

JOB COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project F-3-R-12

Fisheries Investigations and Surveys of the Waters of Region 3-B

Job No. B-19 Basic Survey of Fish Species in Lake Palestine

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ABSTRACT

Three collections were made on Lake Palestine during the 1964 segment. The data collected indicated a slight decrease in the game fish populations since 1963. Some increase in per cent of number and weight of black crappie was noted. Largemouth bass and channel catfish have decreased.

Aquatic vegetation made seining difficult during this segment and presents a major problem in the shallow areas of the reservoir.

The high percentage of rough fish in the lake presents the greatest problem. Two contract commercial fishermen are now on the lake. Each is averaging approximately 1,000 pounds per week of rough fish.

It is recommended that the basic fisheries survey of Lake Palestine be terminated with the completion of this segment.

JOB COMPLETION REPORT

State of Texas

Project No. F-3-R-12

Name: Fisheries Investigations and Surveys
of the Waters of Region 3-B.

Job No. B-19 (Seg. 3 of 3)

Title: Basic Survey of Fish Species in Lake
Palestine.

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

OBJECTIVES:

1. To determine gross changes in fish populations.
2. To determine the growth rate and food of game species.
3. To determine chemical changes of the water.
4. To determine the influx of vegetation and to recommend control of noxious species if feasible.

HISTORY:

Lake Palestine, located on the Neches River near Frankston, Texas is impounded by an earthen dam and covers approximately 6,000 surface acres. The dam is located at Blackburn's Crossing approximately 4 miles east of Frankston. The reservoir lies in Anderson, Cherokee, Henderson and Smith Counties.

TECHNIQUES USED:

Monthly collections were made during the first segment in 1962 and bi-monthly collections were made in 1963. Three collections were made during this segment.

Netting Methods

Experimental type gill nets 125 feet in length with mesh size ranging from 1 to 3 inches were used during this segment. In April the collection was made with fourteen nets set 1 night. During August and January 7 nets were used for each collection. A total of 28 nets were set during this segment. Table 1 includes the numbers and weights as well as the per cents of number and weight by species of fish collected during the 1964 segment.

Game fish species were measured for standard length and weighed for individual weights. Sexual conditions and stomach contents were recorded. The coefficients of condition factors were calculated according to species. Table 2 contains data on the condition of some game fish species collected.

Water Analysis

Routine water analyses were made during each collection. These included pH, total alkalinity, chlorides, temperature and turbidity. Table 3 contains water analyses data collected during the three segments of this job.

Table 1.

1964 Netting Data on Lake Palestine

Species	April		August		January		Total		Per Cent	
	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.
Spotted gar *	43	81.56	8	13.10	-	-	51	94.66	5.76	12.47
Bowfin *	5	16.37	-	-	-	-	5	16.37	.56	2.16
Gizzard shad *	300	88.08	129	28.81	21	7.25	450	124.14	50.85	16.35
Smallmouth buffalo*	41	139.13	7	27.75	1	2.50	49	174.38	5.54	22.96
Bigmouth buffalo*	12	56.69	-	-	-	-	12	56.69	1.36	7.47
Spotted sucker*	-	-	10	15.31	27	51.37	37	66.68	4.20	8.78
Chubsucker*	-	-	-	-	4	2.25	4	2.25	0.45	0.30
Carp*	7	32.18	1	7.75	-	-	8	39.93	0.90	5.26
Golden shiner*	1	0.19	-	-	-	-	1	0.19	0.11	0.03
Channel catfish	6	25.06	7	21.62	-	-	13	46.68	1.47	6.15
Black bullhead*	62	39.44	23	16.43	18	12.81	103	68.68	11.64	9.04
Yellow bullhead*	29	17.13	2	0.74	5	4.12	36	21.99	4.06	2.90
Flathead catfish	1	4.00	-	-	-	-	1	4.00	0.11	0.53
Spotted bass	-	-	1	0.37	-	-	1	0.37	0.11	0.04
Largemouth bass	2	1.31	1	0.50	1	1.19	4	3.00	0.45	0.39
Warmouth	-	-	2	0.87	-	-	2	0.87	0.23	0.11
Redear sunfish	4	2.00	2	0.75	1	0.31	7	3.06	0.79	0.40
Redbreast sunfish	7	1.97	-	-	-	-	7	1.97	0.79	0.26
Bluegill sunfish	17	5.64	18	3.95	-	-	35	9.59	3.95	1.26
Spotted sunfish	2	0.51	-	-	-	-	2	0.51	0.23	0.07
Black crappie	13	4.50	37	15.31	4	1.94	54	21.75	6.10	2
White crappie	-	-	2	1.00	1	0.62	3	1.62	0.34	0.21
TOTALS	552	515.76	250	154.26	83	84.36	885	759.38	100.00	100.00
Game fish	52	44.99	70	44.37	7	4.06	129	93.42		
Rough fish	500	470.77	180	109.89	76	80.30	756	665.96		
Per Cent Game Fish	9.42	8.72	28.00	28.76	8.43	4.81	14.57	12.30		
Per Cent Rough Fish	90.58	91.28	72.00	71.24	91.57	95.19	85.43	87.70		

