

JOB COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-2-R-12

FISHERIES INVESTIGATIONS AND SURVEYS OF THE WATERS OF REGION 2-B

Job No. B-24(b): Fisheries Resurvey of Lake Granite Shoals

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## ABSTRACT

Lake Granite Shoals was resurveyed to determine the effect of commercial netting on the lake. There has not been a reduction of rough fish in the lake effected by the commercial netting of smallmouth buffalo. To date, data collected indicate a replacement of the harvested buffalo by the river carpsucker. The carpsucker is, from both a fishing as well as a nutritional standpoint, the least desirable of the rough fish species.

The job will be continued to obtain more conclusive evidence as to this ratio shift within the rough fish complex.

## JOB COMPLETION REPORT

State of Texas

Project No. F-2-R-12

Name: Fisheries Investigations and Surveys of the Waters of Region 2-B

Job No. B-24(b)

Title: Fisheries Resurvey of Lake Granite Shoals

Period Covered: February 1, 1964 - January 31, 1965

### Objectives:

1. To determine the effect of commercial netting on the carpsucker, Carpionides Carpio, --buffalo, Ictiobus bubalus, population ratio.
2. To determine the overall effect of commercial netting of rough fish on the fish population of Lake Granite Shoals.

### Procedures:

A total of 166 gill nets, standardized for use on all DJ projects, were set in Lake Granite Shoals. The overnight sets were made at stations which were selected to give maximum coverage of the lake. Seining samples were taken with a twenty-foot straight seine in an effort to obtain relative abundance figures on juvenile forage fish in the lake.

Water quality studies were carried out on the lake in conjunction with netting and seining operations.

Data collected in reconnaissance work on the lake was examined closely to determine changes or trends, in the fish population, which could be attributed to commercial netting on the lake.

Table 1 is a checklist of the fish species mentioned in this report.

### Findings:

Table 2 illustrates the results of the netting collections on Lake Granite Shoals during the segment. During this period, commercial fishing for rough fish, notably, smallmouth buffalo, Ictiobus bubalus, entered its second year. As can be seen in Table 3 and the accompanying graph, despite commercial rough fish removal operations, the percentage of rough fish by both weight and number has not decreased over the past six years.

Although there has been little change in the rough fish-game fish ratio, since the commercial fishing contract was let on the lake, there has been a significant ratio shift within the rough fish complex. The removal of the smallmouth

buffalo by commercial netting has been succeeded by an increase in the river carpsucker population. Table 4 and the accompanying graph illustrate the number of buffalo caught per hundred feet of net as compared with the number of carpsucker caught per hundred feet of net over the past six years. As can be seen, minor fluctuations in the figures characterize the first four years, followed by a definite replacement of the buffalo by the carpsucker. Significantly, this replacement can be correlated with the initial removal of buffalo by commercial netting. Table 5 contains the pounds of buffalo and carpsucker collected per hundred feet of net over the past six years. These figures, correspondingly emphasize the definite shift in the buffalo-carpsucker ratio.

In screening the data collected, it was noted that a considerable number of the river carpsucker collected were in the 3/4 pound to 1 1/2 pound category, and averaged from 13 to 15 inches in length. These particular carpsucker are more than likely between thirteen and eighteen months in age, making them the spawn following the start of commercial fishing operations on the lake. From the numbers collected, as well as the condition of the individual species, the spawn has experienced an unusually high rate of survival. Since river carpsucker and small mouth buffalo require almost identical food and environment, the increase in carpsucker population can certainly be attributed in part, if not completely, to the increase in available habitat effected by the removal of the smallmouth buffalo.

Seining samples of the lake did not present any unusual data, and are not presented in this report. The information will, however, be kept on file for future reference.

Water quality study data collected for the lake during the past year will also be kept on file at project headquarters.

#### Discussion:

The theory of project personnel that commercial netting of a lake results in an adverse change in the fishery complex is being borne out on Lake Granite Shoals. From the data collected during this the initial phase of the job, there appears to be a definite shift in the buffalo-river carpsucker ratio, with virtually no change in the rough fish-game fish complex. Popular belief is that the removal of the buffalo results in a decreased rough fish population, but the void is being filled by an increasing carpsucker population.

In a life history study entitled "A Laboratory Study of the Food Habits of Four Species of Rough Fish in Lake Diversion, Texas," Dr. W. W. Dalquest labeled the carpsucker as the least desirable of all the freshwater species of Texas. Also, the carpsucker is very seldom harvested by anglers, yet buffalo are fished for quite successfully on enclosed docks, marinas, etc. In view of this, it appears that the sole effect of commercial netting is not the reduction of the rough fish population, but rather, the replacement of one undesirable species, the buffalo, with a less desirable species, the river carpsucker.

