

FILE

JOB COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-2-R-11

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

Job No. B-24: Fisheries Resurvey of Inks Lake

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ABSTRACT

Inks Lake was resurveyed during the segment. All of the data collected indicates that the largemouth bass population of Inks Lake is improving in both number and individual size.

Seining collections revealed a high rate of survival of largemouth bass through the fingerling stage. Tidewater silversides, Menidia beryllina, were collected on Lake Inks for the first time.

The resurvey will be continued to further evaluate the results of the selective treatment of the lake.

JOB COMPLETION REPORT

State of Texas

Project No. F-2-R-11

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

Job No. B-24

Title: Fisheries Resurvey of Inks Lake

Period Covered: February 1, 1963 - January 31, 1964

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:

Physical data for Inks Lake, located in Burnet County, is available under Job B-14, F-2-R-3 (Basic Inventory). One hundred and twenty-two netting collections were made on Inks Lake at stations established during the basic survey. Experimental gill nets, 125 feet long were employed in this survey. These nets consist of five 25 foot sections ranging between one inch and three inch square mesh, increasing in size by one-half inch per section. Except for January 1964, net sets were made each month of the segment.

Plans called for the use of SCUBA equipped divers to locate bass nests and nesting activity. Because of the shortage of man-power and the inexperience of project personnel in diving, this work was limited. Visual observations from a boat were made to detect any evidences of bass spawning activity.

Seine collections were made in an attempt to pick up bass fry and fingerling. The collections, at special seining stations, were to be made bi-weekly, but again, a man-power shortage limited this work. Water samples were taken monthly and analyzed for O<sub>2</sub>, CO<sub>2</sub>, total hardness, chlorides, and pH.

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

Findings:

Netting collections for the project period are summarized in Table 2, and the netting summaries by month are illustrated in Table 3. As can be seen in the tables, rough fish dominate the catch.

The per cent of rough fish by weight and number, determined by experimental netting since 1955, is given in the chart below.

INKS LAKE ROUGH FISH RATIO, 1955 - 1963

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

As can be seen from the above chart, rough fish still hold a decided edge in the percentages, but both figures are at their lowest level in nine years.

Seining collections revealed a high percentage of largemouth black bass in most instances. A good survival rate of bass in both the fry and fingerling stage was noted in the seining collections. Gizzard shad were collected in the seine sampling, but not in the abundance noted in previous years.

Tidewater silversides, Menidia beryllina, a species previously unrecorded for Inks Lake or any of the other lakes of the Highland Chain of the Colorado River, were collected in large numbers in the seine samples. An Article was submitted to the Texas Journal of Science to officially record the presence of the silversides in Inks Lake. Identification of the tidewater silversides was verified by Dr. Clark Hubbs, of the University of Texas Zoology Department and author of A Checklist of Texas Fresh-Water Fishes. Results of seine sampling are given in Table 4.

Water quality tests revealed no unusual readings, Table 5. No past records of water analysis on Inks Lake were available for comparison with the readings obtained during this segment.

Recommendations:

Despite the seemingly high numbers of gizzard shad and other rough fish species, the largemouth bass population on Inks Lake is improving in both number and condition of fish. Statistics, for the past five years, on largemouth bass collected by netting operations on Inks Lake are given in Table 6. As can be seen there has been a marked increase in each category between 1959 and 1963. More and larger bass were collected during the project segment than in the previous five years.

Of the 120 largemouth bass taken in netting samples, 32 specimens or 27% were in the 1½ - 3 pound class. The average weight of the largemouth bass taken was 1.08 pounds. This compares favorably with the average weight, 0.92 pounds, of the species taken in the previous segment. Most of the bass collected during the project period

were in excellent condition; the average K factor or coefficient of condition of the species was 2.62.

Although a creel census was not taken on Inks Lake, fishermen reported good fishing over the entire lake.

The massive stocking of Inks Lake with largemouth black bass following the chemical reduction of gizzard shad, and the apparently good bass spawns during the two years succeeding the treatment had alleviated somewhat the critical bass situation on Inks Lake. From all the data collected, the largemouth bass population is greater than in any year in the previous eight years.

