

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-8, Job B-16
January 4, 1960 - December 31, 1960

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A B S T R A C T

Three lakes and a portion of the Nueces River (in the northern part of Zavala County) were studied during this segment and the preceding segment.

Rough fish, primarily gizzard shad, Dorosoma cepedianum, small-mouth buffalo, Ictiobus bubalus, gar, Lepisosteus sps., and freshwater drum, Aplodinotus grunniens, were predominant in all of the waters studied.

The irregular water supply and silt bottom strongly favors rough fish species. Floods in the spring and fall are common and for this reason, no renovation work is recommended.

Job Completion Report

State of TEXAS

Project No. F-6-R-8

Job No. B-16

Name: Fisheries Investigations and Surveys
of the Waters of Region 8-B.

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

Period Covered:

January 4, 1960 - December 31, 1960

OBJECTIVES

To determine the physical, chemical and ecological conditions and the fish populations in the Nueces River Lakes in Zavala, Dimmit and LaSalle Counties.

PROCEDURE

During the study period tracings were made from aerial photographs of Comanche, Espantosa, and Bermuda Dam Lakes. Time did not permit similar work for Holland Lake.

The aerial photographs were traced at the Carrizo Springs office of the U.S.D.A. Soil Conservation Service. Because of the large scale (1 inch = 660 feet), it was considered too expensive to make reductions small enough for inclusion in this report. The tracings are on file for future use at the project headquarters.

Fish populations in Comanche, Espantosa and Holland Lakes were sampled with experimental gill nets, 125 feet in length and eight feet deep with mesh sizes varying from one to three inches. Seine collections were made with a $\frac{1}{4}$ -inch mesh, 20- by 4-foot nylon straight seine.

Netted specimens were weighed and measured in the field and sex and stage of sexual maturity were also recorded for the individual specimens. Stomachs of carnivorous specimens were examined for food contents in the field and seined specimens were preserved in 10 percent formalin solution for later identification in the laboratory.

FINDINGS AND DISCUSSION

A checklist of fish species taken in collections from the Middle Nueces River during the period from July, 1959 through December, 1960, is given in Table 1. The results of seining and netting collections are given in Table 2 and the locations of the collection stations are given on the attached map.

The results of water analyses for each station, including M. O. alkalinity and pH, were recorded. Turbidity was recorded in terms of Secchi disc readings. These records are on file at the regional fisheries laboratory at Mathis, Texas.

Comanche Lake

Comanche Lake was originally visited in September, 1959, when netting collections of fish and water analyses were made (See report for Job B-16, Project F-6-R-7). Because the fish population was thought to have been altered by extensive flooding in October, 1959, the lake was revisited in July, 1960. The results of two netting collections of specimens taken at locations previously collected are given in Table 3. No significant change was noted in the fish population.

Aquatic vegetation found during the 1959 visit was apparently removed by the flood since none was found during July, 1960. The water was quite turbid at that time when a Secchi disc reading of only 10 inches was recorded. No submerged vegetation was observed.

Only two anglers and one commercial fisherman were seen on Comanche Lake during the July, 1960, trip. The local game warden reported that the commercial fishermen had been taking large numbers of rough fish, primarily smallmouth buffalo, Ictiobus bubalus, but test nets continue to indicate this species to be very abundant.

As previously indicated the lake is used primarily for irrigation of farm crops. The irregular water supply, in the form of surface runoff, plus the silt bottom favor the rough fish species including gars, smallmouth buffalo, freshwater drum, and catfishes.

Espantosa Lake

Since Espantosa Lake is located downstream from Comanche Lake it also was netted in July, 1960. As found in the case of Comanche Lake, there was no appreciable change in the fish population compared with the results of netting in September, 1959. Rough fish species comprised 94.12 percent of the number of fish netted and 99.00 percent of their weight. Smallmouth buffalo alone constituted 48.37 percent of the weight of the fish collected. With the exception of two small fish, the buffaloes weighed from a pound to over five pounds each. The results of the netting are given in Table 4.

Turbidity readings made with a Secchi disc ranged from 28- to 40-inches at the netting stations. Espantosa Lake is much clearer than Comanche and could probably support good black bass, Micropterus salmoides, and white crappie, Pomoxis annularis, populations. Unfortunately annual floods and excessive drawdown for irrigation during the dry spells have prevented the development of good game fish populations in this lake.

Holland Lake

Holland Lake is located approximately 16 miles southeast of Cotulla in LaSalle County, Texas, on a portion of the Nueces River which flows in a northeasterly direction. Formed by a concrete channel dam, it resembles the other lakes of the area and its main purpose is to retain water for irrigation of farm crops.

