

# THE WINTER FISHERY IN WESTERN LAKE ERIE, WITH A CENSUS OF THE 1942 CATCH

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In the island region of western Lake Erie a hook and line fishery operates on a commercial basis during the period of a year when the lake is covered with ice in that vicinity. The center of this fishery is Put-In-Bay on South Bass Island. No nets are employed in this winter fishery.

The fish captured are of high quality and the catch is of sufficient magnitude to be of importance in the regional economy, although the quantity is but a small fraction of the annual yield of the whole lake. A creel census was placed in operation during the winter of 1942, and, when compared with returns of hook and line fishermen in other water areas, the yield was high.

## HISTORY OF THE FISHERY

Presumably the earliest fur traders and settlers on the Lake Erie islands were familiar with the practice of fishing for food with hook and line through holes in the ice. Until about 1890 fishing was a casual affair, since not much effort was required to take ample supplies of herring, *Leucichthys artedi albus* (LeSueur), for domestic consumption. The fisherman squatted at the edge of a round hole in the ice and used a stick attached to which was a short line bearing a small hook baited with a pearl button or a piece of cloth. This type of fishing, confined mostly to the protected harbor, yielded ample supplies of jumbo herring averaging about 18 inches in length.

When shanties first came into use about 1890, they were built of wood and were heavy, semi-permanent structures that required considerable exertion to bring into position on the ice. With the adoption of the shanty, fishing extended out from the harbor to more exposed situations over deeper water. About 1895 the first shanty was built with a canvas covering over a wood frame. This newer and lighter shanty, mounted on runners, met with general favor so that in succeeding years the number on the ice increased from 50 to as many as 250 shanties. The first wooden shanties were frequently built with several holes in the floor, and accommodated up to half a dozen fishermen. The present canvas shanties are small, coal-heated, one-man shelters, but are occasionally large enough to hold two fishermen. The early fishing gear of two or three lines each with a single hook was modified, between 1910 and 1920, to the present standard equipment of two lines per man, each line with a heavy flat weight, a spreader, and two hooks.

Catches of fish in the early days were generally greater than at the present time. Notably abundant then were herring, a rarity in recent winter catches. Sauger, *Stizostedion c. canadense* (Smith), were taken more abundantly then than now, a fisherman sometimes catching in a day two bags of "clear" sauger (a catch composed of sauger only). Catches of perch, *Perca flavescens* (Mitchill), have always varied greatly throughout the years. The catch of three tons of No. 1 yellow pickerel, *Stizostedion v. vitreum* (Mitchill), in a single day was an outstanding event in 1910.

The sizes of fish caught have also varied. Large pickerel were more frequently encountered forty years ago than now, and fish of 9 and 10 pounds were common. One fisherman at that time caught in one day two very large pickerel, 17 and 18½

pounds; another caught four 12-pound pickerel before 9:00 A. M. and several 8- and 9-pound fish later the same day. Big sauger, now largely unknown, were quite usual. The size of perch has been maintained throughout the period of the fishery, generally at about three fish to the pound.

Fluctuations in market prices and demand have had an effect on the size of the catch. Sometimes in the 1890's fishermen were unable to sell their fish at any price; at other times in the same years they accepted  $\frac{3}{4}$ c. pound for perch, 1c. pound for sauger, and 3c. pound for pickerel and herring. In later years as many as five buyers competed for the catch, and prices were forced higher. During the war of 1914-1918, prices of pickerel reached a peak of 20-25c. pound. In 1942 fishermen received 10c. pound for perch and sauger, 12c. pound for No. 2 pickerel, and 14c. pound for the larger No. 1 pickerel.

The hauling of local wines to the mainland and city markets by teams and sleighs was formerly an important winter industry on the islands, but fish were regarded as of minor importance as a freight load. With intermittent hauling facilities, fishermen were not assured of steady marketing of their fish, and the fishing industry did not become stabilized.

