

Original copy: Fish Division
cc: Mr. Ruhl
Mr. Eschmeyer

INSTITUTE FOR FISHERIES RESEARCH
UNIVERSITY MUSEUMS
UNIVERSITY OF MICHIGAN
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REPORT NO. 368

HOUGHTON LAKE CREEL CENSUS WINTER OF 1935-36

The Houghton Lake census was taken from December 18 to March 24 (exclusive of December 25 and January 1) by a crew of men from Camp Houghton Lake. The work was under the general supervision of Junior Forester H. M. Davenport and under the immediate supervision of enrollees G. DeWitt and Clarence Doran. The census was taken from approximately 8:00 a.m. to 5:00 p.m. by a crew averaging about 15 men. The crew was not large enough to cover all winter fishing; it is estimated that the records available cover all fishing on 85% of the lake during the period of the census.

Data were tabulated for line-fishing, for spearing and for both methods used simultaneously. It could not be determined when a fisherman used both lines and spear, to what extent the lines served as a decoy or to what extent they took fish. Spearing was, of course, limited to January and February.

Unless otherwise indicated, the figures represent only the fishing actually recorded by the census-takers. Records were kept by the men indicating the number of fishermen seen and the number contacted. These records indicate that 100 fishermen were seen but not contacted; it is estimated that there were 46 fishermen on December 25 and 86 on January 1 (average per day for each period); 97 of the records could not be used because they were improperly or incompletely prepared. Records for approximately 329 fishermen were therefore not available (in addition to the estimated 15% not covered by the census). Summaries of the census are given below.

Line Fishing

Data for line fishing do not include data for line fishing and spearing simultaneously. They represent only the fishing where lines were used exclusively by the fishermen.

A total of 3169 records were obtained for line fishing only; 2756 of these were for men, 413 were for women. The line-fishermen caught a total of 4041 legal fish in a total of 17,973 $\frac{1}{4}$ hours. The catch averaged 1.27 fish per fisherman or approximately one fish per five hours of fishing (0.22 per hour). The fishermen fished, on the average 5.7 hours per day. Approximately two-thirds of the fishermen caught no fish. The fish caught by this method were, on the average, 12 inches long. The catch consisted primarily of three species, perch, northern pike and walleyes. Almost three-fourths of all fish caught were perch. (See Table 1).

Spearing

The data in Table 2 refer to spearing only. Where spearing was accompanied by line fishing, the figures are given below under both methods. Spearing is limited by law to the months of January and February. Only 1024 records showed spearing used exclusively as the method of fishing and only 685 fish were taken by this method. The records indicate a total of 5965 $\frac{1}{2}$ hours of spearing. Each fisherman caught, on the average, two-thirds of a fish per fishing day of almost 6 hours. Two thirds of the fishermen caught no fish. The fish, almost all of them Northern Pike, had an average length of 21.2 inches. The 18 Perch and 22 Walleyes listed were probably not speared since spearing for these fish is illegal. It is probable that lines were also used by those who caught these fish, and that the census takers failed to record their use.

Both Methods (Simultaneously)

The 1327 fishermen who used both lines and spears simultaneously while fishing caught fish at about the same rate as those who used spears only. A study of the catch suggests that, for the most part, the bait (usually minnows) served primarily as decoys. Results of the catch by use of the two methods are given in Table 3.

All Fishing

Data in Tables 1,2 and 3 are compiled in Table 4. It will be noted that 5520 fishermen were contacted (4902 men and 618 women). They fished for a total of 31,627 $\frac{1}{4}$ hours and caught fish at the rate of about one fish per 5 hours of fishing. The number of fish caught exceeded, by a very slight margin, the number of fishermen. During January

