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OBSERVATIONS ON THE AGE AND GROWTH OF YELLOW PIKEPERCH AND YELLOW PERCH FROM LAKE MARY, IRON COUNTY, MICHIGAN

by

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Lake Mary is located in Mastodon Township, (T42N, R31W, Sec. 5, 6, 7 and 8) Iron County, Michigan, about five miles southeast of Crystal Falls, two miles south of highway M-69, on the Lake Mary truck trail. It has an area of 250 acres, and has a rather irregular wooded shore line. It is drained by a small creek from the northeast, which flows into the Michigamme River. The surrounding terrain consists of rolling sand hills with a cover of jack pine, white birch and Norway pine.

The lake bottom types vary in composition, the shoals being sandy and the deeper areas being pulpy peat. The maximum depth of 48 feet is found in the west basin of the lake. A "sunken island" comes up to the 20-foot contour northeast of the most prominent southwesterly point. The large cove to the northeast has a maximum depth of 20 feet. Although most of the lake is rather free of vegetation, it is reported that weed growth is dense in certain areas. The water is white and clear with a secchi disc reading of 20 feet (weather cloudy).

A water analysis made on August 25, 1943* after a rain, with the air temperature at 72° F. showed the water to be 72° F. at the surface; 69° at 20 feet; 56° at 30 feet and 51° at 40 feet; thus showing a definite thermocline (zone in which water temperature drops about 1/2 degree F. per foot of depth) between the 20 and 30-foot contours. The oxygen content was 9.3 p.p.m. at 30 feet, but none was present at 40 feet. The lack of oxygen at the lower levels limits the area available to fish life during the portions of both summer and winter, but this has no significant effect on fish population and growth in the lake. The water has a methyl orange alkalinity of 69 parts per million and is neutral (pH 7.0) in reaction.

On July 23, 1947, Mr. F. Warren, District I Fisheries Supervisor, received a petition from Mr. Claude Smith, District Supervisor for the Field Administration Division at Crystal Falls, signed by persons residing in the vicinity of Lake Mary, requesting that a survey be made of the lake to determine the reason for poor fishing during the past few seasons.

At 6:00 p.m. on September 15, 1947, Mr. Warren and the writer set three gill nets in Lake Mary (one experimental net in a small weedy "pocket" opposite the Vet's camp; another experimental net opposite Anderson's Resort and a one-inch bar gill net off the most prominent southwesterly point) in waters ranging from 5 to 30 feet deep, and lifted them the following morning at 8:00. The first net opposite the camp (in poor condition) contained no fish; the second opposite Anderson's Resort produced 10 yellow perch, 10-14" and one white sucker 19 inches; the third net contained 34 yellow pikeperch 10-17-1/2 inches and one

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* Partial survey made by Dr. A. S. Hazzard, Director, Institute for Fisheries Research.

great northern pike 14 inches. All fish were in good condition; most of them were taken near the lead-line of the net so may have been feeding near the bottom. The yellow perch showed evidence of being infected with both "black spot" and white grubs and the pikeperch with "black spot" but these were not numerous enough to affect the physical condition of the fish. The perch also showed tape worms in the body cavity.

In 1935 a growth study was made of five yellow pikeperch sent to the Institute for Fisheries Research from Lake Mary[1]. These fish were thought to be stunted. The results of the studies at that time showed that specimens 10.4 - 11.1 inches long were of the three-year age group (in their fourth summer of life). Comparison with fish of similar age from Wisconsin waters showed them to be decidedly below the average length. These specimens showed evidence of starvation, and had large heads and eyes. No definite conclusions were reached as to the cause for this "stunted" condition, but the following possibilities were given:

(1) Lack of proper food supply; especially forage fish.

(2) Over-population of pikeperch due to (a) very favorable spawning and fry conditions which cause a super abundance of young or (b) over stocking of fry from hatchery.

(3) Cause of dwarfing may be genetical; fish may belong to a dwarf race or a race of slow-growing individuals.

(4) Extremely cold water may affect both the food supply and the amount of food eaten by the pikeperch.

