

STATE Texas
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Segment Completion Report

by

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TITLE

Inventory of Species Present in Benbrook Lake, Benbrook, Texas.

OBJECTIVES

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

HISTORY OF LAKE

The Benbrook Dam is located on the Clear Fork of the Trinity River, 15 river miles above the stream's juncture with the West Fork of the Trinity and about 574 river miles above the mouth of the Trinity.

The dam was constructed by the U. S. Corps of Engineers as a dual purpose impoundment. Flood control and water conservation are the primary purposes, but recreation and municipal water supply are given definite consideration. Closure of the dam was made on September 29, 1952 to begin the impoundment which due to the lack of rainfall, since that date, has remained comparatively small.

PHYSICAL CHARACTERISTICS

Benbrook Lake is located in the Fort Worth Prairie Sub-division of the Grand Prairie Region. The upper portion of the Reservoir area projects into the Western Cross Timbers Region but the majority is in the Fort Worth Prairie. This region is underlaid by alternating limestone and shale strata which forms a gently sloping and almost treeless plain.

The dam is of the rolled-fill embankment type, with both gate and uncontrolled spillway. The bottom of the spillway notch is at an elevation of 710 feet which will provide a depth of 88 feet, and an area of 5,824 surface acres. The conservation pool extends from elevation 622 to 694 and provides 3,769 surface acres with a maximum depth of 72 feet and an average depth of 23.44 feet. This maximum depth is in the old river channel and is not extensive in area. The general lake bottom elevation is 640 feet which provides a depth of 54 feet. The lake at present covers 940 surface acres to a maximum depth of 37.7 feet.

Benbrook Lake is fed by the following streams: Rock Creek, Mustang Creek, Bear Creek, Clear Fork and Dutch Branch, which have a drainage area of 416 square miles. The average annual rainfall on this watershed during the 1891 to 1944 period was 31.3 inches, while the average in 1952 and 1953 was 24.27 and 28.52 inches respectively.

AQUATIC VEGETATION

There is little emergent or floating aquatic vegetation to be found in Benbrook Lake. Small, widely scattered patches of pondweed (*Potamogeton* sp.) may be found along with isolated clumps of cattail (*Typha latifolia*) and bulrush (*Scirpus validus*). Button willow (*Cephalanthus* sp.) and Black Willow (*Salix nigra*) may be found along the margins and in the beds of the tributary streams above the present lake basin.

The submerged aquatic vegetation is largely in two species, *Najas guadalupensis* and *Chara* sp. These plants are quite thick in the tributary streams and in the shallow areas.

The majority of the plant material in the lake is composed of inundated terrestrial vegetation. The failure to cut timber from a rather large tract of land together with the grass and brush that grew up on the cleared land, before inundation, provides much cover for the fish.

COLLECTING METHODS

Sampling of the fish population by the use of gill nets and seines was carried on from July 1953 through May 1954. This sampling was done by means of $1\frac{1}{2}$ inch mesh gill 100 ft. long and 8 feet deep and bag seines of $\frac{1}{4}$ inch mesh, 30 ft. long and 6 ft. deep. The nets were set at established stations and a total of 30 net sets were made. The seining collections were made at three stations where suitable beaches were available and five such collections were made.

Data regarding length, weight and sex of the specimens taken was recorded along with scale samples and stomach contents. There is some doubt as to the validity of age determination from scale examination in this area but scale samples were taken. Stomach contents were examined and recorded.

A check list of the fishes collected from Benbrook Lake is recorded in Table 1.

RESULTS OF SEINING COLLECTIONS

Five seining collections were made on this lake between July 1953 and May 1954. (Table 2) Collections were made during July and September and again in April and May. These collections provided 719 specimens representing 7 families, 14 genera and 22 species. Sunfish made up 44.43% of the total with green sunfish (*Lepomis cyanellus*) providing 25.99%. The game fish group constituted 60.3% of the entire seine catch. The remaining 39% included 5.15% bullheads which leaves only 33.55% of the catch in the forage fish group. Aquatic insects and some fresh water shrimp (*Palaemonetes* sp.) were also taken in seine hauls among vegetation. 3

RESULTS OF NETTING COLLECTIONS

Results of 30 net sets made from August 1953 through May 1954 are shown in Table 3. The 2187 specimens taken in these collections numbered 16 species which represented 11 genera and 5 families. The most numerous species in the net collections was found to be Largemouth bass (*Micropterus salmoides*) which made up 84.77% of the catch by number and 81.94% by weight (Table 4.) This species is largely responsible for the overbalance in favor of game fishes as shown in Table 5. This table shows 88.30% by weight and 89.07% by number to be made up of game species.

