

Report of Fisheries Investigations  
Inventory of Species Present and their Relative Abundance in Several  
Small Public Lakes in Region 3-B.

by

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April 1, 1960 - February 28, 1961

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## A B S T R A C T

The fish populations of five small west Texas lakes were inventoried. These were Mountain Creek Reservoir near Robert Lee, Towle Park Lake near Snyder, Old City Lake near Anson, New City Lake near Anson, and Lake Balmorhea near Balmorhea. Mountain Creek Reservoir, Towle Park Lake, and Lake Balmorhea were found to have such high populations of undesirable fish that management work was recommended to the various agencies involved. This work would consist of a complete eradication of existing species and a restocking with hatchery reared fish.

Old City Lake near Anson was found to have the problem of inadequate access due to profuse aquatic vegetation in the water and along the shores of the lake. This lake's fish population was not composed of undesirable fish in high enough numbers to justify a complete eradication program at this time. However, an excessive population of golden shiners (Notemigonus crysoleucas) was found to occur.

New City Lake near Anson was found to have a high population of rough fish and stunted game species, but a large enough number of channel catfish (Ictalurus punctatus) was discovered to justify not recommending any immediate management work. Another problem noted was that of inadequate access for bank fishermen to the lake's shoreline.

## 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-31

Title: Inventory of Species Present and their  
Relative Abundance in Several Small  
Public Lakes in Region 3-B.

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 in several small public lakes located within the region.

### PROCEDURE

Five small lakes, including Mountain Creek Reservoir, near Robert Lee; Towle Park Lake, near Snyder; Old City Lake and New City Lake, near Anson; and Lake Balmorhea, near Balmorhea were netted during the segment. 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  $\frac{1}{2}$ -inch intervals in each succeeding section. Mountain Creek Reservoir, New City Lake near Anson, and Lake Balmorhea were sampled with four nets each. Three nets were set at Towle Park Lake and two nets were set at Old City Lake near Anson. No collections were made with hoop and/or fyke nets at any of these lakes because these devices require more time to produce an adequate sample than was available and, also because the gill nets used apparently provided sufficient information to satisfy the job requirements.

Seining collections were made at all of the lakes except Old City Lake near Anson. This lake was impossible to seine because of profuse submergent and emergent aquatic vegetation. Seines used at the other lakes were a 30-foot,  $\frac{1}{4}$ -inch mesh, bag seine; a 25-foot,  $\frac{1}{4}$ -inch mesh, straight seine and a 12-foot commonsense seine. Ecological data, such as temperature, depth of water and depth of net set, cover types and bottom types were recorded with each collection. Water quality and dissolved gasses were not determined because there was no reason to suspect pollution. Seined specimens were tallied and samples were preserved for laboratory examination. Notations were made of the length, weight, sex and stage of sexual development of many of the fish captured in nets.

### FINDINGS AND CONCLUSIONS

#### Mountain Creek Reservoir

Mountain Creek Reservoir is located at the northern edge of Robert Lee, Texas, and serves as that town's only municipal water supply. The lake covers 77 acres and when constructed held 950 acre-feet of water. The watershed drains 40 square miles. The dam was closed in 1950 and the lake has never gone dry. The lake's bottom has become covered with several feet of silt during the last few years. A large population of rough fish, at the time the nets were set, was keeping silt stirred up and the lake very turbid. Fishing became very poor during the last three years and for this reason the City of Robert Lee requested that the Texas Game and Fish Commission investigate.

Four nets were set in September, 1960, in water ranging from five to twelve feet in depth. All nets were floated over the silty bottom of the lake. One end of each of these nets was tied to large rocks or small willow trees at the shoreline and the other end was anchored in open water. Much of the shoreline consists of silt flats created when the lake was at a higher level.

Seining was conducted in the upper end of the lake in the creek bed. The bottom was smooth, being covered with silt, but seining was difficult because of the bog. Figure 3 shows the results of seining.