The effect of the tidewater silversides in Inks Lake had not yet been determined. The rapid rate of reproduction of the species as well as its use as a food fish for largemouth bass may be a key factor in the improved bass population of the lake. Although the foregoing is a supposition on the part of project personnel, the silversides will be watched closely in future work to determine the effect, if any, on the largemouth bass population.

It is recommended that this job be continued to further evaluate the results of the selective kill and the massive stocking of largemouth bass on Inks Lake.

Prepared by R.L. White  
Leader

Approved by Marion Toole

Date May 20, 1964

JOHN E. TILTON  
Regional Supervisor

TABLE 1

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>Carpiodes carpio</u>	River carpsucker
<u>Cyprinus carpio</u>	Carp
<u>Notemigonus crysoleucas</u>	Golden shiner
<u>Notropis venustus</u>	Spottail shiner
<u>Notropis lutrensis</u>	Redhorse shiner
<u>Ictalurus punctatus</u>	Channel catfish
<u>Ictalurus melas</u>	Black bullhead catfish
<u>Pylodictus olivaris</u>	Flathead catfish
<u>Gambusia affinis</u>	Mosquitofish
<u>Menidia beryllina</u>	Tidewater silversides
<u>Roccus chrysops</u>	White bass
<u>Micropterus treculi</u>	Texas spotted bass
<u>Micropterus salmoides</u>	Largemouth black 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 humilis</u>	Orange spotted sunfish
<u>Lepomis megalotis</u>	Longear sunfish
<u>Pomoxis annularis</u>	White crappie
<u>Percina caprodes</u>	Logperch
<u>Etheostoma spectabile</u>	Orangethroat darter
<u>Aplodinotus grunniens</u>	Fresh water drum

TABLE 2

INKS LAKE

Netting Results, 1963

SPECIES	NUMBER	PER CENT BY NUMBER	WEIGHT LBS.	PER CENT BY WEIGHT
Longnose gar	34	1.80	148.34	8.78
Gizzard shad	816	43.11	442.77	26.20
Smallmouth buffalo	87	4.60	275.46	16.30
River carpsucker	58	3.06	167.35	9.90
Golden shiner	1	0.05	0.23	0.01
Carp	31	1.63	94.28	5.58
Channel catfish	88	4.65	129.37	7.66
Black bullhead catfish	10	0.53	2.79	0.16
Flathead catfish	8	0.42	34.57	2.05
White bass	125	6.60	151.79	8.98
Texas spotted bass	9	0.48	6.62	0.39
Largemouth black bass	123	6.50	133.06	7.88
Warmouth bass	46	2.43	10.95	0.65
Green sunfish	58	3.06	8.60	0.51
Redear sunfish	28	1.48	6.15	0.36
Bluegill	230	12.15	28.45	1.68
Orangespotted sunfish	1	0.05	0.13	0.01
Longear sunfish	39	2.06	3.92	0.23
White crappie	90	4.75	21.63	1.28
Freshwater drum	11	0.58	23.13	1.37
TOTALS	1,893		1,689.59	

Table 3. Lake Inks Netting Results by Number and Per Cent of Number, Resurvey, 1963

