

JOB COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-4-R-8

FISHERIES INVESTIGATIONS AND SURVEYS OF THE WATERS OF REGION 2-A

Job No. E-8 Evaluation of Rough Fish and
Vegetation Control Work in
Region 2-A

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March 28, 1962

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ABSTRACT

Cleburne State Park Lake is located 12 miles southwest of Cleburne, Johnson County, Texas. It was completed in 1937 by the Civilian Conservation Corps and covers 116 acres to a maximum depth of 36 feet.

A preliminary net check indicated a need for investigation with shad control as a possibility. A female gizzard shad weighing 5 pounds 9 ounces was taken during this netting.

A netting program was started in November 1960 which revealed that threadfin shad composed 60.53 per cent of the net catch. A chemical control for this species was attempted in November 1961.

The creel census that was run for one year prior to the shad control work revealed that the 5,080 fishermen fished 21,341.08 hours to catch 11,236 fish weighing 5,142.06 pounds. The catch per man-hour was 0.52 fish weighing 0.24 pounds. The length of the average fisherman day was 4.20 hours and the majority of the fishermen came from less than 50 miles away.

In order that the results of this work may be evaluated, it has been decided to use the unit system where one hour of fishing equals one unit and one pound of fish equals one unit. Therefore, the unit value of the fishing in Cleburne State Park Lake equals 26,483.14 units. This figure will be compared with a similar value derived from the results of a creel census that will be run for one year following the treatment to determine the value of the treatment in terms of cost per increase in fishing units.

JOB COMPLETION REPORT

State of Texas

Project No. F-4-R-8

Name: Fisheries Investigations and Surveys
of the Waters of Region 2-A

Job No. E-8

Title: Evaluation of Rough Fish and Vegetation
Control Work in Region 2-A

Period Covered: November 1, 1960-October 31, 1961

Objectives:

To evaluate presently used fishery management techniques including selective fish control and aquatic vegetation control, by determining the increase in fishing units (one pound of fish equals one unit and one hour of fishing equals one unit) and the cost per unit increase.

Techniques Used:

A basic survey and inventory of fish species was conducted on Cleburne State Park Lake to determine the physical characteristics of the lake and its watershed. Fish collections were made to determine the species present, their physical condition and relative abundance. All fish captured were identified, weighed, measured and examined to determine sexual maturity, food habits and coefficient of condition.

A creel census was conducted on two successive days of each week. One day was a week day and other a weekend day or holiday. The data collected was kept separate to determine the week day fishing pressure and success as compared with that on weekends or holidays. The items to be considered in this creel census are: Fishing pressure, fishing methods, rate of catch, length of fisherman day, source of fishing pressure and total fish harvest.

Findings:

Cleburne State Park Lake was constructed by the Civilian Conservation Corps and was completed in 1937. This 116 acre lake is located in a hilly cedar covered area 12 miles southwest of Cleburne, Johnson County, Texas. The shoreline is rather irregular and there is no cultivated land in the watershed. The water is very clear and affords a maximum depth of 36 feet with an average depth of 13.29 feet.

The preliminary net check which indicated a need for management produced a female gizzard shad that measured 20.5 inches in total length and weighed 5 pounds 9 ounces, (Figure No. 1). This is believed to be a world record as the largest specimen of this species previously recorded weighed 3 pounds 7 ounces and was reported from the Ohio River drainage. Schools of small shad were observed and their numbers indicated an investigation should be made to determine their relative abundance.

Netting

A netting program was begun in November 1960 and continued throughout the year. The results of this netting showed that the gizzard shad was not the problem species but did reveal an excessive population of threadfin shad. The results of this survey are shown in table 1. The small size of the threadfin shad allowed them to avoid capture as long as the $1\frac{1}{2}$ inch nets were used, but the introduction of one inch mesh nets resulted in the capture of many of this species.

The dominance of threadfin shad is quite apparent in table 1 where this species provides 60.53 per cent of the total number and despite their small size provide 28.68 per cent of the total weight. This overabundance led to the recommendation that a chemical control of shad be attempted in November 1961.

