

Report 266

Analysis of creel census, winter of 1933-1934

Conducted on Fife Lake, Grand Traverse County, by Camp Fife Lake, M.E.C.W.; with a comparison of winter fishing on Hess Lake (Newaygo County).

One of the winter projects for M.E.C.W. Camp Fife Lake (102-S) was that of taking an intensive creel census on Fife Lake. For the purpose of taking this census a small crew of men, the number depending on the extent of fishing, was kept on the lake during all daylight hours on all days from December 21 to April 15 inclusive.

These men were equipped with special creel census blanks on which they recorded various items regarding the fishing of each fisherman. These data included such items as number of fish taken, size of fish, hours fished, method of fishing, bait used and time of day fished. The boys were also equipped with a "shanty" which they used as headquarters, and which they moved from place to place, keeping it in the area where fishing was most concentrated.

The project was under the general supervision of Camp Sup't. A.L. Ferris. Mr. Ferris, himself a scientifically trained man, recognized that to be of most value, creel census had to be taken in a thorough, careful, and detailed manner. Through the careful selection of men and through close contact with the project, Mr. Ferris was able to provide the complete and reliable data on which most of this report is based.

In addition to the creel census sheets, the men prepared each day a list of the number of fishermen seen, the number of fishermen contacted, and, the general weather conditions. These sheets show that all fishermen seen were contacted. Concentration of fishing in certain areas, a limited amount of fishing, a crew of ample size, energetic and conscientious personnel a "movable" headquarters, and the cooperation of the fishermen, made possible the obtaining of these complete returns.

The purpose of a detailed creel census on Fife Lake was the same as that ex-

pressed in the Hess Lake Report (No. 265) for a census on Hess Lake. Fortunately a census was also taken on Fife Lake during the summer of 1934. A comparison will be made later of fishing for the two seasons. Such comparison will be of considerable value in showing the relation between summer and winter fishing for Fife Lake.

Table I gives various data on line fishing only. Table II shows the various computations for spearing, Table III gives a comparison of line fishing and spearing together with returns on all fishing, while Table IV represents a comparison of the winter fishing in Fife Lake and on Hess Lake (Newaygo County).

Table 1. Computations based on line fishing for Fife Lake, winter of 1933-1934

Item	Dec. 21-31	Jan. 1-31	Feb. 1-28	Mar. 1-31	Apr. 1-15	Total
1.						116
2. Bait used	Minnows	Minnows*	Minnows	Minnows	Minnows	Minnows*
3. Hours fished	35.5	203.5	33.5	253.5	75	601
4. Number of fishermen	7	38	6	54	14	119
5. Average hours per fisherman	5.1	5.4	5.6	4.7	5.4	5
6. Number of lines	30	146	24	162	61	423
7. Lines per fishermen	4.3	3.8	4	3	4.4	3.55
8. Line hours	159.5	870	138.5	899.5	343.5	2411.5
9. Fish taken (legal)	21	48	1	31	27	128
10. Undersized fish taken	3	4	-	9	-	7
11. Hours per fish	1.7	4.2	33.5	8.2	2.8	4.7
12. Fish per hour	.59	.24	.03	.12	.36	.21
13. Line hours per fish	7.6	18	139.5	29	12.7	18.8
14. Fish per fisherman	3	1.26	.17	.57	1.9	1.07
15. Perch						
a. No. of fish	20	37	-	28	27	112
b. % of total catch	95	77	-	90	100	37.5
c. % of perch catch	18	33	-	25	24	100
d. Perch per hour	.56	.18	-	.11	.36	.19
16. Walleye						
a. Number fish	-	-	-	2	-	2
b. % of total catch	-	-	-	6	-	1.6
c. % of total walleye	-	-	-	100	-	100
d. Walleyes per hour	-	-	-	.008	-	.003
17. Northern Pike						
a. No. of fish	1	8	1	1	-	11
b. % of total catch	5	17	100	3	-	8.6
c. % of total pike catch	9	73	9	9	-	100
d. N. pike per hour	.03	.04	.03	.004	-	.02
18. Shiners						
	-	3	-	-	-	3

* Minnows were used exclusively as bait, except for one hour with two lines during January.

