

EICE

JOB COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-4-R-12

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

Job No. B-31: Inventory of Hubbard Creek and Proctor Lakes
Including an Evaluation of the Pre-impound-
ment Rotenone Treatment of Hubbard Creek Lake.

Project Leader: Dwane Q. Smith

W. J. Cutbirth
Acting Deputy Director
Texas Parks and Wildlife Department
Austin, Texas

Marion Toole
D-J Coordinator

Eugene A. Walker
Director, Wildlife Services

August 19, 1966

ABSTRACT

Despite the pre-impoundment fish kill executed on the Hubbard Creek watershed, rough fish species have increased faster in this lake than in Proctor Lake where no kill was accomplished. Factors influencing this situation are not clear from data collected so far.

The job will be completed in the next segment of work.

JOB COMPLETION REPORT

State of Texas

Project No. F-4-R-12

Job No. B-31

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

Title: Inventory of Hubbard Creek and Proctor Lakes Including an Evaluation of the Pre-impoundment Rotenone Treatment of Hubbard Creek Lake.

Period Covered: November 1, 1964 - October 31, 1965

Objectives:

1. To determine the fish species present, their relative abundance and the factors influencing their distribution.
2. To compare the fish population in Hubbard Creek Lake (pre-impoundment rotenone treatment of watershed) with those of Proctor Lake (untreated watershed) to determine the following:
 - a. Rough fish - game fish ratio.
 - b. Growth rates (based on length of time since stocking).
 - c. Coefficient of condition of game species.
 - d. Reproduction of game species.

Introduction:

Hubbard Creek Lake

Hubbard Creek Lake, located nine miles northwest of Breckenridge in Stephens County, Texas, was built by the city of Abilene, Texas and is controlled by the West Central Texas Water District. The earthen dam, across Hubbard Creek below the confluence with Sandy Creek, will impound 16,000 surface acres when full but inundated approximately 4,000 surface acres during the F-4-R-11 and F-4-R-12 segments of work. Hubbard Creek Lake was created to provide a water supply for Abilene and smaller surrounding cities. No emphasis were placed on recreation or recreational facilities.

Construction was completed in the fall of 1962 and 2,000 surface acres of water were impounded that year. Additional water was impounded during the spring of 1963 to raise the total surface acres to 4,000.

Soils on the watershed are primarily of clay and clay-loam with underlying limestone. Shoreline vegetation is very limited. Mesquite is the predominant

tree while the shoreline supports bermuda grass, sunflowers and various other range grasses and weeds. The lake is very susceptible to wind which hinders fishermen through wave action.

Hubbard and Sandy Creeks, within the lake basin, were treated at the rate of 1.5 ppm liquid rotenone during the last two weeks of August 1962. Prior to the basin treatment all farm ponds were treated with powdered rotenone in an attempt to eliminate existing pond fish populations (Project F-14-D-6, Job 16a37).

Proctor Lake

Proctor Lake is located on the Leon River near Proctor, Comanche County, Texas. The structure was built by the Army Corps of Engineers for flood prevention and recreation. Work on the dam was completed in the spring of 1963. Due to heavy rains on the watershed the lake was filled immediately.

Lake Proctor has 4,600 surface acres of water which is supplied by Rush Creek, Sabanna River and Leon River. Soils on the watershed are primarily sand with underlying clay. Peanuts and watermelons are the principal crops grown on the immediate watershed. The shoreline has a variety of trees including large pecan trees interspersed with post oak. Bermuda is the predominant grass.

Launching ramps, camp sites, picnic areas and paved roads, built by the Corps of Engineers, make the lake very attractive and extremely accessible to the public.

No pre-impoundment fish kill was attempted.

Stocking of Lakes

Stocking of fish in both lakes from State hatcheries is tabulated in Table 1. Those fish stocked in the Hubbard Creek Lake basin during the months of August and September 1962 were placed in farm ponds which had previously been treated with rotenone to remove native fish.

Techniques:

Gill nets were used to sample fish populations and were set at stations established during the initial (F-4-R-11) segment of this job. The nets were 150 feet long and 6 feet deep, with square mesh graduated from one inch to three and one-half inches, changing every 25 feet. Nets were set in the afternoon and raised the following morning. Netting trips were made to each lake during a minimum of six months of each segment. These trips were distributed more or less randomly over the segment periods. In Hubbard Creek Lake 8,550 feet of net was set during the first segment and 6,450 feet set during the second. In Lake Proctor 8,350 feet were set the first year and 6,000 feet the second.

