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FURTHER OBSERVATIONS ON CRYSTAL LAKE, MONTCALM COUNTY:- ABUNDANCE OF FISH AND POSSIBILITIES FOR PLANTING TROUT

by

Edwin L. Cooper

Crystal Lake in Montcalm County (T.10 N., R. 5 W., Secs. 7, 8, 17 and 18) was mapped by an Institute party in February of 1941, and an inventory survey was made the following summer. It was concluded from this survey that natural reproduction was sufficient to maintain the fish population, and therefore the stocking of warm-water fishes has been discontinued. Since the adoption of a no-stocking policy, numerous complaints of the quality of angling have been received by the Conservation Department. In response to these complaints the lake was rechecked for the success of fish reproduction in September, 1942; August, 1944; and September, 1946. In all instances considerable numbers of young fish were found. Previous Institute reports summarizing the results of the investigations in 1942 and 1944 are Nos. 768a and 956. The present report deals with the results of the September, 1946 investigation.

Prior to this examination of Crystal Lake, contacts were made with Mr. William H. Beck of 615 East Michigan Avenue, Lansing, who is a member of the Crystal Lake Cottage Owner's Association, and with Conservation Officer Earl Bigelow of Stanton; these men were advised of the plans for the examination, with the suggestion that they inform the local people at Crystal

that the examination was to be made. Mr. F. A. Westerman contacted Mr. Beck in Lansing, and Mr. Bigelow was contacted by phone and letter (September 3) from the Institute office in Ann Arbor. Mr. Claude Lydell was notified of the examination by a copy of the letter sent to Mr. Bigelow.

Crystal Lake was netted on September 7 to 9, 1946 by an Institute party consisting of C. M. Taube, J. F. Bruna and the writer. The netting operations were observed by a total of approximately fifty local people during the three days. The nets used were a 25-foot common sense minnow seine, a 100-foot 3/8-inch-square mesh-bag seine, and several gill nets. Eight seine hauls were made on the shoal areas in a representative variety of habitats, including open sandy bottom, and marl and peat bottom with submerged and emergent vegetation.

The results of this collecting are summarized in Table 1. The majority of fish taken by seine were from areas in and around the weed beds while,as might be expected, very few fish were captured on the open sandy shoals. The eight seine hauls, in two limited areas, produced 95 yellow perch which were 2 to 9 inches in length; 89 largemouth bass, 2 to 11 inches; 142 bluegills, 1 to 7 inches; 7 long-ear sunfish, 3 to 3 1/2 inches; 7 rock bass, 1 to 5 inches; 23 pumpkinseeds, 3 to 7 1/2 inches, and numerous forage fishes. The eight seine hauls covered an estimated total of 3/4 acre of lake shoal. The total catch of game and pan fishes was 363, or approximately 485 per acre of lake shoal. This density of the various species, although below that found in most lakes checked in a similar fashion, seems adequate to maintain a maximum population of adult fish, considering the relatively limited living conditions for warm-water game fish in this lake (lack of weed beds, poor food supply). The numbers of adult game and pan fishes taken by gill net in Crystal Lake (Table 1) compare favorably with the results of gill netting in other public lakes in the state.

Some fishermen expressed the opinion that the lake contains a great number of gar pike and bowfin which are eating all the small fish. On the other hand, other fishermen complained that there are nothing but millions of small bluegills in the lake. Neither contention was supported by the results of the seining and gill netting. Answers to queries about the quality of fishing in Crystal Lake this year varied from "the worst in ten years" to "the best I have ever had"; many fishermen reported limit catches of 8- to 10-inch bluegills and large catches of 10- to 14-inch yellow perch.

In Crystal Lake there is a scarcity of aquatic plants and other cover in shallow water. It was reported to us that some cottage owners continually cut bulrushes and other plants on the shoal areas. This practice, if adopted generally among the great number of cottage owners (approximately 250), might become detrimental to the fish population. Some cottage owners complained about the destructiveness of power boats to both weed beds and fish spawning beds.

Water analyses were made on September 8 to determine whether or not the lake has possibilities for supporting hatchery trout. At the one station in the deepest basin the analyses gave the following results: (1) 8.0 p.p.m. of dissolved oxygen at the surface, 2.7 p.p.m. at 30 feet and none at 35 feet or below; (2) carbon dioxide varied from 3 p.p.m. at 30 feet to 12 p.p.m. at the bottom (60 feet); (3) a thermocline was present at 25 to 30 feet, with the temperatures above the thermocline ranging from 63° F. to 68° F., and temperatures below the thermocline ranging from 49° F. to 57° F. The generally accepted temperature and oxygen limits for trout have been placed at not more than 75° F. and not less than 4 p.p.m., respectively. At the time of the analyses only the top 25-foot layer of water met these specifications, but this surface layer, above the thermocline, is typically

too warm for trout during mid-summer. The analyses show that the lake is not good trout water, and therefore not suitable for trout plantings.

INSTITUTE FOR FISHERIES RESEARCH

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Report approved by A. S. Hazzard

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Table 1

Fish in net collections, Crystal Lake, Montcalm County, September 7-9, 1946

(1) 1,125 feet of experimental gill net set for two nights.
(2) 4 hauls with 100-foot bag seine, 200 yards x 50 feet of shoals.
(3) 4 hauls with 25-foot common sense seine, 50 yards x 15 feet of shoals.

	(1) Gill net		(2) 100-ft.seine		(3) 25-ft.seine		Total fish
	No.	Length	No.	Length	No.	Length	
GAME FISHES:							
Northern Pike	7	16-24"					7
Yellow perch	46	6-12"	92	2-9"	3	3"	141
Smallmouth bass	4	10-19"					4
Largemouth bass			77	2-11"	12	2-3"	89
Bluegill	16	4½-9½"	93	2-7"	49	1-3"	158
Longear sunfish					7	3-3½"	7
Pumpkinseed	1	6"	22	3-7½"	1	5"	24
Rock bass	16	4-8"	1	1"	6	1-5"	23
Black crappie	1	9"					1
COARSE FISHES:							
White sucker	2	12-13"					2
Yellow bullhead	4	7-13"					4
OBNOXIOUS FISHES:							
Spotted gar	1	27"					1
FORAGE FISHES:							
Blacknose shiner					237	1½-2½"	237
Blackchin shiner					8	1-2"	8
Mimic shiner					9	1½-2"	9
Golden shiner			2	3-4"			2
Bluntnose minnow					71	1-2½"	71
Banded killifish					5	1½-2"	5
Log perch			9	3-4"			9
Johnny darter					9	1½"	9
Iowa darter					1	1½"	1
Least darter					2	1"	2
Brook silverside					22	1½-2"	22