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THE FISHES OF LAKE ABITIBI (ONTARIO) AND ADJACENT WATERS

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Lake Abitibi lies within the Hudson bay drainage area of north-eastern Ontario, about 175 miles south of James bay. It is surrounded by a comparatively level clay plain, lying somewhat below the general elevation of the Laurentian plateau. The lake is regarded as the successor of the much larger lake, Lake Ojibway, which covered a great part of the region for some time during the retreat of the last Labradorian ice sheet. The great "clay belt" of northern Ontario, in which the lake is situated, represents the deposits of Lake Ojibway and covers an area of 25,000 square miles (Coleman 1922). Rocky hills and ridges protrude through the clay deposits at many points, especially on the south side of the upper lake where the term mountainous may almost be applied to the topography of some districts.

Lake Abitibi really consists of two lakes, an upper and a lower lake. The upper (eastern) lake is about 32 miles in length from east to west and varies from 2 to 8 miles in width in most places, reaching a maximum width of over 15 miles at one point. Near its north-west corner it is connected with the lower lake by "The Narrows." The lower lake is roughly circular in outline and has a width of about 15 miles. It drains into the Abitibi river which flows north to James Bay. The greatest length of the whole lake in a direct line west by north is 47 miles. The shore line is very irregular and numerous wooded islands are scattered throughout both lakes. The altitude of the lake at natural high water level is 878.50 feet.

The region was originally densely forested, but fires have destroyed considerable areas of timber, especially on the higher ground. The lower land is largely covered by a black spruce forest and the better drained areas support growths

of white spruce, balsam fir, balsam, and aspen poplars and paper birch. Considerable areas of the black spruce forest are so poorly drained as to constitute muskegs.

As the lake lies so far north in Ontario, it naturally has a lower average temperature than southern Ontario. The isotherm of 32° F. mean annual temperature passes a few miles north of Lake Abitibi. In January the mean daily maximum varies from 12° to 14° F.; the mean daily minimum from −12° to −14° F. In July the lake is crossed by the isotherm of 74° mean maximum temperature; the mean minimum being 54°. Over a ten-year period at Abitibi Post the highest temperature recorded was 94° F. and the lowest −51° F. Ice usually covers the lake from early in November until the end of April or the beginning of May.

Considering its area Lake Abitibi is remarkably shallow, for although it has an area of approximately 335 square miles, its depth rarely exceeds 15 feet and large areas of it are not over 6 feet in depth. The maximum depth so far as known is about 23 feet.

The shores are for the most part low and composed of clay, but in places they are higher and consist of rock or sand. Most of the numerous islands are also rocky or sandy and, because of the warmer soil, support a vegetation which contrasts strongly with that of the black spruce swamp surrounding the lake in most places.

The rivers of the region, flowing as they do through a clay plain, have cut their channels through the clay, most of them to the underlying rock. In many cases the river bottoms lie below the level of the lake bottom, this over-deepening, in the opinion of Wilson (1913), being brought about by the action of spring floods on the easily transported clay in which the channels of the streams are cut. Because of the nature of the soil through which their channels have been cut, the water of many of these rivers is often quite turbid. Some of the streams, however, which flow from rocky, sandy or muskeg regions are practically free from turbidity, although nearly all are dark coloured. Owing to the extreme shallowness of the lake, wave action frequently

reaches the bottom, hence its waters are also turbid. The turbidity as determined by a U.S. Geological Survey turbidity scale was found to be in the neighbourhood of 75, although at times it was greater than 100. A white wooden disc 20 cm. in diameter (Seechi disc) could be seen at depths of from 9 to 12 inches. Because of the high turbidity accurate colour determinations were difficult to make, but the colour seemed to lie somewhere between 360 and 380, as determined by a U.S. Geological Survey standard colorimeter.

The following pH determinations were secured. The observations were made by the colorimetric method, and by using as indicators bromthymol blue and phenol red. The standard colour tubes as put up by the La Motte Chemical Products Co. in the form of a field set known as their Comparator Set were used in making these determinations.

TABLE 1.—Hydrogen-ion concentration of Lake Abitibi and of some of its tributary streams

Water	Locality	Date	H-ion Con.
Northeast bay, Lake Abitibi (lower lake)		June 19	7.2
Dokis bay, Lake Abitibi (lower lake)		July 2	7.1
Near mouth Ghost river, Lake Abitibi (upper lake)		July 10	7.4
Lowbush river, 1 mile above mouth		July 4	7.0
Circle river, 1 mile above mouth		July 4	7.0
Ghost river, 1 mile above mouth		July 12	7.2
Trollope lake		July 10	6.8

Because Lake Abitibi is so shallow, winds of moderate intensity stir its waters nearly or quite to the bottom, so that the temperature is often remarkably uniform throughout.

