

INSTITUTE FOR FISHERIES RESEARCH
UNIVERSITY MUSEUMS
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN

RECEIVED

MAY 26 1933

FISH DIVISION

Report 212

May 23, 1933

PRELIMINARY EXAMINATION OF TWO LAKES AND A STREAM ON CAMP CUSTER RESER-
VATION, KALAMAZOO COUNTY

One day, May 12, was spent by a field party made up of J. R. Greeley, R. W. Eschmeyer, and G. P. Cooper in a reconnaissance survey of Eagle Lake, Hart Lake, and stream tributary to Eagle lake. The purpose of the survey was to gather information which can be used as a basis for development of a lake and stream improvement program for these waters, located on the Camp Custer reservation.

The status of this improvement project is, at present date, uncertain due to the indefinite standing of plans for the utilization of Citizen Conservation Corps labor for work of this nature. Plans calling for the use of such labor in a state-wide project for stream and lake fishing improvements have been submitted. If approved, this program will call for the training of these men for this work. The Institute for Fisheries Research, which has been gathering information bearing on the technique of installing brush shelters in lakes and improving trout streams by increasing depths, augmenting shelter conditions and increasing shade protection, wishes to be prepared to take charge of whatever duties it may have in the planning of work and directing of training men to install the necessary improvement devices. In the event that demonstrations of methods and practise construction can be done at Camp Custer, as a part of the training course given the Citizen Conservation Corps men who are sent there, information about the possibilities of the waters there may be of use to the development of the project on a state-wide scale.

The type of stream improvement work which has been successfully developed for the improvement of trout fishing in Michigan streams is described in Bulletin No. 1 ~~for~~ of the Institute.

The means which have been employed in the Michigan projects to date have been mostly the improvement of pool conditions. By use of logs, and boulders trout streams can be remodeled so as to afford suitable depths, shelter, and general habitat conditions to more trout than these streams can carry when unimproved.

The lake improvement constructions likewise involve control of environmental conditions. In this case, the work which has been done has mostly been installation of brush shelters and of gravel spawning beds. It has been found that lakes with clean bottom, free from natural shelter, support fewer game fish than those which are better supplied with hiding places. Brush shelters, fastened securely in place with weights, add to the productivity by adding to the shelter resources.

The hurried investigation of the waters concernedⁿ in this report cannot be considered adequate to allow detailed plans to be developed without further survey investigation. The examination showed, however, that both of the lakes would be improved, in carrying capacity for game fish, by adding to the shelter facilities. The stream, tributary to Eagle Lake, is suitable for trout for a short distance near the headwaters. Apparently, the small lake near the headwaters (Sec. 13 of T. 2 S., R. 9 W.) allows the water to warm above limits tolerated by trout. It is possible, however, that further investigation may show that the section of stream from one half mile to one mile south ~~of~~ Eagle Lake may be suitable for trout. Provided this stream is improved, by increasing the number and size of pools, and restricting widths in the exposed areas to keep temperatures down, there is a probability that the carrying capacity for trout can be greatly increased. Due to the difficulties of determining maximum summer temperatures from an examination in May, conclusions regarding possibilities of this as a trout stream will have to await further study. Certainly, most parts of the stream are doubtful for trout. If, however, it should become advisable to demonstrate methods of building trout improvement devices in order to train crews of men in this work, the stream affords ample opportunity to construct wing dams and shelters of logs. Certain areas of the lower parts of the stream, just above Eagle Lake have a firm enough bottom to support constructions built of boulders.

Only passing notice was given to materials available for stream and lake improvement work. The tract includes several abandoned farms which have fields with piles of boulders cleared when the land was prepared for farming. A plentiful supply of boulders, suitable for construction of pool improvements and as weights for brush shelters was noted in Sec. 18 of T. 2 S. R. 9 W. The tract has a plentiful supply of brush and trees. It is possible that supplies of brush and small logs can be obtained without interference with the forest resources of the tract.

Examination of the stream, tributary to Eagle Lake

This stream is approximately three miles long from source to Eagle Lake. It was examined at three points over this area; at road one-half mile south of Eagle Lake, at stone dam in northeast corner of section 13, and above small lake in section 13. The part below Eagle Lake was not examined.

Above the small lake in Section 13.

The water supply is predominately springs. The temperatures are suitable for trout in the extreme upper part, inlet to the small lake in section 13. Time was not available to investigate up to extreme headwaters but the stream above this small lake is undoubtedly to be classed as a trout stream. It runs through a marsh and is sluggish. The bottom is predominately black muck. Dense beds of watercress are present. The stream is ten feet wide and is large enough for fishing. Brook trout are reported here. Other fish appear scarce, as would be expected in a spring stream. The bottom is too soft for improvements to be staked in place just above the lake. The stream should be studied up to extreme headwaters and possibilities for improvement of gravel spawning beds and for making better pools should be investigated.

Immediately below the small lake to the stone dam in northeast corner of

Section 13.

Just below the lake, the stream is rather fast for at least one quarter of a mile. Biologically, it is much changed, due to the lake outlet water having been warmed. Since the small lake is a natural one, not held by a dam, there would be no possibility

for draining it in order to improve ^{the} ~~ent~~ trout stream, even if this were desirable. The lake now provides, we understand, some fishing for perch and bluegills. Chances for trout to survive in the lake cannot be estimated on the basis of the present study. As the stream courses through marsh below the lake, it runs over a peat and gravel bottom which is mostly too soft to hold stakes if improvements were to be attempted. Possibly, by use of long stakes, logs could be held in place to make wing dams which would result in larger pools. The many minnows noted here, however, indicated warmness of the stream and trout possibilities appear doubtful. The stone dam in northeast corner of section 13 makes a long pond in which the current is sluggish. It is possible that trout may persist, in places, between the dam and the natural lake, for spring runs enter at several points along the marsh. One of these, a watercress stream with muck bottom, was fairly cold (58 degrees). At the stone dam the temperature was 66 degrees. The dam is about four feet high and the resulting pond is about 50 feet wide. How much this pond warms the stream needs investigation, but, since most of the water has to come through the small natural lake first, it is probably warmed already.

