

JOB COMPLETION REPORT

FILE

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-4-R-11

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

Job No. B-31: Inventory of Hubbard Creek and Proctor Lakes
Including an Evaluation of the Pre-impoundment
Rotenone Treatment of Hubbard Creek Lake.

Project Leader: L. D. Lamb

J. Weldon Watson
Executive Director
Texas Parks and Wildlife Department
Austin, Texas

Marion Toole
D-J Coordinator

Eugene A. Walker
Assistant Director for Wildlife

July 9, 1965

ABSTRACT

Investigations were conducted on Hubbard Creek Lake and Proctor Lake to determine the success of the pre-impoundment rotenone treatment on the fish population of Hubbard Creek Lake. Data taken from the two reservoirs were compared to determine the effects of pre-impoundment treatment.

The total percent by number of rough fish in Proctor is 40.72 while Hubbard has 40.65 per cent. In per cent of weight rough fish are more abundant in Hubbard Creek with 54.94 compared with Lake Proctor's 41.85.

JOB COMPLETION REPORT

State of Texas

Project No. F-4-R-11

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

Job No. B-31

Title: Inventory of Hubbard Creek and Proctor Lakes Including an Evaluation of the Pre-impoundment Rotenone Treatment of Hubbard Creek Lake.

Period covered: November 1, 1963 - October 31, 1964

OBJECTIVES:

1. To determine the fish species present, their relative abundance and the factors influencing their distribution.
2. To compare the fish population, in Hubbard Creek Lake (pre-impoundment rotenone treatment of watershed) with those of Proctor Lake (untreated watershed) to determine the following:
 - a. Rough fish - game fish ratio.
 - b. Growth rates (based on length of time since stocking)
 - c. Coefficient of condition of game species.
 - d. Reproduction of game species.

INTRODUCTION

Hubbard Creek

Hubbard Creek Lake is located nine miles Northwest of Breckenridge in Stephens County, Texas. The earthen dam, across Hubbard Creek below the confluence with Sandy Creek, will impound approximately 18,000 surface acres when full. Hubbard Creek dam was built by the City of Abilene, Texas, in order to provide water for this city and smaller surrounding towns. Since the project was created for a water supply alone, no roads, fishing facilities or public launching ramps were built. Clearing of brush from the lake basin was complete. During this segment of work the lake inundated about 4,000 surface acres.

Soils on the watershed are primarily of clay, and clay-loam with underlying limestone. Shoreline vegetation is very limited. Mesquite is the predominant tree while the shoreline supports bermuda grass, sunflowers and various other range grasses and weeds. Hubbard Lake is very susceptible to wind which hinders fishermen due to high wave action.

Hubbard and Sandy Creek, within the lake basin, were treated at the rate of 1.5 ppm liquid rotenone during the last two weeks of August 1962. Prior to the basin treatment all farm ponds were treated with powdered rotenone in order to remove the existing fish population.

The small ponds were then stocked with bass and catfish in anticipation that these would provide a brood stock when inundated by the rising lake.

Proctor Lake

Proctor Lake is located on the Leon River near Proctor, Comanche County, Texas. The structure was built by the Corps of Army Engineers for flood prevention and recreation. Work on the dam was completed in the spring of 1963 and due to heavy rains on the watershed the lake was filled immediately.

Lake Proctor has 4,600 surface acres of water which is supplied by Brushy Creek, Sabina River and Leon River. Soils on the watershed are primarily sand with underlying clay. Peanuts and water-melons are the principal crops grown on the immediate watershed. The shoreline has a variety of trees and grasses. Large pecan trees interspersed with post oak form the dominant vegetation while bermuda is the most abundant grass.

Launching ramps, camp sites, picnic areas and paved roads, built by the Army Corps of Engineers, make the lake very attractive and extremely accessible to the public.

Both Hubbard Creek and Proctor Lakes are new impoundments completed in late 1962 and early 1963. Both reservoirs were stocked with catfish and largemouth bass from State hatcheries.

Procedure:

Standard type gill nets were used and set at random locations for each collection. Standard gill nets are 150 feet long, 8 feet deep with graduated mesh from one inch to three and one-half inch changing every 25 feet. Nets were set in the afternoon and raised the following morning and left for a 24 hour period before removing them from the lake. Both Hubbard Creek and Proctor were netted in the same manner.

