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Report of Fisheries Investigations

Inventory of Species Present in Lake Leon near Eastland, Texas

by

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Dingell-Johnson Project F-5-R-8, Job B-29
April 1, 1960 - February 28, 1961

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A B S T R A C T

Twenty-one species representing 13 genera and seven families of fish were collected from Lake Leon. Excessive numbers of forage species and large populations of smallmouth buffalo, Ictiobus bubalus, and river carpsuckers, Carpiodes carpio, were found to be the chief fishery problems. The smallmouth buffalo are considered to be less detrimental in Lake Leon, however, than many other rough fish species would be because of their utilization by the local fishermen for food as well as for sport. Largemouth bass, Micropterus salmoides, were found to still occur in Lake Leon in significant numbers but fewer bass are reportedly caught by anglers now than in past years. This can probably be attributed to the development of excessive forage.

The percentage of rough and/or forage fish occurring in the netting sample (51.18%), while high, does not indicate that selective or total fish eradication treatment could be justified at this time. The possibility of protecting the present flathead catfish, Pylodictus olivaris, population by means of temporary regulations prohibiting the use of trotlines for taking them has been discussed and is being considered by the Eastland County Water Board, who own and control the lake.

Job Completion Report

State of TEXAS

Project No. F-5-R-8

Name: Fisheries Investigations and Surveys
of the Waters of Region 3-B.

Job No. B-29

Title: Inventory of Species Present in Lake
Leon near Eastland, Texas.

Period covered:

April 1, 1960 - February 28, 1961

OBJECTIVES

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

PROCEDURE

A total of 48 netting collections was obtained from Lake Leon during the survey period. All nets used were experimental type nylon gill nets, measuring 125 feet in length and eight feet in depth. They were made up in five, 25 foot long sections with mesh sizes varying from one-inch square mesh to three-inch square mesh, increasing in half-inch intervals in each succeeding section. Sixteen stations were employed in the setting of these 48 nets. Each station had one net set at it for one night during the months of May, July and November of 1960.

All fish taken from the nets were weighed, measured, and their sex and condition determined. Individuals of some species were examined for stomach contents and for parasites.

Hoop and/or fyke nets were not employed for collection purposes as the collections being obtained from gill nets were apparently adequate and because there was insufficient time available for the effective use of these other types of collecting devices.

Seining collections were obtained at three locations during the May and July trips to the lake. Each collection consisted of several seine drags with either a 12 or 20 foot $\frac{1}{4}$ -inch mesh nylon straight seine. The fish collected in seines were counted by species and a sample of each species was preserved for further study in the laboratory.

In addition to netting and seining, records were made during each trip of the surface water temperature, the pH, and the turbidity. Notations concerning the description and general ecological conditions of the lake and surrounding terrain were also recorded. Further hydrological and water analysis information was obtained from the Eastland County Water Board and the Texas State Department of Health.

FINDINGS

Location and Physical Conditions

Lake Leon is located on the Leon River, between the towns of Eastland and Ranger and approximately six miles south of highway 80. Three small impoundments, Lake Olden, Old Eastland Lake and Ringland Lake, are on the Leon River watershed above Lake Leon (Figure 1). The contributing watershed covers 259 square miles. At spillway level the lake covers 1600 surface acres and contains 28,000 acre feet of water.

The dam was completed in 1955 under the direction of the Eastland County Water Board with the firm of Freeze and Nichols serving as engineers. The main dam is 87 feet high, 1,500 feet long, of earthen construction and riprapped with large rock approximately 1- to 3-feet in diameter.

The deepest place in the lake at spillway elevation is 67 feet. The bottom is varied, with bed rock, riprap, mud and silt being the main components. Limestone cliffs are prevalent in the upper reaches of the lake along the river bed.

Turbidity values ranged between 31 and 47 inches as observed by means of a Secchi disk. The recorded pH values ranged between 7.1 and 8.1. Recorded water temperatures ranged between 46 degrees and 79 degrees F. The lake level dropped during the project period from an elevation of 1374.8 in April to 1372.5 in November. The highest water elevation was 1375.3 in May. At this level the lake contains 25,000 acre-feet of water. More complete hydrological information is given in Tables 1 and 2.

Vegetation

Mesquites, button willows, post oaks, hackberries, elms, pecans and cottonwoods are abundant along the shore line. The upper two-thirds of the lake are littered with dead trees of these species that were left standing when the dam was closed (Figures 2 and 3). There are also a few large, dead, fruit trees in the lake, the remnants of former orchards. Native grasses are abundant along the shores. Besides various types of algae, muskgrass, Chara, pondweed, Potamogeton, and cattails, Typha, are principal genera of aquatic vegetation present. None of these species presently constitutes a problem, however, the dead trees that congest the upper end of the lake are thick enough to make access difficult to some areas of the lake.

History and Administration

Lake Leon is owned and operated by the Eastland County Water Board. It was constructed in 1955 for use as a municipal water supply for the towns of Ranger and Eastland, Texas. A water treatment plant and pumping station is located near the lake.

Only a slight amount of siltation appears to have occurred since the dam was completed. This light silt load can probably be attributed to the three small lakes above Lake Leon which tend to serve as settling basins.

