INSTITUTE FOR FISHERIES RESEARCH



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# CENTRAL LAKE

This long narrow body of water, also known as Intermediate Lake, is quite unlike the larger lakes below it in the chain. The lakes above it were not examined and we cannot state to what extent these compare with it. The long shore line, together with abundant vegetation, rich bottom, considerable protection and a number of other favorable characteristics should make this an excellent fishing lake. Much of the shore line is still wooded, giving this lake a more northern and wild appearance than is ordinary for the larger lakes of the region.

**Previous Investigations** We have no record of any investigation made previous to our survey of 1931, except a very short and incomplete investigation of the species of fish present.

**Acknowledgements** We are indebted to Mr. Dickerson of Recreation Point for the use of boats and to other local citizens and resorters who aided us in our work.

**Location and Size** This lake is about centrally located in the Intermediate chain. It is about 2 1/2 miles north of Lake Bellaire and is slightly over 2 miles east of Torch Lake. It has a maximum length of 6 1/4 miles. The average width is about 660 yards or .38 mile. The total area is 1515 acres. The exact amount of shore line cannot be given but it is about 15 miles. The village of Central Lake lies at the north end of the lake.

Inlets and Outlets

The chief inlet is the Intermediate River coming from Benway Lake a short distance above Central Lake. This inlet drains a considerable area and flows through a half dozen or more lakes before reaching this lake. It has a fairly large volume of water. Numerous small inlets flow into the lake on either side. None of these are large and their affect on the water level of the lake must be very slight.

The Intermediate River flows out of the lake at the extreme south end. It is dammed at Bellaire a little over a mile below the lake. The Cedar River flows into the outlet a short distance above the dam. The Cedar is a well known trout stream. Intermediate River empties into Lake Bellaire.

Pollution

A detailed study of pollution was not made but from all appearances no substances were present which would be of serious injury to fish life. The town of Central Lake at the north end of the lake, and the town of Ellsworth farther up the inlet are both small. According to "The Surface Waters of Michigan" published in 1930, neither of these towns have a sewage system. The above-mentioned report states that "the only industry on this watershed which produces wastes capable of stream pollution is a canning plant at Central Lake".

Dam in Outlet

A power dam is located on the outlet at Bellaire. Boats can pass from Elk Rapids to this dam. According to the above-mentioned report Central Lake is 12 feet higher than Lake Bellaire. A fish chute is present at the dam but no effort was made by our party to determine its effectiveness.

Use of Water

Resort development is fairly extensive but can still expand to a very large extent. Between 35 and 50 summer homes, several small resort hotels, the town of Central Lake and a religious camp are located along the shore. Fishing here is rather extensive and is fairly good. A little swimming and a considerable amount of boating is carried on. The boating is chiefly in

connection with fishing. A good road from Bellaire to Central Lake runs along the lake. Much of the shore line is of second growth timber. A part of the shore is swampy.

Temperature Surface temperature is high. When the lake was examined, Sept. 8, 1931, the surface was 70° (Air temperature 72). No definite stratification of the water was found. The temperature drops gradually with depth. At 19 meters (62 feet) it was 52°. Temperature here is not so favorable for cold water fishes as in Lake Bellaire.

Oxygen Oxygen is fairly high in the upper third of the lake but none was found at a depth of 19 meters and only a trace was found at 12 meters. Since considerable decay takes place in this lake, a low oxygen content in the lower depths is to be expected. Although some cold water fishes are present the lake is not well suited for them. Only one cold water fish, a cisco, was taken by our party.

Other Chemical Conditions No carbon-dioxide was found in the upper 20 feet of water but a fairly large amount was found in the lower depths. Since considerable decay takes place here the presence of carbon-dioxide is to be expected. The water is very slightly alkaline at the bottom and is quite alkaline at the top. It is moderately hard at all depths.

In general, the lake may be regarded as satisfactory for warm water fishes but poorly fitted for the cold water species.

Depth Depths vary considerably in the different parts of the lake. Below Recreation Point the maximum depth found is less than 30 feet and the average depth is about 15 to 20 feet. Above this point the lake is deeper. A large

part of the water in the wider area has a depth of between 50 and 60 feet. Maximum depth found was 79 feet. The narrow upper end is somewhat deeper than the lower end of the lake.

Shoals are fairly wide. At the southern end of the lake a shallow area, in some places extending above the surface of the water, reaches from near the outlet to about a mile northward. This narrow strip of shoal area is about midway between the east and west shores. A considerable amount of the lake bottom below the dropoff is shallow enough to have vegetation on it.

