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A COMPARISON OF SUMMER AND WINTER FISHING¹ IN MICHIGAN LAKES

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Fishing in winter either by spear, tip-up or hand line has frequently been held responsible for poor fishing during the summer season. In recent years certain states have enacted laws to prevent or curtail the take of fish through the ice. In the fall of 1935 in Michigan the number of ice lines permitted was reduced by Commission action from five to two. At the time this reduction was being considered the Institute was asked to advise concerning the wisdom of the proposed action. The facts which we had, indicated that winter fishing was not generally a large factor in reducing the fish supply in lakes, but the evidence was then insufficient.

The proponents of winter fishing claim that ice fishing furnishes recreation in the out of doors at a time when it is especially needed and that they should be given consideration along with the objectors. It is true that at present there is no closed season on great northern pike and walleyes in certain Michigan lakes which have been designated as "pike lakes" nor in non-trout streams. Fishing for bluegills, perch and other pan fish is legal except from May 1 to June 25. Owners of summer cottages, resort operators and others dependent in whole or in part upon the tourist fishermen who vacation in Michigan, fear that winter fishing may deplete their lakes so as to reduce the next summer's harvest. Particularly is this true if these objectors are not year round residents. They occasionally drive past their favorite lake in winter or see

¹ "Summer" fishing here includes the period from June twenty-five to September thirtieth, "winter" fishing, the period of ice fishing (usually from late December to early April).

pictures of it in the newspapers and are alarmed at the number of ice shanties or fishermen that are then in evidence. They do not stop to think that many of these shanties are only occupied on week ends or that the reason such pictures are published is often because they show an unusual concentration of fishermen. Nor do they remember that many of the species taken in summer ("largemouth" bass, "smallmouth" bass, rock bass, sunfish and bullheads) are protected or rarely caught in the winter. The large winter catches which they hear about are also those which stand out in the memory of the narrators as unusual.

Opinions on the desirability of controlling winter fishing, in common with most wildlife problems, are numerous and varied; the facts, as revealed by Michigan's creel census are interesting and suggestive. Both the general state census which has been carried on for the past eight years and the intensive or complete census of fish yield on certain lakes contribute to the solution of the problem. The former is a random sampling of the fishing, carried on by the Conservation Officers. Fishermen are contacted in the regular pursuit of enforcement duties and are asked to report their catch for the day up to the time they are approached. The officer records the number and average length of each kind of fish taken, the number of undersized fish returned, the manner of fishing, hours spent on the lake or stream, etc. These reports are sent in to the Institute where the data are transferred to cards for machine or hand sorting and tabulating. Such a sampling yields valuable qualitative data but does not indicate the total number of fish taken from any one stream or lake during given periods or seasons. During the past three years complete or nearly complete records of the fishing for various seasons in certain lakes near C.C.C. camps have been secured through the cooperation of the M.E.C.W. and the States Division of the National Park Service. This year complete fish catch records on many additional lakes are being taken by the above agencies and in the Waterloo and Yankee Springs Projects of the Resettlement Administration. Methods employed in taking and analyzing these data were described by the junior author in a paper presented before this Society last year (Eschmeyer, 1935).

The data for this paper were taken from the general (whole-State) census for 1935 and from other Institute reports of general census on Michigan lakes. Intensive census on

Footnote 1 on page 2:

✓ Since the preparation of this manuscript a discussion of the possible effects of ice fishing has been published by T.T. Odell and W.C. Senning, pp. 120-121 in A Biological Survey of the Delaware and Susquehanna Watersheds. Suppl. 25th Ann. Rept. N.Y.S. Conservation Department, 1935.

six lakes in both winter and summer now contribute the most valuable comparison yet available of the effects of these two types of angling on given fish populations. In order to throw further light on the nature of winter fishing, intensive census data for eighteen additional lakes are included in this discussion.

Comparison of Winter and Summer Fishing

Methods of fishing: The methods of fishing in summer are varied and well known. Winter fishing in Michigan is carried on in three ways: spearing (for great northern pike, muskallonge, suckers and other coarse fish) in January and February; line fishing with a short, limber rod; and by the use of tip-ups. Spearing in shanties with decoy minnows is popular sport on lakes containing pike.

A comparison of spearing and line fishing (Table 1) on six lakes where both methods are used shows that approximately one third as many fish are taken per hour by spearing but that the average size of such fish is more than twice as great as those taken by line. Great northern pike make up a large percentage of fish taken by spear. The data further show that spearing takes twice as many pike per hour as line fishing and tends to remove the larger pike. However the catch per hour of pike is exceedingly slow by either method (average 0.03 pike per hour by line, 0.07 per hour by spear).

