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

Original: Fish Division
cc: Education-Game
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July 28, 1943

REPORT NO. 875

SUMMARY OF INVESTIGATION BY DISTRICT FISHERIES BIOLOGIST,
DISTRICT NO.3, 1942

by

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This report will be in the nature of a summary of the work done in District No. 3. The outline of the proposed program set up at the time of the Biologist's appointment will be followed.

I. Big Bear Lake Investigation

A. Repetition of Population Analysis

The population analysis was repeated between August 19 and September 17. This analysis was made in the same manner as in former summers (Institute Report No. 653, 653A). Results were similiar to those of 1940 and 1941. Data have not been completely compiled but the total population was found to have remained more or less unchanged through the three year period. Fluctuations in the abundance of the various species have been noted, and the following might be specifically mentioned. The sucker population has gradually increased, and this species continues to maintain an unquestionable dominance in the lake's ecology. The bass population (composed of both large and smallmouth bass) is on the decline although bass continue to form the major part of the fishermen's "take." The bluegill and pumpkinseed have both become relatively more abundant than the bass.

This is particularly noticeable in the case of the bluegill which at present, in so far as numbers of legal fish is concerned, is the dominant game species in the lake. As has already been mentioned, the major fishing effort is devoted to bass fishing, with bait unsuitable to the bluegill. Rock bass and bullhead populations remain small. The perch population, which is still composed largely of small fish gave some evidence of improving in quality. The 1938 year class continues to be the dominant group in the game fish population, this being especially noticeable in the bluegills.

B. Continuation of Intensive Creel Census

During the summer of 1942 a complete census of the fishing on the lake was secured by Mr. Howard van Oosten. The results of the census have not as yet been completely analyzed, but summary sheets indicate that fishing in 1942 showed a small but definite improvement over that of 1941. Along with his creel census duties Mr. van Oosten secured a good series of stomachs from adult game species. These were preserved by him and will be examined in the near future.

C. Sucker Investigation

Investigation of the common sucker in Big Bear Lake was continued in 1942. Work was started on April 23. The spawning run was watched, and eggs and fry secured. During the height of the run a series of about 250 blunt-nosed minnows was preserved. These fish were collected from the area where suckers were spawning actively. Stomachs of these minnows have been examined, and results indicate that the blunt-nose minnow is an important predator of sucker eggs. The stomachs of these minnows contained on an average of 2-3 eggs each, and during the spawning run of the suckers at least, sucker eggs formed the bulk of their food. Stomach analysis of a sample of young game fish and minnows secured later (May 25) after the sucker fry had

hatched indicate at present at least, that the sucker fry do not contribute materially to the diet of either young game fish or minnows. To date about 25 stomachs have been examined from this series, and none were found to contain sucker fry, although they were collected from an area where sucker fry were known to be present. Nearly all of these 25 stomachs contained food in abundance.

The report on the Big Bear Lake investigation is now in the process of preparation.

II. Lake Management Investigations

A. Lake Bellaire

This large and attractive lake was inventoried by the Institute for Fisheries Research in 1932, and a report prepared (Institute Report No. 117). Data from the inventory, and in the report indicated that the lake was suited to cold-water species, but recommendations were not in keeping with findings. Therefore it was decided to re-examine the lake, and perhaps make new management suggestions. Consequently, in company with Mr. Wilkinson the lake was visited on July 27 and 28. Temperature series, and dissolved oxygen content showed the lake to be suitable for cold-water species, and the presence of lake herring, and reported fair fishing for lake trout left little doubt as to its suitability for trout. Experimental gill nets set for 24 hours captured perch, lake herring, suckers, and 1 adult smelt. The presence of the latter was unknown before this time. The following suggestions were made: the lake to be planted with 3,000 adult rainbow trout. These are to be planted in the spring of 1943, and marked at the time of planting. In the fall of 1942, 461 adult rainbows were planted. These were marked by the removal of the dorsal and adipose dorsal fins. Secondly it was suggested that the classi-

fication be changed to that of "pike" lake with fall fishing for rainbows permitted. A complete report (Report No. 117A) was turned into the Ann Arbor office.