Creel Census

The creel census revealed that there was little fishing during December, January and February. Adverse weather conditions tended to discourage use of the lake during the winter but fishing became more popular with the advent of warmer weather. An examination of the data in table 2 reveals that bluegill sunfish are the most frequently caught species followed by redear sunfish and largemouth bass. White crappie were not a factor in the catch until October when they became the dominant species. A total of 2,236 fish were caught by the fishermen checked during this creel census.

Table 3 presents the data concerning the weight of the fish taken by the fishermen checked during this creel census. Largemouth bass provided the greatest number of pounds of any species taken, 433.52, followed by bluegill sunfish and redear sunfish with 226.04 and 187.99 pounds respectively. A total of 1,023.27 pounds of fish were taken by the 1,011 fishermen interviewed.

The data collected on week days was separated from that collected on weekend days or holidays in order that any variations due to the day of the week could be taken into consideration. These data are presented in table 4 and indicate little difference except for heavier fishing pressure on weekends. The weekend fishermen provided 74.38 per cent of the total fishermen checked, fished 74.45 per cent of total hours, and took 75.59 per cent of the total fish caught. The catch per man-hour was slightly higher but the pounds per man-hour was slightly less for the weekend fisherman.

A great majority of the fishermen fished from boats, but the number who used this method on weekends remained rather constant when compared with other weekend figures. The bank fishermen showed a rise in the percentage who fished on week days which was the reverse of the situation among trollers where weekend fishermen accounted for 89.55 per cent of those using this method. Still fishing was the most popular method of fishing and trotlining was the least favored.

The total number of fishermen using this lake is a matter of record as fishermen are required to obtain a permit before beginning to fish. A total of 5,080 permits were issued between November 1, 1960 and October 31, 1961. Therefore, the 1,011 fishermen contacted represent 19.9 per cent of this number. The data obtained from this creel census has been expanded to give the total fishing pressure and fishing success by use of this known percentage. The 5,080 fishermen

fished 21,341.08 hours to catch 11,236 fish weighing 5,142.06 pounds. This breaks down into 0.52 fish weighing 0.24 pounds per man-hour of fishing, (table 5).

An average fisherman-day was 4.12 hours on week days with 4.20 on weekends for a total of 4.20 hours for the overall average.

The source of the fishing pressure was found to be local, with the majority of the fishermen living within a 50 mile radius of the lake. There were very few that came more than 100 miles to fish. A small number were tourists who fished a short time in passing, but the majority were from the immediate vicinity and a great number were repeaters who fished from one to three times per week during favorable weather. This latter group provided the majority of the fish that were caught.

The system of evaluation that is being used is to have one pound of fish equal one unit and one man-hour of fishing equal one unit. By this system the unit value of the fishing in Cleburne State Park Lake from November 1, 1960 to October 31, 1961 was 26,483.14 units. This unit value is to be compared with that obtained by a similar creel census to be made following the shad control work which will help determine the effectiveness of such treatment.

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Approved by Marion Toole
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Date March 28, 1962

