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FILE

JOB COMPLETION REPORT

BY

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TITLE

Creel Census of Benbrook Reservoir.

OBJECTIVES

To estimate the total catch by species and to obtain data regarding the growth rate and relative abundance of each species in the catch.

METHODS

The data used in this report was obtained by inspection of the creels of fishermen using Benbrook Reservoir. Census stations were established on the three roads leading into the Reservoir area and were manned by Game and Fish Commission personnel for a total of six days each month. These days were selected to include both week-end days and week days. A check was made to determine what the difference in lake use would be on week days and week end days. The results of this check showed that a greater number of people visited the lake on week ends but the percentage of fishermen remained almost constant. Since the lake is so near a large population center where there is a number of large plants that work night shifts allowing persons to be able to visit the lake at almost any hour, the choice of days had little effect on the results.

The U. S. Army Corps of Engineers maintained traffic counters on all access roads which gave accurate data as to the number of persons visiting the lake for any given period. Spot checks were run by both Game and Fish Commission and U. S. Army Engineer personnel to determine the average number of people per car for the traffic over the counters.

The creel census stations were set up in such a manner that all persons going over the counters would be halted by road blocks. Those persons who were not fishing were recorded as such and those who had been fishing were required to submit their catch to examination. The fish were measured and recorded in inch length groups on forms devised for that purpose. The other pertinent data was obtained by questioning the fisherman and included; method of fishing, type of bait, number of hours fished and part of day when fishing was done.

The data obtained from actual contact with fishermen and count of his catch as expanded to provide the fishing pressure per acre and the total harvest. This expansion was made by finding the average number of fish caught per fisherman contacted and

multiplying the total number of fishermen to visit the lake, as shown by traffic counters, by this figure. The same procedure was followed to determine the total hours of fishing as well as to determine the number of each species taken. Since the sampling was done during good days and bad and on week days as well as week ends, it is believed that the calculated totals are reasonably accurate.

Calculated data was used in Tables 3 and 4, but the data used in all other tables is actual data obtained by a count of the fish taken by the fishermen.

In calculating these totals it was assumed that the average numbers of fish taken and hours fished by the fishermen contacted would hold true for those not contacted. Each month the totals obtained by actual contact were expanded to cover the total number of of fishermen as represented by the traffic counters. The total number of cars passing the counters was divided by two to account for the fact that the car crossed the counter twice on each trip. Further adjustments were made to account for the percentage of the cars found to be pulling a boat trailer. The final result was then multiplied by the average number of persons per car, as determined by the spot checks to give the total number of persons visiting the lake during that month. The road blocks provided the number of fishermen as well as the number of non-fishermen from which the percentage of fishermen among the total visitors could be determined. This percentage was then taken of the total visitors to give the calculated total fishermen for that month.

By this method the calculated totals are:

Total Fishermen	471,683
Total Hrs. Fished	1,855,351
Total Fish Caught	637,344
Av. Fish per Man Hr.	.343

ISTORY 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 uses are given definite consideration.

The dam was closed September 29, 1952 and the impoundment was begun. The lack of rainfall since that date has caused the water level to remain low.

The lake was stocked by State and Federal Fish Hatcheries in May and June of 1953 and was closed to fishing in October of 1953. The lake was opened to fishing on June 1, 1954 at which time this creel census was begun.

FINDINGS

Table 1 shows the fishing success as represented by data collected by actual contact with the fishermen and it may be noted that the month of June 1954 was the best fishing month with January 1955 as the poorest. The fact that the month of June 1955 was the first month of fishing since the closing of the lake in October 1953 may be considered responsible for the unusually high catch as well as the heavy fishing pressure. The high degree of success during this month is also marked since 64% of all fishermen were successful as compared to a high of 35% during the other months and a low of 7.06% in January 1955.

Table 2 presents the monthly variation in species taken by fishermen and here the intensity of the fishing pressure during June 1954 is apparent. The catch of this month made up about 45% of the total catch for the entire 17 months period while the bass catch for June 1954 composed 83% of the total bass catch. The bass were able to dominate the catch in only two months of the entire period. They made up 77.97% of the catch in June 1954 and 59.38% in November. An examination of figure 1 will show that except for the months of June and November, 1954, the brunt of the fishing pressure was taken by the sunfish and bullheads with white crappie increasing in the last three months.

The monthly variation in average weight for the fish taken from Lake Benbrook is presented in Table 3 and closely corresponds to the variations in standard length groups shown in Figures 2, 3, and 4. The larger fish of each species appear to have been rather heavily harvested during the first month the Lake was open to fishing. Five months were required to raise the average weight of the bass caught above the .84 lbs. of the first month. Only four of the seventeen months offered an average weight for bass greater than that of the opening month. Sunfish exceeded the opening month average weight in only one month while the crappie averaged 1.69 lbs. in June 1954 and had attained an average of .65 lbs. by October 1955. The crappie average in June 1954 was based on only six fish which is not large enough sample to give good results. The channel catfish did not appear in good numbers in the catch at any time and averaged .53 lbs. in June 1954 and after disappearing from the catch until May 1955 attained an average weight of 1.53 lbs. and 1.28 lbs. in May and June 1955 respectively. The bullheads however were unable to exceed the .48 lbs. average of June 1954.

