Report of Fisheries Investigations

Basic Survey and Fish Inventory of Four Small Lakes of the Middle Nueces River

by

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Dingell-Johnson Project F-6-R-7, Job B-16
July 1, 1959 - December 31, 1959

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A B S T R A C T

The fish populations, chemical and physical features of two lakes and a portion of the Nueces River (in the northern part of Zavala County) were studied during this segment.

Rough fish, primarily gizzard shad (Dorosoma cepedianum), smallmouth buffalo (Ictiobus bubalus), gar (Lepisosteus sp.), and freshwater drum (Aplodinotus grunniens), were found to be dominant in the three bodies of water studied.

Adverse weather during this segment prevented much needed field work. Therefore, in order to complete the stated objectives, this job will be continued into the next segment.

Job Completion Report

State of TEXAS

Project No. F-6-R-7 Name: Fisheries Investigations and Surveys of the Waters of Region 8-B

Job No. B-16 Title: Basic Survey and Fish Inventory of Four Small Lakes of the Middle Nueces River

Period Covered: July 1, 1959 - December 31, 1959

OBJECTIVES

To determine the physical, chemical and ecological conditions and the fish populations in the Nueces River lakes in Zavala, Dimmit and La Salle Counties.

PROCEDURE

Tracings of the lakes studied during this period were made from aerial photographs obtained from the U. S. Department of Agriculture, ASC office in Carrizo Springs, and the U. S. Department of Agriculture SCS office in Crystal City.

Experimental gill nets (125-feet in length by 8-feet in depth with varying mesh sizes) were used to sample the fish populations; also, small mesh minnow seines were used in some instances. Netted specimens were weighed (in grams) and measured (in millimeters) in the field. Sex and state of sexual development were noted and recorded in the field. Also, stomachs were analyzed for food content.

Seined specimens were preserved in 10 percent formalin solution and taken to the regional fisheries laboratory for identification and tabulation.

Water samples were tested for M. O. alkalinity and pH. Turbidity readings, in terms of light penetration in inches measured with a Secchi disk, were made and recorded.

FINDINGS AND DISCUSSION

Comanche Lake

Comanche Lake, located about four miles southwest of Crystal City, Zavala County, is formed by an earth fill channel dam on Turkey Creek, a tributary of the Nueces River. This lake is used primarily for irrigation but it also serves the boating and fishing needs of the people in the area. Since most of the people who use this lake are local residents, no commercial development has taken place.

At the time this lake was visited (September 1959), it was full. The banks are sharply cut and lined with retama, ash, and willow.

Aquatic vegetation does not present a major problem in this lake since rough fish keep the water roiled and floodwaters clear out most of the vegetation that becomes established along the shoreline. Three types of aquatic vegetation were seen in this lake; duckweeds (Lemma sp.), cattails (Typha latifolia), and pondweed (Potamogeton sp.). In several still water areas, heavy growths of duckweeds were observed which will, in time, be ashed out by floodwaters.

Four experimental gill nets, totaling 500 feet of varying mesh sizes, were set over night in an effort to inventory the fish population. A total of 278 fish of 10 species was collected in the four nets.

Figure 1, which shows the number and percent of the ten species collected, reveals that gizzard shad (Dorosoma cepedianum) comprised over half of the total number of fish netted. The rough fish comprised 89.93 percent by number and game fish comprised 10.07 percent.

The seven species of rough fish comprised 94.30 percent by weight (see Figure 2). Smallmouth buffalo (Ictiobus bubalus) ranked number one by weight, comprising 31.98 percent. In one seining collection, 58 fish of four species and 5 freshwater shrimp were caught. Bluegills (Lepomis macrochirus) represented 86.21 percent of the fish taken. Thus, rough fish appear to be dominant both by number and by weight.

One water sample was analyzed for methyl orange alkalinity (126 p.p.m.) and pH (7.6). Insufficient chemicals prevented making tests for dissolved oxygen and carbon dioxide.

Turbidity readings, in terms of light penetration in inches measured with a Secchi disk, ranged from 11- to 14-inches. Four readings were made, one at each netting station.

Espantosa Lake

This lake is located downstream from Comanche Lake on Turkey Creek (or an old Nueces River channel). Espantosa Lake is also used for irrigation purposes in this area which is known locally as the "Winter Garden". The lake is formed by a concrete channel dam and was full at the time of this survey.

The shoreline of this lake, like Comanche, is lined with dense growths of retama, huisache, willow, mesquite, and live oak trees. Aquatic vegetation is sparse. Several small patches of Sagittaria sp. and Potamogeton sp. were found in the still water of several sloughs. However, the turbidity of this lake as compared with Comanche Lake was considerably less.

