

FILE

Job Completion Report

by

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TITLE

Inventory of Species Present in the Belton Reservoir, Texas.

OBJECTIVES

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

METHODS

Since the Belton Reservoir is a newly impounded body of water, and since it had not filled to the expected normal pool elevation during the study period, and since the lake level varied considerably from month to month, no regular netting or seining stations could be established.

All net and seine collections were therefore made at random, with the purpose of making as many collections as possible from the varied habitats during the allotted

Specimens were collected through the use of small meshed seines, experimental and regular gill nets, and fyke nets. Seined specimens were preserved in a solution of formalin (10 per cent) for later identification in the laboratory. Netted specimens were identified, weighed and measured at the lake. Data was recorded for netted individuals of the game species and in some cases for individuals of the forage and rough species. This data included: length, weight, sex and stage of sexual development. If any game fish specimens were found to have food in their stomachs, these stomachs were preserved for laboratory examination.

Water samples were collected regularly from a station established soon after the gates on the dam were closed and water began to be impounded.

A one day creel census was made on Armistice Day, November 11, 1954, in order to sample the type of fishing pressure presently being exerted on the fish population in the reservoir.

DESCRIPTION OF THE BELTON RESERVOIR

The following description of the Belton Reservoir Area was taken in part from material provided by the U. S. Army Corps of Engineers, in that portion of the Master Plan for the Belton Reservoir entitled Biological Potentialities.

"4-03. Soils and vegetation.- The soils in the project area represent various stages of development. The alluvial soils of the bottom lands are sandy loams and clay loams. The residual soils are clays, stony clays, and rocky soils...

4-04. Only remnants of the bottom timbers remain since a large percentage of the bottom lands have been cleared or selectively cleared for cultivation and pecan production. Tree growth and ground cover of the lowlands consists principally of pecan, American elm, cottonwood, willow, walnut, box elder, sycamore, bur oak, hackberry, water ash, buckeye, Johnson grass, bermuda grass and ragweeds. Vegetative cover on the slopes and uplands consists principally of blackjack oak, post oak, live oak, cedar, hackberry, persimmon, skunkbrush, buffalo grass, grama grass and bluestem. These rough slopes and uplands have been subject to overgrazing and burning and the better areas provide only fair pasture.

4-05. Physical features of the reservoir area.- The reservoir lies in the Lampasas Cut Plains, a physiographic subdivision of the Great Plains Province. To the east of the Belton project is a rolling prairie and to the west is a heavily timbered region. The major streams have cut sharply into the terrain leaving U-shaped valleys varying in width from about one-quarter to more than one mile, and varying in depth from about 70 to 200 feet.

4-06. Physical features of the reservoir basin.- The reservoir lies in the narrow and tortuous valley of the Leon River and the relatively straight valley of Cowhouse Creek, the principal tributary of the Leon River. At the top of conservation pool, elevation 569, the lake will extend about 22 miles up the Leon River Valley and about 8 miles up the Cowhouse Creek Valley. The irregular shoreline will be about 110 miles in length. Most of the shore is steep, and only a small amount can be considered flat."

At the end of the study period the reservoir had filled to elevation 554 and covered 5,170 surface acres with 118,000 acre feet of water. At conservation pool elevation the lake will cover 7,400 acres with a maximum depth of 99 feet. Of this area 21% will be less than 10 feet in depth, indicating large areas of shoal which should provide adequate spawning grounds for the game species.

"Access to the west side of the lake between Cowhouse and Owl Creek will not be available to the general public..., except by water craft. The Cowhouse Creek arm of the reservoir which includes about one-fourth of the water surface of the lake will be needed for military use in the proposed military expansion program."

FINDINGS

Table I contains a checklist of the species found to occur in the Belton Reservoir. In all, a total of 56 seine and 75 net collections were made during the two years the lake was under study. These collections provided a total of 9,607 unsexed specimens and 1,084 netted specimens or a grand total of 10,688 specimens, representing 38 species and 10 fish families. The results of these collections are presented in Tables II and III.

In Chart A. are presented the results of analyses made on the stomachs of 36 white crappie and 51 channel catfish.

Of the large mouth bass collected, only the stomachs of six were found to contain food remains. This food had a total volume of 69 ml., of which 44 ml. was composed of the remains of white crappie, 21 ml. was composed of gizzard shad remains and 4 ml. composed of the remains of small sunfish.

The stomachs of four spotted bass contained food remains totaling 14.5 ml. This was composed of gizzard shad, 8.0 ml.; white crappie, 6.0 ml.; and unidentified fish remains 0.5 ml.

Three drum stomachs contained 20.62 ml. of food remains. Earthworms make up the bulk of the total with 14.0 ml. Sunfish remains were next with 6.5 ml. while the remains of dipterous or fly larvae and vegetation comprised the other 0.12 ml.

Two flathead catfish stomachs contained a total volume of 33.0 ml. of food remains. Most of this, 24.0 ml., was composed of fish to badly digested to identify. Cockleburrs and algae made up the other 9.0 ml.

A single yellow bullhead stomach containing food was found. This food totaled only 1.02 ml. and was made up entirely of insect remains including damselflies, beetles and chironomids.

Only two warmouth bass stomachs containing food remains were examined. These specimens contained a volume of 12 ml. of partially digested food. The bulk of this food was composed of earthworms (9.0 ml.) and the remainder was composed of crayfish (3.0 ml.).

