JOB COMPLETION REPORT

FILE

STATE OF TEXAS

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

Job No. B-14 Title Inventory of Species Present in Eagle Mountain Lake.

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

ABSTRACT

1. Eagle Mountain Lake is a dingy, moderately old impoundment located on the West Fork of the Trinity River about 20 miles northwest of Fort Worth in Tarrant County.

2. The lake was sampled with 2700 feet of gill net from December 1955 through September 1956.

3. White bass, white crappie, and catfish are fairly abundant in the lake. Largemouth bass are scarce.

4. Shad and carpsucker are the two most abundant species of rough fish present in the lake. However, the shad population is not high enough to need control measures.

OBJECTIVES

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

STORY OF LAKE

Eagle Mountain Lake is located on the West Fork of the Trinity River north of Fort Worth and is in the northwest corner of Tarrant County. The dam was completed in 1932 and impounds 210,000 acre feet of water with a surface area of 9,600 acres when the lake is full. The lake is the main source of water supply for the City of Fort Worth. The recent drought has severely limited the amount of water caught in the impoundment causing the lake to only partially fill during the last several years. Eagle Mountain Lake was well known years ago as an excellent crappie, black bass, and catfish lake. White bass were introduced into the lake in 1937 and for several years furnished excellent white bass fishing. The introduction of the new species helped rejuvenate fishing interest which had declined due to a progressively smaller harvest of black bass and crappie. The lake still furnishes fair crappie and white bass catches, although the latter species are smaller than those generally caught a few years ago. Catfishing, mostly by trotline, still furnishes fair sport. Black bass apparently are not abundant in the lake and compose only a small part of the angler's catch.

Eagle Mountain Lake was a clear-water impoundment containing some aquatic vegetation during the first 12 or 15 years of its existence. The low water condition during the past 10 years has allowed the wind to stir the lake and keep the water quite dingy or even muddy at times. Consequently the aquatic vegetation has disappeared. The receding water line has lately caused large areas of willows on the lake shore to die.

COLLECTING METHODS

Gill nets were used to collect random samples of the fish population. Most of the

sampling was done with nets 100 feet long by 8 feet deep composed of meshes 1½ inches measured on the square, but a few nets containing mesh sizes from 1 to 3 inches were also set. Data taken from the netted fish included their length, weight, sex, and degree of gonadal development. Notes were made of any fungus or parasites found on the fish. Minnow seines were used to sample several stations around the lake. The seined samples were preserved in 6 percent formalin and taken to the laboratory to be counted and identified. Table 1 is a checklist of all species collected from Eagle Mountain Lake during the preiod of study.

RESULTS OF SEINING COLLECTIONS

Eight seine collections from three stations were made at various times of the year. Small shad were the most abundant species taken and represented 59.35 percent of all the specimens collected. Notropis lutrensis and Notropis venustus were the most abundant minnows collected. Table 2 shows the number of each species captured and the percentage of the total seine collections that they represent.

RESULTS OF NETTING

A total of 2700 feet of gill nets were set in Eagle Mountain Lake from December 1955 through September 1956. The sampling covered nine stations and collected 1194 fish. The stations netted were representative of the various types of ecological habitats found in the impoundment. Table 3 is a tabulation of data from the gill net collections.

WHITE BASS

White bass accounted for 49 percent of all the fish collected by gill nets. Eagl Mountain Lake has been well known for its excellent white bass fishing for a number of years, but the writer believes that the abnormally high population represented by the net catches is too high. The probable error would be due to some very large catches of white bass netted from the intake and discharge canals of a local power plant. In some instances as many as 98 to 154 white bass were caught in one 100 foot net. If some of these large catches were discarded a more accurate percentage of the population might be ascertained. But is would be equally difficult to obtain a truer population count by arbitrarily juggling the netting data, so it is probably better to let the data speak for itself. It is known that white bass are very plentiful in the lake and that they are considerably smaller than those caught in previous years. A long and severe drought during the last few years has prevented the white bass from making their normal spring run up the flowing rivers and creeks entering the lake. It is highly possible that the present white bass population of Eagle Mountain Lake is too high for the fish to reach a size that is attractive to the angler.

WHITE CRAPPIE

The white crappie was the only species of crappie found in the impoundment. The species represented 12.48 percent of the net catches. The average weight was good, just a little less than one-half pound. The samples collected had an average "K" factor of 2.73 which is not bad. Crappie fishing is still a favorite pastime but not as productive as it was when the lake contained more water and the shoreline extended into the willows and other vegetation that was abundant during the previous years. The most productive crappie fishing found on the lake now is in the back waters of the sloughs and bayous during the spring. Crappie fishing during the hot months of the summer is very unproducti In fact crappie were difficult to locate during hot weather by any sampling means. It is believed that the white crappie population of Eagle Mountain Lake is fairly good and would improve even more if the lake should again fill with water.

