

Mr. Wilke

FILE

Report of Fisheries Investigations
Experimental Control of Undesirable Species in Lakes of Region 4-B

by

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Dingell-Johnson Project F-4-R-7, Job E-5
November 1, 1959 - October 31, 1960

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A B S T R A C T

The development of equipment and methods for control of undesirable species has been continued on Clear Lake in Leon County, Texas. This is the site of the gar control work of two previous segments and was selected because of the high gar population.

The first two segments were devoted to construction and testing of traps and nets designed to take gar with little damage to game species. These include traps that require a sharp turn in the escape route, which allows game species to pass but restrains the gar, and shallow gill nets. These gill nets take advantage of the need for the gar to surface to gulp air. Hoop nets with leads set gang net fashion were to have been tested but were not obtained.

The results of netting with shallow gill nets (3-feet deep) during the previous segment indicated that they would be effective as gar controls because the percentage of game fish taken was 15.45 percent while gars made up 39.02 percent of the total. The results of the present segment show that the shallow gill nets took 39.83 percent game fish along with 32.36 percent gars. The eight foot nets took a higher percentage of gars during the 1959-1960 segment than in the previous segment but the percentage rise in the game fish take was slight.

An attempt at gar control by locating winter concentrations will be attempted. A check of the bottom was made by use of a fathometer during hot weather and another check will be made in cold weather. Any concentrations of gar will be treated with fish toxicant or explosives in an attempt to reduce the gar populations.

Segment Completion Report

State of Texas

Project No. F-4-R-7

Name: Fisheries Investigations and Surveys of
the Waters of Region 4-B.

Job No. E-5

Title: Experimental Control of Undesirable
Species in Lakes of Region 4-B.

Period Covered:

November 1, 1959 - October 31, 1960

OBJECTIVES

To develop methods of selectively controlling undesirable fish species and the improvement of gear for rough fish control.

PROCEDURE

The site of work on this job was the same as for the three previous segments. Clear Lake, in Leon County, contains a large population of alligator gar (Lepisosteus spatula), spotted gar (L. productus), and longnose gar (L. osseus) as well as a rather large population of game species. Many rough fish are present in this lake which is subject to overflow from the Trinity River in flood times.

The first two segments of this job were devoted to construction and testing traps which were designed to allow the game fish to pass through while preventing the escape of the gar. These traps were based on the inability of the gar to execute a right angle turn. These traps were not effective and were abandoned.

Hoopnets with leads were to have been set in gang-net fashion but difficulty in obtaining this type of gear has prevented such an experiment.

The use of gill nets, three feet deep, was indicated by the success of this type of net during the previous segment. These nets were floated and were designed to take advantage of the need for the gar to surface to gulp air. They were used in conjunction with the eight foot nets to provide comparative data for the evaluation of their effectiveness.

The catch of each net was kept separate and weights, lengths, and sexual maturity data were recorded.

RESULTS

Net collections were made with 5,200 feet of shallow (3-foot deep) and 2,600 feet of deep (8-foot deep) gill nets. The results of these collections are compared with the catch of 2,200 feet of shallow nets and 1,200 feet of deep nets that were used during the 1958-1959 segment period (Table 1). The most significant change in the composition of the net catch was in the numbers of gizzard shad (Dorosoma cepedianum) and white crappie (Pomoxis annularis). In the 1958-1959 segment, shad made up 34.15

percent of the 3-foot net catch and 36.18 percent of the fish taken by the 8-foot net. In the 1959-1960 segment shad amounted to 14.52 percent of the 3-foot net catch and 21.57 percent of the 8-foot net collections. The 1958-1959 collections showed white crappie making up 1.63 percent of the 3-foot net catch and 5.69 percent of the fish from the 8-foot nets. In the 1959-60 segment, crappie composed 28.22 percent of the fish taken in 3-foot nets and 27.17 percent of those taken in 8-foot nets.