In Table 4 the monthly variations in fishing pressure per acre of water are hown. This is calculated from creel census data and is based on the results obtained by the use of information furnished by the automatic traffic counters. The average acreage represents the average for the month. The catch per acre in both numbers and pounds is very high but when the monthly variations are noted it becomes apparent that the majority of the harvest was completed during the first month the lake was open to fishing. This month provided 44% of the total number and 71% of the total pounds that were produced during the entire 17 months. The pounds of fish per man-hour of fishing is not good since the month of June 1954 produced the high mark with .38 lbs. and the entire 17 months only produced .2 lbs. per man-hour of fishing.

The data in Table 5 is based on the actual data expanded by the information given by the U. S. Corps of Engineers traffic counters and presents the calculated total harvest in number, percent, and weight of each species in the catch. The bass catch provided 49.71% of the total number of fish caught and 80.14% of the total weight. Sunfish furnished 30.37% of the total number but afforded only 7.41% of the total weight.

Table 6 shows the comparative success of the various fishing methods used on Benbrook Lake and is based on the data obtained from contact with the fishermen. Still-fishing accounted for 83.41% of the total fish caught and usually produced the greatest catch per man-hour fished.

The comparative data on number of fish caught on various baits shows that in June 1954 more fish were caught on artificial lures than any other (42.28%) but in July 1954 combinations of live baits produced 61.32% of the total catch. The catch for ne remaining fifteen months of the creel census was dominated by minnows and worms with worms accounting for the majority of the catch. (Table 7)

The stocking of Benbrook Lake by both State and Federal Hatcheries is presented in Table 8. The initial stocking was made in May and June of 1953 following the closure of the dam in September of 1952. The stream had been almost dry above the dam before closure and few fish were present when the stocking was made. The only stocking in 1954 was made by the Eagle Mountain State Fish Hatchery and consisted of 109,000 bass from 6 inches to 9 inches in length. This stocking was made about November 27, 1954. The 1955 stocking was made by both State and Federal Hatcheries and included yellowbelly sunfish in addition to the species originally stocked with the exception of black crappie which have not appeared in the catch of experimental nets of the biologists.

DISCUSSIONS AND CONCLUSIONS

The percentage of fishermen who caught at least one fish remained fairly constant except for June 1954 when the high of 64.06% was reached and January and February when 7.06% and 14.82% respectively were the low percentages for the period. This lack of success is somewhat due to the fact that the closed season together with the volume of newspaper publicity given the lake during the period when it was closed to fishing caused many people to fish in this lake who were not experienced anglers and who for this reason were unable to catch any fish.

The catch was dominated by largemouth bass during the month of June 1954 when 77.79% of the total catch was composed of this species, Table 2. November of that year was the only other month when bass predominated the catch. The predominance of bass in the catch for June was sufficient to give that species first place with 42.98% of the total catch while sunfish and bullheads make up 31.77% and 21.24% respectively. This domination by bass was due to the heavy stocking of that species in May and June 1953 hen 370,325 bass fingerlings were stocked in the lake.

The monthly variation in average weight for the various species taken from Benbrook Lake show that the largemouth bass averaged .84. lbs. during June 1954, Table 3. These fish were believed to be those stocked or spawned in the lake during the previous spring with the exception of a few fish taken that were obviously present in the stream before impoundment. These older fish were few since the low rainfall during the previous three years had allowed the stream to dry up into a few potholes that were so small and shallow that they supported only a limited population. The average weight of this species remained below that of the first month, with the exception of November 1954 and February 1955, until the following June when the average weight reached .85 pounds. August and September provided average weights 1.18 and 1.01 pounds respectively.

The monthly average weights of sunfish and bullheads did not exceed the weight of June 1954 except for sunfish in December when an average weight of .19 lbs. was reached. The harvest of these species is far below the optimum and the lack of larger individuals in the catch indicates that the danger of overcrowding is present. The streams that form the watershed of this lake were well known for their production of large sunfish in the years past but the recent drought has eliminated the habitat that formerly existed. This has resulted in a population of small sunfish in the limited, shallow pools that are left in these streams, and with each rain that produces stream flow these small specimens are added to the population of the lake resulting in a still further reduction of the average size of the sunfish present.

The data shown in Figure 2 indicates that the small sunfish bear the bulk of the ishing pressure for that species since 54% of the total catch fell in the 3" and 4" standard length groups. The 5" length group provided 32% leaving only 14 % to be made up of the sizes that are usually considered to be above average.

The bullhead harvest (Fig. 3) is made up, largely, of the smaller fish since 68% of the total catch was in the 3" to 6" standard length group.

Lake Benbrook suffered from drastic changes in water level, Table 4 , as the 912 acre average in June 1954 had steadily decreased until only 501 acres remained in February 1955. Rainfall increased in 1955 however and the water rose rather steadily until the basin contained 1,275 acres in October 1955. This change in water level during the first nine months forced the fish to concentrate themselves and their feeding into smaller areas and increased the pressure on the food supply. This should have increased the take of fish per man-hour of fishing but such was not the case. The abnormally high yield in both number and pounds per acre during June 1954 had apparently reduced the population of bass until that species was not crowded to the point where their food supply became critical.

The crowded conditions that prevailed during the winter and spring of 1953-54 had either prevented a spawn of bass or had resulted in the young being eaten soon after hatching since seining operations in all parts of the lake failed to produce young bass. This was in direct opposition to the condition in the spring of 1953 when minnow seine drags in any shallow area of the lake produced an abundance of small bass. The minnow seine did not produce an appreciable number of any forage species at this time to further indicate a crowded condition with regard to the carniverous species.

