

FILE

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(a): Fisheries Resurvey of Lake Inks

Project Leader: R. L. White

J. Weldon Watson
Executive Director
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Marion Toole
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June 23, 1965

ABSTRACT

Inks Lake, Burnet County, Texas, has been the object of reconnaissance work for the past ten years. Efforts to improve the fishery complex of the lake have included two selective treatments for the control of gizzard shad.

Despite periodic increases in the black bass population over the years, rough fish continue to dominate the data collected in seining and netting operations. The past segment revealed the black bass population to be about average as compared to past segments. Until more efficient management methods can be devised for the lake, this job will be terminated.

Federal Aid Project No. F-1-R-12

FISHERIES INVESTIGATIONS AND SURVEYS OF THE WATERS OF REGION 1-2

Job No. F-14(a); Fisheries Resurvey of Lake Inks

Project leader: K. L. White

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June 21, 1982

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 (a)

Title: Fisheries Resurvey of Lake Inks

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

- OBJECTIVES:
1. To determine the fish species present in Inks Lake and their relative abundance.
 2. To determine particularly the relative abundance of largemouth bass following the massive stocking of 1958 through 1962.
 3. To determine if the largemouth bass is reproducing in Inks Lake.

PROCEDURE:

Reconnaissance work has been carried out on Lake Inks, Burnet County, Texas for the past ten years beginning with the basic inventory done in 1955-56 as Job B-14, Project F-2-R-3. Selective treatments of the lake for the control of gizzard shad were conducted on Inks Lake in November 1956 (Project F-14-D-4, Job 16 a-1), and in March 1962 (Project F-14-D-6, Job 16 a-35). All of the work over these years has been aimed at improving the fishery complex, notably the largemouth black bass population, of Lake Inks.

During the past segment, a total of 115 gill net collections were made on the lake. Collections were made with gill nets standardized for use on all D-J projects. Seine samples were made with a 20 foot straight seine. The net sampling was done at stations set up in the basic survey. Except for May 1964, netting collections were made every month of the segment.

An attempt to check spawning activities of the black bass was made in conjunction with reconnaissance work on the lake.

Water quality data was also collected on the lake in conjunction with reconnaissance work.

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

FINDINGS:

Netting collections for the project period are summarized in Table 2. Rough fish, namely gizzard shad, smallmouth buffalo, and river carpsucker dominate the catch.

Comparison of the collections of this segment with that of the other nine reveals negligible difference. Although there is a slight increase in per cent by numbers and weight over 1963, the figures for 1964 are about average for the ten years. It should be noted that the gill nets which were introduced for use on all D-J work during this segment did not favor the collection of black bass.

The gill nets used in past segments stayed near the surface of the water with the float-line on or near the surface, whereas the nets used this year sank to the bottom. Consequently, more deep-dwelling species such as flathead catfish were collected than in past segments. Had the same type of gill nets been used as had been employed in prior segments, perhaps more black bass would have been collected. At any rate, the figures for the percentage by weight and numbers over the past ten segments are given below.

INKS LAKE ROUGH FISH RATIO, 1955-1964

Year	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Per cent rough fish (number)	63	78	63	71	65	70	73	56	55	61
Per cent rough fish (weight)	74	74	78	71	74	79	85	80	68	76

As can be seen from the above figures, the slight drop in the rough fish domination of statistics found last year was short lived, and the figures are near the average for the past years.

Spawning activity of the black bass was checked visually, but evidence of spawning was not plentiful. Seining collections did not reveal as large a number of bass fingerling as had been hoped. Seining activities were somewhat limited because of the shortage of man power.

Water quality data were collected, and no unusual readings were determined, as can be seen in Table 3.

DISCUSSION:

After ten years of reconnaissance work on Inks Lake, the black bass population of the lake has not reached the density which project personnel had hoped it would. The two shad kills provided some drop in the tremendous numbers of rough fish, but it was a brief respite. Although netting collections do not reveal an increase in the black bass population during the past segment, owing possibly to the change in nets, fishermen report some good catches of bass periodically.

It is hoped that when the project becomes fully staffed, that a creel census may be conducted on the lake in order to substantiate any reports of increased harvesting of black bass by fishermen. Until this time, limited reconnaissance work on Inks Lake will be carried out under the state program, and this job will be terminated.

Because of the similarity of this job with Job B-20, F-9-R, and its publication Inland Fisheries Series No. 5, there will be no publication of this job.