CHANNEL CATFISH

Channel cat are usually considered a game fish by anglers of this area and along with the yellow cat (flathead) are very popular with the trotline fishermen. There was only one yellow cat caught by our gill nets but several were captured with wire traps while making a crappie survey on the lake. Good harvest of both species of catfish are quite frequently made by trotline fishermen and are probably the most popular food fish taken from the impoundment. Our netting survey shows the channel cat to represent 3.69 percent of the total fish population.

LARGEMOUTH AND KENTUCKY SPOTTED BASS

Largemouth bass are not plentiful and the Kentucky spotted bass is exceedingly scarce in the lake. Both species totaled only about one percent of the fish netted. It is understood from the past history of the lake, when it was newer and not so muddy, that good catches of largemouth bass were made. This is no longer true although the lake has been restocked with bass every year sicne 1942. During the year that the present survey was made (1956) 392.000 largemouth bass were put in Eagle Mountain Lake. A similar stocking made each year over a period of 15 years would amount to quite a few bass. Considering the poor bass fishing that Eagle Mountain Lake offers at the present time it is evident that stocking alone will not produce good bass fishing. With this thought in mind it reaffirms our need for more specific information regarding the ecological requirements of various species.

ROUGH FISH

Shad were the most abundant rough fish in the lake and accounted for 15.16 percent of the specimens caught. Carpsucker were almost as plentiful as they represented 12.9 percent of the net catch. There was no other species of rough fish that accounted for as much as one and one-half percent of the total harvest. Shad are not a problem in the lake and there are probably no more young shad present than are needed to serve as forage for the game fish. Whether they have been kept in check by the white bass population, by the turbidity of the water, or by a combination of factors is not known. It is known that the power plant, located on the shore of the lake, does not have to use their shad screens to strain the inflowing water. This condition is opposite to that found at most power plant stations located in this area.

A COMPARISON OF THE GAME FISH AND ROUGH FISH POPULATION

Table 4 shows a comparison of the data regarding the game and rough species that were collected by gill nets. As previously indicated the game fish population may not be as high as the data shows due to some large catches of white bass made in the vicinity of the water flowing to and from a local power plant. But white crappie, white bass and channel cat are abundant in the lake and offer fair fishing to the anglers. Largemouth bass are not abundant enough to contribute much to either the sport or harvest of fishermen. Carpsuckers are the only rough fish which are plentiful enough to warrant control.

STOMACH ANALYSIS

A field analysis was made of the stomachs from the netted specimens. Only the more prominent objects of food could be accounted for. Time was not available for a detailed microscopic study of the stomach contents of the species collected. Table 5 shows the frequency of occurrence of various types of food.

SOME EFFECTS UPON THE LAKE FROM THE DISCHARGE OF A POWER PLANT

There is a large power plant located on the east bank about midway on the lake. The plant pulls coolant water from one area of the lake and discharges it into one of the shallow basins of the lake located one-half mile or more from the intake gate. The intake and discharge points are separated by a land area that prevents the discharged water from re-entering the intake canal before it has cooled off. A current is created in both areas but is much more noticeable on the surface of the shallow discharge area. The temperature of the discharge water, as it reaches the lake, is 12 to 17 degrees warmer than the water temperature at the intake gate. The intake water has the same temperature as that of the exposed areas of the lake. The warm water entering the basin from the discharge gate had an interesting effect upon the temperature of the lake. The temperature of the water dropped about two degrees in the first 100 yards from the barrier screen. In the next 100 yards the temperature dropped 8 to 10 degrees. The entire area affected by the warm water amounted to several surface acres. Detail data regarding the effect of the warm water upon the fishes of the lake would have been interesting, but unfortunately time for such a study was lacking. However, a few comments can be made about some of the fish catches that were made in that area. Large catches of white bass were netted in the intake as well as the discharge areas. So it is probable that the species could have been attracted as much by the current as by the increase in water temperature. Active white bass could always be seen playing in the swift current of the discharge canal but seemed to be more abundant in that area during the cooler months of the year. The intake canal was much deeper than the discharge canal thus lessening the surface current in that area.

White crappie and channel cat were not attracted by the warm water in numbers as great as originally expected. Crappie were caught in fair numbers during the cold months of the year but seem to avoid the high temperature of the discharge canal during the summer months. However, good net catches of channel cat were taken during August in the discharge area when the water temperature was 100 degrees.

RECOMMENDATIONS

Low water and fairly high turbidity, which is indirectly caused by low water, appear to be the main causes of poor catches of some species in Eagle Mountain Lake. If and when the lake catches enough water to fill, turbidity should no longer be a major problem in the impoundment. Most of the areas that are now shallow would be deep enough to prevent the wind from completely mixing the water. Vegetation should again grow along the shoreline, attracting various species of fish into shallow water for feeding and spawning activities. Also, the organic material added to the water by the vegetation would cause much of the suspended matter now present in the lake to settle out. The high population of carpsucker offers possibilities for rough fish control work. But until the low water and high turbidity conditions are alleviated it is doubtful if a rough fish control program would increase the game fish population.