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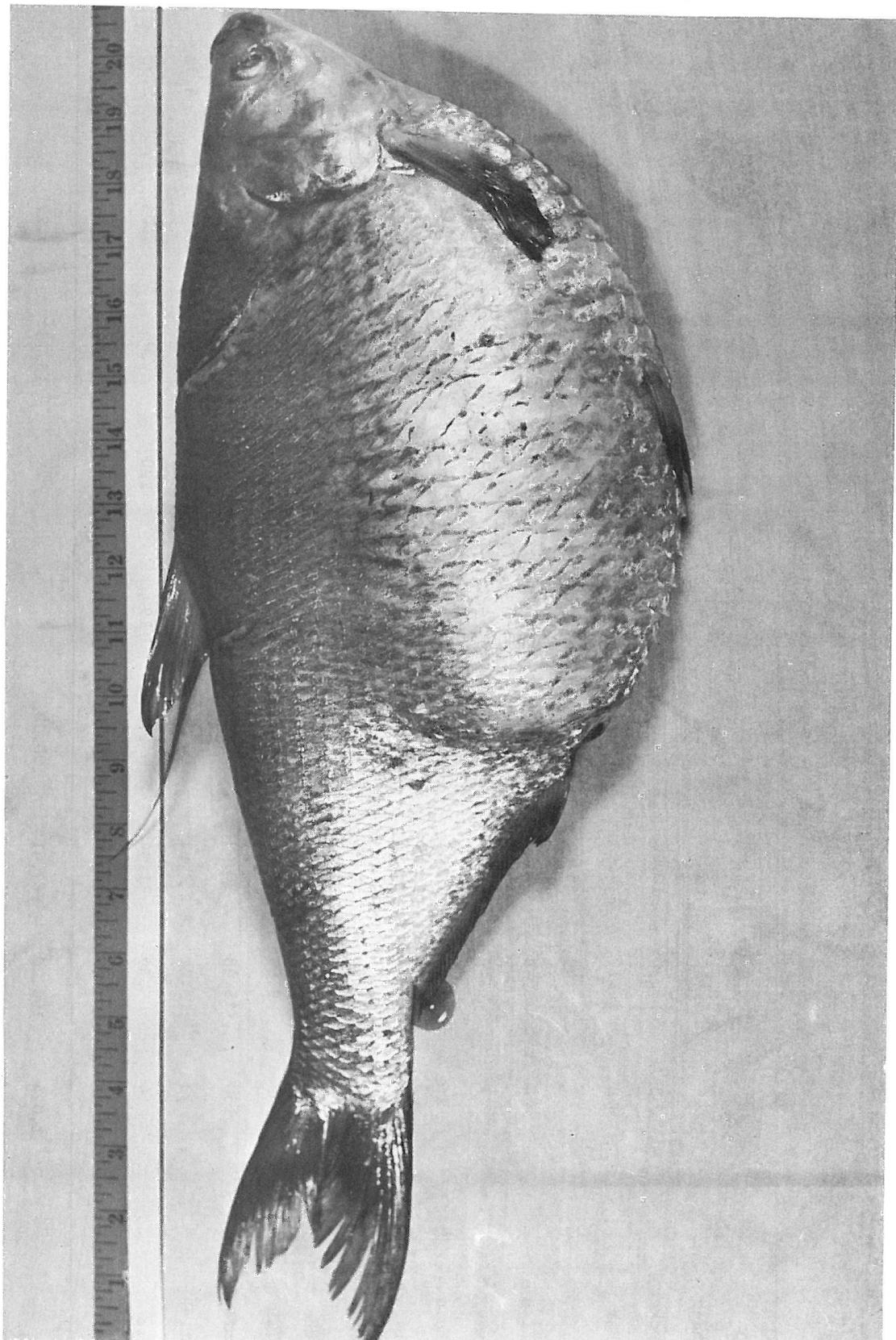


Figure 1. This gizzard shad, taken from Cleburne State Park Lake, was 20.5 inches long and weighed 5 pounds, nine ounces. It is believed to be a world record.

Table No. 1. The Results of Gill Net Collections from Cleburne State Park Lake, November 1, 1960 - October 31, 1961.

