey waters in Region 1-B that have been previously surveyed so that possible changes in any aspect of the previous survey can be detected and recorded.

Procedure:

Basic surveys and inventories of fish species have been conducted on seven streams and eight lakes in Region 1-B within the past five years. It is logically expected that certain changes will naturally occur in these waters that may alter fish populations as well as chemical and physical factors. These waters were resurveyed as time permitted in the same manner as in the previous surveys, except on a much smaller scale, so that changes in the concerned waters can be detected and recorded.

Findings:

Canadian River

During the period from June 1, 1954 to May 1955, a basic survey and inventory of species was conducted on the Canadian River. Results of this work are contained in the Report F-7-R-2, Jobs A-1 and B-5. During that same period, an intensified study was made on the polluted areas near Borger. Details of this study are given in the Report F-7-R-2, Job C-1, Part 1.

Results of this pollution study revealed that effluent ditches of the Phillips Petroleum Company were seriously polluting the Canadian River with substances that were lethal to fishes and other aquatic life, and detrimental to wildlife that might otherwise drink the water. This violation was brought to the attention of the polluting concern who agreed to study the problem and take the necessary action that would eventually abate their contributing pollution of the Canadian River.

Periodic observations continued, and on January 17, 1958, another intensified, 12-hour study was made to determine the extent and results, if any, of their efforts to abate the pollution. According to this study, their efforts had not been sufficient during the previous three years to substantially reduce the amount of pollution from that originally reported. Details of this investigation are given in the Report F-7-R-5, Job C-1, Part 2.

In July 1958, a joint tour was conducted along the most affected section of the Canadian River and industrial effluent ditches with representatives of the State Health Department and U. S. Public Health Service. An extensive pollution investigation was planned at this time. Periodic inspections continued in the polluted areas of the Canadian River to determine the most suitable conditions under which to conduct a more comprehensive survey, and to render assistance to the State Health Department's resident sanitarian who was also conducting a study of this pollution problem.

In January 1959, an additional cooperative study with the State Health Department was conducted on the Canadian River, insofar as it exists in Texas. Water samples were collected from the original sampling locations between the New Mexico line and the Oklah line, across the Texas Panhandle. Also, at this time, a 24-hour study was conducted in the Borger area to determine the extent of pollution present as compared to previous investigations. Collecting stations were established at the same locations on the river and effluent ditches that were used previously. Each station was visited every three hours

for a period of 24 hours, at which time samples were collected, sealed and labeled. In addition to samples collected regularly, random samples were collected from the river above the entrance of all industrial effluents, other effluent ditches and the river, as far down as the Highway 70 crossing, north of Pampa. After collection, samples were delivered to the Texas State Department of Health Laboratory and analyzed. Results of this work will be submitted in a separate report at a later date, possibly in a joint report with the State Department of Public Health, after additional data has been collected.

Buffalo Lake

Buffalo Lake was check-seined in July 1958, to determine spawning success of all species and status of experimentally introduced white bass. Recent light rains had stimulated spawning of carp, goldfish and shad, but no reproduction was indicated for black bass, white bass, crappie or any game fish species other than channel catfish. The lake was apparently still too low to provide suitable spawning conditions for white bass and bottom nesting game fishes.

In August 1958, an additional eight drags were made with a 1,200 foot nylon seine on previously baited and prepared seining beaches. An estimated minimum of 8 tons of rough fish, mostly carp, was removed. Baits used were potatoes, watermelons, grapes and cantaloupes. More fish were taken on beaches baited with potatoes, and cantaloupes seemed to be the second choice. Very few shad were taken during these operations. Random sampling with smaller meshed seines produced no indications of white bass reproduction.