Scientific names of fish mentioned in this report are shown in a checklist (Table 2). The checklist also reflects the various species included among the terms "rough fish", "game fish" and "miscellaneous sunfish", as used in this report

Table 1. Stocking of Hubbard Creek Lake and Proctor Lake.

Hubbard Creek Lake					
<u>Date</u>	<u>Largemouth Bass</u>	<u>Channel Catfish</u>	<u>Catfish Blue</u>	<u>Flathead Catfish</u>	<u>Crappie White</u>
8-62	10,000	2,000			
9-62	5,000	103,050	12,000		
10-62	19,000	10,700	24,000	2,000	
4-63	350,000				1,096
Totals	384,000	115,750	36,000	2,000	1,096
Proctor Lake					
<u>Date</u>	<u>Largemouth Bass</u>	<u>Channel Catfish</u>	<u>Catfish Blue</u>	<u>Flathead Catfish</u>	<u>Crappie White</u>
6-63	167,700				
8-63		76,980			
10-63				5,050	
Totals	167,700	76,980		5,050	

NOTE: See checklist for technical names of fish appearing in this table.

Table 2. Checklist of fishes mentioned in this report and arranged within categories designated for reporting purposes.

Rough Fish

Spotted gar	<u>Lepisosteus oculatus</u>
Longnose gar	<u>L. osseus</u>
Gizzard shad	<u>Dorosoma cepedianum</u>
Smallmouth buffalo	<u>Ictiobus bubalus</u>
River carpsucker	<u>Carpionodes carpio</u>
Carp	<u>Cyprinus carpio</u>
Black bullhead	<u>Ictalurus melas</u>
Yellow bullhead	<u>I. natalis</u>
Freshwater drum	<u>Aplodinotus grunniens</u>

Game Fish

Channel catfish	<u>Ictalurus punctatus</u>
Blue catfish	<u>I. furcatus</u>
Flathead catfish	<u>Pylodictis olivaris</u>
Largemouth bass	<u>Micropterus salmoides</u>
White crappie	<u>Poxomis annularis</u>

Miscellaneous sunfish

Warmouth	<u>Chaenobryttus gulosus</u>
Green sunfish	<u>Lepomis cyanellus</u>
Redear sunfish	<u>L. microlophus</u>
Bluegill	<u>L. macrochirus</u>
Longear sunfish	<u>L. megalotis</u>

Discussion:

Despite the pre-impoundment fish kill, rough fish comprised 40.65 per cent of number and 55.36 per cent of weight of all fish netted in Hubbard Creek Lake during the initial segment (Table 3), as opposed to 40.71 per cent by number and 41.87 per cent by weight for Proctor Lake where no kill was attempted (Table 4). During the second segment of work, rough fish comprised 61.85 per cent of number and 65.39 per cent of weight of the fish netted from Hubbard Creek (Table 5), and 51.08 per cent and 45.46 per cent respectively for Proctor (Table 6). It can be seen from this that rough fish species increased significantly faster in Hubbard Creek Lake during the first two years, despite the pre-impoundment fish kill. However, specific factors influencing this situation are less evident.

It seems probable that detailed examination of all data available including comparison of stocking techniques, times of impoundment for each lake, plus analysis of catch by species and group composition, size ranges and condition factors within species, catch rates by species and groups, and similar indices, may allow conclusions to be drawn. The data presented herein is incomplete, as the job has entered a third and final segment. For this reason, no further analysis at this time appears warranted.

When final data has been collected and analyses completed, any significant findings will be offered for publication in an appropriate journal. Otherwise, a detailed presentation will be given in the job completion report.