COMMON NAME	Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Longnose gar	0	0.00	0	0.00	17	5.23	6	3.06	0	0.00	6	3.32	5	2.76	0	0.00	0	0.00	0	0.00	0	0.00
Gizzard shad	45	44.12	50	53.76	227	69.85	71	36.22	41	29.28	51	27.42	50	27.62	47	40.17	26	18.98	119	53.12	89	46.35
Smallmouth buffalo	1	0.99	1	1.08	10	3.08	15	7.65	8	5.71	12	6.45	9	4.97	8	6.84	8	5.84	7	3.12	8	4.17
River carpsucker	12	11.76	5	5.38	4	1.23	2	1.02	1	0.76	4	2.16	1	0.55	1	0.85	8	5.84	7	3.12	13	6.77
Golden shiner	0	0.00	1	1.08	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Carp	2	1.96	0	0.00	12	3.69	4	2.05	2	1.43	1	0.54	1	0.55	3	2.55	6	4.38	0	0.00	0	0.00
Channel catfish	6	5.88	4	4.30	8	2.46	10	5.10	11	7.86	13	6.99	6	3.31	5	4.25	5	3.65	10	4.46	10	5.21
Black bullhead catfish	0	0.00	0	0.00	1	0.31	2	1.02	1	0.71	1	0.54	2	1.10	0	0.00	1	0.73	0	0.00	2	1.04
Flathead catfish	0	0.00	0	0.00	0	0.00	3	1.54	0	0.00	1	0.54	0	0.00	0	0.00	4	2.92	0	0.00	0	0.00
White bass	17	16.67	4	4.30	12	3.69	8	4.08	4	2.86	14	7.53	13	7.18	4	3.40	4	2.92	35	15.62	10	5.21
Texas spotted bass	0	0.00	1	1.08	0	0.00	0	0.00	0	0.00	1	0.54	5	2.76	0	0.00	1	0.73	0	0.00	1	0.52
Largemouth blackbass	16	15.68	9	9.67	3	0.92	8	4.08	4	2.86	9	4.84	23	12.71	10	8.50	20	14.60	13	5.80	8	4.17
Warmouth bass	0	0.00	0	0.00	8	2.46	4	2.04	4	2.86	7	3.76	9	4.97	4	3.40	7	5.11	1	0.45	2	1.04
Green sunfish	1	0.98	2	2.15	4	1.23	6	3.06	7	5.00	10	5.38	6	3.31	3	2.55	8	5.84	4	1.79	7	3.65
Redear sunfish	0	0.00	3	3.22	2	0.62	1	0.51	14	10.00	1	0.54	2	1.10	0	0.00	1	0.73	2	0.89	2	1.04
Bluegill sunfish	2	1.96	10	10.75	14	4.31	40	20.40	37	26.43	34	18.28	25	13.81	14	11.90	19	13.87	12	5.36	23	11.98
Orangespotted sunfish	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.55	0	0.00	0	0.00	0	0.00	0	0.00
Longear sunfish	0	0.00	1	1.08	3	0.92	14	7.15	5	3.57	3	1.61	4	2.21	1	0.85	3	2.19	3	1.34	2	1.04
White crappie	0	0.00	2	2.15	0	0.00	0	0.00	1	0.72	16	8.60	14	7.73	17	14.45	15	10.95	11	4.91	14	7.29
Freshwater drum	0	0.00	0	0.00	0	0.00	2	1.02	0	0.00	2	1.08	5	2.76	0	0.00	1	0.73	0	0.00	1	0.52
<b>TOTALS</b>	<b>102</b>		<b>93</b>		<b>325</b>		<b>196</b>		<b>140</b>		<b>186</b>		<b>181</b>		<b>117</b>		<b>137</b>		<b>224</b>		<b>192</b>	

Table 3 (Continued) Inks Lake Netting Results by Weight and Per Cent of Weight, Resurvey, 1963.