Excellent catches of largemouth bass, white crappie, and channel catfish were made the first few years after the lake was opened to public fishing. In the spring of 1959 the fishing was not as good as it had been previously and the Eastland County Water Board made an official request for the Texas Game and Fish Commission to make a survey and inventory of species present. This investigation indicates that the

lake is still providing a large number of desirable bass and catfish but that these species are not as easy to catch in Lake Leon as they once were.

A charge of fifty cents per person, per day is collected by the water board for the use of the lake. The money is used to pay the lake patrolman and for maintenance of the roads and facilities around the lake.

Water skiers use the lower end of the lake where there are no trees during all but the colder months of the year. The upper reaches of the lake are not as accessible to the skiers due to the inundated trees, therefore fishermen utilize this area.

Netting

Tables 3 through 8 present the data obtained by the use of gill nets and Figure 4 shows the locations of the netting stations. A total of 549 specimens representing 15 species were collected by netting. Of this number 48.82 percent were game species. However, part of this 48.82 percent game fish were small sunfish and stunted crappie.

Description of Netting Stations

Station 1: One end of the net was tied to a large rock on the south end of the dam while the other end was stretched perpendicular to the dam, out into the open water. The water depth was 6-feet at the dam and became increasingly deeper so that the extended end of the net was in 32-feet of water. The bottom was covered with the dam's course rock riprap.

Station 2: This station was approximately 200 yards west of Station 1, at the entrance to a small slough. One end of the net was tied to a small oak tree and the other end was anchored in open water. Water depth ranged from 3-feet at the shoreline to 25-feet deep. The bottom was composed of large limestone rocks, boulders, and silt.

Station 3: The net was tied to a water pump dock on a rocky ledge, up the main body of the lake, and approximately 150-yards west of Station 2. The water ranged in depth from the bank to the extended end of the net from 5- to 22-feet. The bottom was covered with silt and avalanched rocks toward the shore.

Station 4: This station was approximately 200 yards west of Station 3, up the main lake channel. One end of the net was tied to a willow tree in three feet of water 20-feet from shore. The other end was anchored in open water 19-feet deep. The gradually sloping beach was covered with native grasses and rubble. The bottom, below the net, was rubble, sand and silt. Numerous oak stumps protruded from the water.

Station 5: This area was located on the opposite side of the lake from Station 2. This was a small slough by the north corner of the dam. One end of the net was tied to a liveoak tree and the other end was stretched parallel with the shoreline and anchored. The water was 6-feet deep at both ends of the net and the bottom was sandy. There were small patches of pondweed growing in the water near the shore.

Station 6: This station was about one-third of the way up the lake from the dam. One end of the net was tied to a boat dock in 5-foot water. The other end was anchored in open water 13-feet deep. The shallow sloping shore was covered with

Russian thistle and native grasses. The bottom was silt.

Station 7: This area was over the site on an old lake which had been in existence before the construction of Lake Leon. The old earthen dam still protruded from the water. One end of the net was tied in a willow grove on the old dam and the other end was anchored straight out from the dam in 4-feet of water. The bottom was deep silt. Pondweeds were abundant and there was scattered patches of cattails in the area.

Station 8: This station was at the end of a dirt road that entered the water. One end of the net was tied to a partly inundated oak tree located 75-yards from the shore. The other end was anchored in 12-feet of water. The net was stretched over the old road bed and was parallel to the shoreline. The bottom was hard packed clay and caliche. There were numerous oaks and elms nearby.

Station 9: This station was 400-yards out in the lake from Station 8 and was over the same road bed. One end of the net was tied to a large, dead pecan tree and the other end was tied to a large, dead cottonwood tree. The water was 30-feet deep but the net was left floating.

Station 10: This station was directly across the lake from Station 8 and on the south shore. The net was tied to a barbed-wire fence at one end in three feet of water and was anchored out into the lake at the other end in 10 feet of water. There were numerous green button willows along the fence line. The bottom was once cultivated land and was composed of mud and silt.

Station 11: The net set at this station was tied to an inundated oak tree located 50 feet from the south shore of the lake. The water was 10 feet deep. Green willow trees and native grasses were abundant along the shore. The bottom was mud and silt.

Station 12: This station was also at the end of a road that entered the water. One end of the net was tied 30 feet from shore to a fence post which was adjacent to a large pear tree. The other end was anchored on the road. The water was 4-feet deep. There were willow trees, cattails, and pondweed growing along the shoreline.

Station 13: This station was near a farm road bridge which crosses the lake. One of the nets was attached to a dead pear tree in the lake approximately 50 feet from shore. The other end was stretched parallel to the farm road and anchored. The bottom was rocky as the bar ditch and sides of the farm road were riprapped on each end of the bridge. The water ranged in depth from 4- to 8-feet.

Station 14: This location was across the farm road bridge in the extreme upper end of the lake. One end of the net was tied to a dead hackberry tree 75 feet from shore and the other end was stretched out perpendicularly from the shore and anchored in the river channel. The depth at the tree was 4-feet and at the other end of the net the depth was 16-feet. Large dead trees protruded from the water over this entire area. The bottom was mud and silt.

Station 15: This station was in the river channel in the upper end of the lake. One end of the net was tied to a pecan tree and the other end was tied to a cottonwood tree which had previously grown along the edge of the river. The water was 16-feet deep and the bottom was covered with silt. Thick groves of dead inundated trees surrounded the station.