B. Lakes in the Pigeon River Forest

a. Pot-hole lakes

The pot-hole "trout" lakes in the Pigeon River Forest have been the object of rather extensive investigation by the staff of the Institute for Fisheries Research. Reports reaching Ann Arbor indicated that fishing in these lakes had fallen off, and that those fish captured were in rather poor condition. Consequently it was decided that the biologist should re-examine these lakes to determine if any changes in management policy should be inaugurated. This investigation was conducted between July 13 and 24. Samples of the trout were secured through the use of experimental gill nets, and scale samples, weights, and measurements taken. Results indicated that the rainbow trout in North and South Twin Lakes, Hemlock Lake, and Section 4 Lake were in rather poor condition. Brook trout in Lost and West Lost Lakes were in fair condition. Competing species (perch) were found to have become abundant in North and South Twin, and Section 4 Lake; and (pumpkinseeds) in West Lost Lake. The minnow population of all of these lakes, and also Hemlock, was found to be quite abundant. In view of the expected light fishing pressure this coming season, it was suggested that all stocking in these lakes be discontinued for at least 1 year. Secondly, inasmuch as brook trout have given generally better results than have rainbow trout and since the present trout season is better adapted to the species, future stocking should probably be limited to this species.

Devils Soup Bowl presents a somewhat different picture. The lake

is known to have given some excellent fishing for brook trout certain years since the time of the original inventory, but no reliable reports of any trout being taken from the lake since 1939 could be gathered, and it was therefore suggested that the lake be re-inventoried to determine if it is still suitable for trout. It is quite possible that this warmer and shallower lake is no longer suited to trout. Minnows were found abundant. Repeated gill net sets, and some few hours of angling effort failed to produce a single fish of any kind.

Of the trout lakes in the area, only Pickerel Lake continues at this time to afford really good fishing for trout. Also, and perhaps significantly, the fishing for warm-water species (bass and bluegills) is also very good. At the time of the investigation Pickerel Lake was being fished fairly heavily for trout and for bass and bluegills. All rainbow trout seen and captured (about 30) were in excellent condition, and several different plantings were represented. One large brook trout was also caught in the gill net. Since Pickerel Lake continues to give good fishing and since it seems probable that this lake will be fished more than the other trout lakes in the area this coming season it was suggested that planting in this lake be continued as outlined in Institute Report No. 620, i.e., 2,000 adult rainbows in the fall, and 1,000 in the spring.

b. Grass Lake

At the time of the investigation this small lake was being fished to some extent, and with good results for bluegills, pumpkinseeds, bullheads, and largemouth bass. The bass-bluegill population is well established, as evidenced by the many young of the year of both species present. Natural reproduction is undoubtedly sufficient to maintain the populations of these species, and growth is known to be at least

average. No suggestions were made, except that stocking should be discontinued for a period of at least 3 years.

c. Round Lake

This lake in the area has not been inventoried. It was mapped by the C.C.C. in the winter of 1939-40. It has an area of 69 acres, and a maximum depth of 35 feet. Since fair fishing was reportedly present, the biologist made a brief examination, with the following results. Game species present were found to be walleyes, bluegills, perch. Catfish (described by one fisherman as having a forked tail) were reported but none were captured. Bluegills, perch, and walleyes apparently make good growth, one bluegill captured having a weight of a full pound. No record of the introduction of walleyes can be found but their presence was verified. A large population of golden shiners probably furnish a good food supply for walleyes and perch. Vegetation is quite abundant, and the lake is apparently fairly productive. The only management suggestions made were that the lake should be completely inventoried, and that stocking for the time being should be discontinued.

