JOB COMPLETION REPORT

FILE

STATE OF TEXAS

Project No. F4R3 Name Fisheries Investigations and Surveys of Waters of Region 4-B.

Job No. B-16 Title Inventory of the Species in Mountain Creek Lake.

Period Covered: November 1, 1955 to October 31, 1956

ABSTRACT

Mountain Creek Lake is a murky, shallow lake located on Mountain Creek near the junction with the Trinity River 512 miles above the Gulf of Mexico. The reservoir impounds 3,000 acres and was built by the Dallas Power and Light Company to provide coolant water for a steam turbine power plant.

Thirty-six net sets were made at six net stations. A total of 785 fish weighing 489.58 pounds was taken. Fourteen species were taken by seining and netting. Rough fish constituted 64% of the catch by number and 56% by weight. River carpsucker was the most numerous species making up 30.1% of the total net catch.

Two seine stations were established and a total of 218 specimens was taken. The catch of freshwater shrimp was reduced by the 1/4-inch mesh of the seine used, as many were small enough to escape. The comparatively large numbers of small gizzard shad indicates that forage is not lacking, despite the heavy winter kill in December.

The Brazos River shiner (Notropis brazosensis) was probably introduced into the lake by fishermen and is not present in sufficient quantities to indicate that it has become established.

The need for rough fish control appears to be centered on the river carpsucker since the shad make up only 9.4% of the net catch.

OBJECTIVES

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

HISTORY OF LAKE

Mountain Creek Lake is located on Mountain Creek at a point some three miles above the juncture with the Trinity River. This juncture is about 512 miles above the mouth of the Trinity. The Dallas Power and Light Company constructed this lake to provide an adequate supply of coolant water for the boilers of a steam turbine power plant. The dam was completed in 1937 and the lake was closed to fishing until 1939.

PHYSICAL CHARACTERISTICS

Mountain Creek is a shallow lake with a maximum depth of 18 to 20 feet and an average depth of 9 feet. The lake bottom is rather regular forming a shallow flat basin with the channel of Mountain Creek forming the only major depression. At spillway level the area is 3,000 acres and the maximum volume is 27,000 acre feet.

The terrestrial vegetation is largely prairie grasses and weeds while the aquatic vegetaion is almost entirely cattail (Typha latifolia). The watershed is a mixture of grassland and cultivated crops, largely cotton. The runoff carries a large amount of silt and the lake is murky at all times. Mountain Creek Lake is not subject to rapid fluctuations but because of the small watershed and infrequent rains the fluctuations are rather severe.

TECHNIQUES USED

The fish population of this lake was sampled by means of gill nets and seines. Net sets were made at six stations (Map 1). These stations were sampled when weather and water conditions would permit but were selected so that some stations would be accessible regardless of weather conditions. The nets used were generally $1\frac{1}{2}$ inch square mesh gill nets, 100 feet long and 8 feet deep, but occasionally experimental nets 125 feet long were used. These nets were of variable mesh ranging from 1 inch to 3 inches square mesh in size.

Seine samples were taken by means of a 30 foot bag seine of $\frac{1}{4}$ inch mesh. Two seine stations were used since they represented the two bottom types offered by the lake.

FINDINGS

A checklist of the species taken (Table 1) includes fourteen species of which one, the Brazos River shiner (Notropis brazosensis), was probably introduced by minnow fishermen. No collections of sunfish were made and none were observed in the catches of the fishermen.

Table 2 gives the results of the seining collections. Station 1 was located off a point projecting out into the lake (Map 1) and was in very shallow water. The bottom was smooth and clean. It was of firm clay with no cover or vegetation. Station 2 was located near the mouth of the canal that discharges coolant water from the power plant. The bottom was of clay and mud and was much less firm than that of Station 1. Some grasses and other terrestrial vegetationwere present and the water was about 2 feet deep.