Station 16: This was the station furthest up the lake. One end of the net was tied to an electric pole and the other end was anchored. The water was 6-feet deep. The bottom was formerly cultivated land and was muddy.

Seining

There were only three small areas in Lake Leon where seining was possible. These were all located over dirt roads entering the water. These roads are also popular boat launching areas. Their frequent use in this capacity tended to impair the effectiveness of these areas for seining. This factor, plus the clearness of the water, the particular water temperatures at the times seining was done, and the limited space in the areas available for seining account for the poor results obtained by this sampling method. Only 64 specimens, representing 10 species, were collected by use of seines in Lake Leon.

Description of Seining Stations

Station 1: The end of a dirt road entering the water with a barrow on each side. The barrow ditch was bounded by a barbed wire fence on one side and pondweed on the other. The bottom had a fairly steep gradient with water too deep for seining approximately 20 feet from shore.

Station 2: The end of a dirt road entering the water by a former fruit orchard. A large pear tree was nearest the road. The remains of a barbed wire fence were near the orchard. There were willow trees, cattails and pondweed growing along the shoreline. The bottom was firm and had a gently sloping gradient with water too deep for seining approximately 60 feet from shore.

Station 3: This station was also at the end of a dirt road that entered the water in a large slough. Dead mesquite trees were numerous on each side of the road. The bottom was firm and had a gently sloping gradient with water too deep to seine approximately 50 feet from shore.

Annotated Species List

Lepisosteidae (gars)

Lepisosteidae productus (spotted gar): Only a few small individuals were captured. These fish appear to primarily confine themselves to the upper reaches of the lake in the river channel.

L. osseus (longnose gar): Only a few specimens were collected. Their average size was large enough for them to serve as predators but there is apparently not enough gar in the lake to be effective in controlling the forage populations.

Clupeidae (herrings)

Dorosoma cepedianum (gizzard shad): This species has not thus far become dominant in Lake Leon as it has in many other reservoirs. However, netting samples indicate that these fish are abundant composing 9.66 percent of the total number of fish netted. Most shad captured were still small enough to be used by game fishes for forage. According to the lake patrolman it was not possible to observe as many shad in the clear shallow waters during the survey period as it had been in previous

years. From this observation and considering the relatively small size of nearly all shad captured it is possible that natural control or die-off of shad occurred prior to the inventory.

Catostomidae (suckers and buffalofishes)

Ictiobus bubalus (smallmouth buffalo): Lake Leon contains an exceptionally large number of these fish. They constituted 23.50 percent of the netting sample. The reason for their abundance in this lake when in many other West Texas lakes they are not nearly so plentiful can possibly be attributed to the large number of trees inundated in the upper two-thirds of the lake. Lake Fort Phantom Hill has a great many trees in the upper end and it too has a high percentage of smallmouth buffalo. These are the only two lakes in this area, to the author's knowledge, that support these populations. Whether the simultaneous existence of inundated trees and smallmouth buffalo is merely a coincidence or whether the trees help support this species by increased area for growth of food and/or the provision of additional spawning areas cannot be concluded from the scanty knowledge of this species life history that is recorded in the literature. Dalquest, in an unpublished report to the Texas Game and Fish Commission, states that the diet of this species consists mostly of animal life.¹ The large area of inundated forest and the debris created by it no doubt supports a high population of small animal organisms in Lake Leon.

Carpiodes carpio (river carpsucker): This problem species has become firmly established in Lake Leon composing 10.74 percent of the netting sample by number and 20.65 percent by weight.

Cyprinidae (shiners and minnows)

Cyprinus carpio (carp): This species was fairly evenly distributed in the shallower netting areas but was not abundant in any collection. More were taken at Station 7, an old silted-in lake bed, than at any other station. Some anglers fish for carp at Lake Leon with reportedly fair success. Due to this fact and their relatively low occurrence in the netting sample (4.01 percent by number) they are not presently considered to be detrimental in this lake.

Notropis venustus (spottail shiner): These shiners may be more abundant than the seining sample indicated. Schools of either these or redhorse shiners were observed swimming in clear water but could not be captured.

Notropis lutrensis (redhorse shiner): These are probably the most common shiners in Lake Leon.

Pimephales vigilax (parrot minnow): Only one large individual of this species was captured.

Ameiuridae (freshwater catfishes)

Ictalurus punctatus (channel catfish): The netting collections indicated a large population of channel catfish occur in Lake Leon, representing 20.40 percent of the total catch. The lake is usually laced with trotlines in the upper end and some good catches of channel catfish are often reported. The average size collected by netting was only 7.71 ounces.

¹ Dalquest, Walter W., 1960. Natural history of four species of rough fishes in Lake Diversion. Second annual report to Texas Game and Fish Commission. 2 pages.

I. melas (black bullhead): A few small specimens were collected in the upper end of the lake. These fish apparently do not constitute a major problem at this time.

I. natalis (yellow bullhead): One yellow bullhead was collected. This species are not as common as the black bullheads in most area lakes.

Pylodictus olivaris (flathead catfish): Only two small specimens of this desirable species were captured. Anglers occasionally take them on trotlines. Some individuals weighing over 20 pounds have been reported caught in this manner. This species may, by predation, serve as a partial control on overpopulations of bullheads and small game species.