PREPARED BY: R. L. White
Project Leader

Marion Toole
(Coordinator)

Date: June 23, 1965

John E. Tilton
Regional Supervisor

Inks Lake

A Checklist of Species Mentioned in the Report

<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>Pomoxis nigromaculatus</u>	Black crappie
<u>Aplodinotus grunniens</u>	Freshwater drum

TABLE 2

Inks Lake

Netting Results, 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>	12	0.50	39.63	1.00
<u>Dorosoma cepedianum</u>	934	39.10	423.92	10.66
<u>Ictiobus bubalus</u>	281	11.76	1,725.67	43.38
<u>Carpionodes carpio</u>	108	4.52	361.03	9.08
<u>Moxostoma congestum</u>	1	0.04	3.25	0.08
<u>Cyprinus carpio</u>	73	3.06	333.42	8.38
<u>Notemigonus crysoleucas</u>	7	0.29	1.44	0.04
<u>Ictalurus punctatus</u>	104	4.35	138.36	3.48
<u>Ictalurus melas</u>	6	0.25	2.69	0.07
<u>Ictalurus natalis</u>	2	0.08	0.56	0.01
<u>Pylodictis olivaris</u>	57	2.39	380.45	9.57
<u>Roccus chrysops</u>	189	7.91	268.59	6.75
<u>Micropterus treculi</u>	5	0.21	4.56	0.11
<u>Micropterus salmoides</u>	54	2.26	73.36	1.84
<u>Chaenobryttus gulosus</u>	48	2.01	9.49	0.24
<u>Lepomis cyanellus</u>	31	1.30	5.09	0.13
<u>Lepomis microlophus</u>	48	2.01	11.91	0.30
<u>Lepomis macrochirus</u>	305	12.77	39.86	1.00
<u>Lepomis megalotis</u>	29	1.21	3.22	0.08
<u>Pomoxis annularis</u>	54	2.26	36.31	0.91
<u>Pomoxis nigromaculatus</u>	1	0.04	0.19	0.01
<u>Aplodinotus grunniens</u>	40	1.68	114.65	2.88
TOTALS	2,389	100.00	3,977.65	100.00

Table 3. Lake Inks, Water Analysis, 1964

	February 6, 1964			March 4, 1964			April 7, 1964			June 9, 1964				
	Surface	10'	30'	Surface	10'	30'	Surface	10'	20'	30'	Surface	10'	20'	30'
Water Temperature	49 F	49 F	49 F	50 F	50 F	50 F	65 F	66 F	65 F	63 F	74.5F	74 F	72 F	72 F
pH	7.2	7.4	7.4	7.2	7.2	7.2	7.2	7.2	7.4	7.2	7.2	7.2	7.2	7.2
O ₂ (ppm)	5.4	5.8	5.2	4.2	4.0	*	3.8	3.2	3.6	2.8	3.6	2.6	2.8	2.2
CO ₂ (ppm)	15.0	6.0	4.0	3.0	3.0	3.0	0.0	0.0	0.0	0.0	5.0	4.0	3.0	11.0
Alk. pH-th (ppm)	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0	5.0	2.0	0.0	0.0	0.0	0.0
Alk. M.O. (ppm)	118.0	120.0	120.0	127.0	127.0	126.0	33.0	34.0	30.0	32.0	38.0	35.0	37.0	36.0
Alk. Total (ppm)	118.0	120.0	120.0	127.0	127.0	126.0	38.0	39.0	35.0	34.0	38.0	35.0	37.0	36.0
Salinity (ppm)	45.0	45.0	46.0	45.0	44.0	45.0	77.0	76.0	77.0	76.0	75.0	74.0	75.0	74.0

	July 2, 1964			August 4, 1964			September 2, 1964			October 1, 1964				
	Surface	10'	30'	Surface	10'	30'	Surface	10'	20'	30'	Surface	10'	20'	30'
Water Temperature	80 F	77 F	77 F	83 F	81 F	80 F	82 F	82 F	*	*	77 F	76 F	76 F	75 F
pH	7.2	7.2	7.2	7.2	7.2	7.2	7.4	7.4	7.4	7.4	7.2	7.2	7.2	7.2
O ₂ (ppm)	4.8	4.0	2.4	8.6	7.6	6.6	7.4	8.8	6.8	4.0	11.2	10.2	9.8	10.2
CO ₂ (ppm)	15.0	4.0	5.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	11.0	3.0	10.0
Alk. pH-th (ppm)	0.0	0.0	0.0	0.0	0.0	0.0	3.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
Alk. M. O. (ppm)	37.0	37.0	37.0	34.0	33.0	33.0	28.0	30.0	27.0	32.0	71.0	65.0	70.0	61.0
Alk. Total (ppm)	37.0	37.0	37.0	34.0	33.0	33.0	31.0	34.0	27.0	32.0	71.0	65.0	70.0	61.0
Salinity (ppm)	30.0	30.0	29.0	61.0	61.0	60.0	*	*	*	*	61.0	61.0	61.0	61.0