Following are some temperature records obtained in the lake:

In Northeast bay, June 19, 9.40 a.m., surface 15.4° C.

One-half mile off mouth of Lowbush river, June 30, 2.30 p.m., surface 14.4° C.

Near mouth of Ghost river, July 12, 5.30 p.m., surface 18.4° C., bottom (7 ft.) 17.7° C.

Near source of Abitibi river, July 24, 2 p.m., surface 17.5° C., bottom (5 ft.) 17.0° C.
Off Sand Point, July 25, 2 p.m., surface 19.6° C., 1 yard 17.0° C., bottom (5 ft.) 17.0° C.

ADJACENT WATERS

In addition to collections in Lake Abitibi, a number of small lakes in the immediate vicinity were visited and their fish fauna determined.

Chesney lake is a small lake near the base of Long Point. It is roughly circular in shape, about one-quarter of a mile across and about 15 feet deep. One side is formed by a sand ridge supporting a growth of red pine. The rest of the shore line is low, consisting of muskeg and Labrador tea. The bottom in the centre is covered with chara. The water is dark in colour, but not turbid, a secchi disc being visible to a depth of 8 feet. pH 6.8. The only fish taken in the seine in this lake was the yellow perch (*P. flavescens*).

Sucker lake is a typical muskeg lake near the Teddy Bear river, about five miles from its mouth. It is about one-half mile long and a quarter mile wide, and is surrounded by a sphagnum bog stretching for some distance back from the shore. The water is dark, but transparent. A few casts of the seine from a number of points along one side yielded considerable numbers of red-bellied dace (*C. erythrogaster*), some Cope's minnows (*P. neogaeus*), and a few fatheads (*P. promelas*).

Trollope lake is a clear-water lake, free from the dark coloration typical to the district. It lies among high rocky hills about three and a half miles from the base of Lightning Point and is about a mile and a half long by three-quarters of a mile wide. A number of species, including the speckled trout, are reported from the lake, but we did not take any, although several seine hauls were made over a sand beach on the northwest shore. The pH was 6.8.

A lake constituted by an expansion of the Ghost river about a half mile long by a quarter of a mile wide, consists

almost entirely of marsh. In it we took a large number of spot-tailed minnows (*N. hudsonius*), pike (*E. lucius*), yellow perch (*P. flavescens*) and one golden shiner (*N. crysoleucas*).

Drained by a small creek about two miles long, flowing into Camp Three Bay, is another clear-water lake, about a quarter of a mile in diameter, surrounded by sand hills. The shores were sandy, overlaid in places with silt. The species taken in this lake were pike (*E. lucius*), black-nosed minnows (*N. heterolepis*), perch (*P. flavescens*), and Iowa darters (*P. exilis*).

EXTENT AND METHODS OF INVESTIGATION

The present paper is the result of an expedition which we made to Lake Abitibi during the summer of 1925. We reached the lake on June 9 and left on August 3. Most of our time was spent investigating the lower lake and its surroundings, but in July we visited the upper lake and spent a week there.

Specimens were obtained by the use of gill nets of $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$ and 5 inch stretched mesh and by the use of minnow seines. Specimens were also secured from the commercial fishermen of the lakes.

The measurements were all made on fresh specimens. The same methods of measurement and of counting scales and fin rays were adopted as were used in the study of the fish of Lake Nipigon (Dymond 1926).

ACKNOWLEDGMENTS

The Abitibi Power and Paper Company of Iroquois Falls, Ont., who control extensive timber limits around Lake Abitibi, placed at our disposal, through Mr. H. G. Schanche, manager of their Woods Department, many facilities which not only added to our comfort while engaged in these studies, but enabled us to accomplish more in the time at our disposal than would have been possible otherwise. From the commercial fishermen, Messrs Johnson and Peterson of Mace, and Mr. F. Gallinsky and Mr. F. Rowland of La Reine, we

received much assistance, always cheerfully and generously given, for which we express our appreciation and thanks.