Poeciliidae (mosquitofishes)

Gambusia affinis (mosquitofish): A few specimens were collected by seining and many more were observed in the shallow back water areas of the sloughs.

Centrarchidae (black basses and sunfishes)

Micropterus salmoides (largemouth bass): Considering the fact that this species is often not easily captured by netting, Lake Leon appears to have a relatively good population of this species. They composed 4.74 percent by number of the netting sample. Lake catches of this species have been made in the past. Recently these fish have been more difficult to catch. This can probably be explained, in part, by the abundance of forage species which has developed due to the overpopulation of small sunfish, crappie, and shad. The average size of largemouth bass caught in nets was 1 pound 10.4 ounces. This species is probably still reproducing in Lake Leon. There are large areas of good spawning habitat and several small bass were collected by seining. However, this is not conclusive evidence of their reproduction as the State Fish Hatcheries frequently stock this species.

Lepomis cyanellus (green sunfish): A few small green sunfish were collected by seining. None were captured in nets.

L. microlophus (redeer sunfish): Only one fish, weighing five ounces, was netted and none were taken by seining. During the first few years of the lake's existence strings of large redear were reported caught by anglers. These fish were stocked in the lake, when it was new, by the State Fish Hatcheries and may have also been native to the stream. They have apparently lost their place in Lake Leon to other members of the Centrarchid family during the last few years.

L. macrochirus (bluegill): This is probably the dominant sunfish in Lake Leon, as it is in most other waters of the area. Relatively significant numbers were captured both by netting and seining. The average size was only 1.22 ounces. Sunfish of this size are not large enough to be desirable to anglers for food or sport and, since they add to the already over abundant supply of forage fish existing in the lake, they are also not desirable to anglers from the standpoint that they make the larger fish harder to catch.

L. humilis (orangespotted sunfish): Two of these small, relatively unimportant sunfish were obtained by seining.

L. megalotis (longear sunfish): This is probably the second most abundant sunfish in Lake Leon. These were in both the netting and seining samples. Most of the longears in Lake Leon appear to be stunted as no individuals large enough to keep by fishermen were captured but some fish only three inches in total length were found to contain ovaries full of ripe eggs.

Pomoxis annularis (white crappie): Many white crappie were caught in the nets

but due to the limited and inadequate seining areas available none were taken by seining. Most of the white crappie captured in nets were too small for angler value, but a few individuals of desirable size were obtained. Most of these small fish were no doubt stunted as many of them were sexually mature. The average weight of individuals of this species was 3.34 ounces.

CONCLUSIONS AND RECOMMENDATIONS

Lake Leon appears to be following the general trend of most West Texas lakes as they grow older. Rough and forage fish are becoming more numerous each year and large-mouth bass are becoming less numerous and harder to catch because of the crowded conditions. A high percentage (27.5 percent) of the total fish populations, as indicated by netting, are composed of smallmouth buffalo and carp. This is a more desirable situation than it would be if most of the rough fish were shad and suckers because buffalo and carp are sometimes caught by anglers and often used for food whereas shad and suckers are hardly ever caught and seldom eaten.

Since the shad population was not found to be extremely excessive and since there are still some good catches of bass and catfish taken from the lake, a selective control treatment for shad or a complete eradication of fish species and consequent restocking program is not practical or justifiable at this time. Nearly the only effort that could be considered would be an attempt to increase the population of flathead catfish occurring in Lake Leon so that more predation of forage fish might result. Moving flathead catfish from other lakes is not economically feasible and probably would not be permissible. A restriction on taking flatheads by means of trotlines could be enacted by the Eastland County Water Board to protect the existing numbers. However, trotlines should not be prohibited since channel catfish taken by this means constitute a large percentage of the anglers' catch. Enforcement by the lake patrolman would be difficult if channel catfish could be trotlined and flathead catfish could not. Two nearby lakes that do not allow trotlining at all have large populations of flathead catfish. This fact cannot be interpreted to mean that if Lake Leon allowed no trotlining it too would have a large population because there are many other variables and factors which are different between the three lakes. However, as a short term experiment, for possibly two or three years, a restriction on taking flatheads by trotline could be attempted and netting surveys could be conducted at the end of this period to determine the practicality of the restrictions. The present lake patrolman is willing to attempt enforcement of this restriction.

This possibility was suggested to the Eastland County Water Board for their consideration. Any decision to enact such a restriction would be their responsibility.

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Approved by Marion Toole
Director Inland Fisheries Division

Date July 21, 1961

Checklist of fish species, Lake Leon, April 1, 1960 through February 28, 1960.