Data recorded at the temperature and water sampling station are presented in Tables IV and V. This station was established in the open lake near the dam in July, 1954 and the data shown are for the period from July 1954 through May, 1955.

Secchi disc readings were taken during the same period as temperatures and water samples. These varied from 19.5 inches to 72.0 inches, with an average of 39.25 inches for the year. The readings were obtained from the lower end of the lake where the water is normally the clearest. The upper end of the lake, which is rapidly affected by rises on the Leon River, often turns red with silt when runoff is heavy.

Chart B. presents a monthly reading of reservoir elevation, the approximate surface acreage and the acre footage for the months June, 1954, through May, 1955. At its highest level, in May 1955, the Belton Reservoir covered 5,170 acres and contained 118,000 acre feet of water. Its greatest depth during the period was 63 feet.

Tables VI through X present data concerning weights and "K" factors for individuals of given total lengths for 19 of the species collected in the reservoir. Total lengths are given in inches and weights are given in pounds and tenths of pounds for most of the specimens. The weights of some smaller individuals are given in grams where they weigh less than 0.1 pounds. "K" factors were based on standard length in mm. and weight in grams.

In Table XI are given the results of a one day creel census taken in an effort to sample the type of fishing pressure being exerted on the fish population. The table shows the number of fish caught, the number of hours spent fishing and the return per unit of effort in numbers of fish per man hour, for the various species taken, the methods of fishing employed and the types of baits used. It needs to be pointed out that the figures shown are based only on pure catches of each species shown, or as in the case of sunfish, for all types of sunfish, and for fish caught when only a single method or type of bait was used.

DISCUSSION AND CONCLUSIONS

Work during the study period conclusively proved the existence of a large crappie population in the reservoir. These fish were frequently seined and netted and ranged in total length from 2 to 14 inches, and from 1.5 grams to 1.6 pounds in weight. Of the netted crappie, the average total length was 12 inches and the average weight was 0.9 pounds.

Crappie accounted for 15.2 per cent of the specimens netted during the period June, 1954 through May, 1955 and for 14.2 per cent of the specimens netted over the two year study period. Regardless of their apparent abundance, however, this species has not yet been taken in appreciable numbers by sport fishermen. This may be due in part to the abundance of forage fish in the reservoir. For example: Gizzard shad taken in nets accounted for 12.7 per cent of the total netted catch over the two year period. (Table II) Redfin shiners and blacktail shiners together comprised 55.4 per cent of the seined specimens and the other ten forage species increased this per centage to more than 67 per cent. (Table III)

Of the 36 crappie stomachs found to contain food, 91 per cent of the food was composed of shad. (Chart A.)

It seems plausible that a species, such as the crappie, which prefers dense cover and is provided with both excellent cover, in the form of brush and trees left standing in the reservoir basin, and with an abundance of food fishes to prey upon, would be difficult to take on the rod and reel with either live or artificial bait. So far this has been the case in the Belton Reservoir.

Carp and carpsuckers are also very abundant in the Belton Reservoir. The two species accounted for more than 30 per cent of the specimens netted during the two years of the study. The average size for carp was 9 inches in total length and for carpsuckers was 15 inches. Fortunately, many fishermen of the Temple-Belton area do not object to these species and large numbers of fishermen specifically go the lake to fish for carp and sucker type fish. The method commonly employed when fishing for carp or suckers has been bank fishing with pole and line, baited either with doughbait or worms. There is no doubt, however, that these two species along with the gizzard shad will have to be controlled in the near future.

Since the lake now covers large areas of what were formerly cultivated fields of sandy loam, it might be possible, in the future, to bait areas which could be dragged with large haul seines. If this were done during the spawning season, it is conceivable that the populations of carp and carpsuckers could be effectively cropped.

Gizzard shad comprised better than 12 per cent of the netted specimens and nearly 5 per cent of the seined specimens over the two years. For the present, at least, this species is not a major problem although their future control will be necessary. This could be effected through the use of rotenone as a selective poison.

Like the gizzard shad, the combined species of sunfish comprised approximately 12 per cent of the netted specimens and more than 13 per cent of the seined specimens. The bulk of these specimens were under seven inches in total length and are of a size not desirable to most fishermen. Some form of control of these species which will help to crop the population also needs to be devised or it is certain that these fish will soon be overly abundant.

Like the crappie, channel catfish are more abundant in the lake than is apparent in the catch of the sport fisherman. The species accounted for nearly 10 per cent of the total netted specimens during the study period.

The channel catfish taken ranged in size from 9 to 25 inches and in weight from 0.45 pounds to 6.9 pounds. The average netted catfish was found to be 15.5 inches long and weighed 1.6 pounds. This species has not been frequently taken by fishermen.

Perhaps the most apparent reason for this is the fact that the lake bed, as it was covered by the rising water level, contained many earthworms which, when covered by water, tried to escape by coming out of the ground and were eaten in quantities by channel catfish. Earthworms were found to be more than 36 per cent of the diet in the contents of 51 channel catfish stomachs examined. (Chart A.)

Likewise, yellow, or flathead catfish, are relatively abundant, making up approximately one per cent of the total catch. The presence of this species is a definite asset to the lake both as an effective predator and as a desirable sport species.

Large mouth bass, though not taken in large numbers in either seine or net collections are apparently fairly numerous in the Belton Reservoir. Judging from the number taken during one day's fishing by 74 fishermen, the relative abundance of this species seems to be fairly high. (Table XI.)