d. Ford Lake

This lake, along with the pot-hole lakes in the area has received considerable attention; having been stocked with trout, and later poisoned and planted with grayling, and again with trout. The grayling grew well for a short period, but at the end of about 3 years had become so scarce that specimens could be secured only with great difficulty. Bluegills were introduced through an unauthorized planting at the same time that grayling were stocked and are now very numerous, and decidedly dwarfed. The original planting of bluegills, and their first progeny grew well (Institute Report 620, p. 22), so that apparently

the lake can support at least a small game fish population. The abundant bluegill population, which is increasing rapidly as judged from the number of nests in evidence at the time of the investigation, along with a considerable number of small but slow growing brook trout stocked as fingerlings the preceding fall, makes the establishment of a more desirable population difficult unless some rather drastic measures are adopted. Rather than re-poison the lake at the time, it was suggested that 25-35 adult northern pike be introduced in the spring of 1943 in the hope that they would utilize the bluegills for food, and thereby reduce the population of the latter to the point where reasonable growth might be maintained. Ecologically, the lake seems well suited to the northern pike, and these can be expected to furnish at least a limited amount of sport fishing. The lake may still have possibilities for trout (to be determined this summer), but until the present population is under better control the introduction of more trout does not seem wise.

e. Other Lakes in the Area

Two Acre Lake, and Hardwood Lake were also examined, and no evidence of the presence of fish in either one could be found. As fishing lakes these two bodies of water must be abandoned because the basins are so nearly filled with sediment. Dog Lake was not examined.

C. Hoffman Lake, Charlevoix County

This "made" trout lake was examined twice; once on September 28, and again on November 2. The purpose of the investigation was to determine the success of the management which had been adopted, and to determine if possible whether any changes needed to be inaugurated. The lake was originally planted with equal numbers of adult brook and rainbow trout. A limited number of creel census slips obtained during the earlier part

of the season showed the catch of trout to be better than 2 to 1 in favor of the brook trout. However, the gill net set in September caught only rainbows. These fish were all in good condition, and averaged about 12 inches in length. It might be assumed that the survival of the brook trout had been poor, but it seems more likely that brook trout had been more readily removed by angling. Recent conversation with Conservation Officer Starback indicates that for the greater part of the season, rainbow trout, and not brook trout formed the bulk of the fishermen's catch. In order to determine which species is the more satisfactory it was suggested that 250 each of adult brook and rainbow trout be planted in the spring of 1943. These fish are to be marked so that they can be distinguished from those of the initial planting. It seems probable that the brook trout can be expected to furnish better fishing to a few fishermen early in the season, but that the rainbows will give more fishing to a greater number of fishermen and for a longer period. Known results bear out the above contention.

Examination of the lake on November 2, in company with Dr. Allison indicated that fishing in the lake will probably have to be maintained largely through more or less regular stocking. The inlet, outlet, and various springs entering the lake were all examined for the presence of spawning brook trout, and none were seen or captured with seines.

Summary of the Hoffman Lake investigation is given in Report No. 698-A.

D, E, F, G. Lakes which have been inventoried to be checked, and changes suggested if necessary.

This work has not been done, and has been included on program for 1943.

H. Preliminary fisheries investigations of other lakes, as suggested by supervisor.

a. Green Lake, Antrim County

This small lake was visited twice during the summer, and a partial inventory completed. The lake consists of three separate basins, and temperatures and chemical analysis of the uppermost north basin showed it to be suitable for trout. However, since conditions in connected basins may affect the management, the initial planting of trout is not contemplated until the inventory has been completed. Some of the more pertinent information concerning the north basin is its maximum depth of 55 feet; with a definite thermocline and sufficient dissolved oxygen. The fish population at present consists of abundant and stunted bluegills and rock bass. A good population of blunt-nosed minnows is present. The lake is fed by several small springs. The small rivulet, connecting the upper basin with those below is probably passable for fish. Should this small lake, or rather chain of lakes, prove to be suitable for trout, as is expected, it offers some very attractive features for a study of migration, and trout tolerance in a more or less natural situation. The presence of the heavy bluegill-rock bass population of course gives rise to certain complications.

b. Silver Lake, Cheboygan County

This lake (T. 33 N., R. 3 W., Sec. 11, 12) was visited by the writer and Mr. Wilkinson on August 14, and a partial fisheries survey was made. The lake was mapped in the winter of 1938-39 by the C.C.C. It has an area of 73 acres, and a maximum depth of 90 feet. The shores are bold, and the basin nearly circular. Temperatures and chemical analysis showed the lake to be suited to cold-water species.