Table 6 records the length, weight and coefficient of condition of the specimens taken in gill net collections. The coefficient of condition fails to indicate the overcrowded condition of the lake. The moderate infestation of a copepod parasite (*Ergasilus versicolor*) which was noted in February 1953 became intensified until by April, 100% of the largemouth bass specimens taken harbored this parasite along with *Achtheries microptera*. The May collections showed heavy infestations of Yellow Grub,

(*Clinostomum marginatum*) and Leeches, along with the two previously mentioned Copepods and a third that is as yet unidentified.

The number of nets used varies from month to month and from one lake to another and for that reason Table 7 was prepared to show the average number of each species taken per net. The average of 63.09 largemouth bass per net is rather significant as this species tends to be wary of nets and generally is caught in relatively small numbers.

Table 8 records the stocking of game fishes in Benbrook Lake since the closure of the dam, by both the State and Federal fish hatcheries. A total of 548,575 fish were stocked in 1953. All of these were more than one inch in length although the 270,325 largemouth bass from the State Fish Hatchery are listed as fry. The records of fish stocking on the Clear Fork and the tributary streams is not available but the fact remains that much stocking of this watershed had been done in the past.

This lake was closed to fishing in September 1953 and remained closed until June 1, 1954 which will in part account for the high percentage of game species in the population of the lake.

In view of the data collected, it is the opinion of the writer that further study of this lake is advisable.

Data collected from representative seine and net stations are included in the following data sheets and is typical of the data collected from all such stations.

SUMMARY

1. Benbrook Lake is located on the Clear Fork of the Trinity River, 15 river miles from Fort Worth, Texas. It is a flood control and water conservation reservoir constructed by the U. S. Corps of Engineers and completed September 29, 1952.
2. The conservation pool, when filled, will impound 3,769 surface acres to an average depth of 23.44 feet, but due to a much lower than average rainfall, the impoundment now covers only 940 surface acres to a maximum depth of 37.7 feet.
3. Twenty-eight species representing twenty genera and six families were taken from Benbrook Lake by seining and netting from July 1953 through May 1954. Largemouth bass accounted for 10.16% of the seining and 84.77% of the netting collections.
4. Gill net collections totaled 2,187 fish that weighed 1,651 pounds. The largemouth bass made up 84.77% of the number and 81.94% of the weight of all species collected.
5. Game fish totaled 88.32% by number and 89.07% by weight with channel catfish recorded as game fish.
6. The overcrowded condition of the bass population of this lake is reflected in the catch per net where 63.09 bass were taken per net set with nets 100 ft. long, 8 feet deep and 1½ inch mesh.
7. Hatchery stocking of this lake in 1953 totaled 548,575 fish of which 370,325 were largemouth bass. This is 393.9 bass per surface acre for the 940 acres in the lake. The entire stocking numbered 583.6 fish per surface acre which is in addition to natural spawn present in the impoundment.
8. Data collected from representative seine and net stations and typical of data collected from all stations are included.

Table 1. Checklist of Species Collected from Benbrook Lake, Tarrant County, Texas, 1953 - 1954.

Common Name	Scientific Name
1. Gizzard shad	<i>Dorosoma cepedianum</i>
2. River carpsucker	<i>Carpionodes carpio</i>
3. Texas Gray redhorse	<i>Moxostoma congestum</i>
4. Spotted sucker	<i>Minytrema melanops</i>
5. European carp	<i>Cyprinus carpio</i>
6. _____ minnow	<i>Ceraticichthys</i> sp.
7. Suckermouth minnow	<i>Phenacobius mirabilis</i>
8. Redfin shiner	<i>Notropis umbratilis</i>
9. Blacktail shiner	<i>Notropis venustus</i>
10. Plains red shiner /	<i>Notropis lutrensis</i>
11. Silvery minnow	<i>Hybognathus nuchalis</i>
12. Stoneroller	<i>Campostoma anomalum</i>
13. Southern channel catfish	<i>Ictalurus punctatus</i>
14. Black Bullhead Catfish	<i>Ameiurus melas</i>
15. Yellow bullhead catfish	<i>Ameiurus natalis</i>
16. Tadpole madtom	<i>Schilbeoides mollis</i>
17. Blackstripe topminnow	<i>Fundulus notatus</i>
18. Common mosquitofish	<i>Gambusia affinis</i>
19. Spotted bass	<i>Micropterus punctulatus</i>
20. Largemouth black bass	<i>Micropterus salmoides</i>
21. Warmouth bass	<i>Chaenobryttus coronarius</i>
22. Green sunfish	<i>Lepomis cyanellus</i>
23. Small sunfish	<i>Lepomis symmetricus</i>
24. Spotted sunfish	<i>Lepomis punctatus</i>
25. Bluegill sunfish	<i>Lepomis macrochirus</i>
26. Yellowbelly sunfish	<i>Lepomis auritus</i>
27. Rock bass	<i>Ambloplites rupestris</i>
28. White crappie	<i>Pomoxis annularis</i>

