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ANALYSIS OF CREEL CENSUS

Winter of 1933-'34

Conducted on Hess Lake by Camp Newaygo, 107-S, M.E.C.W.

Introduction

Most fishermen in Michigan have become familiar with the term "Creel Census". In 1927 such a census was begun by the Department of Conservation, chiefly through the efforts of Commissioner Titus.

On January 19, 1934, Dr. Carl L. Hubbs, Director of the Institute for Fisheries Research, submitted to the Department a comprehensive report, "First Analysis of the Michigan Creel Census", in which was presented a thorough analysis of fishing for the years 1928 to 1932, the analysis based on the thousands of creel census returns for that period.

Creel census on Hess Lake during the winter of 1933-1934 differed from this other, larger, creel census program in that the one was an intensive check-up while the other was quite extensive; the one was concerned with complete catch, the other with a random sampling of the general catch.

Purpose

The writer was anxious to have creel census projects initiated in some of the C.C.C. Camps and succeeded in having several such projects established. Reasons for taking a thorough creel census on several lakes for a period of years (if possible) were several:

1. Such census would indicate the intensity of fishing and the fish production of these waters.

2. The census would indicate the seasonal catch and would allow the comparison of the winter fishing as compared with summer fishing. Ill feeling often exists between resorters, who fish in the summer and local residents who fish through the ice, over this matter, each accusing the other of overfishing the lake. Definite figures might settle at least some of the arguments.

3. Continuing a creel census over a number of years, before and after lake improvement, or before and after stocking, would indicate the relative success of such improvement work, or of such stocking.

Removal of Camp Newaygo to a new location in the spring of 1934 destroyed hopes of accomplishing the several ends which were desired but an analysis of the winter catch gives some valuable data nevertheless.

Method of Taking Census

The census work was under the immediate direction of I. L. Bullis of Newaygo. Mr. Bullis was well acquainted with the lake and with the local fishermen. Men from the camp, using the Boy Scout Cabin on the west side of Hess Lake as headquarters, were detailed to cover the lake at regular and frequent intervals. Each fisherman was approached and questioned relative to time fished, bait used, etc. Such data were recorded on especially prepared creel census blanks.

The crews doing this work were carefully selected and were constantly reminded of the fact that accuracy and thoroughness were highly essential. As a result the data obtained by the boys is considered adequate and dependable.

A list of the fishermen seen, the fishermen contacted, and, the creel census sheets for each fisherman contacted, were regularly forwarded to the writer. These covered 7 days per week and all daylight hours, from December 25 to March 31, therefore virtually all winter fishing for the season.

Two distinct types of fishing were practiced, viz. line fishing and spearing. Virtually all the fishing was by use of lines. In the tables below line fishing and spearing are considered separately except where otherwise indicated. Table I gives various data on line fishing only.

Table I. Computations based on line fishing for Hess Lake, Newaygo

County, winter of 1933-1934

Item	Dec. 25-31	Jan. 1-31	Feb. 1-28	March 1-31	Total 97 days
2 Bait used					All minnows
3 Hours fished	212.5	2082	1289.5	1306.25	4890.25
4 No. of fishermen	45	405	255	242	947
5 Av. hours per fisherman	4.7+	5.14	5.06-	5.4-	5.16+
6 No. lines	222	1907	1221	1080	4431
7 Lines per fisherman	4.9+	4.7+	4.8-	4.5-	4.68
8 Line hours	1059.5	9971.5	6287.5	6096.25	23414.75
9 Fish caught	39	834	601	636	2110
10 Hrs. per fish	5.45	2.50	2.15	2.01	2.32
11 Fish per hr.	.18+	.4	.46	.49+	.43
12 Line hrs. per fish	27.2	12.0	10.5	9.6	11.1
13 Perch:					
a. No:fish	5	479	415	503	1402
b. % of total catch	12.8	57.4+	69+	79.1-	66.4+
c. % of total perch catch	.3+	34.2-	29.6	35.9-	100
d. Perch per hr.	.02+	.23+	.32+	.39-	.286
14 Walleye:					
a. No. taken	10	33	5	10	58
b. % of total fish catch	25.6	4.0-	.83	1.57	2.75
c. % of total walleye catch	17.25	56.9-	8.6+	17.25	100
d. Walleyes per hr.	.047+	.016	.004	.008	.012-
15 Northern pike:					
a. No. taken	24	182	107	85	398
b. % of total fish catch	61.5+	21.8+	17.8-	13.4-	18.9-
c. % of total N. Pike catch	6.0+	45.7+	26.9-	21.4-	100
d. N. Pike per hr.	.113	.087	.083	.065	.081
16 Calico Bass:					
a. No. taken	0	134	64	38	236
b. % of total fish catch	0	16.1-	10.6+	5.9+	11.2-
c. % of total calico bass catch	0	56.8-	27.1+	16.1+	100
d. Calico bass per hr.	0	.064	.05	.029	.048+
17 Bluegill:					
No. taken	..	3	9	..	..
18 Bullhead					
No. taken	..	1	..	..	..
19 Rock bass					
No. taken	..	2	..	..	..
20 Dogfish					
No. taken	..	..	1	..	..
21 Fish per hr. for last 4 species	..	..	..	..	.003
22 Total fish per hour	..	..	..	..	.43-