Data for individuals taken in nets consisted of length, weight, sex, stage of sexual development and stomach analysis to determine food habits of different species.

Seining collections were taken from both lakes using a combination of seines: A 20 - by 4-foot commonsense minnow seine, a 26 - by 6 - foot bag seine and a 60 - by 6 - foot straight seine. Specimens were preserved in 10 per cent formalin solution and brought to the laboratory for identification.

Findings:

Netting - Lake Proctor

Netting and seining from both Hubbard Creek and Proctor Lakes yielded a total of twenty-three species of fish representing nine families.

A total of 2,179 fish were taken in eight collections from Proctor Lake. White crappie proved to be the most abundant species with 843 or 38.68 per cent by numbers netted. Largemouth bass were next with 221 or 10.14 per cent followed by river carpsucker with 217 or 9.96 per cent, drum with 203 or 9.32, carp with 190 or 8.72 and channel catfish with 123 or 5.64 per cent (Table No. 1).

Reconnaissance netting during the 1962 -1963 segment (Job No. B-29) shows bass to have an average length of 226 millimeters while this year the average length is 254 or an increase of 28 millimeters. During the 1962 -1963 reconnaissance the average weight of bass was 295 grams while this segment shows an average of 454 grams for an increase of 159 grams. Average "K" for bass remained relatively unchanged. (Tables No. 1 and No. 2).

White crappie show a slight increase in both average length and average weight but a slight drop in the "K" average while channel cat show a slight drop in average length but an increase in average weight.

Stocking Lake Proctor was accomplished in 1963. Largemouth bass fry were released as follows: May 27, 51,000; May 30, 40,000; June 13, 50,800; and June 19, 15,000; 21,700 channel catfish were stocked June 16 and on November 11, 1963 a total of 5,250 flathead catfish were released in Proctor.

Seining - Proctor

Brush and other obstructions covered by the newly formed lake made seining difficult. Only sand flats and launching areas could be seined. Seine samples taken during the month of June yielded the following: gizzard shad - 148; blackstripe topminnow - 1; buffalo - 2; and gambusia - 6. These were taken with a 20 foot seine while seining near launching ramps. During July a 60 foot straight seine was utilized to seine on the sand flats and this collection produced 406 gizzard shad, 14 bluegill, 500 red shiner, 10 buffalo and one crappie. A 26 foot bag seine was purchased in August and was used to take 8 shad, 208 red shiner and 4 crappie while seining near weed beds and brush.

Netting - Hubbard Creek

A total of 1,481 fish were caught by ten collections from Hubbard Creek Lake. Bluegill sunfish proved to be the most abundant species with 342 or 23.09 per cent by numbers netted. Largemouth bass were next with 212 or 14.31 per cent followed by buffalo with 203 or 13.71 per cent, carp with 161 or 10.87 per cent, shad with 152 or 10.26 and blue catfish with 134 or 9.05 per cent (Table No. 3).

Reconnaissance netting during the 1962 - 1963 segment (Job B-29) shows largemouth bass to have an average length of 230 millimeters while this year the average length is 253 millimeters or an increase of 23 millimeters. During the 1962 - 1963 reconnaissance the average weight of bass was 299 grams while this year shows an average of 414 grams or an increase of 113 grams. Average "K" for bass has decreased only slightly (Tables No. 3 and No. 4).

White crappie and channel catfish show only a slight change in average length or weight, but blue catfish show a considerable increase in both average length and weight.

Fish stocking in Hubbard Creek Lake from State Fish Hatcheries was completed immediately after the lake caught water. A total of 36,000 blue catfish; 2,000 flathead catfish and 150,000 fingerling channel catfish were released into the lake. In addition to the above mentioned fish 31,000 largemouth bass were released into the lake.

Seining in Hubbard Creek was made difficult also due to the rough type ground which the water inundated. Seining during the month of July 1964, using a 60 foot straight seine produced one longear sunfish, seven bluegill, 61 red shiner and only 2 gizzard shad. Using a 26 foot bag seine and seining in small sloughs near the dam, the catch increased in number to 4,000 red shiner, 2 largemouth bass, 7 bluegill, 12 shad, 9 buffalo and 1 crappie.

