

MICHIGAN DEPARTMENT OF CONSERVATION

(Institute for Fisheries Research Report No. 1426)

MICHIGAN'S WARM-WATER FISH PROGRAM

(Presented at MUCC - Petoskey - June 18, 1954)

By Gerald P. Cooper

July 22, 1954

Activities of the Fish Division in management for warm-water species, and research activities of various staff members of the Institute working on warm-water fisheries problems, are summarized. Some of the current management activities and accomplishments have been: (1) Relaxing of regulations on fishing in lakes, especially on pan fishes, with lengthening of open seasons and elimination of size limits. In this trend of change, Michigan is behind her neighboring states. Judging from test waters, the liberalization on lake fishing in Michigan is allowing an increase in fishing and in catch, to the extent of about 10 to 30 percent. (2) The installation of brush shelters in barren-shoal lakes to concentrate fish for the benefit of anglers. In 1951-52 for example, a total of 3,194 brush shelters were installed in 25 large lakes located in 20 counties (on 5 lakes, work done by sportsman's organizations). (3) Protection of pike spawning grounds, by court decree, on Otsego and Whitmore lakes. (4) Providing lake maps to anglers as an aid to fishing-- about 10,000 maps sold since 1930, about 2,400 lakes are mapped. (5) Planting bass, pike, walleyes, etc. in lakes for "new introductions"; as an example, during 1954, such plantings were made in 43 lakes.

Some of the current research activities of the Institute, dealing with warm-water fish, are: (1) An intensive study of the muskellunge. (2) The effect of both liberalized and restricted fishing for bass, pike and walleyes in certain test lakes. (3) Population estimates, census of angling, and basic limnology including fish-food production in a group of test lakes. (4) Studies on fertilization and related methods of increasing productivity.

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Decision - 1
Game - 1
Field Admin. - 1
S. C. Record - 1

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The subject which I am to cover is a very extensive and diversified one, so that the best I can hope to do is to hit some of the high spots.

The Department's warm-water fish program includes a variety of regulations established either by the Legislature or, under legislative authority, by the Director. Another important item in Department procedure has been the recent considerable curtailment in the propagation and planting of warm-water species on a generalized planting schedule throughout the State. Members of this audience are well acquainted with these two aspects of the Department's program, so that little more will be said about general regulations or about a state-wide planting program for warm-water fish.

The subject of my talk is divided into two sections: (1) what the Department is doing in the way of current management procedures for warm-water fishing, and (2) the major items of research and experimental management which are being conducted on warm-water fish problems, largely by staff members of the Institute for Fisheries Research.

Current Management Procedures

Generally, management covers three procedures: (1) regulations, (2) environmental improvement, and (3) fish cultural activities.

You are well aware of the fact that the trend in warm-water fish regulations, both in this state and in neighboring ones, is toward liberalization, either reducing closed seasons considerably or eliminating them entirely, and doing away with size limits. In many respects, Michigan is quite a bit behind the neighboring states of Ohio, Wisconsin and Minnesota in this trend toward liberalization. Our steps in liberalized fishing here in Michigan have mostly followed, and been based on, rather careful testing of the effects of these changes in certain experimental lakes. This process of testing is a slow one, which accounts for our being somewhat behind the neighboring states.

In 1945-1951, Michigan inland lakes were open to year-around fishing, size limits on pan fish have recently been eliminated, and by 1955 there will be no closed season on bluegills and sunfish (as well as other pan fish). Judging from the census on our test lakes, this liberalization will result (and is resulting) in an increase in fishing of about 10% to 30% for the seasons total and on a state-wide basis, without reducing fishing quality.

The installation of brush shelters in large, barren-shoaled lakes is one of Michigan's principal activities in physical improvement of lakes for fishing. In the early days of lake improvement, it was believed that the principal value of brush shelters was to provide cover for fingerling game fishes to protect them from predatory loss. However, according to present viewpoint, the main value of these brush shelters is that they attract large-size game and pan fish where fishermen can concentrate on them and obtain a greater harvest. That is why brush shelters are installed generally in large and open-shoaled lakes, in which game fish are usually widely dispersed and therefore difficult for anglers to locate. As an example of the extent of this type of activity in Michigan, during the biennium of 1951-52, a total of 3,194 individual brush shelters were installed in 25 Michigan lakes located in 20 counties in both peninsulas. On five of these lakes, sportsman's organizations carried on the work with technical assistance from the Department.