Discussion of Table I.

Items:

1. The creel census might well have been begun several weeks prior to December 25th. However, reports indicate that a few fish were taken before this date, so virtually all fishing was covered.
2. In every instance minnows were listed as the bait used. Neither the species nor the size of the minnows used was ascertained. In view of the fact that some minnow fishermen took perch and calico bass in fair numbers while many other minnow fishermen took only northern pike, walleyes, or "no fish" almost certainly indicate that several sizes of minnow were used: small ones for perch and calico bass, large ones for pike and walleyes.
3. "Hours fished" was recorded to nearest quarter hour. Efforts were made to contact the fishermen at, or near, the close of his fishing.
4. The number of fishermen indicates only the fishermen actually contacted by the creel census-takers (see later discussion on total catch).
5. The average fisherman spent almost an even five hours on the lake. A majority started at 9 or 10 in the morning and fished until mid afternoon.
- 6 and 7. Most fishermen used the full number of lines (five) allowed by law.
8. Line hours were obtained by multiplying the number of lines by the number of hours that they were used by the fisherman. The fishing listed was equivalent to fishing with one line for 23,414.75 hours (975 days continuously).
9. All "fish caught" are listed. The greatest number were taken in January although fishing was not quite as good then as during the next two months.
- 10 and 11. Hours per fish and fish per hour are merely two ways of expressing the same thing. Fishing improved with each month according to the figures for all fish. This hardly presents a fair picture however, since a study of fishing for the several species indicates that perch fishing improved each month but fishing for all of the larger, and probably more desired, species declined. Total catch for non-trout waters in Nawaygo County based on general creel

census for the years 1928-1932 inclusive is listed in Dr. Hubbs' report as 1.26 per hr. or almost 3 times the catch per hr. taken in the winter of 1933-1934 in Hess Lake.

12. Had the fishermen used one line each they would have had to fish about 11 hours for each fish taken.
13. Two-thirds of the fish taken were perch.
14. Walleye fishing was much better in December and January than in the next two months.
15. The proportion of northern pike to walleyes was almost 7 to 1.
16. Calico bass fishing declined very much in March. None were taken in December (25-31).
- 17-21. The other species were so few that computations were not made for them.

Species of fish present

It is evident that winter fishing does not give a true picture of the relative abundance of the several species. For Hess Lake the only recent data on the fish population, other than the creel census, are those of an Institute party (Cooper, Shetter and Leonard) who on November 19th, 1934 seined along the northwest shore of the lake. Twenty hauls with a 30 ft. "common sense" minnow seine produced, besides minnows, the following fish:

Perch, 1 adult.

Large-mouth bass, 2 juvenile

Bluegill, 43 juvenile to adult

Sunfish (pumpkinseed), 4 adults and 1 young

Rock Bass, 1 juvenile

Neither the limited seining nor the ice fishing is reliable as a check on the relative abundance of the several species in the lake. Winter fishing and summer fishing together would probably give a much more accurate but still probably not a true picture.

Average size of fish taken

Table No. 2. shows the average size of the fish taken. Size was estimated or measured to the nearest half-inch. In preparing the table the average size for each day was estimated, from this the average size for each week was obtained, and the monthly figures were compiled from the weekly averages.