Discussion:

The small number of shad in the seine sample taken from Hubbard Creek tends to indicate that the pre-impoundment treatment was a success in reducing shad but the feeding habits of the bass, catfish and crappie as shown by stomach analysis, show that shad made up the greater portion of their diet. Crappie made up the next most abundant species found in the stomach analysis. Stomach analysis of fish from Lake Proctor indicated that shad was utilized as the major forage species.

Shad reproduce very rapidly as shown by the work done on Fincastle Lake in East Texas therefore they will tend to become a major rough fish in Hubbard Creek Lake.

Gill net samples indicate a smaller per cent of shad in Lake Proctor than in Hubbard Creek. Proctor filled without the pre-impoundment rotenone treatment. Buffalo and river carpsucker are present in Proctor also but the total per cent by number of rough fish in Proctor is 40.72 while Hubbard Creek Lake has 40.65 per cent rough fish by number.

Therefore the two lakes have approximately the same ratio of fish as also shown by per cent by weight. Hubbard Creek shows 54.94 per cent and Lake Proctor shows 41.85 per cent by weight of rough fish.

Recommendations:

It is recommended that the project be continued in order to determine the condition and the ratio of rough fish to game fish. Preliminary analysis based on the data gathered during this segment indicate that the pre-impoundment treatment of Hubbard Creek either was not successful or that the reduction of the fish population does not have long enough lasting benefits to justify the cost.

Prepared by: Dwane Q. Smith
Co-Leader

Approved by Marion Toole
(Coordinator)

Date: July 9, 1965

JOHN E. TILTON,
Regional Supervisor

Table 1. Results of netting Lake Proctober November 1, 1963 - October 30, 1964

| Species | Number | Per Cent by Number | Total Weight Pounds | Per Cent by Weight | Average Length mm | Average Weight Gms | Average "K" |
|--------------------|--------|--------------------------|---------------------------|--------------------------|-------------------------|--------------------------|----------------|
| Spotted gar | 60 | 2.75 | 100.10 | 7.55 | 478 | 757 | --- |
| Longnose gar | 9 | 0.41 | 26.16 | 1.98 | 668 | 1319 | --- |
| Gizzard shad | 90 | 4.13 | 28.16 | 2.12 | 184 | 142 | 1.68 |
| Smallmouth buffalo | 45 | 2.07 | 23.63 | 1.79 | 198 | 238 | 2.56 |
| River carpsucker | 217 | 9.96 | 131.26 | 9.91 | 218 | 274 | 2.41 |
| European carp | 190 | 8.72 | 92.40 | 6.97 | 192 | 220 | 2.43 |
| Channel catfish | 123 | 5.64 | 125.09 | 9.45 | 290 | 461 | 1.44 |
| Black bullhead | 42 | 1.93 | 33.70 | 2.54 | 228 | 364 | 2.22 |
| Yellow bullhead | 31 | 1.43 | 22.37 | 1.69 | 224 | 327 | 2.63 |
| Flathead catfish | 11 | 0.51 | 33.07 | 2.50 | 405 | 1365 | 1.59 |
| Largemouth bass | 221 | 10.14 | 221.24 | 16.70 | 254 | 454 | 2.37 |
| Warmouth | 12 | 0.55 | 4.30 | 0.32 | 171 | 162 | 3.13 |
| Greensunfish | 28 | 1.28 | 4.12 | 0.32 | 129 | 66 | 2.58 |
| Redear sunfish | 1 | 0.05 | 0.08 | 0.07 | 115 | 40 | 2.70 |
| Bleugill sunfish | 52 | 2.39 | 4.42 | 0.34 | 103 | 38 | 3.68 |
| Longear sunfish | 1 | 0.05 | 0.11 | 0.09 | 115 | 50 | 3.45 |
| White crappie | 843 | 38.68 | 377.65 | 28.52 | 201 | 203 | 2.65 |
| Freshwater drum | 203 | 9.32 | 96.68 | 7.30 | 215 | 216 | 2.14 |
| Total | 2179 | 100.00 | 1324.54 | 100.00 | | | |