In September 1958, Buffalo Lake was resurveyed to determine relative-abundance of species and spawning success. Gill nets were set in the same general locations as those used during previous surveys. Reduction in water level necessitated moving some of the nets farther out into the lake. Results of this survey indicated that shad had re-established themselves as the dominant species in Buffalo Lake, comprising 58.9 percent of the total. Carp, carpsucker, and goldfish followed in abundance with 11.4 percent, 10.2 percent and 4.9 percent respectively. Game fish species, combined, made up only 14.3 percent of the total, of which crappie comprised 9.8 percent. Percentage composition, sex ratios and average weights by sex of fish collected by gill nets during this survey are given in Table 1. Percentage composition by weight and mean weights of fishes collected by gill nets is shown in Table 2.

Also in September, seining continued to determine effectiveness of experimental baits for concentrating rough fish on prepared seining beaches at Buffalo Lake. Cottonseed meal pellets were compared with potatoes, watermelons, cantaloupes and grapes. Great numbers of shad were taken on beaches baited with cottonseed meal, whereas, they practically ignored the other baits. Carp also preferred cottonseed meal over other baits, with potatoes and cantaloupes as second and third choices. Both channel catfish and crappie were taken in abundance on beaches containing cottonseed meal. Catfish fed extensively on the meal, whereas crappie were apparently feeding on minnows that were attracted by the bait.

In January, and again in February 1959, temperatures in the Texas Panhandle dropped to extreme sub-freezing temperatures, resulting in extensive fish-kills. Both times, the surface was completely frozen over except for a small area in the center which was constantly agitated by swimming ducks and geese. Surface ice was also covered with light snow which enhanced decomposition of organic matter and oxygen depletion. Great numbers of shad were killed, as well as a high percentage of game fish, including catfish up to 45 pounds.

Buffalo Lake was resurveyed on April 14 and 15 to determine results of the freeze-kills during January and February. Results of this survey are condensed as follows:

Carp	186	83.0 %
Goldfish	10	4.5 %
Carpsucker	11	5.0 %
Bullhead catfish	6	2.6 %
Channel catfish	10	4.5 %
Flathead catfish	1	0.4 %
Total	224	100.0 %

At the time of the survey, the water level was extremely low and the turbidity was high, thick and "soupy". After conferring with Jack Hemphill, Regional Biologist, U. S. Fish and Wildlife Service, it was decided that game fish populations had been depleted to the extent that a total eradication of the remaining population was justifiable. Arrangements were made at that time for a total-kill treatment with toxaphene. The lake was treated April 29 and 30, 1959. Cooperative stocking and management plans for Buffalo Lake have been worked out with the U. S. Fish and Wildlife Service, the federal agency in charge of the Buffalo Lake National Wildlife Refuge.

Rita Blanca Lake

Rita Blanca Lake (near Dalhart) was check-seined in July 1958, to determine spawning success of black bass which had been previously stocked in an effort to increase predation on golden shiners. Numerous bass fry were taken all around the lake, indicating a successful natural spawn for the first time in possibly 6 years. Suitable conditions for this reproduction were provided by recent rains on the watershed which raised the water level over rocks and gravel beds that were normally high and dry.

An additional survey with gill nets was made in April 1959. A total of 2,000 feet of experimental type gill nets was set in various locations over the lake on April 16 and raised on the morning of April 17. Results are condensed as follows:

Black bass	5	1.3 %
Channel catfish	60	15.1 %
Crappie	46	11.6 %
Bluegill	1	.3 %
Bullhead catfish	114	28.7 %
Golden shiner	167	42.0 %
Goldfish	1	.3 %
Carp-goldfish cross	3	.7 %
Total	397	100.0 %

Stomach analyses disclosed that black bass were feeding on golden shiners. Channel catfish contained mostly wheat and maize, with smaller amounts of chara, algae, fish remains (including one small channel catfish) and crayfish. Crappie contained small fish remains, probably small golden shiners and other minnows.

Since the most outstanding problem affecting the Rita Blanca Lake fishery is the over-abundance of golden shiner and black bullhead catfish, an experimental management project was initiated in an effort to control these species. This work is set up under F-7-R-7, Job B-16, and is effective June 1, 1959.