Table 1

Data for Line Fishing, Houghton Lake. Winter of 1935-36

	Dec. 18-31	Jan. 1-15	Jan. 16-31	Feb. 1-15	Feb. 16-29	Mar. 1-15	Mar. 16-24	Average or Totals
1. No. of fishermen - male	527	457	228	78	100	685	681	2756
female	66	71	36	12	10	98	120	413
total	593	528	264	90	110	783	801	3169
2. No. of fish (legal)	599	450	149	32	52	1074	1685	4041
3. No. of hours	3399 $\frac{1}{2}$	2951 $\frac{1}{4}$	1338 $\frac{1}{2}$	455 $\frac{1}{2}$	586 $\frac{1}{2}$	4571 $\frac{3}{4}$	4670 $\frac{1}{2}$	17973 $\frac{1}{4}$
4. Catch per fisherman	1.01	0.85	0.56	0.36	0.48	1.37	2.10	1.27
5. Catch per hour	0.17	0.15	0.11	0.07	0.09	0.23	0.36	0.22
6. Ave. no. of hrs. per fisherman	5.7	5.6	5.1	5.1	5.3	5.8	5.8	5.7
7. Per cent taking no fish	54	71	77	74	77	56	50	60
8. Ave. size of all fish caught	15.3	11.0	11.6	18.7	14.6	12.8	10.4	12.0
9. Perch - no. taken	191	318	99	11	23	594	1184	2420
average size	7.2	7.5	7.4	7.4	7.1	7.6	6.9	7.2
10. Northern Pike - no. taken	260	78	36	14	16	252	264	920
average size	19.9	20.8	20.3	27.9	21.7	22.1	21.9	21.3
11. Walleye - no. taken	146	54	14	7	13	211	178	623
average size	17.9	17.5	19.0	18.1	19.0	16.7	17.0	17.3
12. Rock Bass - no. taken	2	...	...	...	...	6	13	21
average size	8.5	...	...	...	...	8.8	8.8	8.8
13. Dogfish - no. taken	...	...	...	...	...	1	...	1
average size	...	...	...	...	...	24.0	...	24.0
14. Bluegill - no. taken	...	...	...	...	...	10	37	47
average size	...	...	...	...	...	6.7	7.8	7.6
15. Sunfish - no. taken	...	...	...	...	...	...	9	9
average size	...	...	...	...	...	...	9.0	9.0

Table 2

Data for Spearing, Houghton Lake. Winter of 1935-36.

	Jan. 1-15	Jan. 16-31	Feb. 1-15	Feb. 16-29	Totals
1. No. of fishermen - male	255	274	180	242	951
female	18	24	11	20	73
total	273	298	191	262	1024
2. No. of fish (legal)	212	217	126	130	685
3. No. of hours	1602 $\frac{1}{2}$	1668 $\frac{1}{4}$	1081 $\frac{3}{4}$	1613	5965 $\frac{1}{2}$
4. Catch per fisherman	0.78	0.73	0.66	0.5	0.67
5. Catch per hour	0.13	0.13	0.12	0.08	0.11
6. Ave. no. of hrs. per fisherman	5.9	5.6	5.7	6.2	5.8
7. Per cent taking no fish	56	60	55	65	59
8. Ave. size of all fish caught	22.2	19.5	21.8	21.7	21.2
9. Perch - no. taken	9	9	...	...	18
average size	7	6.6	...	...	6.8
10. Northern Pike - no. taken	198	196	120	127	641
average size	23.1	19.9	21.9	21.8	21.7
11. Walleyes - no. taken	3	12	6	1	22
average size	18.7	23.0	20.3	18.0	21.5
12. Dogfish - no. taken	...	...	...	1	1
average size	...	...	...	24.0	24.0
13. Bullhead - no. taken	2	...	...	1	3
average size	9	...	...	8.0	8.7

Table 3

Data for Both Methods (simultaneously), Houghton Lake. Winter of 1935-36

	Jan. 1-15	Jan. 16-31	Feb. 1-15	Feb. 16-29	Totals
1. No. of fishermen - male	364	407	211	213	1195
female	44	52	14	22	132
total	408	459	225	235	1327
2. No. of fish (legal)	315	348	108	133	904
3. No. of hours	2463 $\frac{1}{2}$	2579 $\frac{1}{2}$	1239	1406 $\frac{3}{4}$	7688 $\frac{1}{2}$
4. Catch per fisherman	0.77	0.76	0.48	0.56	0.68
5. Catch per hour	0.13	0.13	0.09	0.09	0.12
6. Ave. no. of hrs. per fisherman	6.0	5.6	5.5	6.0	5.8
7. Per cent taking no fish	58	60	71	66	62
8. Ave. size of all fish caught	17.4	19.1	20.3	22.1	19.2
9. Perch - no. taken	81	58	15	10	164
average size	7.3	7.4	8.2	8.7	7.5
10. Northern Pike - no. taken	199	254	87	116	656
average size	21.3	21.3	23.1	23.5	21.9
11. Walleye - no. taken	33	33	3	5	74
average size	18.8	22.9	18.3	17.8	20.6
12. Bluegill - no. taken	...	...	1	...	1
average size	...	...	7.0	...	7.0
13. Dogfish - no. taken	...	1	2	...	3
average size	...	25.0	26.0	...	25.7
14. Bullhead - no. taken	1	...	...	2	3
average size	12.0	...	...	15.0	14.0
15. Sucker - no. taken	1	1	...	...	2
average size	18.0	18.0	...	...	18.0
16. Gar Pike - no. taken	...	1	...	...	1
average size	...	20.0	...	...	20.0