It should be noted that the adoption of a standardized gill net for all Dingell-Johnson jobs may have some bearing on the statistics. These nets are longer than the ones employed up to 1963, as fifty feet of 3 1/2" mesh has been added. This addition would theoretically increase the buffalo harvesting efficiency by 25 percent. Presumably then, the ratio of buffalo-carpsucker would have favored the

carpsucker to a greater extent had the previous experimental gill nets been employed.

Because this is the initial phase of this investigation, it is difficult to arrive at definite conclusions. Despite the strong shifts in the buffalo-carpsucker ratio, it is felt that additional data should be collected to rule out the possibility of fluctuations caused by population cycles within the individual species.

Recommendations:

In order to collect additional data to substantiate the carpsucker-buffalo shift, it is recommended that this job be continued.

Prepared by Richard L. White  
Project Leader

Approved by Marion Toole  
(Coordinator)

Date: June 25, 1965

JOHN E. TILTON  
Regional Supervisor

TABLE 1

A CHECKLIST OF SPECIES

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
<u>Lepisosteus osseus</u>	Longnose gar
<u>Dorosoma cepedianum</u>	Gizzard shad
<u>Ictiobus bubalus</u>	Smallmouth buffalo
<u>Carpionodes carpio</u>	River carpsucker
<u>Moxostoma congestum</u>	Gray redhorse sucker
<u>Cyprinus carpio</u>	European carp
<u>Notemigonus crysoleucas</u>	Golden shiner
<u>Ictalurus punctatus</u>	Channel catfish
<u>Ictalurus melas</u>	Black bullhead
<u>Ictalurus natalis</u>	Yellow bullhead
<u>Pylodictis olivaris</u>	Flathead catfish or yellow catfish
<u>Roccus chrysops</u>	White bass
<u>Micropterus treculi</u>	Guadalupe bass or Texas spotted bass
<u>Micropterus salmoides</u>	Largemouth bass
<u>Chaenobryttus gulosus</u>	Warmouth
<u>Lepomis cyanellus</u>	Green sunfish
<u>Lepomis microlophus</u>	Redear sunfish
<u>Lepomis macrochirus</u>	Bluegill sunfish
<u>Lepomis megalotis</u>	Longear sunfish
<u>Pomoxis annularis</u>	White crappie
<u>Aplodinotus grunniens</u>	Freshwater drum

TABLE 2

## LAKE GRANITE SHOALS

Netting Data 1964

<u>SPECIES</u>	<u>NUMBER</u>	<u>PER CENT BY NUMBER</u>	<u>WEIGHT</u>	<u>PER CENT BY WEIGHT</u>
<u>Lepisosteus osseus</u>	45	0.91	105.35	1.46
<u>Dorosoma cepedianum</u>	1,542	31.34	692.39	9.58
<u>Ictiobus bubalus</u>	577	11.73	2,902.04	40.15
<u>Garpiodes carpio</u>	1,438	29.23	2,112.52	29.23
<u>Moxostoma congestum</u>	8	0.16	11.01	0.15
<u>Cyprinus carpio</u>	80	1.63	369.90	5.12
<u>Notemigonus crysoleucas</u>	5	0.10	0.95	0.01
<u>Ictalurus punctatus</u>	90	1.83	169.63	2.35
<u>Ictalurus melas</u>	3	0.06	0.75	0.01
<u>Ictalurus natalis</u>	5	0.10	1.57	0.02
<u>Pylodictis olivaris</u>	55	1.12	393.18	5.44
<u>Roccus chrysops</u>	73	1.48	68.24	0.94
<u>Micropterus treculi</u>	27	0.55	29.70	0.41
<u>Micropterus salmoides</u>	51	1.04	49.76	0.69
<u>Chaenobryttus gulosus</u>	43	0.87	14.07	0.19
<u>Lepomis cyanellus</u>	25	0.51	3.67	0.05
<u>Lepomis microlophus</u>	25	0.51	3.97	0.05
<u>Lepomis macrochirus</u>	600	12.20	90.72	1.26
<u>Lepomis megalotis</u>	34	0.69	2.74	0.04
<u>Pomoxis annularis</u>	100	2.03	55.63	0.77
<u>Aplodinotus grunniens</u>	94	1.91	150.13	2.08
TOTALS	4,920	100.00	7,227.92	100.00

