Report of Fisheries Investigations

Fisheries Problem Determination

by

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A B S T R A C T

Overabundance of rough fish is still considered to be the biggest problem in Region 1-B. Food habits studies have shown that shad and carpsucker feed at the very base of the food chain, and possibly gain an advantage in this way. Similarly, buffalo and carp have advantageous food habits. There is no evidence that game fish are not getting enough food, however, and it is felt that the population dynamics which occur as new lakes pass through the good fishing cycle will be understood only after much basic research on ecology and life histories has been completed.

Some phases of the natural history study have been limited by the inadequacy of collecting techniques. Specifically, the selectivity of sampling gear, and the inability to collect seine samples of each species of rough fish each month of the year, in order to follow growth rates and food habits, have been the limiting factors.

Public access to public streams and lakes is a subject of growing concern. Not only access but ample facilities including camping areas, picnic facilities, parking areas for vehicles, and boat launching ramps are lacking at many places.

Regulations may be necessary to protect the striped bass that were recently introduced into Lake Diversion. Due to their similarity to white bass, considerable efforts will be necessary to teach the sportsmen of that area the difference and to encourage them to assist in the protection of the striper. Also, a size limit of 18 inches is being considered for striped bass in order to protect them until they have had an opportunity to reproduce.

Pollution of waters by salt from oil field brine pits and from natural springs continues in this area. Insecticides used at feed lots located on the watersheds of lakes have continued to cause fish kills when the insecticides were washed into the lakes. Corrective measures at two of these feed lots are being worked out. Industrial effluents from the Borger area continue to pollute the Canadian River.

Difficulties have been experienced in achieving desirable total fish kills with both rotenone and toxaphene in lakes with high organic content. Studies are greatly needed to determine reasons for the many factors that limit the success and increase the cost of chemical treatments. Cheaper chemicals are needed, as well as more efficient and economical methods of distribution.

Job Completion Report

State of TEXAS

Project No. F-7-R-8 Name: Fisheries Investigations and Surveys of the Waters of Region 1-B.

Job No. D-1 Title: Fisheries Problem Determination

Period covered: January 1, 1960 - December 31, 1960

OBJECTIVES

Analysis of data to determine specific fisheries problems in the concerned waters.

PROCEDURE

Data collected during the work on various jobs in Segment F-7-R-8 have been studied to determine the existence of problems that may require additional investigations or experimental methods of resolution.

FINDINGS AND DISCUSSION

The Rough Fish Problem

One of the most outstanding problems affecting the sport fishery of Region 1-B remains an over-abundance of rough fish species. An abundance of these species has a detrimental effect on the game fish population in some, and as yet, undetermined way. Competition between rough and game species is apparent, but the nature of this competition, whether for space, food, or for some other requirement has not been established. Results of recent food habits studies (Job B-15) disclose that two species of rough fish, shad and carpsucker, gain a great advantage over other species in that they feed at the very base of the food chain. Another species, buffalofish, feeds at the second and third levels of the food chain, and a fourth species, carp, feeds heavily on Chara and other vegetation which abounds in most of the lakes in this area. Thus, rough fish appear to have a distinct advantage insofar as food supply is concerned. At the same time, there are no indications that game fish are not getting plenty of food. Forage in the forms of young shad, minnows, insect larvae, and other items are abundant in most of our lakes, yet rough fish are dominant over game fish species.

Fishery science has proven that a new lake produces large quantities of desirable-sized game fish for several years after construction. Reproduction is successful and growth is rapid during this period and sports fishermen are usually very successful. After a few years, however, rough fish begin to appear in increasing numbers, and finally the ratio of game to rough fish species is reversed in favor of the undesirables. Fishing pressure, lack of food, low fertility, drouths, rains, muddy water, lack of suitable spawning facilities, improper bag and size limits, commercial fishermen,

lack of cover, excessive vegetation, predation, diseases, fish hatcherymen, and fishery biologists have at one time or another been blamed, in part or in full, for the lack of good fishing which invariably occurs as the numbers of rough fish increase. Certain assumptions, postulates, hypotheses, and guesses have been made as to the reasons these waters experience this cycle of changes, but very few efforts in the form of basic research, that we know of, have been made to scientifically determine exactly why this occurs.

