

JOB COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-7-R-12

FISHERIES INVESTIGATIONS AND SURVEYS OF THE WATERS OF REGION 1-A

Job No. D-1 Fisheries Problem Determination

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## ABSTRACT

Fisheries problems encountered at each of ten major public lakes are briefly discussed.

Dominance by rough fish is the primary problem at Lakes Fryer, Rita Blanca and Tule. Water quality and sunfish overabundance are problems at Lake Marvin. Lakes Baylor, Childress, Pauline and McClellan have been adversely affected by low water levels. At Buffalo Lake a lack of channel catfish production is a problem which hatchery stocking has failed to improve. Lake Meredith will present problems in planning and coordinating a stocking program.

Problematic waters in Region 1-A2 which are discussed in this report are: New Anson City Lake, Aspermont City Lake, Buffalo Springs Lake, Old Hamlin Lakes, Reese Air Force Base Lake, and Lake Stamford.

Other problems mentioned are lack of fishing water, stocking and data interpretation. Suggestions for establishing criteria for defining undesirable fish and fish populations are made.

JOB COMPLETION REPORT

State of Texas

Project No. F-7-R-12

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

Job No. D-1

Title: Fisheries Problems Deterimination (Fisheries Region I-A1)

Period Covered January 1, 1964 - December 31, 1964

Objectives:

Analysis of data to determine specific problems on the concerned waters.

Procedure:

Data collected during the present segment and past segments were reviewed to determine specific problems and needed methods of resolution.

Findings:

Lake Fryer has an overpopulation of undesirable species and a stunted white crappie population. Although stunting was less evident during this segment, the fishery of this lake remains poor. Only a fraction of its potential for game fish production is being realized. Carp and bullheads constitute the major problem and a total kill renovation, including watershed ponds and stream areas, is recommended.

Lake Rita Blanca similarly is in poor condition and if this lake remains at a low level, a renovation is recommended for sometime in 1966. Timing of this renovation will depend upon the size of fish available for restocking. Creel data and population data based on netting and seining data should be accumulated during the next segment in order that the results of a renovation can properly be evaluated.

Fertilization of Lake Marvin in 1964 was only partially successful. The first application of 150 pounds of 16-20-0 per surface acre did not produce the desired algae bloom. Although the second application did produce a good phytoplankton bloom, it developed too late to adequately suppress the growth of submerged vegetation. Fertilization should be repeated again in 1965, and if the desired results are not obtained, some other type of management should be considered.

Buffalo Lake has an increasing bass population, a stable crappie population, and a reduced channel catfish population. It appears that most of the fingerling channel catfish stocking in 1963 did not survive. Possible causes of mortality include competition from other species, predation, and pollution. Further study at Buffalo Lake is recommended, with special attention given to the effects of pollution from Tierra Blanca Creek.

Drastic reduction of water levels at Lakes Baylor and Childress caused unfavorable conditions during 1964, but when these lakes refill, conditions

should be better than usual due to abundant cover and organic fertilization from the weed-grown lake bed areas now exposed. These lakes will be the site of a research project for the next few years and management activities will be limited to those outlined in the research plan.

Lake Pauline has received practically no run-off since it was renovated in May 1963. The lake level dropped to a point which jeopardized the operation of the electric plant located at the lake and water was pumped to the lake from Groesbeck Creek. This creek contains rough species and thus it was a source of contamination. In spite of low water and rapid reintroduction of rough species the lake is producing excellent fishing, and will probably continue to produce good fishing for the next few years.

The last survey at Tule Lake produced mostly rough species. Rapidly fluctuating water levels and a rough-fish infested watershed constitute the main management problems at this lake.

Meredith Lake should partially fill in 1965. A study of past run-off records indicates that the lake should fill to about 4,000 acres by late July. However, the historically unpredictable flow of the Canadian River will present a problem in coordinating the stocking program. Obtaining an adequate supply of reservoir type minnows for this lake will also be a problem. The native minnows in the Canadian River are mostly species that do not adapt to a reservoir existence. Brood minnows are of prime importance to establishment of a proper food supply for the predaceous game species to be introduced early this summer.

Lake McClellan was renovated early in 1964, but a critically low water level threatens survival of the 10,000 bass and 70,000 channel catfish that were restocked in October 1964. This lake should be checked this spring to determine the degree of survival of these fish. Additional stocking will likely be needed if the lake receives normal spring run-off.