The total production shown in Table 5 was calculated on the basis of data provided by the automatic traffic counters regarding the total number of fishermen visiting the Lake each month. The average number of fish in each size group found in the creels of the fishermen was expanded by the calculated number of fishermen to give the totals used in this table. The average lengths and weights along with the percentage of number and weight remain constant with the fisherman. These totals show that three species provided almost the entire production of the lake with largemouth bass carrying the major portion of the load. The 316,833 bass averaged 9.35 inches in standard length and .86 pounds in weight for the entire 17 months period and constituted 49.71% of the total number and 80.14% of the total weight. The 193,585 sunfish averaged 4.83 inches in standard length and .13 pounds in weight to make up 30.37% of the total number and 7.41% of the total weight. Bullheads numbered 111,126 and averaged 6.23 inches standard length and .29 pounds in weight for 17.43% of the total number and 9.47% of the total weight. The other three species in the catch were in such small numbers that they appear to be negligible. The black crappie did not appear in either the creel checks or the netting operations involved in the inventory job that was carried on at the same time as the creel census. This was not expected since 23,650 of this species were stocked in the lake in 1953.

The analysis of the various fishing methods revealed that after September 1954 only stillfishing and casting were used to any extent and only stillfishing continued to be productive. (Table 6). The favored method of fishing during the month of June 1954 was stillfishing but trolling produced the best catch per man-hour. Trolling however soon failed to produce and stillfishing became the accepted method with a few fishermen continuing to cast with comparative poor results. Artificial lures proved to be the most effective bait during June 1954 when approximately 78% of the total catch was largemouth bass but that condition lasted only during that month (Table 7). The percentage of fish caught on lures fell from 42.28% in June to 2.19% in July and never exceeded 14.05% thereafter. Combinations of live baits proved to be the most productive in July producing 1.32% of the total catch but the bulk of the catch after July was made by minnows and worms with worms accounting for the majority. This may be attributed to the fact that except for June and November 1954 the entire catch was predominately sunfish and bullheads. These species are readily taken on both worms and minnows with worms being most readily accepted and least expensive to use.

The initial stocking of Benbrook Lake was made with the assumption that reasonably normal rainfall would occur. This was not the case, however, and the 940 surface acre area at the time of the initial stocking was reduced to 912 surface ares by June 1954 when the lake was opened to fishing and this creel census was begun. The initial stocking of 548,575 fish amounted to 583.6 fish per surface acre of which 393.9 were largemouth bass. This stocking was in addition to the fish already present in the lake, some of which had spawned during the spring and early summer. The usual stocking of bass in waters that do not contain fish is 150 per acre when stocked alone or 100 per acre in combination with other species. This apparent overstocking was further complicated by the lack of rainfall and the closing of the lake to fishing.

RECOMMENDATIONS

1. The results of this study have indicated a need for further study and it is recommended that a similar study be considered within the next four years to check on changes that may occur in the fishing success and pressure.

2. It is further recommended that the policy of closing lakes to fishing during the first year after closure be examined closely to determine if the lake benefits from such closure.

3. The need for an increased harvest of sunfish and bullheads is quite apparent and further study of this problem is suggested.

4. The possible introduction of flathead catfish as a control on the small bullhead and sunfish population is offered as a possible aid in solving that and the ough fish problem.

SUMMARY

1. Benbrook Lake is located on the Clear Fork of the Trinity River near Fort Worth, Texas. It is a flood control and water conservation impoundment constructed by the U. S. Corps of Engineers and completed September 29, 1952.

2. The lake was stocked with 548,575 fish in May and June, 1953 and closed to fishing October 1, of that year.

3. The fishing season was opened June 1, 1954 at which time the creel census was begun with census stations operating on the three access roads. These stations were manned by Game and Fish personnel a total of six days each month with these days so distributed as to include both week days and week-ends and good weather and bad to give an adequate sample of fishing conditions.

4. Road blocks were set up at these census stations which were so located as to stop all cars leaving the lake. These cars were required to pass over automatic traffic counters maintained by the U. S. Corps of Engineers and gave the total number of cars using the lake area. This data was used to expand the data that was obtained by the creel census stations during the six days per month they were in operation to give total productions.

5. The fishing during the month of June 1954 was largely for bass with stillishing as the most popular method but trolling producing the greatest number of fish per man-hour and artificial lures accounting for the greatest number of fish. This condition changed rather rapidly and except for November 1954, bass were exceeded in the catch by either sunfish or bullheads. The favored fishing method continued to be still-

fishing with casting a poor second and minnows and worms becoming the most productive bait.

6. The average weights of the fish taken from Benbrook Lake indicated that after the first month the catch consisted largely of young of the year fish with an occasional catch of a fish that was present in the stream at the time of impoundment. The average weights during the succeeding months was generally below that of the opening month.

7. The loss of water due to lack of rainfall reduced the average acreage from 912 in June 1954 to 501 by February 1955. The increase in rainfall during 1955 increased the acreage to 1,275 acres by October 1955. The harvest of fish per acre and pounds per acre was very high for the first month but declined rather steadily until the lake started to increase in volume when the decrease in production became less pronounced.

8. The calculated total production indicates that bass, sunfish, and bullheads carry the load with white crappie beginning to show an increase during the latter months of the census period. Because of the heavy predominance of bass in the first month of the census that species accounts for 49.71% of the total number and 80.14% of the total weight.