Prepared by: Dwane Q. Smith
Project Leader

Approved by: Marion Toole
Coordinator

Date: August 19, 1966

GARY WOOD
Regional Supervisor

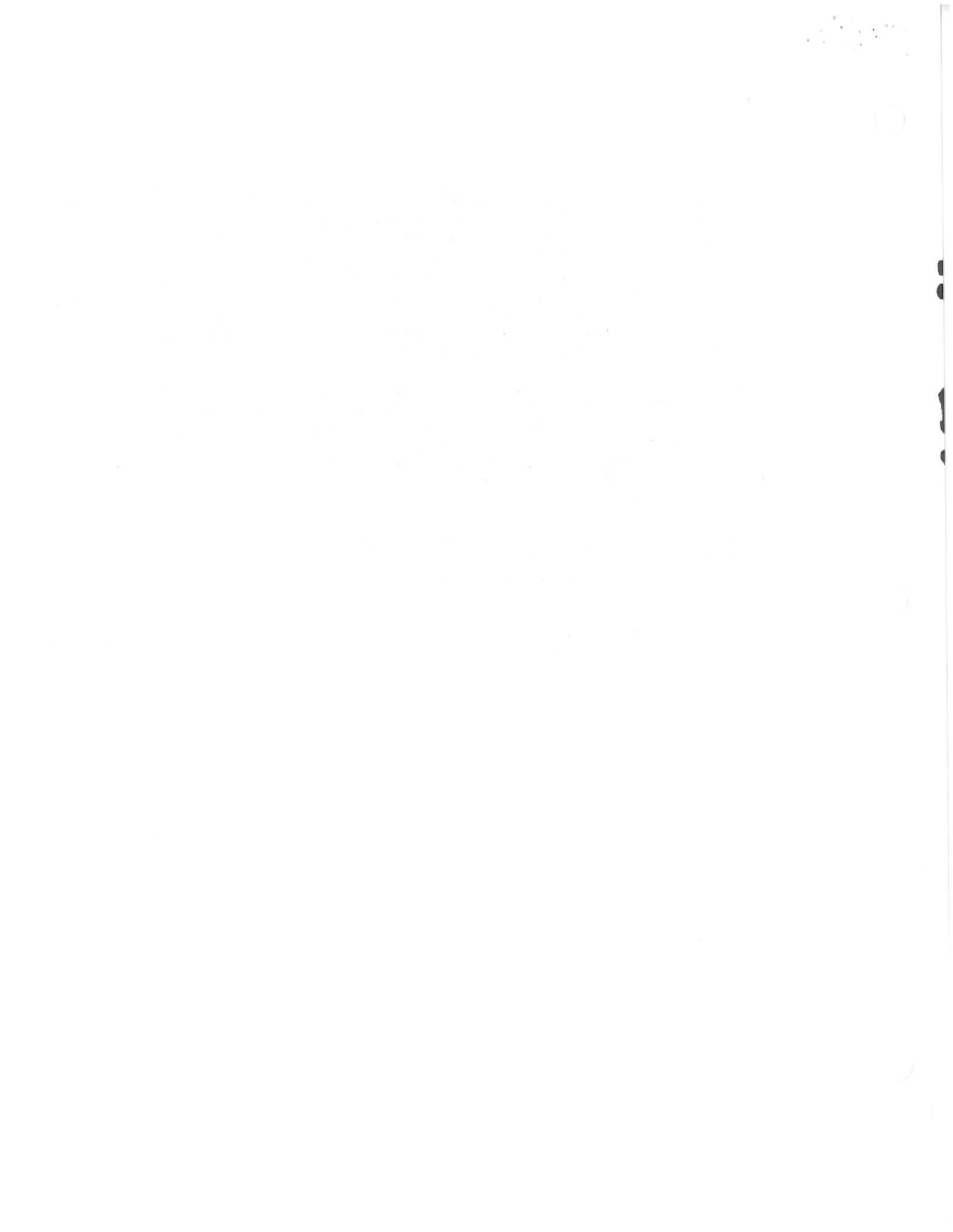


Table 3. Hudson Creek Netting, 1963 - 1964 (F-4-R-11).

