JOB PROGRESS REPORT

As Requested By

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-3-R-19

Region III-B Fisheries Studies

Job No. 17: Largemouth Bass Studies

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ABSTRACT

The multiple objectives considered mandatory for this study have resulted in considerable amounts of field data for the 1971 segment. Correlations of species composition between Lakes Murvaul and Tyler West are interesting. Lake Murvaul contains no buffalo, carp, or freshwater drum with the dominant rough fish species being the gizzard shad. Lake Tyler carp represented 55.52 per cent of the consolidated netting total weight.

The recent collections made with electro-fishing gear have greatly improved the collection of bass for tagging purposes. Creel census and stomach analysis data have not been fully evaluated to date. It is anticipated that adequate numbers of largemouth bass will be collected during the coming segment to provide valid growth rate determinations on both Lake Murvaul and Lake Tyler West.

JOB PROGRESS REPORT

State Texas Name: Region III-B Fisheries Studies

Project No. F-3-R-19

Job No. 17 Title: Largemouth Bass Studies

Period Covered: February 1, 1971 to January 31, 1972.

OBJECTIVES:

PS: To identify factors that may be responsible for differences in largemouth bass populations and growth rates in two East Texas reservoirs.

Segment:

1. To identify the interrelationships of the largemouth bass populations and other species.

   (a) The extent of predation on bass spawns by other species.

   (b) The competition among predators including bass for forage species.

   (c) Correlate fishing success and species composition.

2. To estimate the influence of invertebrate populations on bass fry populations.

3. To monitor growth rates of known-age largemouth bass.

4. To determine variations in chemical water quality and possible relationships concerning bass production in each lake.

PROCEDURES:

1. Population survey data from previous segments collected under separate jobs on both reservoirs were utilized to determine species abundance. Current population data were collected with the use of experimental gill nets, bag seines, and an electro-fishing boat.

   (a) Stomach analyses were made on various species of forage fishes and sunfish to determine the extent of predation, if any, on bass spawns.

   (b) Stomach analyses were also conducted on various predator species, including largemouth bass, to estimate the extent of predation on individual forage species.

   (c) Fishing pressure influence was evaluated on both lakes by creel census. Correlations on various criteria of fishing success will be made.

2. Invertebrates collected from seine and plankton net samples were compared volumetrically. Class 0 largemouth bass stomachs were examined for incidence of invertebrate food items.

3. Largemouth bass fingerlings from Lakes Murvaul and Tyler West were mass marked with a flourescent pigment for monitoring growth rates. Additional tagging of adult bass with plastic dart tags was conducted to evaluate growth rates in each lake.

4. Chemical water quality analyses were conducted on each lake with the use of a Hach field kit. Tests included pH, chlorides, total hardness, total alkalinity, dissolved oxygen, and temperature.

FINDINGS:

Species Composition Data:

Some interesting comparisons are evident in the species composition of the two lakes. Consolidated netting data from six separate collections revealed a 14.52 per cent by weight figure for largemouth bass in Murvaul and only 3.41 per cent in Lake Tyler West. Murvaul contains no buffalo, carp, or drum. This conclusion is based on current data as well as that collected under separate jobs since the lakes impoundment in 1957.

In Lake Tyler, carp comprised 55.52 per cent of the total weight. It is interesting to note that these carp weighed 1.029 pounds, a figure considerably higher than the weight of all species collected from Murvaul. Freshwater drum made up 8.45 per cent by weight of the Tyler collections.

The dominant rough fish species in Murvaul is the gizzard shad, which represented 28.64 per cent of the collections. The bowfin is also considered an important predator species in Murvaul. Only 2 bowfin were netted at Murvaul this segment but numerous bowfin were observed while operating electro-fishing gear at night in January.

Eight flathead catfish weighing 156 pounds were collected from Murvaul as compared to one 8-pound fish at Tyler West. Several large flatheads were taken by sport fishermen on trotlines in Tyler this year. The flathead is a significant predator species in both lakes, particularly in Murvaul where habitat is optimum in the timbered areas of the lake. Both lakes now contain adequate channel catfish populations. This species has been increased in Murvaul since 1968, through a rearing-stocking program conducted by the Panola County Water District, owners of the lake.