Figures 1 and 2 show the results of the netting samples. River carpsuckers, Carpiodes carpio, are highly dominant in this lake composing 85.56 percent of the fish taken from nets and 98.87 percent of the weight of the netting sample. The lake apparently contains many small bluegill sunfish, Lepomis macrochirus, and white crappie, Pomoxis annularis. The high population of undesirable fish, the poor fishing which has resulted recently, the low expense involved and the fact that Mountain Creek Reservoir is Robert Lee's only lake is considered ample justification to recommend a complete eradication and restocking program. This recommendation was presented to the City Commission and was accepted.

#### Towle Park Lake

Towle Park Lake is located in a Scurry County park which is within the City of Snyder. This lake was created in 1951 by raising the dam of a smaller lake. At capacity the lake covers about seven acres and holds 57 acre-feet of water. The bottom of the lake is red clay and sand. The shoreline is rock riprap at the dam and barren dirt slopes, with small willow trees, around the rest of the lake. Many children fish the lake but few have very much success. The Superintendent of Scurry County Parks requested that the Game and Fish Commission investigate.

The three nets set in July, 1960, were set in water ranging from 3 to 10 feet in depth. All nets were floated over the smooth, sandy lake bottom. One end of each of these nets was tied to willow trees and the other end was anchored in open water. The water was turbid, with much colloidal suspension. Figures 4 and 5 show the results of the netting samples.

River carpsuckers composed 29.34 percent of the netting sample and black bullheads, Ictalurus melas, composed 34.78 percent. Carp, Cyprinus carpio, small bluegill and small white crappie made up most of the rest of the netting sample. The only desirable fish obtained was one small largemouth bass, Micropterus salmoides.

Seining was done along the shore towards the upper end of the lake but large areas

could not be seined as the water became deep too quickly. Figure 6 shows the results of seining.

It was recommended to the Scurry County Commissioners that this small lake be treated to eradicate the present fish population and restocked with more desirable species. They accepted and approved this recommendation.

#### Anson Old City Lake

Old City Lake is located approximately three miles south of Anson, Texas. It was constructed in 1922 by the city for a municipal water supply. However, with the advent of the new city lake, the old lake is no longer used for city water. At spillway capacity the lake covers approximately 75 acres and at this present level has an estimated volume of 600 acre feet of water. This lake has collected quite a lot of silt since its construction. The shoreline and much of the shallower areas of the lake are covered by bulrushes, Scirpus sp.. The relatively clear water also supports much submergent vegetation, principally muskgrass, Chara sp., and pondweed, Potamogeton sp.. Also, in the shallower water and along the shoreline are many willows and salt cedar trees.

Anglers catch several large channel catfish and largemouth bass from the lake each year and a number of bream fishermen frequent the lake, but essentially the lake is not heavily utilized. In the opinion of project personnel and city officials, more anglers would utilize the lake if it had more available shoreline area. Most of the shoreline is inaccessible because of the bulrushes.

Two nets were set in October, 1960, in water ranging from 3 to 9 feet. The lake was low at this time but filled up during the spring of 1961. These nets were both tied to bulrushes at one end and anchored in relatively open water at the other end. The bottom was silt, interspersed with dead cedar trees. One end of one of the nets was stretched over part of the dam's rock riprap.

Figures 7 and 8 show the results of the netting collections. From the small sample obtained it appears that golden shiners, Notemigonus crysoleucas, and bluegill sunfish dominate the lake. There is apparently no serious rough fish problem other than the abundance of golden shiners.

The aquatic vegetation in this lake was much too profuse and obstructive for seining. However, many bluegills, golden shiners and mosquitofish, Gambusia affinis, could be seen in the water.

It was recommended to the City of Anson that steps be taken to eradicate part of the bulrushes along the shores of the lake so that more fishermen could use the lake. It was explained that payment for the chemical for this work could not be justified through a federal aid project because the fishing pressure at the lake was so light. The city decided to purchase this chemical with their own lake maintenance funds if the Game and Fish Commission would supervise the application. This was agreed on and treatment is expected to occur during the summer of 1961.