Scientific name	Common name
<u>Lepisosteidae</u> (gars)	
<u>Lepisosteidae productus</u>	spotted gar
<u>Lepisosteidae osseus</u>	longnose gar
<u>Clupeidae</u> (herrings)	
<u>Dorosoma cepedianum</u>	gizzard shad
<u>Catostomidae</u> (suckers and buffalofishes)	
<u>Ictiobus bubalus</u>	smallmouth buffalo
<u>Carpiodes carpio</u>	river carpsucker
<u>Cyprinidae</u> (shiners and minnows)	
<u>Cyprinus carpio</u>	carp
<u>Notropis venustus</u>	spottail shiner
<u>Notropis lutrensis</u>	redhorse shiner
<u>Pimephales vigilax</u>	parrot minnow
<u>Ameiuridae</u> (freshwater catfish)	
<u>Ictalurus punctatus</u>	channel catfish
<u>Ictalurus melas</u>	black bullhead
<u>Ictalurus natalis</u>	yellow bullhead
<u>Pylodictus olivaris</u>	flathead catfish
<u>Peciliidae</u> (mosquitofishes)	
<u>Gambusia affinis</u>	mosquitofish
<u>Centrarchidae</u> (black bass and sunfishes)	
<u>Micropterus salmoides</u>	largemouth bass
<u>Lepomis cyaneellus</u>	green sunfish
<u>Lepomis microlophus</u>	redeer sunfish
<u>Lepomis macrochirus</u>	bluegill
<u>Lepomis humilis</u>	orangespotted sunfish
<u>Lepomis megalotis</u>	longear sunfish
<u>Pomoxis annularis</u>	white crappie

Table 1. Lake Leon, lake level elevations and water storage data.

Elevation	Acre Feet	Elevation	Acre Feet	Elevation	Acre Feet
1,313	0	1,339	1,100	1,365	12,400
1,314	5	1,340	1,120	1,366	13,450
1,315	10	1,341	1,360	1,367	14,570
1,316	15	1,342	1,500	1,368	15,750
1,317	20	1,343	1,660	1,369	17,000
1,318	30	1,344	1,840	1,370	18,300
1,319	40	1,345	2,030	1,371	19,600
1,320	50	1,346	2,240	1,372	20,920
1,321	65	1,347	2,460	1,373	22,260
1,322	80	1,348	2,690	1,374	23,620
1,323	100	1,349	2,940	1,375	25,000
1,324	125	1,350	3,220	1,376	26,440
1,325	155	1,351	3,520	1,377	28,000
1,326	190	1,352	3,850	1,378	29,640
1,327	230	1,353	4,200	1,379	31,380
1,328	275	1,354	4,600	1,380	33,200
1,329	325	1,355	5,040	1,381	35,100
1,330	375	1,356	5,530	1,382	37,050
1,331	425	1,357	6,060	1,383	39,050
1,332	480	1,358	6,650	1,384	41,100
1,333	540	1,359	7,300	1,385	43,200
1,334	610	1,360	8,000	1,386	45,400
1,335	690	1,361	8,780	1,387	47,650
1,336	780	1,362	9,600	1,388	49,950
1,337	880	1,363	10,480	1,389	52,300
1,338	990	1,364	11,400	1,390	54,700

Table 2. Results of water analyses, Lake Leon.¹

Analysis	Sampling date			
	Feb. 12, 1958	May 19, 1958	June 29, 1959	Oct. 28, 1960
Calcium (Ca)	46.00	46.00	35.00	27.00
Magnesium (Mg)	9.00	8.00	5.00	3.00
Iron (Fe)	.11	.20	.29	.95
Manganese (Mn)	.05	.05	.05	.05
Sodium (Na)	29.00	20.00	9.00	5.00
Carbonate (CO ₃)	0.00	0.00	0.00	0.00
Bicarbonate (HCO ₃)	129.00	133.00	98.00	78.00
Sulphate (SO ₄)	20.00	23.00	19.00	11.00
Chloride (CL)	52.00	45.00	28.00	14.00
Flouride (F)	.20	.10	.20	.20
Nitrate (NO ₃)	.40	.40	.40	.40
Specific conductance micromhs/cm	442.00	429.00	286.00	274.00
Dissolved residue (T.S.) calculated	265.00	257.00	172.00	164.00
Phenolphthlein alkalinity as CaCO ₃	0.00	0.00	0.00	0.00
Total alkalinity as CaCO ₃	106.00	109.00	80.00	64.00
Total hardness as CaCO ₃	152.00	148.00	110.00	81.00
pH	7.9	8.1	8.0	7.1

¹Analyses made by Texas State Department of Health.

Table 3. Results of netting, Lake Leon, May 1960.

Species	Number	Percent by Number	Total weight		Average weight		Percent by Weight	Average "K"
			lbs.	oz.	lbs.	oz.		
Longnose gar	2	.88	10	4	5	2.00	3.78	.52
Spotted gar	5	2.20	16	12	3	15.60	6.19	.69
Gizzard shad	25	11.01	2	7		1.56	.90	1.66
Smallmouth buffalo	48	21.14	96	12	2	.25	35.72	2.99
River carpsuckers	22	9.70	49	4	2	3.81	18.18	2.79
Carp	16	7.05	34		2	2.00	12.55	2.21
Channel catfish	36	15.86	21	15		9.75	8.10	1.52
Black bullheads	4	1.76	1	7		5.75	.53	2.17
Flathead catfish	2	.88	3	8	1	12.00	1.29	2.09
Largemouth bass	12	5.29	27	15	2	5.25	10.32	2.37
Bluegill sunfish	27	11.89	2	1		1.22	.76	3.33
Longear sunfish	6	2.64		7		1.16	.16	3.74
White crappie	22	9.70	4	2		3.00	1.52	1.85
Total	227	100.00	270	14			100.00	

Table 4. Results of netting, Lake Leon, July 1960.

