Original: Fish Division
cc: Education-Game
Inst. for Fish. Res.
Portage Trails Boy Scout Council
R. S. Marks
R. G. Fortney
W. R. Crowe

INSTITUTE FOR FISHERIES RESEARCH
DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

ALBERT S. HAZZARD, PH.D.
DIRECTOR

ADDRESS
UNIVERSITY MUSEUMS ANNEX
ANN ARBOR, MICHIGAN

February 18, 1955

Report No. 1438

FISHERIES SURVEY OF BRUIN LAKE, WASHTENAW COUNTY

By

Walter R. Crowe

Abstract

A fisheries survey of Bruin Lake, Washtenaw County was undertaken by the Institute for Fisheries Research in July, 1954. The survey was initiated with a dual purpose: first, to fulfill an obligation for cooperation with the Portage Trails Council of the Boy Scouts of America, and second, to obtain information which would permit the formulation of a management program for this public lake.

Bruin Lake is a marl lake of only moderate productivity. Sport fishes present are making average growth. Bluegills, largemouth bass, and northern pike are the most abundant sport fishes. Perch and black crappies are also present.

Management recommendations call for:

1. Installation of brush shelters by Boy Scouts under the supervision of the Lake and Stream Improvement Section of the Fish Division, Michigan Department of Conservation.

2. The lake should be added to the list of lakes open to cisco netting to permit some utilization of these fish in Bruin Lake. Construction of a smoke house would provide a fine Boy Scout project.

3. Introduction of rainbow trout in the hope of providing an additional fishery in the lake.

Original: Fish Division
cc: Education-Game
Inst. for Fish. Res.
Portage Trails Boy Scout Council
R. S. Marks
R. G. Fortney
W. R. Crowe

INSTITUTE FOR FISHERIES RESEARCH
DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

ALBERT S. HAZZARD, PH.D.
DIRECTOR

ADDRESS
UNIVERSITY MUSEUMS ANNEX
ANN ARBOR, MICHIGAN

February 18, 1955

Report No. 1438

FISHERIES SURVEY OF BRUIN LAKE, WASHTENAW COUNTY

By

Walter R. Crowe

Introduction

Recently, the State of Michigan leased the former group camp on Bruin Lake to the Portage Trails Boy Scout Council. Upon taking up the lease on the land and buildings, the Portage Trails Council drew up, with the assistance of various state and federal agencies, a comprehensive land use program for the area. As a part of this program, the Institute for Fisheries Research of the Michigan Department of Conservation offered to conduct a routine biological inventory of the lake. Such a survey would serve a dual purpose: the Conservation Department's obligation for continued cooperation with the Boy Scouts would be fulfilled, and the inventory would be added to the growing accumulation of lake survey data. Bruin Lake is a public water, and there is a public fishing site on its shore, so that a management program for the lake's fishery would be most desirable.

Physical-chemical features

The map of Bruin Lake, which includes depth contours and bottom types, was made by the Institute for Fisheries Research in January, 1942. The lake has a surface area of 123 acres, and a maximum depth of 48 feet. The basin is irregular in shape, and contains a single major depression. The drop-off

around the main depression is well defined, except on the eastern side of the lake where there is a large shallow bay containing a small secondary depression. Bottom soils are composed of marl in the shallower areas, and pulpy peat underlies the deeper water. In the vicinity of the drop-off, bottom soils are mixed marl and peat. A small amount of sand is present at certain points around the lake margin, particularly on the eastern side. An outlet on the east connects Bruin Lake with Halfmoon Lake and other lakes in the Huron River headwaters. The terrain surrounding the lake is rolling--composed of moraines and outwash plain. Cover is mainly oak.

A vertical temperature series obtained on July 29, 1954 showed the lake to be thermally stratified. The warm surface layer (epilimnion) extended to a depth of 10 feet. Underlying the epilimnion there was a layer of water where temperature dropped rapidly (thermocline). This stratum of water was 14 feet deep, extending from a depth of 10 feet down to a depth of 24 feet. Below the thermocline there was a layer of cool water in which temperatures were fairly uniform--this layer (hypolimnion) extended from 28 feet to the bottom. Temperatures on July 29 ranged from 80.7° F. at the surface to 46.6° F. at 41 feet.

