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PARTIAL FISHERIES SURVEY OF HORSESHOE LAKE, MONTCALM COUNTY

by

C.J.D. Brown and W. F. Carbine

At the request of Mr. Lattimer, President of the Howard City Conservation Club, brought to our attention by District Fisheries Supervisor Claude Lydell, Mr. W. F. Carbine and the writer undertook a partial survey of Horseshoe Lake (T. 12 N., R. 7 W., Sec. 19, 29, 30), Montcalm County on August 16, 1943. We were not able to see Mr. Lattimer who was reported to be away on a fishing trip at the time.

This lake is situated in the north-central part of the county, about 2 miles southwest of the village of Six Lakes and 14 miles directly east of Howard City. It is accessible by a fair township road which skirts along the northeast shore.

Insofar as we were able to ascertain, all of the land surrounding this lake is privately owned. The public is not prohibited however. An abandoned farm house and several other buildings including a boat house are located on the northeast bay. Six boats were counted on the lake--these presumably were property of private individuals. No active boat livery exists, but seven row boats were found stored on the abandoned farm mentioned above.

We are indebted to Mr. Len Shelly for the use of his boat and to him and Mr. Lloyd Outman for information about this lake.

Physical and Chemical Characteristics

Hoseshoe Lake is irregular in outline, being roughly hourglass shaped. It has a small east lobe and a large west lobe with a narrow neck between (Fig. 1). The greatest depth found was 38 feet, but soundings were not very extensive, being confined to the central part of the basins and channel. We are satisfied that there is no substantial area greater than this depth however.

High banks surround the lake. These appear to be sandy moraines. The shores are wooded or partly wooded except to the south of the main basin where a large cultivated field was observed.

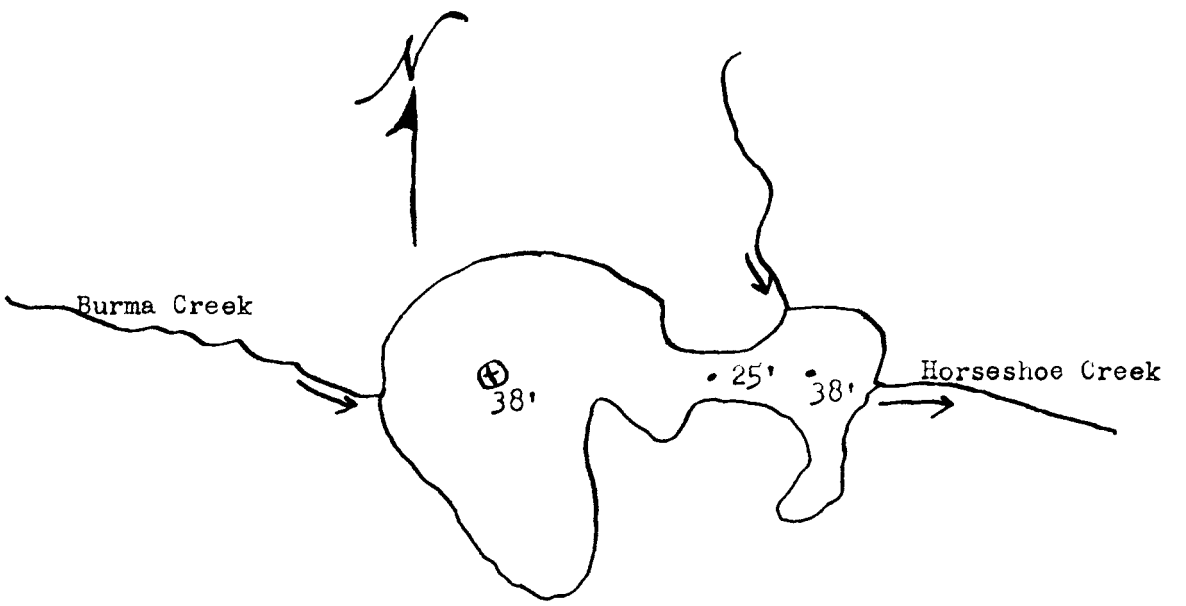

Fig. 1. Sketch of Horseshoe Lake showing station (⊕) where temperature and chemical analyses were made.

The surface area of Horseshoe Lake is estimated to be about 100 acres. The lake is fed by two tributaries--a small one from the north and a substantial one known as Burma Creek from the west. The outlet, Horseshoe Creek, is about 10 feet wide and 10 inches deep. This is tributary to the Flat River. The water temperature of this creek where the road crosses it below the lake was 73°F. on the date of this survey.

The water in Horseshoe Lake is light brown in color and a Secchi disc was visible to a depth of 8 feet. The bottom appeared to be almost exclusively of pulpy peat covered with marl in the very shallow zone.

Temperature and chemical conditions are summarized in the following table.

Depth feet	Temperature °F.	Oxygen p.p.m.	M. O. Alkalinity p.p.m.	pH
0	75	...	...	...
7	75	...	...	...
10	71	8.8	175	8.6
12	67	...	...	...
14	63	...	...	...
15	..	8.0	...	...
17	57	...	...	...
20	54	...	...	...
22	..	6.5	...	...
23	51	...	...	...
26	49	0.3	...	...
29	49	...	...	...
36	47	...	...	...

This information shows the presence of a well developed thermocline comprising the zone between 10 and 26 feet. Temperatures in this zone are cold (49-71°F.) and oxygen is abundant (6.5-8.8 p.p.m.). The water is very alkaline (pH 8.6) and hard (M. O. 175 p.p.m.).

Biological Characteristics

Aquatic vegetation was abundant in Horseshoe Lake from the shore to the drop-off. Although no collections were made, a comparatively large number of submerged species were observed. There is reason to believe that

fish food is plentiful.

The following game fish were seen or reported:

Yellow perch
Bluegills
Pumpkinseed
Bullhead
Rock bass (reported)
Largemouth bass (reported)
Northern pike (reported)

The bluegills, pumpkinseeds and yellow perch seen were all small and appeared to be somewhat stunted although no growth study has been made to substantiate this.

Management Proposals

The temperature and chemical conditions in Horseshoe Lake are suitable for trout. The water in this lake was unusually cold for the middle of August for a lake in this area, and it is believed that much spring water and that coming from Burma Creek may account for these low temperatures. This last named tributary is reported to have considerable watercress along the stream bed and to have very brushy banks. Temperature conditions are not favorable for the growth of largemouth bass and bluegills.

It is proposed, therefore, that this lake be given an experimental planting of rainbow trout (2,000 legal size) late in the fall, just before the freeze up. If descriptions of local residents are correct, trout (probably brook trout) already exist in the main inlet creek and have been taken in fair numbers from this stream this current summer. Rainbow trout may move up into this stream and may find conditions suitable for natural propagation.

The planting of trout in this lake should only be carried out if and when public access is guaranteed. A public fishing site should be secured

on this lake. Possibly the abandoned farm on the northeast bay now reported to be owned by a Mr. Golden could be secured at a reasonable figure.

INSTITUTE FOR FISHERIES RESEARCH

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