Reports from various sections of the state indicate that the change from five to two ice lines has had two effects on the fishing in lakes containing pike. The tip-up seems to have been practically eliminated. Many former tip-up fishermen evidently took up spearing, and in addition operated two ice lines inside their shanties. Most complaints concerning the change in regulations (from two to five lines), came from fishermen frequenting lakes containing perch, pike and walleyes, since these are the species which were formerly taken by the tip-ups. The change in regulations particularly affected those who formerly fished with tip-ups for perch and walleyes since these species cannot be taken legally by spearing. The fish usually came slow with five tipups; two were not considered worth watching.

Number of lakes fished and number of fishermen: The number of lakes where winter fishing is practiced is small compared with the number fished in summer. Lakes not on or near the main travelled roads are seldom if ever visited by ice fishermen. Of twenty-eight lakes in the Waterloo Project area, ice fishing of any significance took place on only two during the past winter. The great majority of lakes in northern Michigan which are popular with the summer tourist are little if any fished in winter.

The total number of fishermen contacted during the intensive census on the six lakes which were checked by the C.C.C. was 13,077 in summer and 899 in winter, i.e., more than fourteen times the number of fishermen used the lakes in summer than in winter. The average number of ice fishermen per lake-acre on twenty-four lakes covered by intensive census (Table 3) was 0.2 as compared with an average of 4.8 fishermen per acre on the six lakes checked in summer.

Length of fishing day: The average number of hours spent on a lake by a fisherman seems to be inversely proportional to his luck. In winter when the catch per hour was low, fishermen spent, on the average, 3.6 hours; in summer the average "fisherman-day" was 3.0 hours.

Even though the fisherman-day is longer in winter than in summer, the effects of winter and summer fishing upon a lake are by no means balanced because of the smaller number of anglers in winter and the smaller catch per hour.

Species caught: In his papers on the fish catch in Fife Lake, the junior author (1935, 1936) has shown that most of the species which make up the bulk of the catch in summer, i.e., rock bass, bluegill, "smallmouth" bass, "largemouth" bass, walleyes, pumpkinseed sunfish and bullheads were rarely if ever caught in winter in this lake. In a pike lake such as Houghton Lake where walleyes, great northern pike and yellow perch dominate the catch in both winter and summer, and fishing is legal throughout the year there may be a logical argument for some closed period. Whether this should be done by eliminating winter fishing, as has been suggested by some, is open to question.

The percentage of the total catch for the entire year and for the winter as made up for each of the ten species of warm water fish most caught, in the various districts of Michigan, is shown in Table 4. It will be noted from this table that yellow perch,

great northern pike and suckers are the species taken most consistently over the state in winter. Except in districts 1 and 2, bluegills are taken little or not at all in winter even though they make up a good share of the catch in all districts for the year as a whole. The fish caught in winter are mainly predacious species; so that it may be that in most lakes summer fishing actually benefits by the removal in winter of a certain number of the larger pike, walleyes, perch and crappies--which if not so taken, would presumably keep down the supply of bass, bluegills and other pan fish which usually make up the bulk of the catch in summer.

Average Size of Fish: The general census for 1935 indicates an average length of 9.0 inches for fish caught in summer as compared with 9.5 inches for winter caught fish. The averages for the intensive census are 8.3 inches by summer fishing and 12.3 inches by winter fishing.

The majority of lakes which were covered by the intensive census contained great northern pike or walleyes, and since these made up a greater proportion of the catch in winter than in summer, the discrepancy between these figures for the general and for the intensive censuses seems to be accounted for.

Catch per Hour: The number of legal fish taken per hour is an index to the quality of the fishing but tells us little concerning the quantity of fish removed unless a complete record of the "take" is secured as in the intensive census. The general census indicates that the catch per hour is higher in winter than in summer for four districts, the reverse in 2 others and equal for the seventh; the average for the two seasons being almost equal (1.7 fish per hour in winter, 1.6 fish per hour in summer).

Over a period of seven years, Conservation Officer Thomas White secured a record by random sample of 67,759 hours of fishing on Houghton Lake, our largest and one of our most productive "pike lakes". As in the general state census for 1935, the catch per hour in summer and winter in this particular lake was practically the same (0.36).

On many southern "bluegill" lakes the catch per hour at certain times in the winter may greatly exceed the catch per hour in summer. Conservation Officer C. G. Cole included six Branch County lakes in his general census returns for 1935. Records for these lakes indicated an average of 6.1 fish per hour, over 99% of which were bluegills.