The fact that the Belton Reservoir was not full during the study period made work in the area relatively difficult. Much of the shoreline and much of the shoal area of the lake was covered with peach, plum and pecan orchards as well as scrub cedar and scrub oak. It was not until the last month of the study period that sufficient water was impounded to place the shoreline at a level where the trees and brush had been removed. If this level is maintained, or if the lake level rises, it should be somewhat easier for fishermen to fish the lake and the fish may be forced to leave the heavier cover, with which the floor of the reservoir basin is covered.

The one day creel census, taken on Armistice Day, 1954 revealed the following information: Seventy four fishermen, in 176.5 hours caught 62 fish. This was at the rate of one fish every 2.9 hours or 0.35 fish per man hour. Sunfish were caught at the rate of 1.3 fish per man hour, largemouth bass were caught at the rate of 1.0 fish every 2.5 hours and carp were caught at the rate of 1.1 fish per hour.

Of the total hours spent fishing by the 74 fishermen, 140.5 hours out of 176.5 hours, or 79 per cent of the time, was spent in still fishing from the bank. During only 21 per cent of the hours fished, were the people engaged in trolling from boats.

The average fishing trip lasted 2.4 hours and produced 0.8 fish per fisherman.

The fact that most of the fishing in Belton Reservoir was done from the shore indicates either one of two things. Either the fishermen using the lake prefer shore fishing to boat fishing or there are not enough boats to go around. The latter is more probably true. This strongly indicates a need for additional boat liveries to supplement the service now being given by the existing two dock operators.

RECOMMENDATIONS

1. It is recommended that further study of the Belton Reservoir be made to determine a method or methods of controlling the gizzard shad, river carpsucker, carp and sunfish populations.
2. It is also recommended that this lake be opened to contract fishermen.
3. It is further recommended that both state and federal fish hatcheries be instructed not to stock any of the species of sunfish or crappie since both types of fish are already present in relative abundance.

SUMMARY

1. Belton Reservoir lies in the rough, tortuous valley of the Leon River and the relatively straight valley of Cowhouse Creek, Texas.
2. The Reservoir now covers approximately 5,000 surface acres, or roughly 71% of the surface acreage expected at conservation pool elevation.
3. About one fourth of the surface acreage of the lake will be used for military purposes and shall not be available to the general public.
4. 10,688 specimens, representing 38 species of fish were collected during the study.
5. Catfish and crappie are present in greater abundance than the results of sport fishing would indicate.
6. Largemouth bass also are relatively abundant.
7. Gizzard shad, river carpsuckers and carp are multiplying rapidly and will need to be controlled in the near future.
8. Of the crappie collected, 91% of their food, based upon the contents of 36 stomachs, was composed of gizzard shad.
9. Of the channel catfish, earthworms comprised the most frequent food, being 36 per cent of the total volume of food remains in 51 stomachs.
10. Based on one day's creel census data, 79 per cent of the time spent fishing on Belton Reservoir is devoted to bank fishing, the average fishing trip lasted 2.4 hours and fish were caught at the rate of 0.8 fish per fisherman per trip.

