

Original: Fish Division
cc: Huron National Forest
Mr. Potts
Mr. Howard Russell

Swain
near) *Swain possibilities*

INSTITUTE FOR FISHERIES RESEARCH Mr. Ruhl
DIVISION OF FISHERIES Dr. Brown
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

pt. 4

ALBERT S. HAZZARD, PH.D.
DIRECTOR

November 10, 1939

ADDRESS
UNIVERSITY MUSEUMS
ANN ARBOR, MICHIGAN

REPORT NO. 557

FISHERIES SURVEYS OF LOON, ISLAND, TWIN, NERO AND HELMER LAKES
IN OSCODA AND OGEMAW COUNTIES

C.J.D. Brown and A. S. Hazzard

Five small lakes situated in south-central Oscoda County and north-central Ogemaw County were studied during July and August, 1937, by the Institute for Fisheries Research survey parties.* A description of their specific locations are as follows:

<u>Lake</u>	<u>County</u>	<u>T.</u>	<u>R.</u>	<u>S.</u>
Loon	Oscoda	25 N.	2 E.	36
Island	Oscoda + Ogemaw	24-25 N.	2 E.	35, 36, 1, 2
Twin	Oscoda	25 N.	2 E.	25
Nero	Ogemaw	24 N.	3 E.	5, 6
Helmer	Oscoda	25 N.	2 E.	22

The outline contour maps of all the lakes except Nero were prepared by the U. S. Forest Service. The last named lake was mapped by the Institute for Fisheries Research. Data including the physical, chemical and biological features were taken for each lake and are discussed here in so far as they

* Loon, Island and Helmer lakes were surveyed by Horace Telford, L. E. Shettles and Joseph Bailey; Nero and Twin lakes by David C. Chandler, Walter Crowe and E. L. Cheatum.

appear to affect the management of fish in these waters.

These lakes occupy a high wooded plain between the Au Sable drainage on the east, north and west and the Rifle River drainage on the south. Each has a separate drainage and all are without substantial inlets or outlets. Surface water and a few small springs are their sole source of water supply and their fluctuation in level are therefore markedly affected by wet and dry years.

Loon Lake is the largest of this group, and Helmer Lake the smallest. A summary of the areas, depths and bottom types if given in the table below.

Lake	Area, acres	Maximum depth, feet	Shoal	Depths
Loon	90	50	Gravel and sand covered with marl	Pulpy peat
Island	65	25	Mostly sand, some marl and peat	" "
Twin	18	43	Mostly pulpy peat, some sand	" "
Nero	9	35	Mostly pulpy peat, some sand	" "
Helmer	6	25	Sand and pulpy peat	" "

As can be seen from the above table, sand is the predominant bottom of the shoal areas. It is confined, however, to the waters under 5 feet in depth except in Loon Lake, where it extends down to the 35-foot contour at the east end. Most of the sandy areas in this lake are covered by a thin layer of marl. Helmer Lake has rather large deposits of sawdust mixed with the sand in all of the shallower water. The bottom of the deeper areas in all of these lakes is uniformly of pulpy peat.

The basins of Island, Helmer and Nero lakes are regular, i.e. the deepest point occurs approximately in the center of the lake. Loon Lake has five distinct depressions or holes; three of which are over 40 feet

in depth. Twin Lake consists of two distinct basins separated by a narrow neck of water less than five feet in depth. This lake may be divided into two parts during low water levels.

A series of temperature and chemical data were taken for each of these lakes. This is summarized in the following table.

Lake	Date	Temperature, degrees Fahrenheit			Oxygen ppm.			CO ₂ ppm.		M.O. Alk. ppm.		pH Range
		Surface	Middle		Surface	Top		Top	Bottom	Top	Bottom	
			Ft.	Thermocline		Ft.	Thermocline					
Loon	7/9/37	78	25 - 67	40 - 46	7.8	40 - 3.4	50 - 0.6	0.0 - 12.0	130 - 153	* ✓		
Island	7/13/37	77	...	68	8.9	...	24 - 7.5	0.0 - 4.0	108 - 115	* ✓		
Twin	8/11/37	80	24 - 62	40 - 47	8.5	24 - 10.1	40 - 0.3	0.0 - 1.3	71 - 76	7.1 - 8.1		
Nero	8/13/37	74	18 - 56	30 - 48	7.2	18 - 10.0	0.6	0.0 - 2.0	102 - 128	7.1 - 8.5		
Helmer	7/13/37	76	... None	20 - 72	8.4	...	5.4	0.0 - 6.0	49 - 54	* ✓		

* Not taken

The water temperatures and chemical analyses taken during July probably do not represent climax summer conditions, but they do indicate the general temperature and oxygen trends in these waters. Those analyses taken during August are of more direct significance.