Table 4

Data for All Fishing, Houghton Lake. Winter 1935-36

	Dec. 18-31	Jan. 1-15	Jan. 16-31	Feb. 1-15	Feb. 16-29	Mar. 1-15	Mar. 16-31	Average or Totals
1. No. of fishermen - male	527	1076	909	469	555	685	681	4902
female	66	133	112	37	52	98	120	618
total	593	1209	1021	506	607	783	801	5520
2. No. of fish (legal)	599	977	714	266	315	1074	1685	5630
3. No. of hours	3399 $\frac{1}{2}$	7017	5586 $\frac{1}{4}$	2776	3606 $\frac{1}{4}$	4571 $\frac{3}{4}$	4670 $\frac{1}{2}$	31627 $\frac{1}{4}$
4. Catch per fisherman	1.01	0.81	0.69	0.52	0.52	1.37	2.10	1.02
5. Catch per hour	0.17	0.14	0.13	0.10	0.09	0.23	0.36	0.18
6. Ave. no. of hrs. per fisherman	5.7	5.8	5.5	5.5	5.9	5.8	5.8	5.7
7. Per cent taking no fish	54	63	64	66	68	56	50	60
8. Ave. size of all fish caught	15.3	15.5	17.7	21.1	20.7	12.8	10.4	14.3
9. Perch - no. taken	191	408	166	26	33	594	1184	2602
catch per hour	0.06	0.06	0.03	0.01	0.01	0.13	0.25	0.08
average size	7.2	7.5	7.4	7.8	7.6	7.6	6.9	7.2
10. Northern Pike - no. taken	260	475	486	221	259	252	264	2217
average size	19.9	22.0	20.7	22.8	22.6	22.1	21.9	21.6
catch per hour	0.08	0.07	0.09	0.08	0.07	0.06	0.06	0.07
11. Walleyes - no. taken	146	90	59	16	19	211	178	719
average size	17.9	18.0	22.1	19.0	18.6	16.7	17.0	17.7
catch per hour	0.04	0.01	0.01	tr.	tr.	0.05	0.04	0.02
12. Rock Bass - no. taken	2	...	...	...	...	6	13	21
average size	8.5	...	...	...	...	8.8	8.8	8.8
13. Bullhead - no. taken	...	3	...	...	3	...	...	6
average size	...	10.0	...	...	12.7	...	...	11.3
14. Sucker - no. taken	...	1	1	...	...	...	...	2
average size	...	18.0	18.0	...	...	...	...	18.0
15. Dogfish - no. taken	...	...	1	2	1	1	...	5
average size	...	...	25.0	26.0	24.0	24.0	...	25.0
16. Gar Pike - no. taken	...	...	1	...	...	...	...	1
average size	...	...	20.0	...	...	...	...	20.0
17. Bluegill - no. taken	...	...	...	1	...	10	37	48
average size	...	...	...	7.0	...	6.7	7.8	7.6
18. Sunfish - no. taken	...	...	...	...	...	...	9	9
average size	...	...	...	...	...	...	9.0	9.0
Total length of all fish	9191 $\frac{1}{2}$	15148 $\frac{1}{2}$	12649	5603	6509	13770	17438 $\frac{1}{2}$	80309 $\frac{1}{2}$

and February the catch averaged considerably below one fish per fisherman. Of the 5520 who fished, 3324 took no fish. Fishing was poorest in February and best in March. It is possible that the improved fishing, in March, was due to the approach of the spawning season for the three most caught species. Perch ranked first in number taken, but Northern Pike undoubtedly ranked highest in total weight for any species and in value to the fishermen. Species ^{other} ~~less~~ than Perch, Northern Pike and Walleyes were taken in very small numbers and constituted an insignificant portion of the total catch.

Records of the fishing on this lake have been taken for a period of years by Conservation Officer Thomas White. These records represent a sampling of the fishing rather than an intensive census. Mr. White's winter census covered the winter fishing from 1931-1935. Data for each month of each year (except 1935) are included in Table 3 of Report No. 363. Catch of Perch (per hour) in January varied from a trace in 1931 to 0.24 in 1933; in February it varied from 0.02 in 1934 to 0.22 in 1932; in March it varied from 0.13 in 1931 to 0.24 in 1934. The 1935-36 winter catch (included in this report) fall within these extremes except that February fishing was poorer than any of the February fishing from 1931 to 1934.

Ranges for Walleye fishing were: January trace to 0.01 per hour; February 0.00-0.01 per hour; March 0.02-0.06 per hour. Fishing for the period included by this report falls within these ranges.

Ranges for Northern Pike fishing were: January 0.12-0.29 per hour; February 0.06-0.24 per hour; March 0.13-0.24 per hour. The fishing for the period included by this report was below the 1931-1934 range in January and March and was within the range in February.

The comparative data cannot be used to indicate the trend of fishing since it is not known to what extent Mr. White's figures were representative and since only 2 lines were permitted in the winter of 1935-36 as compared with 5 lines in previous winters.

