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DATA ON THE RATE OF GROWTH OF PIKE PERCH
(*STIZOSTEDION VITREUM*) AND SAUGER
(*S. CANADENSE*) IN ONTARIO

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INTRODUCTION

The pike perch or pickerel (*Stizostedion vitreum* (Mitchill)) has not been, on the whole, of as great commercial importance as the whitefish, lake trout, or cisco, but the species has always been of very significant value to the Ontario fisheries. The annual catches throughout the last twenty years have fluctuated around two million pounds, the estimated values varying between the extremes of \$150,000 and \$415,000. Until 1925, when the cisco catch fell off badly, the pike perch was the fourth most valuable commercial fish in Ontario; since that time it has been in third place.

Commercial fishermen on Lake Nipigon take pike perch in considerable numbers during August and September (Dymond, 1926, p. 79), and receive a higher price per pound for them than for whitefish or trout. In Lake Abitibi the pike perch is the chief commercial fish throughout the year (Dymond and Hart, 1926, p. 16).

The sauger (*Stizostedion canadense* (Smith)) does not grow large enough in Lake Nipigon to be caught in the four and one-half inch gill nets used by the fishermen, but we took it very commonly in two and three inch nets set in some parts of the lake (Dymond, 1926, p. 80). Local fishermen have suggested special regulations to permit the capture of saugers for commercial purposes.

The purpose of the present study was to determine the rate of growth of the pike perch and sauger in Lake Nipigon

MATERIAL AND METHODS

The length in inches and the weight in ounces of the individual fish have been plotted against the age for the three species. The resulting growth curves are shown in figs. 1, 2 and 3.

TABLE 1.—GIVING THE AVERAGE LENGTH AND WEIGHT OF FISH OF VARIOUS AGES AND THE NUMBER OF SPECIMENS BELONGING TO EACH AGE GROUP FOR PIKE PERCH FROM LAKE NIPIGON AND LAKE ABITIBI AND FOR SAUGERS FROM LAKE NIPIGON.

Age in years	Pike perch—Lake Nipigon			Pike perch—Lake Abitibi			Sauger—Lake Nipigon					
	Length mm.	Length in.	Weight oz.	No. of specimens	Length mm.	Length in.	Weight oz.	No. of specimens	Length mm.	Length in.	Weight oz.	No. of specimens
1	123	5½	1½	4	...	...	...	...	...	...	...	...
2	169	7½	2½	15	175	7½	2	1	...	...	...	...
3	207	9½	4	2	...	...	...	...	...	...	3½	5
4	275	12½	9½	8	252	11	7½	2	206	9	4	5
5	312	13½	14½	9	260	11½	8	1	229	10½	4	5
6	315	13½	15½	9	280	12½	11	1	270	12	9	4
7	335	15	19	2	306	13½	14	4	274	12	9	6
8	407	18	31	4	386	17½	27	7	288	12½	9½	17
9	426	18½	33½	3	390	17½	29	10	318	14	15	6
10	457	20½	50	10	401	18	32	3	337	14½	18½	8
11	472	20½	50	10	382	17	23	2	330	12½	15½	5
12	492	21½	69	5	...	...	...	...	330	14½	14	1
13	...	...	...	...	...	...	...	...	362	16	20	6
14	535	23½	72	1	508	22½	70	1	362	16½	23	1
15	572	25	136	2	470	21	55	1	...	...	...	...