TABLE 3

PERCENTAGE OF ROUGH FISH

LAKE GRANITE SHOALS

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	1959	1960	1961	1962	1963	1964
PER CENT BY WEIGHT	79.02	85.57	88.71	90.14	85.94	87.81
PER CENT BY NUMBER	70.59	72.54	73.89	75.82	73.88	77.17

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Graph to Table III

----- % Rough fish by Number  
———— % Rough Fish by Weight

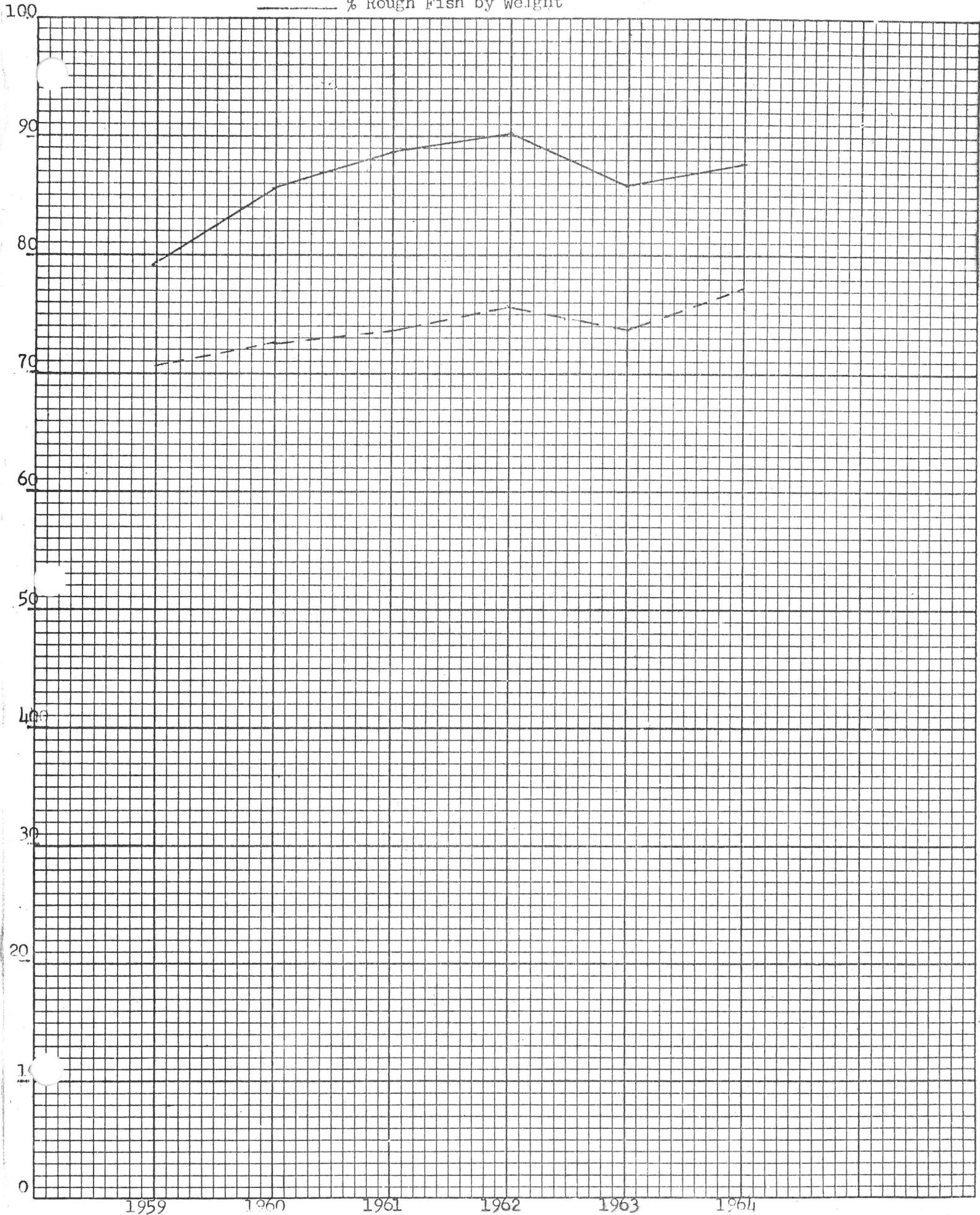


TABLE 4

Number of Fish Caught Per 100 Feet of Net

Lake Granite Shoals

SPECIES	1959	1960	1961	1962	1963	1964
Smallmouth Buffalo	6.12	5.30	3.20	7.71	3.23	2.32
River carpsucker	4.17	6.40	5.20	4.19	5.18	5.78

<u>Year</u>	<u>Feet of Net Set</u>
1959	2875
1960	3000
1961	3250
1962	6250
1963	6750
1964	24900

