Report of Fisheries Investigations

Experimental Control of Undesirable Species

by

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Dingell-Johnson Project F-4-R-6, Job E-5
November 1, 1958 - October 31, 1959

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Segment Completion Report

State of TEXAS

Project No. F-4-R-6 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, 1958 - October 31, 1959

Abstract:

A floating weir and a trap of poultry wire over a wood frame were constructed and tested during the previous segments along with a shallow gill net. Only the gill net was successful and was given a more thorough test during this segment.

Gill net sets consisting of 2200 feet of the three foot nets and 1200 feet of the eight foot nets were set in Clear Lake. These sets were made by using shallow nets and deep nets in the same location in order to make a comparison of their respective catches.

The deep nets caught more fish and took more gar per 100 feet of gill net, but the shallow nets caught a greater percentage of both gar and other rough species. The catch of game fish was much less in the shallow nets, where only 0.54 game fish were taken per 100 feet of net. The deeper, eight foot nets took 5.33 game fish per 100 feet.

Objectives:

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

Procedure:

Clear Lake in Leon County was the site of the previous segments of this job and was again selected because, along with other rough fish, it contains a large population of three species of gar.

The two previous segments of this job were devoted to the construction and testing of devices designed to selectively take gar. A floating weir was built but was not successful. A trap, made of poultry wire over a wood frame, was also constructed and tested. This trap was designed to permit the escape of game species while retaining the gar. This was to be accomplished by a right angle turn in the escape route. The gar are unable to negotiate this sharp turn while other species do not have this trouble. This trap was no more successful than the floating weir and was also abandoned.

Hoop nets with leads, set in gang net fashion, were not tested since they were not obtained. One such net was borrowed but not in time for use in this project.

The lack of time prevented experimental work on baiting undesirable species into netting areas as well as specialized studies of undesirable species such as carp, buffalo, gar, suckers and shad.

The only equipment, developed during the previous segments, that appeared to offer a solution to the problem was the shallow gill net. This device was given a fairly thorough test during this segment with comparative net sets made with the eight foot gill nets.

The shallow gill nets were three feet deep and were floated at the surface. They were set in 200 foot lengths at right angles with the shore but were never set completely across the lake. The eight foot deep gill nets were also set at the surface and in the same vicinity but were only 100 feet in length.

Excessive rains produced overflows that reduced the number of net trips to five. These were made in January, March, April, July and August of 1959.

The catch of each type of net was kept separate upon removal from the net and length, weight, sexual development and food habits data were recorded for each collection of specimens.

Results:

The original plan called for the use of the shallow, or three feet deep, gill net on a rather continuous basis. It was soon learned that the size of the catch of a net set in a given location diminished after the first night of netting. By the third night the net took few fish and it became necessary to change the location of the net.

In all a total of 369 fish were taken in 3,400 feet of gill netting. This consisted of 2,200 feet of net, three feet deep, and 1,200 feet of net eight feet deep. The mesh size for both types of net was $1\frac{1}{2}$ inches square mesh.

The majority of the total fish taken were considered undesirable or rough fish. Only 22.49 percent of the total catch consisted of game fish. Three species of gar composed 27.65 percent of the total catch and gizzard shad comprised another 35.5 percent. The other 14.36 percent consisted of other rough fish species (Table 1).

Table 2 presents a breakdown by species of the fish taken in the shallow, three feet deep, gill nets and Table 3 gives similar data for the fish taken in the deeper, eight feet, deep, nets. The total catch of the eight foot net was greater in that 246 fish, or 63.66 percent of all fish taken in both types of nets, were taken in this kind of net.

Though the deep type of net caught more fish, the shallower, three feet deep net was more selective in taking rough fish species. Rough fish comprised 90.24 percent of the total catch of the shallow type of net (Table 2) and 73.99 percent of the catch in the deeper net (Table 3). In comparing the catch of the two types of net in regard to their selectivity for garfish, 39.02 percent of the fish taken in the shallow net were gars (Table 2) while 21.95 percent of the fish caught in the deeper net were gars (Table 3).

Channel catfish were taken in both types of nets more frequently than other game species but comprised only 8.13 percent of the catch of the shallower net and 17.48 percent of the catch of the deeper net.

Other game species, specifically white bass, largemouth bass, bluegills and black crappie were not taken in the shallower type of net (Table 2).

A comparison of the catch of the two types of net per 100 linear feet shows the deeper (8 feet deep) net to be more productive in taking fish in that 20.5 fish per 100 feet were caught while the shallower type of gill net took only 5.59 fish per 100 feet (Table 4). Similarly the rate of catch per 100 square feet also shows the deeper net to be more productive. It took 2.56 fish per 100 square feet compared to only 1.86 fish per 100 square feet in the shallower net. In like manner the rate of catch of gars was greater in the deeper gill net since 4.5 gar were taken per 100 linear feet compared with only 2.18 gar per 100 linear feet in the shallow net (Table 4). However, the rate of catch of gars per 100 square feet of the two types of net shows the deeper net to be only slightly superior to the shallower net in that they took 0.82 and 0.73 gars per 100 square feet respectively.