Species	Total Number	Per Cent of Number	Total lbs. Weight	Per Cent of Weight	No. Per 100 ft. Net	Lbs. Per 100 ft. Net	Length Range mm	Av. Length mm	Weight Range gm	Av. Weight gm	"K" Range	"K" Average
<u>Rough Species</u>												
Spotted gar	6	0.40	6.39	0.56	0.07	0.07	340-580	437	240-1,247	581	0.62-0.74	0.68
Longnose gar	13	0.88	85.42	7.60	0.15	0.99	540-1,140	761	734-9,866	2,983		
Gizzard shad	152	10.26	62.24	5.53	1.77	0.72	125-305	211	30-515	186	1.07-2.45	1.67
Smallmouth buffalo	203	13.71	174.43	15.50	2.37	2.04	175-450	221	150-2,835	390	2.25-4.20	2.77
River carpsucker	29	1.96	44.97	4.00	0.33	0.52	250-360	306	395-1,134	704	2.00-2.80	2.32
Carp	161	10.87	217.09	19.29	1.88	2.53	200-570	297	185-5,046	612	1.32-3.00	2.12
Black bullhead	18	1.21	4.81	0.42	0.21	0.05	155-230	172	75-275	121	1.52-2.25	1.82
Freshwater drum	<u>20</u>	<u>1.36</u>	<u>27.63</u>	<u>2.46</u>	<u>0.23</u>	<u>0.32</u>	150-355	305	60-1,134	627	1.40-2.52	2.07
Sub Total	602	40.65	622.98	55.36	7.01	7.24						
<u>Game Species</u>												
Channel catfish	84	5.67	53.97	4.80	0.98	0.63	120-500	260	25-1,673	292	0.97-1.70	1.31
Blue catfish	134	9.05	111.22	9.89	1.56	1.30	200-480	289	110-1,446	377	1.10-1.88	1.38
Flathead catfish	10	0.68	45.15	4.02	0.11	0.52	380-580	495	1,219-3,062	2,050	1.52-2.25	1.75
Largemouth bass	212	14.31	193.59	17.20	2.47	2.26	160-375	254	45-1,361	415	0.66-3.20	2.18
White crappie	<u>86</u>	<u>5.80</u>	<u>67.97</u>	<u>6.04</u>	<u>1.00</u>	<u>0.79</u>	95-305	243	20-1,071	359	2.00-3.75	2.61
Sub Total	526	35.51	471.90	41.95	6.12	5.50						
<u>Miscellaneous Sunfish</u>												
Warmouth	2	0.14	0.57	0.05	0.02	0.01*	155-185	170	80-180	130	2.13-2.85	2.49
Green sunfish	9	0.61	1.10	0.10	0.10	0.01	120-150	129	50-145	56	1.52-3.18	2.56
Bluegill	<u>342</u>	<u>23.09</u>	<u>28.53</u>	<u>2.54</u>	<u>4.00</u>	<u>0.33</u>	90-120	104	25-50	38	1.90-4.40	3.29
Sub Total	<u>353</u>	<u>23.84</u>	<u>30.20</u>	<u>2.69</u>	<u>4.12</u>	<u>0.35</u>						
Total	1,481	100.00	1,125.08	100.00	17.25	13.09						

* Less than

Table 4. Lake Proctor Netting 1963 - 1964 (F-4-R-11).