	November 5, 1964			December 2, 1964			January 5, 1964			
	Surface	10'	30'	Surface	10'	30'	Surface	10'	20'	30'
Water Temperature	68 F	68 F	68 F	62.5F	62 F	62 F	58 F	58 F	58 F	58 F
pH	7.2	7.2	7.2	7.2	7.2	7.2	7.3	7.3	7.3	7.3
O ₂ (ppm)	16.2	15.8	16.0	8.0	8.4	8.2	10.8	12.0	10.4	10.0
CO ₂ (ppm)	4.0	3.0	3.0	2.0	2.0	2.0	4.0	4.0	3.0	3.0
Alk. pH-th (ppm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alk. M. O. (ppm)	47.0	45.0	46.0	92.0	90.0	93.0	93.0	91.0	89.0	91.0
Alk. Total (ppm)	47.0	45.0	46.0	92.0	90.0	93.0	93.0	91.0	89.0	91.0
Salinity (ppm)	89.0	88.0	88.0	83.0	82.0	84.0	92.0	92.0	91.0	92.0

* No reading taken.

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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

Project Leader: R. L. White

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D-J Coordinator

Eugene A. Walker
Assistant Director for Wildlife

June 25, 1965

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

	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

Graph to Table III

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

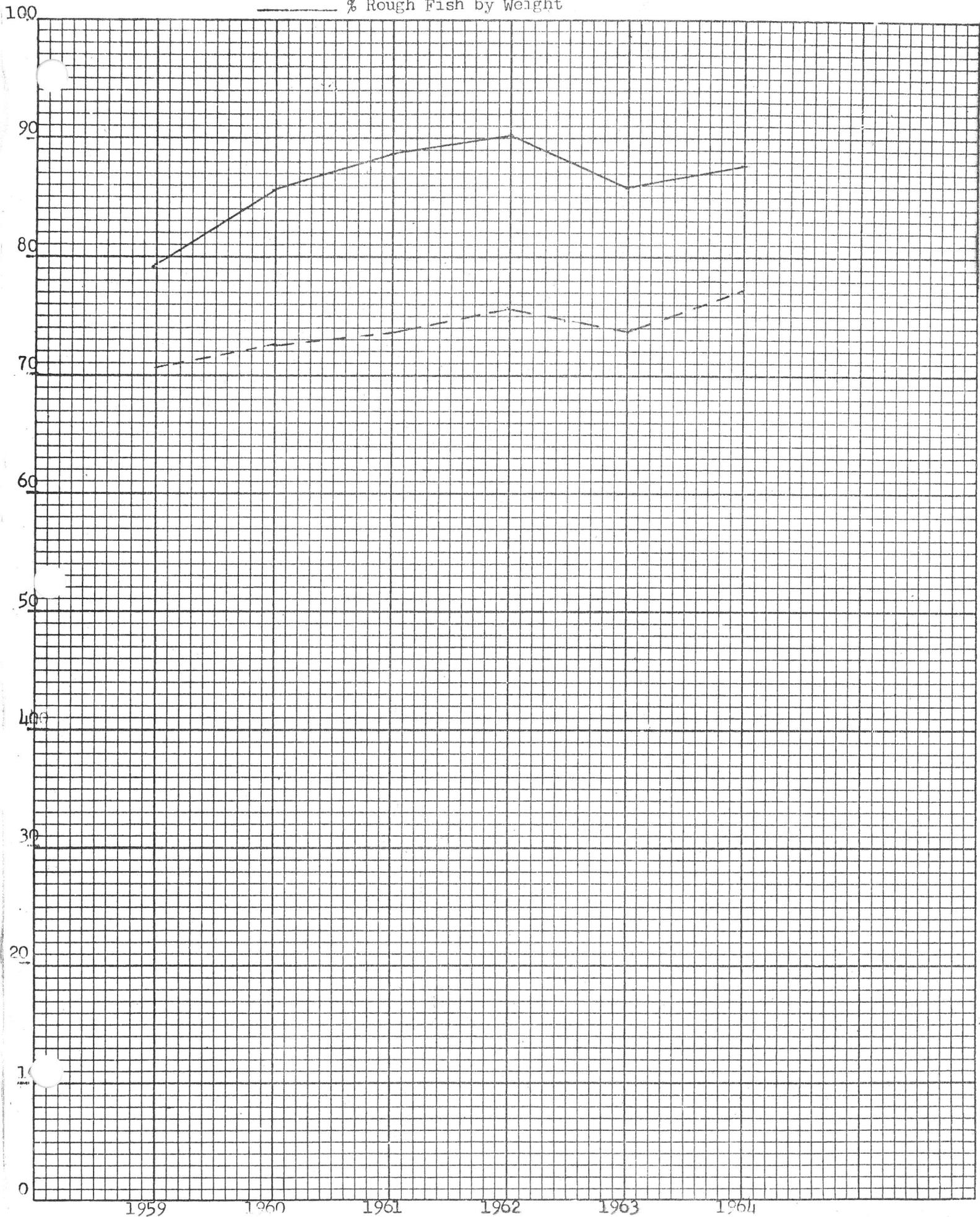


TABLE 4

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

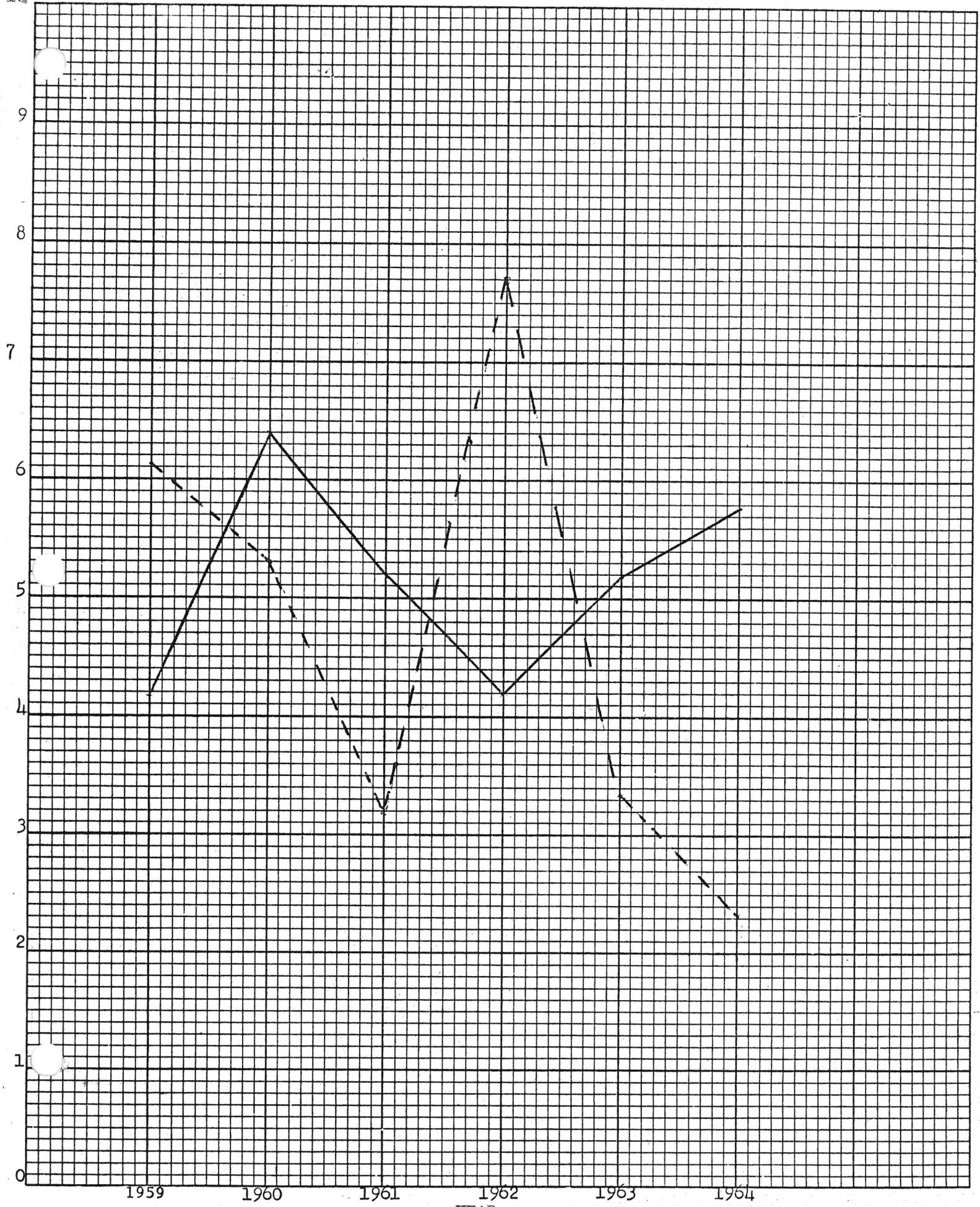
Lake Granite Shoals

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