Beginning about 1900, mail, passengers, and freight including fish were carried to the mainland in winter by regular contractors who used iron-clad boats capable of travel over both water and ice. Regularly scheduled trips could be depended upon, except during violent extremes of weather, and additional iron-clads were put into service solely for the fish trade. Two men could carry four 250-pound barrels of fish in one boat, and sometimes completed three round trips daily to the mainland, about  $3\frac{1}{2}$  miles distant. The fish-carrying ironclads occasionally transported as much as three tons of fish daily, and the winter fishing industry thus proceeded on a firmer basis.

The final development in the improvement of the island fishing industry was the permanent establishment of an airplane freight service which has carried fish dependably and continuously each winter since 1931-32.

Before the present century fish were readily available, but, owing to low prices, daily incomes generally amounted to \$3 or \$4, and sometimes up to \$7 per fisherman. The wages of the men engaged in the transportation of fish were about the same as those of the fishermen. More recently, even with satisfactory ice conditions, fish have sometimes been caught with greater difficulty; fifty days of fishing in 1933 resulted in earnings of \$57 for one fisherman. At other times the fortuitous combination of moderate numbers of fish with high prices has resulted in individuals making catches of outstanding value: \$78-worth of fish in three days, and \$31 in one day are instanced.

Yellow pickerel, perch, sauger and herring have constituted the chief species entering the fishery, and in some seasons there has been a market for lawyers, *Lota lota maculosa* (LeSueur), but the fishermen were required to dress these fish before the buyers would accept them at 1c. pound. Herring have been of no importance for about the last twenty years.

The capture of lake shiners, *Notropis a. atherinoides* Raf., for bait has generally been simple, as they were usually plentiful and readily available. Sometimes shiners were so abundant that fishermen did not bother to keep a live-box, but in the morning on the way out to the shanty stopped in a bay where in a few minutes they would easily catch a day's supply with a few hauls of a circular dip net through a hole in the ice. At other times shiners were more difficult to catch, and their extreme scarcity in 1912 was paralleled by that in 1942. The catching of shiners for bait has been a commercial effort by one or two men each year, and prices have been as high as \$2 quart, but average about 50c. quart, there being approximately 400 shiners in a quart.

THE CENSUS

Methods—

In most creel census operations it has been customary for the census-taker either to talk with the fishermen while they were angling, to meet the fishermen at a dock or other point of egress from the fishing waters, or to set up census stations at points about the lake where cards were available for the voluntary use of anglers. In this census, the practice of obtaining data has been simplified because most of the catches eventually passed through the hands of only two buyers, and both have furnished records of the number of pounds of fish purchased each day.

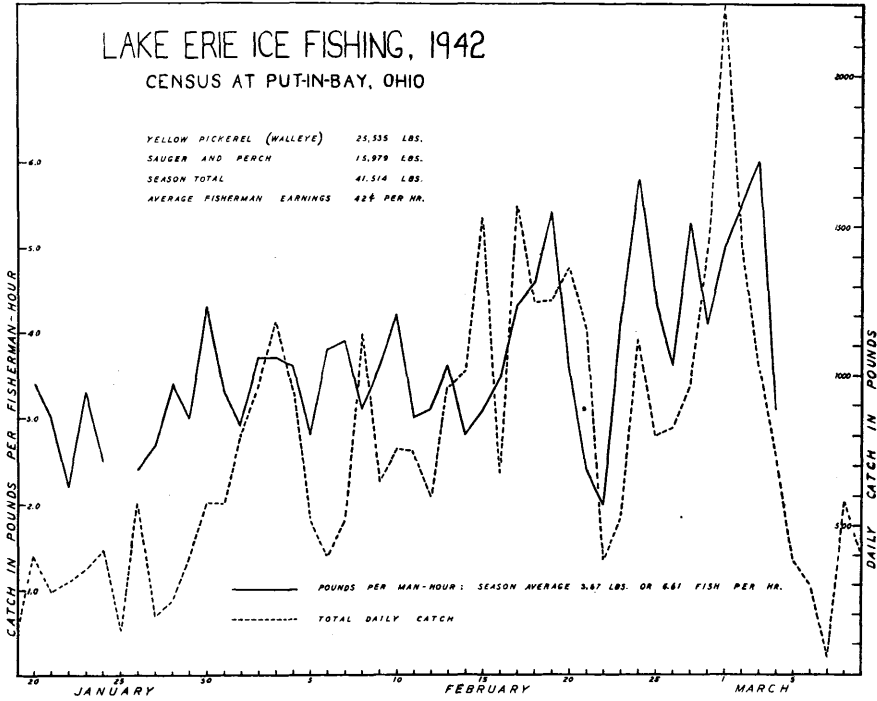


FIGURE 1. Graph showing fluctuations in daily total catch and in daily catch per man-hour in the winter hook and line fishery. Yields increased irregularly with progress of the season.

