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**INSTITUTE FOR FISHERIES RESEARCH**  
DIVISION OF FISHERIES  
**MICHIGAN DEPARTMENT OF CONSERVATION**  
COOPERATING WITH THE  
**UNIVERSITY OF MICHIGAN**

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December 6, 1939

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UNIVERSITY MUSEUMS  
ANN ARBOR, MICHIGAN

REPORT NO. 563

THE FISH POPULATION OF O'BRIEN LAKE, ALCONA COUNTY

by

John Greenbank

This report consists chiefly of a tabulation of the fish population of O'Brien Lake, Alcona County, as of the time when the fish of the lake were killed with poison in August, 1939. It is one of a series of similar reports dealing with the populations of several poisoned lakes. These reports are of a preliminary nature; further work remains to be done before a detailed analysis of each of these populations can be presented.

History of the Lake

O'Brien Lake was surveyed by an Institute for Fisheries Research party, under the leadership of Horace Telford, in July, 1937. The findings of this survey were summarized in an Institute report<sup>\*</sup> written by C. J. D. Brown.

The lake has a surface area of 10.35 acres, a maximum depth of 30 feet, and very little shoal area. Its water is rather alkaline and hard, and overlies a bottom which is largely marl. Most of the body of water remains fairly cool throughout the summer, since the lake is fed

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<sup>\*</sup>Brown, C. J. D. Survey of O'Brien Lake, Alcona County. Institute for Fisheries Report No. 525, March 24, 1939.

by a number of large, cold springs. There is no other inlet. The outlet stream flows into the Au Sable River. Brown concludes that in general the lake is well suited to trout, and rather poorly adapted to the support of warm-water fishes.

Upon recommendation of the Institute, it was decided by the Conservation Department and the National Forest Service to destroy the existing mixed population of warm-water fish, and then to attempt, by stocking and control, to convert the lake into a trout lake.

The poisoning was done by an Institute field party\* on August 9, 1939. Two hundred forty pounds of powdered derris root (5% rotenone content) was put into the lake, yielding a calculated concentration of about one part in two million by weight. At that time the surface temperature of the water was 70°F. Within an hour the first of the fish to die (minnows and some small perch) began to appear on the surface. A few fish did not finally succumb for two or three days.

As nearly as possible, all of the dead fish were picked up. The total weight of the fish of each species was obtained, as well as individual length measurements of the fish of the game species. A series of scale samples was taken, and a sample of the fish was brought to the laboratory for record and study.

#### Tabulation

In the light of subsequent netting (see below), it seems fairly certain that the kill of the fish was complete, with the possible exception

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\* The party included John Greenbank, W. C. Beckman, and Clark Hubbs. They were assisted by several CCC enrollees, under the supervision of the Forest Service, by some of the Conservation Officers of the Mio district, and by the personnel of the Harrisville State Hatchery.

of a few suckers, and possibly a very few brown trout. A small percentage of the dead fish were not recovered, particularly some of the smaller minnows and perch. However, the recovered fish were of a large enough proportion of the total number killed (probably 95% or more) that the figures as tabulated give an accurate summary of the population.

Table 1 gives the total numbers of fish recovered, the pounds of fish per acre, and the number of legal-sized game fish. The fish are tabulated by species, with two exceptions. The black-nosed shiner and the black-chinned shiner are lumped because of the difficulty of separating large numbers of them in the field. The proportion of the two was somewhat in favor of the black-nosed shiner. Similarly, and for the same reason, the two species of darter present, the Iowa darter and the least darter, were lumped.