Table 1. Fishing Success as Represented by Data Collected From Benbrook Lake Creel Census, June 1, 1954 to October 31, 1955.

Month	Successful Fishermen	Unsuccessful Fishermen	Total Fish Caught	Unsuccessful Hours Fished	Fish/Man Hr. Successful Fishing	Total Fishermen	Total Hours Fished	Fish/Man Hour	Percent of All Fishermen Successful
1954									
June	916	514	3636	1830	.715	1430	6912	.526	64.06
July	33	123	137	333	1.650	156	416	.329	21.16
August	83	233	285	516	.925	316	824	.345	26.27
September	75	129	185	287	.864	204	501	.369	36.77
October	37	102	139	181	.713	107	376	.369	26.62
November	38	87	96	223	.565	125	393	.244	30.40
December	11	40	80	106	1.633	51	155	.516	21.57
1955									
January	12	158	53	420	1.204	170	464	.114	7.06
February	32	184	101	504	.971	216	608	.166	14.82
March	109	202	364	545	.953	311	927	.392	35.05
April	167	667	529	1857	.459	834	2650	.199	20.03
May	171	457	577	1398	.739	628	2179	.265	28.23
June	148	560	362	1949	.620	708	2532	.143	20.91
July	94	240	194	817	.570	334	1157	.168	28.14
August	173	318	782	973	1.251	491	1598	.489	35.24
September	91	165	251	560	.684	256	927	.270	35.55
October	60	116	194	337	.767	194	590	.328	34.10
TOTAL	2,250	4,295	7,965	14,225	.865	6,531	23,209	.343	34.45

Table 2. Monthly Variation in Species Taken from Benbrook Lake as Shown by Creel Census Data, June 1, 1954 to October 31, 1955.

Species / Month	L. M. Bass No.	%	Sunfish No	%	Bullheads No.	%	W. Crappie No.	%	C. Catfish No.	%	Carp No.	%	Totals
June-1954	2,835	77.97	484	13.31	309	8.50	6	.16	2	.06			3,636
July	16	11.68	97	70.80	20	14.60	4	2.92					137
August	28	9.82	167	58.59	85	29.83	4	1.41	1	.35			285
September	56	30.27	87	47.03	35	18.92			5	2.70	2	1.08	185
October	29	20.86	44	31.66	58	41.73	6	4.31	2	1.44			139
November	57	59.38	25	26.04	11	11.46	2	2.08			1	1.04	96
December	9	11.25	54	67.50	17	21.25							80
January-1955	13	24.53	21	39.62	19	35.85							53
February	21	20.79	67	66.34	11	10.89	2	1.98					101
March	35	9.62	117	32.14	199	54.67	8	2.20			5	1.37	364
April	98	18.53	147	27.79	207	39.13	60	11.34	1	.19	16	3.02	529
May	34	5.89	256	44.37	269	46.62	4	.69	4	.69	10	1.74	577
June	34	9.39	175	+8.34	141	38.95	2	.55	9	2.48	1	.27	362
July	36	18.55	97	50.00	60	39.92					1	.51	194
August	36	4.60	512	65.47	161	20.58	67	8.56	4	.51	2	.25	782
September	47	18.72	109	+3.42	69	27.49	24	9.56	1	.39	1	.39	251
October	40	20.61	72	37.11	21	10.82	58	29.89	3	1.54			194
TOTALS	3,424	42.98	2,531	31.77	1,692	21.24	247	3.10	32	.40	39	.48	7,965

Table 3. Monthly Variations in Average Weights of Species Taken from Benbrook Lake as Shown by Creel Census Data, June 1, 1954 to October 31, 1955.

Month	German Carp	Channel Catfish	Bullhead Catfish	Largemouth Black Bass	Sunfish	Crappie
1954						
June		.53	.48	.84	.18	1.69
July			.13	.72	.15	.08
August			.19	.62	.13	.10
September		.15	.20	.69	.16	
October			.17	.78	.10	
November			.27	1.11	.15	
December			.41	.71	.19	
1955						
January			.45	.68	.10	
ebruary			.46	1.27	.13	.18
March	2.01		.22	.72	.15	.24
April	1.25		.21	.78	.12	.42
May	2.41	1.53	.22	.80	.15	.35
June		1.28	.17	.85	.10	.39
July			.26	.75	.12	
August	1.08	.38	.22	1.18	.11	.34
September			.23	1.01	.10	.31
October		.36	.36	.71	.11	.65
17 MONTH AVERAGE	1.63	.90	.29	.86	.13	.40

Table 4. Monthly Variations in Fishing Pressure on Lake Benbrook as Calculated from Creel Census Data, June 1, 1954 to October 31, 1955.

Month	Average Acres	No. Fish Per Acre	Pounds of Fish Per Acre	No. Fish Per Man/ Hr.	Pounds Fish Per Man Hr.
1954					
June	912	377.3	272.7	.526	.38
July	853	58.3	12.2	.329	.07
August	802	43.8	8.5	.345	.07
September	731	47.4	15.4	.369	.12
October	685	24.5	8.5	.369	.13
November	665	17.0	12.4	.244	.18
December	645	18.4	5.4	.516	.15
1955					
January	626	2.6	1.2	.114	.05
February	501	16.4	6.6	.166	.07
March	628	50.2	13.6	.392	.11
April	628	24.8	6.9	.199	.06
May	772	15.9	4.3	.265	.07
June	1,165	12.6	2.9	.131	.03
July	1,265	6.5	1.8	.168	.05
August	1,254	14.2	2.9	.358	.07
September	1,238	13.3	4.3	.270	.09
October	1,275	6.1	2.6	.328	.14
TOTAL		849.2	381.8	.379	.20

Table 5. Number, Weight and Percentage each Species Represents in Total Weight and Number as shown by Benbrook Lake Creel Census, June 1, 1954 to October 31, 1955.