The present game fish consists of slow growing rock bass, perch, bluegills, and smallmouth bass. It is obviously poorly suited to warm-water species, and except for competing species is well suited to trout. However, since the lake is classed as semi-private it is suggested that the Conservation Department try to secure a fishing site, and thereby guarantee public access. Some of the remaining data pertaining to the inventory will be secured this summer.

c. Lakes on Beaver Island, Charlevoix County

Several lakes on Beaver Island were investigated between August 4 and 8, in company with Mr. Wilkinson. These lakes were Barney's, Fox, Green, Genesareth, and Font. Each will be considered briefly.

Barney's Lake differed from most of the others in being alkaline rather than acid. It was quite shallow, with a maximum depth of about 15 feet. At the time of the investigation fishing was very poor, and a gill net set in the lake for a period of 24 hours caught only 3 small fish, 1 bluegill, and 2 small largemouth bass. One more largemouth, of legal size, was caught by angling. Conversation with some fishermen, and with the Conservation Officer on the island, revealed that the lake's fishing reputation was rather good. Probably, judging from results of the investigation, its good reputation was based on fishing derived from rather large plantings of adult smallmouth from Lake Michigan, which had been made in the past few years. Ecologically, the lake does not seem well suited to the smallmouth; its weed filled basin, and rather soft bottom make it appear better suited to the largemouth. Rather extensive seining failed to secure a single specimen of smallmouth,

although young largemouth and young bluegills were fairly numerous. As a result of the investigation it was suggested that further stocking with smallmouth be discontinued. In the fall of 1942, 2,500 4-months-old largemouth were planted. It is to be hoped that these may help to build up the present rather limited supply of largemouth bass, and thereby improve the fishing.

Fox Lake, located near the fire tower on the island is an attractive lake and at the time of the investigation was furnishing excellent fishing, especially for black crappies. The latter is by far the dominant species in the lake at the present time, but perch, bluegills, large- and smallmouth bass are also present. All species with the possible exception of the perch are growing well, and young of the year largemouth, smallmouth, and bluegills were observed. Management suggestions were that all stocking be discontinued for a period of at least 3 years. No records of the introduction of the crappie are available but it has obviously been very successful, and numerous age groups were represented. Chemically the lake is acid, and the water very dark. Most of the shore is clear sand with some gravel present. There are, however, two weed filled bays, and the lakes productivity, as judged from the fish seen, is at least fair.

Green Lake was examined only briefly. No chemical analysis was made but it is safe to assume that the lake is quite acid. It is very shallow. Bluegills and small black bullheads were introduced at one time. Some of the bullheads were recovered, but it is doubtful that the bluegills survived. The lake is not fished at all.

Lake Genesareth is by far the most important lake on the island, and the only one of sufficient depth to become stratified. A definite

thermocline was present at the time of the survey, but oxygen below the thermocline was found to be deficient. It is not surprising that rainbow trout planted in this lake a few years previously had not given good results. The lake was being fished quite heavily, as compared with the other lakes on the island, and with very good results for bluegills, brown bullheads, northern pike, large- and smallmouth bass. Rock bass, and sunfish are also present. In common with many lakes where the northern pike is present in quantity all fish captured were of good size. At present the bluegill and the northern pike are the most important game species, and these were being caught in good numbers. Young of the year of bluegills, rock bass, pumpkinseeds, large- and smallmouth bass were observed. No management recommendations were made, except that stocking be discontinued for the time being. Undoubtedly, all species present can maintain their numbers through natural reproduction. The northern pike probably has a beneficial effect, rather than a harmful one as is so often supposed.