#### Anson New City Lake

New City Lake is located approximately 7 miles north of Anson, Texas. This dam was originally constructed in 1940 but the elevation was raised in 1952. The storage capacity is 2,380 acre-feet of water and when at this level the lake covers approxi-

mately 150 acres. The lake is presently full and many mesquite trees are inundated. There are many willow trees along the steep banks and around the dam. The dam is covered with rock riprap. The water is slightly turbid even when full because red clay soils from the watershed wash into the lake.

Fishing has not been good at the lake for the last two years according to local reports. However, the water has not been as high during this period as it is at present. This increased volume is expected to improve fishing conditions.

Four nets were set in October, 1960. Two of these nets were set off the dam's riprap and were stretched out and anchored in open water approximately 20-feet deep. The other two nets were set from willow limbs along the shoreline and the other ends of these nets were anchored in open water about 8-feet deep. The bottom under these nets was smooth red dirt and clay.

Figures 9 and 10 show the results of the netting collections. Gizzard shad, Dorosoma cepedianum, river carpsuckers and black bullheads were all abundant. These rough fish, along with the large number of small white crappie taken in the nets, create an undesirable fisheries situation. The desirable fish population occurring in the lakes appears to be composed almost entirely of channel catfish.

Seining was done at the boat launching area near the dam. The bottom in this area was rubble and clay. Seining indicated that the lake is heavily infested with small bluegill sunfish. These fish were too small to become caught in gill nets and this no doubt explains their low incidence in the netting collections. Figure 11 shows the results of seining.

Even though the lake contains many undesirable fish species and many small, stunted crappie and sunfish it is felt by project personnel that the large population of channel catfish and the cost of treating a body of water of this lake's size do not justify a recommendation for a complete eradication program. However, if and when the lake level is considerably reduced as it has been previously, a management effort might be considered. The only recommendation that could be made at this time is for the city to open up more of the shoreline of the lake to anglers by the construction of roads. At present there is no way for bank fishermen to reach two-thirds of the shoreline, except by trespassing on private property.

#### Lake Balmorhea

Lake Balmorhea is located 4 miles south of Balmorhea, Texas. The lake is partially fed by its watershed and partially by San Soloman springs. The lake is operated by the Reaves County Water District and used for irrigation purposes. It was constructed in 1916. Due to its use for irrigation purposes the lake fluctuates considerably. At spillway level Lake Balmorhea contains 6,300 acre-feet of water and covers 650 acres. Much of the shoreline is covered by willow trees. The lake's long dam is covered with rock riprap. The water turbidity varies as the lake fluctuates. At the time of survey the lake was turbid.

Reports from local anglers and concessionnaires indicate that fishing has been very poor at Lake Balmorhea for some time. A few white bass, Roccus chrysops, large-mouth bass and channel catfish are still caught.

Four nets were set in June, 1960. One net was tied to a light pole in the water's edge and stretched out into open water about 10 feet deep. Another net was set from one bank to the other of a small slough. The water here ranged from 2 feet to 8 feet deep. The other two nets were tied to willow limbs along the shoreline and anchored at the other end in water 8 to 10 feet deep. The bottom was sand and silt interspersed with large rocks.

Figures 12 and 13 show the results of the netting collections. Gizzard shad, river carpsucker and carp apparently completely dominate the lake. All of the large-mouth bass captured were small. These were possibly fish stocked from the state hatcheries the year before.

Seining was conducted in a small area where boats were often launched. The bottom here was covered with rubble. Figure 14 shows the results of seining.

Since the rough fish population of Lake Balmorhea is apparently very high and since fishing has been poor even though considerable amount of fishing occurs at the lake it was recommended to the Superintendent of the Reaves County Water Board that a complete kill of all fish in the lake be effected and that suitable hatchery raised game fish be restocked. The decision to be made concerning this recommendation, by the Reaves County Water Board is still pending.