The sharply cut banks of the lake are lined with pecan, willow, live oak and wild mulberry trees.

The only aquatic vegetation seen in the lake was very little duckweed, Lemna sp., scattered through large areas of water fern, Azolla caroliniana. One area, approximately five acres in size, was completely blanketed with the fern. This was in the main part of the lake and more than likely the vegetation will be washed over the dam.

Analysis of surface water samples showed methyl orange alkalinity to range from 130 to 180 parts per million. The pH was in excess of 8.8. Turbidity was measured in terms of Secchi disc readings. These ranged from 12 to 15 inches.

In two netting collections (Table 5), it was found that rough fish species comprised 67.73 percent of the number of fish netted and 85.67 percent of their weight. Smallmouth buffalo alone accounted for more than 72 percent of the weight of fish taken in nets. The most abundant game fish species netted were channel catfish, Ictalurus punctatus, and white crappie. No largemouth bass were taken in nets.

Because of the sharply cut banks no seining collections could be made in Holland Lake.

Bermuda Dam Lake

Bermuda Dam is located on the Nueces River about five miles south of the State Highway 85 crossing. The lake it impounds is similar to the other lakes in that it is a channel dam impoundment. It was not netted because no access road to the lake itself could be located and no boat launching lake was found. There is a private road leading to the dam, however, and a seining collection of 73 specimens was made below it (Table 6).

CONCLUSIONS

During the course of this job only 14 anglers and one commercial fisherman were seen on the four lakes studied. Rough species, primarily smallmouth buffalo, gars, shad and drum, are predominant in all the lakes. Since severe floods are likely to occur annually, renovation would not be feasible. Dimmit and Zavala Counties are included in the South Central Texas Regulatory Authority Area and it has been recommended that the use of gill nets with meshes not less than three inches square be allowed in an effort to reduce the numbers of rough fish by utilizing these species.

The aerial photographs of the lakes studied are not included in this report due to the fact that they are too bulky. However, these maps will be kept at this office for future use.

Adaptations of county highway maps are used in this report to show locations of netting and seining stations. Numbers followed by a small "s" indicate seining station, others represent netting stations.

RECOMMENDATIONS

No developmental work such as complete or partial removal of fish in any of the lakes studied is recommended since these waters are subject to floods once or twice a year. Periodic floods serve as a natural control on the aquatic vegetation in the lakes.

Largemouth bass should be stocked in the Nueces River north of Crystal City, above FM Highway 1025. A good black bass population was present in this portion of the river before the drought and it is felt that restocking would restore the population. Only one black bass fingerling was taken in a seining collection in this area. This indicates

a few bass are present but additional stocking should speed their restoration. Sufficient cover and food are available in this portion of the river and bass, if stocked should provide much recreation for the anglers in the area. Five Secchi disc readings were made at various places on this portion of the river; they ranged from $36\frac{1}{2}$ to 48-inches.

Future work relative to recommending changes in the fishing regulations in Dimmit and Zavala Counties, etc., will be done under the reconnaissance job (F-6-R, Job B-20).

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Approved by Marion Toole
Director Inland Fisheries Division

Date March 3, 1961

Table 1. A checklist of fish species from middle Nueces River.

Common name	Scientific name
Alligator gar	<u>Lepisosteus spatula</u>
Spotted gar	<u>Lepisosteus productus</u>
Longnose gar	<u>Lepisosteus osseus</u>
Gizzard shad	<u>Dorosoma cepedianum</u>
Smallmouth buffalo	<u>Ictiobus bubalus</u>
Grey redhorse	<u>Moxostoma congestum</u>
Pugnose minnow	<u>Opsopoeodus emiliae</u>
Redhorse shiner	<u>Notropis lutrensis</u>
Parrot minnow	<u>Pimephales vigilax</u>
Channel catfish	<u>Ictalurus punctatus</u>
Black bullhead	<u>Ictalurus melas</u>
Gambusia	<u>Gambusia affinis</u>
Tidewater silversides	<u>Menidia beryllina</u>
Largemouth bass	<u>Micropterus salmoides</u>
Redear sunfish	<u>Lepomis microlophus</u>
Bluegill sunfish	<u>Lepomis macrochirus</u>
White crappie	<u>Pomoxis annularis</u>
Freshwater drum	<u>Aplodinotus grunniens</u>
Rio Grande cichlid	<u>Cichlasoma cyanoguttatum</u>

Table 2. Numbers of specimens taken in netting and seining collections, Nueces River, July 1959 - December 1960.