In general, the rough fish problem is characterized by a lack of basic knowledge of ecology and life histories of problematical species. It is quite evident that such knowledge is greatly needed for the advancement of rough fish control. Management practices that are effective in maintaining the highest possible initial productivity in large impoundments continues to represent one of the most urgent needs of our fisheries improvement efforts.

There are four species of rough fish which most commonly invade the larger lakes in Region 1-B, and when combined often constitute 50 percent to 85 percent of the total fish populations. Smallmouth buffalo, probably the most desirable of the four are found in considerable numbers in Lakes Wichita, Diversion, Kickapoo, Olney, Graham and Eddleman. Although rare, they are also present in Lake Kemp, and will most probably increase quite rapidly. Locally, a few persons fish for buffalofish and quite a number eat them, but there is no great commercial market for this species in this particular area of Texas. Commercial fishermen annually remove thousands of pounds of smallmouth buffalofish from Region 1-B, but they are transported to other states for marketing. Carp are present in practically all areas of this region, but their abundance varies from one area to another. They are now being sought by increasing numbers of fishermen, mostly for sport rather than for food. Many local people eat carp, however. Although there is no local market for carp, commercial fishermen take them to be sold in other areas. Gizzard shad, which is probably the most abundant species throughout this area, is an important forage species when they are small. However, they grow rapidly to a size that is too large to be eaten by the average size game fish, and being quite prolific, they become overly abundant in a very short period of time. Shad are thin-bodied, boney, and have a repulsive odor. They are seldom, if ever, eaten by even the poorest of humans. If it were not for the fact that shad can be controlled chemically, they would probably be considered as the most outstanding threat to our sport fishery. Fortunately, selective removal of shad will reduce this species and rejuvenate the fishery for a period of three to four years, and this removal can be accomplished on a reasonably economical basis. The river carpsucker, which cannot presently be controlled selectively, is not used for food to any extent by either humans or game fish. It has a great reproductive potential, and is secretive in its habits. We consider the carpsucker to be the greatest potential detriment to the game fishery in the eastern portion of Region 1-B.

Besides the four major rough fish species previously discussed, other species are locally problematical. Some of the larger lakes in the western areas have specific problems. Rita Blanca Lake (Dalhart) and Buffalo Springs Lake (Lubbock) both have an overabundance of golden shiners and black bullhead catfish. Buffalo Lake (Umbarger) still has an alarming population of carp, goldfish and bullhead catfish in spite of the recent total kill treatment with toxaphene.

The freshwater drum is abundant in many lakes, but because of the difficulty involved in the capture and determination of the relative abundance of this species,

its present status has not been determined. Many sportsmen regard the drum as a game fish, while others do not. Stomach analyses have shown that drum feed quite heavily on young shad throughout the summer, therefore it may be a more desirable species for this reason. Because of its edible qualities, predaceous habits, and its susceptibility to rotenone, it is not considered a major threat to the sport fishery.

Another species whose status is questionable is the longnose gar. While very few people eat this fish, it is very tasty if properly prepared. Although its bait stealing habits provoke minnow fishermen, it is a powerful fighter when hooked and is sometimes considered a game fish for that reason. Being a predator, its usefulness in control of other rough species is recognized, and it is not considered a problem species in this area.

Natural History Study

The natural history study of problematical species has been in progress for almost three years. The objectives of this study are to conduct laboratory and field studies on the anatomy, food and feeding habits, distribution, movements, and reproductive habits of problematical species with special emphasis on such features of natural histories that may aid in population controls. The scope of the field work on this job has been the collection of digestive tracts for food habits study, fresh specimens for anatomical study, bottom and plankton samples for correlation with stomach contents, distribution data, and data concerning spawning and growth rates. Most of the laboratory work on this job has been conducted by Midwestern University through an inter-agency contract agreement.

