

STATE TexasPROJECT NO. F-2-R-1, Job B-5PERIOD June 1 - September 30, 1953

JOB COMPLETION REPORT

by

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TITLE

Inventory of the Species Present in the City Lake at Georgetown, Texas.

OBJECTIVES

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

TECHNIQUES USED

City Lake at Georgetown, Texas was visited regularly once a month from June through September, 1953. On the occasion of each monthly visit, two gill nets, measuring 125 feet in length x 8 feet in depth, were set for at least twelve hours before running. The nets were composed of a series of 25 foot sections in which the square mesh sizes were graduated in one-half inch intervals ranging from one inch to three inches.

An effort was made to keep all specimens alive until they could be examined for length, weight, sex, stage of sexual development and stomach contents, which was done as soon as possible after taking the fish from the nets.

Seining collections of fish specimens were made once a month at three widely separated localities on the lake, using a 30 ft. straight seine, six ft. in depth with a $\frac{1}{4}$ inch mesh size. All seined specimens were preserved in ten percent formalin and later examined in the laboratory. Limited ecological data were recorded with each seining collection.

FINDINGS

City Lake at Georgetown, Texas is a small lake of approximately 6.3 acres. It is impounded by a low dam, 200 ft. long and 10 ft. high. It contains approximately 25.2 acre feet of water.

The dam was built in 1933 by the Works Progress Administration for the purpose of providing fishing and swimming facilities for the people of Georgetown. The lake itself is situated just downstream from the confluence of the combined North and Middle San Gabriel Rivers with the South San Gabriel River.

The combined rivers have a sixteen year average discharge rate of 159 second feet; i. e., from 1924 through 1925 and from 1934 through 1950. The maximum discharge rate over the same period was 37,500 second feet on June 6, 1944, while the minimum discharge rate was 0.2 second feet in August 1942.

For the year 1952, the maximum discharge rate was 233 second feet and the minimum was 2.36 second feet, with a mean of 39.9 second feet. The year 1951 had a maximum discharge rate of 11.2 second feet, a minimum of 1.36 second feet and a mean of 7.87 second feet. All of which indicates the extremes in water conditions which might be expected to occur in this small lake.

The lake is characteristic of the barren, clear pools which occur in the stream to the west where there is generally one side which is a deep cut, mud bank, heavily shaded by pecan, willow, hackberry and sycamore trees, while the other bank is a steep cut limestone outcrop, with willows, sycamores and other vegetation in pockets of soil along the water's edge. The lake varies from this description only in the abundant aquatic vegetation found in the lower end of the lake.

On the north bank of the lake, the City of Georgetown has developed an area for a city park. There is a grove of large pecan trees which shades the park but offers little shade to the lake itself. The City also has built a rock retaining wall on the north bank and this side of the lake is used for swimming in clement weather. The depth of the water along this side of the lake is from six to eight feet, depending upon where the sounding is made. The park contains several small springs which flow into the lake during wet weather but their flow is so small that no further mention need be made here.

Since all of the water entering the lake flows over exposed limestone bedrock, the diurnal temperature fluctuations are great. Summertime temperatures reach as high as 86 degrees Fahrenheit.

The pH of the water during the period the inventory was carried on ranged from 7.0 to 7.9.

Aquatic vegetation in the lake is comprised of the following species and in abundance, as listed in diminishing order: parrot's feather, Myriophyllum heterophyllum Michx.; smartweed, Persicaria sp., arrowhead, Sagittaria platyphylla (Engelm.) J. G. Smith; water pennywort, Hydrocotyle sp.

In October, 1953, on the dates scheduled for the regular visit, it was found that the gates on the dam had been opened to permit an expected rise on the combined San Gabriel Rivers to scour out the silt which had collected in the lake over a period of years. The City of Georgetown hoped that the scouring would also remove the aquatic vegetation, primarily parrot's feather, which was beginning to take over the lake. This raising of the gates had also occurred in early August but the lake had been refilled by the time the scheduled visit took place.

The action of the City in October forced inventory work to be postponed and later abandoned since the gates have remained open until the time of the present writing.

During the period from June through September, 1953, a total of eight net sets took sixty-one specimens, weighing a total of 33 pounds.

The most abundant species taken in nets was the river carpsucker, Carpionodes carpio (Rafinesque), accounting for 55.73 per cent of the total number and 65.273 percent of the total weight. (Tables I and II) They ranged in size from 5.3 inches (standard length) to 12.4 inches. Their weight ranged from 1½ ounces to 1 pound, 13 ounces. They had an average standard length of 8.7 inches and an average weight of 10.7 ounces. The sex ratio was one female to two males.

Game species including the channel cat, Ictalurus punctatus (Rafinesque); the largemouth bass, Micropterus salmoides (Lacepede); the warmouth bass, Chaenobryttus coronarius (Bartram); the bluegill, Lepomis macrochirus Rafinesque; the longear sunfish, Lepomis megalotis (Rafinesque) and the white crappie, Pomoxis annularis (Rafinesque); accounted for 39.3 per cent of the total number and 29.245 per cent of the total weight. (Tables I and II).

In the seining collections, 1,053 specimens were taken. Of this number, 51.092 per cent were native longear sunfish, Lepomis megalotis. Three other species of sunfish including bluegills, Lepomis macrochirus; green sunfish, Lepomis cyanellus (Rafinesque); and orange spotted sunfish, Lepomis humilis (Girard) combined to account for 1.992 percent of the total number. Forage species accounted for 45.484 percent of the total number. (Table III).

The draining of the lake affected the fish population in that, after the first draining in early August, netting results dropped off to less than one-third of what they had been in July. Fewer species were taken and these, with the exception of the river carpsucker, which was the most abundant species netted in earlier trips, were all Centrarchids in August and except for one yellow bullhead, Ameiurus natalis (Le Sueur), were all Centrarchids in September.