The lake water contained 8.8 parts per million of dissolved oxygen at the surface, 8.6 p.p.m. at 12 feet, 3.9 p.p.m. at 23 feet, 1.6 p.p.m. at 28 feet, and 0.0 at 40 feet. Bruin Lake may be described as a hard-water lake with a methyl-orange alkalinity of 105 to 160 p.p.m. of dissolved mineral salts.

Biological features

Aquatic vegetation in Bruin Lake is not abundant. The large eastern bay is sparsely covered with patches of Chara (musk grass) and Scirpus (bulrushes). Various pond weeds (Potamogeton) are present in a narrow band along the drop-off. Extensive weed beds are generally lacking. Cover, except for aquatic vegetation, is not too abundant in the lake.

Fish collections were made by means of gill nets and a seine. The following species of fish were collected:

Species	Number	Length range, inches
Northern pike	7	16.0-23.0
Largemouth bass	1	14.4
Bluegill	8	2.4-6.5
Black crappie	1	4.9
Yellow perch	2	4.5-5.9
Pumpkinseed	6	2.4-6.1
Green sunfish	1	3.7
Longear sunfish	8	2.4-3.4
Cisco	24	10.6-15.4
Bluntnose minnow	34	0.7-2.7
Sand shiner	40	1.5-2.6
Blacknose shiner	37	1.1-2.3
Blackchin shiner	1	1.1
Blackstripe topminnow	5	1.0-1.4

In addition, 1 young-of-the-year northern pike (2.0") and 14 young-of-the year largemouth bass (1.4"-2.2") were collected.

Scale samples were secured from some of the fishes to assess growth rates of the fish in Bruin Lake. Numbers of the various species captured were insufficient to permit a very thorough examination of the growth rates of the different species, but what scale samples we have indicate that the sport fish in the lake are making about average growth. Northern pike, bluegills, largemouth bass, and pumpkinseeds are probably the most abundant sport fish in the lake, but because of the limited amount of collecting done, not much can be said about the relative abundance of the various species. Crappies and perch are also present. The green sunfish and the longear sunfish are of little

interest to anglers because they seldom reach desirable size. Forage minnows seemed to be fairly numerous. Ciscos were rather numerous in the gill nets, and these fish probably represent a more or less unused resource in the lake.

Management suggestions

Bruin Lake is not a highly productive lake as might be expected from its physical characteristics. In Michigan, most marl-bottomed lakes are less productive than other types of lakes.

From the rather limited sample of fishes collected, it appears that sport fishes now present in the lake are growing reasonably well and the only program which might benefit the fishing for these species would be the installation of brush shelters. The shelters have a tendency to concentrate fish around them, and in lakes lacking in cover, brush shelters are sometimes beneficial. Brush shelters might well be placed in the lake by Boy Scouts as part of their overall conservation program for Bruin Lake. Such a program would have to be under the supervision of the Lake and Stream Improvement Section of the Fish Division, Conservation Department.

A second step which would provide considerable sport, and further utilization of the fisheries resources in the lake, would be to harvest some of the ciscos which appear to be fairly abundant now. Present Michigan conservation laws make provision for harvesting ciscos from inland lakes. The Director of Conservation is authorized by law to designate certain lakes for cisco netting. It is hereby recommended that Bruin Lake be added to the list of lakes designated for cisco netting during 1955. A license could be secured by a responsible member of the Portage Trail Council, or a competent scout master, and scouts could participate in the fishing. A smoke house in which to prepare the catch could provide a very worthwhile project for a late fall or early winter camp.

Bruin Lake contains a stratum of water which is suitable for trout in mid-summer, and it is recommended that rainbow trout be introduced on an experimental basis. Annual plants of 2,500 legal-size trout should be made for 3 years beginning in 1955. The abundance of northern pike makes the success of trout introduction dubious, but ciscos may act as a buffer, and if trout are successful, they will add much to the fishing potential in the lake.

INSTITUTE FOR FISHERIES RESEARCH

Walter R. Crowe

Approved by: A. S. Hazzard

Typed by: P. R. Darling