The presence of freshwater shrimp (Palaemonetes sp.) of rather large size and in comparatively large numbers indicates that the forage chain is not completely broken when the shad have grown to a size that eliminates them from the diet of the crappie. These shrimp attain a length of 38 millimetersand are present in sufficient quantity to provide a considerable item in the diet of all carnivorous species.

A comparison of the catch by gill netting shows that the ratio of game to rough species is quite favorable to the production of game fish. The rough or forage species, as shown by Table 3, make up 63% of the total catch by number but are only 54% of the total weight. The average weight of the game fish was .75 pounds while that of the rough species was .55 pounds.

The checklist (Table 1) indicates a lack of predatory species other than the game fish. The channel catfish is considered to be a game fish. The total absence of any species of gar together with a scarcityof bullheads leaves the bulk of the predation to three species. Largemouth bass, white crappie, and channel catfish comprise the bulk of the carnivorous population.

Thirty-six net sets totaling 3,650 feet of gill net were set during the eleven months of netting on Mountain Creek Lake. Table 4 gives the monthly variation in the catch per 100 feet of net. Seasonal variation may have something to do with these fluctuations but the most probable cause is the weather. High winds seemed to accompany the

majority of the poor catches since the lake is very shallow the wave action made the water rather turbulant.

A rather distinct lack of variation in length, weight and coefficient of condition is shown in Table 5. The many small drum taken produced an average length of 183 millimeters while the greatest length average of 295 millimeters was shown by the largemouth bass.

The various species appeared in the net catch almost each month with the exception of the yellow bullhead, black bullhead and largemouth bass. The bullheads appeared once each and the largemouth bass appeared in the netting on three occasions. River carpsucker appeared in the catch each month as did channel catfish and white crappie (Table 6). The river carpsucker make up 30.1 percent of the total catch followed by white crappie with 20.5 percent and drum with 18.5 percent (Table 7). Gizzard shad which are generally very numerous in the older lakes of this area occupied fifth place in the percentage with only 9.4 percent of the catch made up of this species. This may be due to the winter kills that result in the death of many small shad during the colder months. Such a kill occurred on December 20, 1955 when the entire shoreline of the lake was covered with small shad up to about four inches in length. No larger shad were observed in this kill.

A total of 489.58 pounds of fish were taken in the gill nets of which 138.87 pounds were river carpsucker and 131.08 pounds were white crappie (Table 8). They made up 28.4 and 26.8 percent of the catch, respectively (Table 9). The 69.51 pounds of channel catfish made up 14.2 percent of the total weight.

The average number of each species taken per 100 feet of gill net set overnight in Mountain Creek Lake is shown in Table 10 with river carpsucker providing 6.46 specimens followed rather closely by white crappie, drum and channel catfish with 4.41, 3.94, and 3.0 specimens, respectively. The monthly variations in the number of each species taken per 100 feet of net presented an interesting comparison but did not show a definite pattern. December produced the greatest number of channel catfish along with a good crappie catch while January presented the best crappie catch but the catch of other species was not outstanding. February afforded a good carpsucker catch but the catch of other species was average or below. The gizzard shad catch was high in March along with a rise in the appearence of the carpsucker but April and May produced catches of all species that were average or lower. The drum catch rose sharply in June and July but other species showed little change from the average. The carpsucker and carppie catch rose in August but while the carpsucker rise continued into September the crappie declined to the lowest point of the year. The September catch of drum was the highest of the year for any species and the channel catfish catch rose sharply. October provided the largest catch of carpsucker for the year and also produced the second highest month for the crappie.

The stomachs of all game fish were examined to determine to what extent the available food was being utilized (Table 11). A total of 126 fish contained food with gizzard shad having been taken by 83 of them. The food of 24 specimens was fish, but identification was not possible. Algae composed the food of 17 fish with white crappie and fish eggs being taken by one fish each.