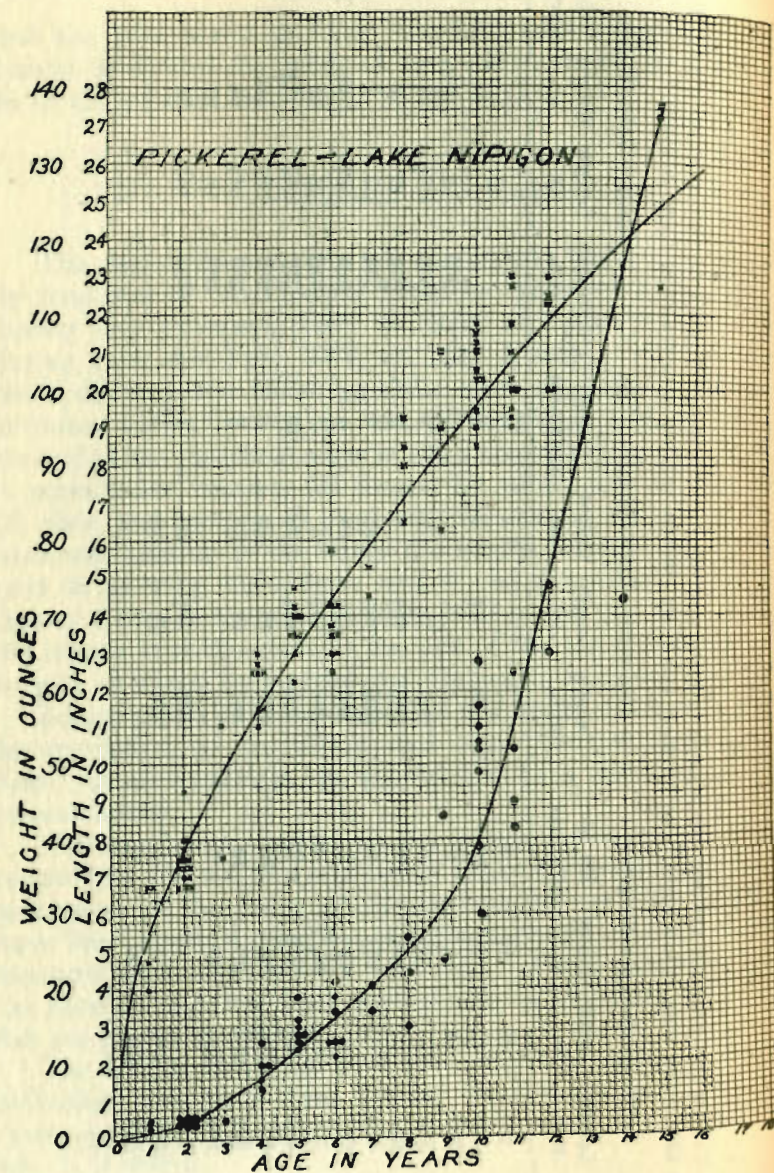


Figure 1

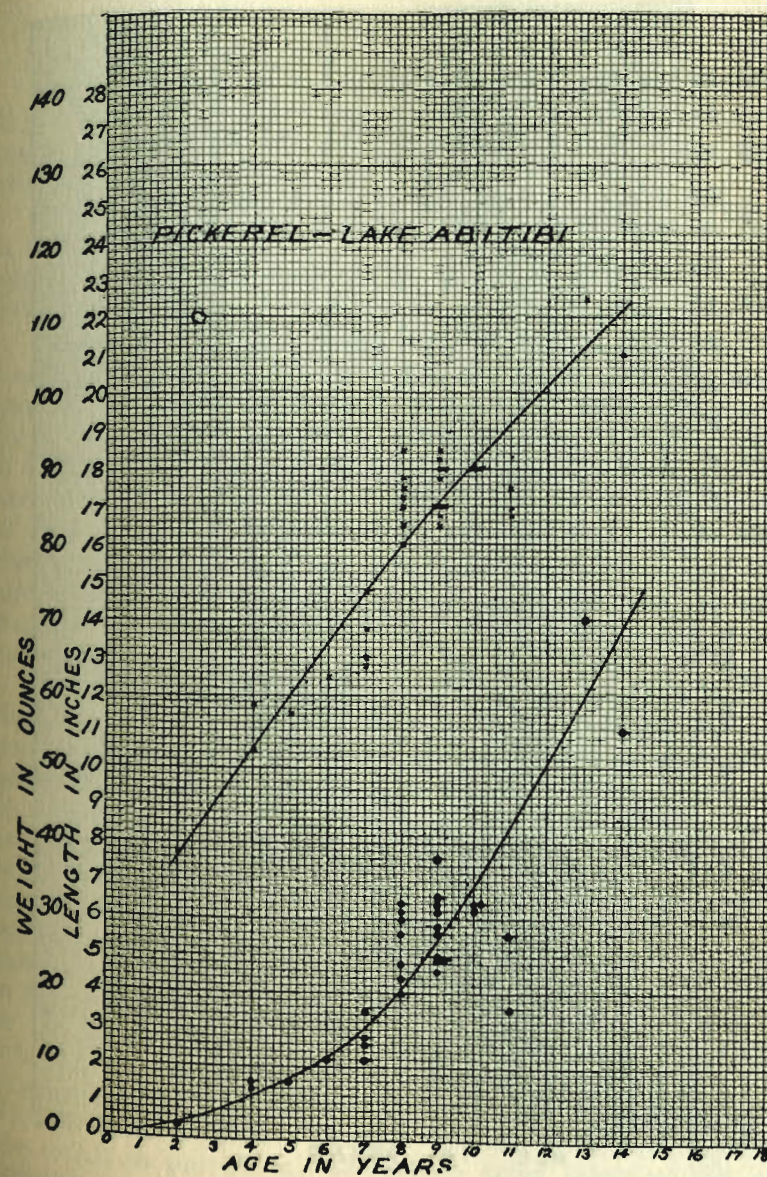


Figure 2

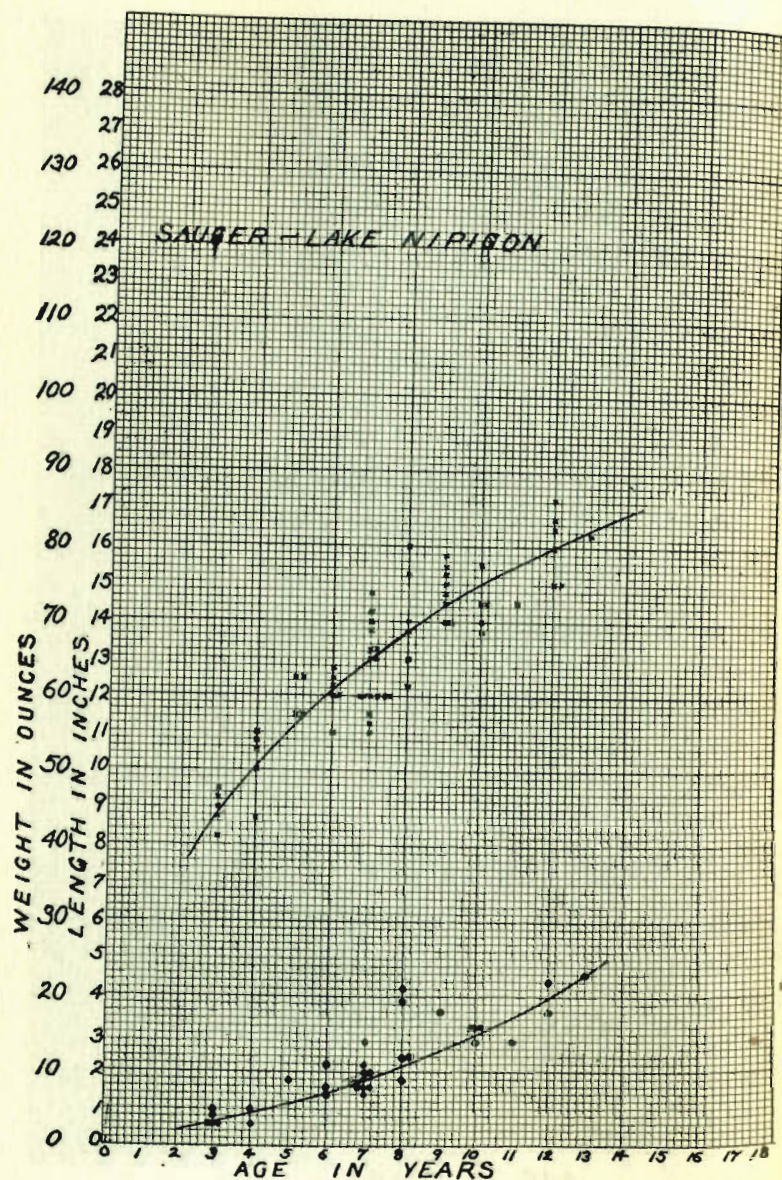


Figure 3

DISCUSSION

An examination of these curves shows that the pike perch in Lake Nipigon grows considerably faster than the same species in Lake Abitibi, and that both grow much faster than the Lake Nipigon sauger.