Species	Stations															Totals				
	1	1s	2	2s	3	4	5	5s	6	7	8	9	10	11	12		13	14	15s	
Alligator gar	1																			1
Spotted gar	1		2		1	2	10	1	5	3	2	3	17	2	6	1	1			56
Longnose gar	1		4		2	3	15	12	12	11	11	2	7	8	6	4	1			83
Gizzard shad	2		2			9	49	77	24	18	18	6	27	9	2	4	16			223
Smallmouth buffalo			1				7	15		10				9	1	9	16			96
Grey redbhorse	2																	9		2
Pugnose minnow																		58		9
Redhorse shiner						7														65
Parrot minnow		1																		1
Channel catfish	9		2		3	3	4		1	3	8		6	10	9	4	5			67
Black bullhead																	1			1
Gambusia		11					1											2		33
Tidewater silverside		15					6											3		87
Largemouth bass						63	1						1							2
Redear sunfish						1							1							3
Bluegill						4														67
White crappie	1	7	4		1	4	1	50	3	4	9	8	1	3	2	1	5			52
Freshwater drum			1		1		2	1	9	5	56	1	1		1	2	2			113
Rio Grande cichlid		1							2											1
Totals	16	35	16	94	8	21	118	58	127	57	114	19	77	41	27	23	38	73		962

Table 3. Results of collections with experimental gill nets, Comanche Lake, July, 1960.

Species	Numbers of fish collected			Percent of total number	Weights of fish collected (grams)			Percent of total weight
	Stations				Stations			
	1	2	Total		1	2	Total	
Spotted gar	6	0	6	4.34	3,099	0	3,099	5.25
Longnose gar	5	2	7	5.07	3,911	6,152	10,063	17.05
Gizzard shad	17	4	21	15.22	2,878	666	3,544	6.00
Smallmouth buffalo	4	4	8	5.80	3,719	6,653	10,372	17.58
Channel catfish*	2	6	8	5.80	231	5,276	5,507	9.33
White crappie*	1	5	6	4.34	261	361	622	1.05
Freshwater drum	28	54	82	59.43	7,016	18,788	25,804	43.74
Totals	63	75	138	100.00	21,115	37,896	59,011	100.00
Percent game fish				10.14				10.38
Percent rough fish				89.86				89.62

*Indicates game fish species

Table 4. Results of collections with experimental gill nets, Espantosa Lake, July 1960.

Species	Numbers of fish collected			Percent of total number	Weights of fish collected (grams)			Percent of total weight
	Stations		Total		Stations		Total	
	1	2			1	2		
Spotted gar	2	14	16	31.37	430	6,877	7,307	22.92
Longnose gar	2	3	5	9.80	1,815	1,928	3,743	11.74
Gizzard shad	0	1	1	1.96	0	132	132	0.41
Smallmouth buffalo	4	13	17	33.34	3,147	12,268	15,415	48.37
Channel catfish*	0	2	2	3.92	0	299	299	0.93
Redear sunfish*	0	1	1	1.96	0	0	25	0.07
Freshwater drum	8	1	9	17.65	4,560	399	4,959	15.56
Totals	16	35	51	100.00	9,952	21,928	31,880	100.00
Percent game fish				5.88				1.00
Percent rough fish				94.12				99.00

*Indicates game fish species

Table 5. Results of collections with experimental gill nets, Holland Lake, December 1960.

Species	Numbers of fish collected			Percent of total number	Weights of fish collected (grams)			Percent of total weight
	Stations		Total		Stations		Total	
	1	2			1	2		
Spotted gar	1	1	2	3.22	0	152	152	0.42
Gizzard shad	4	0	4	6.45	638	0	638	1.76
Smallmouth buffalo	9	16	25	40.33	6,855	19,324	26,179	72.57
Channel catfish*	4	5	9	14.52	2,421	740	3,161	8.77
Black bullhead	0	1	1	1.61	0	242	242	0.67
Bluegill	1	1	2	3.22	106	45	151	0.41
White crappie*	2	9	11	17.75	441	1,568	2,009	5.56
Freshwater drum	2	6	8	12.90	854	2,695	3,549	9.84
Totals	23	39	62	100.00	11,315	24,766	36,081	100.00
Percent game fish				32.27				14.33
Percent rough fish				67.73				85.67

*Indicates game fish species

Table 6. Seining results, Nueces River below Bermuda Dam, December 1960.

Species	Numbers collected	Percent of total
Pugnose minnow	9	12.32
Redhorse shiner	58	79.49
Gambusia	2	2.73
Tidewater silverside	3	4.10
Bluegill	1	1.36
Totals	73	100.00