The food preference of the various species taken is shown in Table 12. One specimen of black bullhead and one drum were found to contain food that could be identified. The bulk of the data was obtained from channel catfish and white crappie. Gizzard shad made up 77.5 percent of the food of the 80 channel catfish that contained food while 43.2 percent of the white crapppie had consumed shad. Fish remains that had been digested beyond identification as to species accounted for the stomach contents of 45.4 percent of the white crappie containing food. The one white crappie as well as the single occurrence of fish eggs were eaten by channel catfish. Algae was consumed by 15 percent of the channel

catfish and 11.4 percent of the white crappie.

Mountain Creek Lake is difficult to fish since it is shallow near the shore and the mud bottom makes launching boats difficult. The fluctuations prevent the establishment of suitable boat liveries or docking space thus restricting fishing to the banks of the discharge canal where the warm water from the power plant is returned to the lake after condensing the steam from the boilers of the steam turbine electric power units.

The average size of the crappie and channel catfish that make up the bulk of the game fish population is good since the game fish taken in gill nets average .62 pounds and make up 44 percent of the total weight of fish taken.

Gizzard shad generally make up a rather high percentage of the total catch in the older lakes of this area but only 9.4 percent of the catch from Mountain Creek Lake were shad. The most numerous species was river carpsucker making up 30.1 percent of the catch. The importance of shad in the food chain of this lake is readily seen when Table 12 is examined. Gizzard shad appeared in 65.9 percent of the fish stomachs that contained food and doubtless a good portion of the 19 percent identified as fish remains was also of that species.

The absence of sunfish from the net collections was not as significant as the lack of sunfish in the seine samples. None of these species were observed on the stringers of the fishermen and the writer is not able to account for this condition.

The absence of gar and other predators was noted and no explanation is at hand since gar are quite numerous in the Trinity River and abound in the stilling basin below the dam.

RECOMMENDATIONS

1. The lack of boat launching facilities prevents the full utilization of the fishing potential of this lake. The dredging of a small stream near the mouth of the discharge canal could provide a launching site at little cost. This stream was used when the lake level was high but as the level decended to normal or below it became impossible to use.

2. The rough fish control problem in this lake differs from that of the other lakes of the area in that the gizzard shad is of less importance. The introduction of white bass into this lake as a shad control measure has been suggested. The lack of deep water and the absence of running, gravel botton streams might well prove to be a limiting factor in this type of control but there is little expense involved in the introduction of this species and no objection is at hand.

3. While the gizzard shad appears to be a smaller problem than usual the river carpsucker assumes a more important place. The need for control of this species becomes more prominent when one notes the absence of this fish from the list of foods consumed by the carnivorous species. The most numerous species in the net catches appears to be absent from the diet of the other inhabitants of the lake.

Table 1. Checklist of fishes from Mountain Creek Lake, December 1, 1955 - October 31, 1956.

Scientific Name	Common Name
Dorosoma cepedianum	Gizzard shad
Ictiobus bubalus	Smallmouth buffalo
Carpiodes carpio	River carpsucker
Cyprinus carpio	European carp
Notropis brazosensis	Brazos River shiner
Notropis lutrensis	Redhorse shiner
Pimephales vigilax	Parrot minnow
Ictalurus punctatus	Channel catfish
Ictalurus melas	Black bullhead
Ictalurus natalis	Yellow bullhead
Gambusia affinis	Mosquitofish
Micropterus salmoides	Largemouth black bass
Pomoxis annularis	White crappie
Aplodinotus grunniens	Freshwater drum

Table 2. Species of Fishes Collected by Seining from Mountain Creek Lake, by Number of Each Species Taken Each Seining Station December 1, 1955 - October 31, 1956.

Fish Species	Station 1	Station 2	Total
Dorosoma cepedianum	64	45	109
Cyprinus carpio	1	0	1
Notropis brazosensis	0	1	1
Notropis lutrensis	28	24	52
Pimephales vigilax	20	1	21
Ictalurus melas	0	1	1
Gambusia affinis	0	3	3
Palaemonetes sp. *	2	28	30
Total	115	103	218

* Freshwater shrimp included since they appear to be an important food item.