Houghton Lake has an area of 18,950 acres (according to the Michigan Lakes and Streams Directory). The catch recorded averaged a little over one fish per $3\frac{1}{2}$ acres.

If the fishing recorded represented 85% of ^{all} the fishing, the lake produced approximately one fish per 3 acres.

Winter and summer fishing cannot now be compared. If the proposed summer census materializes it will be possible to determine the percentage of fish taken at each of the two seasons. Houghton Lake is one of the most heavily winter-fished of the larger northern Michigan lakes.

Residence of Anglers

Census on other lakes suggest that winter fishing on northern Michigan lakes tends to attract only local residents. Houghton Lake, in contrast attracted fishermen from a rather wide variety of localities. All except 23 fishermen (Ohio 18, Illinois 3, Indiana 2) were Michigan residents.

The distance traveled (air-line) by residents, by 25 mile zones, and the number of resident fishermen from each zone were:

<u>Zone</u>	<u>Number of fishermen</u>
0 - 25 miles	2537
25 - 50 "	711
50-75 "	270
75 - 100 "	137
100-125 "	1129
125 - 150 "	196
150 - 175 "	226
175 - 200 "	27
Not legible, not given, or not located on map	<u>264</u>
Total	5497

Residences of fishermen and number from each residence are: Adrian 6, Albion 2, Algonac 2, Alma 30, Almont 2, Alpena 2, Ann Arbor 8, Ashley 1, Athens 1, Auburn 2, Bannister 2, Bath 8, Battle Creek 14, Bay City 11, Beaverton 2, Belding 2, Belleville 2, Birch Run 12, Birmingham 1, Blanchard 2, Blissfield 24, Breckenridge 2, Bridgewater 1, Butterfield 9, Cadillac 62, Carson City 43, Casnovia 1, Charlotte 7, Chesaning 1, Clare 196, Clinton 3, Clio 6, Coleman 2, Columbiaville 2, Coldwater 1, Dearborn 2, Denton 3, Detroit 148, DeWitt 24, Dimondale 1, Dundee 1, Eaton Rapids 5, Elwell 7, Falmouth 92, Farwell 14, Farmington 8, Fenton 2, Fife Lake 2, Flint 152, Fowler 1, Fowlerville 4, Frankenmuth 3, Frederick 10, Freeport 1, Gains 3, Gaylord 2, Gladwin 54, Goodrich 2, Grand Blanc 3, Grand Ledge 1, Grand Rapids 9, Grayling 54, Hammond 3, Harrison 93,

Haslett 1, Hemlock 1, Hersey 3, Higgins Lake 2, Holland 8, Holly 6, Holt 48, Hope 5, Houghton Lake 1712, Howard City 1, Howell 5, Ithaca 15, Ionia 4, Isabella 1, Jackson 101, Jonesville 1, Kalamazoo 4, Kawkawlin 2, Laingsburg 6, Lake City 193, Lansing 765, Lapeer 3, Leation 1, Leslie 9, Long Lake 4, Lukas 2, Lupton 3, McBain 99, Manchester 3, Manton 38, Markey 92, Marshall 6, Mason 24, Marion 12, Maple Rapids 1, Merrill 6, Merrit 19, Midland 62, Michelson 22, Mio 2, Millets 2, Milan 1, Morenci 3, Mooristown 1, Moderville 10, Mount Clemens 4, Mt. Morris 7, Mt. Pleasant 155, Montrose 11, Munith 1, Muir 1, Nashville 7, North Bay 5, North Bradley 4, North Lake 1, Oak Grove 2, Okemas 4, Onsted 11, Owosso 24, Oxford 6, Pompeii 2, Pontiac 14, Port Huron 2, Potterville 9, Prudenville 97, Rankin 6, Reading 3, Roscommon 135, Rosebush 40, Roseville 2, Royal Oak 2, Saginaw 99, St. Louis 6, St. Helena 2, St. Johns 7, Saline 16, Sandusky 1, Shepard 6, Sherwood 4, Sigma 1, Stanton 2, Swartz Creek 4, Tipton 9, Vassar 3, Vermontville 1, Vogel Center 3, West Branch 17, Wheeler 10, White Lake 2, Williamston 2, Winn 4, Woodland 12, Wyman 2.

It is probable that winter fishing provided considerable revenue through meals, housing and bait.

Whether or not the production of one fish per several acres of water might affect subsequent summer fishing deleteriously cannot now be determined. The winter production probably did not exceed one pound per acre. Actual comparison of the winter and summer production can be made when and if the proposed creel census is taken during the coming summer. It is anticipated that a biological, chemical and physical examination of Houghton Lake will also be completed. This survey will probably give some indication of the abundance of fish actually present.

INSTITUTE FOR FISHERIES RESEARCH

By: R. W. Eschmeyer