| Species | Total No. | Per Cent of Total | Total Weight (lbs.) | Per Cent of Weight | Average Length (mm) | Average Weight (gms.) | No. Per 100 Feet of Net | Lbs. Per 100 Feet of Net | "K" Average |
|------------------|-----------|-------------------|---------------------|--------------------|---------------------|-----------------------|-------------------------|--------------------------|-------------|
| Gizzard shad | 3 | .30 | 1.81 | .67 | 223 | 275 | .04 | .02 | 2.03 |
| Threadfin shad | 620 | 60.53 | 76.70 | 28.68 | 140 | 56 | 9.93 | 1.23 | 2.01 |
| River carpsucker | 3 | .30 | 10.80 | 4.04 | 421 | 1635 | .04 | .17 | 2.82 |
| Spotted sucker | 2 | .19 | 4.93 | 1.85 | 360 | 1120 | .03 | .08 | 2.80 |
| Carp | 7 | .69 | 56.02 | 20.95 | 530 | 3633 | .12 | .90 | 2.37 |
| Channel catfish | 4 | .39 | .59 | .22 | 176 | 68 | .06 | .01 | 1.20 |
| Black bullhead | 1 | .10 | .53 | .19 | 220 | 245 | .02 | .01 | 2.30 |
| Yellow bullhead | 25 | 2.44 | 11.43 | 4.28 | 205 | 207 | .40 | .18 | 2.16 |
| Largemouth bass | 28 | 2.73 | 28.93 | 10.82 | 245 | 469 | .44 | .46 | 2.20 |
| Warmouth | 34 | 3.32 | 11.44 | 4.28 | 153 | 152 | .55 | .19 | 3.71 |
| Green sunfish | 5 | .49 | 1.46 | .54 | 149 | 133 | .08 | .02 | 3.68 |
| Redear sunfish | 89 | 8.69 | 24.50 | 9.16 | 152 | 124 | 1.42 | .39 | 3.38 |
| Bluegill sunfish | 158 | 15.43 | 30.42 | 11.38 | 124 | 87 | 2.53 | .49 | 3.90 |
| Longear sunfish | 33 | 3.22 | 2.82 | 1.05 | 106 | 38 | .53 | .04 | 4.31 |
| White crappie | 4 | .39 | 1.94 | .73 | 190 | 220 | .06 | .03 | 2.52 |
| Black crappie | 8 | .79 | 3.09 | 1.16 | 273 | 175 | .13 | .05 | 2.81 |
| Totals | 1,024 | 100.00 | 267.41 | 100.00 | | | 15.78 | 4.27 | |

Table 2. Number of Each Species Taken from Cleburne State Park Lake by the Fishermen Checked During the Creel Census, November 1, 1960 through October 31, 1961

| SPECIES | Nov. | Dec. | Jan. | Feb. | March | Apr. | May | June | July | Aug. | Sept. | Oct. | Totals |
|------------------|------|------|------|------|-------|------|-----|------|------|------|-------|------|--------|
| Carp | | | | | | | | 2 | | | | | 2 |
| Channel catfish | | | | | | | 1 | 8 | 2 | 3 | | 5 | 19 |
| Bullhead catfish | | | | | | 2 | 4 | 8 | 28 | 2 | 2 | | 46 |
| Largemouth bass | 33 | | 8 | | 13 | 41 | 49 | 36 | 33 | 90 | 71 | 82 | 456 |
| Warmouth | | | | | 2 | 6 | 14 | 1 | 7 | 1 | | | 31 |
| Green sunfish | | | | | | | | 12 | 2 | | | | 14 |
| Redear sunfish | | | | | | 91 | 89 | 118 | 153 | 58 | 35 | 19 | 563 |
| Bluegill sunfish | 2 | | | | 1 | 88 | 172 | 204 | 313 | 60 | 47 | 37 | 924 |
| Longear sunfish | | | | | | 10 | 1 | 9 | | 1 | | 1 | 22 |
| Crappie | 2 | | | 1 | 8 | 9 | 3 | | 5 | 14 | 7 | 110 | 159 |
| Totals | 37 | | 8 | 1 | 24 | 247 | 333 | 398 | 543 | 229 | 162 | 254 | 2,236 |

Table 3. Weight, in Pounds, of Each Species Taken From Cleburne State Park Lake by the Fishermen Checked During the Creel Census, November 1, 1960 through October 31, 1961.

| SPECIES | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Total |
|------------------|-------|------|-------|------|-------|--------|--------|--------|--------|--------|--------|--------|----------|
| Carp | | | | | | | | 1.00 | | | | | 1.00 |
| Channel catfish | | | | | .30 | | | 5.20 | 1.30 | 1.83 | | 3.48 | 12.11 |
| Bullheads | | | | | 6.03 | 2.04 | | 8.80 | 32.85 | 2.74 | 4.99 | | 57.45 |
| Largemouth bass | 22.66 | | 16.29 | | 9.71 | 32.15 | 41.93 | 40.35 | 26.95 | 111.92 | 75.67 | 55.89 | 433.52 |
| Warmouth | | | | | .73 | 2.93 | 5.92 | .10 | 2.05 | .29 | | | 14.63 |
| Green sunfish | | | | | | | | 4.80 | .68 | | | | 5.48 |
| Redear sunfish | | | | | | 35.55 | 28.72 | 49.31 | 46.65 | 14.77 | 8.47 | 4.52 | 187.99 |
| Bluegill sunfish | .40 | | | | .34 | 29.25 | 41.30 | 46.14 | 76.58 | 11.56 | 10.99 | 9.84 | 226.04 |
| Longear sunfish | | | | | | 3.65 | .07 | 1.10 | 2.84 | .09 | | .09 | 5.00 |
| Crappie | 1.14 | | | 1.22 | 15.53 | | 1.45 | | | 5.92 | 1.37 | 50.58 | 80.05 |
| Totals | 24.20 | -- | 16.29 | 1.22 | 26.31 | 112.77 | 125.72 | 156.80 | 189.91 | 149.12 | 101.49 | 124.38 | 1,023.27 |