Species	Number	Percent by Number	Total weight		Average weight		Percent by weight	Average "K"
			lbs.	oz.	lbs.	oz.		
Gizzard shad	7	3.82		13		1.80	.48	1.87
Smallmouth buffalo	58	31.69	94	12	1	10.10	56.52	2.02
River carpsuckers	15	8.20	24	8	1	10.10	14.62	2.09
Carp	6	3.28	15	14	2	10.30	9.47	1.72
Channel catfish	30	16.39	14	6		7.60	8.58	1.53
Black bullheads	4	2.19	1	1		4.25	.63	1.98
Yellow bullheads	1	.55		5		5.00	.19	1.86
Largemouth bass	11	6.01	11	5	1	.40	6.74	1.88
Redear sunfish	1	.55		5		5.00	.19	3.39
Bluegill sunfish	17	9.28	1	5		1.20	.78	3.40
Longear sunfish	4	2.19		6		1.4	.23	3.44
White crappie	29	15.85	2	10		1.4	1.57	2.17
Total	183	100.00	167	10			100.00	

Table 5. Results of netting, Lake Leon, November, 1960.

Species	Number	Percent by Number	Total weight		Average weight		Percent by weight	Average "K"
			lbs.	oz.	lbs.	oz.		
Longnose gar	2	1.43	5	9	2	12.50	3.93	.36
Gizzard shad	21	15.11	2	11		2.04	1.90	1.67
Smallmouth buffalo	23	16.55	57	12	2	8.17	40.81	2.89
River carpsuckers	22	15.83	46		2	1.45	32.51	2.56
Channel catfish	46	33.09	18	2		6.30	12.81	1.39
Largemouth bass	3	2.16	3	11	1	3.66	2.60	2.04
Bluegill sunfish	4	2.88		5		1.25	.22	2.69
Longear sunfish	2	1.43		2		1.00	.10	2.59
White crappie	16	11.52	7	4		7.25	5.12	2.38
Total	139	100.00	141	8			100.00	

Table 6. Results of netting, Lake Leon, April 1, 1960 to February 28, 1961.

Species	Number	Percent by			Average weight		Percent by weight	Average "K"	"K" Range
		number	Lbs.	oz.	Lbs.	oz.			
Longnose gar	4	.72	15	13	3	11.25	2.72	.44	0.32-0.54
Spotted gar	5	.91	16	12		5.60	2.88	.69	0.61-0.80
Gizzard shad	53	9.66	5	15		1.09	1.02	1.69	1.23-2.42
Smallmouth buffalo	129	23.50	249	4	1	14.91	42.98	2.54	1.40-3.53
River carpsucker	59	10.74	119	12	2	.47	20.65	2.53	1.07-3.60
Carp	22	4.01	49	14	2	4.27	8.59	2.08	1.07-2.43
Channel catfish	112	20.40	54	7		7.71	9.39	1.46	1.02-1.90
Black bullheads	8	1.46	2	8		5.00	.43	2.07	1.64-2.48
Yellow bullheads	1	.18	5	5		5.00	.06	1.86	1.86-1.86
Flathead catfish	2	.36	3	8		12.00	.60	2.09	2.07-2.11
Largemouth bass	26	4.74	42	15	1	10.42	7.40	2.14	1.02-3.00
Redear sunfish	1	.18	5	5		5.00	.06	3.39	3.39-3.39
Bluegill sunfish	48	8.75	3	11		1.22	.63	3.30	2.40-4.27
Longear sunfish	12	2.18	15	15		1.25	.17	3.45	2.31-4.50
White crappie	67	12.21	14			3.34	2.42	2.11	1.36-3.91
Total	549	100.00	580				100.00		

Table 7. Results of netting by stations, Lake Leon, April 1, 1960 to February 28, 1961

Species	Stations																								
	1			2			3			4			5			6			7			8			
	May	July	Nov.	May	July	Nov.	May	July	Nov.	May	July	Nov.	May	July	Nov.	May	July	Nov.	May	July	Nov.	May	July	Nov.	
Longnose gar																							1		
Spotted gar										1										1					
Gizzard shad	1		1		1				1				1	2	2			5	3						1
Smallmouth buffalo		5	1			1				3	7					1	4	5	8	7	3		2	5	
River carpsucker	1			3		1				2	1	1	4		2		3	2	1	7		2	1		
Carp											1							5	2						
Channel catfish	1	2	1	1	2	3	1	1	2	5		4	3	2	1	1		10			2	3			
Black bullhead																			2				1		
Yellow bullhead																									
Flathead catfish																									
Largemouth bass				1	1			1					1						2	1	1	3	1		
Redear sunfish																									
Bluegill sunfish		1		1	6			1			1			1				1	5						
Longear sunfish														1					1					2	
White crappie	9	2	1	3	10					1	6			3				3	1			6	1		
Totals	12	10	4	9	20	5	1	3	3	12	10	11	9	9	3	4	4	27	30	11	10	4	17	11	