The 3-foot deep nets are not as effective in gar control as the results of the 1958-1959 netting would indicate. The data presented in Table 1 shows that the catch of gar in the 3-foot nets in the 1958-1959 segment was 39.02 percent while gar made up only 32.36 percent of the catch of these nets in the 1959-60 segment. The catch of gar in the 8-foot nets rose which would indicate that the fault was with the shallow nets rather than a reduction of the gar population. There is a possibility that gar learn to avoid the shallow nets by diving under them and are caught by the deeper nets. This would not account for the rise in the percentage of game fish taken in the three-foot nets. Game fish made up 15.45 percent of the catch of the three-foot nets in 1958-1959 but rose to 39.83 percent in the 1959-1960 netting. There was a slight rise in the percentage of game fish taken by the 8-foot nets but the rise was much less pronounced.

The data presented in Table 2 takes into consideration the differences in the depths of the nets. Here the catch per 100 linear feet and per 100 square feet of net is compared. The 3-foot nets took 0.73 gar per 100 square feet during the 1958-59 netting but caught only 0.46 gar per 100 square feet in 1959-60. The deeper nets showed a catch of 0.56 gar per 100 square feet in 1958-59 while the 1959-60 catch was 0.60 gar per 100 square feet.

Table 2 further shows that the catch of game fish per 100 square feet of shallow net was 0.29 in 1958-59 but rose to 0.57 in 1959-60. The deep nets showed a drop from 0.66 in 1958-59 to 0.60 in 1959-60. This drop is not significant except to indicate that the increase in catch by the shallow nets was not due to an explosion of the game fish population.

The results of the work done during this segment are not conclusive but do appear to indicate that the shallow gill net is not an effective means of controlling gar without great damage to game species. Further work should be done to find a satisfactory method of control and with this in mind a fathometer check of the lake bottom was made on September 22, 1960. The purpose of this check was to prepare a chart of the bottom that would indicate the presence of any concentrations of debris that could be confused with a large number of gar that might collect during the colder months. There have been numerous reports that gar do collect in large numbers, in winter, and if they are located may be killed by explosives or chemicals which are pumped into the concentration. This search of the bottom did not reveal any such debris and a second chart will be made to locate gar concentrations if they exist.

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Table 1. A Comparison of Clear Lake
1958 - 1959

Species	3-foot deep nets		8-foot deep nets		Totals	
	Number	Percent	Number	Percent	Number	Percent
Alligator gar*	4	3.25	17	6.91	21	5.66
Spotted gar*	21	17.07	14	5.69	34	9.46
Longnose gar*	23	18.70	23	9.35	46	12.47
Gizzard shad*	42	34.15	89	36.18	131	35.56
Smallmouth buffalo*	11	8.94	29	11.79	40	10.81
River carpsucker*	2	1.63	8	3.25	10	2.71
Carp*			1	0.41	1	0.27
Channel catfish**	17	13.82	43	17.48	60	16.26
Striped mullet*	1	0.81	1	0.41	2	0.54
White bass**			1	0.41	1	0.27
Largemouth bass**			2	0.81	2	0.54
Bluegills**			2	0.81	2	0.54
White crappie**			14	5.69	16	4.34
Black crappie**	2	1.63	2	0.81	2	0.54
Freshwater drum*						
Totals	123	100.00	246	100.00	369	100.00
Total rough fish*	104	84.55	182	73.99	286	77.51
Total game fish**	19	15.45	64	26.01	83	22.49
Total gar fish	48	39.02	54	21.95	102	27.65

Table 2. Comparison of the catches of shallow and deep types of gill nets at Clear Lake.

	Shallow gill nets (100' X 3')		Deep gill nets (100' X 8')	
	1958-59 (22 nets)	1959-60 (52 nets)	1958-59 (12 nets)	1959-60 (26 nets)
Total fish caught	123	241	246	357
Fish per 100 linear feet	5.59	4.64	20.50	13.73
Fish per 100 square feet	1.86	1.55	2.56	1.72
Total gars caught	48	78	54	124
Gars per 100 linear feet	2.18	1.50	4.50	4.77
Gars per 100 square feet	0.73	0.50	0.56	0.60
Total game fish caught	19	96	64	124
Game fish per 100 linear feet	0.86	1.85	5.33	4.77
Game fish per 100 square feet	0.29	0.62	0.67	0.60
Total rough fish caught*	104	145	182	233
Rough fish per 100 linear feet	4.73	2.79	15.17	8.96
Rough fish per 100 square feet	1.58	0.93	1.90	1.12

* Includes gars