Table 4. A comparison of week days and weekend days fishing, in terms of percentages, based on the 1960-1961 creel census, Cleburne State Park Lake, November 1, 1960-October 31, 1961.

| | WEEK DAYS | | WEEKEND DAYS | | Totals |
|------------------------------|-----------|----------|--------------|----------|----------|
| | Number | Per Cent | Number | Per Cent | |
| Total fishermen checked | 259.00 | 25.62 | 752.00 | 74.38 | 1,011.00 |
| Total hours fished | 1,085.00 | 25.55 | 3,162.00 | 74.45 | 4,241.00 |
| Number of fish caught | 537.00 | 24.02 | 1,699.00 | 75.89 | 2,236.00 |
| Fish per man-hour | 0.49 | | 0.53 | | 0.52 |
| Pounds of fish caught | 271.00 | 26.52 | 751.87 | 73.48 | 1,023.00 |
| Pounds per man-hour | 0.25 | | 0.23 | | 0.24 |
| Number persons boat fishing | 214.00 | 24.19 | 671.00 | 75.81 | 885.00 |
| Number persons bank fishing | 45.00 | 35.72 | 81.00 | 64.28 | 126.00 |
| Number persons still fishing | 195.00 | 27.13 | 524.00 | 72.87 | 719.00 |
| Number persons casting | 50.00 | 25.13 | 149.00 | 74.87 | 199.00 |
| Number persons trolling | 7.00 | 10.45 | 60.00 | 89.55 | 67.00 |
| Number persons trotlining | 7.00 | 26.93 | 19.00 | 73.07 | 26.00 |

Table 5. A Comparison of Week Days and Weekend Days Fishing Results Together with Calculated Fishing Results based on the 1960-1961 Creel Census, Cleburne State Park Lake, November 1, 1960-October 31, 1961.

| <u>ACTUAL DATA FROM CREEL CENSUS</u> | | | | |
|--------------------------------------|-----------|--------------|----------|--------------------|
| | Week-days | Weekend-days | Totals | Calculated totals* |
| Total fishermen | 259.00 | 752.00 | 1,011.00 | 5,080.00 |
| Hours fished | 1,085.00 | 3,162.00 | 4,247.00 | 21,341.08 |
| Hours in fisherman days | 4.19 | 4.20 | 4.20 | 4.20 |
| Number of fish caught | 537.00 | 1,699.00 | 2,236.00 | 11,236.00 |
| Fish per man-hour | 0.49 | 0.53 | 0.52 | 0.52 |
| Pounds of fish caught | 271.40 | 751.87 | 1,023.27 | 5,142.06 |
| Pounds per man-hour | 0.25 | 0.23 | 0.24 | 0.24 |
| No. persons boat fishing | 214.00 | 671.00 | 885.00 | 4,447.00 |
| No. persons bank fishing | 45.00 | 81.00 | 126.00 | 633.00 |
| No. persons still fishing | 195.00 | 524.00 | 719.00 | 3,612.00 |
| No. persons casting | 50.00 | 149.00 | 199.00 | 1,001.00 |
| No. persons trolling | 7.00 | 60.00 | 67.00 | 335.00 |
| No. persons trotlining | 7.00 | 19.00 | 26.00 | 132.00 |

* The fishermen checked during the creel census represented 19.9 per cent of the total number of fishermen using the lake. The total number of fishermen is actual data taken from park record.