Common Name	Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.	
	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%
Longnose gar	0.00	0.00	0.00	0.00	87.96	22.13	23.94	13.27	0.00	0.00	17.50	12.15	22.44	14.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gizzard shad	47.93	35.40	49.55	50.45	162.79	40.95	47.22	26.19	18.29	21.07	18.06	12.54	8.50	5.35	7.63	13.97	6.20	5.59	39.67	22.62	37.66	24.78
Smallmouth buffalo	0.88	0.65	6.69	6.82	48.39	12.17	21.91	12.15	28.61	32.96	39.32	27.29	45.25	28.49	12.81	23.46	21.82	19.69	22.26	12.69	27.52	18.11
River carp sucker	37.45	27.67	10.24	10.43	15.32	3.85	3.15	1.75	3.13	3.60	11.12	7.72	2.81	1.77	1.69	3.10	32.82	19.69	21.69	12.25	39.12	25.74
Golden shiner	0.00	0.00	0.23	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carp	7.25	5.35	0.00	0.00	44.69	11.42	16.51	9.16	7.00	8.06	0.63	0.44	7.44	4.68	5.13	9.40	5.63	5.08	0.00	0.00	0.00	0.00
Channel catfish	2.80	2.06	11.14	11.14	14.76	3.72	17.08	9.48	8.34	9.61	13.94	9.68	10.31	6.49	10.88	19.93	11.75	10.60	19.70	11.23	8.87	5.84
Black bullhead catfish	0.00	0.00	0.00	0.00	0.28	0.08	0.52	0.28	0.25	0.29	0.19	0.13	0.50	0.31	0.00	0.00	0.37	0.33	0.00	0.00	0.68	0.45
Flathead catfish	0.00	0.00	0.00	0.00	0.00	0.00	17.94	9.95	0.00	0.00	4.75	3.30	0.00	0.00	0.00	0.00	11.88	10.72	0.00	0.00	0.00	0.00
White bass	14.73	10.88	4.57	4.66	12.08	3.04	10.45	5.79	5.06	5.83	15.69	10.89	15.94	10.64	4.32	7.91	5.07	4.57	50.21	28.63	13.67	8.99
Texas spotted bass	0.00	0.00	1.50	1.52	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.17	1.81	1.14	0.00	0.00	2.25	2.03	0.00	0.00	0.81	0.53
Largemouth black bass	23.98	17.71	10.49	10.68	4.45	1.11	8.15	4.51	4.95	5.70	10.44	7.25	24.81	15.62	7.32	13.41	12.95	11.68	14.82	8.45	10.70	7.04
Warmouth bass	0.00	0.00	0.00	0.00	2.14	0.53	1.43	0.80	0.66	0.76	1.31	0.91	1.88	1.18	0.95	1.74	1.83	1.65	0.25	0.14	0.50	0.33
Green sunfish	0.15	0.12	0.23	0.23	0.83	0.21	0.93	0.52	1.01	1.16	1.19	0.83	0.94	0.59	0.39	0.71	1.16	1.05	0.56	0.32	1.21	0.80
Redear sunfish	0.00	0.00	0.64	0.65	0.66	0.17	0.10	0.05	3.80	4.38	0.13	0.09	0.31	0.20	0.00	0.00	0.06	0.05	0.19	0.11	0.26	0.17
Bluegill	0.22	0.16	1.08	1.10	2.89	0.73	5.31	2.95	5.10	5.88	4.19	2.91	2.63	1.65	1.45	2.66	1.97	1.78	1.07	0.61	2.54	1.67
Orangespotted sunfish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Longear sunfish	0.00	0.00	0.10	0.11	0.31	0.07	1.50	0.83	0.52	0.60	0.31	0.21	0.37	0.25	0.13	0.24	0.18	0.16	0.25	0.14	0.26	0.17
White crappie	0.00	0.00	1.94	1.97	0.00	0.00	0.00	0.00	0.08	0.10	1.94	1.35	3.12	2.05	1.90	3.48	3.02	2.72	4.90	2.79	4.73	3.11
Freshwater drum	0.00	0.00	0.00	0.00	0.00	0.00	4.19	2.32	0.00	0.00	3.12	2.16	9.50	5.98	0.00	0.00	2.88	2.60	0.00	0.00	3.44	2.26
Totals	135.39		99.40		397.55		180.33		96.80		144.08		158.69		54.60		110.84		175.37		151.97	

Table 4. Lake Inks (Seining collections by number and date for 1963)

SPECIES	May 2	May 8	May 29	June 4	July 8	Aug. 7	Sept. 4	Oct. 2	Nov. 5	Totals
<i>Dorosoma cepedianum</i>	31	26	48	5	13	51	0	0	0	174
<i>Notropis venustus</i>	38	35	25	43	3	24	63	2	16	249
<i>Notropis lutrensis</i>	0	0	3	3	0	0	0	0	0	6
<i>Gambusia affinis</i>	0	0	0	0	0	0	0	1	0	1
<i>Menidia beryllina</i>	136	686	144	680	162	125	95	0	43	2071
<i>Micropterus treculi</i>	4	4	10	21	0	6	5	0	1	51
<i>Micropterus salmoides</i>	69	96	86	188	31	15	6	54	12	557
<i>Chaenobryttus gulosus</i>	0	0	0	5	0	0	0	0	0	5
<i>Lepomis cyanellus</i>	1	2	1	1	0	0	0	0	0	5
<i>Lepomis microlophus</i>	0	6	0	0	1	1	3	76	8	95
<i>Lepomis macrochirus</i>	4	45	5	41	10	31	2	61	17	216
<i>Lepomis megalotis</i>	24	2	6	15	6	5	22	93	10	183
<i>Percina caprodes</i>	22	3	9	14	19	0	2	2	2	73
<i>Etheostoma spectabile</i>	1	0	0	0	0	0	0	0	0	1
<b>TOTALS</b>	330	905	337	1016	245	258	198	289	109	3687