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[1] Trautman, Milton B., "Report on the age, rate of growth and condition of 13 yellow pikeperch from lakes Tobin and Mary, Iron County, Mich. IFR Report No. 316, October 8, 1935.

It is not known what the exact history of this lake is or what species were originally present. Fish Division planting records show that 80,000 pikeperch fry and 3,000 five-months-old bluegills were planted here in 1933 and 3,000 seven-month-old perch in 1935. Since then there have been no fish planted. It is possible that other species present such as northern pike, smallmouth bass, ling and white suckers may have entered via the small creek from the Michigamme River.

A white sucker mortality of minor degree occurred here and was observed and reported by Roy H. Johnston, District Fisheries Supervisor, on August 14, 1940. The cause was not known. This sucker mortality occurred on other lakes in the vicinity at about the same time.

On August 26, 1943, Dr. A. S. Hazzard of the Institute for Fisheries Research, took 4 specimens of pikeperch averaging 12.5 inches; 8 yellow perch averaging 12.9 inches; one ling, 17 inches and 2 white suckers averaging 18.5 inches in an experimental gill net. It was set off the most prominent southwesterly point in the lake in water ranging from 10 to 30 feet in depth.

Results of an examination of these scales together with those of 34 pikeperch taken on September 16, 1947, from approximately the same place in the lake, are summarized in Table I.

In comparing these figures with studies made in Minnesota, Wisconsin and Michigan (see Table III) it was found that the pikeperch in Lake Mary are above average in the first four age groups; are above the tentative Michigan State averages, equal to Lake of the Woods, Minnesota, but below the Wisconsin state average in the 5th year age group; are

Table I.--Age, average lengths and weights of pikeperch in Lake Mary, Iron County.

Date of Collection	Age group	Average total length (inches)		Average weight (Lake Mary)	
		Lake Mary	State*	Pounds	Ounces
August 26, 1943					
	0	9.3(1)**	...	...	3.8
	I	11.7(1)	8.4	...	6.4
	II	12.6(1)	11.5	...	9.2
	VIII	16.5(1)	18.2	1	7.3
September 16, 1947					
	I	11.3(11)	8.4	...	6.8
	II	14.4(8)	11.5	...	15.1
	III	16.4(3)	13.4	1	8.6
	IV	17.0(5)	14.6	1	10.4
	V	17.2(6)	15.5	1	12.8
	VI	17.4(1)	16.8	1	12.0

* Tentative averages, determined by Wm. C. Beckman

** Figures in parentheses indicate number of specimens

Table II.--Comparison of average total lengths of pikeperch from Lake Mary with those of pikeperch of similar age groups from Michigan, Wisconsin and Minnesota.

Age group (annuli)	AVERAGE TOTAL LENGTH IN INCHES					
	Michigan*	Wisconsin**	Minnesota (Lake of the Woods)***	Lake Mary		
				1947	1943	1935
0	...	5.4	6.4	...	9.3	...
I	8.4	9.8	9.2	11.3	11.2	...
II	11.5	13.2	11.5	14.4	12.6	...
III	13.4	15.9	13.6	16.4	...	11.0****
IV	14.6	17.8	15.4	17.0	...	...
V	15.5	19.5	17.2	17.2	...	...
VI	16.8	21.8	19.0	17.4	...	...
VIII	18.2	24.8	22.6	...	16.5	...

* Tentative averages by W. C. Beckman, Institute for Fisheries Research

** Tentative averages by Juday and Schloemer, 5th Report on Growth of Game

*** Tentative averages by Eddy and Carlander, Growth Rate Studies of Minn. Fish, 1942

**** Tentative averages by G. P. Cooper, I.F.R. Report 316, 1935 (Trautman)

Table III.--Age of Specimens of Yellow Perch from Lake Mary as Compared with the State Average

Date of collection	Age group	Average total length (inches)		Average weight	
		Lake Mary	State**	Pounds	Ounces
8/26/43					
	IV (2)*	11.3	7.5	...	9.8
	V (4)	12.3	8.5	...	13.8
	VI (1)	13.8	9.5	1	2.5
9/16/45					
	II (1)	8.9	5.8	...	4.9
	III (1)	10.4	6.4	...	8.0
	IV (3)	12.8	7.5	1	0.8
	V (2)	13.0	8.5	1	0.1
	VI (2)	14.0	9.5	1	6.2
	VII (1)	14.2	10.4	1	8.0

*Number of specimens in each age group

**Determinations by Wm. C. Beckman

above the Michigan State average. The results of an examination of scale samples of 17 yellow perch taken from Lake Mary on August 26, 1943 and September 16, 1947, are summarized in Table III. State averages are also tabulated.