Table 2. Results of Seining Collections by Number and Percentage of Each Species, Benbrook Lake, Tarrant County, Texas, 1953 - 1954.

Species	July	Sept.	Apr.	May	No.	% of No.
<i>Dorosoma cepedianum</i>	12				12	1.68
<i>Minytrema melanops</i>	9			2	11	1.54
<i>Phenacobius mirabilis</i>				3	3	.42
<i>Notropis umbratilis</i>	11			7	18	2.50
<i>Notropis lutrensis</i>	28		2	78	108	14.92
<i>Hybognathus nuchalis</i>				3	3	.42
<i>Campostoma anomalum</i>	8				8	1.12
<i>Ameiurus melas</i>			32	2	34	4.73
<i>Ameiurus natalis</i>			3		3	.42
<i>Schilbeodes mollis</i>			7		7	.98
<i>Fundulus notatus</i>	23		61		84	11.68
<i>Gambusia affinis</i>			2		2	.29
<i>Micropterus punctulatus</i>	1				1	.14
<i>Micropterus salmoides</i>	44	15		14	73	10.16
<i>Lepomis cyanelus</i>	118	39	26	4	187	25.99
<i>Lepomis symmetricus</i>				1	1	.14
<i>Lepomis punctatus</i>	13				13	1.82
<i>Lepomis macrochirus</i>	12	24		43	79	10.99
<i>Lepomis auritus</i>		11	6	8	25	3.48
<i>Pomoxis annularis</i>	4	36			40	5.57
<i>Ceratichthys</i> sp.		4			4	.56
<i>Notropis venustus</i>				3	3	.42
Totals	283	129	139	168	719	99.98

TABLE 3. Results of Netting Collections by number and Percentage of each Species, Benbrook Lake, Tarrant County, Texas, 1953-1954.

SPECIES	AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		JANUARY		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
<u>Dorosoma cepedianum</u>	4	2.58	15	4.49	5	1.81			1	1.75	5	1.06	
<u>Carpoides carpio</u>			1	.30				1	1.61				
<u>Moxostoma congestum</u>													
<u>Minytrema melanops</u>					1	.39					3	.63	
<u>Cyprinus carpio</u>	3	1.93	2	.60				1	1.61				
<u>Ictalurus punctatus</u>	8	5.16	13	3.87	2	.76					2	.42	
<u>Ameiurus melas</u>	7	4.52	25	7.41	4	1.52				6	10.53	1	.21
<u>Ameiurus natalis</u>	13	8.39	5	1.48	2	.76		2	3.22	1	1.78	26	5.50
<u>Micropterus punctatulus</u>	1	.64											
<u>Micropterus salmoides</u>	104	67.11	253	75.90	243	91.72		55	88.72	45	78.94	436	92.18
<u>Chaenobryttus coronarius</u>	2	1.29											
<u>Lepomis cyanellus</u>			1	.30									
<u>Lepomis macrochirus</u>	6	3.87	13	3.87	6	2.26		3	4.84	4	7.03		
<u>Lepomis auritus</u>	6	3.87	1	.30	1	.39							
<u>Ambloplites rupestris</u>					1	.39							
<u>Pomoxis annularis</u>	1	.64	1	1.48									
TOTALS	155	100.00	334	100.00	265	100.00	62	100.00	57	100.00	473	100.00	

TABLE 3. (continued)