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Table 1. Checklist of Fish Species from Eagle Mountain Lake, Texas, 1955 - 1956.

Common Name	Scientific Name
Spotted gar	Lepisosteus productus
Longnose gar	Lepisosteus osseus
Gizzard shad	Dorosoma cepedianum
Smallmouth buffalo	Ictiobus bubalus
River carpsucker	Carpiodes carpio
European carp	Cyprinus carpio
Brazos River shiner	Notropis brazosensis
Spottail shiner	Notropis venustus
Redhorse shiner	Notropis lutrensis
Sand shiner	Notropis deliciosus
Parrot minnow	Pimephales vigilax
Fathead minnow	Pimephales promelas
Channel catfish	Ictalurus punctatus
Flathead catfish	Pylodictus olivaris
White bass	Roccus chrysops
Spotted bass	Micropterus punctulatus
Largemouth bass	Micropterus salmoides
Green sunfish	Lepomis cyanellus
Redear sunfish	Lepomis microlophus
Bluegill sunfish	Lepomis macrochirus
Yellowbelly sunfish	Lepomis auritus
White crappie	Pomoxis annularis
reshwater drum	Aplodinotus grunniens

Table 2. Results of Seining Collections by Number of Each Species, Eagle Mountain Lake, Texas, 1955 - 1956.

Species	Number Collected	Percent of Total
Gizzard shad	346	59.35
Brazos River shiner	1	.17
Spottail shiner	61	10.46
Redhorse shiner	136	23.33
Sand shiner	5	.86
Parrot minnow	1	.17
Fathead minnow	1	.17
Green sunfish	1	.17
Redear sunfish	1	.17
Bluegill sunfish	2	.34
Yellowbelly sunfish	27	4.64
White crappie	1	.17
Total	583	100.00

Table 3. Tabulation of Data from Gill Net Collections from Eagle Mountain Lake, November 1955 through September 1956.

Species	Number Caught	Percent of Total Number	Pounds Caught	Percent of Total Weight	Avg. Weight in Pounds	No. of Fish Per 100' Net	Pounds Fish Per 100' Net
Spotted gar	15	1.26	25.60	3.04	1.71	.56	.95
Longnose gar	16	1.34	74.75	8.87	4.67	.59	2.77
Gizzard shad	181	15.16	87.04	10.33	.48	6.70	3.22
Buffalo	16	1.34	18.18	2.16	1.14	.59	.67
Carpsucker	154	12.90	155.12	18.41	1.01	5.70	5.75
Carp	4	.34	8.56	1.02	2.14	.15	.32
Channel catfish	44	3.69	27.24	3.23	.62	1.63	1.01
Flathead catfish	1	.08	.74	.09	.74	.04	.03
White bass	585	48.99	356.05	42.25	.61	21.67	13.19
Kentucky Spotted Bass	1	.08	.60	.07	.60	.04	.02
Largemouth bass	14	1.17	11.33	1.34	.81	.52	.42
Bluegill sunfish	2	.17	.42	.05	.21	.07	.02
White crappie	149	12.48	65.22	7.74	.44	5.52	2.42
Drum	12	1.00	11.80	1.40	.98	.44	.44
Total	1194	100.00	842.65	100.00		44.22	31.23

Table 4. A Comparison of the Rough and Game Fish Caught by Gill Nets in Eagle Mountain Lake, 1955 - 1956.

Total Number of Specimens Caught	1194
Total Weight of Specimens Caught *	843
Average Weight per Specimen	.71
Total Weight of Rough Fish	369
Total Weight of Game Fish **	474
Total Number of Rough Fish	386
Total Number of Game Fish	808
Average Weight per Rough Fish	.96
Average Weight per Game Fish	.59
Percent Rough Fish (by weight)	43.77
Percent Game Fish (by weight)	56.23
Percent Rough Fish (by number)	32.33
Percent Game Fish (by number)	67.67

* Weight is figured in pounds.
** Catfishes, Drum and White Bass are included in Game Fish.

Table 5. Frequency of Occurrence of Food Items from Fish Collected by Gill Nets, Ealge Mountain Lake, December 1955 through October 1956.

Species	Shad	Unidentifiable Fish Remains	Insects	Algae and Vegetation	Stock Feed	Total No. of Fish Examined
Channel catfish	1	6	1	14	4	26
White bass	4	148	3	1	0	156
Kentucky spotted bass	0	1	0	0	0	1
Largemouth black bass	1	1	0	0	0	2
Bluegill sunfish	0	0	0	1	0	1
White crappie	0	104	0	0	2	106