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Mr. Stanley Shust 4-24-42
Mr. Sauheidl 4-29-42

INSTITUTE FOR FISHERIES RESEARCH Dr. Roelofs
DIVISION OF FISHERIES
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ALBERT S. HAZZARD, PH.D.
DIRECTOR

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A FISHERIES SURVEY OF AIRPORT LAKE,

MARQUETTE COUNTY

by

E. W. Roelofs and F. E. Locke

Introduction

Airport Lake, in Forsyth Township (T. 45 N., R. 25 W., Sec. 23), Marquette County, is situated just west of the Gwinn Intermediate Airport and one mile northeast of New Swanzy.

An Institute for Fisheries Research party* prepared a map and made a biological survey of the lake during August 10-13, 1940. Mr. Louis Sauheidl, in charge of the Marquette Hatchery, suggested the study of this lake and gave considerable help to the survey party.

There is no evidence of former industrial use of the lake. There is no resort development; the quaking bog shoreline decreases its recreational value, except perhaps for fishing. Its proximity to Gwinn and New Swanzy and its accessibility make it a potential fishing water, however. Public access has now been assured through purchase from the 40 cent fund.

Physical Characters

Airport Lake, situated in the jack pine plains, is a pit lake. It is roughly "T"-shaped with the main axis in a northwest-southeast direction.

*The party consisted of: F. E. Locke, leader; B. P. Hunt, I. J. Cantrall, and P. Galvin, assistants.

A quaking bog mat 3 to 15 feet wide completely encircles the lake. There is an abrupt drop-off from the mat, so that water less than 5 feet deep is very limited. A small depression, 28 feet in depth, occurs in the northwestern end of the lake. Except for this small area, the lake is less than 20 feet deep.

Although the lake has no inlet or outlet streams, it lies within the drainage of the East Branch of the Escanaba River. Water fluctuations are slight.

A summary of the physical characters of Airport Lake is given below.

Area	6.7 acres
Maximum depth	28 feet
Shoal area	39 per cent (10 feet and under)
Bottom types	
Shoal area	Pulpy and fibrous peat
Depths	Pulpy peat
Color	Colorless
Secchi disc	17 feet

Except for the lack of shallow water, the physical character of the lake favors productivity; the absence of shallow water prohibits spawning of those species requiring it. The small size of the lake reduces wave action and favors bog mat formation.

Temperature and Chemical Character

The temperature and chemical conditions of a lake largely determine the type of animal and plant life present. Different fish, for example, grow best at different temperatures, and some fish require more dissolved oxygen than others.

A summary of the temperature and chemical conditions as found in the northwest depression on August 12, 1940, follows.

	Temperature	Dissolved oxygen
Surface	76°F.	7.1 p.p.m.
Bottom (28 ft.)	48°F.	0.3 p.p.m.
Thermocline		
Top (18 ft.)	57°F.	5.25 p.p.m.
Bottom (25 ft.)	48°F.	0.3 p.p.m.
CO ₂ range -	3.0 - 19.0 p.p.m.	
M. O. Alkalinity -	5.0 p.p.m.	
pH range -	5.4 - 6.2	

In the main part of the lake, the surface temperature on August 11, 1940, was 76°F; the bottom temperature (12 ft.) was 71°F. Adequate oxygen was present at all depths.

The only water which is unsuitable for fish life is below 20 feet in the small depression. This area is so small that it is relatively insignificant. The water cold enough for trout is also restricted to this small area. The rest of the lake is marginal for trout since they may not tolerate temperatures much over 70°F. for very long.

The acidity of the lake tends toward limiting the number of plant species.

Biological Character

Vegetation

Plants are very limited in Airport Lake both in regard to kind and amount. Three species, including the yellow water lily, bladderwort and one pondweed, occur in small amounts.

Fish food

Owing to the scarcity of vegetation, larger fish food organisms are not plentiful enough to support many fish, particularly since the pulpy and fibrous peat bottom is usually quite barren of food. Plankton (small, floating plants and animals) was abundant at the time of the survey.

Although a single sample is not reliable for estimating the abundance of plankton, it indicates a large potential supply.

Fish

Only two species of fish were present in the lake at the time of the survey. Perch were abundant; trout were rare. No obnoxious, coarse, or forage fish were taken.

Growth studies on perch are shown below.

Fish	No. of specimens	Age group*	Ave. length (in.)
Perch	6	0	2.7
	10	I	5.2
	10	II	5.9
	10	III	5.9
	12	IV	6.1
	9	V	6.2
	11	VI	6.5
	1	VII	6.6

*Age determinations by W. C. Beckman.

The perch population was severely stunted. The young grew rapidly until their third summer, when growth decreased markedly. The lack of food may have been responsible. The young probably fed largely on plankton; the older fish were forced to feed on the young so that only the fast-growing young survived. Competition among the larger fish was great, and growth was retarded.

The presence of brook trout in the population, as well as temperature and oxygen content, is evidence that conditions are suitable for this species. These fish are undoubtedly from a planting of 1,000 fingerlings in 1938.

Spawning facilities were adequate for perch but not for trout. The soft bottom and lack of shallow water would almost surely prevent successful trout spawning.

Management

Since survey results confirmed Mr. Sauheidl's belief that Airport Lake would support trout, especially if perch were removed, the lake was poisoned in August, 1940. A report of the poisoning and of the fish population present is being prepared. In September, 1940, a month later, 1,400 brook trout were planted. The poison apparently was still effective (probably because of the extremely soft water) and it is believed that the entire planting was killed.

In June, 1941, following a minnow test of the lake in May which showed the water to be suitable for fish, 1,100 two-year-olds were planted. Later that year 3,000 8-month-old brook trout were planted.

Annual samples of the fish should be taken about mid-September each year to determine the condition and growth.

No predators or serious parasite infestations were noted; no control measures are necessary.

Cover in the form of floating bog mats and submerged vegetation is adequate.

The water level cannot be regulated as there are no inlets or outlets.

The lake is, and should remain, a trout lake.

INSTITUTE FOR FISHERIES RESEARCH

By E. W. Roelofs
and
F. E. Locke

Report approved by: A. S. Hazzard

Report typed by: R. Bauch