Several problems have been encountered in collecting comparative distribution data. Most important has been the selectivity of sampling gear. It has been found that the shape and size of various species, the amount of movement, and preferred habitats greatly affect collection of these species under study. Similar factors also affect collection of these species by seining. Thus, population studies depend upon a number of factors that must be overcome before desirable data can be obtained. We have also encountered difficulty in following the movements of young fish, especially shad, due to rocks and stumps, current and water depth. For example, we can watch the movements and check on growth and food habits of young shad as long as they are schooling in shallow areas. However, most of them move out of these shallows in the early fall, and we have been unable to follow their movements due to the lack of adequate collecting equipment. Locating spawning areas of carpsuckers has also been a problem. We hope to locate, in part at least, spawning areas next spring. Indirect evidence from seine samples during this period of study has indicated general spawning areas of all species under study but we need to pin-point these areas.

One breakdown in our procedure has been the inability to net and seine the river areas above the lake. Rapid currents and floating debris have repeatedly washed out gill nets set across the river. Attempts to use 300-foot, $\frac{1}{2}$-inch mesh seines were abandoned because fast currents washed the seines downstream and lifted them off the bottom before they could be pulled in. A series of hoop net stations in the river channel combined with a series of gill net stations in eddies and tributaries will be attempted next spring in an effort to obtain more conclusive data.

Access to Public Waters

Public access to public waters continues to be problematical in that it limits the harvest of standing fish crops and restricts all types of aquatic recreation. For instance, public access to two public lakes in this region is controlled by a private concern which charges entrance because they own the land surrounding the lakes. Many sportsmen refuse to fish these waters because of the unfairness of having to pay a fee to obtain access to public waters over privately-owned land. Parks adjacent to lakes, adequate parking space for vehicles, and launching facilities for boats are greatly needed on most of our lakes and streams.

Legal access to public streams is so unclearly defined by State laws that there is constant friction between landowners and fishermen, as well as others who attempt to utilize streams for recreational purposes. An understandable proclamation which accurately defines the laws concerning sportsmen's rights along public streams is greatly needed.

Regulations on Striped Bass

The introduction of striped bass, Roccus saxatilis, into Lake Diversion to increase predation on rough fish and to provide an additional game fish has been accomplished. Approximately 800 fingerling size stripers were placed in Lake Diversion in early December, 1960. Proof that they survived the transplant was obtained on January 17, 1961, when a striped bass was found in the stomach of a large white bass. The size of the devoured striper indicates rapid growth in their new environment, and it is hoped that reproduction will eventually occur. If this species can adjust to life in Texas waters, it may be necessary to impose regulations to protect them. There is a great similarity between small stripers and white bass, and the average fisherman may not be able to detect the difference between them. Therefore, considerable efforts will be necessary to inform and educate sportsmen who fish the waters where this experimental introduction has been made. Also, a size limit of 18 inches is being considered for striped bass in order to protect them until they have had an opportunity to reproduce.

Pollution

Pollution problems, in general, in Region 1-B have changed very little since the preceding segment. Several cases of minor fish kills due to feed lot insecticides have occurred, but the main source of pollution is in the form of chlorides from oil fields and natural springs. Considerable progress has been made in getting old salt pits leveled and in getting lease operators to dispose of brine by returning it to the strata from which it came.

The Red River Authority has been organized during this period of study and promises to be a great potential as a pollution abatement agency in this area. The Inland Fisheries Division will continue to cooperate with this organization in every way possible.

Industrial pollution of the Canadian River in the Borger area still exists. However, local industries claim a considerable degree of improvement in their effluents due to new processes.

Chemical Treatments

There is a great need for more efficient and economical methods of distributing fish toxicants of all kinds, including powder, liquids, and perhaps, gasses. Reclamation of fishing waters, especially large lakes with high organic content and flowing tributaries, is greatly limited by the high costs of chemicals and their distribution. Cheaper chemicals are needed, as well as more efficient and economical methods of distribution.

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