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INSTITUTE FOR FISHERIES RESEARCH

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A FISHERIES SURVEY OF JACKSON LAKE, MONTMORENCY COUNTY

by

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Introduction

Location and Drainage

Jackson Lake is located in Briley Township (T. 31 N., R. 2 E., Secs. 11, 14), Montmorency County, about seven miles north of Atlanta on Highway M-33. It is in the drainage basin of the Black River, a tributary of the Cheboygan River. Other prominent lakes nearby are Valentine, Muskellunge and Clear. It is in the Presque Isle State Forest.

Acknowledgments

Jackson Lake was mapped and sounded in 1935-1936 by the Michigan Emergency Conservation Work (Camp Presque Isle 76-S), which previously had installed shelters and spawning beds in the lake in 1933. On September 2-4, 1937, the lake was given a biological inventory by a party of the Institute for Fisheries Research.*

Past and Present Use

There is no evidence that this lake has ever had any industrial use. Its location, a short distance from Atlanta on a state highway makes it available as a recreation center; however, it is near several large, popular lakes which must distract from this value. At the time of the inventory, Jackson Lake had practically no recreational development. There were no cottages or resorts and no facilities for boating or swimming. Fishing was considered fair. Bass were most popular. The potential importance of this lake is probably greater than generally realized.

Physical Characteristics

Geological Origin

No information has been found on the geological origin of Jackson Lake.

* The personnel of this party consisted of: D. C. Chandler, leader; Walter Crowe and E. L. Cheatum, assistants.

Shape of Basin and Extent of Drainage

Jackson Lake is round in shape with a small indentation on the north side. The shoreline is only slightly longer than that of a perfectly round lake of the same area. The shore development is 1.1. The area was found to be 25.3 acres. The basin is a single depression with the deepest point of 26 feet just southwest of the center. The immediate shore is swampy. The surrounding terrain is rolling and wooded. The drainage of Jackson Lake is limited to seepage and runoff. The total area drained would probably be less than one square mile.

Water Fluctuation

The water supply of Jackson Lake is derived from seepage and runoff from the immediate surroundings. The lake has neither inlet nor outlet, although an outlet is shown on some maps. Therefore, any fluctuation in the water level would be controlled directly by rainfall and evaporation. Extreme fluctuations were not reported by the survey party.

The most important physical features of Jackson Lake are summarized in Table I.

Table I
Some physical features of Jackson Lake, Montmorency County

Area in acres	Maximum depth in feet	Shore development	Dominant bottom types		Color of water	Transparency (Secchi disc) in feet
			0-15 ft.	Over 15 ft.		
25.3	26	1.1	Sand, marl.	Pulpy peat.	Colorless	17.5

Discussion of Physical Factors in Relation to Fisheries

Jackson Lake has physical features similar to many small warm-water lakes of Southern Michigan which are favorable to warm-water fish. Some favorable factors that are worthy of note are the highly transparent water which would permit the penetration of sunlight through the water to most of the lake bottom; marl deposits that supply much needed minerals to plants and animals; and sandy, shallow areas and deadheads that add to the spawning facilities.

Temperature and Chemical Characteristics

Temperature

The water of Jackson Lake was warm when surveyed in early September. The temperature was 78°F. at the surface and 70°F. at the bottom (25 feet). These temperatures are indicative that this lake is only suitable for warm-water fish. It is probably even warmer in August, and would never be expected to support cold-water fish during the summer.

Chemical Conditions

Oxygen was present in sufficient abundance for any species of fish. There were 7.5 parts per million at the surface and 6.4 p.p.m. at the bottom. In late August and September when the oxygen in the bottom water of a lake of this type is generally the lowest of the summer, there was still an abundant supply in Jackson Lake. This is evidence of ample oxygen all summer. Rapid decomposition of the organic bottom soils may deplete the oxygen in the winter but it is very doubtful if this reduction is great enough to produce "winter-kill." At any rate, no winter-kill has been reported for Jackson Lake.

Alkalinity and pH

The water of Jackson Lake is alkaline (pH 8.0-8.4) and moderately soft (Methyl Orange alkalinity, 26-101 p.p.m.). Hardness of water is caused by inorganic salts which are necessary for the proper growth of life. A reasonable amount of these salts is conducive to high productivity. Jackson Lake is fairly well supplied.

Pollution

No evidence of pollution was noted in the lake.

The chemical and temperature data are summarized in Table II.

Table II
Chemical and temperature data of
Jackson Lake, Montmorency County

Date	Temperature (°F.)		Oxygen (p.p.m.)		M. O. alkalinity (p.p.m.) range	pH range
	Surface	Bottom	Surface	Bottom		
9/2/37	78	70	7.5	6.4	26-101	8.0-8.4

Biological Characteristics

Vegetation

Aquatic plants cover the lake bottom to a depth of ten feet. The loose, pulpy peat bottom below this depth probably prevents their extending into deeper water. A list of the species is given in Table III. All are ~~present~~ ~~in~~ ~~abundant~~ equally scarce. However, it is believed that there is sufficient vegetation in Jackson Lake to meet the needs of the fish present.