The surface temperatures of all these lakes (74° - 80° F. July and August readings) probably get too high to support trout or other cold water game fish. Nero Lake may be the one possible exception to this since its surface temperature was only 74° F. on August 13. The deeper waters of these lakes, except Island and Helmer, have relatively cold temperatures. At 16 feet in Loon Lake the temperature was 67° F. in July and at 24 feet the temperature in Twin Lake was 62° F. in August. Nero Lake had a temperature of 56° F. at 18 feet in August. The oxygen supply was adequate for trout at these depths but gradually diminished to inadequate amounts near the bottom. This means that at least in Twin and Nero lakes the temperature and oxygen supply are adequate for trout throughout the summer. Island and Helmer lakes are much too shallow and warm to support trout, and Loon Lake is certainly marginal for trout as far as temperature and oxygen are concerned.

The carbon dioxide present is in small quantities and of no significance as a direct influencing factor. The total alkalinity ranges from the "soft water" of Helmer (M.O. 49-54 ppm.) and Twin (M.O. 71-76 ppm.) to the moderately hard water of Loon, Island and Nero lakes (M.O. 102-153 ppm.).

The vegetation in these lakes is relatively scarce. Most of the beds are small in extent and of thin to moderate density. The most common plants are pondweeds and Chara. The pondweeds (Potamogeton) are confined to the shallower water and the Chara occupies the zone of rapid drop off. Twin Lake supports the most abundant vegetation of this group, including the pondweed (Potamogeton), naiad (Najas) and yellow water lilies (Numphar).

Certain of the deeper areas supports moderate growths of muskgrass (Chara). The plant species are very similar to those in Loon and Island lakes, but the vegetation density is much less. Nero Lake has the smallest plant population, comprised chiefly of yellow water lily and muskgrass.

While vegetation density is ordinarily an index to productivity, there may be other compensating factors which are as important to good fish production. However, the rather poor weed beds of most of these lakes places them in the class of fair to poor producers of fish. This is confirmed in part by the fish food studies made at the time of the survey.

Loon and Island lakes appeared to have the most abundant fish foods present. Crayfish, "shrimp" and insect nymphs were fairly common. These waters are probably average in fish food production for the lakes of that area. All of the other lakes seemed to have very small quantities of food. Amphipods were present in small numbers along with midge larvae and oligochaete worms. In general, fish food productivity of these lakes seems to be below average for the region.

The fish collected during the survey show these lakes to be inhabited only by warm water species. Trout were reported for Loon, Twin and Nero lakes, but collections did not confirm these reports. A summary of the fish collected, in the order of abundance, is given below. This table also shows the stocking records (1935-1938 inclusive) and the creel census summary where the latter is available. The fish are listed in the order of frequency taken, the most frequent first, etc.

Lake	Game fish collected	Game fish planted 1935-1938	Forage fish present	Coarse fish	Obnoxious fish
Loon	Bluegills Pumpkinseed Yellow perch Largemouth bass	4100 bluegills 500 largemouth bass	Iowa darter Bluntnose	None taken	None taken
Creel census - Bluegills, pumpkinseed, perch, largemouth bass, smallmouth bass					
Island	Bluegill Pumpkinseed Largemouth bass Smallmouth bass	7500 perch 120,000 pike perch 14,000 bluegills 500 largemouth bass	Iowa darter	None taken	None taken
Creel census - Pumpkinseed, largemouth bass, bluegills, smallmouth bass, perch					
Twin	Perch Largemouth bass Bluegill Pumpkinseed Smallmouth bass	8200 bluegills	None taken	None taken	None taken
Creel census - Perch, largemouth bass, bluegills, smallmouth bass					
Nero	Pumpkinseed Perch	None	None taken	None taken	None taken
Helmer	Bluegill Pumpkinseed Largemouth bass Longear sunfish	8500 bluegills	None taken	None taken	None taken

No studies have been made to determine the growth rate of the fish taken from these lakes. It is almost certain that the pan fish grow rather slowly due to the low water temperatures and scarcity of food. This should be particularly noticeable in Twin and Nero lakes, which seem to be more suited to trout than bluegills and bass.

Fishing is reported to be medium to heavy on Loon, Island and Twin lakes and light on Helmer and Nero lakes. None of these waters have much of a fishing reputation, but reports show fair catches of pan fish have been made on Loon and Island lakes.

Predators including the kingfisher, blue heron and turtles were common at Loon, Island and Twin lakes. No fish predators were observed by the survey parties at Helmer and Nero lakes. While the effect of predation on the fish production in these lakes is not definitely known, we doubt that it has any serious results on the fish population and believe that no predator control should be undertaken at this time. Predatory fish are completely absent from these waters and no fish parasites were reported by the survey party.

The spawning grounds in these lakes seem to be adequate for bass and bluegills. Loon Lake especially has an abundance of suitable spawning areas for bluegills and smallmouth bass. There are, however, absolutely no suitable trout spawning beds.