Another type of lake improvement has been the protection given to pike spawning marshes on certain lakes. As cottage development becomes more intensive on lakes, the tendency is for marshy shore lines to be filled in for building sites. Thus the shallow marshes which pike must have for spring spawning are eliminated, with a corresponding reduction or practical elimination of the pike population from the lake. Even though cottage owners might be willing to sacrifice their pike fishing for a good cottage site, they must also realize that more than just the pike fishing might be lost. It appears most likely that pike (and other large predators) play an important role in preventing overpopulation and stunting of other game and pan species, and therefore the loss of a pike population might make poorer fishing for bluegills and other pan fish. In lakes where pike play an important role in fish production, either directly or indirectly, it is the Department's responsibility to protect the species. Thus there have been recent court injunctions and court decisions where property owners on lakes were prevented from filling spawning marshes, namely the case involving pike spawning areas at the north end of Otsego Lake, another pike spawning area on Whitmore Lake in Washtenaw County, and a third on Wampplers Lake in Jackson County. In a recent development on Orchard Lake in Oakland County, a land owner was not restrained from filling a pike spawning marsh, because the lake is being managed as a trout lake in which the presence of pike might best be discouraged.

Another recent activity to improve pike propagation in a good pike lake has been the attempt made in the fall of 1953 and the spring of 1954, on Otsego Lake, to eliminate small perch, bullheads and mudminnows from a pike spawning marsh to prevent a large loss of pike fry from predation. For the restoration of pike in Otsego Lake, the lake has been closed to all fishing from December 1 to May 15, and adult pike are being transferred to the lake from Lake Huron and from the Seney Wildlife Refuge. The results of this management experiment

are not yet available, and the future application of this procedure is thus still undecided.

A major activity of the Fisheries Institute, and a contribution in the improvement of fishing, has been the preparation of lake maps, showing lake features and water depths, needed for lake inventories and for lake improvement. These maps are also sold at cost to fishermen and have proven to be very helpful in locating fish in strange lakes. Since 1930, about 2,400 lakes have been mapped. As an example of the extent to which these maps are used, in the fiscal year 1951-1952 there were 1,533 maps sold. The total number sold to the public since 1930 has been about 10,000.

Fish cultural and planting activities of the Department, for warm-water species, are rather limited, since it has not proven to be necessary to plant bass and pan fish in lakes on a maintenance basis. Current plantings are to introduce a particular species into a lake where it does not occur, and experimentally to maintain walleyes, pike and muskellunge in a few test lakes.

Lakes where a "new" species might be introduced are usually "discovered" by summer survey parties or by district fisheries personnel, or sometimes reported by local anglers. Where a field check indicates that some species is absent, and where a study indicates that a lake might produce better fishing if the species were introduced, such introductions are then made. In 1954 as an example, it is planned to introduce largemouth bass into 15 lakes, northern pike into 10 lakes, walleyes into 8, bluegills into 6, perch into 2, smallmouth into 1 and white bass into 1 (or a total of 43 lakes); some of these plantings have already been made (as of June 18). In planting for initial introductions, the annual plantings are continued over a period of 3 years, after which a field check by netting is made to determine whether or not the introduction has been successful.

A limited amount of maintenance stocking of walleye fingerlings is being carried on, in 8 lakes at the present time. These are not lakes which are notable walleye producers (such as Gogebic and Houghton); rather, they are lakes which produced some walleye fishing under the former state program of planting walleye fry, but in which the walleye fishing has gone down with stopping of this earlier fry planting. We still recognize the possibility that a limited amount of planting of certain warm-water species (especially the predators) might prove to be an efficient management tool. This would necessarily be limited to those lakes where some particular species might find a favorable habitat, except that facilities for spawning are unfavorable. This is the situation in the planting of trout in Michigan lakes, where in most instances there is no chance for natural reproduction, but where the species does well if fry, fingerlings or adults are stocked regularly.

The State has also been conducting a limited operation in the propagation of northern pike for experimental plantings, and an attempt is being made to propagate the muskellunge, although thus far unsuccessfully. During the spring of 1954, a total of 400,000 pike eggs were hatched at the Drayton Plains Fish Hatchery and it is probable that they will produce from 10,000 to 50,000 pike fingerlings for introductions to new waters, or possibly for planting in lakes such as Otsego where a formerly abundant pike population has been greatly reduced.

Current Research

A consideration of what is being done with the muskellunge leads naturally to the second section of my talk, dealing with current research and possibilities of future management.

An intensive study of the muskellunge in Michigan is being undertaken by one member of the Institute staff. Over the past 3 years, working with fish culturists in the State, he has tried to obtain musky eggs for artificial propagation, from the Torch and Indian rivers and from Lake St. Clair. So far

these attempts at propagation have been failures, either because of the difficulty of getting enough brood fish, or because of mortality of eggs or newly hatched fry. The principal obstacle is the difficulty of obtaining enough breeders. There is no good collecting site in Michigan where a considerable number of ripe fish can be obtained at one time. Attempts at muskellunge propagation will be continued in the future. The musky is being propagated in Wisconsin, and presumably it can be done here.

Another important aspect of the musky study has been a compilation of musky catch records for Michigan as a whole, and a creel census of anglers' take of muskies in certain Michigan waters, particularly Round and Elk lakes during the past 2 years. On Round and Elk lakes, the total take by fishermen is divided, according to seasons, approximately as follows:

10% of the catch taken during the spring spawning season

5% of the catch taken by angling during summer and fall

85% of the catch taken by winter spearing

This census has indicated that, if some conservation measure is to be applied to the muskellunge in the form of a protective, reduced harvest, it might best be done by curtailing winter spearing.