SPECIES	FEBRUARY		MARCH		APRIL		MAY		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%
<u>Dorosoma cepedianum</u>	24	14.11	3	.74	4	1.74			61	2.79
<u>Carpoides carpio</u>	2	1.18			3	1.30			7	.32
<u>Moxostoma congestum</u>			1	.25					1	.05
<u>Minytrema melanops</u>			13	3.22	6	2.61			23	1.05
<u>Cyprinus carpio</u>					1	.43			7	.32
<u>Ictalurus punctatus</u>	4	2.35	1	.25	1	.43	1	2.70	32	1.46
<u>Ameiurus melas</u>	3	1.77			19	8.27	2	5.40	67	3.06
<u>Ameiurus natalis</u>	1	.59	9	2.23	12	5.22	2	5.40	73	3.34
<u>Micropterus punctulatus</u>									1	.05
<u>Micropterus salmoides</u>	136	80.00	375	92.81	176	76.53	31	83.80	1187	84.77
<u>Chaenobryttus coronarius</u>									2	.10
<u>Lepomis cyanelius</u>					5	2.17			6	.27
<u>Lepomis macrochirus</u>			1	.25					33	1.51
<u>Lepomis auritus</u>			1	.25	3	1.30	1	2.70	13	.59
<u>Ambloplites rupestris</u>									1	.05
<u>Pomoxis annularis</u>									6	.27
TOTALS	170	100.0	404	100.0	230	100.0	37	100.0	2187	100.00

Table 4. Results of Netting Collections by Weight, in Pounds, of Each Species, Benbrook Lake, Tarrant County, Texas, 1953-1954.

Species	August		September		October		November		December		January	
	lbs.	%	lbs.	%	lbs.	%	lbs.	%	lbs.	%	lbs.	%
Dorosoma cepedianum	2.68	2.50	6.25	3.09	2.13	1.01	.63	1.68	3.91	1.26		
Carpiones carpio			1.40	.68			2.56	5.69				
Moxostoma congestum												
Minytrema melanops					1.08	.52			3.33	1.07		
Cyprinus carpio	2.15	2.06	3.25	1.11			2.00	4.46				
Ictalurus punctatus	23.51	21.95	28.42	13.20	7.37	3.62			4.68	1.51		
Ameiurus melas	6.60	5.78	16.06	7.75	3.00	1.40			4.61	12.30	1.00	.33
Ameiurus natalis	7.92	7.39	3.05	1.47	1.50	.73	1.95	4.35	.99	2.65	14.40	4.27
Micropterus punctulatus	.75	.70										
Micropterus salmoides	60.32	56.31	143.31	68.98	185.26	91.65	36.91	82.12	30.23	80.72	285.27	91.55
Chaenobryttus coronarius	.39	.35										
Lepomis cyanellus			.37	.20								
Lepomis macrochirus	1.44	1.34	2.62	1.28	1.49	.72	1.52	3.38	.99	2.65		
Lepomis auritus	1.18	1.10	.31	.17	.26	.12						
Ambloplites rupestris					.44	.21						
Pomoxis annularis	.56	.52	2.77	1.35								
Totals	107.10	100.00	207.81	99.29	202.07	100.00	44.94	100.00	37.45	100.00	311.60	99.99

Table 4. Continued

Species	February		March		April		May		Totals	
	lbs.	%	lbs.	%	lbs.	%	lbs.	%	lbs.	%
<i>Dorosoma cepedianum</i>	21.46	14.26	2.00	.52	3.93	2.13	42.99	2.60		
<i>Carpiodes carpio</i>	1.19	.78			7.81	4.24	12.96	.78		
<i>Moxostoma congestum</i>			.94	.25			.94	.05		
<i>Minytrema melanops</i>			15.61	4.13	7.14	3.87	27.16	1.65		
<i>Cyprinus carpio</i>			1.94	1.05			9.34	.56		
<i>Ictalurus punctatus</i>	16.05	10.66	.88	.23	5.97	3.24	87.37	5.27		
<i>Ameiurus melas</i>	2.92	1.94			18.34	9.95	53.71	3.31		
<i>Ameiurus natalis</i>	1.19	.78	4.21	1.13	9.41	5.10	45.57	2.72		
<i>Micropterus punctulatus</i>	.75	.70					.75	.04		
<i>Micropterus salmoides</i>	107.53	71.58	355.98	94.03	127.30	69.12	21.76	86.90	1353.89	81.94
<i>Chaenobryttus coronarius</i>							.39	.02		
<i>Lepomis cyanellus</i>					1.78	.96	2.15	.13		
<i>Lepomis macrochirus</i>	.22	.06					8.28	.52		
<i>Lepomis auritus</i>					.67	.36	2.68	.17		
<i>Ambloplites rupestris</i>							.44	.04		
<i>Pomoxis annularis</i>							3.33	.20		
Totals	150.34	100.00	379.84	100.00	184.29	100.02	25.04	100.00	1651.93	100.02

Table 5. Results of Netting Collections by Game and Rough Species, Benbrook Lake, Tarrant County, Texas, 1953 - 1954.

