Report of Fisheries Investigations

Basic Survey and Inventory of Species Present in Lake Arlington

by

Leonard D. Lamb
Project Leader

Dingell-Johnson Project F-4-R-5, Job B-22
August 6, 1957 - October 31, 1958

H. D. Dodgen - Executive Secretary

Texas Game and Fish Commission
Austin, Texas

Marion Toole
Coordinator

William H. Brown and Kenneth C. Jurgens
Assistant Coordinators

JOB COMPLETION REPORT

State of TEXAS

Project No. F-4-R-5 Name: Fisheries Investigations and Surveys of the Waters of Region 4-B.

Job No. B-22 Title: Basic Survey and Inventory of Species Present in Lake Arlington.

ABSTRACT:

Lake Arlington is a 2,200 surface acre water supply lake for the City of Arlington and is located on Village Creek near Handley, Texas, a short distance above the confluence with the West Fork of the Trinity River.

Rough fish contributed 51 percent of the total number and 59 percent of the total weight of the fish taken in gill net collections with carpsuckers providing 27.6 percent of the number and 31.2 percent of the weight. This species increased in the net catch during the last few months of the project period to indicate that they would become a problem in the near future.

White crappie did not appear in significant numbers in the catch during the first seven months of the investigation but were very numerous in the last five samples to make up 18.92 percent of the total catch.

OBJECTIVES:

To determine the species present and their abundance as well as to determine the ecological factors influencing their distribution.

METHODS:

Gill nets were used to take random samples from Lake Arlington at monthly intervals from August 1957 to June 1958. The sampling was changed in July to alternate months since little variation was noted. The sampling was discontinued with the end of the segment on October 31, 1958.

The netting was begun during the period when the City of Arlington had closed the lake to fishing. The net stations were established to cover the entire length of the lake but with the opening of fishing the boat traffic became quite heavy. The advent of warmer weather brought out speed boats and water skis which forced the netting operations into the sloughs where some protection was afforded.

The fish taken in gill nets were weighed, measured and examined for disease, parasites, and stomach content. The data recorded were tabulated for inclusion in his report.

The shoreline of this lake was such that efficient seining was impossible.

PHYSICAL DESCRIPTION:

Lake Arlington is an impoundment that covers about 2,200 surface acres. It was constructed by the City of Arlington to serve as a water supply. The dam is located on Village Creek just South of Highway 80 in the east edge of Handley, Texas. The dam was completed in April 1957 and was filled within two weeks after the closure.

This lake was stocked with largemouth black bass fry in May and with crappie, channel catfish and sunfish in September. The ban on fishing was removed on March 5, 1958.

RESULTS:

Netting operations produced only eleven species representing five families, seven genera, and eleven species (Table 1). Channel catfish, largemouth bass, bluegill sunfish, white and black crappie were stocked by the Eagle Mountain State Fish Hatchery but the other species present were native to Village Creek. There is little doubt that some specimens of those species introduced by the hatchery were also native but the limited stream flow of the stream before impoundment indicates that only a small population was able to survive the dry weather.

Table 2 presents the comparison between the game and rough species with the channel catfish included in the game fish. The average weight of rough fish was 0.65 pounds while that of game fish was 0.46 pounds. This was due largely to a comparatively heavy population of carpsuckers which contributed 27.6 percent to the total number and 31.2 percent to the total weight of fish taken in net samples.

Game fish make up 41 percent of the total weight and 49 percent of the total number of all fish taken in gill nets. This is a good situation but it will be noticed that in latter months rough fish showed a sharp increase in the catch, with carpsucker providing the majority of this increase in both numbers and weight (Tables 5 and 6).

Table 3 shows the success of gill netting in terms of fish caught per 100 feet of net. There is considerable variation in the catch from month to month but in general the number of fish taken is a good indication of the weather conditions at the time of netting. Netting in September and December of 1957 was hampered by high winds as was that of March. July netting suffered from high temperature that sent the fish out of the sloughs and into the deep open water where the boat traffic made netting unwise.

The high points in netting occurred in October 1957 and October 1958. The October 1957 catch was dominated by largemouth bass with 32.56 percent followed by bluegill and black bullhead with 26.74 and 19.77 percent respectively. The October 1958 catch was dominated by white crappie with 64.1 percent followed by carpsucker and largemouth bass with 23.08 and 6.41 percent respectively (Table 5).

Table 4 presents data concerning the length, weight and condition of the various species taken. There is considerable difference in the length and weight ranges which may be expected since the early net samples included young of the year fish and the later samples included larger adults.