Discussion of Table 1

1. Creel census was taken over a period of 116 days. It covers all, or virtually all, of the ice fishing period.
2. Minnows were used as bait for all fishing except for two line hours.
3. Some line fishing was done during all five months. The decided drop in line fishing in February may have been due chiefly to weather conditions.
7. Fishermen used an average of $3 \frac{1}{2}$ lines each or only 70 percent of the number permissible.
9. The figures for December and April, on the basis of days fished, are higher than the figures for January and March. It is to be noted, however, that the fish taken in December and April were, with one exception, all perch while for the other two months perch were in a minority while the much larger, more desired northern pike predominated the catch during January and March. Without taking into account the kind and size of fish taken, these figures are misleading.
10. Undersized fish were not considered in computations. These were returned to the lake and were of no benefit to the fishermen catching them.
- 11 and 12. As for item 9 the species taken should be considered in connection with the figures given.
13. Fishing with one line would have produced, on the average, one fish for each 19 hours of fishing.
14. Had the catch been evenly distributed each fisherman would have taken one fish per day's fishing. A majority of the fishermen, however, fished with no success.

Discussion of Table II.

1. Spearing is permissible during January and February only.
2. Most of the spearing was done during January.
- 4, 5 and 6. It is evident that fishing was much "better" during January than in February.
9. Northern pike represented 78 percent of the catch by spearing.

Table II. Computations for fishing on Fife Lake, winter of 1933-1934

Spearing only

1	Jan.	Feb.	Total
2. Hours fished	1112.25	270.5	1392.75
3. No. fishermen	271	61	332
4. Hours per fish	9.26	22.5	10.5
5. Fish per hour	.11	.044	.095
6. Fish per fishermen	.44	.2	.4
7. Av. hrs. per fisherman	4.1	4.44	4.2
8. Fish caught	120	12	132
9. Northern pike			
a. Number of fish	99	4	103
b. % of total catch	82.5	33	78
c. % of total n. pike catch	96	4	100
d. N. pike per hour	.09	.015	.074
10. Walleye			
a. Number of fish	1	-	1
b. % of total catch	.8	-	.8
c. % of total walleye catch	100	-	100
d. Walleyes per hour	trace	-	trace
11. Bullhead			
a. Number of fish	12	5	17
b. % of total catch	10	42	12.9
c. % of total walleye catch	71	29	100
d. Bullheads per hour	.01	.02	.013
12. Common sucker			
a. Number of fish	8	3	11
b. % of total catch	6.7	25	8.3
c. % of total common sucker catch	73	27	100
d. Suckers per hour	.01	.01	.003

Table III, Comparison of Line fishing and spearing on Fife Lake during winter of 1933-1934

Item	Line fishing	Spearing	Total or average
1 Hours fished	601	1382.75	1983.75
2 No. of fishermen	119	332	444
3 Av. hrs. per fisherman	5	4.2	4.5
4 Fish caught	128	132	260
5 Fish per hour	.21	.095	.13
6 Hrs. per fish	4.7	10.4	7.5
7 Fish per fisherman day	1.07	.4	.59
8 Perch	112	0	112
9 Walleyes	2	1	3
10 Northern pike	11	103	114
11 Bullheads	0	17	17
12 Common suckers	0	11	11
13 Shiners	3	0	3

Discussion of Table III

1. More than two-thirds of the total hours of winter fishing on this lake were spent in spearing.
2. The total figure 444 does not equal the total number of fishermen listed under line fishing and spearing. Seven individuals both line fished and speared. These were considered separately in both line fishing and spearing because both methods of fishing were carried on simultaneously.
- 3 to 7. Species taken should be considered in evaluating these figures.
Line fishing produced a far better catch in terms of fish per hour and fish per fisherman, but spearing produced much more desired fish.

Discussion of Table IV

Hess Lake and Fife Lake are similar in several respects. Both are easily accessible in winter, both are relatively shallow, both have an extensive resort development, both are considered relatively "heavily fished" lakes. A physical, biological and chemical analysis of the two lakes would be helpful in connection with this comparison. Such analysis has not yet been made.

Areas of the two lakes as listed in "Michigan Lakes and Streams Directory" are: Hess Lake, 750 acres, Fife Lake, 800 acres. These figures are probably not exact, but indicate, nevertheless, that the two lakes are of a similar size. They differ somewhat in shape and, of course, differ in latitude. Fife Lake is considerably farther north and has a somewhat longer ice fishing season. Figures for Fife Lake are for a total of 116 days while those for Hess Lake are for a 97-day period.