Total Number of Individuals Collected	2,187
Total Weight of Individuals Collected	1,651.93
Average Weight Per Individual (pounds)	.75
Total Weight of Rough Species Collected (pounds)	191.95
Total Number of Rough Species Collected	239
Average Weight Per Rough Fish (Pounds)	.80
Percent Rough Fish By Weight	11.69
Percent Rough Fish By Number	10.93
Total Weight of Game Species (pounds)*	1,459.98
Total Number of Game Species*	1,948
Average Weight Per Game Fish (pounds)*	.75
Percent Game Fish By Weight*	88.32
Percent Game Fish By Number*	89.07

*Note: Channel Catfish (*Ictalurus punctatus*) has been included in the game fish group since they are so considered by the local fishermen and are often taken by the sport fishermen.

Table 6. Weight, Length and Coefficient of Condition of Fish Collected by Gill Nets from Benbrook Lake, Tarrant County, Texas, 1953 - 1954.

Species	No. of Fish	Standard L. Range (MM)	Standard L. Average (MM)	Weight Range (gm)	Weight Aver. (gm)	"K" Range	"K" Average
<i>Dorosoma cepedianum</i>	61	140-432	278.00	57-709	349.10	0.58-4.06	1.78
<i>Carpoides carpio</i>	7	285-385	250.71	539-1662	840.23	2.20-2.55	2.44
<i>Moxostoma congestum</i>	1	275	275.00	425	425.00	2.04	2.04
<i>Minytrema melanops</i>	23	255-340	298.56	328-794	535.63	1.90-2.32	2.07
<i>Cyprinus carpio</i>	7	320-343	284.00	340-907	619.57	2.26-2.70	2.62
<i>Ictalurus punctatus</i>	32	255-510	396.84	221-2665	1238.00	1.11-2.80	1.77
<i>Ameiurus melas</i>	67	120-310	268.48	30-567	364.06	1.74-2.91	2.27
<i>Ameiurus natalis</i>	73	145-349	249.58	68-1021	401.38	1.58-2.49	2.31
<i>Micropterus punctatulus</i>	1	238	238.00	340	340.00	1.80	1.80
<i>Micropterus salmoides</i>	1854	164-340	218.33	85-851	331.16	1.06-3.90	2.56
<i>Chaenobryttus coronarius</i>	2	162-178	170.00	156-198	177.00	3.55-3.69	3.62
<i>Lepomis cyanellus</i>	6	160-180	169.83	144-185	162.35	3.20-3.81	3.34
<i>Lepomis macrochirus</i>	33	42-149	129.27	57-142	114.00	1.80-5.50	4.18
<i>Lepomis auritus</i>	13	125-143	131.83	85-125	93.77	3.31-5.80	4.30
<i>Ambloplites rupestris</i>	1	165	165.00	198	198.00	4.39	4.39
<i>Pomoxis annularis</i>	6	75-235	185.37	12-425	251.66	2.51-3.32	3.07

Table 7. Results of Netting Collections by Fish Taken per 100 Feet of Gill Net, Benbrook Lake, Tarrant County, Texas, 1953 - 1954.