TABLE 5

Pounds of Fish Caught Per 100 Feet of Net

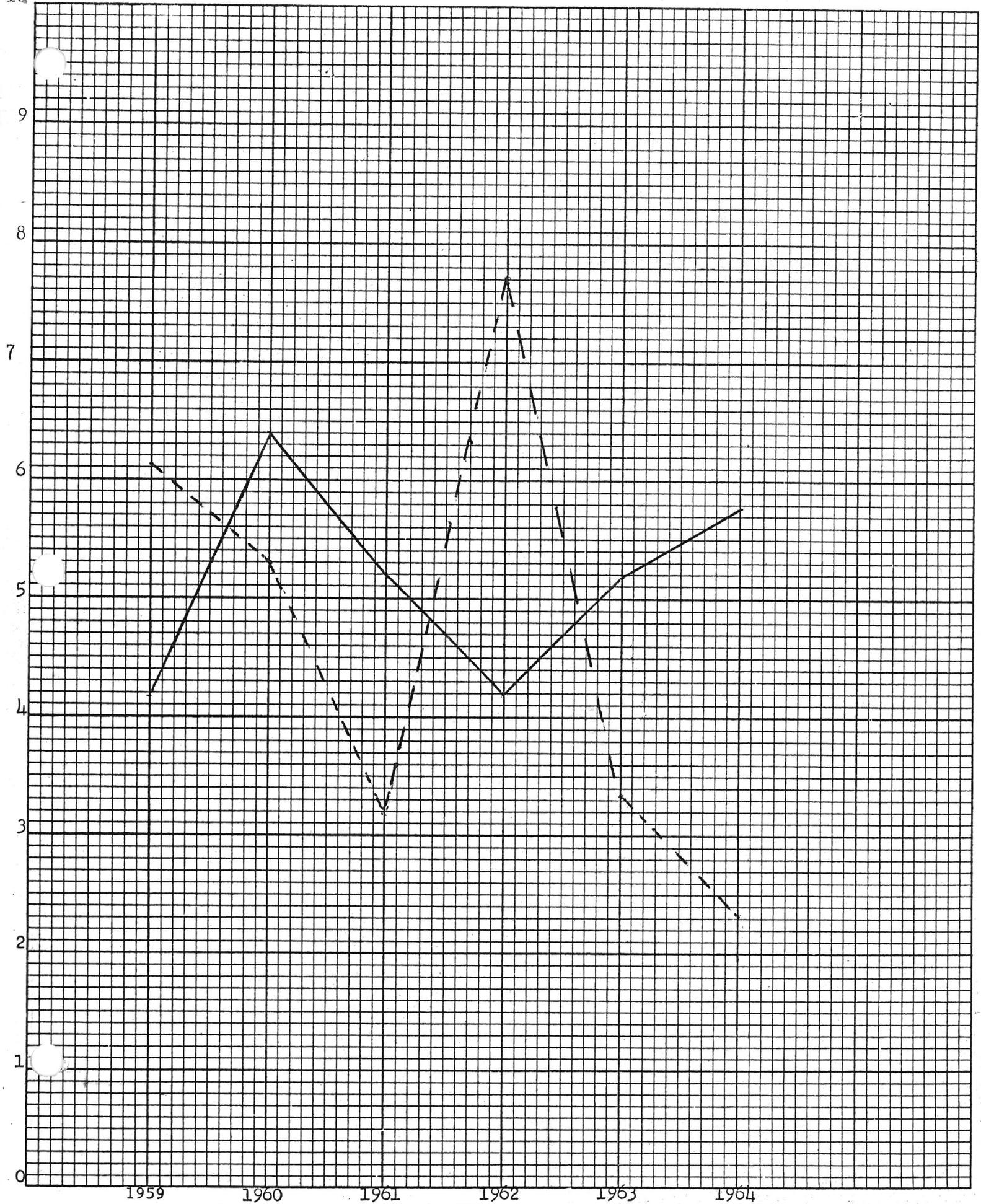
Lake Granite Shoals

SPECIES	1959	1960	1961	1962	1963	1964
Smallmouth buffalo	15.21	15.47	13.07	22.93	14.79	11.65
River carpsucker	3.63	6.96	5.36	5.13	6.86	8.48

Graph to Table IV. Number of Rough Fish Caught Per 100 Feet of Net

Number  
10

-----Smallmouth Buffalo  
-----River Carpsucker



Graph to Table V. Pounds of Fish Caught Per 100 Feet of Net

Pounds

-----Smallmouth buffalo  
-----River Carpsucker