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Table 5. Inks Lake (Water analysis, 1963)

	March 18, 1963			April 17, 1963			May 8, 1963			June 5, 1963						
	Surface	10'	20'	Surface	10'	20'	Surface	10'	20'	Surface	10'	20'	Surface	10'	20'	30'
Water Temperature	62 F	61 F	61 F	66.5F	66.5F	66.5F	74 F	74 F	72 F	76.5F	76.5F	74.5F	76.5F	76.5F	74.5F	72.5F
pH	7.6	7.6	7.6	7.7	7.7	7.8	7.6	7.8	7.4	7.2	7.3	7.2	7.2	7.3	7.2	7.4
O <sub>2</sub> (ppm)	6.0	6.0	6.2	*	*	*	5.4	4.6	4.0	0.8	5.2	4.4	3.2	4.4	3.2	1.8
CO <sub>2</sub> (ppm)	0.0	5.0	0.0	0.0	0.0	6.0	0.0	0.0	12.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
Alk. pH-th (ppm)	1.0	0.0	5.0	0.0	0.0	6.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alk. M.O. (ppm)	90.8	68.0	94.0	110.0	100.0	93.0	102.0	104.0	116.0	107.0	115.0	114.0	115.0	114.0	115.0	115.0
Alk. Total (ppm)	91.8	68.0	99.0	110.0	100.0	98.0	102.0	104.2	116.0	107.0	115.0	114.0	115.0	114.0	115.0	115.0
Salinity (ppm)	13.0	13.0	10.0	13.0	11.0	12.0	14.0	10.4	10.6	10.4	13.0	13.0	12.0	13.0	12.0	12.0
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>July 8, 1963</p> </div> <div style="width: 30%;"> <p>August 8, 1963</p> </div> <div style="width: 30%;"> <p>September 4, 1963</p> </div> <div style="width: 30%;"> <p>October 3, 1963</p> </div> </div>																
Water Temperature	*	*	*	83.0F	81 F	79 F	82 F	81 F	80 F	79 F	75.5F	75 F	75 F	75 F	74 F	74 F
pH	7.3	7.4	7.2	7.4	7.4	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
O <sub>2</sub> (ppm)	4.6	*	*	*	*	*	*	*	*	*	4.6	3.6	3.0	3.0	2.8	2.8
CO <sub>2</sub> (ppm)	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	12.0
Alk. pH-th (ppm)	2.0	2.0	0.0	2.0	3.0	0.0	4.0	3.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alk. M.O. (ppm)	52.0	90.0	85.0	117.0	105.0	125.0	108.0	117.0	125.0	124.0	123.0	123.0	122.0	123.0	122.0	122.0
Alk. Total (ppm)	54.0	92.0	85.0	119.0	108.0	125.0	108.0	121.0	128.0	124.0	123.0	123.0	122.0	123.0	122.0	122.0
Salinity (ppm)	13.0	13.0	13.0	66.0	66.0	67.0	67.0	*	*	*	47.0	48.0	46.0	48.0	46.0	48.0

\* No reading taken.

Tab 5 (Continued) Inks Lake (Water analysis, 1963)

	December 4, 1963			
	Surface	10'	20'	30'
Water Temperature	56.5F	56.5F	56 F	56 F
pH	7.2	7.2	7.2	7.2
O <sub>2</sub> (ppm)	6.6	8.0	5.8	5.8
CO <sub>2</sub> (ppm)	13.0	4.0	5.0	3.0
Alk. pH-th (ppm)	0.0	0.0	0.0	0.0
Alk. M.O. (ppm)	123.0	127.0	126.0	125.0
Alk. Total (ppm)	123.0	127.0	126.0	125.0
Salinity (ppm)	46.0	43.0	46.0	48.0

Table 6. Largemouth Bass Taken From Inks Lake, 1959-1963

YEAR	Number of Nets Set	Number of Bass Collected	Per Cent Number of Catch	Weight of Bass Collected	Per Cent Weight of Catch	Bass Per 100 Ft. of Net
1963	122	123	6.50	133.06	7.87	0.81
1962	96	64	4.94	59.45	3.56	0.53
1961	100	27	1.36	26.40	1.14	0.22
1960	107	37	1.49	38.25	1.27	0.28
1959	84	22	1.13	34.11	1.64	0.21