Species	Total		Per Cent of		Total lbs. Weight	Per Cent of Weight	No. Per 100 ft. Net	Lbs. Per 100 ft. Net	Length Range mm	Av. Length mm	Weight Range gm	Av. Weight gm	"K" Range	"K" Average
	Number	Number	Number	Weight										
<u>Rough Species</u>														
Spotted gar	60	2.75	100.10	7.56	0.71	1.19	330-670	479	350-2,552	757	-	-	-	-
Longnose gar	9	0.41	26.16	1.98	0.10	0.31	600-740	668	794-2,268	1,320	-	-	-	-
Gizzard shad	90	4.13	28.16	2.13	1.07	0.33	95-280	185	12-450	142	0.15-2.30	1.68	0.15-2.30	1.68
Smallmouth buffalo	45	2.07	23.63	1.78	0.53	0.28	135-430	199	60-2,296	238	1.97-3.12	2.56	1.97-3.12	2.56
River carpsucker	217	9.96	131.26	9.91	2.59	1.57	115-320	219	50-822	275	1.63-3.45	2.41	1.63-3.45	2.41
Carp	190	8.72	92.40	6.98	2.27	1.10	115-450	193	45-2,013	221	1.77-2.55	2.43	1.77-2.55	2.43
Black bullhead	42	1.93	33.70	2.54	0.50	0.40	130-420	228	35-1,134	364	1.52-3.15	2.22	1.52-3.15	2.22
Yellow bullhead	31	1.42	22.37	1.69	0.37	0.26	155-335	224	65-1,021	328	1.38-3.05	2.63	1.38-3.05	2.63
Freshwater drum	203	9.32	96.68	7.30	2.43	1.15	100-470	216	15-3,742	216	1.32-3.58	2.14	1.32-3.58	2.14
Sub Total	887	40.71	554.46	41.87	10.57	6.59								
<u>Game Species</u>														
Channel catfish	123	5.64	125.09	9.44	1.47	1.49	125-475	290	20-1,871	462	0.98-2.80	1.44	0.98-2.80	1.44
Flathead catfish	11	0.50	33.07	2.50	0.13	0.39	200-560	405	105-3,175	1,365	1.30-1.85	1.59	1.30-1.85	1.59
Largemouth bass	221	10.14	221.24	16.70	2.64	2.64	150-360	255	70-1,361	454	1.57-3.47	2.37	1.57-3.47	2.37
White crappie	843	38.69	377.65	28.51	10.09	4.52	115-285	202	20-737	203	1.23-3.60	2.65	1.23-3.60	2.65
Sub Total	1,198	54.97	757.05	57.15	14.33	9.04								
<u>Miscellaneous sunfish</u>														
Warmouth	12	0.55	4.30	0.32	0.14	0.05	130-200	171	60-245	163	2.75-3.60	3.13	2.75-3.60	3.13
Green sunfish	28	1.28	4.12	0.31	0.33	0.04	100-200	130	40-245	67	1.80-4.70	2.58	1.80-4.70	2.58
Redear sunfish	1	0.05	0.08	*0.01	0.01	*0.01	115	115	40	40	2.70	2.70	2.70	2.70
Bluegill	52	2.39	4.42	0.33	0.62	0.05	95-115	103	25-60	39	2.55-4.90	3.68	2.55-4.90	3.68
Longear sunfish	1	0.05	0.11	*0.01	0.01	*0.01	115	115	50	50	3.45	3.45	3.45	3.45
Sub Total	94	4.32	13.03	0.98	1.11	0.16								
Total	2,179	100.00	1,324.54	100.00	26.01	15.79								

* Less than

Table 5. Howard Creek Netting 1964 - 1965 (F-4-R-12).

Species	Total Number	Per Cent of Number	Total lbs. Weight	Per Cent of Weight	No. Per 100 ft. Net	lbs. Per 100 ft. Net	Length Range mm	Av. Length mm	Weight Range gm	Av. Weight gm	"K" Range	"K" Average
<u>Rough Species</u>												
Gizzard shad	98	9.25	14.87	1.29	1.51	0.23	110-520	153	30-345	69	1.54-2.11	2.02
Smallmouth buffalo	243	22.95	295.35	25.81	3.76	4.57	180-435	273	170-2,495	552	2.53-3.41	2.93
River carpsucker	110	10.38	152.12	13.29	1.70	2.35	260-370	303	440-1,361	628	2.20-2.61	2.39
Carp	147	13.88	263.44	23.01	2.27	4.08	160-550	309	110-3,742	814	2.20-2.66	2.44
Black bullhead	2	0.19	0.41	0.04	0.03	*0.01	140-165	70	80-110	95	2.40-2.90	2.65
Freshwater drum	55	5.20	22.31	1.95	0.85	0.34	130-380	214	40-1,247	184	1.85-2.27	2.14
Sub Total	655	61.85	748.50	65.39	10.12	11.58						
<u>Game Species</u>												
Channel catfish	90	8.50	59.88	5.14	1.39	0.91	110-500	247	15-2,381	297	1.39-1.75	1.49
Blue catfish	25	2.36	24.79	2.17	0.38	0.38	240-400	296	200-907	450	1.28-1.75	1.43
Flathead catfish	17	1.61	83.49	7.29	0.26	1.29	380-560	497	1,021-3,204	2,230	1.68-1.85	1.73
Largemouth bass	105	9.91	132.31	11.56	1.62	2.05	160-400	285	115-1,843	572	2.16-2.95	2.42
White crappie	104	9.82	90.40	7.90	1.61	1.41	100-350	229	20-1,106	395	2.10-2.99	2.52
Sub Total	341	32.20	319.87	34.06	5.26	4.63						
<u>Miscellaneous Sunfish</u>												
Warmouth	2	0.19	0.50	0.04	0.03	*0.01	115-170	143	60-170	115	3.40-3.90	3.65
Green sunfish	7	0.66	0.67	0.06	0.10	0.01	95-120	105	30-60	44	2.90-4.40	3.77
Redear sunfish	1	0.10	0.13	0.01	0.01	*0.01	120	120	120	60	3.40	3.40
Bluegill	50	4.72	4.64	0.41	0.77	0.07	85-130	96	30-90	42	3.47-4.27	3.74
Longear sunfish	3	0.28	0.35	0.03	0.04	*0.01	85-100	95	40-60	53	6.00	6.00
Sub Total	63	5.95	6.29	0.55	0.95	0.11						
Total	1,059	100.00	1,144.66	100.00	16.33	16.32						