Vegetation — Weed beds are present along almost all of the shore. Some vegetation is present below the dropoff. None is found in the deepest part of the lake. The plants include bulrush, sedge, leather leaf, muskgrass, bladderwort, burreed, pond weeds, wild celery, milfoil, arrowhead and pond lilies.

Natural Food — Aquatic insects are abundant and minnows are numerous. Some clams and crayfish are present. The food is capable of supporting a large fish population. The small inlets also contain some food as well as vegetation.

Fertility — This is the only lake of the lower six in the chain in which an organic bottom is dominant. The peat is mixed with clay in most areas but generally the mixture is more peat than clay. The shoal is chiefly of marl and sand. Both of these have quite a bit of fertile substance mixed with them and both are fairly productive.

This can be classed as a relatively rich lake. It is much higher in fertility than are Torch, Elk, and Bellaire lakes.

Spawning Grounds — Some gravel is present at various points along the shore. Since this lake was examined quite lake in the summer, a study of the

spawning beds could not be made. Conditions appear to be fairly favorable for the nest-building species. Since weed beds are fairly abundant conditions for perch spawning should be satisfactory. Walleyes, according to Adams and Hankinson, 1928, run up streams to spawn but will lay their eggs in lakes if prevented by weather or other causes from entering streams. These fish are known to spawn along the shores of the streams on gravel bottom. Neither the main inlet or the many small inlets were examined by our party and we cannot state to what extent spawning conditions here are favorable for the species.

Species of Fish Present

Game Fish — The brief examination made in 1891 showed that rockbass, perch, grass pike, small-mouth bass and sunfish were taken. No statement regarding the abundance of the various species at that time are available.

At present bluegills, walleyes, perch and small-mouth bass are fairly abundant. Northern pike are quite common. Large-mouth bass, pumpkinseed sunfish and rockbass are present. One large cisco was taken. The lake appears to be fairly well stocked with game fish.

Coarse Fish — Some common suckers are now present. They were also in the lake in 1891. No coarse fish other than the sucker were found here. The lake appears to be favorable for bullheads but none were taken by either party. Possibly they are present in limited numbers.

Obnoxious Fish — Gar-pike are present but we cannot make a statement regarding their relative abundance. No other obnoxious fish were found other than the gar.

Forage Fishes — Log perch are fairly abundant. Blunt-nosed minnows and Johnny darters are common. Iowa darters and muddlers are present. This

lake was not seined quite as thoroughly as it might have been and possibly some species are present which were not found by our party. No report on the forage fishes present in 1891 is available. Probably these were not investigated at that time.

Predators — Some kingfishers are present. These are fairly common but are not abundant. Some gar are present. Predators, other than these two, were not seen or taken by our party.

Cover — Quite a few snags are present at various places along the lake. Vegetation is fairly abundant. These two items provide considerable protection for the young fish. Cover may be regarded as fairly satisfactory.

Water Level — Water level is quite constant. The chief inlet has a fairly even flow of water and the small inlets are not large enough to effect the water level of the lake to any noticeable extent. A dam in the outlet also tends to keep the level stable.

Laws and Regulation — Walleyes are fairly abundant and northern pike are quite common. Although we cannot definitely state whether these two species are dominant, it may be assured that these are two of the most fished-for species present. The lake is now classed as a pike lake. This appears to be consistent with the policy of the Conservation Department relative to the designation of our lakes.

## RECOMMENDATIONS

With relatively high fertility, fairly abundant vegetation, good cover, and with spawning grounds appearing to be favorable, we can suggest very few improvements for the lake.

Stocking — A plant of 10,000 walleye fry, 5000 large-mouth bass, 5000 small-mouth

bass, and 5000 bluegill fingerlings, also 5000 perch fingerlings is recommended. This is a relatively small plant, slightly over 20 per acre of water. The planting of cold water species is not recommended because of the lack of oxygen in the lower parts of the lake.

Predator Control Should gar be found to be at all abundant, spearing parties should be organized to reduce their numbers. Possibly they could also be reduced by netting without injury to the other fish. We are unable to make any definite statement regarding the relative abundance of the gar now present. Control of other predators appears unnecessary.

Rearing Ponds The large amount of fish needed in this and other lakes of the chain make the construction of rearing ponds somewhere in the vicinity appear to be quite desirable.

Food Increase Although not so urgently necessary here, as in certain other lakes of the chain, the placing of slabs, boards, or other flat objects on firm bottom in water from 1 to 4 feet deep is advised. This should increase the number of blunt-nosed minnows and certain other forage fish present. These minnows are not very abundant now and an increase in their numbers would be an asset to the lake.

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R. W. Eschmeyer