The Table 5 data shows the first seven months to be the most productive period as far as largemouth bass were concerned, since all but 16 of the 150 bass taken were caught during the last five net samples. The reverse is true of the carpsucker with 147 of the 200 total being taken in the last five samples. White crappie also failed to appear in significant numbers during the first seven months but increased sharply in the net catch of the last five samples.

The success of the netting in terms of the number of each species caught per 100 feet of gill net set overnight is shown in Table 7 where the catch is recorded on a monthly basis. Carpsuckers (Carpiodes carpio) did not appear in the catch during the first two months of netting but steadily increased during the remainder of the netting period. Black bullheads (Ictalurus melas) were taken in abundance the first month of netting but disappeared from the catch during the last three months. Largemouth bass (Micropterus salmoides) were present in the netting catches of all but one of the months but no conclusion concerning this species could be drawn since they were not regularly abundant in the samples. It would seem that the weather conditions tended to affect this species to a greater extent than other species since they were abundant in the catch when the weather was favorable and scarce when it was not favorable. Bluegill sunfish (Lepomis macrochirus) appeared in all but two of the net samples but like the bass seemed to follow no set pattern. White crappie (Pomoxis annularis) were scarce in the catches during the early months of the netting period but increased in the catch toward the end of segment period, the greatest number being taken during the final month of netting.

Prepared by Leonard D. Lamb, Project Leader — Approved by Marion Toole, Director Inland Fisheries Division

Date January 21, 1959

Table 1. Checklist of Fish from Lake Arlington August 16, 1957 - October 31, 1958

SCIENTIFIC NAME	COMMON NAME
Dorosoma cepedianum	gizzard shad
Carpiodes carpio	river carpsucker
Cyprinus carpio	carp
Ictalurus punctatus	channel catfish
Ictalurus melas	black bullhead
Ictalurus natalis	yellow bullhead
Micropterus salmoides	largemouth bass
Lepomis cyanellus	green sunfish
Lepomis macrochirus	bluegill sunfish
Pomoxis annularis	white crappie
Pomoxis nigromaculatus	black crappie

Table 2. A Comparison of Game Fish and Rough Species Caught in Gill Nets from Lake Arlington August 16, 1957-October 31, 1958.

Total number specimens caught	724
Total weight of specimens (pounds)	403.94
Average weight per specimen (pounds)	.56
Total weight of rough fish (pounds)	237.59
Total weight of game fish (pounds)	166.35
Total number of rough fish	367
Total number of game fish	357
Average weight per rough fish (pounds)	.65
Average weight per game fish (pounds)	.46
Percent rough fish (by weight)	59
Percent game fish (by weight)	41
Percent rough fish (by number)	51
Percent game fish (by number)	49

Channel catfish included in game fish.

Table 3. Success of Gill Netting at Arlington Lake in Terms of Number and Pounds of Fish Caught August 16, 1957-October 31, 1958.

MONTH	No. of Nets Sets	No. ft. Nets Sets	No. Fish Caught	No. lbs. Fish Caught	Avg. no. Fish per Net	Avg. no. Fish per 100' Net	Avg. no. lbs. Fish per Net	Avg. no. Pounds Fish per 100'
August	2	150	60	21.56	30.00	40.00	10.78	14.22
September	3	300	22	7.63	7.33	7.33	2.54	2.54
October	3	300	86	56.09	28.66	28.66	18.70	18.70
November	2	200	60	33.42	30.00	30.00	16.71	16.71
December	2	200	37	18.27	18.50	18.50	9.13	9.13
January	2	200	25	11.87	12.50	12.50	5.93	5.93
February	3	300	67	30.21	22.33	22.33	10.07	10.07
March	3	300	45	17.53	15.00	15.00	5.84	5.84
April	3	300	52	56.51	17.33	17.33	18.84	18.84
May	3	300	64	37.31	21.33	21.33	12.44	12.44
July	3	300	50	25.80	16.66	16.66	8.60	8.60
October	3	300	156	87.74	52.00	52.00	29.25	29.25
TOTAL	32	3,150	724	403.94	22.63	22.98	12.62	12.82

Table 4. Length, Weight and Coefficient of Condition of Fish Collected by Gill Nets from Lake Arlington August 16, 1957--October 31, 1958.