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Date March 9, 1965

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JOB COMPLETION REPORT

State of Texas

Project No. F-7-R-12

Name: Fisheries Investigations and Surveys of the Waters of Region 1-A

Job No. D-1

Title: Fisheries Problem Determination (Fisheries Region 1-A2)

Period Covered January 1, 1964 - December 31, 1964

Objectives:

Analysis of data to determine specific problems on the concerned waters.

Procedure:

Problems were determined by careful perusal of field collected data. The specific fisheries problems which will require additional investigations or experimental methods of resolution are mentioned in this report.

Several waters in Region 1-A2 are either presently problematic or approaching a problematic condition. Observations concerning these waters are based on current and past reconnaissance data.

New Anson City Lake

This lake had acceptable percentages of game species by weight and number when surveyed in May 1964. However, it showed poor average sizes for white crappie (Pomoxis annularis), bluegill (Lepomis macrochirus), and black bullhead (Ictalurus melas). The desirable species are 41.07 per cent by number, but only 14.89 per cent by weight. White crappie comprised 63.04 per cent of the number of desirable species present, or 25.90 per cent of the total fish population. Their average weight (crappie) was 0.16 pound. Other game species were numerically sparse, providing only 15.17 per cent of the total population.

River carpsucker (Carpionodes carpio) and carp (Cyprinus carpio) made up 33.49 per cent of the total population by number and 73.22 per cent by weight. This percentage of rough fish is undesirable and "K" factors indicate that these rough fish are in better condition than game species.

If this lake follows the trend indicated by most lakes, it will soon be in quite bad condition. Since this lake is a public water supply, it would be advisable to begin experimental biological management to prevent its deterioration into a condition necessitating chemical renovation. A suggested measure is heavy stocking of advanced fingerling largemouth bass (Micropterus salmoides) in the fall. This should provide acclimatized, predacious fish to harvest young fish the following spring during spawning season. Regardless of the action taken, the lake should be surveyed to determine its need for management within two years.

### Aspermont

At present, Aspermont City Lake has a generally undesirable fish population. Its fish population is 59.10 per cent large gizzard shad (Dorosoma cepedianum). If these shad survive the winter and the remaining population is unchanged, the lake should be managed in 1965 by selective treatment and restocked.

If this is not done, supplemental stocking of channel catfish (Ictalurus punctatus) is needed because last year's reconnaissance survey indicated that channel catfish had not spawned in the lake.

### Buffalo Springs Lake

Buffalo Springs Lake is now the subject of a detailed study. Analysis of one year's data indicates that the basic problem is water quality; however, additional data is necessary to substantiate or refute this evidence.

It is known that the lake stratifies thermally during the summer and a layer of noxious dissolved gases, of unknown chemical composition but containing high concentrations of hydrogen sulfide and ammonia nitrogen, develops. This layer exists from depths of 14 feet to the lake bottom with the upper depth fluctuating during the summer. A stunted bullhead and sunfish population exists. Game fish did not successfully reproduce and numerous fish died from unknown causes during the spring and summer of 1964.

The Buffalo Springs Lake study is being continued.

### Hamlin Lakes (Old)

Both Old Hamlin Lakes are west of Hamlin in Fisher County. They are quite saline. The salt water comes from natural salt springs and brine originating in the oilfield on the watershed. The odor of hydrogen sulfide from bottom samples suggests that the lakes may contain noxious dissolved gas layers in the summer if they stratify thermally. Their present fish population is very poor and thus provide little sports fishing. Past stocking has been unsuccessful. Before any further stocking or management is attempted, a water quality study and limnological analysis of the lakes should be made. If their only problem is salinity, experimental salt water introductions should be considered.

### Reese Air Force Base Lake

Reese Lake is an end recipient of treated sewage from Reese Air Base personnel offices and housing. The sewage is treated by the Hays contact aeration process. There are two small (approximately one-fourth acre) oxidation ponds between the treatment plant and the lake. The first pond is aerated by compressed air delivered through perforated plastic hoses, and the second pond is not aerated.

This lake produced excellent growth of largemouth bass and channel catfish stocked in the spring of 1963. By the fall of 1963 they were in excellent condition and weighed close to one-half pound. Several of these fish survived until the late winter and early spring of 1964, when several die-offs occurred. The only known surviving fish were goldfish. It is suggested that a study on this lake would apply to fisheries problems wherever sewage is a pollution problem.

Successfully raising game fish in the situation here would provide a means of producing fishing in many of the arid regions of Texas where few natural waters occur. There is also a close relationship between water quality readings from Reese Air Force Base Lake and Buffalo Springs Lake. Any solutions discovered in a study at Reese might well be applicable at Buffalo Springs Lake.