Table 3. A Comparison of Game and Rough Species caught in Gill Nets from Mountain Creek Lake, Texas, December 1, 1955 - October 31, 1956.

Total No. Specimens Caught	785
Total Wt. Specimens Caught (pounds)	489.58
Average Wt. Per Specimen (pounds)	.62
Total Weight of Rough Fish (pounds)	276.83
Total Weight of Game Fish (pounds)	212.95
Total Number of Rough Fish	500
Total Number of Game Fish	285
Average Weight per Rough Fish (pounds)	.55
Average Weight per Game Fish (pounds	.75
Percent Rough Fish (by weight)	56.0
Percent Game Fish (by weight)	44.0
Percent Rough Fish (by number)	64.0
Percent Game Fish (by number)	36.0

* All catfish included in game fishes.

Table 4. Success of Gill Netting at Mountain Creek Lake in Terms of Number and Pounds of Fish Caught, December 1, 1955 - October 31, 1956.

Month	No. of Net Set	No. Ft. Net Set	No. Fish Caught	No. Lbs. Fish Caught	Avg. No Fish Per Net	Avg. No. Fish Per 100' Net	Avg. No. Lbs. Fish Per Net	Avg. No. Lbs. Fish Per 100' Net
December	3	300	93	55.86	31	31	18.62	18.62
January	3	300	54	49.41	18	18	16.47	16.47
February	4	400	66	35.11	17	17	8.78	8.78
March	3	300	113	82.03	38	38	27.34	27.34
April	4	400	58	39.91	15	15	9.98	9.98
May	4	400	34	19.07	9	9	4.77	4.77
June	3	300	43	21.59	14	14	7.20	7.20
July	3	300	35	18.52	12	12	6.17	6.17
August	4	425	79	55.81	20	19	13.95	13.13
September	2	225	81	30.80	41	36	15.40	13.69
October	3	300	129	81.47	43	43	27.16	27.16
Totals	36	3650	785	489.58				
Monthly Av.	3.27	331.80	71.36	44.50	22	21.50	13.60	13.41

Table 5. Length, Weight, and Coefficient of Fish Collected by Gill Nets from Mountain Creek Lake - December 1, 1955 - October 31, 1956.

Species	Total No.	Std. Length Range	Length Average	(gm) Weight Range	Weight Average	K Range	K Average
D. cepedianum	74	170-230	200	90-250	170	1.8-2.05	1.93
I. bubalus	21	135-410	273	85-2722	1404	3.4-3.9	2.7
C. carpio	236	185-285	235	170-595	383	2.6-2.7	2.65
Cy. carpio	25	190-270	230	170-454	312	2.5-2.8	2.65
I. punctatus	113	130-400	244	30-1134	247	1.6-1.75	1.68
I. melus	3	197-230	211	200-344	248	2.3-2.82	2.59
I. natalis	1	150-150	150	67-67	67	1.95-1.95	1.95
M. salmoides	7	250-330	295	454-907	680	2.5-2.85	2.68
P. annularis	161	160-300	214	120-851	380	1.35-3.9	3.35
A. grunniens	144	110-220	183	32-250	156	2.1-3.3	2.40

Table 6. Species Distribution in Net Catch by Number in Mountain Creek Lake - December 1, 1955 - October 31, 1956.