SPECIES	Total No.	Std. (MM) Length Range	(MM) Length Average	(gms) Weight Range	(gms) Weight Av.	"K" Range	"K" Average
D. cepedianum	23	160-280	199	135-200	162	1.55-4.80	2.09
C. carpio	200	180-260	216	185-415	261	2.10-4.00	2.57
CY. carpio	36	195-365	276	185-1247	655	2.25-3.40	2.98
I. punctatus	11	200-380	270	105-907	338	1.30-1.95	1.57
I. melas	104	180-280	211	170-355	232	1.60-2.70	2.27
I. natalis	4	180-230	213	107-305	237	1.80-2.80	2.32
M. salmoides	150	145-280	224	72-475	250	1.75-3.10	2.23
L. cyanellus	1	160-160	160	140-140	140	3.40-3.40	3.40
L. macrochirus	52	95-160	134	30-160	113	3.40-5.00	4.52
P. annularis	137	129-238	187	28-280	174	1.10-4.70	2.61
P. nigromaculatus	6	150-168	161	113-138	119	2.35-3.40	2.89

Table 5. Species Distribution in Net Catch by Number in Arlington Lake, August 16, 1957 - October 31, 1958.

SPECIES	August		September		October		November		December		January		February	
	No.	%	No.	%.	No.	%	No.	%	No.	%	No.	%	No.	%
C. cepedianum	1	1.67	1	4.54	3	3.49	3	5.00					9	13.42
C. carpio					7	8.14	8	13.33	7	18.92	13	52.00	18	23.85
Cy. carpio	6	9.99			4	4.65	1	1.67						
I. punctatus					1	1.16								
I. melas	33	55.00	10	45.46	17	19.77	10	16.67	6	16.22	2	8.00	8	11.93
I. natalis			1	4.54	2	2.33								
M. salmoides	18	30.00	3	13.64	28	32.56	32	53.33	16	43.24	10	40.00	27	40.28
L. cyanellus							1	1.67						
L. macrochirus	1	1.67	7	31.82	23	26.74			1	2.70				
P. annularis	1	1.67			1	1.16	5	8.33	5	13.51			1	1.49
P. nigromaculatus									2	5.41			4	5.96
TOTALS	60	100.00	22	100.00	86	100.00	60	100.00	37	100.00	25	100.00	67	100.00

Table 5. (Continued) Species Distribution in Net Catch by Number in Arlington Lake, August 16, 1957-October 31, 1958.

SPECIES	March		April		May		July		October		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
D. cepedianum	3	6.67	1	1.92			1	2.00	1	0.64	23	3.18
C. carpio	31	68.89	10	19.23	49	76.56	21	42.00	36	23.08	200	27.62
Cy. carpio			19	36.54	4	6.25	1	2.00	1	0.64	36	4.97
I. punctatus							3	6.00	7	4.49	11	1.52
I. melas	1	2.22	17	32.69							104	14.36
I. natalis							1	2.00			4	0.55
M. salmoides	1	2.22			1	1.56	4	8.00	10	6.41	150	20.72
L. cyanellus											1	0.14
L. macrochirus	6	13.33	4	7.70	8	12.50	1	2.00	1	0.64	52	7.18
P. annularis	3	6.67	1	1.92	2	3.13	18	36.00	100	64.10	137	18.92
P. nigromaculatus											6	0.83
TOTALS	45	100.00	52	100.00	64	100.00	50	100.00	156	100.00	724	100.00

Table 6. Species Distribution, in Net Catch by Weight and Percentage, August 16, 1957-October 31, 1958

SPECIES	August		September		October		November		December		January	
	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%
D. cepedianum	0.09	0.46	0.31	4.06	1.06	2.45	0.94	2.77	0.00	0.00	0.00	0.00
C. carpio	2.08	10.63	0.00	0.00	3.25	7.52	4.25	12.51	3.62	19.81	5.37	45.28
Cy. carpio	0.00	0.00	0.00	0.00	7.25	16.79	1.56	4.59	0.00	0.00	0.00	0.00
I. punctatus	0.00	0.00	0.00	0.00	2.00	4.63	0.00	0.00	0.00	0.00	0.00	0.00
I. melas	12.01	61.37	4.37	57.27	9.25	21.42	5.37	15.80	3.00	16.42	1.06	8.94
I. natalis	0.00	0.00	0.23	3.02	1.37	3.17	0.00	0.00	0.00	0.00	0.00	0.00
M. salmoides	5.25	26.83	1.43	18.74	15.75	36.47	19.79	58.24	9.20	50.36	5.43	45.78
L. cyanellus	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.91	0.00	0.00	0.00	0.00
L. macrochirus	0.00	0.00	1.29	16.91	2.89	6.69	0.00	0.00	0.25	1.37	0.00	0.00
P. annularis	.14	0.71	0.00	0.00	0.37	0.86	1.76	5.18	1.65	9.03	0.00	0.00
P. nigromaculatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	3.01	0.00	0.00
TOTALS	19.57	100.00	7.63	100.00	43.19	100.00	33.98	100.00	18.27	100.00	11.86	100.00