1. The method of fishing for the two lakes differs decidedly. On Fife Lake spearing predominates while almost all fishing on Hess Lake was by line. Fishing on Hess Lake was about 2 1/2 times as heavy as on Fife Lake (in terms of hours fished).
4. The slight difference recorded in hours per fisherman may be due in part to the time of day (with relation to the period fished) at which the census was taken.
5. Hess Lake fishermen on the average fished more than 1 line more than did those of Fife Lake. No reason for this difference is apparent.

Table IVx Comparison of statistics for fishing during winter of 1933
 1934 on Fife Lake (Grand Traverse County), and Hess Lake
 (Newaygo County).

1. Kind of fishing	Fife Lake line	Hess Lake line	Fife Lake spear	Hess Lake spear
2. Hours fished	601	4890.20	1382.25	96.5
3. Number of fishermen	119	947	332	18
4. Av. hours per fisherman	5	5.16	4.28	5.36
5. Lines per fisherman	3.55	4.68	-	-
6. Fish caught	128	2110	132	13
7. Fish per hour	.21	.43	.095	.135
8. Hours per fish	4.7	2.32	10.5	7.4
9. Line hours per fish	18.8	11.1	-	-
10. Fish per fisherman	1.07	2.23	.4	.7
11. Species and number of fish taken:				
Perch	112	1402	-	-
Walleye	12	58	1	-
Northern pike	11	398	103	11
Calico bass	11	236	-	-
Bluegills	-	12	-	-
Bullhead	-	1	17	-
Rockbass	-	2	-	-
Dogfish	-	1	-	-
Shiners	3	-	-	-
Suckers	-	-	11	2

6, 7, and 8. Disregarding species of fish taken, fishing on Hess Lake was over four times as good as on Fife Lake during the winter of 1933-1934.

11. Ratio of perch to northern pike in Hess Lake, however, is 3 1/2 to 1 while in Fife lake the number of pike almost equals the number of perch taken. Comparisons of sizes of species for the two lakes shows that the Fife Lake fish were larger. So, although Hess Lake produced more fish, Fife Lake produced a greater proportion of the more desired species as well as a larger size for any of the species common to the two lakes.

Average size in inches of fish taken in Fife Lake

Species	Line fishing	Spearing	Average for both types of fishing
Perch	9.3	-	9.3
Walleyes	23	25	23.7
Northern pike	25.2	25.4	25.4
Bullheads	-	12	12
Common sucker	3	-	3
Average for all species	10.7	22.8	16.9

The fish caught by spearing averaged over twice the length of those taken by line fishing.

The three shiners were probably taken for later use as pike bait.

Comparison of average size of fish from Fife Lake and Hess Lake

Species	Fife Lake	Hess Lake
Perch	9.3	7.4
Walleyes	23.7	18.5
Northern pike	25.4	21.5
Bullhead	12	11.5

All species in Fife Lake averaged larger than in Hess Lake.

Women as ice fishermen

Fourteen women fished, 3 with lines, 9 with spears and 2 with both lines and spears. In 70.5 hours they took a total of one fish, a 26 1/2 inch northern pike. Of the seven persons who fished with lines and spears simultaneously, 2 were women. It is evident that the women ice fishermen cannot be charged with depleting our lakes.

Weather conditions in relation
to ice fishing.

The figures below are based on weather conditions as reported by the creel census takers. Since many factors are involved, any conclusions drawn on these figures alone may easily be erroneous. "Cloudy" includes also the days when "rain" was listed under weather conditions. Of the several kinds of weather listed only two are used here, namely clear and cloudy. These indicate, primarily, a difference in the amount of light diffused through the ice.

	<u>Clear</u>	<u>Cloudy</u>
Number of fishermen	120	299
Number of days	31	71
Fish per fisherman	.47	.64
Number of fish	59	192
Species		
Perch	31	79
Northern pike	15	91
Walleye	1	1
Bullhead	6	15
Sucker	3	3
Shiners	0	3

In a subsequent report the yield for "fish per hour" will be computed for the several kinds of weather.

Effect on general fishing

All fish taken during the winter of 1933-1934 if laid end for end, would form a string 365 feet long. Comparison with the summer fishing will show what portion of the total catch this represents. Assuming that the lake has an area of 800 acres, less than 6 inches of fish per acre were taken. Eight hundred acres produced 260 fish, an average of about 1 fish per three acres. It is improbably that this catch noticeably affected the fishing during the following summer.

A subsequent report will give a definite comparison of winter and summer fishing for Five Lake.

INSTITUTE FOR FISHERIES RESEARCH

R. W. Eschmeyer
Investigator of Lake Improvement Evaluation