Table 2. Lake Proctor netting results, 1962 - 1963 (Reconnaissance)

| Species | Number | Per Cent by Number | Total Weight Pounds | Per Cent by Weight | Average Length mm | Average Weight Gms | Average "K" |
|--------------------|--------|--------------------------|---------------------------|--------------------------|-------------------------|--------------------------|----------------|
| Spotted gar | 20 | 4.48 | 31.70 | 10.84 | 462 | 719 | 0.72 |
| Longnose gar | 1 | 0.23 | 2.12 | 0.72 | 600 | 964 | --- |
| Gizzard shad | 21 | 4.71 | 8.44 | 2.89 | 221 | 198 | 1.76 |
| Smallmouth buffalo | 21 | 4.71 | 5.67 | 1.94 | 119 | 118 | 2.53 |
| River carpsucker | 13 | 2.92 | 11.62 | 3.98 | 238 | 406 | 2.35 |
| European carp | 22 | 4.93 | 16.50 | 5.64 | 232 | 431 | 2.12 |
| Channel catfish | 108 | 24.21 | 101.95 | 34.88 | 308 | 389 | 2.45 |
| Black bullhead | 25 | 5.61 | 17.51 | 5.99 | 238 | 318 | 2.27 |
| Yellow bullhead | 3 | 0.67 | 2.00 | 0.68 | 252 | 305 | 1.93 |
| Flathead catfish | 1 | 0.22 | 0.70 | 0.24 | 270 | 320 | 1.65 |
| Largemouth bass | 73 | 16.37 | 47.43 | 16.23 | 226 | 295 | 2.39 |
| Green sunfish | 8 | 1.80 | 1.60 | 0.55 | 141 | 90 | 3.15 |
| Bluegill sunfish | 18 | 4.30 | 1.64 | 0.56 | 105 | 43 | 3.90 |
| Longear sunfish | 5 | 1.12 | 0.47 | 0.16 | 105 | 43 | 3.81 |
| White crappie | 104 | 23.32 | 42.17 | 14.42 | 190 | 184 | 2.72 |
| Freshwater drum | 3 | 0.67 | 0.79 | 0.28 | 163 | 120 | 2.78 |
| Total | 446 | 100.00 | 292.31 | 100.00 | | | |

Table 3. Results of netting Hubbard Creek Lake November 1, 1963 - October 30, 1964

| Species | Number | Per Cent by Number | Total Weight Pounds | Per Cent by Weight | Average Length mm | Average Weight Gms | Average "K" |
|--------------------|--------|--------------------------|---------------------------|--------------------------|-------------------------|--------------------------|----------------|
| Spotted gar | 6 | 0.40 | 6.39 | 0.56 | 437 | 580 | 0.68 |
| Longnose gar | 13 | 0.88 | 85.42 | 7.60 | 760 | 2983 | ----- |
| Gizzard shad | 152 | 10.26 | 62.24 | 5.53 | 211 | 185 | 1.67 |
| Smallmouth buffalo | 203 | 13.71 | 174.43 | 15.50 | 221 | 391 | 2.77 |
| River carpsucker | 29 | 1.96 | 44.97 | 4.00 | 306 | 704 | 2.32 |
| European carp | 161 | 10.87 | 217.09 | 19.29 | 296 | 612 | 2.12 |
| Channel cat | 84 | 5.67 | 53.97 | 4.80 | 259 | 291 | 1.31 |
| Blue cat | 134 | 9.05 | 111.22 | 9.89 | 289 | 376 | 1.38 |
| Black bullhead | 18 | 1.21 | 4.81 | 0.42 | 171 | 121 | 1.82 |
| Flathead cat | 10 | 0.68 | 45.15 | 4.02 | 495 | 2049 | 1.75 |
| Largemouth bass | 212 | 14.31 | 193.59 | 17.20 | 253 | 414 | 2.18 |
| Warmouth | 2 | 0.14 | 0.57 | 0.05 | 170 | 130 | 2.49 |
| Green sunfish | 9 | 0.61 | 1.10 | 0.10 | 128 | 55 | 2.56 |
| Bluegill sunfish | 342 | 23.09 | 28.53 | 2.54 | 103 | 37 | 3.29 |
| White crappie | 86 | 5.80 | 67.97 | 6.04 | 242 | 358 | 2.61 |
| Freshwater drum | 20 | 1.36 | 27.63 | 2.46 | 304 | 627 | 2.07 |
| Total | 1481 | 100.00 | 1125.08 | 100.00 | | | |