We are also indebted to Mr. Carl Hubbs, Museum of Zoology, University of Michigan, for the identification of several species of fish; to Mr. Bryant Walker for the identification of Mollusks; and to Mr. J. H. Emerton for the identification of spiders referred to herein. The meteorological data for the Lake Abitibi region were supplied by the Meteorological Service of Canada.

COMMERCIAL IMPORTANCE AND POSSIBILITIES

Neither the Ontario nor the Quebec fisheries reports give the quantities of fish taken from Lake Abitibi separately. Some idea of the fish produced may be gained from the fact that three fishing outfits are engaged in commercial fishing on the lake—Messrs Peterson and Johnson, who ship from Mace on the lower lake, and Mr. F. Gallinsky and Mr. F. Ward, who ship from La Reine on the upper lake.

Pike perch is the most important commercial species, and is said to be of sufficiently high quality to command a premium on the New York market. Special attention should be given to this species in considering plans for the improvement of the Lake Abitibi fisheries. It would probably be a mistake to introduce any species not naturally occurring in the lake, on account of the danger of doing injury to this species, which is so well suited to these waters and commands such a satisfactory price. The possibility of developing a market for smoked goldeyes is worthy of consideration as this product finds a ready market in western Canada. This fish is taken in very large numbers in Lake Abitibi, but, because of its poor keeping qualities and the distance it must be shipped to market, is of little commercial value at present.

RELATIONSHIP OF THE FISH FAUNA

Most of the thirty species of fish found in the Abitibi region are characteristic of the Great Lakes. Coleman (1922, p. 40) has shown that there were at least three passes across

the watershed toward Hudson bay through which the waters of glacial Lake Algonquin extended northward. These northern extensions probably became small lakes when the water level of Lake Algonquin fell, but ultimately merged into Lake Ojibway, the precursor of Lake Abitibi. It is therefore not surprising to find the Great Lakes element so prominent in the fish fauna of Lake Abitibi. There is, however, a small though significant element which suggests a western relationship. Neither the tullibee (*Leucichthys nipigon*) nor the mooneye (*Amphiodon alosoides*) have been authentically recorded from the Great Lakes (Hubbs 1926), but they are both represented in Manitoba. The sheepshead (*Aplodinotus grunniens*) occurs in the Great Lakes, but is absent from Lake Nipigon and other northern Ontario lakes, so far as is known, but is reported from Manitoba. The occurrence of these western species in Lake Abitibi may be due to ecological factors, as ecologically Lake Abitibi probably resembles the lakes of Manitoba more closely than it does Lake Nipigon or any of the Great Lakes. As is the case with the lakes of Manitoba, Lake Abitibi is the successor of a much larger lake, the deposits of which formed the great clay plain within which it lies. The western relationship of the Abitibi fauna is further emphasized by the finding of western species of mollusks and spiders. A small *Lymnaea* from the vicinity of the lake was provisionally identified as *Lymnaea ferruginea* Hald. by Mr. Bryant Walker, who remarks: "Except that it is a little smaller it agrees very well with Baker's description and figure of that species, but it is clearly out of the recorded range of that species which, as far as the records go, is a west coast form." Two spiders, *Pellenes luggani* Pkm. and *Cariarachne brunneipes* Bnks., which we took in the district are, according to Mr. J. H. Emerton, thus reported for the first time east of the Rocky Mountains.

Acipenser fulvescens Rafinesque. LAKE STURGEON

An occasional sturgeon is taken by the commercial fishermen in pound nets, although very few are of sufficient size

to be marketed. One specimen which we examined was over 40 inches long. It is said that sturgeon did not originally occur in the lake, but that they gained access to it in 1921, when the dam at Twin Falls in the Abitibi river was completed. This dam raised the level of the river between Couchiching Falls and Twin Falls, so that sturgeon could ascend the former, which had previously been impossible of ascent.

Amphiodon alosoides Rafinesque. GOLDEYE; NORTHERN MOONEYE

Body deep, much compressed, the ventral surface of the body forming a sharp edge from the isthmus to the anal insertion; width 10.0(9.3-12.0); depth 3.3(3.1-3.5); head rather small 4.6(4.3-5.0); eye 3.5(3.3-3.8); snout 5.0 (4.4-5.5); mouth large, maxillary 1.9, rarely 2.0, the dentition very complete, arrangement of teeth as described by Jordan and Thompson (1911); interorbital 3.7(3.5-3.9); length of caudal peduncle 2.4(1.9-2.9) in head, its depth approximately equal to its length; dorsal fin inserted well behind a vertical through anal insertion, with 9 or 10, rarely 11 rays, its base 2.4(2.1-2.7) in head, its height 0.8(0.6-1.0) in its base; anal with 32(29-34) rays, its base 0.7(0.6-0.8) in head, its height 2.4(1.9-2.6) in its base; pectoral length 1.0-1.1 and ventral 1.6(1.5-1.7) in head; scales 6-58(57-59)-9. Largest specimen 13¾ inches.