Month	December	January	February	March	April	May	June	July	August	September	October	Total
D. cepedianum	0	0	3	49	12	2	3	2	1	1	1	74
I. bubalus	1	2	0	0	0	0	1	1	6	0	10	21
C. Carpio	8	7	37	31	14	17	13	9	27	18	55	236
Cy. carpio	1	0	2	1	3	4	3	0	7	1	3	25
I. punctatus	60	11	4	8	10	3	1	1	1	10	4	113
I. melus	3	0	0	0	0	0	0	0	0	0	0	3
I. natalis	0	0	0	0	0	1	0	0	0	0	0	1
M. salmoides	0	2	0	4	0	0	0	0	0	0	1	7
P. annularis	20	31	14	15	18	2	5	6	25	1	24	161
A. grunniens	0	1	6	5	1	5	17	16	12	50	31	144
Total	93	54	66	113	58	34	43	35	79	81	129	785

Table 7. Species Distribution in Net Catch by Percentage of Number in Mountain Creek Lake - December 1, 1955 - October 31, 1956.

Month	December %	January %	February %	March %	April %	May %	June %	July %	August %	September %	October %	Total
D. cepedianum	0.0	0.0	4.5	43.4	20.7	5.9	7.0	5.7	1.3	1.2	0.8	9.4
I. bubalus	1.1	3.7	0.0	0.0	0.0	0.0	2.3	2.9	7.6	0.0	7.8	2.7
C. carpio	8.6	12.9	56.1	27.4	24.1	50.0	30.2	25.7	34.2	22.2	42.6	30.1
Cy. carpio	1.1	0.0	3.0	0.9	5.2	11.8	7.0	0.0	8.9	1.2	2.3	3.2
I. punctatus	64.5	20.4	6.1	7.1	17.2	8.8	2.3	2.9	1.3	12.4	3.1	14.4
I. melus	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
I. natalis	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.1
M. salmoides	0.0	3.7	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.9
P. annularis	21.5	57.4	21.2	13.3	31.1	5.9	11.6	17.1	31.5	1.2	18.6	20.5
A. grunniens	0.0	1.9	9.1	4.4	1.7	14.7	39.6	45.7	15.2	61.8	24.0	18.3
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 8. Species Distribution in Net Catch by Weight in Pounds from Mountain Creek Lake December 1, 1955 - October 31, 1956.

Month Weight-Pound Species	December Weight	January Weight	February Weight	March Weight	April Weight	May Weight	June Weight	July Weight	August Weight	September Weight	October Weight	Total
D. cepedianum	0.0	0.0	1.00	17.80	5.33	0.67	1.23	0.61	0.29	0.19	0.25	27.37
I. bubalus	6.00	5.24	0.00	21.88	0.00	0.00	0.31	0.31	9.72	0.00	6.18	49.64
C. carpio	5.12	5.06	20.54	9.18	8.16	10.01	8.12	5.94	16.53	12.68	37.53	138.87
Cy. carpio	1.52	0.00	1.25	0.48	1.73	1.86	1.60	0.00	3.10	0.78	1.67	12.99
I. punctatus	31.89	8.44	2.08	9.53	8.20	2.56	.75	0.06	0.11	3.65	2.24	69.51
I. melas	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.64
I. natalis	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.14
M. salmoides	0.00	3.80	0.00	5.68	0.00	0.00	0.00	0.00	0.00	0.00	1.00	10.48
P. annularis	10.69	26.55	8.24	16.47	16.40	1.67	3.14	5.35	22.18	0.69	19.70	131.08
A. grunniens	0.00	0.32	2.00	1.01	0.09	2.16	6.44	6.25	3.88	12.81	12.90	47.86
Total	55.86	49.41	35.11	82.03	39.91	19.7	21.59	18.52	55.81	30.80	81.47	489.58

Table 9. Species Distribution in Net Catch by Percentage of Weight in Mountain Creek Lake - December 1, 1955 - October 31, 1956.