Four netting collections took a total of 113 fish of eight species. Rough fish were found to be dominant in this lake. They comprised 73.45 percent by number and 72.26 percent by weight, according to the netting samples. Figure 3 shows the numbers of fish collected in the nets and Figure 4 shows the weights of the fish.

One water sample was checked for methyl orange alkalinity and pH; the alkalinity was 162 p.p.m. and the pH 8.2. Secchi disk readings, which were made at the four netting stations, ranged from 29- to 44-inches with an average of approximately 40-inches.

Nueces River

In conjunction with the survey of Espantosa and Comanche Lakes, four netting and two seining collections were made on the Nueces River, north of Crystal City, in an effort to determine the status of the fish population in that portion of the river.

A total of 61 fish of eight species was collected in the four gill nets and 129 fish of seven species were collected in the two seining collections. On the basis of these netting collections, the game fish (crappie Pomoxis annularis and channel catfish Ictalurus punctatus) are more abundant in this portion of the river than in either Comanche or Espantosa Lakes. These two species comprised 44.26 percent by number and 33.07 percent by weight. Figure 5 shows the numbers of fish, by species, taken at each netting station, and Figure 6 shows the weight of the fish collected. According to the net catch, channel catfish ranked first by number and by weight. Gizzard shad appeared to be abundant in the river just as they are in Comanche and Espantosa Lakes. Several species of fish that were found in the lakes were not found in the river; one species, Texas grey redhorse (Moxostoma congestum) was not found in either lake but it was collected in the Nueces River. This species was recorded previously in the area (see Project F-6-R-3, Job B-1, Table 2, page 4).

The two seining collections produced evidence that indicates the presence of largemouth bass (Micropterus salmoides) in the river although none was taken in the nets. The speciman collected was a fingerling which would indicate that it was spawned in the summer. Tidewater silversides (Menidia beryllina) were the dominant species taken in the seining collections. They comprised over 60 percent of the collections. Redhorse shiners (Notropis lutrensis), parrot minnows (Pimephales vigilax), bluegills (Lepomis macrochirus), Rio Grande cichlids (Cichlasoma cyanoguttatum) and Gambusia (Gambusia affinis) accounted for approximately 40 percent of the fish collected.

Five Secchi disk readings were made at various places on the river; they ranged from 36½- to 48-inches. This relatively clear water should prove helpful in establishing a good bass population and fishery, provided the water level stays fairly constant.

The banks of the river resemble those of the lakes in this area in that they are sharp cut and are lined with pecan, live oak, willow, and wild mulberry trees. This part of the Nueces River, in Zavala County, flows in a general north-south direction. The width of the river, in northern Zavala County, ranges from less than 100-feet to over 300-feet.

CONCLUSIONS

The data gathered during this period, clearly indicates the abundance of rough fish present in the Nueces River as well as the two lakes studied. In view of the fact that these waters are subject to severe floods annually, renovation would not be feasible. Since Dimmit and Zavala Counties are included in the South Central Texas Regulatory Authority Area, Game Commission biologists recommended the use of hoop nets, trammel nets, and gill nets with meshes not less than three inches square in an effort to reduce the numbers of rough fish by utilizing these species.

Adverse weather conditions during most of this segment prevented field work on this job. Only three field trips were made concerning work on this job; one was a mapping trip and the other two were for the purpose of netting, seining, etc. In order to complete the mapping and field work, as stated in the Job Description, this job will be continued into the next segment.

Prepared by Charles T. Menn
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Approved by Marion Toole
Director Inland Fisheries Division

Date July 1, 1960

Figure 1. Numbers of fish collected in experimental gill nets, from Comanche Lake, September 1959

Species	Stations				Total	Percent
	1	2	3	4		
Lepisosteus spatula	0	1	0	0	1	0.36
Lepisosteus productus	4	5	3	2	14	5.04
Lepisosteus osseus	10	12	12	9	43	15.47
Dorosoma cepedianum	32	77	24	14	147	52.87
Ictiobus bubalus	3	15	6	6	30	10.79
*Ictalurus punctatus	2	1	3	2	8	2.88
*Lepomis microlophus	0	2	0	0	2	0.72
Lepomis macrochirus	0	3	0	0	3	1.08
*Pomoxis annularis	1	9	4	4	18	6.47
Aplodinotus grunniens	3	2	5	2	12	4.32
Total	55	127	57	39	278	100.00

Percent game fish 10.07

Percent rough fish 89.93

* indicates game fish

Figure 2. Grams of fish collected in experimental gill nets, from Comanche Lake, September 1959