This is one of the commonest species of fish in Lake Abitibi. It is also found commonly in the tributary streams, at least in their lower reaches. It is rarely shipped, as the distance from market is so great as to make it unprofitable to send it so far in view of the low price it commands.

Insects form the bulk of the food of the goldeye, although crayfish are eaten in considerable numbers. The stomach contents of thirty-five specimens were examined. Of these twelve contained terrestrial beetles, ten crayfish, nine mayflies (adult), eight water boatmen, seven unidentified insect remains, five mayfly nymphs, four caddis worms, three chironomid larvae, two aquatic beetles, two aquatic beetle larvae, two mosquito larvae, one dragon fly larvae, one gastropod, one mammal (*Microtus*), one unidentified fish remains. A number of the stomachs contained more than one kind of food material, which explains why these numbers total more than thirty-five.

The species is common in the lakes and larger rivers of Manitoba and Saskatchewan, north at least to Pine Island lake (Richardson 1832), ranging eastward south of the Great Lakes to Ohio. In Ontario it has previously been recorded from the Lake of the Woods.

Leucichthys nipigon Koelz. TULLIBEE

Body deep and moderately compressed, width 7.4[6.4(6.7-7.8)8.3]; depth 3.4(3.2-3.6); head 3.9(3.6-4.2); eye 4.4[(4.1-4.6)5.0]; snout 3.9(3.6-4.3); interorbital 3.4(3.1-3.7); maxillary 2.9(2.8-3.1); length of caudal peduncle 2.3(2.0-2.5) in head, its depth 1.1(1.0-1.3) in its own length; dorsal fin with 11, rarely 10 or 12 rays, its base 1.9(1.7-2.0) in head and 1.5(1.3-1.8) in its own height; anal with 13 or 14, rarely 12 or 15 rays, its base 1.8[(1.6-1.9)2.2] in head, its height approximately equal to its base, pectoral length 1.3(1.1-1.5) and ventral 1.4(1.2-1.5) in head, scales 8 or 9−64[57(60-69)]; gill rakers 21+37(17+33 to 24+39). Largest specimen 13¾ inches, 1 pound 8 ounces.

Colour, silvery, slightly dark above, dorsal and caudal fins dark, especially on the outer half, pectoral usually dusky on anterior edge, ventral and anal nearly or quite immaculate.

This is the only species of cisco found in the lake. It shows some differences from the form described by Koelz (1925) as *Leucichthys nipigon*, but it is believed to be of the same species. It does not reach so large a size as the tullibee of Lake Nipigon and comparisons of body proportions of the two forms are therefore not entirely satisfactory, since some of these proportions change considerably with growth. It is evidently a deeper and more compressed fish with a shorter and stouter caudal peduncle, longer fins and fewer scales in the lateral line.

That these differences are in some way related to the environment can scarcely be doubted we think. Hubbs (1922) and others have shown that the number of vertebrae, fin-rays, and scales are determined in part by the environmental conditions, particularly temperature, which prevail during some sensitive developmental period. The characters mentioned (vertebrae, fin-rays, and scales) have been shown to average higher in individuals which develop at the lower temperature. Similarly these characters are higher in number in northern localities, as compared with the corresponding characters of the same species from farther south.