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Species	Stations																								Totals			
	9			10			11			12			13			14			15			16			May	July	Nov.	
	May	July	Nov.	May	July	Nov.	May	July	Nov.	May	July	Nov.	May	July	Nov.	May	July	Nov.	May	July	Nov.	May	July	Nov.	May	July	Nov.	
Longnose gar	1					2																			2		2	
Spotted gar										1								1								5		
Gizzard shad			2			1	1		1	11		5			2	6	1		1		2	2			25	7	21	
Smallmouth buffalo		7	2	1	4	3	1		1	4	12		4	4	2	10	3	1	4	2	1	12	1		48	58	23	
River carpsucker	1	3	3	4	3		1	1			1			1	3			2		1	1	2	1		22	15	22	
Carp				1	1		1			1			1			4	1				2			16	6			
Channel catfish	5	7	2		1	5	2	3	1		2	3	3	1	2	1		2	4		5	7	6	5	36	30	46	
Black bullhead				1										3								1			4	4		
Yellow bullhead											1															1		
Flathead catfish				1									1												2			
Largemouth bass		1		1		1	2				2	2						1			1	1	2		12	11	3	
Redear sunfish															1					1	1	2			12	11	3	
Bluegill sunfish				5	1		7			6	4	2		1						1	2	1			27	17	4	
Longear sunfish				4	1						2											2	1		27	17	4	
White crappie				1		1	2	1	1	3	2	2	1			1	3				1		4		22	29	16	
Totals	7	18	9	19	11	13	17	5	4	28	25	12	11	11	7	25	9	5	9	5	10	30	15	5	549			

Table 8. A comparison of rough and/or forage species to game species obtained in forty-eight netting collections from Lake Leon during the period from April 1, 1960 to February 28, 1961.

Type of fish	Numbers		Weights		
	Fish	Percent	lbs.	oz.	Percent
<u>Rough and/or forage species</u> (Longnose gar, gizzard shad, smallmouth buffalo, river carpsucker, carp, black bullhead, yellow bullhead, spotted gar)	281	51.18	460	3	79.34
<u>Game species</u> (Channel catfish, flathead catfish, largemouth bass, red-ear sunfish, bluegill sunfish, longear sunfish, white crappie)	268	48.82	119	13	20.66
Total	549	100.00	580		100.00

Table 9. Results of seining collections made at Lake Leon during the period from April 1, 1960 to February 28, 1961.

Species	May 11, 1960			July 12, 1960			Totals
	Station			Station			
	1	2	3	1	2	3	
Gizzard shad		4	2				6
Spottail shiner						2	2
Redhorse shiner		12	5			4	21
Parrot minnow		1					1
Mosquitofish					3		3
Largemouth bass						3	3
Green sunfish	1				2		3
Bluegill sunfish		7	3			8	18
Orangespotted sunfish		2					2
Longear sunfish	1	3				1	5
Total							64