Month Percentage Species	December %	January %	February %	March %	April %	May %	June %	July %	August %	September %	October %	Total
D. cepedianum	0.0	0.0	2.8	21.7	13.4	3.5	5.7	3.2	0.5	0.6	0.3	5.6
I. bubalus	10.7	10.6	26.7	0.0	0.0	0.0	1.4	1.7	17.5	7.6	0.0	10.1
C. carpio	9.2	10.2	58.5	11.2	20.4	52.5	37.6	32.2	29.6	41.2	46.1	28.4
Cy. carpio	0.9	0.0	3.6	0.6	4.3	9.8	7.4	0.0	5.6	2.5	2.1	2.7
I. punctatus	57.1	17.1	5.9	11.6	20.5	13.4	3.5	0.3	0.2	11.9	2.7	14.2
I. melas	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
I. natalis	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.1
M. salmoides	0.0	7.9	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.1
P. annularis	19.2	3.6	23.5	20.1	41.2	8.8	14.5	28.9	39.7	2.2	24.2	26.8
A. grunniens	0.0	0.0	5.7	1.2	0.2	11.3	29.9	33.7	7.0	41.6	15.8	9.7
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 10. Number of Each Species Caught per 100 Feet Gill Net (Set Overnight) in Mountain Creek Lake, December 1, 1955 - October 31, 1956.

No. 100' Nets	3	3	4	3	4	4	3	3	4.25	2.25	3	36.50
Species	December	January	February	March	April	May	June	July	August	September	October	Total
D. cepedianum	0.00	0.00	0.75	16.33	3.00	0.50	1.00	0.67	0.24	0.44	0.33	2.03
I. bubalus	0.33	0.67	0.00	0.00	0.00	0.00	0.33	0.33	1.41	0.00	3.33	0.57
C. carpio	2.67	2.33	9.25	10.33	3.50	4.25	4.33	3.00	6.35	8.00	18.33	6.46
Cy. carpio	0.33	0.00	0.50	0.33	0.75	1.00	1.00	0.33	1.65	.44	1.00	0.68
I. punctatus	20.00	3.67	1.00	2.67	2.50	0.75	0.33	0.00	0.24	4.44	1.33	3.10
I. melas	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
I. natalis	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.03
M. salmoides	0.00	0.67	0.00	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.19
P. annularis	6.67	10.33	3.50	5.00	4.50	0.50	1.67	2.00	5.88	0.44	8.00	4.41
A. grunniens	0.00	0.33	1.50	1.67	0.25	1.25	5.67	5.33	2.82	22.22	10.33	3.94
Total	31.00	18.00	16.50	37.66	14.33	8.50	14.33	11.33	18.59	35.99	42.98	21.49

Table 11. Frequency of Occurrence and Number of Food Organisms from Stomachs of Fish taken in Gill Nets, from Mountain Creek Lake, Texas, December 1, 1955 - October 31, 1956