TABLE 2. Comparative measurements of **Leucichthys nipigon**

Specimen No.	1461	1534	1532	1479	1489	1511	1490	1520	1480	1481	1519	Average
Length	312	312	296	279	275	265	263	256	254	251	250	274
Scales	62	66	69	62	61	67	60	64	68	62	65	64
Gill rakers	22+37	23+38	23+38	22+38	21+35	20+34	21+39	20+38	21+35	21+37	24+39	59
Head length	250	237	250	258	258	257	264	265	275	273	260	259
Body depth	314	292	304	274	291	298	311	305	289	285	316	298
" width	157	144	149	136	135	125	141	129	122	120	136	136
Caudal peduncle												
Length	115	118	118	109	116	109	114	113	110	108	104	112
Depth	106	098	101	100	105	102	114	100	104	102	103	101
Eye	050	051	061	055	058	060	063	063	063	062	060	59
Snout	061	063	068	065	067	065	070	065	071	064	068	66
Interorbital	074	075	081	075	076	072	076	078	075	074	072	75
Maxillary	087	080	088	091	093	091	097	090	098	093	092	90
Snout to occiput	167	160	177	176	180	170	177	172	181	173	168	173
Ventral to pectoral	304	282	273	283	280	275	277	258	273	295	300	282
Pectoral length	176	196	203	208	211	226	205	207	189	187	184	199
Ventral length	166	196	189	200	196	196	194	195	189	187	176	189
Dorsal height	182	211	203	211	237	215	205	199	205	191	200	205
" base	135	128	142	136	131	140	141	152	138	139	128	137
Anal height	*	144	149	147	165	143	156	137	142	127	123	144
" base	135	131	115	143	138	138	141	164	157	147	152	144
Adipose length	080	064	068	075	065	068	091	089	063	052	068	68

*Injured

TABLE 2—Continued

Specimen No.	1462	1512	1521	1465	1466	1464	1510	1491	1467	1463	1468	1469	Average
Length	246	244	242	240	235	232	232	230	221½	218	218	217	231
Scales	67	60	66	66	62	65	57	67	64	66	59	62	63
Gill rakers	22+37	22+41	23+37	19+34	21+36	18+33	22+37	22+37	20+37	17+33	21+35	21+32	56
Head length	266	262	252	258	268	250	258	259	284	259	264	263	262
Body depth	281	291	318	302	298	288	315	282	306	309	312	277	298
" width	114	131	136	125	128	138	129	135	117	133	138	115	128
Caudal peduncle													
Length	110	117	105	113	113	121	108	104	117	114	115	097	111
Depth	096	099	096	106	106	103	103	102	095	101	110	097	102
Eye	063	061	058	063	062	060	060	061	068	067	062	065	62½
Snout	067	064	062	063	062	060	063	059	063	060	062	065	62½
Interorbital	069	074	072	071	072	069	073	067	070	071	069	068	70
Maxillary	087	092	087	092	089	091	091	087	093	089	101	090	91
Snout to occiput	171	168	165	171	174	172	172	181	172	174	174	177	173
Ventral to pectoral	264	266	281	275	268	276	272	278	284	284	271	299	276½
Pectoral length	195	193	182	196	213	198	194	187	208	179	201	175	193
Ventral length	191	193	178	192	196	198	194	183	199	192	197	170	190
Dorsal height	211	205	194	216	196	207	220	198	203	220	211	212	208
" base	128	135	140	142	140	147	146	130	135	147	133	134	138
Anal height	159	156	132	150	106	151	146	139	149	161	142	147	152
" base	154	156	153	138	145	147	155	139	144	147	161	143	150
Adipose length	073	074	074	075	068	073	073	091	059	073	*	065	70

*Injured

In Table 2 are presented comparative measurements of twenty-three specimens of *Leucichthys nipigon* from Lake Abitibi. The values given for the head length, body depth, body width, caudal peduncle length and depth, etc., represent thousandths of the body length (snout to end of vertebral column) and are therefore comparable with those given for the same species in the Nipigon report (Dymond 1926).

Coregonus clupeaformis (Mitchill). COMMON WHITEFISH

Following are the proportionate measurements of twelve specimens, average length 33.6 cm.(15.0-45.8); width 7.3(6.3-9.4); depth 3.2(2.8-4.1); head 4.7 (4.3-4.9); eye 4.4(3.3-5.0); snout 3.9(3.5-4.4); interorbital 3.3(3.0-3.7); maxillary 3.4(3.2-3.7); length of caudal peduncle 1.9(1.5-2.6) in head, its depth 1.1(0.9-1.3) in its own length; dorsal fin with 12 rays, less often 11 or 13, its base 1.5(1.3-1.6) in head and 1.4(0.9-1.7) in its own height; anal with 12 or 13 rays, its base 1.5[(1.4-1.6)1.8] in head and 1.1[(1.0-1.2)1.4] in its own height; pectoral length 1.0(0.9-1.1) and ventral 1.6(1.3-1.8) in head; scales 9 or 10—75(72-79)—8 or 9; gill rakers 17+10[10+14(10+15 to 11+17)]. Largest specimen 19½ inches, 4 pounds 5 ounces in weight.