Table 4. Hubbard Creek Lake netting results, 1962 - 1963 (Reconnaissance)

| Species | Number | Per Cent by Number | Total Weight Pounds | Per Cent by Weight | Average Length mm | Average Weight Gms | Average "K" |
|--------------------|--------|--------------------------|---------------------------|--------------------------|-------------------------|--------------------------|----------------|
| Spotted gar | 8 | 3.00 | 8.58 | 4.29 | 441 | 487 | 0.65 |
| Longnose gar | 12 | 4.51 | 31.65 | 15.84 | 677 | 1596 | 0.57 |
| Gizzard shad | 22 | 8.27 | 12.07 | 6.05 | 237 | 249 | 1.75 |
| Smallmouth buffalo | 31 | 11.65 | 35.39 | 17.71 | 221 | 518 | 2.90 |
| River carpsucker | 3 | 1.13 | 3.37 | 1.69 | 252 | 511 | 2.51 |
| European carp | 52 | 19.55 | 34.74 | 17.39 | 243 | 303 | 2.33 |
| Channel catfish | 33 | 12.41 | 26.35 | 13.19 | 263 | 362 | 1.37 |
| Blue catfish | 52 | 19.55 | 17.11 | 8.57 | 256 | 228 | 1.30 |
| Black bullhead | 6 | 2.26 | 2.20 | 1.10 | 199 | 166 | 2.00 |
| Flathead catfish | 1 | 0.37 | 1.37 | 0.68 | 330 | 624 | 1.75 |
| Largemouth bass | 33 | 12.41 | 19.77 | 9.90 | 230 | 299 | 2.22 |
| Bluegill sunfish | 5 | 1.88 | 0.59 | 0.30 | 111 | 54 | 3.80 |
| White crappie | 5 | 1.88 | 3.87 | 1.93 | 288 | 351 | 2.76 |
| Freshwater drum | 3 | 1.13 | 2.70 | 1.36 | 228 | 408 | 2.56 |
| Total | 266 | 100.00 | 199.76 | 100.00 | | | |

Table 5. Inventory of Species Present in Hubbard Creek and Proctor Lakes.

- I. LEPISOSTEIDAE -- (Gars)
 1. L. oculatus - (Spotted gar)
 2. L. osseus - (Longnose gar)
- II. CLUPEIDAE -- (Herrings)
 3. Dorosoma cepedianum - (Gizzard shad)
- III. CATOSTOMIDAE -- (Suckers and buffalofishes)
 4. Ictiobus bubalus - (Smallmouth buffalo)
 5. Carpionotus carpio - (River carpsucker)
- IV. CYPRINIDAE -- (Shiners and minnows)
 6. Cyprinus carpio - (European carp)
 7. Notemigonus crysoleucas - (Golden shiner)
 8. Notropis lutrensis - (Red shiner)
- V. AMEIURIDAE -- (Freshwater catfishes)
 9. Ictalurus punctatus - (Channel catfish)
 10. Ictalurus furcatus - (Blue catfish)
 11. Ictalurus melas - (Black bullhead)
 12. Ictalurus natalis - (Yellow bullhead)
 13. Pylodictis olivaris - (Flathead catfish)
- VI. CYRPINODONTIDAE -- (Topminnows)
 14. Fundulus notatus - (Blackstripe topminnow)
- VII. POECILIIDAE (mosquitofish)
 15. Gambusia affinis - (Mosquitofish)
- VIII. CENTRARCHIDAE -- (Black basses and sunfishes)
 16. Micropterus salmoides - (Largemouth bass)
 17. Chaenobryttus gulosus - (Warmouth)
 18. Lepomis cyanellus - (Green sunfish)
 19. Lepomis microlophus - (Redear sunfish)
 20. Lepomis macrochirus - (Bluegill sunfish)
 21. Lepomis megalotis - (Longear sunfish)
 22. Pomoxis annularis - (White crappie)
- IX. SCIAENIDAE - (Freshwater drum)
 23. Aplodinotus grunniens - (Freshwater drum)