Table 1

Summary of Fish Population of O'Brien Lake

Species	Total number	Size range, inches (total length)	Weights		Legal-sized fish	
			Total	Pounds per acre	Total number	Number per acre
<b>Game Fish:</b>						
Small-mouth bass	2	14	2.4	0.24	2	0.2
Northern pike	125	3-23	72.0	6.96	55	5.4
Common sunfish	1,556	1-7	12.6	1.21	20	1.9
Rock bass	1,013	1-9	39.4	3.80	75	7.2
Yellow perch	2,264	2-7	12.2	1.18	2	0.2
Brown trout	2	23-27	10.7	1.03	2	0.2
Total Game Fish	4,962		149.3	14.42	156	15.1
<b>Coarse Fish:</b>						
Common sucker	280	2-18	63.3			
Redhorse sucker	2	12-25	6.0			
Total Coarse Fish	282		69.3	6.70		
<b>Forage Fish:</b>						
Golden shiner	3,086		14.4			
Red-bellied dace	202		0.4			
Black-nosed and black-chinned shiners	12,765		20.7			
Blunt-nosed minnow	1,886		4.9			
Mud minnow	5,993		20.7			
Darters (2 species)	1,413		1.2			
Stickleback	1,054		1.2			
Total Forage Fish	26,399		63.5	6.13		
<b>TOTALS</b>	<b>31,643</b>		<b>282.1</b>	<b>27.25</b>		

Discussion

The fish population, as shown in the table, was not a very desirable one from the standpoint of the angler. The small-mouth bass and brown trout, although large, constituted little in the way of game fish, since there were present only two of each in the entire lake. These either were relics of previous (and largely unsuccessful) plantings (although according to the records of the Conservation Department no plantings of any kind of fish have been made in the lake since 1921), or else had entered the lake at some time in the past from the Au Sable River.

The northern pike, although fairly numerous, were rather small. The largest one in the lake was only 23 inches long, and there were only 5 1/2 legal-sized (over 14-inch) pike per acre. There were 7 legal-sized rock bass and 2 legal-sized common sunfish (over 6-inch) per acre; but most of these were just barely legal--6 to 7 inches--with the largest one only 9 inches long.

Of the 2,264 perch, there were only two in the entire lake that were legal-sized (over 6-inch), and the larger of these was only 7 inches. The vast majority were young of the year or one-year-old fish. The absence of larger perch may possibly be explained on the basis of too much competition for food. The 6- and 7-inch perch had fairly well developed gonads, and it is quite possible that the young of the year were produced by the spawn of these comparatively small adults.

The total weight of all fish was 27.25 pounds per acre. In comparison with many other lakes in the state, this total poundage is quite low. And of this amount, only about half, or 14.42 pounds per acre, represented game fish.

If brook trout can be assumed to be able to utilize the primary food sources (the plankton, bottom organisms, etc.) as efficiently as did the mixed population, O'Brien Lake should support at least 27 pounds per acre, all of which would be of game species. Whether or not such an assumption can safely be made may be open to question, for the mixed population represented several diverse feeding habits. However, in view of the rather wide range of food utilized by trout, and the fact that the trout might be favored in growth (over the warm-water species) by the temperature, it seems as though a reasonably good growth and production can be expected.

#### Other Work on the Lake

At the time of poisoning of the lake, the beaver dam at its outlet was used as the basis for the construction of a filter dam. The holes in the dam were plugged with brush, so as to allow for the flow of a fair amount of water, and at the same time to prevent the passage of fish into the lake from the stream.

On September 20, 1939, a planting of 10,500 brook trout, of large fingerling size, was made by the Huron National Forest.

On October 25-26, 1939, an over-night set of six experimental gill nets and a fyke net resulted in the capture of about twenty-five of these brook trout, plus two 6- or 7-inch suckers. It is possible that the suckers may have been introduced along with the brook trout. Otherwise they were missed by the poisoning.

#### Suggestions for Future Management

It is suggested that some work be done in cleaning out the spring streams, and that beds of fine gravel be constructed in these streams and at their entrances into the lake, in order to furnish spawning grounds for the trout.

The filter dam in the outlet should be checked occasionally to see that it does not become passable to fish (particularly to large pike and sunfishes).

The lake should be given the status of a "trout lake." One closed season (1940) would be desirable, in order to give the trout a chance to reach slightly larger than legal size before they begin to be caught out.