The three growth curves are typical in that they all show a decreasing rate of increment in length and an increasing rate of increment in weight as the fish grows older. Although evident, this is least marked in the case of the sauger.

Adamstone (1922), dealing with the yellow pike perch of Lake Erie, showed that there was a marked acceleration in growth in weight occurring between the ages of two and three years. The weight of a two-year-old Lake Erie fish is about three ounces, that of a four-year-old fifteen ounces, and of a seven-year-old forty-three ounces. A comparison of these results with those of the present study shows that the rate of growth as a whole is much greater in Lake Erie, and that the acceleration occurs at an earlier age. In the two northern lakes, the whole life cycle of pike perch appears to be extended.

In view of the fact that there is an advanced period in the life of a fish when its rate of increase in weight is relatively much greater than it is during its earlier years, it appears advisable to allow it several years of this more rapid increase in weight before it is liable to capture in commercial nets. In the case of the pike perch of Lake Nipigon this more rapid increase in weight sets in about the beginning of the tenth year, when the fish is about 18 inches in length. A study of table 2, shows that 95 per cent. of the pike perch taken in four and one-half inch gill nets were over 18 inches in length and that 65 per cent. were over 20 inches in length or ten years of age. This means that 35 per cent. of the fish taken in four and one-half inch nets have not had the opportunity of more than one year of accelerated growth. This condition indicates that gill nets of this size are slightly too small to permit full advantage being taken of the increased growth rate of the pike perch in Lake Nipigon.

HART: RATE OF GROWTH OF PIKE PERCH

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Nets of four and one-half inch stretched mesh, however, are large enough to avoid doing extensive damage to the fishery. Accordingly, it would appear advisable to continue the use of nets of this size if they are found suitable for the whitefish and lake trout fishery.

Although for the pike perch of Lake Abitibi the growth is on the whole slower than that in Lake Nipigon, the acceleration in growth occurs at the age of about seven years. As these fish do not reach a length of 18 inches until they are ten years of age, 95 per cent. of the specimens have had the advantage of three years of accelerated growth before they are liable to capture in four and one-half inch nets. However, as the growth rate is comparatively slow, the stock will be replaced more slowly. Accordingly, the amount of net permitted in the fishery should be rigidly controlled.

Unfortunately, no data as to the minimum spawning age of pike perch are available, but it is altogether likely that the present regulations permit the fish at least one opportunity of spawning before they are liable to capture in commercial nets in either Lake Nipigon or Lake Abitibi.

The smallest spawning female sauger taken in Lake Nipigon measured 14 inches in length. Reference to table 2 shows that 48 per cent. of the saugers taken in two inch nets and 15 per cent. of the saugers taken in three inch nets are under this size. It is evident therefore that no net of a smaller size than three inch mesh should be used for taking saugers. However, from the evidence of our operations it is apparent that even nets of this size are certain to do very considerable damage to young whitefish and pike perch. For this reason and because the sauger, owing to its inferior quality, does not command a good price, it appears inadvisable to take any steps towards fishing them in Lake Nipigon under present conditions.

The greater average length of saugers over pike perch taken in the same nets as shown in table 2 is, no doubt, related to the slightly greater compression of the former species (Dymond, 1926, pp. 78 and 80).

CONCLUSIONS

1. The four and one-half inch gill nets in current use in Lake Nipigon allow pike perch on the average one year of rapid growth in weight. Although this condition is not ideal, four and one-half inch nets might be continued if found satisfactory for other species.
2. Four and one-half inch gill nets allow pike perch three or more years of accelerated growth in Lake Abitibi. This should ensure a continued fishery if the amount of net is not unduly increased.
3. The establishment of a sauger fishery in Lake Nipigon is not advisable at present. If conditions should ever make such a fishery desirable a three inch net is indicated.

LITERATURE CITED

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