* Denotes rough fish species.

Table 2

A Comparison of Condition Data of Some Game Fish Species from Lake Palestine

Species	1964		1963		1962		Regional Average
	No.	Average K	No.	Average K	No.	Average K	
Channel catfish	13	1.90	65	1.92	210	1.88	1.70
Flathead catfish	1	1.90	7	2.02	9	1.97	2.03
Spotted bass	1	2.16	3	3.25	35	3.26	2.55
Largemouth bass	9	2.54	44	2.70	99	2.78	2.72
Warmouth	2	4.03	12	4.24	41	4.42	4.10
Bluegill sunfish	32	4.43	54	4.63	59	5.32	4.38
Redbreast sunfish	8	5.24	3	4.85	24	5.76	-
White crappie	3	2.71	3	3.30	5	3.04	3.03
Black crappie	39	3.22	104	3.28	45	3.31	3.34

Table 3

Surface Water Analyses Data on Lake Palestine

	1964				1963 Average	1962 Average
	April	August	January	Average		
pH	7.0	6.6	6.8	6.8	6.9	6.8
Alkalinity- methyl orange p.p.m.	23	32	68	41	38.80	32.50
Chlorides p.p.m.	70.92	70.92	28.37	56.73	38.29	39.39
Air Temperature degree F.	76	86	58	73	71	74
Water Temperature Surface degree F.	70	81	55	68	73	72
Turbidity - inches secchi disc	36	42	40	39	37*	40

Fish Collections

A total of 885 fish was netted in 1964, 14.57 per cent by number of which were game fish. Black crappie (Pomoxis nigromaculatus) was the most numerous game fish species netted, compiling 6.10 per cent by number of the catch.

The most numerous rough fish species was the gizzard shad (Dorosoma cepedianum). A total of 450 shad comprised 50.85 per cent by number of the total 1964 collection. The most numerous commercially important species was the smallmouth buffalo (Ictiobus bubalus). A total of 49 smallmouth buffalo made up 22.96 per cent by weight of the 1964 collection.

A grand total of 6,450 fish were netted from Lake Palestine during the 1962, 1963 and 1964 segments. Of this total, 1,379 or 21.38 per cent were game fish. Gizzard shad made up 21.04 per cent of the catch. Black bullhead catfish (Ictalurus melas) made up 13.78 per cent by number. Spotted gar (Lepisosteus oculatus) were present in good numbers and made up 10.54 per cent of the catch. Smallmouth buffalo and bigmouth buffalo (Ictiobus cyprinellus) combined made up 8.39 per cent by number.

A total of 5,525.63 pounds of fish were netted with 78.46 per cent being rough fish and 21.54 per cent game fish species. Table 4 contains the totals of netting data compiled for the 3-year period of the basic survey. Table 5 is a checklist of all species collected from Lake Palestine.

Table 6 is a graph comparing per cents of game fish populations in Lake Palestine collected in 1962, 1963 and 1964.

Seining

Seining collections were made to supplement netting. These collections were made with 26 by 6 foot bag seine with 1/4-inch mesh and a 15 by 4 foot bag seine having 1/8-inch mesh. Seining was done where access to the shore was not obstructed by timber, brush or aquatic vegetation. Fish collected were preserved in formalin and counted by species at the laboratory. Table 7 gives the species and numbers of fish collected each segment.