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Date August 28, 1961

Figure 1. Results of four netting samples taken from Mountain Creek Reservoir, Robert Lee, on September 28, 1960.

| Species          | Number | Percent by number | Total weight |     | Average weight |     | Percent by weight | Average "K" |
|------------------|--------|-------------------|--------------|-----|----------------|-----|-------------------|-------------|
|                  |        |                   | lbs.         | oz. | lbs.           | oz. |                   |             |
| River carpsucker | 338    | 85.56             | 1,161        | 14  | 3              | 7   | 98.87             | 2.60        |
| Channel catfish  | 1      | .26               |              | 11  |                | 11  | .06               | 1.49        |
| Black bullheads  | 3      | .76               |              | 14  |                | 4.8 | .08               | 2.19        |
| Largemouth bass  | 8      | 2.02              | 4            | 14  |                | 9.7 | .41               | 2.03        |
| Redear sunfish   | 3      | .76               |              | 12  |                | 4.1 | .06               | 4.07        |
| Bluegill sunfish | 11     | 2.79              | 1            | 12  |                | 2.5 | .15               | 3.48        |
| White crappie    | 31     | 7.85              | 4            | 4   |                | 2.2 | .37               | 2.99        |
| Total            | 395    | 100.00            | 1,175        | 1   |                |     | 100.00            |             |

Figure 2. A comparison of rough and/or forage species to game species in Mountain Creek Reservoir.

|   | Number | Percent<br>by<br>number | Total weight |     | Percent<br>by<br>weight |
|---|--------|-------------------------|--------------|-----|-------------------------|
|   |        |                         | lbs.         | oz. |                         |
| Rough and/or forage species<br>(River carpsucker, black<br>bullheads)                             | 341    | 86.32                   | 1,162        | 12  | 98.95                   |
| Game species<br>(Channel catfish, largemouth<br>bass, redear sunfish, bluegill,<br>white crappie) | 54     | 13.68                   | 12           | 5   | 1.05                    |
| Totals  | 395    | 100.00                  | 1,175        | 1   | 100.00                  |

Figure 3. Results of seining collections taken from Mountain Creek Reservoir near Robert Lee on September 29, 1960.

| Species               | Number | Percent by number |
|-----------------------|--------|-------------------|
| Golden shiner         | 9      | 4.45              |
| Redhorse shiner       | 76     | 37.62             |
| Mosquitofish          | 45     | 22.28             |
| Largemouth bass       | 2      | .99               |
| Green sunfish         | 13     | 6.44              |
| Redear sunfish        | 3      | 1.48              |
| Orangespotted sunfish | 8      | 3.96              |
| Bluegill sunfish      | 35     | 17.33             |
| White crappie         | 11     | 5.45              |
| Totals                | 202    | 100.00            |

Figure 4. Results of three netting samples taken from Towle Park, Snyder, on July 27, 1960.

| Species          | Number | Percent by number | Total weight |     | Average weight |     | Percent by weight | Average "K" |
|------------------|--------|-------------------|--------------|-----|----------------|-----|-------------------|-------------|
|                  |        |                   | lbs.         | oz. | lbs.           | oz. |                   |             |
| River carpsucker | 27     | 29.34             | 84           | 6   | 3              | 2   | 61.53             | 2.48        |
| Carp             | 5      | 5.44              | 32           | 3   | 6              | 7   | 23.47             | 2.79        |
| Black bullheads  | 32     | 34.78             | 15           |     |                | 7.5 | 10.94             | 2.25        |
| Largemouth bass  | 1      | 1.09              |              | 7   |                | 7   | .32               | 2.10        |
| Bluegill sunfish | 14     | 15.21             | 2            | 6   |                | 2.7 | 1.73              | 3.37        |
| White crappie    | 13     | 14.14             | 2            | 12  |                | 3.4 | 2.01              | 2.73        |
| Totals           | 92     | 100.00            | 137          | 2   |                |     | 100.00            |             |

Figure 5. A comparison of rough and/or forage species to game species in Towle Park Lake near Snyder, Texas.