Species	August		September		October		November		December		January	
	2 nets set No Fish P/net	4 nets set No. Fish P/net	4 nets set No. Fish P/net	4 nets set No. Fish P/net	2 nets set No. Fish P/net	2 nets set No. Fish P/net	1 net set No. Fish P/Net	4 nets set No. Fish P/Net	1 net set No. Fish P/Net	4 nets set No. Fish P/Net	1 net set No. Fish P/Net	4 nets set No. Fish P/Net
<i>Dorosoma cepedianum</i>	4	2.00	15	3.75	5	1.25	1	1.00	5	1.25		
<i>Carpiodes carpio</i>			1	.25			1	.50				
<i>Moxostoma congestum</i>												
<i>Minytrema melanops</i>					1	.25			3	.75		
<i>Cyprinus carpio</i>	3	1.50	2	.50			1	.50				
<i>Ictalurus punctatus</i>	8	4.00	13	3.25	2	.50			2	.50		
<i>Ameiurus melas</i>	7	3.50	25	6.25	4	1.00			6	6.00	1	.25
<i>Ameiurus natalis</i>	13	6.50	5	1.25	2	.50	2	1.00	1	1.00	26	6.50
<i>Micropterus punctulatus</i>	1	.50										
<i>Micropterus salmoides</i>	104	52.00	253	63.25	243	60.75	55	27.50	45	45.00	436	109.00
<i>Chaenobryttus coronarius</i>	2	1.00										
<i>Lepomis cyanellus</i>			1	.25								
<i>Lepomis macrochirus</i>	6	3.00	13	3.25	6	1.50	3	1.50	4	4.00		
<i>Lepomis auritus</i>	6	3.00	1	.25	1	.25						
<i>Ambloplites rupestris</i>					1	.25						
<i>Pomoxis annularis</i>	1	.50	5	1.25								
Totals	155	77.50	334	83.50	265	66.25	62	31.00	57	57.00	473	118.25

Table 7. (Continued)

Species	February 2 nets set		March 6 nets set		April 3 nets set		May 1 net set		Average No. Fish Per Net
	No. Fish	Per Net	No. Fish	Per Net	No. Fish	Per Net	No. Fish	Per Net	
<i>Dorosoma cepedianum</i>	24	12.00	3	.50	4	1.33			2.10
<i>Carpiodes carpio</i>	2	1.00			3	1.00			.24
<i>Moxostoma congestum</i>			1	.17					.03
<i>Minytrema melanops</i>			13	2.17	6	2.00			.79
<i>Cyprinus carpio</i>					1	.33			.24
<i>Ictalurus punctatus</i>	4	2.00	1	.17	1	.33	1	1.00	1.10
<i>Ameiurus melas</i>	3	1.50			19	6.33	2	2.00	2.31
<i>Ameiurus natalis</i>	1	.50	9	1.50	12	4.00	2	2.00	2.52
<i>Micropterus punctulatus</i>									.03
<i>Micropterus salmoides</i>	136	68.00	375	62.50	176	58.67	31	31.00	63.09
<i>Chaenobryttus coronarius</i>									.06
<i>Lepomis cyanellus</i>					5	1.67			.20
<i>Lepomis macrochirus</i>			1	.17					1.14
<i>Lepomis auritus</i>			1	.17	3	1.00	1	1.00	.45
<i>Ambloplites rupestris</i>									.03
<i>Pomoxis annularis</i>									.20
Totals	170	85.00	404	67.35	230	76.66	37	37.00	74.53

Table 8. Stocking of Fish in Benbrook Lake, Tarrant County, Texas, By State and Federal Fish Hatcheries in 1953.

Species	State Hatchery	Federal Hatchery	Total Stocked
Channel catfish (<i>Ictalurus punctatus</i>)	25,875		25,875
Largemouth Bass (<i>Micropterus salmoides</i>)	270,325	100,000	370,325
Warmouth Bass (<i>Chaenobryttus coronarius</i>)	40,075		40,075
Redear Sunfish (<i>Lepomis microlophus</i>)	50,525		50,525
Bluegill Sunfish (<i>Lepomis macrochirus</i>)	22,325		22,325
Longear Sunfish (<i>Lepomis megalotis</i>)	4,500		4,500
White Crappie (<i>Pomoxis annularis</i>)	11,300		11,300
Black Crappie (<i>Pomoxis nigro-maculatus</i>)	23,650		23,650
Total	448,575	100,000	548,575

Fish Card

Coll. No. B5S1

Locality: Benbrook Lake, Sta. sl) 7-14-53, Collector: Lamb

Collections made on Rock Creek above lake basin. Time: 1:00 to 5:00 P. M.

Description

Shoreline: Stream banks variable but fairly low - often rocky.

Bottom: Rock and gravel with some silt in deeper pools.

Cover: Little except for some rocks and undercut banks. Chara scattered.

Weather - Present: Clear and Hot. Preceding: Clear and Hot.

Water - Temperature: Color: Clear

Surface: 78^oF Turbidity: none

Bottom: 78^oF

Vegetation: Chara and Najas in small amounts in some pools.

Submerged: Small amounts of chara and najas.

