BIOLOGICAL BOARD OF CANADA

MANUSCRIPT REPORTS OF THE BIOLOGICAL STATIONS

No. 189A

Title

SURVEYS OF CLEARWATER AND GRANITE LAKES, N. S.

Author

M. W. Smith.

SURVEYS OF CLEARWATER AND GRANITE LAKES, N. S.

At the request of the Fish Culture branch of the Department of Fisheries brief surveys were made of Clearwater and Granite lakes, Yarmouth county, Nova Scotia, in August, 1938. The object of the surveys was to secure information upon the desirability of eradicating the fish populations in these two lakes as a fish cultural measure in the establishment of trout stocks. Observations were made on August 12, 13 and 14, 1938. The writer was assisted by Mr. Percy Hills and Mr. Frank Tingley. The transportation of gear was arranged for and made by the staff of the Yarmouth hatchery.

Observations upon the temperature, dissolved oxygen content and pH value of the waters were made in each lake. The data from these observations are presented in table I. Plankton samples were taken by nets and trap, but have not yet been analyzed. A gill-net was set over one night in each lake. The general characteristics of the lakes were noted and information upon the fishing conditions in the lakes was sought.

CLEARWATER LAKE.

This lake has an area of 17.5 acres. The area was determined from a survey made by members of the Yarmouth branch of the Nova Scotia Fish and Game Protective Association. The survey was made on January 26, 1938. Numerous soundings were made by this survey party and a maximum depth of thirteen feet was discovered.

The lake lies approximately two miles from the road and in rough country that was burnt over a few years ago, thus, for the most part, the shores are sparsely wooded. As the name of the lake implies, the water is clear, and not stained as are so many

waters of the region. In shoals around the shore there are heavy growths of rooted emergent aquatics such as Juncus, Scirpus, Nymphaea, Pontederia, etc. Apparently a great deal of the bottom throughout the lake is covered with submerged aquatics, which condition may be a direct result of the clearness of the water. The outlet from the lake drains into the Little Salmon river, Yarmouth county.

Due to the comparative shallowness of the water, the lake remains non-stratified in summer, and the temperatures of both the bottom and surface waters approach the same value, which in summer is quite high, although there is no evidence that it would be above the tolerance of brook trout. The reaction of the water in the lake is acid. The dissolved oxygen content approaches the saturation value (table I). A greater value was obtained for the bottom water than for water about one metre above. This rather unusual condition may be attributed to the photosynthetic activities of the aquatic vegetation which carpets the bottom at the point where the observations were made.

The gill-net placed in the lake over the night of August 13-14 captured ten yellow perch (Perca flavescens). Two of the individuals were partially eaten, presumably by eels. The other eight specimens ranged in length from 24.3 to 28.3 cm. and in weight from 157.25 to 253.25 gm. No doubt the net was selective in the sizes of perch that it captured. All of the perch stomachs were empty except one, which contained the remains of one fish (Perca ?) about 6 cm. in length. Killfish (Fundulus diaphanus), in schools, were noted in the shallow water.

The results of the netting would indicate that medium-sized yellow perch were plentiful in the lake, and possibly the species dominates the fish population. On the basis of our findings the destruction of these fish would seem warranted before stocking with trout. As far as could be ascertained no trout are now taken in this lake. There are no records that the lake was ever planted with trout.

GRANITE LAKE.

This lake was also surveyed by the Yarmouth branch of the Nova Scotia Fish and Game Protective Association on February 6, 1938. The maximum depth sounded was twenty-eight feet. The outlet after a short run empties into Tusket river. It was stated that this outlet was underground. At the time we visited the lake a good flow was made overground, at least on that part of the outlet examined by us near the lake. Possibly in dry seasons water may flow out under tree roots, etc. Rooted aquatic vegetation, principally Nymphaea, is limited almost entirely to the shallow northern end.

The waters of the lake are deeply stained. Although not very deep, the waters become stratified in the summer, and there is considerable diminution of the dissolved oxygen content of the water toward the bottom. (table I.) The waters are acid in reaction.

The gill-net, set during the night of August 12-13, captured two trout (Salvelinus fontinalis) and one white perch (Morone americana). The trout weighed about one-half a pound each. The stomach of one was empty, the other was filled with water-striders (Gerris). The white perch was partially destroyed, most likely by eels.

It was ascertained that Granite lake is quite intensively fished in the spring and fair numbers of trout are taken. Apparently angling for trout has been good in this lake in the past. There is a record that Granite lake was stocked with 5,000 number two trout fingerlings in 1932. It is apparent that, although the lake supports white perch, the species does not entirely dominate the situation.

Discussion and recommendations.

The following recommendations are based upon the data secured from our surveys. If additional information was obtained these recommendations might well be amended.

If it is desirable to establish trout in Clearwater lake, then it is recommended that the existing perch population be destroyed, preferably by the poisoning method, as the lake is not large in area or volume. The lake, however, is not easily accessible, and the transportation of boats and materials into the lake would be time consuming and inconvenient. This feature would not make the lake populat with the general fishing public. Lake fishing is largely done from boats or canoes, and unless boats were maintained upon the lake, not many anglers could take the time or would make the effort to fish there. We understand that this procedure of rehabilitating lakes as trout habitats is for the benefit of all anglers. If this be the case, there are many lakes in the region more suitable. We received the impression, rightly or wrongly, that only a few individuals were interested in the lake and that something akin to"a private fishing ground" was being sought in Clearwater lake.

In Granite lake, although white perch are present, we would

recommend on the basis of our findings, and until further data are obtained, that the lake be stocked with large fingerlings or yearling trout. We see no justification at present of destroying the existing trout stock. Additional investigations are necessary to determine more concerning the ststus of the trout in this lake.

In general, we would recommend that neither lake, even if desirable, be treated with posion until more has been learned of the results of the poisoning procedure and until the relative merits of Derris root and copper sulphate as fish poisons have been more thoroughly investigated.

M. W. Smith,
November 16, 1938.

TABLE I. TEMPERATURE, DISSOLVED OXYGEN CONTENT, AND pH VALUE OF THE WATERS IN CLEARWATER AND GRANITE LAKES, NOVA SCOTIA.

Depth metres	Temperature °C	Dissolved oxygen content c.c. per litre	% saturation	pH value
Granite lake, August 12, 1938.				
0	22.4	5.25	83.3	6.0
3	21.9	5.30	83.3	
5	15.2	4.40	61.2	
6.25	13.1	3.38	45.0	5.9
CLEARWATER lake, August 13, 1938.				
0	22.7	5.74	91.5	6.2
1	22.65	5.66	90.1	
2	22.4	5.47	86.7	
3.25	22.1	5.65	89.1	6.1