Species	Total Number	Average Length(std)	Average Weight(lbs)	Total Weight (Lbs)	Percent of Number	Percent of Weight
European Carp	1,791	11.20	1.63	2,919	.29	.86
Channel Catfish	2,277	10.06	.90	2,493	.36	.74
Bullhead Catfish	111,126	6.23	.29	32,226	17.43	9.47
Largemouth Bass	316,833	9.36	.86	272,476	49.71	80.14
Sunfish	193,585	4.83	.13	25,166	30.37	7.41
White Crappie	11,732	7.02	.40	4,692	1.84	1.38
TOTALS	637,344			339,972	100.00	100.00

Table 6. Comparative Success of Various Fishing Methods Used on Lake Benbrook as Revealed by Creel Census Data, June 1, 1954 to October 31, 1955.

Method	1954 June	July	August	Sept.	Oct.	Nov.	Dec.	1955 Jan.	Feb.	March
Still Fishing	1346	131	265	141	139	84	79	53	99	362
Hours Fished	2998	323	606	338	343	330	127	409	536	376
Fish/Man Hr.	.449	.405	.437	.417	.405	.254	.622	.130	.185	.963
% of Total	37.01	95.62	92.98	76.21	100.0	87.50	98.75	100.0	98.01	99.45
Casting	219	3	3	24	0	2	1	0	2	0
Hours Fished	427	50	106	81	12	24	14	27	27	41
Fish/Man Hrs.	.512	.060	.028	.296	0	.083	.071	0	.074	0
% of Total	6.02	2.18	1.05	12.97		2.06	1.25		1.98	
Trolling	628	0	2	0	0	0	0	0	0	0
Hours Fished	446	0	24	22	0	3	0	8	0	2
Fish/Man Hr.	1.409	0	.083	0	0	0		0	0	0
% of Total	17.27		.70							
Fly Fishing	4	1	13	13	0	0	0	0	0	0
Hours Fished	5	9	28	18	2	0	0	0	0	0
Fish/Man Hr.	.800	.111	.464	.722	0	0	0	0	0	0
of Total	.11	.72	4.56	7.02						
Trotline	0	0	2	0	0	0	No Trotline Fishing			
Hours Fished	0	30	20	0	0	0				
Fish/Man Hr.	0	0	.1	0	0	0				
% of Total			.70							

Table 6. (Continued)

Method	1955 April	May	June	July	August	September	October	Total
Still Fishing	497	509	298	166	763	222	179	5333
Hours Fished	1678	2070	493	536	555	903	549	13,170
Fish/Man Hr.	.296	.246	.604	.309	1.373	.246	.326	.404
% of Total	93.95	88.21	89.75	85.56	97.57	88.44	92.26	83.48
Casting	12	7	22	24	16	29	15	379
Hours Fished	215	29	46	62	56	24	41	1282
Fish/Man Hr.	.056	.241	.478	.387	.285	1.21	.366	.295
% of Total	2.26	1.21	6.83	12.37	2.04	11.55	7.73	5.93
Trolling	0	0	0					630
Hours Fished	8	0	0					495
Fish/Man Hr.	0	0	0					1.272
% of Total								9.86
Fly Fishing	0	0	0		3			34
Hours Fished	0	0	0		4			66
.sh/Man Hr.	0	0	0		.750			.515
% of Total					.38			.43
Troline	No Troline		10					12
Hours Fished			14					64
Fish/Man Hr.			.478					.187
% of Total								.15

Table 7. Number and Percentage of Fish Caught on Various Bait, Benbrook Lake Creel Census, June 1, 1954 to October 31, 1955.

Month	June 1954		July		August		September		October		November	
Bait	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Minnows	1031	28.36	17	12.41	26	9.12	37	20.00	35	25.18	46	47.91
Grasshoppers	20	.55	0		0		0		2	1.44	0	
Worms	388	10.68	30	21.90	196	68.77	84	45.40	88	63.31	27	28.13
Other Live Bait	0		0		0		0		0		0	
Doughbait	0		0		0		0		0		0	
Bloodbait	0		0		0		0		0		0	
Shrimp	26	.71	0		2	.70	17	9.19	4	2.88	0	
Cutbait	0		0		0		0		0		0	
Liver	0		0		0		0		0		0	
Lures	1537	42.28	3	2.19	5	1.75	26	14.05	0		5	5.21
Spinners	1	.02	0		0		0		0		0	
Flies	6	.16	1	.72	13	4.56	13	7.03	0		0	
Lure & Live Comb.	476	13.09	0		0		0		0		10	10.41
Live Combination	110	3.02	84	61.32	34	11.93	0		10	7.19	8	8.33
Live & Dead Comb	21	.57	0		9	3.16	0		0		0	
Lure, Live & Dead	12	.33	2	1.46	0		0		0		0	
Dead Bait Comb.	0		0		0		8	4.32	0		0	
Unknown	8	.22	0		0		0		0		0	
TOTAL	3636	99.99	137	100.00	285	99.99	185	99.99	139	100.00	96	99.99