Fish Tagging and YOY Mass Marking:

The inability to capture adequate numbers of largemouth bass for tagging was a serious detriment to this phase of the study before electro-fishing equipment was received in January 1972. Prior to the use of this equipment, a total of 100 bass had been captured and tagged in Murvaul and only 24 in Lake Tyler. With the electro-fishing boat an additional 120 bass in Murvaul and 36 in Tyler were tagged within a week. It is now anticipated that this collection method will provide adequate numbers for tagging and consequent growth evaluations.

Approximately 8,000 young-of-the-year bass fingerlings were seined and mass-marked with flourescent pigment at Lake Murvaul. Less than 500 were collected and marked in Lake Tyler West. Average lengths of randomly selected recaptured Murvaul fingerlings indicated a stable growth rate through October 1971. A comparison of average lengths from fingerlings marked in early June indicated an earlier spawn in Murvaul this year. The lack of protective cover in Lake Tyler is believed to be an important factor in the apparent low bass reproduction. Reduced shoreline vegetation is attributed, at least in part, to the large carp population in Tyler. Predation by this species on bass spawns is suspected although stomach analysis did not reveal positive identification of bass eggs. Increased effort to evaluate carp in Lake Tyler will be made in 1972.

Invertebrate Comparisons:

Lake Murvaul has maintained a high basic fertility since its impoundment. Nurtients are flushed annually from the fertile watershed, much of which is farmland and improved pasture. Volumetric plankton counts from Murvaul in April 1971, were significantly higher than those from Tyler. Counts taken in May-June 1971, were similar for both lakes. The initial early bloom in Murvaul is believed to be significant to the good bass production.

Stomach analyses on YOY bass from both lakes revealed that freshwater shrimp is a prevalent food item. Both lakes contain good populations of this crustacean as indicated by seine collections. Stomachs of the blacktail shiner were examined at Lake Tyler to determine if this abundant forage species was competing with bass fingerlings. It was determined that competition for aquatic insects does exist between these species.

Predator-Forage Competition:

Stomach analysis data from predator and forage fishes have not been fully evaluated at this writing. Threadfin shad is an important native forage species in Murvaul. Threadfin shad were stocked in Tyler by the Regional State Biologist and have reproduced successfully.

Bluegill and redear sunfish populations are considerably higher in Murvaul than in Lake Tyler West. Length-frequency data from basic survey reports indicate a degree of stunting has occurred in Murvaul among these species.

Fish eggs were observed in numerous bluegill stomachs from both lakes during April 1971. As with the carp examinations, no positive identifications of bass eggs were recorded.

Creel Census:

Both lakes were monitored for creel checks on selected dates this segment. Data are compiled and will be evaluated by a statistical analysis during the coming year. A tentative analysis based on approximately one third of a year has been made which indicated a significant difference in bass per man hour. A 0.38 figure was compiled for Lake Tyler as compared to 0.53 for Murvaul. Other tests will include angler days,

bass caught, total man-hours, pounds of bass, and pounds per man-hour. Murvaul has established an excellent reputation as a "lunker" bass lake and is regularly fished by numerous Texas and Louisiana bass clubs. Lake Tyler West does not have such a reputation and is primarily fished by local sportsmen. The evaluation of this fisherman useage in terms of the above mentioned criteria will be beneficial in determining actual fishing pressure on each lake.

CONCLUSIONS AND RECOMMENDATIONS:

The multiple objectives and procedures considered mandatory for this study have resulted in considerable amounts of data during the 1971 segment.

More efficient field procedures will be utilized during the coming segment as data forms and charts have now been established. The addition of the electro-fishing gear has greatly increased collection efficiency of largemouth bass. It should also provide improved sampling of all species for stomach content analysis work. Stomachs from numerous netted fishes examined in 1971, contained a high percentage of un-identifiable food items due to the time lag from capture to dissection. This problem should be effectively reduced when specimens are collected with the electro-fishing gear. It is now anticipated that sufficient numbers of bass will be captured, tagged, and released during the coming segment to initiate valid growth rate estimates for both lakes.

Excellent cooperation has been experienced from Lake Murvaul and Tyler fishermen and concession operators in securing bass and reporting tagged fish. Records kept by one Murvaul concessionaire show that 254 fishermen caught bass weighing 6 pounds or more in 1971. He screens an estimated 60 per cent of the lake's fishermen.

Numerous collection data charts and tables have been prepared from this segment's field data but are not included in this initial segment's report on this study.

Water Quality Data:

Water quality analyses conducted this segment revealed no adverse conditions in either lake. Coordination with the Regional chemist will be made in 1972, to monitor dissolved solids and make comparative analyses to correlate with Hach kit readings.

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