Immediately below stone dam to road in northwest corner of Section 12.

The stream was examined only at the upper and lower points noted. Below the stone dam the stream is fast, with bottom of gravel. Pools are few, small and with relatively poor shelter. Pool construction with logs is practicable here. Trout possibilities immediately below the dam are not good, however. Still, small springs were noted entering at places in the swamp land along the stream and may help the stream as a trout habitat. The lower part, at road one-half mile south of Eagle Lake is fast, coursing through comparatively steep banks. The bottom is firm, of sand, gravel and cobble. Pool construction with logs and boulders can be done in this part of the stream. The shade is good and possibilities for trout seem good. Final judgement as to trout standing conditions here throughout the summer need investigation. If the volume of spring water entering between this point and the upper limit of the section is large, temperatures may be safe. Presence of large numbers of minnows indicates that conditions are not very cold, however.

Seine collections in the stream yielded the following fish records: Horned dace, red-spotted chub, stone-roller minnow, black-nosed dace, rainbow darter, brook silversides, and common shiner. None of these fish can be considered evidence of unsuitability for trout, but the heavy minnow population indicates that temperatures are not low throughout the year.

Stocking recommendations.

For a stream of the size, less than 15 feet wide, brook trout should be preferred if there are any chances of having them succeed. Rainbow trout might be tried below the stone dam in section 13 and have the advantage that they are less limited in spawning places, and will stand minnow competition and warm water better than brook trout. Brook trout should be tried first, we believe, before the stream is definitely classed as too warm for them. Experimental plantings of brook trout, fish of as large a size as can be procured, are recommended for this part of the stream. Brook trout, of as large a size as can be secured, should be tried above the small lake in section 13.

Stream improvement recommendations.

Details of a stream improvement program cannot be given, at present. If the project is to be carried on, the entire course of the stream should be examined with a view to chances for improvement. If it should prove advisable to use this stream for the training of field crews in stream improvement work, ample opportunity for making wing deflectors of logs and boulders, and trout shelters of logs and brush is afforded. Such work could be done at any places where the stream bottom is firm enough to hold stakes or to support boulders. Results, in trout production, are uncertain in most parts of the stream due to the doubtful temperatures and we cannot definitely state that stream improvement can make this stream definitely suitable for trout over the greater part of the stream course. Any plans developed for the stream should recognize the undesirable temperature condition, the critical factor in limiting the range of trout in this stream. By ditching spring runs, to facilitate entrance of spring water with minimum exposure to warming, restriction of stream widths by use of wing deflectors, deflection of stream

current to take advantage of existing shade, temperature can be helped. The possibilities for improving trout spawning beds at the extreme headwaters, and in any cold spring runs should be investigated. Brook trout require gravel beds in spring water that is near enough its source so that winter temperatures are not near the freezing point. The type of trout pool most suitable for this stream is a narrow, fast type. These can be readily made by use of wing deflectors which will restrict stream widths. If conditions are improved by the carrying out of the measures here listed, stocking with trout will have a better chance to succeed.

Examination of Eagle Lake

The examination of this lake was not a detailed one and complete recommendations cannot be given. Such investigations as were made indicate, however, that much can be done to improve fishing conditions here.

A considerable variety of fish, including large-mouth bass, bluegills and crappies, was seen. Very few fish were found along the east shore, but fish appeared to be relatively abundant near the diving docks along the north west side. The fact that so many fish were seen at the docks and that so few were seen elsewhere, indicates that there is a decided need for more shelter.

Gravel appears to be ample to assure satisfactory spawning conditions. What effect the unusually large number of turtles may have on the spawning situation cannot now be determined. There was no indication that yearling fish are abundant.

Recommendations for Eagle Lake.

1. A considerable number of brush shelters can be used to advantage. These not only afford food and protection for young fish but tend to attract larger ones to the vicinity of the shelters, thus tending to improve fishing immediately as well as to shelter and feed the future "crop".

2. Considerable slabs are available along the lake. These could readily be submerged at proper depth to provide suitable spawning conditions for some of the forage fish, one of which (the blunt-nosed minnow) is an exceptionally good food for the game fish

present. This minnow spawns on the under side of flat objects. Suitable spawning facilities for this species can be provided with a minimum of effort.

The two above mentioned recommendations, if carried out, should have a decided effect on the fish population. A more detailed examination of the lake might indicate that certain other conditions can be improved.

Hart Lake

The investigation of this lake was too brief to permit formulation of definite recommendations. A further study of conditions here is desirable.

Supplementary Note

Recent developments (May 22) of the lake and stream improvement program are that the available Institute for Fisheries Research staff will probably be tied up with direction of construction work on lakes and streams in the four camps where this work has been approved. Time is not available for any further work at Camp Custer before June 5, the estimated starting date for the improvement project. If a program for work of this nature at Camp Custer is approved it can be handled in the same manner as the work in the other camps, for which plans calling for supervision by trained men are now pending.

INSTITUTE FOR FISHERIES RESEARCH