Table 7. (Continued)

Month	December		Jan. 1955		February		March		April		May	
BAIT	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Minnows	13	16.25	18	33.96	26	25.74	82	22.53	219	41.40	60	10.40
Grasshoppers	0		0		0		0		0		2	.35
Worms	66	82.50	35	66.04	68	67.33	210	57.69	204	38.56	441	76.43
Other Live Bait	0		0		0		0		1	.19	0	
Doughbait	0		0		0		2	.55	16	3.02	7	1.21
Bloodbait	0		0		0		0		0		0	
Shrimp	0		0		0		22	6.04	34	6.43	15	2.60
Cutbait	0		0		0		0		15	2.83	0	
Liver	0		0		0		0		3	.57	13	2.25
Lures	1	1.25	0		2	1.98	0		16	3.02	13	2.25
Spinners	0		0		0		0		3	.57	0	
Flies	0		0		0		0		0		0	
Lure & Live Comb.	0		0		0		0		0		0	
Live Combination	0		0		5	4.95	26	7.15	18	3.40	11	1.91
Live & Dead Comb.	0		0		0		22	6.04	0		15	2.60
Lure, Live & Dead	0		0		0		0		0		0	
Dead Bait Comb.	0		0		0		0		0		0	
Unknown	0		0		0		0		0		0	
TOTAL	80	100.00	53	100.00	101	100.00	364	100.00	529	99.99	577	100.00

Table 7. (Continued).

Month	June		July		August		September		October		Total	
BAIT	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Minnows	71	21.45	37	19.06	110	14.07	47	18.72	114	58.76	1,989	25.11
Grasshoppers			1	.56	12	1.53					37	.46
Worms	205	61.93	116	59.78	513	65.60	156	62.15	47	24.23	2,874	36.28
Other Live Bait	1	.30									2	.02
Doughbait							1	.40			26	.33
Bloodbait					1	.13					1	.01
Shrimp	16	4.83	12	6.17	127	16.24	17	6.77	5	2.58	297	3.75
Cutbait	6	1.81	2	1.03							23	.29
Liver	9	2.72					1	.40			26	.33
Lures	19	5.74	26	13.40	16	2.04	29	11.55	15	7.73	1,713	21.61
Spinners											4	.05
Flies					3	.38					36	.45
Lure & Live Comb.											486	6.13
Live Combination											306	3.86
Live & Dead Comb.									13	6.70	80	1.00
Lure, Live & Dead											14	.17
Dead Bait Comb.											8	.10
Unknown	4	1.21									4	.05
TOTAL	331	99.99	194	100.00	782	99.99	251	99.99	194	100.00	7,921	100.00

Table 8. Hatchery Stocking of Fish in Benbrook Reservoir, May 1, 1953-October 31, 1955.

Species	1953	1954	1955	Totals
Channel Catfish (Ictalurus punctatus)	25,875		41,000	66,875
Largemouth Bass (Microterus salmoides)	370,325	109,000	34,970	514,295
Warmouth Bass (Chaenobryttus coronarius)	40,075		20,000	60,075
Redear Sunfish (Lepomis microlophus)	50,525		12,660	63,185
Bluegill Sunfish (Lepomis macrochirus)	22,325		12,660	34,985
Longear Sunfish (Lepomis megalotis)	4,500			4,500
Yellowbelly Sunfish (Lepomis auritus)			12,660	12,660
White Crappie (Pomoxis annularis)	11,300			11,300
Black Crappie (Pomoxis nigromaculatus)	23,650			23,650
TOTALS	548,575	109,000	133,950	791,525

Figure 1. Percentage of Total Catch Represented by Each Species, Benbrook Lake Creel Census, June 1, 1954 - October 31, 1955.