The deeper type of gill net caught 5.33 game fish per 100 linear feet of gill net while the shallower net took only 0.54 game fish per 100 linear feet. In other words the 8 foot deep net took nearly ten times as many game fish per 100 feet of net than did the shallow, 3 foot deep net. On the basis of 100 square feet, the shallow type of gill net took only 0.18 game fish compared with 0.66 game fish taken in the deeper net (Table 4).

Summing up it seems indicated by comparing the catches of both types of net that while the deeper net catches more gar fish it also takes proportionately greater numbers of game fish than does the shallow net. Therefore it is concluded that the shallow type of net is somewhat better fitted to the task of removing gars from a body of water, especially if it is desirable that few game fish be destroyed.

The need for further study of the shallow gill net in other locations is indicated.

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Table 1. Number and Percentage of Various Species Taken in Gill Nets from Clear Lake, November 1, 1958 - October 31, 1959

1959 Species	January No.	January Percent	March No.	March Percent	April No.	April Percent	July No.	July Percent	August No.	August Percent	Total No.	Total Percent
Alligator gar	2	5.88	1	10.00	5	2.88	7	12.50	6	6.32	21	5.69
Spotted gar	1	2.94	3	30.00	15	8.62	10	17.84	6	6.32	35	9.49
Longnose gar			1	10.00	12	6.89	15	26.78	18	18.94	46	12.47
Gizzard shad			3	30.00	113	64.94			15	15.79	131	35.50
Smallmouth buffalo	2	5.88			12	6.89	9	16.07	17	17.90	40	10.84
River carpsucker					1	0.58	1	1.79	8	8.42	10	2.71
Carp									1	1.05	1	0.27
Channel catfish	17	50.00	2	20.00	15	8.62	8	14.29	18	18.94	60	16.26
Striped mullet							1	1.79	1	1.05	2	0.54
White bass	1	2.94									1	0.27
Largemouth bass					1	0.58	1	1.79			2	0.54
Bluegill sunfish									2	2.11	2	0.54
White crappie	10	29.42					3	5.36	3	3.16	16	4.34
Black crappie	1	2.94					1	1.79			2	0.54
Totals	34	100.00	10	100.00	174	100.00	56	100.00	95	100.00	369	100.00

Table 2. Number and Percentage of Various Species Taken by Gill Nets Three Feet Deep, in Clear Lake, January 1959 through August 1959.

No. 100' Nets Set	2		2		6		4		8		22	
Month	January		March		April		July		August		Total	
Species	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Alligator gar	-	-			1	1.45	2	10.52	1	3.12	4	3.25
Spotted gar	-	-	1	33.33	11	15.95	6	31.58	3	9.38	21	17.07
Longnose gar	-	-			7	10.14	8	42.11	8	25.00	23	18.70
Gizzard shad	-	-	2	66.67	40	57.97					42	34.15
Smallmouth buffalo	-	-			3	4.35			8	25.00	11	8.94
River carpsucker	-	-							2	6.25	2	1.63
Carp	-	-									7	5.69
Channel catfish	-	-			7	10.14	2	10.52	8	25.00	10	8.13
Striped mullet	-	-					1	5.27			1	0.81
White crappie	-	-							2	6.25	2	1.63
Totals	-	-	3	100.00	69	100.00	19	100.00	32	100.00	123	100.00

Table 3. Number and Percentage of Various Species Taken by Gill Nets Eight Feet Deep, in Clear Lake, January 1959 through August 1959.

No. 100' Nets Set	2		1		3		2		4		12	
Month	January		March		April		July		August		Totals	
Species	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Alligator gar	2	5.88	1	14.28	4	3.81	5	13.51	5	7.93	17	6.91
Spotted gar	1	2.94	2	28.58	4	3.81	4	10.81	3	4.77	14	5.69
Longnose gar			1	14.28	5	4.77	7	18.92	10	15.88	23	9.35
Gizzard shad			1	14.28	73	69.52			15	23.81	89	36.18
Smallmouth buffalo	2	5.88			9	8.57	9	24.31	9	14.28	29	11.79
River carpsucker					1	0.95	1	2.71	6	9.53	8	3.25
Carp									1	1.58	1	0.41
Channel catfish	17	50.00	2	28.58	8	7.62	6	16.21	10	15.88	43	17.48
Striped mullet									1	1.58	1	0.41
White bass	1	2.94									1	0.41
Largemouth bass					1	0.95	1	2.71			2	0.81
Bluegill sunfish									2	3.18	2	0.81
White crappie	10	29.42					3	8.11	1	1.58	14	5.69
Black crappie	1	2.94					1	2.71			2	0.81
Totals	34	100.00	7	100.00	105	100.00	37	100.00	63	100.00	246	100.00

Table 4. Comparison of the Catches of the Shallow (3 feet deep) and Deep (8 feet deep) Types of Nets used During the Period January through August 1959.

	Shallow Net (3 feet deep)	Deep Net (8 feet deep)
Total fish caught	123	246
Rate of catch/100 linear feet	5.59	20.5
Rate of catch/100 square feet	1.86	2.56
Total gar caught	48	54
Rate of catch/100 linear feet	2.18	4.5
Rate of catch/100 square feet	0.73	0.82
Total game fish caught	12	64
Rate of catch/100 linear feet	0.54	5.33
Rate of catch/100 square feet	0.18	0.66