Species	Stations				Total	Percent
	1	2	3	4		
Lepisosteus spatula	0	8,138	0	0	8,138	6.87
Lepisosteus productus	2,783	4,410	1,357	1,474	10,024	8.46
Lepisosteus osseus	6,405	7,644	9,039	8,537	31,625	26.70
Dorosoma cepedianum	4,995	9,556	4,082	2,988	21,621	18.26
Ictiobus bubalus	3,742	14,392	6,381	13,354	37,869	31.98
*Ictalurus punctatus	778	482	939	2,177	4,376	3.69
*Lepomis microlophus	0	73	0	0	73	0.06
Lepomis macrochirus	0	115	0	0	115	0.10
*Pomoxis annularis	152	988	470	696	2,306	1.95
Aplodinotus grunniens	532	345	1,029	380	2,286	1.93
Total	19,387	46,143	23,297	29,606	118,433	100.00

Percent game fish 5.70

Percent rough fish 94.30

* indicates game fish

Figure 3. Numbers of fish collected in experimental gill nets, from Espantosa Lake, December 1959

Species	Stations				Total	Percent
	1	2	3	4		
Lepisosteus productus	1	3	2	6	12	10.62
Lepisosteus osseus	0	4	8	6	18	15.93
Dorosoma cepedianum	0	26	9	2	37	32.75
Ictiobus bubalus	2	3	9	1	15	13.27
*Ictalurus punctatus	0	4	10	9	23	20.36
*Micropterus salmoides	0	1	0	0	1	0.88
*Pomoxis annularis	0	1	3	2	6	5.31
Aplodinotus grunniens	0	0	0	1	1	0.88
Total	3	42	41	27	113	100.00

Percent game fish 26.55

Percent rough fish 73.45

* indicates game fish

Figure 4. Grams of fish collected in experimental gill nets, from Espantosa Lake, December 1959

Species	Stations				Total	Percent
	1	2	3	4		
Lepisosteus productus	1,418	1,575	390	3,237	6,620	13.66
Lepisosteus osseus	0	2,835	4,591	3,236	10,662	22.01
Dorosoma cepedianum	0	2,317	1,258	145	3,720	7.68
Ictiobus bubalus	2,438	1,074	6,833	2,211	12,556	25.93
*Ictalurus punctatus	0	1,482	6,120	3,502	11,104	22.92
*Micropterus salmoides	0	1,247	0	0	1,247	2.57
*Pomoxis annularis	0	181	521	390	1,092	2.25
Aplodinotus grunniens	0	0	0	1,446	1,446	2.98
Total	3,856	10,711	19,713	14,167	48,447	100.00

Percent game fish 27.74

Percent rough fish 72.26

* indicates game fish

Figure 5. Numbers of fish collected in experimental gill nets, Nueces River, north of Crystal City, Zavala County, September 1959

Species	Stations				Total	Percent
	1	2	3	4		
Lepisosteus productus	1	2	1	2	6	9.84
Lepisosteus osseus	1	4	2	3	10	16.39
Dorosoma cepedianum	2	2	0	9	13	21.31
Ictiobus bubalus	0	1	0	0	1	1.64
Moxostoma congestum	2	0	0	0	2	3.28
*Ictalurus punctatus	9	2	3	3	17	27.87
*Pomoxis annularis	1	4	1	4	10	16.39
Aplodinotus grunniens	0	1	1	0	2	3.28
Total	16	16	8	21	61	100.00

Percent game fish 44.26

Percent rough fish 55.74

* indicates game fish

Figure 6. Grams of fish collected in experimental gill nets, Nueces River, north of Crystal City, Zavala County, September 1959

Species	Stations				Total	Percent
	1	2	3	4		
Lepisosteus productus	227	3,549	567	485	4,828	20.46
Lepisosteus osseus	365	1,998	1,049	1,691	5,103	21.62
Dorosoma cepedianum	369	191	0	710	1,270	5.38
Ictiobus bubalus	0	2,211	0	0	2,211	9.37
Moxostoma congestum	1,163	0	0	0	1,163	4.93
*Ictalurus punctatus	4,061	517	1,160	966	6,704	28.41
*Pomoxis annularis	145	384	143	427	1,099	4.66
Aplodinotus grunniens	0	652	567	0	1,219	5.17
Total	6,330	9,502	3,486	4,279	23,597	100.00

Percent game fish 33.07

Percent rough fish 66.93

* indicates game fish

CORRECTION SHEET

Job Completion Report

State of TEXAS

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Job No. B-16 Title: Basic Survey and Fish Inventory of Four Small Lakes of the Middle Nueces River

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That portion of the sixth paragraph, Page 3, which reads "...Game Commission biologists recommended the use of hoop nets, trammel nets, and gill nets...", should read Game Commission biologists recommended the use of gill nets ....

The captions for Figures 3 and 4, Pages 7 and 8, which reads "...December 1959" should read ...September 1959.