The Port Clinton Fish Company purchased about 65 per cent of the total catch, and collected data for 58 per cent of the total catch on the number of hours occupied by each fisherman to catch the fish which he offered for sale. It is these data which form the basis for calculations of effort. Effort refers to the number of pounds of fish caught per man-hour; perhaps it should more properly refer to the time required to catch a unit weight of fish, but the former definition of the term has been adopted in this report.

In the calculation of a daily average of effort, two procedures could be used. The first would be to find the simple mean of individual efforts for the day; this might be regarded as a better measure of availability, since it does not give undue weight to either the poor or successful fisherman. The second method would be to calculate the daily mean effort by weighting individual efforts according to the number of hours fished; or, in practice, to divide the total catch for the day by

the total number of hours fished. This mean could be construed as a true measure of the average return per hour for all fishing.

Since this report may possibly have more value if calculations are based on the average return per hour for all fishing, the weighted mean has been used. However, simple means have also been calculated, but the two means have not differed by more than 0.39 pounds per hour, of total catch, on any one day, and have differed by less than 0.10 pound per hour throughout 64 per cent of the season. Weighted averages have also been employed in the comparison of catches over periods of several days or weeks, and in the treatment of financial returns to the angler.

The poundages of fish listed in Table I do not indicate the total yield. Fish that were sold conformed to minimum size limits of one pound for No. 1 pickerel (about 15 inches total length), 13 inches for No. 2 pickerel, 11 inches for sauger, and 8 inches total length for perch.

TABLE I  
HOOK AND LINE CATCHES IN THE WINTER FISHERY IN LAKE ERIE AT PUT-IN-BAY, OHIO,  
FROM JANUARY 17 TO MARCH 13, 1942.

MONTH	CATCH IN POUNDS, AS REPORTED BY DEALERS							
	YELLOW PICKEREL				SAUGER	PERCH	NOT SPECIFIED SAUGER AND PERCH	TOTAL CATCH
	No. 1	No. 2	Not Specified	Total				
January.....	661	2,295	1,227	4,183	271	703	623	5,780
February.....	1,503	14,132	.....	15,635	3,700	4,077	3,147	26,559
March.....	920	4,797	.....	5,717	907	1,018	1,533	9,175
Totals.....	3,084	21,224	1,227	25,535	4,878	5,798	5,303	41,514
Per cent of total catch.....	7.4	51.1	3.0	61.5	11.8	14.0	12.8	

and 8 inches total length for perch. Undersized fish were taken for home use, and non-resident sportsmen also caught a proportion of the total yield; however, the fish not offered for sale probably constituted not more than 20 per cent of the total catch, or about four tons. Because buyers paid the same price for sauger and perch, poundages of these fish were generally listed together on the sales slips,<sup>1</sup> so that efforts for these species individually were not available throughout the season.<sup>2</sup>

#### Catch—

The winter catch of fish in Lake Erie at Put-In-Bay, as reported by commercial dealers, has averaged about 44,500 pounds from 1935 to 1940, and has been composed of 70 per cent pickerel, 24 per cent perch, and 6 per cent sauger. During this period the winter catch of pickerel, perch, and sauger has amounted to 1.04, 0.31, and 0.23 per cent, respectively, of the annual catch of these three species by commercial nets in the Ohio portion of Lake Erie.

<sup>1</sup>Blue pike, *Stizostedion vitreum glaucum* Hubbs, were taken in small amounts, and have been included with sauger.

<sup>2</sup>Total catches, apart from the data on effort, were obtainable by species.

The winter fishing season in 1942, as regulated by the period of ice-cover on the lake, extended from January 17 to March 13, and data on effort are available between January 20 and March 4, for which catches, efforts, and fishermen's earnings are presented in Tables I and II.