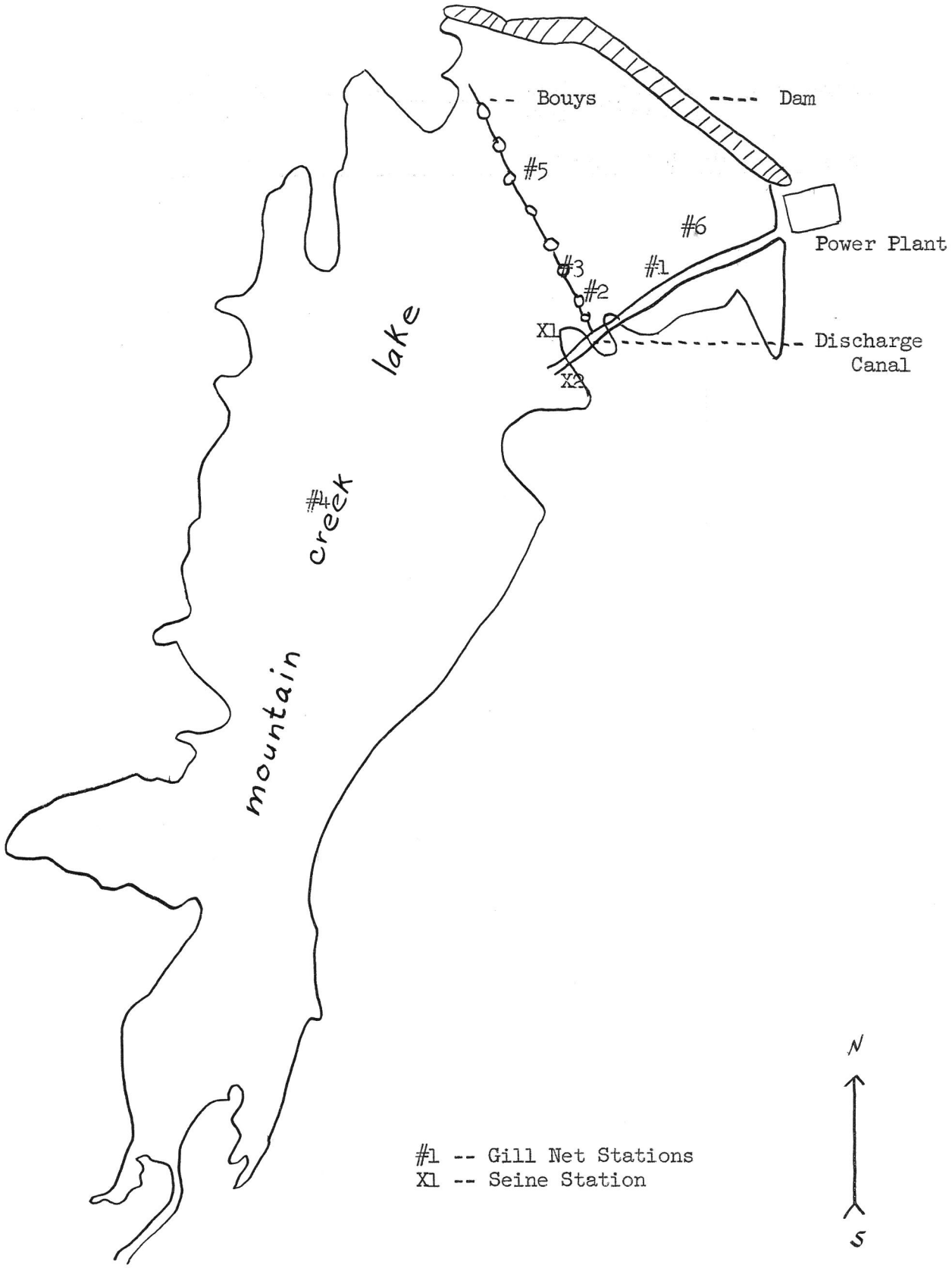
Food Items	Frequency of Occurrence	Total No. Identified
Algae	17	17
Gizzard Shad (D. cepedianum)	83	429
White Crappie (P. annularis)	1	1
Unidentifiable Fish Remains	24	24
Unidentifiable Fish Eggs	1	8
Total	126	479

Table 12. Frequency of Occurrence of Food Organisms Eaten by the Various Species taken by Gill Nets from Mountain Creek Lake, Texas, December 1, 1955 - October 31, 1956.

Food Items	Algae		Shad		Crappie		Fish Remains		Fish Eggs		Totals	
Species	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Channel Catfish	12	15.0	62	77.5	1	1.3	4	5.0	1	1.3	80	100.0
Black Bullhead	0	0.0	1	*	0	0.0	0	0.0	1	0.0	1	*
White Crappie	5	11.4	19	43.2	0	0.0	20	45.4	0	0.0	44	100.0
Drum	0	0.0	1	*	0	0.0	0	0.0	0	0.0	1	*
Total	17	13.5	83	65.9	1	0.8	24	19.0	1	0.8	126	100.0

* Included in totals but sample too small to be considered valid.

Map 1. Seine and Gill Net Stations on Mountain Creek Lake.



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