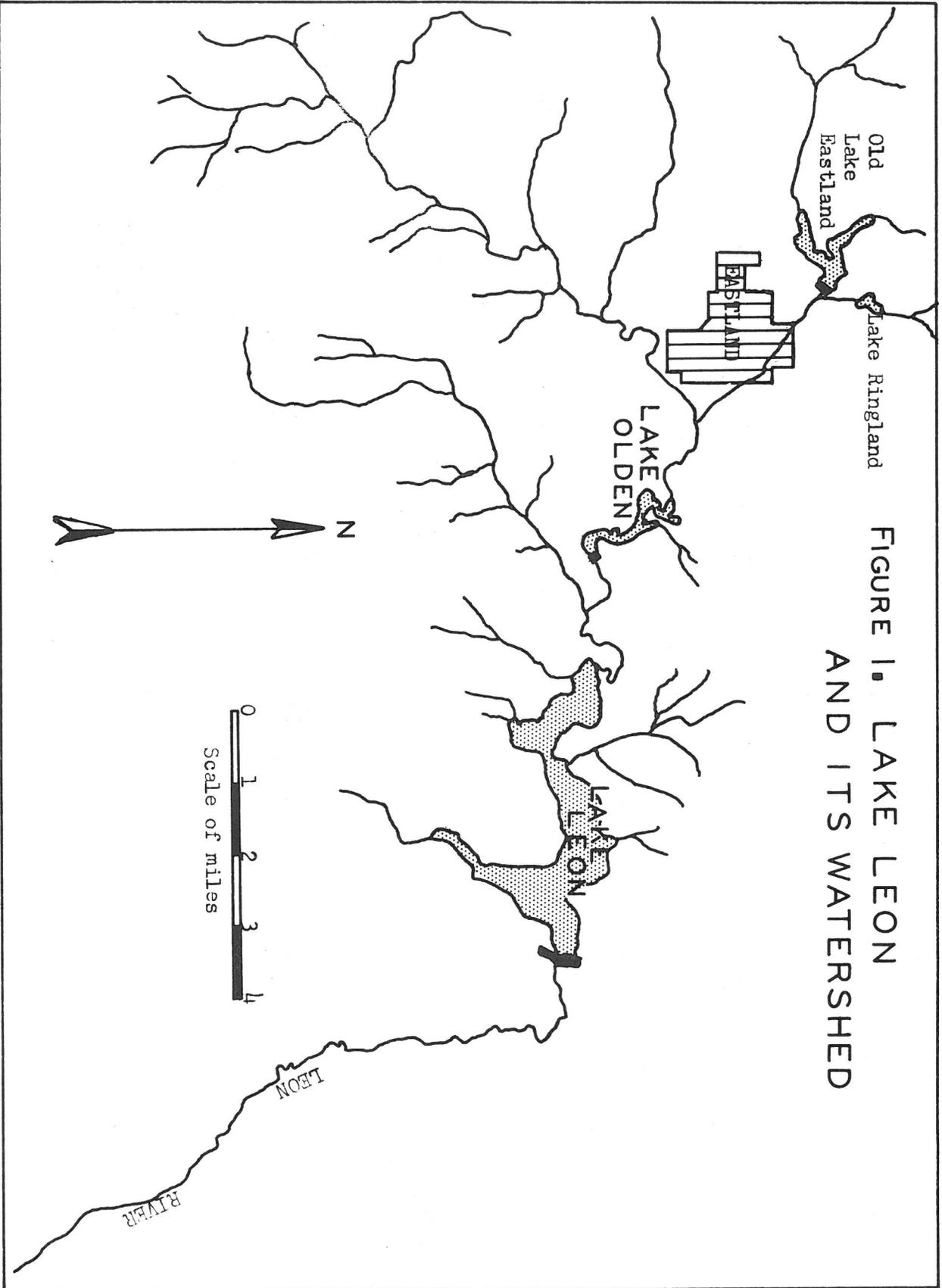


FIGURE 1. LAKE LEON
AND ITS WATERSHED

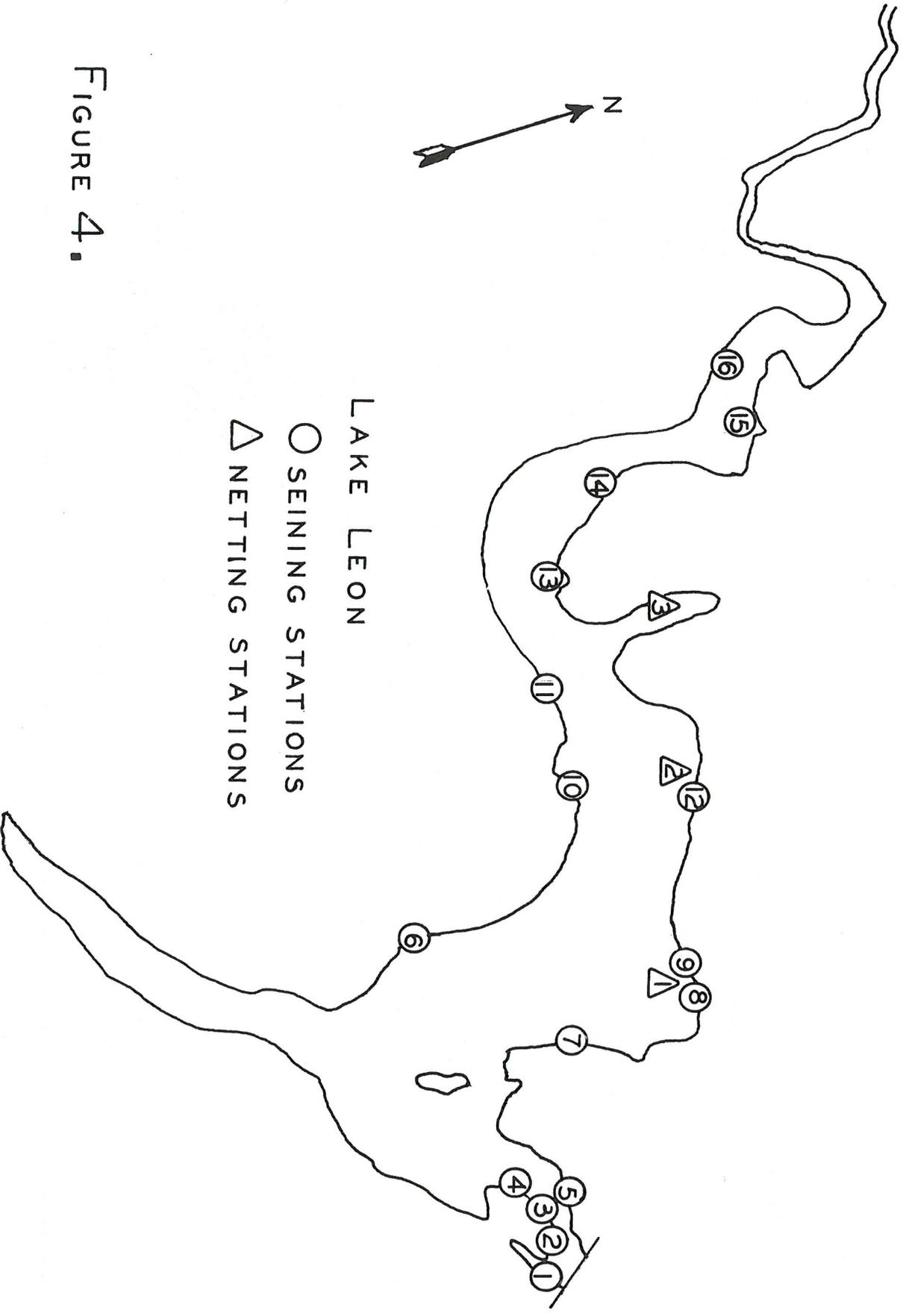


Figure 4.



Figure 2. Running gill nets in clearing in timber at Station 14 near the upper end of Lake Leon.



Figure 3. Running nets set in timbered area at Station 16 in upper end of Lake Leon.



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