The trend of success in fishing evidenced an irregular increase from a minimum average catch of 2 pounds per hour of all species near the beginning of the season to a maximum daily average of 6 pounds per hour in early March, as shown in Figure 1. The season's average rate of catch was 3.67 pounds per fisherman-hour.

Yellow pickerel constituted 61.5 per cent of the total yield of the winter fishery in 1942, and these fish were taken at the rate of 2.34 pounds per hour (2.03 pounds

TABLE II  
AVERAGE FISHING EFFORTS IN THE WINTER HOOK AND LINE FISHERY IN LAKE ERIE  
AT PUT-IN-BAY, OHIO, 1942.

	Number of Fisherman Reports	Average Length of Fisherman-day, in Hours	Yellow Pickerel			Sauger	Perch	Sauger and Perch	Total, All Species	Average Fisherman Earnings Per Hour
			No. 1	No. 2	Total					
Pounds of fish caught per fisherman hour.										
Jan. 20-Jan. 31..	116	8.1	0.51	1.90	2.41	.....	.....	0.67	3.08	\$0.368
Feb. 1-Feb. 15..	307	8.3	0.23	1.70	1.92	.....	.....	1.37	3.29	0.374
Feb. 16-Feb. 28..	274	8.5	0.23	2.22	2.44	.....	.....	1.49	3.94	0.448
Mar. 1-Mar. 4...	77	8.9	0.59	2.88	3.47	.....	.....	1.51	4.98	0.575
Season total, or average.....	774	8.4	0.31	2.03	2.34	.....	.....	1.33	3.67	0.421
Average weight per fish, in lbs.....			1.54	0.70	.....	0.46	0.33	.....		
Calculated number of fish caught per fisherman-hour..... (Season average)			0.20	2.90	.....	1.33	2.18	.....	6.61	.....

per hour of No. 2, and 0.31 pounds per hour of No. 1 pickerel). Perch and sauger, which composed the remaining 38.6 per cent of the total catch, were together caught at the rate of 1.33 pounds per hour.

#### COMPARISON WITH HOOK AND LINE FISHING IN OTHER LAKES

Many creel censuses have expressed the results in fish per hour, without conversion into the more comparable expression of rate of catch in pounds. It is generally safe to assume that for most fishing areas the figure representing catch in fish per hour is greater than that of catch in pounds per hour.

Fishing in a group of Michigan lakes yielded average catches of 0.4 fish per hour and 1.1 fish per hour in summer (Hazzard and Eschmeyer, 1937); winter catches in several other lakes in Michigan varied between 0.1 and 1.7 fish per hour, and summer catches in the same lakes from 0.4 to 2.5 fish per hour (Hazzard and Eschmeyer, 1938). Surveys in seven Ohio lakes showed catches of 1.30 to 4.77 fish per hour in summer and autumn (Wickliff, 1936). Catches in the spring, summer and autumn in some Wisconsin lakes have been reported at the rate of

1.24 to 1.86 fish per hour (Frey, Pedracine, and Vike, 1939), and 0.90 to 1.53 pounds per hour (Frey and Vike, 1941). Fish have been taken in the summer by anglers in several Algonquin Park lakes, Ontario, at the rate of 0.66 to 2.56 fish per man-hour (Hart, 1941), and at rates of 0.54 to 3.20 fish per boat-hour (Kennedy and Banfield, 1942).

Spring and summer fishing in Illinois have yielded results of 4.37 fish per hour (Bennett, Thompson, and Parr, 1940). Angling throughout the year, or portions of it, in several reservoirs and their tributaries in Alabama and Tennessee gave catches of 0.2 to 1.4 fish per hour (Eschmeyer and Tarzwell, 1941; Tarzwell, 1941).

The average daily catch made by hook and line fishermen operating through the ice in the island section of western Lake Erie amounted to 3.67 pounds, or 6.61 fish, per fisherman-hour between January 20 and March 4, 1942. In general, this is a higher rate of return to the angler than in most fisheries elsewhere and in various seasons of a year.

#### ACKNOWLEDGMENTS

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