In spite of the increased winter fishing in these lakes in past years, the catch per hour in summer for 1935 in District 1 is second highest in the state (Table 5) and no complaints of depleted fishing in this region are heard.

As a result of severe winter-killing, it was possible last spring to get rough estimates of the population of fish in several southern Michigan lakes. Mr. Gerald P. Cooper of the Institute staff found that one lake had contained approximately 1,125 fish per acre of an average size of about 6 inches; another contained approximately 1,200 fish per acre of an average size of about 7 inches. Forage fish, obnoxious fish, the fish which survived (if any), the dead fish which were not floating, and the fingerling food and game fish are not included in the above estimates. These data are, of course, too few to justify generalization, but there seems little reason to assume that the rich southern Michigan lakes are being seriously depleted of fish despite relatively intensive fishing during both winter and summer.

Our six lakes which were checked at both seasons yielded an average of 1.1 fish per hour in summer but only 0.4 fish per hour in winter. The average catch per hour on all twenty-four lakes checked in winter was 0.6. It is felt that this is a more accurate comparison of the catch per hour than can be secured from the general census because records for complete seasons were obtained so that the poor days and poor catches are represented as well as the poorer lakes.

Total Catch and Catch per Acre: Probably the most significant comparison of summer and winter fishing which can be made is of the actual per acre and total catch in lakes in the two seasons.

Summer fishing on the six lakes checked resulted in a total catch of 50,114 fish. Winter fishing on these same lakes (plus an additional winter for Clear Lake, Montmorency County) yielded 733 fish. In other words, more than sixty-eight times as many fish were removed in summer as in winter.

Considering the catch per acre for the average of these six lakes during these two seasons, the figures are even more impressive and probably more nearly correct. Summer fishing removed on the average 36.0 fish per acre; winter fishing 0.3 fish per acre.

The effect of summer fishing was therefore 120 times as great as winter fishing. More fish were removed per acre during an average summer fishing day than were taken during the entire period of ice fishing. It is interesting to note (Table 3) that the average catch per acre for winter fishing of the twenty-four lakes checked was also 0.3 fish per acre, indicating that the six lakes compared directly for summer and winter fishing are quite representative in this important respect.

Summary and Conclusions

The evidence from creel census data may be summarized as follows:

1. Relatively few lakes are fished in winter as compared with summer, particularly in the northern part of the state.
2. Lakes are fished more heavily in summer than in winter although the average fisherman-day is slightly longer in winter.
3. The species caught in winter are mainly limited to predacious fish such as pike, walleyes, perch and to coarse species represented by the suckers. Except in the extreme southern part of the state bluegills are not taken in numbers.
4. Winter fishing, especially by spear tends to remove the larger sizes of pike.
5. The number of fish taken per hour is much lower in winter than in summer on lakes where intensive census was carried on. The number of bluegills per hour may be higher in southern lakes on certain days in winter than in summer, but the general census does not indicate any decline in the catch per hour.
6. The total winter catch and catch per acre is much less than in summer.

On the basis of this evidence it must be concluded that winter fishing is not generally harmful to summer fishing in Michigan. In "pike lakes" such as Houghton Lake a closed period to protect the great northern pike and walleyes during the spawning season seems more justifiable than eliminating the sport of winter fishing. When sportsmanlike methods are employed, ice fishing may furnish fully as much and as valid recreation as does summer fishing, and is deserving of equal consideration.

Literature Cited

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TABLE 1. COMPARISON OF LINE FISHING AND SPEARING, INTENSIVE
WINTER CENSUS ON SIX MICHIGAN LAKES (PERIODS OF CENSUS ARE
GIVEN IN TABLES 2 AND 3)

Lake	County	No. of fishermen		Hours fished		Catch per hour		Ave. size of fish caught		Ave. north-ern pike caught	Catch per hour of northern pike		
		Line	Spear	Line	Spear	Line	Spear	Line	Spear		Line	Spear	
Houghton	Rosecommon	5,169	1,024	17,975	5,965	0.22	0.11	12.0	21.2	21.5	21.7	0.06	0.11
Fife	Kalkaska and Grand Traverse	142	332	715	1,363	0.21	0.09	11.8	22.8	25.2	25.4	0.02	0.07
Crescent	Oakland	266	69	767	247	0.19	0.06	9.1	23.9	17.0	24.1	trace	0.05
Round	Jackson, Washtenaw and Lenawee	4	43	8	169	0.27	0.04	8.0	28.6	...	28.6	...	0.04
Wauplers	Jackson and Lenawee	98	650	520	3,591	0.18	0.08	11.1	21.8	20.2	21.9	0.05	0.08
Hess	Newaygo	947	18	4,890	96	0.45	0.13	8.9	19.5	21.5	19.4	0.06	0.11
Total or Average		4,626	2,136	24,875	11,451	0.25	0.08	10.2	23.0	21.0	23.0	0.03	0.07