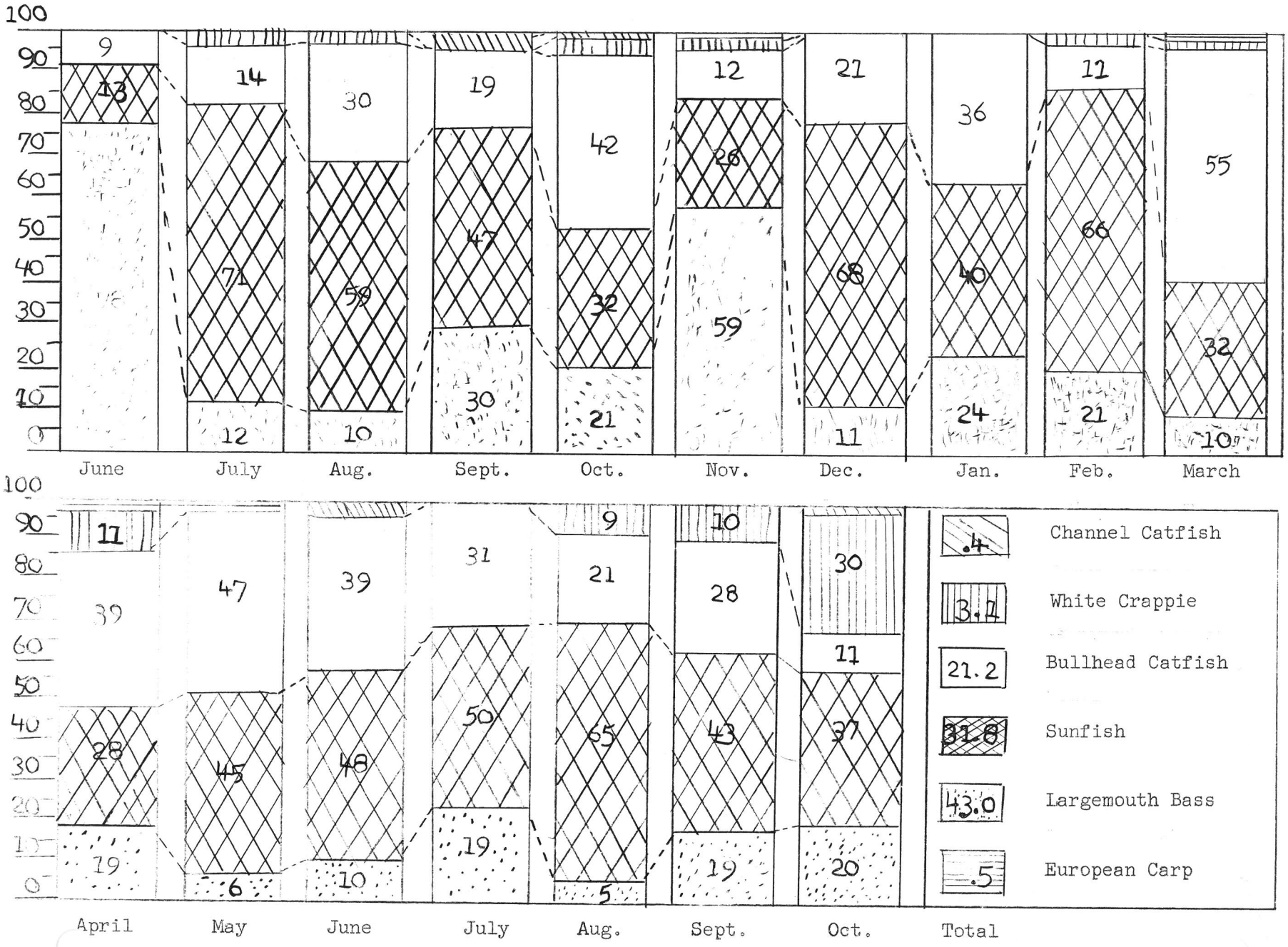

Figure 2. Sunfish Harvest Shown as Standard Length Groups and the Percentage of the Total Catch Represented by Each Group, Benbrook Lake Creel Census, June 1, 1954--August 31, 1955.