Table 4

A Comparison of Netting Data from Lake Palestine

Species	1962		1963		1964	
	Number	Weight	Number	Weight	Number	Weight
Spotted gar *	447	375.58	182	230.00	51	94.66
Longnose gar *	15	25.19	1	1.50	-	-
Bowfin *	197	213.75	64	119.25	5	16.37
Gizzard shad *	319	207.82	593	146.54	450	124.14
Grass pickerel *	2	0.58	1	0.25	-	-
Smallmouth buffalo *	294	401.00	160	333.75	49	174.38
Bigmouth buffalo *	41	83.18	50	103.18	12	56.69
Blacktail redhorse *	48	80.62	-	-	-	-
Spotted sucker *	168	223.80	168	202.57	37	66.68
River carpsucker *	23	4.99	-	-	-	-
Chubsucker *	74	18.11	118	42.57	4	2.25
Carp *	157	200.11	30	112.32	8	39.93
Golden shiner *	22	3.32	18	2.87	1	0.19
Channel catfish	242	427.50	62	180.76	13	46.68
Black bullhead *	322	96.95	464	146.93	103	68.68
Yellow bullhead *	101	73.68	127	68.81	36	21.99
Flathead catfish	12	37.63	7	29.75	1	4.00
Spotted bass	49	55.55	3	3.44	1	0.37
Largemouth bass	225	147.87	43	37.32	4	3.00
Warmouth	63	22.64	14	4.57	2	0.87
Green sunfish	1	0.19	-	-	-	-
Redear sunfish	8	2.38	5	2.43	7	3.06
Redbreast sunfish	44	12.03	4	1.31	7	1.97
Bluegill sunfish	168	41.94	74	19.57	35	9.59
Spotted sunfish	21	3.78	4	0.87	2	0.51
Longear sunfish	7	1.81	-	-	-	-
White crappie	9	7.37	3	3.13	3	1.62
Black crappie	50	12.98	139	39.68	54	21.75
Flier	-	-	2	0.19	-	-
Freshwater drum	88	123.28	12	26.94	-	-
Totals	3,217	2,905.75	2,348	1,860.50	885	759.38
Game fish	890	773.67	360	323.02	129	93.42
Rough fish	2,327	2,132.08	1,988	1,537.48	756	665.96
Per cent game fish	27.67	26.63	15.33	17.36	14.57	12.30
Per cent rough fish	72.33	73.37	84.67	82.64	85.43	87.70

Table 5

A Checklist of Lake Palestine Fish Species

- I. Family: PETROMYZONTIDAE - lampreys
1. Ichthyomyzon castaneus - chestnut lamprey
- II. Family: LEPISOSTEIDAE - gars
2. Lepisosteus oculatus - spotted gar
 3. L. osseus - longnose gar
- III. Family: AMIIDAE - bowfin
4. Amia calva - bowfin
- IV. Family: CLUPEIDAE - herrings
5. Dorosoma cepedianum - gizzard shad
- V. Family: ESOCIDAE - pickerels
6. Esox americanus - grass pickerel
- VI. Family: CATOSTOMIDAE - suckers and buffalofishes
7. Ictiobus cyprinellus - bigmouth buffalo
 8. I. bubalus - smallmouth buffalo
 9. Carpionodes carpio - river carpsucker
 10. Moxostoma poecilurum - blacktail redhorse
 11. Minytrema melanops - spotted sucker
 12. Erimyzon sucetta - lake chubsucker
- VII. Family: CYPRINIDAE - shiners and minnows
13. Cyprinus carpio - carp
 14. Notemigonus crysoleucas - golden shiner
 15. Notropis atherinoides - emerald shiner
 16. N. fumeus - ribbon shiner
 17. N. texanus - weed shiner
 18. N. potteri - chub shiner
 19. N. venustus - spottail shiner
 20. N. stramineus - sand shiner
 21. N. volucellus - mimic shiner
 22. N. maculatus - taillight shiner
 23. Pimephales vigilax - parrot minnow
- VIII. Family: AMEIIURIDAE - freshwater catfishes
24. Ictalurus punctatus - channel catfish
 25. I. melas - black bullhead
 26. I. natalis - yellow bullhead
 27. Pylodictis olivaris - flathead catfish
 28. Schilbeodes gyrinus - tadpole madtom

Table 5 (Continued)