Font Lake, the other large lake on the island presented a rather interesting situation, where a good fish crop was not being utilized. Conversation with the Conservation Officer and with fishermen revealed that the lake was scarcely ever fished. When a gill net revealed the presence of a population of large and heavy perch the situation became interesting. The probable explanation for this is that good perch fishing is readily available in the harbor at St. James. The basin of Font Lake is shallow and very soft bottomed, except for a considerable area around the point jutting out from the middle of the east shore. In this area there is a firm sand and gravel bottom, and the water drops off to a depth of about 7 feet. A large minnow population is present,

and in this respect the lake differs from the other lakes on the island where the minnows were observed to be rather scarce. The minnows probably furnish good perch food. Besides the minnows and perch there is a fairly large population of suckers, represented in the gill net collection by several age groups. In order that fishing in this lake might be encouraged, and the perch "cropped" to some extent at least, it was suggested that the lake be planted with hatchery reared smallmouth bass. Consequently, in the fall 500 selected smallmouth were sent over. These were selected so as to avoid predation by perch, but unfortunately, the Beaver Island Sportsmen Club took matters into its own hands and planted these fish in Fox Lake instead. The planting in Fox Lake will not do any harm, but it is unfortunate in that the planting in Font Lake will have to be postponed. The hatchery representative who accompanied the planting was unable to stay, therefore this occurrence was unavoidable.

III. General Investigations

A. Creel Census

Creel census slips were secured from only a few waters; lakes in the Pigeon River State Forest, and lakes on Beaver Island. A few slips from the Bear River near Petoskey were also secured, and a few from Round Lake near Oden. During 1943 a greater number will be obtained, and a larger number of areas will be visited. A start has been made on this.

B. Beaver-trout Investigation

Only a small amount of investigation relative to the beaver-trout situation has been done. Beaver dams on Mill Creek (Cheboygan County) were examined. Here three large dams are present on the headwaters of a small trout stream. Little timber has been flooded, since the

stream runs through a rather deep valley. All dams are abandoned and few or no trout are present in the ponds. However, a few small trout were seen both above and below the ponds. In company with Conservation Officer Roberts, 4 beaver dams in the northern part of Emmet County were visited. Two of these on rather warm streams were found to be occupied, and the others on smaller colder streams were abandoned.

C. Feeder Stream Investigation

Investigation of feeder streams was confined to the mere location of a few possible sites for weirs on small tributaries to the Boyne and Bear Rivers. Town Line Creek near the Oden Hatchery offers attractive possibilities, and it is planned to construct a small weir on this stream. Up to the present time permission for its operation has not been secured.

D. No work has been done relative to the possible dispersal of the bass tapeworm through plantings.

E. Those deeper lakes which have been examined for oxygen content have already been discussed.

F. The natural fish distribution of the district has received some attention, and is continuing. However, no collecting trips have been made, and fish collections have been confined to those lakes where other investigation was carried on. These findings have already been summarized.

G. Most of the findings from other lakes which have been investigated have already been summarized. However, the biologist has prepared a file for the lakes of the district and in this file the attempt has been made to keep up to date on available information relative to the lakes of the district. Information has been summarized as in the following example:

303 EMMET COUNTY

Crooked Lake T35N, R14-5W, many sections Littlefield Twp.

Map: yes 2,133 acres; maximum depth 68 ft.

Inventory: no The lake drains into Burt Lake through Crooked River.

Stocking: in recent years has been more or less regularly stocked with adult fish of the following species: smallmouth bass, rainbow trout, walleyed pike.

Recommendations: none until more information is available.

Other information: lake affords good to fair fishing for perch, especially in winter. Many adult rainbows caught in past 2-3 years.

Walter R. Crowe

Oct. 31, 1942

Cards such as the above have been prepared for all lakes of the district, and through the use of this file it will be possible to find any available information immediately, and to keep abreast of management proposals, etc.

With the advent of winter weather the biologist's time has been spent in the office working up reports, etc, with the exception of a few very brief investigations such as smelt mortality along the shore of Emmet County, and an investigation of cisco run from Torch Lake into Clam River.

INSTITUTE FOR FISHERIES RESEARCH

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