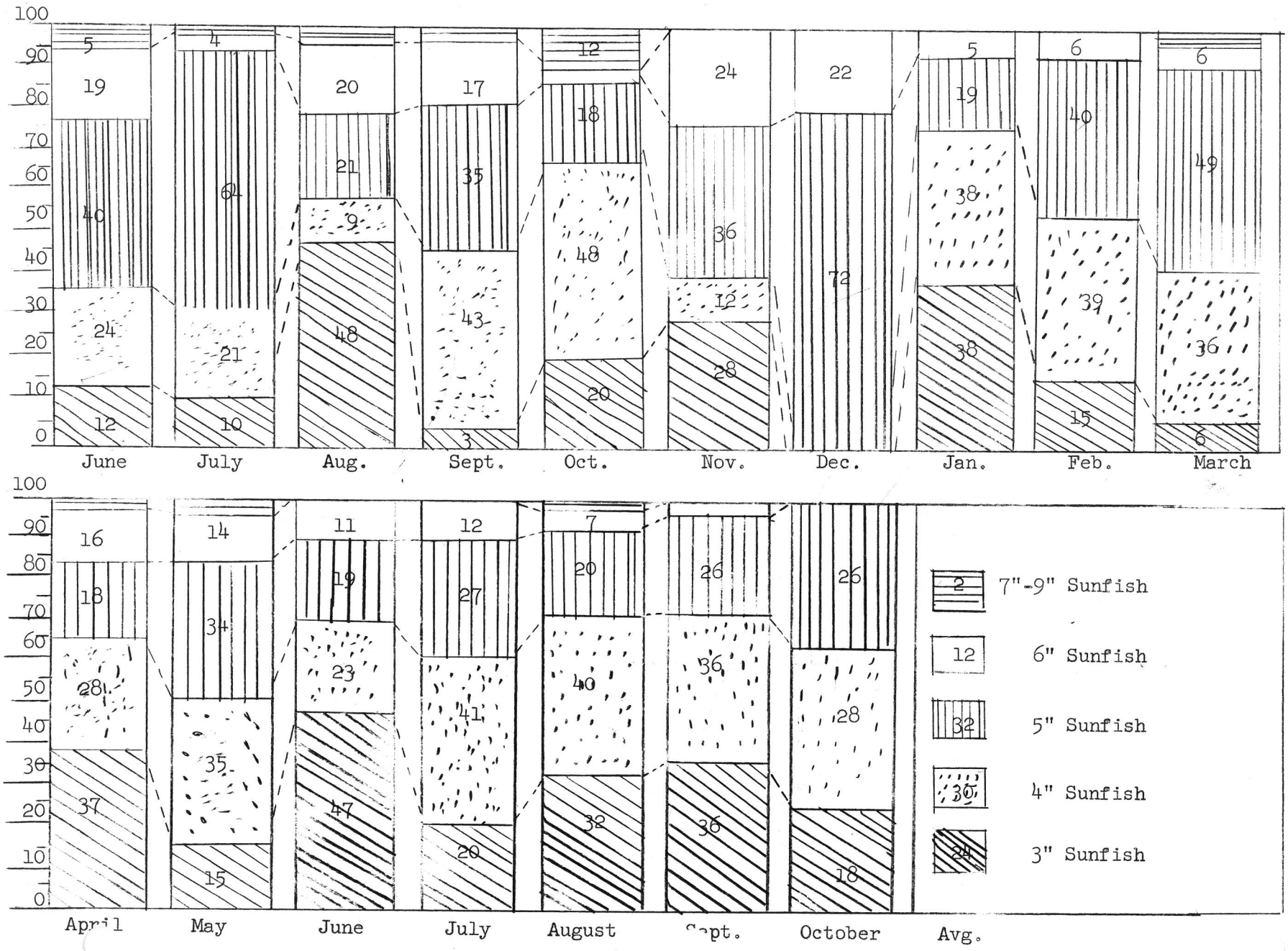

Figure 3. Bullhead Catfish Harvest Shown as Standard Length Groups and the Percentage of the Total Catch Represented by Each Group, Benbrook Lake Creel Census, June 1, 1954 - October 31, 1955.

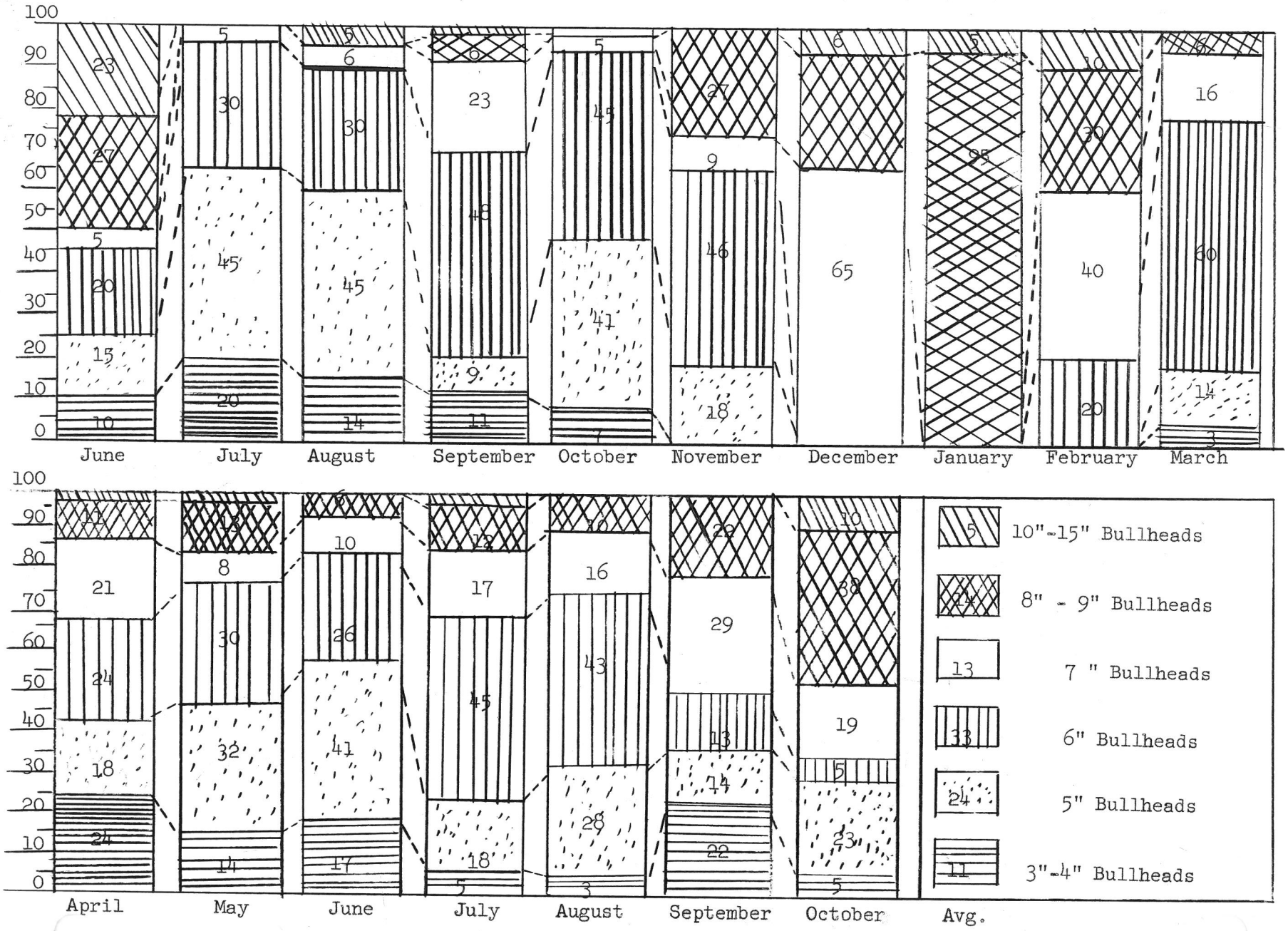

Figure 4. Largemouth Bass Harvest Shown as Standard Length Groups and the Percentage of the Total Catch Represented by Each Group, Benbrook Lake Creel Census, June 1, 1954-August 31, 1955.