The use of live minnows should be prohibited in order to avoid the establishment of competitive or predatory species.

A creel census of fishing on the lake for the next few years after opening would be desirable, if at all practicable. The periodic taking and study of fish samples should (and probably will) be done by the Institute for Fisheries Research. Further trout plantings should be made only in the light of such study, in order to avoid over-planting, with possible consequent stunting of growth.

INSTITUTE FOR FISHERIES RESEARCH

# Anglers Catching Cut-Throat Trout in Michigan for First Time

## Hatcheries Responsible for the Fish

Opening-Day Take Near Mio Plentiful but Now They're Becoming More Wary

BY JACK VAN COEVERING

Cut-throat trout are being caught in Michigan. Black-spotted, with a striking light-red mark on the lower jaw, they are giving anglers a real thrill—although not a great deal of fight. They were a sensation in the vicinity of Mio on opening day of the trout season. For a couple of weeks they were caught freely. Now only the more wary fish remain and it is harder to catch them.

The cut-throats, which perhaps would be more accurately called mountain trout or black-spotted trout, are entirely a product of Michigan's fish hatcheries. The

## Be Sure to Enter Fishing Contest

The tenth annual Free Press Fishing Contest began April 26 and will continue until Labor Day.

There will be 12 trophies for the biggest fish in 12 different classes. There is no fee to enter and entry blanks are free at the public relations counter, first floor, Free Press, or by mail. Send a stamped addressed envelope to the Wildlife Editor, Detroit Free Press.

eggs came from Montana. In April, 1940, the fish had grown to planting size — they were nine months old, and the whole batch of them weighed nine pounds. Fisheries men planted them carefully in twenty-four-acre O'Brien Lake in Alcona County. At the same time they planted 5,000 Montana grayling of the same age.

### A Secluded Spot

O'Brien Lake is deep, surrounded with spruces and looks more like a small waterhole in the Canadian wilds than a typical Michigan lake. There is not a boat or cottage on it. It may be reached only on a sand trail that winds through the high plains. At one time it yielded few, if any, keeper fish. It was full of stunted perch. The Institute for Fisheries Research decided to experiment with it, so all the fishlife was poisoned and removed and the lake was given a fresh start.

The United States Forest Service, within whose domain the lake is located, either got its signals crossed or else was eager to do something on its own and planted 10,500 brook trout fingerlings in September, 1939. The next spring the State Fisheries Department put in black spotted trout and grayling. When the lake opened to fishing April 26, anglers caught plenty of black-spotted trout, a few grayling, which they naturally put back, and scarcely any brook trout. Whether this means that the brook trout did not take hold or were more wary than the cut-throats is anybody's guess.

### Novelty Fishing

Anglers fished the black-spotted trout more for novelty than anything else. The fish seemed quite unable to resist worms. By late afternoons they began to jump, at which time they could be taken on flies. They averaged about nine and 10 inches long, but were scarcely to be called desperate fighters.

Before Michigan anglers adopt the name cut-throat, perhaps they should be told that Dr. G. Brown Goode calls it a "horrible name" which he hopes never will be sanctioned in literature. Nevertheless, cut-throat is an interesting appellation and will probably stick.

The cut-throats have no red spots at all, like other Michigan trout. Its red under mandible is usually distinctive, but it may be extremely pale. A quick test for the cut-throat is to run the finger back along the fish's tongue. In both cut-throat and rainbow, there is a group of small teeth on the tip of the tongue, but the cut-throat invariably has a second group farther back on the base of the tongue. These are known as the hyoid teeth and are never present in rainbow trout.

Cut-Throats on the High Plains



A year ago the State Department of Conservation planted 2,500 black spotted trout (often called cut-throats) in O'Brien Lake on Michigan's high plains

in Alcona County. Now anglers are pulling in the fish, which have grown to be eight to 10 inches long. As there are no boats on the lake, anglers have

to bring their own, as did Henry and A. J. Rheume, of Detroit, in the canoe above. The lower photo shows a fine catch of the new trout.