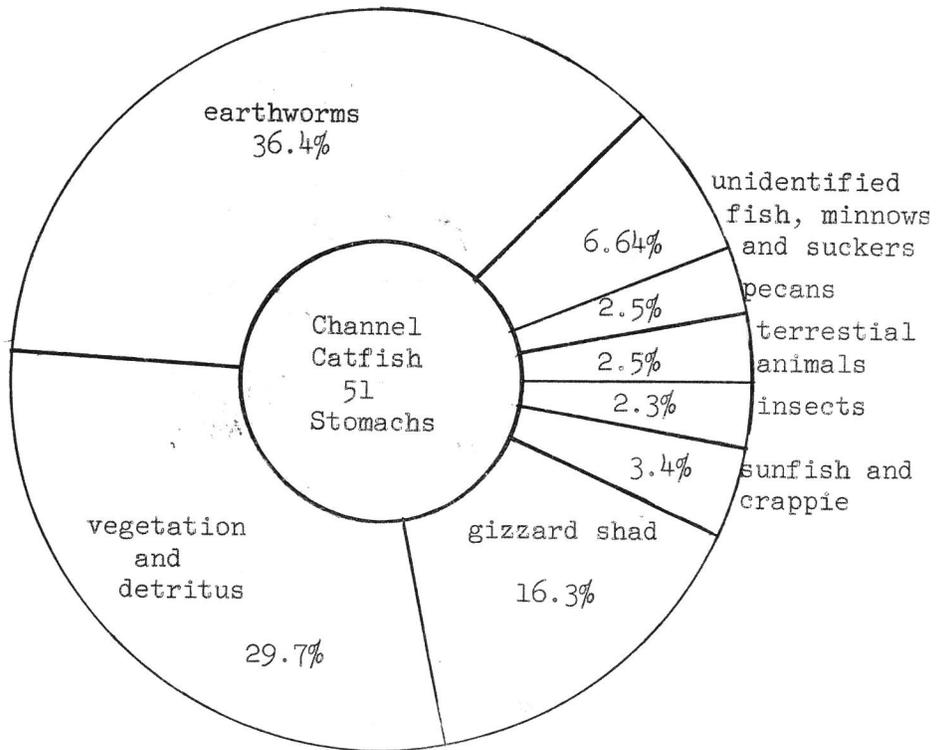
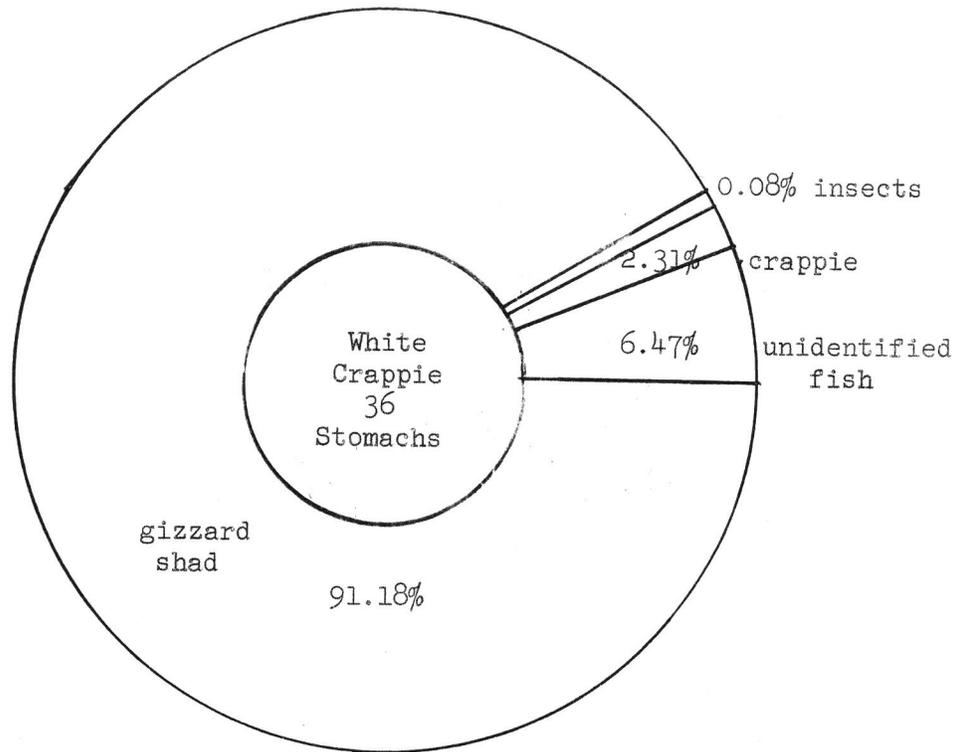


Chart "A" - Results of Stomach Analyses, Belton Reservoir,
June 1953 through May 1955.

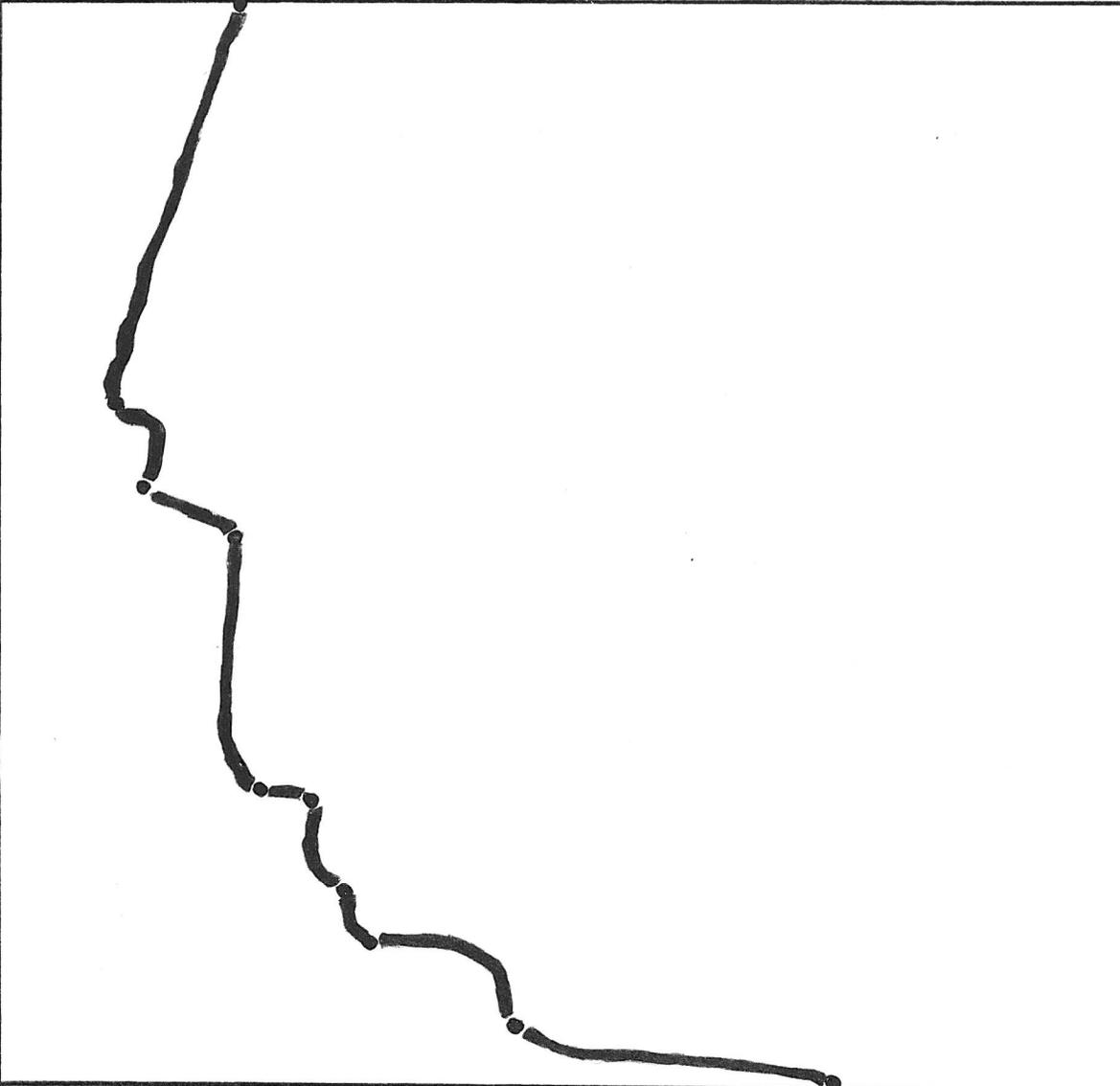
ELEVATION IN FEET	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	SURFACE AREA IN ACRES	STORAGE AREA IN ACRE FEET
569													5,170	118,000
565														
560														
555														
550														
545														
540														
535													2,940	45,800
530													1,970	24,600
525													1,800	21,600
520													1,340	14,700
515													1,270	13,900
510													1,230	13,500
													920	9,540
													740	7,720