Lake Kemp

Lake Kemp was checked on several occasions during this period of study with both gill nets and seines. The primary objective of this work was to determine the status of experimentally introduced redfish and speckled trout, rather than to collect data that would be comparative to that collected during the inventory of species as presented in the Report F-7-R-1, Job B-1, (1953-1954). Gill nets were set in areas that would be most likely to collect redfish and speckled trout selectively, which were quite different from gill netting stations used during the inventory of species. Therefore, no attempt will be made to compare data collected for these two completely different purposes.

However, gill nets were set in Lake Kemp in June 1958, to collect data for a resurvey. Netting stations were similar to those used during the original survey. Results of this work are given in Table 3, which presents numbers and percentage composition of fish species collected in gill nets from Lake Kemp in June 1958, as compared with that collected from June 1953 through May 1954.

According to results of the resurvey, Lake Kemp is still, biologically, an old impoundment with rough fishes greatly outnumbering game fishes. It would be quite discouraging, indeed, if these results were accepted as a true indication of the fishery of Lake Kemp. Rough fish species increased from 76 percent to 91 percent of the total, and game fish species decreased from 24 percent to 9 percent of the total.

Noteworthy is the capture of one smallmouth buffalo (approximately 4 pounds) from Lake Kemp in June 1958. This species is abundant in Lake Diversion, immediately below Lake Kemp, but has never, to the writer's knowledge, been taken from Lake Kemp.

Gill netting and seining failed to produce redfish and speckled trout of any size.

Lakes Eddleman and Graham

Lake Eddleman and Lake Graham were resurveyed in April 1959, in an effort to determine results of selective-kill treatments for control of shad and drum. Results of this survey are given in the Job Completion Report F-14-D-3, Job 16a-14. In order to avoid repetition of data, the reader is referred to the job completion report for information concerning this work.

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Date July 28, 1959

Table 1. Percentage Composition, Sex Ratios and Average Weights by Sex of Fishes by Gill Nets from Buffalo Lake, September 15 and 16, 1958.

Species	No. Taken	% of Total	Males				Females			
			No.	%	Total Wt.	Avg. Wt.	No.	%	Total Wt.	Avg. Wt.
Shad	145	58.94	56	38.62	42.71	.76	89	61.38	81.97	.92
Carpsucker	25	10.16	13	52.00	31.57	2.43	12	48.00	33.68	2.81
Carp	28	11.38	17	60.71	19.39	1.14	11	39.29	16.37	1.49
Goldfish	12	4.88	4	33.33	4.59	1.15	8	66.67	28.49	3.56
Cross	1	.41					1	100.00	3.75	3.75
Channel catfish	10	4.07	3	30.00	.97	.32	7	70.00	4.74	.68
White bass	1	.41					1	100.00	.63	.63
Crappie	24	9.75	7	20.17	3.09	.44	17	70.83	7.99	.47
Totals	246	100.00			102.31				161.24	

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Table 2. Percentage Composition by Weight and Mean Weights of Fishes Collected by Gill Nets from Buffalo Lake.

Species	Weight (lbs.)	% of Total Wt.	Mean Weight
Shad	124.68	47.31	.86
Carpsucker	65.24	24.75	2.61
Carp	35.76	13.57	1.28
Goldfish	16.71	6.34	1.39
Cross	3.75	1.42	3.75
Channel catfish	5.71	2.17	.57
White bass	.63	.24	.63
Crappie	11.07	4.20	.46
Totals	263.55	100.00	

Table 3. Numbers and Percentage Composition of Fish Species Collected in Gill Nets from Lake Kemp in June 1958, as Compared to Total Collections from June 1953 through May 1954.

Species	1953-1954 Number	1953-1954 % of Total	June 1958 Number	June 1958 % of Total
Spotted gar	40	4	7	1.7
Gizzard shad	222	22	67	16.7
Carpsucker	428	43	228	57.0
Carp	61	6	62	15.5
Channel catfish	39	4	10	2.5
White bass	79	8	19	4.8
Black bass	15	2	3	0.8
White crappie	111	10	3	0.8
Drum	8	1	0	0.0
Smallmouth buffalo	0	0	1	0.2
Total	1,003	100	400	100.0