- IX. Family: CYPRINODONTIDAE - killifishes and topminnows
- 29. Fundulus chrysotus - golden topminnow
 - 30. F. notatus - blackstripe topminnow
- X. Family: POECILIIDAE - Mosquitofishes
- 31. Gambusia affinis - mosquitofish
- XI. Family: ATHERINIDAE - silversides
- 32. Labidesthes sicculus - brook silversides
- XII. Family: CENTRARCHIDAE - black basses and sunfishes
- 33. Micropterus punctulatus - spotted bass
 - 34. M. salmoides - largemouth bass
 - 35. Chaenobryttus gulosus - warmouth
 - 36. Lepomis cyanellus - green sunfish
 - 37. L. punctatus - spotted sunfish
 - 38. L. microlophus - redear sunfish
 - 39. L. macrochirus - bluegill sunfish
 - 40. L. auritus - redbreast sunfish
 - 41. L. megalotis - longear sunfish
 - 42. Pomoxis annularis - white crappie
 - 43. P. nigromaculatus - black crappie
 - 44. Centrarchus macropterus - flier
 - 45. Elassoma zonatum - banded pigmy sunfish
- XIII. Family: PERCIDAE - perches and darters
- 46. Hadropterus scierus - dusky darter
 - 47. H. shumardi - river darter
 - 48. Percina caprodes - logperch
 - 49. Ammocrypta vivax - scaly sand darter
 - 50. Etheostoma chlorosomum - bluntnose darter
 - 51. E. gracile - slough darter
- XIV. Family: SCIAENIDAE - croakers, drums and weakfishes
- 52. Aplodinotus grunniens - freshwater drum

Table 6

Comparison of Percentages of Game Fish Collected in
Lake Palestine during 1964, 1963 and 1964