Chart "B" - Reservoir Elevation, Surface Area Inundated and Storage in Acre Feet, Belton Reservoir,
June 1954 - May 1955.

Table I
Checklist of Species, Belton Reservoir.

Scientific name	Common name
1. <u>Lepisosteus platostomus</u>	shortnose gar
2. <u>Lepisosteus productus</u>	spotted gar
3. <u>Dorosoma cepedianum</u>	gizzard shad
4. <u>Cycleptus elongatus</u>	blue sucker
5. <u>Ictiobus bubalus</u>	smallmouth buffalo
6. <u>Carpiodes carpio</u>	river carpsucker
7. <u>Moxostoma congestum</u>	grey redhorse
8. <u>Cyprinus carpio</u>	carp
9. <u>Notemigonus crysoleucas</u>	golden shiner
10. <u>Notropis atherinoides</u>	emerald shiner
11. <u>Notropis venustus</u>	spottail shiner
12. <u>Notropis lutrensis</u>	redhorse or red shiner
13. <u>Notropis volucellus</u>	mimic shiner
14. <u>Notropis buchanani</u>	ghost shiner
15. <u>Pimephales vigilax</u>	parrot minnow
16. <u>Pimephales promelas</u>	fathead minnow
17. <u>Campostoma anomalum</u>	stoneroller
18. <u>Ictalurus punctatus</u>	southern channel catfish
19. <u>Ameirus melas</u>	black bullhead
20. <u>Ameirus natalis</u>	yellow bullhead
21. <u>Pilodictus olivaris</u>	yellow catfish
22. <u>Schilbeodes mollis</u>	tadpole madtom
23. <u>Fundulus natalis</u>	blackstripe topminnow
24. <u>Gambusia affinis</u>	common mosquitofish
25. <u>Micropterus punctulatus</u>	Kentucky spotted bass
26. <u>Micropterus treculi</u>	Texas spotted bass
27. <u>Micropterus salmoides</u>	largemouth bass
28. <u>Chaenobryttus coronarius</u>	warmouth
29. <u>Lepomis cyanellus</u>	green sunfish
30. <u>Lepomis microlophus</u>	redeer sunfish
31. <u>Lepomis macrochirus</u>	bluegill sunfish
32. <u>Lepomis humilis</u>	orangespotted sunfish
33. <u>Lepomis megalotis</u>	longear sunfish
34. <u>Pomoxis annularis</u>	white crappie
35. <u>Hadropterus scierus</u>	dusky darter
36. <u>Percina caprodes</u>	logperch
37. <u>Etheostoma spectabile</u>	orangethroat darter
38. <u>Aplodinotus grunniens</u>	freshwater drum

Table II
Results of Netting Collections, Belton Reservoir, June 1953 through May 1955.