Most neighboring states (Wisconsin, Minnesota and New York) and Ontario give much more protection to the muskellunge than we do here in Michigan, by a closed season during the spawning period in May and June and by outlawing winter spearing. Michigan's closed season on the muskellunge in the spring gives practically no protection to the species during spawning time. It would be ill-advised to jump to the conclusion that outlawing winter spearing or providing a closed season during spawning time would result necessarily in a greater population of muskies in Michigan waters. There is the possibility that the abundance of muskies is limited by environmental factors other than fishing; in other words, more protection might not increase the population. The best procedure, we believe,

would be to restrict winter spearing on a few test lakes where data on quality of musky fishing are already available (as for example, Elk and Round) and to determine whether or not the species would greatly increase in abundance with this extra protection. The end result might be a much greater harvest of muskies by angling during summer and fall. It is also hoped that progress can be made in the propagation of muskies in Michigan so that checks can be made on certain test waters on the value of artificial stocking of musky fingerlings. (The muskellunge is here discussed at some length, because it is an item on this year's MUCC agenda.)

The major fields of current research on warm-water fishes in Michigan have to do with (1) regulations, (2) basic production, and (3) methods of controlling populations.

Liberalized fishing has been in effect on a dozen experimental lakes since 1946. The first round of experiments on these lakes, from 1946 through 1950, tested the effect of doing away with closed seasons on pan fish and doing away with size limits and bag limits on undersized pan fish. A second "round" of experiments on most of these same lakes, set up for the 5-year period from 1954 to 1958, is concerned primarily with testing various regulations on predatory fishes, namely, the basses, pike and walleye. Three lakes have no closed season on bass, pike and walleye; and 3 other lakes have no size limit on these predatory species; whereas a third group of 3 lakes has a 16-inch size limit on bass and a 24-inch size limit on pike. These experimental regulations on predatory fishes obviously are going in two directions; one towards liberalization, and the other toward rather drastic restriction on what the anglers can remove. It is perfectly obvious then that we are here at a crossroads, not being too sure as to which direction any change in regulations on predatory fish might well take. On the one hand we recognize the possibility that a much greater harvest of predatory fish as well as pan fish in a given lake might be realized with no

restriction at all on these predatory species; whereas, on the other hand, a much greater total fish production might be realized from lakes if the predatory species were given more protection than they now have. Further protection for predatory fishes might pay off in the form of a much larger average size of predatory fish taken by anglers, or in the form of a larger average size of pan fish in lakes where pan fish are now badly stunted, or both.

In our studies on the improvement of fishing in warm-water lakes, we are relying considerably on results which might be obtained from intensive studies of basic fertility and fish populations in a series of about 10 test lakes. These test waters were selected mostly from the same group of lakes on which there have been experimental fishing regulations since 1946, because we already have on these lakes a good record of fish production to the angler from creel census. This study of productivity in lakes was started about two years ago with the addition of a technical limnologist to the Institute staff. The 10 lakes include examples of our least productive, marl type of lake; plus lakes of medium productivity; plus examples of our most productive lakes. On these lakes intensive studies are being made of what the lake is producing in the form of basic food; the rooted plant life, the bottom food organisms, and the plankton organisms which are free floating in the water. The study will probably be extended to a consideration of lake bottom soils, and of soil fertility of the surrounding lake drainage basin. On these lakes we have creel census data on the total take by anglers throughout the year, and on some of them we have, from time to time, trap-net population estimates of the legal-sized game fish that are present.

This intensive study of problems of basic fertility still has a year or two to go, after which various management practices can be attempted and evaluated, including the following: (a) Increase of basic fertility, either by adding fertilizers or some type of organic material, or by proper management of the drainage basin. (b) Increase of weed growth in unproductive marl lakes as

a method of increasing fish foods and fish production. (c) Manipulation of lake water levels, with periodic flooding of shoal areas as a method of increasing basic fertility. (d) The introduction of predatory fishes as a method of population control, elimination of stunting, etc. (e) Reduction of aquatic weeds in weed-choked lakes as a method of increasing productivity and so that stunted fish can be weeded out by predators.

A study of the feasibility of lake fertilization has been going on for several years, by several members of the Institute and associates, both on warm-water lakes and on trout lakes. It has been demonstrated that basic fertility can be greatly increased by adding organic or commercial fertilizers. One problem has been that lakes can be overfertilized to the point where a fish population may be lost due to winterkill. Also, the high economic cost of intensive fertilization may be more than could be justified by the returns from angling. Nevertheless, fertilization might still have a worthwhile role, especially on some of the very unproductive, marl type of lakes, and on several lakes of this type experiments are still in progress and planned for the future.

Most of the information in this report has been provided by the author's associates in the Institute for Fisheries Research.

INSTITUTE FOR FISHERIES RESEARCH

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