|   | Number | Percent by number | Total weight |     | Percent by weight |
|---|--------|-------------------|--------------|-----|-------------------|
|   |        |                   | lbs.         | oz. |                   |
| Rough and/or forage species<br>(River carpsucker, carp, and black bullhead) | 64     | 69.56             | 131          | 9   | 95.94             |
| Game species<br>(Largemouth bass, bluegill, white crappie)                  | 28     | 30.44             | 5            | 9   | 4.06              |
| Totals  | 92     | 100.00            | 137          | 2   | 100.00            |

Figure 6. Results of seining collections taken from Towle Park Lake near Snyder on July 27, 1960.

| Species          | Number | Percent by number |
|------------------|--------|-------------------|
| Green sunfish    | 6      | 20.68             |
| Redear sunfish   | 2      | 6.90              |
| Bluegill sunfish | 17     | 58.62             |
| White crappie    | 4      | 13.80             |
| Totals           | 29     | 100.00            |

Figure 7. Results of two netting samples taken from Old Anson Lake near Anson on October 26, 1960.

| Species          | Number    | Percent by number | Total weight |          | Average weight |      | Percent by weight | Average "K" |
|------------------|-----------|-------------------|--------------|----------|----------------|------|-------------------|-------------|
|                  |           |                   | lbs.         | oz.      | lbs.           | oz.  |                   |             |
| Carp             | 1         | 3.12              | 8            | 13       | 8              | 13   | 36.52             | 2.84        |
| Golden shiner    | 17        | 53.13             | 3            | 4        |                | 3.1  | 13.48             | 2.09        |
| Channel catfish  | 2         | 6.25              | 9            | 7        | 4              | 11.5 | 39.12             | 1.94        |
| Black bullheads  | 1         | 3.12              | 1            | 5        | 1              | 5    | 5.44              | .72         |
| Bluegill sunfish | 11        | 34.38             | 1            | 5        |                | 1.9  | 5.44              | 3.55        |
| <b>Totals</b>    | <b>32</b> | <b>100.00</b>     | <b>24</b>    | <b>2</b> |                |      | <b>100.00</b>     |             |

Figure 8. A comparison of rough and/or forage species to game species in Old Anson Lake.

|  | Number    | Percent by number | Total weight |          | Percent by weight |
|--|-----------|-------------------|--------------|----------|-------------------|
|  |           |                   | lbs.         | oz.      |                   |
| Rough and/or forage species<br>(Carp, golden shiner, black bullhead) | 19        | 59.37             | 13           | 6        | 55.44             |
| Game species<br>(Channel catfish, bluegill sunfish)                  | 13        | 40.63             | 10           | 12       | 44.56             |
| <b>Totals</b>  | <b>32</b> | <b>100.00</b>     | <b>24</b>    | <b>2</b> | <b>100.00</b>     |

Figure 9. Results of four netting samples taken from New Anson Lake near Anson on October 26, 1960.

| Species          | Number | Percent<br>by<br>number | Total weight |     | Average weight |      | Percent<br>by<br>weight | Average<br>"K" |
|------------------|--------|-------------------------|--------------|-----|----------------|------|-------------------------|----------------|
|                  |        |                         | lbs.         | oz. | lbs.           | oz.  |                         |                |
| Gizzard shad     | 29     | 15.02                   | 3            | 10  |                | 2    | 3.43                    | 1.83           |
| River carpsucker | 17     | 8.81                    | 32           | 14  | 1              | 14.9 | 31.12                   | 2.28           |
| Channel catfish  | 35     | 18.13                   | 48           | 15  | 1              | 6.4  | 46.33                   | 1.44           |
| Black bullheads  | 14     | 7.26                    | 2            | 10  |                | 3    | 2.49                    | 2.09           |
| Largemouth bass  | 1      | .52                     |              | 11  |                | 11   | .65                     | 1.98           |
| Bluegill sunfish | 2      | 1.03                    |              | 3   |                | 1.5  | .18                     | 3.51           |
| White crappie    | 95     | 49.23                   | 16           | 11  |                | 2.8  | 15.80                   | 2.51           |
| Totals           | 193    | 100.00                  | 105          | 10  |                |      | 100.00                  |                |