#### Stamford

Lake Stamford now contains a 72.85 per cent undesirable fish population by number and 82.49 per cent undesirable population by weight. Because it is a water-supply lake, it is doubtful if the recommendation in this year's B-18 job completion report for project F-7-R-12 can be followed. The report states: "This lake should be checked with nets in 1965, and if the population proportions have not improved, a heavy marginal treatment of the lake is recommended. Fingerling largemouth bass, and channel catfish should be stocked immediately after the toxic conditions cease following the treatment."

If this cannot be done, experimental management by other than chemical means should begin as soon as possible. At one time a commercial fisherman worked in the lake, however, it is not known for certain that his activities were beneficial.

If it were possible to net rough fish and at the same time stock with advanced fingerling largemouth bass and channel catfish, some analysis of benefits obtained could be attained by continued survey of the lake and comparing data with the past data available. This data was gathered through an inventory of species in Lake Stamford conducted in 1962 and subsequent reconnaissance work. These reports represent a good basis for a before-and-after comparison of the effects of netting activities on the fish population in Lake Stamford.

#### Other Problems Lack of Fishable Waters

Region 1-A2 was located just below the Texas Panhandle and was bordered by a line including Bailey, Foard, Jones, and Gaines Counties. Regional reorganization has changed these boundaries this year. In this region, however, there is little fishable water. The city of Lubbock and its surrounding communities supply fishermen to lakes as remote as Falcon reservoir. Nearly all lakes in region 1-A2 are "pay to fish" lakes and probably will continue to be so. Water is scarce and water rights jealously guarded and land posted.

#### Stocking

The necessity for providing hatcheries with advance notice of the number and species of fish needed in definite reservoirs is a problem. Lack of water in reservoirs which depend on local rainfall for their water supply complicates the problem. When a lake has been recommended for stocking and rainfall does not maintain or improve its water level, overstocking results. When a lake is dry or not in need of stocking because it is low, and it fills without warning, immediate stocking of desirable species is very desirable and many times can not be arranged under the present fish distribution plan.

Desirable and Undesirable Species

At the present time there are no written criteria as to what constitutes a desirable fish or species of fish in Region I. It is recognized that different species are desirable or undesirable depending upon the size of individual fish and their abundance in a body of water. Fish species which are often items of controversy are sunfish, bullhead, and crappie. Any one of these species is desirable in moderate numbers and large adult sizes. The controversy arises over when they cease to be desirable and become undesirable. It is realized that some waters naturally foster prolific growth of one or more of the mentioned species. In these waters these species are undesirable because they quickly become overpopulated and stunted. Experimental work on prevention of this sequence of events is desirable since prevention of the introduction of these species is almost impossible. The establishing of a definitive limit to separate desirable from undesirable populations would be advantageous in reporting and data analysis.

A suggested solution to the problem is a weight to population sample comparison. For example, when 50.00 per cent of the bullhead sample in gill netting surveys weigh more than an established minimum (example 0.50 lb), the population should be considered desirable. Like standards could and should be established for all fish found in Region I. If the population is not proportionally this large, it should be considered undesirable.

Another approach would be to examine the netting sample and when the species under consideration are uniform in size and have an average weight of less than an established minimum they should be considered undesirable unless special conditions exist. One such condition would be an immature population which has just been stocked.

Data Interpretation

Another problem lies in interpreting data. In reports, average sizes of fish species in populations are listed instead of establishing a utilizable size and giving the percentage of utilizable fish of each species in the population.

For example, a netting sample might contain 40 largemouth bass which weigh 0.15 pound each and 5 which weigh 5 pounds each. Averaging these weights produces an average weight for largemouth bass of 0.68 pound. Here are 45 fish, of which 5 are utilizable, and the average leaves the impression that the entire population is utilizable at the present time. This leads to misinterpretation of data and should be clarified by establishing a standard utilizable size for all species of fish in Region I. Similar confusion can arise with all species, whether rough, forage, or game. Standard means of treating this data, which would be more significant than a simple arithmetical mean should be established.

A suggested addition to the above data is: 45 largemouth bass, 1 out of 9 of utilizable size (if 0.20 lb. is standard minimum utilizable size for example), whose average weight was 0.68 pound were taken from Lake Blank. Even this simple addition clarifies the statement and adds meaning to the data. This type analysis has not been made in the past and cannot readily be achieved from the present rough data forms without undue expenditure of time. It is recommended that these problems be given serious consideration and that minimum regional standards be set for utilizable sizes and desirable populations of all species of fish, particularly controversial species.

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Date March 9, 1965

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