This type of fish population is typical of the river pools on the Edwards Plateau which is just to the west of the City of Georgetown and is the area which is drained in part by the San Gabriel Rivers.

SUMMARY

City Lake at Georgetown, Texas is a small lake of 6.3 acres, containing 25.2 acre feet of water, situated on the combined San Gabriel Rivers. The San Gabriel Rivers are a part of the Brazos drainage and flow through a part of the Edwards Plateau, just to the west of Georgetown.

The lake is similar to and contains a fish population typical of the barren clear pools of the river on the plateau. Aquatic vegetation, in the form of parrot's feather, was taking the lake and a great deal of silt had collected in the lake bottom. For this reason the lake was drained and the flood gates have since remained open to permit any rise on the river to scour the lake bottom.

The most abundant species taken in nets was the river carpsucker, making up a total of 55 percent of the catch in eight net sets over a four month period. Of the total weight, they accounted for 65 percent. In seining collections, longear sunfish accounted for 51 percent of the total number and forage species, primarily cyprinids, comprised 45 percent of the number. After the first draining and refilling of the lake, the fish population was composed primarily of cyprinid and centrarchid species, typical of the river pools on the Edwards Plateau. Inventory work was abandoned because the lake was drained a second time in October and had not been refilled.

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SPECIES	June		July		August		September		Totals	
	No.	% of No.	No.	% of No.	No.	% of No.	No.	% of No.	No.	% of No.
<i>Lepisosteus platostomus</i>	1	5.88	0	0.00	0	0.00	0	0.00	1	1.63
<i>Carpiodes carpio</i>	11	64.70	19	65.55	4	50.00	0	0.00	34	55.73
<i>Ictalurus punctatus</i>	1	5.88	2	6.89	0	0.00	0	0.00	3	4.91
<i>Ameiurus natalis</i>	1	5.88	0	0.00	0	0.00	1	14.28	2	3.27
<i>Micropterus salmoides</i>	1	5.88	1	3.44	0	0.00	2	28.57	4	6.55
<i>Cahenobryttus coronarius</i>	1	5.88	4	13.78	1	12.50	3	42.86	9	14.75
<i>Lepomis macrochirus</i>	0	0.00	3	10.34	1	12.50	1	14.28	5	8.19
<i>Lepomis megalotis</i>	1	5.88	0	0.00	1	12.50	0	0.00	2	3.27
<i>Pomoxis annularis</i>	0	0.00	0	0.00	1	12.50	0	0.00	1	1.63
Totals	17	99.98	29	100.00	8	100.00	7	99.99	61	99.93

Table I - Netting Results, City Lake, Georgetown, Williamson County, Texas, 1953.

SPECIES	June		July		August		September		Total	
	Weight lbs.	% of weight oz.	Weight lbs.	% of Total Weight oz.						
Lepisosteus platostomus	14.0	6.45	0.00	0.00	0.00	0.00	0.00	0.00	14.0	2.599
Carpoides carpio	8	12.5	10	14.0	2	5.0	0.00	0.00	21	15.5
Ictalurus punctatus	3.0	1.38	1	9.0	0.00	0.00	0.00	0.00	1	12.0
Ameiurus natalis	7.5	3.44	0.00	0.00	0.00	0.00	8.0	13.54	15.5	2.878
Micropterus salmoides	3	1.0	10.0	4.13	0.00	0.00	2	4.0	5	17.641
Chaenobryttus coronarius	3.0	1.38	11.0	4.53	2.0	3.50	13.0	22.03	1	13.0
Lepomis macrochirus	0.00	0.00	4.5	2.60	2.0	3.50	2.0	3.38	8.5	1.578
Lepomis megalotis	1.0	0.45	0.00	0.00	3.0	5.26	0.00	0.00	4.0	0.742
Pomoxis annularis	0.00	0.00	0.00	0.00	6.0	10.54	0.00	0.00	6.0	1.114
Totals	13	10.0	13	13.5	3	2.0	3	11.0	33	10.5
		99.96		99.99		99.99		99.96		99.995

Table I I - Netting Results by Weight, City Lake, Georgetown, Williamson Co., Texas, 1953.

SPECIES	June			July			August			September			Totals	Percent of No.
	1	2	3	1	2	3	1	2	3	1	2	3		
<i>Carpiodes carpio</i>				1		3							4	0.379
<i>Notropis lutrensis</i>				2						1		3	6	0.569
<i>Notropis venustus</i>	1			20		118			4		19		174	16.524
<i>Notropis volucellus</i>	8	3		8	1	2					1		23	2.184
<i>Pimephales vigilax</i>	9	4	2	1	1	47	15	2		2	33	34	150	14.244
<i>Campostoma anomalum</i>	4	3	2	13	29	3						35	92	8.736
<i>Ameiurus natalis</i>							1						1	0.094
<i>Gambusia affinis</i>	2			5			17		1	4	4		33	3.133
<i>Fundulus olivaceus</i>									1				1	0.094
<i>Micropterus punctulatus</i>			1	1	1	1	2	1	1			1	9	0.854
<i>Micropterus salmoides</i>						1							1	0.094
<i>Lepomis cyanellus</i>	3	1											4	0.379
<i>Lepomis macrochirus</i>	1			14									15	1.424
<i>Lepomis humilis</i>	2												2	0.189
<i>Lepomis megalotis</i>	17	12	25	19	110	70	140	84	13	26	14	8	538	51.092
Totals	46	24	30	56	170	132	178	88	140	32	56	101	1053	99.989

Table III - Results of Seining Collections, City Lake, Georgetown, Williamson County, Texas, 1953.