SPECIES	1954												1955					% OF TOTAL	1953- 1954 TOTAL	1953- 1955 TOTAL	% OF TOTAL 53-55
	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	TOTAL	TOTAL	TOTAL						
L. platostomus	1	0	0	0	0	2	0	0	18	16	0	7	44	4.55	27	71	6.55				
L. productus	2	0	0	5	0	0	0	0	0	2	0	2	11	1.14	6	17	1.57				
D. cepedianum	6	0	3	3	3	9	49	20	7	3	3	15	121	12.15	17	138	12.73				
C. elongatus	2	0	0	0	0	0	0	0	0	0	0	0	2	0.21	0	2	0.18				
I. bubalus	6	0	0	0	0	0	0	0	0	6	5	22	39	4.03	0	39	3.59				
Carpiodes carpio	13	0	2	3	2	15	28	21	26	4	13	17	144	14.89	15	159	14.67				
M. congestum	1	0	0	0	0	0	2	2	4	0	1	4	14	1.45	0	14	1.29				
Cyprinus carpio	8	30	25	0	3	4	12	2	17	47	12	16	176	18.20	0	176	16.24				
N. venustus	0	3	1	0	0	0	0	0	0	0	0	0	4	0.41	0	4	0.37				
N. lutrensis	0	0	2	0	0	0	0	0	0	0	0	0	2	0.21	0	2	0.18				
I. punctatus	7	3	0	1	7	10	17	7	3	12	13	15	95	9.82	8	103	9.50				
A. melas	1	0	1	0	0	0	0	0	0	0	1	0	3	0.31	1	4	0.37				
A. natalis	1	0	0	0	0	0	0	0	0	0	0	0	1	0.10	1	2	0.18				
P. olivaris	2	0	0	0	1	1	1	3	0	2	0	0	10	1.03	0	10	0.92				
M. punctulatus	2	6	2	1	0	0	0	0	0	0	0	1	12	1.24	2	14	1.29				
M. salmoides	9	0	1	5	1	0	0	0	18	0	1	6	41	4.24	1	42	3.87				
C. coronarius	1	2	1	0	0	0	0	0	0	0	1	2	7	0.72	3	10	0.92				
L. cyanellus	6	3	9	0	0	0	0	0	0	0	0	0	18	1.86	4	22	2.03				
L. macrochirus	17	6	4	1	0	0	0	0	0	1	2	14	45	4.65	15	60	5.54				
L. humilis	0	1	0	0	0	0	0	0	0	0	0	0	1	0.10	0	1	0.09				
L. megalotis	12	1	4	0	0	0	0	0	0	0	0	1	18	1.86	10	28	2.58				
P. annularis	3	22	42	2	8	38	16	10	0	3	0	3	147	15.20	7	154	14.21				
A. grummiens	1	0	0	0	1	2	3	1	1	0	2	1	12	1.24	0	12	1.11				
TOTALS	101	77	97	21	26	81	128	66	94	96	54	126	967	99.97	117	1084	99.98				

Table VI
 Belton Reservoir, Total Lengths, Weights and "K" Factors, June 1954 through May 1955.
 (Weights given in pounds unless otherwise indicated.)

INCHES	NUMBER	WEIGHT RANGE	TOTAL WEIGHT	WEIGHT AVG.	"K" FACTOR RANGE	TOTAL "K"	AVERAGE "K"
<u>Lepisosteus platostomus--shortnose gar</u>							
24	4	1.2	6.18	1.54	0.35	1.83	0.46
25	7	1.2	10.61	1.51	0.33	2.79	0.70
26	8	1.6	13.42	1.67	0.38	3.16	0.39
27	2	1.9	3.74	1.87	0.40	0.80	0.40
28	1	1.6	1.58	1.58	0.42	0.42	0.42
29	1	2.5	2.49	2.49	0.43	0.43	0.43
31	1	3.93	3.93	3.93	0.45	0.45	0.45
32	2	3.6	7.49	3.74	0.43	0.87	0.44
35	1	4.1	4.1	4.1	0.37	0.37	0.37
<u>Lepisosteus productus--spotted gar</u>							
15	1	0.44	0.44	0.44	0.59	0.59	0.59
18	2	0.67	1.50	0.75	0.55	1.22	0.61
19	3	0.62	2.52	0.84	0.37	1.58	0.52
22	1	1.24	1.24	1.24	0.50	0.50	0.50
<u>Pilodictus olivaris--flathead catfish</u>							
15	1	1.31	1.31	1.31	1.82	1.82	1.82
16	1	1.62	1.62	1.62	1.83	1.83	1.83
18	2	2.4	5.24	2.62	1.89	4.09	2.04
19	2	2.5	5.24	2.62	1.73	3.50	1.75
20	1	3.43	3.43	3.43	1.93	1.93	1.93
27	1	5.3	5.3	5.3	1.79	1.79	1.79
<u>Lepomis cyanellus--green sunfish</u>							
2	2	4 gms	9 gms	4½ gms	3.20	4.25	3.72
3	1	3 gms	3 gms	3 gms	1.90	1.90	1.90
4	1	19 gms	19 gms	19 gms	3.10	3.10	3.10
5	3	35 gms	0.28	0.09	2.43	9.34	3.11
6	4	0.11	0.61	0.15	3.23	14.97	3.74
7	4	0.31	1.37	0.34	2.08	17.47	4.36

Table VII
 Belton Reservoir, Total Lengths, Weights and "K" Factors, June 1954 through May 1955.
 (Weights given in pounds unless otherwise indicated.)