Table III
Names of plants and their relative abundance in
Jackson Lake, Montmorency County

<u>Species</u>	<u>Abundance</u>
Bushy pondweed (<u>Najas flexilis</u>)	Few
White water lily (<u>Nymphaea odorata</u>)	Few
Pondweed (<u>Potamogeton angustifolius</u>)	Few
Floating-leaf pondweed (<u>P. natans</u>)	Few
Hardstem bulrush (<u>Scirpus acutus</u>)	Few
Common cattail (<u>Typha latifolia</u>)	Few
Musk grass (<u>Chara sp.</u>)	Few

Fish Foods

Plankton, the very small plants and animals that float freely in the water, was collected in moderate abundance from Jackson Lake; however, a single collection is only of general significance because plankton normally varies greatly from time to time and place to place in a lake. Plankton is a source of food for the very young of most fish and for adults of a few such as bluegills. It is also used as food by many invertebrate animals.

Fish food organisms were found in moderate abundance in the sand and marl bottom soils. In the sand, scuds and midge larvae were dominant. In the marl, midge larvae were most abundant. A collection in the pulpy peat bottom of the deeper water produced no organisms. No samples were taken in the vegetation, but experience has generally shown a greater abundance of organisms to be found on and among plants than actually in the water soils.

The only forage fish collected in Jackson Lake were mudminnows which were not very common. It is possible that others were missed by the survey party.

Fish Present

A list of the fish found in Jackson Lake is given in Table IV. Stocking of game species is shown for the periods from 1933 to the time of the survey in 1937 and also since the survey from 1938 to 1941.

Table IV
Kinds, relative abundance and stocking (1933-1941)
of fishes in Jackson Lake, Montmorency County

Species	Abundance	Stocking	
		1933-1937	1938-1941
GAME FISH			
Perch	Common	...	5,000 fingerlings
Walleye	...	840,000 fry	400,000 fry
Largemouth bass	Common	...	800 fingerlings
Smallmouth bass	Few	...	400 fingerlings
Bluegill	Common	11,100 fingerlings	27,000 fingerlings
Pumpkinseed	Common
FORAGE FISH			
Mudminnow	Few

Perch, largemouth bass, bluegills and pumpkinseed were collected by the party in about equal abundance. Young smallmouth bass were observed but not collected. No walleyes were seen nor collected, although they had previously been stocked (1933-1934) in large numbers.

Creel census reports show that catches from this lake have consisted largely of pumpkinseed, perch, and largemouth and smallmouth bass. At the time of the survey the lake was considered a good bass lake.

Growth Rate of Game Species

The age, lengths, and weights of game fish that were collected are summarized in Table V.

Table V
Growth of game fish in Jackson Lake, Montmorency County

Name	Age*	Number of individuals	Total length in inches	Weight in ounces	Tentative average for state, in inches*
Perch	II	1	6.5	1.5	6.2
	III	4	7.6	2.6	7.1
	IV	2	9.1	4.8	7.3
	V	3	10.9	7.9	9.4
Largemouth bass	I	1	6.3	1.5	5.5
	VI	1	15.3	31.1	14.4
Bluegill	II	1	7.5	4.5	4.3
	III	1	6.7	...	5.6
Pumpkinseed	II	5	4.1	0.6	4.4
	III	4	6.2	2.3	5.8
	IV	4	6.7	3.9	6.4
	V	3	7.1	4.2	6.3
	VI	1	7.3	4.7	7.1

* Determined by W. C. Beckman.

Although the number of specimens was small in some cases, it is believed the results give a fairly good picture of the growth of the fish in Jackson Lake. Comparison may be made with the tentative averages for the State of Michigan given in the last column.

It may be seen that all four species listed--perch, largemouth bass, bluegill and pumpkinseed--grow slightly faster than average. No specimens of smallmouth bass were collected and their growth rate is not known.

With this evidence it appears that the fish in Jackson Lake have the necessary food, shelter and spawning facilities to maintain favorable growth and reproduction, and, of greater importance, they do not seem to be overcrowded to the extent of causing slow growth, a condition that is so common in many lakes of similar size and productivity.

Natural Propagation

Water weeds and sandy shallow areas provide ample spawning for all game fish in Jackson Lake except walleyes, which, it is now believed, prefer wave-swept rubble. Spawning facilities are also sufficient for forage fish. The M.E.C.W. as early as 1933 installed artificial minnow spawning beds in this lake; however, there is no evidence that this has increased the population of forage fish. The survey party collected only mudminnows. There appears to be enough vegetation and logs in the lake, without the aid of artificial spawning devices, to provide the necessary spawning facilities for most species of forage fish that might ordinarily be present.

Management Proposals

Designation of Lake

Jackson Lake is in the "all other lakes" category. The present investigation shows this to be the proper designation.

Stocking

No stocking of game fish is advised for Jackson Lake. Fishing at the time of the survey was fairly good for largemouth bass, bluegills, and perch, and these species should be encouraged. Their growth was good and conditions were favorable for their self-maintenance without stocking. According to recent investigations on the habits of walleyed pike, Jackson Lake does not provide desirable conditions for the spawning of this species and it is not deemed advisable to stock the lake with fish that won't reproduce naturally. Failure of walleyes to become established is considered fortunate since these fish are highly predacious and might ruin the present good fishing for bass and pan fish in a lake of such small size.

Predators and Parasites

No extensive predation or parasitism was observed in Jackson Lake.

Shelter

Sufficient shelter is present in the form of deadheads, aquatic vegetation and artificial devices installed by M.E.C.W.

Regulation of Water Level

No regulation of the water level is possible or necessary.

Improvement of Spawning Facilities

The present spawning facilities are adequate for the fish in the lake, except walleyes which should not be encouraged, according to the present management plan.

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