Floating: None

Emerged: None

Predators: None observed.

Parasites and Disease: None observed.

Tackle Used: Bag Seine. Length: 30 ft. Mesh: $\frac{1}{4}$ inch Depth: 6 ft.

Number of Hauls: 6 Length of Hauls: 100 ft. average

Species	No.	No.
Spotted Sucker	7	Green sunfish 109
Redfin Shiner	10	Spotted sunfish 13
Stoneroller Minnow	8	Bluegill sunfish 4
Blackstripe Topminnow	23	
Spotted Bass	1	
Largemouth Black Bass	20	
	69	126

Fish Card

Coll. No. B5G13 Locality: Benbrook Lake(Sta. 2) Date: May 6, 1954

Collector: Lamb Time: Overnight (12 hours)

Description

- Shoreline: Rather regular, sparse vegetation for the most part.
- Bottom: Gravel and clay - rather irregular.
- Cover: Grass and weeds were inundated - brush and trees left in places.

Weather - Present: Clear and rather warm. Preceeding: Clear and warm.

Water Temperature: Color: Clear

Surface: 75^oF Turbidity: None

Bottom: 75^oF

Vegetation

Submerged: Terrestrial vegetation submerged plus chara and najas.

Floating: Small amount of potamogeton.

Emerged: Terrestrial trees and shrubs in flooded area.

Predators: Water snakes (Natrix sp.) and turtles of various species.

Parasites and Disease: Ergasilus versicolor, Achtheres micropterae, yellow grub and leeches.

Tackle Used: 1 gill net Length: 125 ft. Mesh: Variable Depth: 8 ft.

No. of Hauls: 1 Length of Hauls: Overnight - 12 hours.

Species	No.	Species	No.
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Channel Catfish	1		
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Black bullhead	2		
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Yellow bullhead	2		
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Largemouth black bass	31		
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Yellowbelly sunfish	1		
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Total	37		
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Collection No. B5G13 Locality BENBROOK LAKE (Station no. 2) Date May 6, 1954Tackle Used 1 gill net (100' x 8' x 1 1/2") Time Overnight about 12 hours

No.	Species	Sex & Develop.	Length in mm Stand. Total	Wt. in Grams	"K"	Stom. No.	Remarks
1	C. Cat.	F (4)	255	221	1.35	Fish	remains
	B. Bullh.	M (4)	128	44	2.11	Algae	& other vegetation
	B. Bullh.	F (4)	120	30	1.76	"	" "
	Y. Bullh.	M (4)	250	364	2.36	Empty	
	Y. Bullh.	F (4)	145	68	2.22	Unidentifiable insect remains.	
32	Y. B. Sun.	M (2)	143	125	4.21	1 Beetle ? & Vegetation	
1	L. M. Bass	F (1)	260	427	2.40	Empty	
2	"	F (ps)	275	450	2.13	"	
3	"	F (1)	268	394	2.09	"	
4	"	M (3)	270	390	2.00	"	
5	"	M (3)	240	320	2.34	"	
6	"	M (3)	255	365	2.23	"	
7	"	F (2)	275	410	1.94	"	
8	"	F (1)	265	446	2.33	Fish	remains unidentifiable
9	"	F (1)	250	317	2.08	Empty	
10	"	F (1)	245	358	1.75	"	
11	"	M (2)	255	377	2.30	"	
12	"	M (2)	245	335	2.30	"	
13	"	M (2)	240	315	2.30	Fish	remains Unidentifiable
14	"	M (3)	250	342	2.21	Empty	
15	"	M (2)	255	350	2.14	"	
16	"	M (2)	248	315	2.09	"	
17	"	F (4)	242	304	2.15	"	
18	"	F (2)	255	389	2.38	Fish	remains ?.
19	"	M (2)	230	281	1.06	Empty	
20	"	F (ps)	248	320	1.90	"	
21	"	M (3)	238	290	2.15	"	
22	"	F (4)	240	298	2.19	"	
23	"	F (ps)	250	237	2.11	"	
24	"	F (ps)	242	281	2.00	"	
25	"	M (3)	233	265	2.10	"	
26	"	M (3)	245	298	2.01	"	
27	"	M (3)	238	317	2.39	"	
28	"	F (3)	235	281	2.20	Fish	remains ?.
29	"	F (4)	195	141	1.91	Empty	
30	"	F (4)	164	89	2.00	"	