Figure 10. A comparison of rough and/or forage species to game species in New Anson Lake.

|   | Number | Percent by number | Total weight |     | Percent by weight |
|---|--------|-------------------|--------------|-----|-------------------|
|   |        |                   | lbs.         | oz. |                   |
| Rough and/or forage species<br>(Gizzard shad, River carp-sucker, black bullhead)    | 60     | 31.08             | 39           | 2   | 37.04             |
| Game species<br>(Channel catfish, largemouth bass, bluegill sunfish, White crappie) | 133    | 68.92             | 66           | 8   | 62.96             |
| Totals  | 193    | 100.00            | 105          | 10  | 100.00            |

Figure 11. Results of seining collections taken from New Anson Lake near Anson on October 26, 1960.

| Species          | Number | Percent by number |
|------------------|--------|-------------------|
| Gizzard shad     | 29     | 25.21             |
| Redhorse shiner  | 12     | 10.44             |
| Green sunfish    | 4      | 3.48              |
| Bluegill sunfish | 53     | 46.08             |
| White crappie    | 17     | 14.79             |
| Totals           | 115    | 100.00            |

Figure 12. Results of four netting samples taken from Lake Balmorhea near Balmorhea, June 16, 1960.

| Species          | Number | Percent<br>by<br>number | Total weight |     | Average weight |     | Percent<br>by<br>weight | Average<br>"K" |
|------------------|--------|-------------------------|--------------|-----|----------------|-----|-------------------------|----------------|
|                  |        |                         | lbs.         | oz. | lbs.           | oz. |                         |                |
| Gizzard shad     | 95     | 28.78                   | 49           | 4   |                | 8.3 | 16.87                   | 1.78           |
| River carpsucker | 162    | 49.09                   | 214          | 10  | 1              | 5.2 | 73.53                   | 2.34           |
| Carp             | 36     | 10.91                   | 3            | 6   | 1              | 1.5 | 1.16                    | 2.20           |
| Channel catfish  | 17     | 5.15                    | 17           | 5   | 1              | 0.3 | 5.93                    | 1.73           |
| White bass       | 8      | 2.43                    | 3            | 10  |                | 7.2 | 1.24                    | 2.09           |
| Largemouth bass  | 9      | 2.73                    | 3            | 1   |                | 5.4 | 1.05                    | 2.10           |
| Bluegill sunfish | 1      | .30                     |              | 3   |                | 3   | .07                     | 3.45           |
| White crappie    | 2      | .61                     |              | 7   |                | 3.5 | .15                     | 2.74           |
| Totals           | 330    | 100.00                  | 291          | 14  | .              |     | 100.00                  |                |

Figure 13. A comparison of rough and/or forage species to game species in Lake Balmorhea.

|   | Number | Percent by number | Total weight |     | Percent by weight |
|---|--------|-------------------|--------------|-----|-------------------|
|   |        |                   | lbs.         | oz. |                   |
| Rough and/or forage species<br>(Gizzard shad, river carpsucker, Carp)                           | 293    | 88.78             | 267          | 4   | 91.56             |
| Game species<br>(Channel catfish, white bass, largemouth bass, bluegill sunfish, white crappie) | 37     | 11.22             | 24           | 10  | 8.44              |
| Totals  | 330    | 100.00            | 291          | 14  | 100.00            |

Figure 14. Results of seining collections taken from Lake Balmorhea near Balmorhea, June 16, 1960.

| Species          | Number | Percent by number |
|------------------|--------|-------------------|
| Gizzard shad     | 47     | 42.72             |
| Banded tetras    | 14     | 12.73             |
| Carp             | 21     | 19.09             |
| White bass       | 6      | 5.46              |
| Bluegill sunfish | 19     | 17.27             |
| White crappie    | 3      | 2.73              |
| Totals           | 110    | 100.00            |

