

INSTITUTE FOR FISHERIES RESEARCH

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LAKE BELLAIRE

This fine body of water was formerly called Grass Lake. Seemingly, this term as applied to it had little significance, and the name Lake Bellaire appears to be much more appropriate since Bellaire, the county seat of Antrim County, is only a short distance away. There is little connection between this body of water and the picture which usually comes to one's mind when he thinks of a typical "Grass Lake".

A large proportion of the resorters here are Ohio people. Good roads lead to the lake. "Fisherman's Paradise" on the east side is well known throughout the state.

In several respects Bellaire Lake is peculiar: it has an unusually flat bottom in the deep area and marl concretions are extensive on parts of the shelf.

Previous Investigations We have no record of previous investigations except for a brief statement of some of the fish present in the lake. This very brief and incomplete examination was made in 1891. Names of game fishes only, with no indication of their relative abundance, were given.

Acknowledgements We are indebted to a number of resorters and local residents for the valuable information and assistance which they have given us.

Location and size This lake lies about two miles east of Torch Lake. It is slightly over a mile south of Bellaire. A number of roads

lead to it.

The maximum length, from the tip of North Arm to the extreme south end of the lake, is about $4\frac{1}{2}$ miles while the maximum width is 1.3 miles. The total area is 1,785 acres. In the chain this lake is located between Central Lake and Clam Lake.

Inlets and
Outlets

The chief inlet, Intermediate River, enters at the northeast end of the lake. This river drains the Intermediate Lakes and carries a relatively large amount of water. The city of Bellaire is located on this river. Here a power dam prevents boats from passing from one lake into the other. A fish chute is present but this was not examined and the extent to which it is used (if at all) cannot be stated. Boats can pass up the river to Bellaire.

Two small creeks enter the North Arm. One of these enters at the extreme tip of the arm and the other comes in on its south side. The upper one of these is known as Grass Creek. It is several miles long but it is not large.

Several very small intermittent streams enter the lake on the east side.

The Cedar River, a prominent trout stream, and a small creek enter Intermediate River some distance above its mouth.

The outlet, Grass River, leaves the lake on the southeast side. The shelf is very wide here. This outlet does not begin where one would normally expect it to and to the newcomer it is a little hard to find. The stream contains considerable vegetation and quite a bit of food. This river winds around in the low swampy region and eventually reaches Clam Lake. Several trout streams, Cold Creek and Shanty Creek, enter Grass River below Lake Bellaire.

Pollution

The city of Bellaire is located on the inlet, but is recorded as having no sewer system or other source of pollution. No dead fish were found anywhere along the shore. The water appears to be very clean.

Use of
Water

Resort development is fairly extensive. Fifty or more summer homes and cottages, several hotels, a golf course, and a dance hall are found near the lake. Boats and provisions can be obtained. Fisherman's Paradise is one of the well known and modern resort establishments of this state.

Motor boating is fairly extensive and swimming is good. Fishing is not nearly so good as it was at one time but is still fair. It is hoped that this may be improved in the near future.

Temperature

The water is definitely stratified. It is warm to a depth of 25 feet. Between 25 and 35 feet it gradually becomes colder and all water below 35 feet is cold. When the lake was examined, August 26th, 1931 (air temperature 70 degrees), the surface water was 70 degrees and the bottom 44 degrees. The upper 25 to 30 feet are well suited for warm water species, while the water below 30 feet is ideal, so far as temperature is concerned, for cold water species.

Oxygen

Fortunately the oxygen is fairly high at all depths. Fish can live at the very bottom of the lake. This means that a considerable amount of water is suitable for lake trout, cisco, and whitefish.

Other Chemical
Conditions

The lake is quite alkaline. Carbon-dioxide was found only in the lower half and in very small quantities. The water is fairly soft, softer than one would expect it to be in a lake containing so much marl. Chemically this lake appears to be quite favorable for fish life.

Depth

The shoal generally is wide. In several locations it is very wide. Water on the shoal area is not deep but is of sufficient depth to permit motor boats to pass over most of it. This wide shelf should be capable of producing a large number of warm water fishes. Below the drop-off the sides of the lake are fairly steep until the flat bottom area is reached. The floor, in the central

part of the lake, is quite level. It has a depth of 25 to 30 meters. The maximum depth found is 99 feet. Much of the water is over 80 feet deep.

The North Arm is relatively shallow and has some vegetation even in the deeper parts. This arm is somewhat more productive than the lake in general and fishing here is regarded as somewhat better than in the other parts.

Bottom

The shelf is made up largely of marl with a wide sand margin along the greater part of the shore. Much of this marl resembles gravel. These concretions are formed by certain microscopic plants. The bottom below the drop-off is of clay mixed with a little marl. The slope is chiefly of marl. Peat occurs in the extreme end of North Arm. Evidently only a very small amount of decay has taken place here since the lake floor contains very little organic matter.

Vegetation

A considerable number of weed beds are found on the shelf and on the slope. Rushes are fairly abundant on the wide shoal area near the outlet and on the southern end of the lake. The North Arm contains considerable vegetation. Muskgrass and pond weeds are found in various locations along the lake. Vegetation is not abundant but is present to a greater extent than in either Torch or Elk Lakes.

Natural

Minnows are fairly abundant. Most of those taken were silversides,

Food

a species which prefers the open waters and is not found much in the weed beds near shore. Clams and aquatic insects are common. Generally food is not plentiful. It is more common here than in Torch and Elk Lakes but is not present in large enough quantities to support a large fish population. Considerable food for lake trout is present but for some reason or other this species is not nearly so plentiful as one would expect it to be under conditions which appear to be ideal for it. Spawning conditions may be responsible.