INCHES	NUMBER	WEIGHT RANGE	TOTAL WEIGHT	WEIGHT AVG.	"K" FACTOR	RANGE	TOTAL "K"	AVERAGE "K"
<u>Ictiobus bubalus--smallmouth buffalo</u>								
8	1	0.2	0.2	0.2	3.76	3.76	3.76	3.76
10	1	0.6	0.62	0.62	3.83	3.83	3.83	3.83
11	1	0.74	0.74	0.74	2.98	2.98	2.98	2.98
13	2	1.2	2.74	1.37	3.62	3.87	7.49	3.75
14	2	1.6	3.41	1.70	3.27	3.66	6.93	3.47
15	2	1.9	4.18	2.09	3.32	3.60	6.92	3.46
<u>Moxostoma congestum--grey redhorse</u>								
8	1	0.3	0.3	0.3	2.52	2.52	2.52	2.52
10	1	0.24	0.24	0.24	2.51	2.51	2.51	2.51
12	2	0.8	1.65	0.82	2.25	2.41	4.66	2.33
13	4	0.9	4.16	1.04	2.26	2.89	10.13	2.53
14	1	1.15	1.15	1.15	2.27	2.27	2.27	2.27
15	2	1.60	3.12	1.60	2.27	2.29	4.56	2.28
16	2	1.24	3.37	1.68	1.48	2.35	3.83	1.91
<u>Ictalurus punctatus--channel catfish</u>								
9	4	0.2	1.8	0.45	1.95	2.28	8.50	2.12
10	2	0.3	0.67	0.33	1.77	2.22	3.99	1.99
11	9	0.4	4.83	0.53	1.87	2.45	18.53	2.05
12	8	0.5	4.86	0.60	1.64	2.55	15.37	1.92
13	8	0.6	5.93	0.74	1.73	2.00	14.91	1.86
14	11	0.8	10.92	0.99	1.68	2.48	22.00	2.00
15	2	1.4	2.81	1.40	2.19	2.22	4.41	2.20
16	9	1.4	13.05	1.45	1.64	2.37	17.80	1.97
17	10	1.4	17.59	1.75	1.67	2.38	19.50	1.95
18	9	1.6	18.61	2.06	1.72	2.24	16.99	1.88
19	8	1.9	18.85	2.35	1.71	2.25	15.73	1.96
20	3	2.5	7.86	2.62	1.62	1.84	5.25	1.75
21	4	3.2	14.89	3.72	1.79	2.40	8.20	2.05
22	2	4.5	9.17	4.58	2.14	2.36	4.50	2.25
24	2	6.2	12.55	6.27	2.07	2.11	4.18	2.09
25	1	6.9	6.9	6.9	2.32	2.32	2.32	2.32

Table VIII
 Belton Reservoir, Total Lengths, Weights and "K" Factors, June 1954 through May 1955.
 (Weights given in pounds unless otherwise indicated.)

INCHES	NUMBER	WEIGHT RANGE	TOTAL WEIGHT	WEIGHT AVG.	"K" FACTOR RANGE	TOTAL "K"	AVERAGE "K"
<u>Dorosoma cepedianum--gizzard shad</u>							
7	1	0.11 0.11	0.11	0.11	2.38	2.38	2.38
9	3	0.29 0.37	0.97	0.32	2.03	2.31	2.15
10	3	0.31 0.41	1.10	0.37	1.86	2.27	2.05
11	3	0.37 0.51	1.39	0.46	1.68	2.35	2.08
12	7	0.56 0.74	4.79	0.67	2.04	2.31	2.19
13	11	0.74 0.93	8.68	0.79	1.93	2.36	2.18
14	9	0.87 1.18	9.68	1.08	1.91	2.65	2.27
15	1	1.37 1.37	1.37	1.37	2.31	2.31	2.31
16	5	1.24 1.74	7.86	1.57	2.00	2.65	2.30
<u>Micropterus salmoides-- largemouth black bass</u>							
4	3	0.02 0.03	0.09	0.03	1.92	2.19	3.05
5	2	0.03 0.07	0.11	0.05	1.70	2.49	2.09
6	6	0.07 0.18	0.76	0.12	1.71	3.87	2.65
9	5	0.31 0.44	1.84	0.36	2.49	2.92	2.68
10	2	0.52 0.59	1.12	0.56	2.62	2.73	2.62
11	15	0.56 0.77	9.94	0.66	2.30	2.79	2.50
12	7	0.74 1.00	6.02	0.86	2.05	2.64	2.48
13	1	1.18 1.18	1.18	1.18	2.74	2.74	2.74
19	1	4.99 4.99	4.99	4.99	3.54	3.54	3.54
<u>Chaenobryttus coronarius--warmouth</u>							
5	2	28 gms 35 gms	63 gms	31½ gms	2.42	3.20	2.81
6	3	85 gms 113 gms	311 gms	0.23	4.35	6.37	5.17
7	1	142 gms 142 gms	142 gms	0.31	5.06	5.06	5.06
8	1	170 gms 170 gms	170 gms	0.37	3.85	3.85	3.85
<u>Lepomis megalotis--longear sunfish</u>							
2	1	4 gms 4 gms	4 gms	4 gms	4.39	4.39	4.39
4	11	25 gms 57 gms	1.05	43½ gms	1.11	8.09	5.31
5	1	57 gms 57 gms	57 gms	0.12	5.37	5.37	5.37

Table IX
 Belton Reservoir, Total Lengths, Weights and "K" Factors, June 1954 through May 1955.
 (Weights given in pounds unless otherwise indicated.)