The whitefish is fairly common in the lake, but does not occur in such large numbers as the pickerel, pike, or moon-eye.

As compared with the whitefish of Lake Nipigon, the species in Lake Abitibi is deeper and more compressed, with a shorter and stouter caudal peduncle, longer fins and fewer scales. It is interesting to note that this is exactly parallel to the differences found between the tullibee of Lake Abitibi and the same species in Lake Nipigon. What significance, if any, this parallel variation may have, we are not prepared at present to suggest.

Salvelinus fontinalis (Mitchill). BROOK TROUT

The brook trout is reported from the swifter headwaters of a number of rivers, especially those rising in the higher semi-mountainous districts south of the upper lake. They are said not to be confined to clear water, but to be found also in the turbid lower reaches of some of these streams.

Catostomus catostomus (Forster) NORTHERN OR STURGEON-NOSED SUCKER

This is a rather common fish of the lake. It reaches a large size, specimens of 20 inches in length and 5 pounds weight being not uncommon.

Catostomus commersonii (Lacépède). COMMON SUCKER

This species is also common in Lake Abitibi, but it does not reach so large a size as the northern sucker.

Moxostoma lesueurii (Richardson). SHORT-HEADED RED-HORSE

Body stout, moderately compressed; deepest in front of the dorsal fin, the dorsal profile continuing the slope of the head in a smooth curve to the dorsal insertion; width 6.3[5.9(6.1-6.5)]; depth 3.6[(3.3-3.7)4.1]; head very short 5.1[(4.9-5.3)5.5], subconical, tapering above and below to the bluntish snout; eye 4.4(4.0-4.8); snout 2.2(2.0-2.3); interorbital 2.1(1.9-2.2); mouth small, the lips plicate, the folds not continued back to the inside of the lip, the folds of the lower lip scarcely forming papillae, a few cross furrows near the outer angles; length of caudal peduncle 1.5(1.3-1.8) in head, its depth 1.2(1.0-1.4) in its own length; dorsal fin with 13 rarely 11, 12 or 14 rays, its base 0.9(0.85-1.1) in head, its height 1.2(1.0-1.4) in its own base; anal with 7, sometimes 8 rays, its base 2.0(1.8-2.2) in head, and 2.0(1.7-2.2) in its own height; pectoral length 1.0(0.9-1.2) and ventral 1.2 (1.1-1.3) in head; scales 6, rarely 7 – 44(42-46) – 5, rarely 6. Largest specimen 18½ inches, weight 3 pounds 7 ounces.

The short-headed red-horse is occasionally taken in the fishermen's pound nets, but is not one of the common fishes of the lake. Males taken on July 17 still had traces of tubercles on the anal and lower half of the caudal fin, such as characterize these fins at spawning time.

The Abitibi specimens have considerably shorter heads than those from Lake Nipigon, although the range of variation for the two lakes (4.5-5.5) is almost exactly that found by Forbes and Richardson (1908) for this species in Illinois (4.6-5.4).

Chrosomus erythrogaster Rafinesque. RED-BELLIED DACE

This minnow was taken only in a muskeg lake (Sucker lake) south of the upper lake.

Pimephales promelas Rafinesque. FATHEAD

The fathead was taken in Sucker lake and also in a small stream flowing from a black spruce swamp into the Lowbush river.

Notemigonus crysoleucas (Mitchill). GOLDEN SHINER

This species was found in protected, weedy bays of Lake Abitibi and in the small reedy lake of the Ghost river. It does not reach a large size, the largest taken by us being about 2½ inches long.

Notropis heterolepis Eigenmann and Eigenmann. BLACK-NOSED MINNOW

This minnow is not common. It was taken in a shallow, reedy, well-protected bay (Shea's bay) and also in a small inland lake (Camp Three Lake).

Notropis hudsonius (Clinton). SPOT-TAILED MINNOW

This species is common in protected bays, especially where there is some growth of aquatic vegetation. It also occurs in the rivers and in their lake-like expansions.

Notropis atherinoides Rafinesque. LAKE SHINER

This species is very common in some localities. In contrast with the preceding species it occurs in exposed situations.

Couesius plumbeus (Agassiz). LAKE CHUB

The lake chub is generally distributed in the lake, but is nowhere very common. It appears to prefer a sandy or gravelly bottom in exposed situations rather than protected bays supporting vegetation. A few specimens were taken in comparatively swift water in the Lowbush river.