TABLE 2. COMPARISON OF RESULTS OF INTENSIVE CENSUS IN "SUMMER" AND "WINTER"
ON SIX MICHIGAN LAKES

Lake	County	Area (acres) ¹	Period of census (days)	Ave. hours per fisherman-day	Fisherman contacted		Fish caught			Catch per acre ²
					% ³	No.	Total no.	Per hr.	Ave. size (inches)	
<u>Pike</u>	Traverse & Kalkaska	800								
Summer 1934			98	2.6	95	2,399	10,656	1.7	8.3	13.3
Winter '33-'34			entire season ³	4.5	100	444	290	0.1	16.9	0.3
Summer 1935			98	2.5	98	3,594	11,375	1.3	8.1	14.2
Winter '35-'36			entire season	5.3	98	191	135	0.1	12.0	0.2
<u>Budd</u>	Clare	150								
Summer 1935			98	3.2	60	2,996	14,221	1.5	7.5	94.8
Winter '35-'36			entire season	...	100	none	...	...	...	...
<u>Clear</u>	Ogemaw	380								
Summer 1934			85	3.0	75	739	1,817	0.8	8.1	4.8
Winter '33-'34			entire season	3.8	100	63	106	0.45	9.7	0.3
<u>Clear</u>	Montmorency	180								
Summer '34-'35 ⁴			98	2.8	60	245	605	0.9	9.3	3.8
Winter '35-'34			entire season	4.0	100	28	164	1.5	7.4	1.0
Winter '34-'35			" "	2.7	75	8	2	0.3	8.0	trace
<u>Deer</u>	Oseage	375								
Summer 1935			85	2.9	85	561	1,345	0.8	9.1	3.6
Winter '35-'34			entire season	1.5	100	8	...	...	...	...
<u>Pleasant⁵</u>	Oakland	98								
Summer 1935			98	4.2	95	2,526	10,095	1.0	7.7	117.4
Winter '35-'36			entire season	3.1	98	161	63	0.1	19.6	0.7
<u>Ave. or total</u>										
Summer		2,751	94	3.0	81	13,077	50,114	1.1	8.5	36.0
Winter		2,911	entire season	3.6	96	899	733	0.4	12.3	0.3

¹ Approximate

² Catch per acre based on records for fishermen contacted only. The actual summer catch was considerably higher for some lakes.

³ Entire season includes entire period lake was ice-covered (about 120 days)

⁴ Summer data are for July 10 - Sept. 30, 1934 and June 25 - July 9, 1935.

⁵ Census on Pleasant Lake taken by National Parks Service camp, all others by M.E.C.W.

TABLE 3. RESULTS OF INTENSIVE WINTER CENSUS ON EIGHTEEN ADDITIONAL LAKES

Lake	County	Area (acres) ¹	Period of census ²	Ave. no. hrs. per fisher-man-day	Fishermen contacted		Fish caught			Catch per acre ⁴	Year
					% ³	No.	No.	per hr.	ave. size		
Muskallonge	Montmorency	90	entire season	4.7	100	47	41	0.2	11.5	0.5	'35-'34
Hess	Newaygo	750	97 days	5.2	91.4	970	2,124	0.4	8.9	2.8	'33-'34
Round	Jackson	30	75 days	3.7	100	47	8	0.05	23.4	0.3	"
Wamplers	Jackson	800	75 days	5.5	96	716	402	0.1	19.2	0.5	"
Crescent	Oakland	150	69 days	3.0	100	336	162	0.2	10.6	1.1	"
Houghton	Rosecommon	18,950	95 days	5.7	85	5,520	5,650	0.2	14.3	0.3	'35-'36
Lower Hamlin	Mason	3,100	59 days	3.9	75	377	420	0.3	11.0	0.1	"
Hubbard	Alcona	3,420 ⁵	81 days	4.2	98	215	262	0.3	11.7	0.1	"
Grand	Presque Isle	5,000	81 days	4.9	90	98	211	0.5	10.9	0.04	"
Long	Presque Isle and Alpena	4,800 ⁶	81 days	4.0	95	109	186	0.4	11.3	0.04	"
Ocqueoc	Presque Isle	320	entire season	...	100	none	...	...	...	...	"
Manistee	Kalkaska	845	96 days	5.0	100	125	52	0.1	20.0	0.06	"
Pickereel	Kalkaska	133	96 days	5.7	100	58	86	0.4	11.8	0.65	"
Higgins	Rosecommon	9,600	74 days	3.8	100	365	785	0.6	10.2	0.1	"
Margrethe	Crawford	1,640	81 days	5.3	100	792	345	0.1	22.5	0.2	"
W. Twin	Montmorency	1,000	70 days	2.9	100	300	3,287	3.8	7.8	3.3	"
N. Manistique	Luce	2,000	77 days	3.8	99	117	1,552	3.5	8.3	0.8	"
Independence	Marquette	1,848	108 days	4.4	99	487	437	0.2	21.0	0.2	"
Tot. or Ave. ⁸	...	57,187	...	4.2	96	11,577	16,723	0.6	13.3	0.5 ⁷	...