INCHES	NUMBER	WEIGHT RANGE	TOTAL WEIGHT	WEIGHT AVG.	"K" FACTOR RANGE	TOTAL "K"	AVERAGE "K"
<u>Carpoides carpio--river carpsucker</u>							
7	3	0.1 0.2	0.47	0.15	2.78	3.87	9.93
8	4	0.3 0.9	1.83	0.45	2.71	3.76	13.84
9	15	0.3 0.5	5.75	0.38	2.73	4.03	50.59
10	10	0.4 0.5	4.74	0.47	2.71	3.26	29.74
11	3	0.6 0.7	1.93	0.64	2.74	2.97	8.48
12	4	0.8 1.1	3.77	0.94	2.68	3.28	12.03
13	52	0.9 1.2	54.54	1.04	2.59	3.32	148.59
14	10	1.1 1.6	12.92	1.29	2.27	3.16	28.02
15	1	1.5 1.5	1.5	1.5	2.88	2.88	2.88
<u>Cyprinus carpio--carp</u>							
6	4	0.12 0.18	0.62	0.15	2.92	5.30	15.96
7	5	0.12 0.18	0.77	0.15	2.17	3.30	13.33
8	9	0.12 0.29	2.20	0.24	1.62	3.07	22.78
9	38	0.29 0.50	14.21	0.37	2.04	3.81	111.79
10	14	0.43 0.54	6.75	0.48	2.47	3.03	38.95
11	4	0.56 0.81	2.82	0.71	2.71	3.03	11.30
12	7	0.77 1.06	6.51	0.93	2.63	3.14	20.62
13	11	1.00 1.18	12.05	1.09	2.58	3.08	31.43
14	2	1.24 1.31	2.55	1.28	2.44	2.45	4.89
15	5	1.51 1.99	8.57	1.71	2.68	3.53	14.84
<u>Ameiurus melas--black bullhead</u>							
7	1	0.18 0.18	0.18	0.18	2.37	2.37	2.37
<u>Aplodinotus grunniens--freshwater drum</u>							
10	2	0.4 0.4	0.81	0.40	1.86	2.52	4.38
12	2	0.8 0.9	1.68	0.84	2.54	2.67	5.21
13	5	0.9 1.1	4.68	0.93	2.38	2.66	12.44
15	2	1.5 1.6	3.12	1.56	2.59	2.73	5.32
16	1	0.86 0.86	0.86	0.86	2.91	2.91	2.91

Table X
 Belton Reservoir, Total Lengths, Weights and "K" Factors, June 1954 through May 1955.
 (Weights given in pounds unless otherwise indicated.)

INCHES	NUMBER	WEIGHT RANGE	TOTAL WEIGHT	WEIGHT AVG.	"K" FACTOR RANGE	TOTAL "K"	AVERAGE "K"
<u>Ameiurus natalis</u> --yellow bullhead							
8	1	85 gms 85 gms	85 gms	85 gms	1.85 1.85	1.85	1.85
<u>Micropterus punctulatus</u> --Kentucky spotted bass							
3	3	6 gms 8 gms	21 gms	7 gms	1.67 2.13	5.78	1.92
4	16	7 gms 19 gms	186 gms	11.6 gms	1.60 2.44	29.72	1.85
5	9	13 gms 29 gms	189 gms	21 gms	1.21 2.65	17.11	1.90
6	1	0.2 0.2	0.2	0.2	1.37 1.37	1.37	1.37
7	1	0.24 0.24	0.24	0.24	3.22 3.22	3.22	3.22
8	1	0.5 0.5	0.5	0.5	3.26 3.26	3.26	3.26
12	2	0.8 0.8	1.68	0.84	2.61 2.64	5.25	2.62
<u>Lepomis macrochirus</u> --bluegill							
2	1	1 gm 1 gm	1 gm	1 gm	1.26 1.26	1.26	1.26
3	2	3 gms 6 gms	9 gms	4½ gms	1.82 2.01	2.83	1.42
4	2	28 gms 28 gms	0.12	28 gms	3.59 3.98	7.56	3.78
5	7	28 gms 0.18	0.78	0.11	3.16 9.03	37.03	5.29
6	17	0.12 0.37	4.52	0.27	4.28 8.30	105.21	6.19
7	8	0.24 0.43	2.46	0.31	4.12 6.36	41.02	5.13
<u>Pomoxis annularis</u> --white crappie							
2	6	1 gm 3 gms	9 gms	1½ gms	1.09 2.71	10.23	1.70
3	49	1 gm 8 gms	231 gms	4.7 gms	0.80 3.00	106.26	2.16
4	54	7 gms 15 gms	592 gms	11 gms	1.47 4.02	131.19	2.42
5	1	19 gms 19 gms	19 gms	19 gms	2.70 2.70	2.70	2.70
8	4	0.2 0.3	1.03	0.25	1.89 2.92	10.34	2.58
9	8	0.2 0.4	2.56	0.32	2.00 3.40	21.40	2.67
10	3	0.5 0.7	1.70	0.56	3.06 3.67	9.87	3.29
11	27	0.6 1.0	22.29	0.82	1.03 3.99	87.98	3.25
12	37	0.7 1.24	37.34	1.00	1.86 3.86	122.78	3.31
13	9	1.1 1.6	12.54	1.39	3.25 4.03	31.69	3.52
14	4	1.6 1.7	6.59	1.64	3.30 3.66	14.03	3.50

Table XI
Results of Creel Census, Belton Reservoir, Armistice Day, November 11, 1954.

<u>SPECIES</u>	<u>NUMBER OF FISH</u>	<u>HOURS FISHED</u>	<u>FISH/MAN HOUR</u>
Sunfish	9	7.0	1.3
Largemouth bass	22	61.0	0.4
European carp	12	11.0	1.1
<u>METHOD</u>			
Still fishing	56	140.5	0.4
Trolling	6	26.0	0.2
<u>BAIT USED</u>			
Minnows	29	49.5	0.6
Worms	1	44.0	0.02
Shrimp	9	27.0	0.3
Lures	6	26.0	0.2
Total fishermen--74	Total fish caught--62	Total hours fished--176.5	Total fish/man hour--0.35



BELTON RESERVOIR, TEXAS

INUNDTED ROADS
ROAD UNDER WATER AT FLOOD CONTROL LEVEL