Margariscus margarita nachtriebi (U. O. Cox). NACHTRIEB'S MINNOW

This minnow was taken only in the Teddy Bear river about three miles from the lake.

Pfrille neogaeus (Cope). COPE'S MINNOW

This minnow was found in a muskeg lake (Sucker lake) in association with *Chrosomus erythrogaster* and *Pimephales promelas*.

Esox lucius Linnaeus. PIKE

The pike is one of the commonest species of the lake and is of commercial importance, considerable quantities being shipped to Montreal and New York.

Eucalia inconstans (Kirtland). BROOK STICKLEBACK

This species was taken only in pools of a small stream flowing from a black spruce swamp into the Lowbush river. In these pools it was associated with *Pimephales promelas* and the young of *Catostomus catostomus*.

Percopsis omisco-maycus (Walbaum). TROUT PERCH

The trout perch is found commonly in the lake and larger rivers. In the lake it was usually taken over a sandy or gravelly bottom in exposed situations.

Perca flavescens (Mitchill). YELLOW PERCH

The perch is quite common in Lake Abitibi and occurs also in a number of smaller lakes of the region.

Stizostedion vitreum (Mitchill). PIKE PERCH; YELLOW PICKEREL

This is the chief commercial species of Lake Abitibi. Specimens up to eight pounds in weight are reported by the commercial fishermen, but the largest specimen we saw weighed 4½ pounds. We took quite a number in the Lowbush and Circle rivers on set lines.

Stizostedion canadense (Smith). SAUGER

The sauger is very common in the lake and larger streams. Most of the specimens taken from the Circle and Lowbush rivers were of a dark grey colour only faintly marked with yellow. Specimens from the lake were more yellowish. The

species does not reach a large size, specimens of over 12 inches in length being rare.

Percina caprodes zebra (Agassiz). LOG PERCH

The log perch appears to be the only species of darter found in the main lake. It is not common, as specimens were taken only in Shea's bay and in the Lowbush river.

Poecilichthys exilis (Girard). IOWA DARTER

The Iowa darter was found only in Camp Three Lake, where it was associated with *N. heterolepis*, *E. lucius*, *P. flavescens*. This association is quite similar to that found for the Iowa darter in the Lake Nipigon region (Dymond 1926, pp. 12-13).

Ambloplites rupestris (Rafinesque). ROCK BASS

We were informed by several persons that bass were taken in the Teddy Bear river, but we were unable to investigate the particular locality where they were said to occur. Mr. Fred Rowland, who has fished for many years on Lake Erie and in other parts of Ontario, told us that he had seen a few rock bass from Lake Abitibi.

Aplodinotus grunniens Rafinesque. SHEEPSHEAD

Body compressed, the back strongly arched, width 6.1(5.9-6.5), depth 2.6 (2.4-2.8); head 3.7(3.5-4.0); eye 5.2(4.8-6.6); snout 3.5(3.2-3.7); interorbital 3.3(3.0-3.7); length of caudal peduncle 1.2(1.1-1.3) in head, its depth 2.2(2.1-2.3) in its own length; dorsal base 1.5(1.4-1.5) in length; spinous portion with 8 or 9 spines and soft portion with 30-32 rays; longest spine 4.7(4.5-5.1) and longest ray 4.0(3.5-4.2) in dorsal base; anal with 1 spine and 7 or 8 rays; its base 2.3 (2.1-2.5) in head and 1.5(1.3-1.6) in its own height; pectoral length 1.1(1.1-1.2) and ventral 1.3(1.2-1.5) in head; scales, 8, less often 7, 51(50-52), 16(15-18); gill rakers 15(14-16)+8(7-9).

The sheepshead is fairly common in Lake Abitibi and reaches a weight of at least fourteen pounds. The species occurs throughout the Great Lakes being particularly abundant in Lake Erie. It occurs also in Manitoba (Eigenmann 1895).

Cottus bairdii Girard. MILLER'S THUMB

One specimen of this species was taken in the Circle river at Lowbush.

Cottus ricei Nelson. RICE'S SCULPIN

Two specimens of this cottid were seined from shallow water at the side of a rapid about ten miles from the mouth of the Lowbush river.

Lota maculosa (LeSueur). LING

The ling occurs in the lake and larger rivers, but does not appear to reach a large size. Not many were taken in our gill nets, but the commercial fishermen report taking them in the pound nets in considerable numbers in the autumn.

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