* Less than

Table 6. Lake Proctor Netting 1964 - 1965 (F-4-R-12).

Species	Total		Per Cent of		Total lbs. Weight	Per Cent of Weight	No. Per 100 ft. Net	Lbs. Per 100 ft. Net	Length Range mm	Av. Length mm	Weight Range gm	Av. Weight gm	"K" Range	"K" Average
	Number	Number	Number	Weight										
<u>Rough Species</u>														
Spotted gar	2	0.13	4.05	0.35	0.03	0.06	490-540	515	907-936	922	0.59-0.77	0.68		
Longnose gar	1	0.07	7.61	0.67	0.02	0.13	890	890	3,459	3,459	0.49	0.49		
Gizzard shad	123	8.28	17.60	1.56	2.05	0.29	95-270	146	20-345	65	1.71-2.40	1.96		
Smallmouth buffalo	91	6.12	105.64	9.32	1.51	1.76	210-515	260	260-3,289	527	2.56-3.28	2.82		
River carpsucker	294	19.78	249.38	22.02	4.90	4.16	210-335	252	245-1,701	385	2.13-2.54	2.32		
Carp	74	4.98	48.54	4.29	1.23	0.81	125-430	221	50-1,956	298	2.17-2.35	2.26		
Black bullhead	35	2.36	6.98	0.62	0.58	0.12	130-230	162	60-285	91	1.91-3.20	2.13		
Yellow bullhead	26	1.75	6.39	0.56	0.43	0.11	155-250	180	70-330	112	1.87-2.22	2.02		
Freshwater drum	113	7.61	68.71	6.07	1.88	1.14	130-530	237	45-5,046	276	2.14-2.84	2.34		
Sub Total	759	51.08	514.90	45.46	12.63	8.58								
<u>Game Species</u>														
Channel catfish	60	4.04	68.71	6.06	1.00	1.14	150-580	286	55-3,515	520	1.29-1.74	1.56		
Flathead catfish	21	1.41	125.94	11.12	0.35	2.10	380-665	510	210-5,500	2,723	1.91-2.18	2.01		
Largemouth bass	107	7.20	166.59	14.71	1.79	2.77	140-405	285	65-1,985	707	2.11-2.78	2.39		
White crappie	447	30.08	246.33	21.75	7.45	4.11	85-330	214	15-1,134	250	2.45-2.95	2.70		
Sub Total	635	42.73	607.57	53.64	10.59	10.12								
<u>Miscellaneous Sunfish</u>														
Warmouth	5	0.34	1.44	0.12	0.08	0.03	120-170	157	65-150	131	2.75-3.55	3.28		
Green sunfish	3	0.20	0.34	0.03	0.05	*0.01	100-130	117	40-60	52	2.70-4.10	3.63		
Bluegill	78	5.25	7.99	0.71	1.30	0.14	90-135	108	20-100	47	3.34-4.69	3.94		
Longear sunfish	6	0.40	0.49	0.04	0.10	*0.01	95-105	101	30-45	38	3.50-4.10	3.69		
Sub Total	92	6.19	10.26	0.90	1.53	0.19								
Total	1,486	100.00	1,132.73	100.00	24.75	18.69								

* Less than