Table 2. Average length in inches of fish taken in Hess Lake in the winter 1933-'34. Line fishing only.

	No. of fish	Dec. 15-31	Jan. 1-31	Feb. 1-28	Mar. 1-31	Average for winter
Perch	1402	10	7.6	7.3	7.3	7.4
Walleye	58	19.5	18.1	19.6	18.4	18.5
Calico Bass	236		7.2	7.6	7.8	7.4
Northern pike	398	19.9	22.2	21.6	20.5	21.5
Bluegills	12	..	7	7	..	7
Bullhead	1	..	11.5	..	..	11.5
Rock Bass	2	...	7	..	..	7
Dogfish	1	..	..	24	..	24

Total estimates for line fishing show that almost 22,000 inches of fish were taken. Laid end for end these would form a string slightly over a third of a mile long.

Spearing

The spear is used very little in Hess Lake, much less than might be anticipated. Poorer results were obtained from spearing than from line fishing. The following figures indicate the extent of spearing:

Number of hours, 96.5

Hours per fish, 7.4

Number of fishermen, 18

Fish caught, 13: Suckers 2; average size, 20 inches

Northern pike 11; average size, 19.4 inches

Women as Ice Fishermen

Of the 965 fishermen for whom creel census ^{b/ads} cards were prepared 40 were women. One of these speared for 3 hours (without success). All others used lines. The number for each month is as follows: December, none; January, 25; February, 8; March, 7. Since only about 4% of the fishermen listed belonging to the gentler sex, it is evident that ice fishing on Hess Lake is still essentially a man's pastime.

The 39 women who used lines fished for a total of 184 hours with a total of 162 lines (average 4.15 lines per woman). They fished on the average 4.67 hours. Both these figures are slightly below the figures for all fishermen.

In the 184 hours fished the women caught 2 walleyes, 10 northern pike and 40 perch, a total of 52 fish. They fished approximately 3.6 hours to obtain a fish while the fishermen as a whole fished 2.32 hours per fish.

Total Catch

The figures presented above indicate the fish actually taken and recorded. It was evident that a small crew could not contact every fisherman. Fishermen were generally approached and asked regarding the length of time they might fish, so that the census takers could return shortly before the fisherman quite fishing. It was considered better to miss a few fishermen completely than to check their fishing prematurely—i.e. before they had completed most of the days fishing. Consequently two lists were kept for each day, one indicating the number contacted, the other indicating the number "missed". The number of fishermen were counted each day - at various times. This number was undoubtedly very near 100% of the actual fishermen. Few if any should have escaped the attention of the creel census takers. The number "seen" included those contacted and those "missed". Figures for the 97 days are: contacted 970, missed 91. There is evidently a slight discrepancy since 965 creel census sheets were turned in. This difference of 5 fishermen will not in any serious way interfere with the following figures.

Assuming that 1061 (970 + 91) fishermen used the lake during the 97 days, the % contacted was 91.4-- while the % missed was 8.6. If fishing was similar for those contacted and for those missed the probable number of fishes taken can be calculated.

The probable total number of fish taken in Hess Lake during the entire winter season of 1933-1934 was as follows:

Perch, 1541
Walleye, 64
Northern pike, 450
Calico bass, 260
Bluegills, 13
Bullhead, 1
Rockbass, 2
Dogfish, 1
Suckers, 2

Considering such fishing as may have been carried on before December 25, and adding the 13 fish taken by spearing, The total number of fish taken was probably near 2500.

Conclusion regarding intensity of winter fishing
on Hess Lake

Detailed data regarding physical, chemical or biological factors of this lake are not available. Indications of the extent of summer fishing are also, unfortunately, not to be obtained. Hess Lake is listed by the Michigan Lake and Stream Directory as having an area of 750 acres. Using this figure as the area and 2334 as the number of fish taken, the winter "yield" per acre, was 3.1 fish consisting of about 2 small perch, .1 walleye, .6 northern pike, and .3 calico bass.

Even without adequate data concerning the summer fishing and ~~concerning the~~

~~summer fishing and~~ concerning the lake, it is considered improbable that the winter fishing on Hess Lake in 1933-'34 did ~~not~~ yield enough fish to seriously affect fishing during the following summer.

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