Table 6. (Continued) Species Distribution, in Net Catch by Weight and Percentage, August 16, 1957-October 31, 1958

SPECIES	February		March		April		May		July		October		Totals	
	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%
D. cepedianum	2.81	9.28	1.00	5.61	0.50	2.18	0.00	0.00	0.44	1.72	0.32	0.36	7.47	2.04
C. carpio	8.06	26.63	13.25	74.40	5.25	22.88	24.75	68.15	12.25	47.81	32.00	36.44	114.13	31.22
Cy. carpio	0.00	0.00	0.00	0.00	5.19	22.61	8.12	22.36	2.00	7.81	0.64	0.73	24.74	6.77
I. punctatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	5.07	4.90	5.58	8.20	2.24
I. melas	4.11	13.58	0.78	4.38	10.75	46.84	0.00	0.00	0.00	0.00	0.00	0.00	58.90	16.11
I. natalis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	1.99	0.00	0.00	2.11	0.58
M. salmoides	13.95	46.09	0.55	3.09	0.00	0.00	1.00	2.75	2.90	11.32	8.25	9.40	85.61	23.42
L. cyanellus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.08
L. macrochirus	0.00	0.00	1.41	7.92	1.12	4.88	2.25	6.19	0.07	0.27	0.22	0.25	9.50	2.60
P. annularis	0.30	0.99	0.82	4.60	0.14	0.61	0.20	0.55	6.15	24.01	41.48	47.24	53.01	14.50
P. nigromaculatus	1.04	3.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.44
TOTALS	30.27	100.00	17.81	100.00	22.95	100	36.32	100	25.62	100.00	87.81	100.00	365.57	100.00

Table 7. Number of Each Species Caught Per Month Per 100 Foot of Gill Nets Set Overnight in Lake Arlington, August 6, 1957-October 31, 1958

No. 100' Net	1.5	3	3	2	2
Species	August	September	October	November	December
D. cepedianum	00.66	0.33	1.00	1.50	00.00
C. carpio	00.00	00.00	2.33	4.00	3.50
Cy. carpio	4.00	00.00	1.33	0.50	00.00
I. punctatus	00.00	00.00	0.33	00.00	00.00
I. melas	22.00	3.33	5.66	5.00	3.00
I. natalis	00.00	0.33	0.66	00.00	00.00
M. salmoides	12.00	1.00	9.33	16.00	8.00
L. cyanellus	00.00	00.00	00.00	0.50	00.00
L. macrochirus	0.66	2.33	7.66	2.50	0.50
P. annularis	0.66	00.00	0.33	00.00	2.50
P. nigromaculatus	00.00	00.00	00.00	00.00	1.00
TOTALS	39.98	7.32	28.63	30.00	18.50

Table 7. (Continued) Number of Each Species Caught Per Month Per 100 Foot of Gill Nets Set Overnight in Lake Arlington, August 6, 1957-October 31, 1958

No. 100' Net	2	3	3	3	3	3	3	31.50
Species	January	February	March	April	May	July	October	Average Weight
D. cepedianum	00.00	3.00	1.00	0.33	00.00	0.33	0.33	0.73
C. carpio	6.50	6.00	10.33	3.33	16.33	7.00	12.00	6.35
Cy. carpio	00.00	00.00	00.00	6.33	1.33	0.33	0.33	1.14
L. punctatus	00.00	00.00	00.00	00.00	00.00	1.00	2.33	0.35
I. melas	1.00	2.66	0.33	5.66	00.00	00.00	00.00	3.30
I. natalis	00.00	00.00	00.00	00.00	00.00	0.33	00.00	0.13
M. salmoides	5.00	9.00	0.33	00.00	0.33	1.33	3.33	4.76
L. cyanellus	00.00	00.00	00.00	00.00	00.00	00.00	00.00	0.03
L. macrochirus	00.00	00.00	2.00	1.33	2.66	0.33	0.33	1.65
P. annularis	00.00	0.33	1.00	0.33	0.66	6.00	33.33	4.35
P. nigromaculatus	00.00	1.33	00.00	00.00	00.00	00.00	00.00	0.19
TOTALS	12.50	22.32	14.99	17.31	21.31	16.65	51.98	22.98