¹ Areas taken primarily from Michigan Lake and Stream Directory and are only approximate.

² Entire season includes entire period the lake was ice-covered.

³ Approximate percentage.

⁴ Based on fishermen contacted during census period. For most lakes this figure would be slightly higher if records for all fishing for the entire season were available.

⁵ Half of lake covered by census, area given above is half the area of the lake.

⁶ 90% of lake covered by census, area given above is 90% of the area of the lake.

⁷ Weighted average, other averages unweighted.

⁸ Includes data for winter fishing as given in Table 2.

TABLE 4. PER CENT OF TOTAL FISH CATCH FOR WINTER AND FOR ENTIRE YEAR, FOR THE 10 MOST CAUGHT WARM-WATER FISH. GENERAL CENSUS, 1936, NON-TROUT WATERS ONLY. W = WINTER, Y = ENTIRE YEAR, TR. = TRACE

District ¹	Large-mouthed Bass		Small-mouthed Bass		Bluegills		Sunfish ²		Perch		Walleyes		Northern Pike		Rock Bass		Sucker		Crappie ³	
	W	Y	W	Y	W	Y	W	Y	W	Y	W	Y	W	Y	W	Y	W	Y	W	Y
1	tr. ⁴	3	..	tr.	91	86	tr.	1	5	5	..	..	1	1	tr.	1	1	tr.	2	3
2	..	4	..	tr.	53	63	tr.	3	15	9	tr.	tr.	5	3	1	2	2	4	23	13
3	tr.	4	tr. ⁴	1	3	43	tr.	3	86	29	tr.	1	3	1	tr.	7	1	1	6	9
4	tr.	2	..	2	4	18	1	12	75	34	4	5	12	8	tr.	16	4	1	..	1
5	..	1	..	3	..	7	tr.	6	93	49	1	11	5	9	..	13	1	1	..	..
6	..	7	..	2	..	39	..	4	..	16	..	tr.	5	4	..	10	95	3	..	17
8	..	10	..	20	..	13	..	3	45	23	13	13	43	.7	..	3	..	1	..	..
Ave.	tr.	4	tr.	4	22	38	re.	5	45	24	3	4	11	5	tr.	7	15	2	4	6

¹ District 7 omitted because of inadequate data.

² Primarily common sunfish (*Lepomis gibbosus*).

³ Mostly black crappie (*Pomoxis sparoides*).

⁴ Caught and returned. Illegal to take bass in winter.

TABLE 5. COMPARISON OF HOURS FISHED, AVE AGE SIZE AND NUMBER OF FISH CAUGHT PER HOUR BY DISTRICTS. DATA FROM GENERAL CENSUS FOR 1935. (JANUARY, FEBRUARY, MARCH AND DECEMBER CONSIDERED WINTER FISHING; BALANCE SUMMER FISHING.)

District No.	Season	Hours fishing reported	Fish taken	Average size in inches	Fish per hour
1	Winter	2,055	5,898	7.7	2.9
	Summer	1,812	3,467	8.0	1.9
2	Winter	2,099	3,398	9.0	1.6
	Summer	4,744	7,414	8.2	1.6
3	Winter	3,299	8,167	7.4	2.5
	Summer	13,170	28,756	7.7	2.2
4	Winter	2,924	4,724	9.8	1.6
	Summer	6,237	8,835	8.0	1.4
5	Winter	726	1,444	7.4	2.0
	Summer	780	1,402	10.9	1.8
6	Winter	95	75	12.2	0.9
	Summer	2,631	4,191	8.4	1.6
8	Winter	181	106	12.9	0.6
	Summer	2,313	1,771	11.9	0.8
Average	Winter	1,621	3,402	9.5	1.7
	Summer	4,534	7,977	9.0	1.6

1 District 7 was omitted because of insufficient data.