State averages give a basis for comparison and reveal gross differences between growth rate in individual lakes and average growth rate of the species in representative waters throughout the state. State averages are based on collections made throughout the year, while the Lake Mary collections were made late in the year. Allowances should be made for the time of year. In the case of Lake Mary, the growth rate of yellow perch is shown to be much faster than the state average, in all age groups studied.

The 1943 and 1947 late summer (probably near end of growing season) catches of pikeperch from Lake Mary if compared with fish from Minnesota and Wisconsin waters at that same period of the year would probably be more or less equal through Age Group IV, but are ahead of the tentative Michigan average. The fish from Age Group V and above show slow growth in comparison with the averages of the other two states, but are on a level with the tentative Michigan average.

Though no population studies have been made in Lake Mary it seems that there is a good population of pikeperch and yellow perch present, if one can assume that the take from three gill nets set for 14 hours is good criterion. In comparing this catch with catches on other lakes where the fishing has been considered good during the season, I would say there is a good population of game species present. Though no smallmouth bass were taken in the net (these do not gill as readily as perch

and pike), numerous fingerlings of this species were observed on the shoal area, so there is probably a fair number of adult smallmouth present also.

There was some variance in opinion as to the fishing success on this lake in the 1947 season. Mr. Anderson and son, proprietor of a recently founded resort on Lake Mary, and whom we met on the lake at the time of the netting operations, stated that as far as they were concerned the "walleye fishing was good." This of course was contradicted by Mr. Jacobs who circulated the petition regarding poor fishing. One signer of the petition when confronted with our 14-hour catch admitted that he had no doubt about the presence of numerous pikeperch and yellow perch in the lake, but had signed the petition just to satisfy his neighbor. Mr. John Schemky, local conservation officer, also felt that there was a fair population of pikeperch and perch present in the lake, but that other pan fish (bluegills) should be introduced to afford better fishing during the latter part of July and August when the pikeperch are less apt to be biting. This is deemed a logical conclusion providing conditions are suitable.

On checking the planting records it was found that 3,000 (5 month-old) bluegills had been introduced in 1933; evidentally this plant did not survive. Where the fish population is dominated by pikeperch, perch and smallmouth bass (species more conducive to colder and less productive waters) a lake frequently does not tend to support a substantial bluegill population.

The stomachs of seven of the 34 pikeperch (ranging from 11.6 to 17.9 inches in length) taken on September 16, 1947, were found to contain 982 items of food, with a volume of 25 cc. There were 831 midge

larvae and 139 midge pupae, totalling 13.7 cc., or 55 percent of the total. Four fish (one identified as a perch) and one crayfish were found. Particles of plants, one scud and one caddis pupa were also observed. (The latter two items may have come from the stomachs of the smaller fish present in the pikeperch stomach).

All specimens taken in the 1947 catch were in good condition and contained large amounts of mesenteric fat. The reason for the fish growth falling off so rapidly after the fourth or fifth year is not accounted for. It may be caused by a lack of forage fish on which the larger pikeperch usually feed, or which they may prefer to an insect diet. No forage fish were observed in this lake except for a few large white suckers. The stomach of one pikeperch contained a small perch. Competition with other larger game species for similar foods may be another cause.

With the present knowledge of the fish present and their fast rate of growth to a legal size, it is recommended that no further predatory game fish be planted. It may be feasible to introduce some adult bluegills to see if they will become established in the presence of the other game species. It may also be of value to introduce golden shiners or some other species of forage fish to afford food for the game fish present, but bluegills should be tried first, as if the planting succeeds, then young would provide forage and the adults might add variety to the fishing.

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