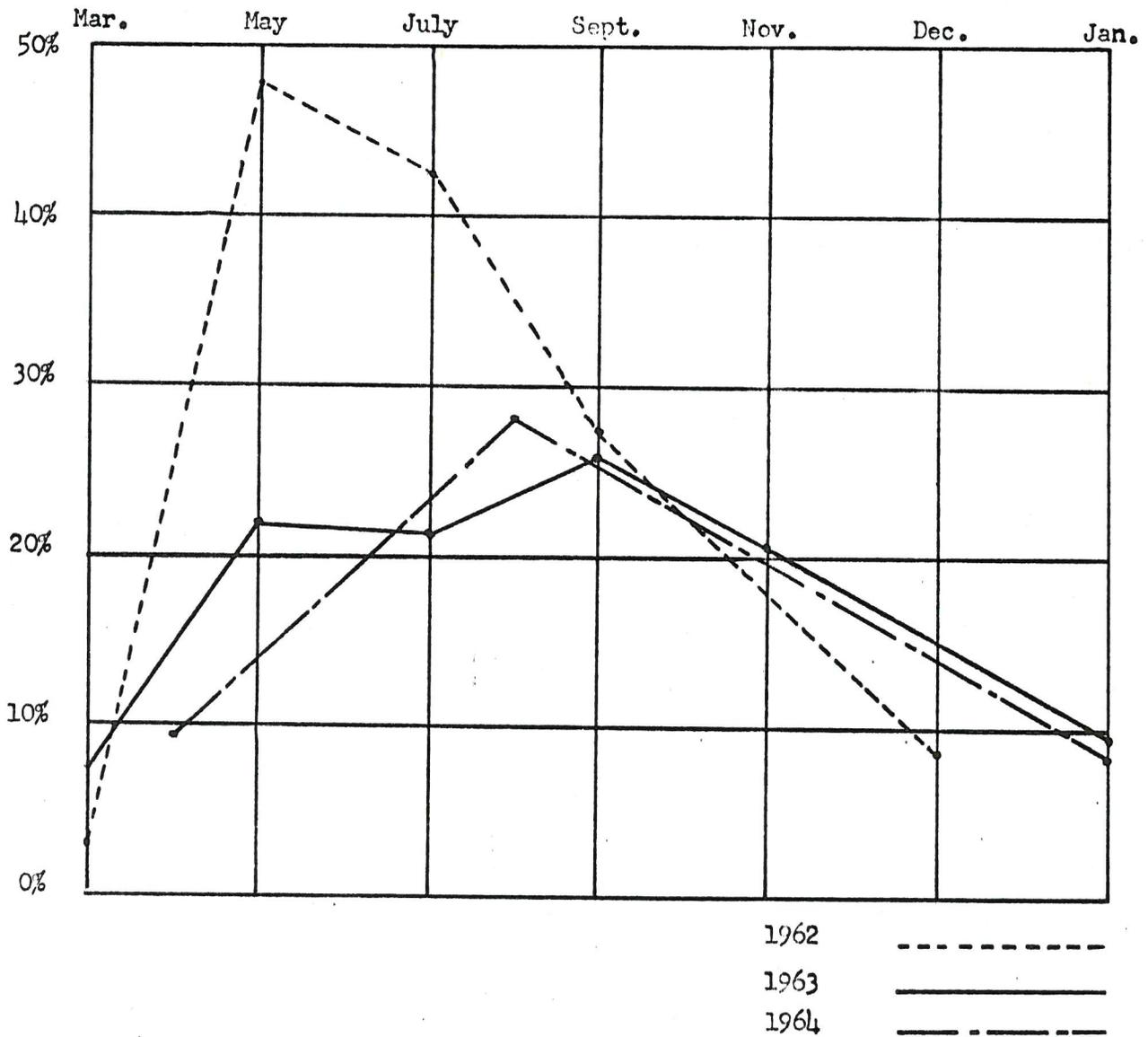


Table 7

Tabulation of Seining Collections from Lake Palestine

<u>Species</u>	<u>1962-63</u>	<u>1963-64</u>	<u>1964-65</u>
Spotted gar	1	1	-
Bowfin	1,267	-	-
Gizzard shad	10	5	-
Grass pickerel	108	2	-
Bigmouth buffalo	1	-	-
River carpsucker	13	-	-
Lake chubsucker	1	2	-
Carp	1	-	-
Golden shiner	91	66	4
Emerald shiner	5	-	-
Ribbon shiner	18	-	-
Redhorse shiner	-	-	10
Chub shiner	68	-	-
Spottail shiner	381	18	-
Sand shiner	1,241	154	18
Mimic shiner	13	-	-
Taillight shiner	-	1	-
Parrot minnow	3	-	-
Black bullhead	1	208	2
Yellow bullhead	18	2	-
Tadpole madtom	-	2	1
Golden topminnow	10	2	8
Blackstripe topminnow	230	163	46
Mosquitofish	1,133	772	-
Brook silversides	49	255	41
Spotted bass	27	2	1
Largemouth bass	559	27	1
Warmouth	3	1	1
Green sunfish	5	-	-
Spotted sunfish	64	125	20
Redear sunfish	47	110	26
Bluegill sunfish	59	1,381	16
Redbreast sunfish	17	-	-
White crappie	2	-	-
Black crappie	144	6	-
Flier	625	-	-
Banded pigmy sunfish	40	-	-
Dusky darter	1	-	-
River darter	41	-	-
Logperch	-	2	-
Scaly sand darter	20	1	-
Bluntnose darter	7	-	-
Slough darter	65	5	-
TOTALS	6,389	3,313	195

CONCLUSIONS AND RECOMMENDATIONS:

The 14.57 per cent by number of game fish species taken in 1964 from Lake Palestine is only slightly lower than the 15.33 per cent game fish netted in 1963. Largemouth bass (Micropterus salmoides) and channel catfish (Ictalurus punctatus) continue to decrease in numbers netted. However sport fishing for these two important game fish species continues to be successful. Black crappie are increasing in numbers and size.

Lake Palestine has an adequate population of buffalo (Ictiobus sp.) and carp (Cyprinus carpio) to support a moderate commercial fishery. Two contract commercial fishermen are presently averaging a catch of 1,000 pounds each per week.

Submerged aquatic vegetation is a constantly increasing problem in Lake Palestine. It is recommended that shoreline areas be cleared of all brush and timber in the event that the proposed third stage of the reservoir is constructed. The present shoreline in many areas is choked with dense brush and timber. This provides calm, clear water in shallow areas that supports excessive growths of vegetation.

It is recommended that this job be terminated with the completion of this 1964 segment of the basic fisheries survey.

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Approved Marion Toole
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Date May 28, 1965

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