Management Suggestions

The five lakes in this group have considerable cover for fish in spite of the lack of abundant vegetation. This is particularly true of the shallow or near shore areas where there are many fallen logs. Loon Lake has already received some improvement devices in the form of brush shelters. It is quite possible that a few brush shelters in water of 10-25 feet might improve conditions in all these lakes.

Plantings during the past five years have been confined mostly to bluegills and largemouth bass, and the number of fish planted has probably been adequate to establish suitable populations, i.e. if bass and bluegills are desired. Because of relatively low productivity and scarcity or absence of forage fish and because of relatively small size, no plantings of

walleyes (pike perch) should be made in any of these lakes. It is our belief that these lakes should be divided into two groups, the one to be encouraged for trout and the other for warm water fish.

Stocking Recommendations for Twin and Nero Lakes

According to our survey studies, Twin and Nero lakes should be more successful as trout lakes than for pan fish. The future policy regarding them should be either of the following:

(1) Complete removal of the fish population and stocking with fingerling trout at first. Then restocking with 6-8 inch trout every two or three years thereafter. Restocking will be necessary because of the absence of adequate trout spawning beds.

(2) The stocking of 6-8 inch trout (brooks or rainbow or both) at regular intervals without removing the population of warm water species. If this procedure is anticipated, large trout should be stocked because there would most certainly be a tremendous loss of fingerlings if planted in these lakes containing large bass and perch.

We lack sufficient tested information to indicate which of these methods is most desirable. Several plantings of trout in waters first cleaned by poisoning all fish have shown remarkable survival and growth, and in small lakes where the cost of poisoning is not excessive this has been most often recommended. On the other hand, we have on record a few cases where legal sized trout did exceedingly well when stocked in suitable waters along with bluegills and bass.

Twin Lake

Since Twin Lake has two small, separate basins which could be isolated from one another, we propose an experimental study to test the value of stocking trout with other species.

Our procedure would be as follows: Place a fine mesh screen in the narrow neck of water between the two basins so as to prevent all fish migration between these two waters. Poison the smaller basin to remove all of the standing population, then stock each of these two parts with a number of trout (size 6-8 inches in length) proportionate to their areas.

A careful creel census on this lake would then give an index to the effectiveness of each method. It is hoped that this experiment may be carried out with the cooperation of the U. S. Forest Service.

Nero Lake

It is thought desirable to remove the fish population of Nero Lake by poisoning before stocking with fingerling trout. The Institute for Fisheries Research is willing to undertake this project. Some form of creel census will be undertaken. Perhaps a modified form of the old original system could be put into effect whereby each fisherman fills out his own records and deposits them in a box prepared for the purpose. Occasional checking by an Institute employee would give some indication of the effectiveness of this system.

Stocking Recommended For Loon, Island and Helmer Lakes

Loon Lake

From fish collections made by the survey and from creel census reports by conservation officers, it appears that Loon Lake has a good variety of game fish either native or established by plantings. Conditions for bluegills, pumpkinseeds, perch and largemouth bass are favorable and it does not appear that any further planting should be necessary to maintain as large a population of these fish as is consistent with the food supply. However, there is a question whether smallmouth bass are present, although Loon Lake appears to be better suited to this species than to the largemouth.

None were taken in fish collections made by the survey. The one record from creel census may well have been an error. Since Loon Lake seems better suited to smallmouth bass than to largemouth and since the former is considered the more desirable game fish, annual plantings of at least 10,000 smallmouth bass fingerlings are recommended for the next three years. At the end of that time a check should be made to determine if the species is established. If so, no further stocking of any kind should be required. If the smallmouth is not established after this attempt, it is likely that any further attempts would prove futile. Transfer of adult smallmouth bass from Lake Huron is not recommended as the bass tapeworm apparently is not present and there is a strong likelihood that it would be introduced by this method.

Island Lake

Survey and census records show that bluegill, pumpkinseed, largemouth, ^{bass} smallmouth, and perch are established in this lake, so that no further plantings of any species should be made. Introduction of pike perch apparently failed, which is fortunate considering that suckers and minnows are absent. Pike perch thrive only in larger lakes (from 100 acres up) where an abundance of forage fish are present.

Helmer Lake

Bluegills, pumpkinseeds, long-eared sunfish, and largemouth bass are now established in this lake, and considering its small size, no other species should be introduced. No further stocking should be required. It would probably be desirable to reduce the number of long-eared sunfish in the lake since research has shown that this species rarely if ever reaches six inches in Michigan and is a direct competitor of bluegills and other sunfish. However, no satisfactory means to accomplish this has been

perfected short of poisoning the entire population. Should fishing become poor (as reported to have been the case previously) this form of management might be considered as the lake is small and could be poisoned and restocked at relatively low cost.

INSTITUTE FOR FISHERIES RESEARCH