Fertility

No determination of the basic fertility of the lake was made and our opinions regarding the relative richness of the lake are made on certain other factors. The shoal, though chiefly sand and marl, supports considerable vegetation. Food is fairly abundant. These lead one to conclude that the lake is fairly rich. Since little organic bottom is present on the shoal or in the deeper area, and since food and vegetation are only fairly abundant the lake cannot, from all indications, be regarded as a fertile lake. The fish population is not nearly so large as it is in some lakes.

We regard this lake as probably lower in fertility than Round, Clam and Central Lakes but higher than Elk and Torch Lakes.

The inlet, coming from a relatively rich lake, should carry a considerable amount of fertilizing substance into Lake Bellaire. The city of Bellaire may also make some contribution toward enriching the inlet.

Spawning

Very little gravel is present. Marl concretions which resemble gravel cover a considerable portion of the shoal area. We cannot state certainly to what extent this material is used by the nest-building fishes, but the best evidence we have would indicate that it is so used. At present no definite statement regarding the improvement of the spawning grounds can be made. The lake should be studied carefully during the spawning period.

Species of

Resorters state that fishing was good until about seven years ago.

Fish Present

Then it suddenly became relatively poor. This lake more nearly approaches a pike lake than do either Torch or Elk Lakes. Our net sets indicated that quite a few northern pike are present.

Perch and small-mouth bass are quite common. Cisco are abundant. Wall-eyes, largemouth bass, bluegills, rockbass and lake trout are also present. J. P. Marks, August 8-11, 1891, reports lake trout, perch, herring, grass pike, rockbass and small-mouth

bass. He states that whitefish are reported. Our party was unable to take whitefish, but they were also reported as being present when our investigations were made. Evidently these are comparatively few in number.

Coarse Fishes Suckers were not reported in 1891 but a number of them were taken by our party (1931) in seines. None were caught in the nets. They are common but do not appear to be abundant.

Obnoxious Fishes Gar-pike are fairly abundant. Although few were taken by our party they are reported to be quite common. Obnoxious species, other than this one were not found.

Forage Fishes Silversides appear to be abundant. When seining was done, however, the young fish were swimming in schools at the surface. Since they were quite easy to take in the seines the number taken might lead one to over-estimate the number present. Blunt-nosed minnows are quite common. Straw-colored shiners are also common. Black-nosed shiners, common shiners and log perch are fairly common. Johnny darters, rosy-fronted minnows and muddlers are present.

Predators As has been stated above, gar pike are common. A few kingfishers were also seen. No other predators were found. Conditions seem favorable for lawyers but none of these were taken or reported. The kingfishers evidently do little harm but the gar undoubtedly take their toll of food and game fish. This species is too common here to be ignored if fishing is to be built up.

Cover In some locations the vegetation together with some snags provide considerable protection for the fish. Much of the area, however, has not nearly enough protected areas. Since gar-pike and northern pike are both quite common, good protection for the young fishes is highly essential. Logs and

deadheads generally are not nearly so good as brush heaps or dense weed beds. Better cover should be provided.

Water Level The water level is fairly constant. A dam in the inlet appears to keep the water flowing at a fairly even rate and the other inlets are too small to have any noticeable effect on the lake. A constant level is desirable.

Laws and Regulations Although a considerable number of northern pike and a few wall-eyes are present, this lake is not at present designated, as a pike lake. Should lake trout become more abundant a special open season on the species here, as in Torch and Elk Lakes, may be called for. Should pike and wall-eyes become decidedly more numerous the special designation of pike lake would be desirable. For the present the lake is properly designated. It does approach a pike lake more than any of those below it in the chain, even those now designated as pike lakes.

RECOMMENDATIONS

Stocking Fairly heavy stocking is needed. It appears that the fish supply has become more or less depleted. Although we cannot account for the rather sudden drop-off in fishing about seven years ago with any certainty, we feel that, with certain conditions remedied, fishing can be built up again. Conditions seem quite favorable for the cold water species. The planting of 5,000 lake trout fingerlings or 50,000 lake trout fry is recommended. A plant of 10,000 whitefish fry per year is also suggested.

Of the warm water species 10,000 small-mouth bass, 5,000 large-mouth bass and 5,000 bluegills, 5,000 perch, all fingerlings, are estimated as a suitable quota.

According to local statements, the lake has been stocked with wall-eyes in the past. If this is the case the species has not succeeded very well. A further

plant of 10,000 wall-eye fry per year is recommended; to be made for several years as an experiment.

Rearing Ponds Because of the large number of fish needed to properly stock this and other lakes of the chain, the construction of rearing ponds in the vicinity appears very desirable.

Predator Control Efforts could be made to advantage to reduce the number of gar pike. Spearing parties might be organized, or surface nets set by the state. Except during the open season for spearing such parties would be under the direct supervision of a conservation officer. These parties have produced good results in certain parts of the state.

At present no effort would appear needed to reduce the number of predators other than the gar pike.

Cover Increase Although some cover is present more protection is needed. Brush heaps should be placed where weed beds and snags are fewest. These heaps are discussed in some detail in the Torch Lake report, which should be consulted for a statement on their value and on the nature of their construction. Seventy-five of these large heaps are recommended for Lake Bellaire. These should be placed on the shoal area far enough below the surface so as not to interfere with the motor boats or with the general appearance of the lake. The definite location for these can best be determined by those constructing them.

Vegetation and Fertility Increase When brush heaps are placed where little or no vegetation occurs, two cubic yards of rich dirt should be placed in the heap. Some muskgrass should be placed in this dirt. Attempts to increase the vegetation and fertility, except locally as here recommended, apparently cannot be made at any reasonable economy.

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