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A SUMMARY OF FISHING ON HOUGHTON LAKE, ROSCOMMON COUNTY,

JUNE 8 - SEPTEMBER 24, 1957

By

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A creel census was conducted on Houghton Lake, Roscommon County, from June 8 through September 24, 1957. This census consisted of periodic counts of fishing boats, and interviews with individual fishermen for records of their fishing effort and catch. From the combination of boat counts and individual fishermen records, total fishing effort, total catch, catch by species, etc., were computed for this summer period.

Three methods were used in obtaining the census data: (1) Mr. Floyd E. Simonis, the Institute's creel census clerk, spent full time contacting anglers and making boat counts while working on the lake in a boat; (2) Messrs. Roy Knapp and Richard Fuller, the Department's Forest Fire towermen assigned to the lookout tower on the south shore of the lake, made periodic counts from the tower of fishing boats over a major portion of the lake; and (3) Pilot Peter Van Valin and K. E. Christensen, in the Department's plane out of Roscommon, made several counts of fishing boats from the air, as a check on the accuracy of counts made from the tower. As a final step, the boat counts made by the census clerk, those made from the tower, and those made from the plane were related to give the best estimate of total fishing effort for the season.

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For purposes of census sampling and boat counts, Houghton Lake was divided into east and west halves, and each half was divided into three zones. Furthermore, three main bays (North, Muddy, and East) were considered as separate areas because they were not visible for boat counts from the fire tower.

The census clerk, on a forty-hour week, worked on a prearranged daily schedule which involved either the east half or west half of the lake and either a morning (7:30 a.m. to 3:30 p.m.) or afternoon (1:00 p.m. to 9:00 p.m.) shift on a particular day. The clerk used his own discretion in selecting the zone upon which he concentrated his efforts, in order to give adequate coverage to each zone, and especially to allow for inclement winds which might keep anglers from venturing into a particular zone. Fishing effort on different portions of Houghton Lake may be highly variable depending on wind direction; most fishing is done from small rowboats which are unsafe in rough water. For records on angler effort and catch, the clerk contacted only fishermen who had completed their fishing trips. The census clerk interviewed anglers over all zones of the lake, and made periodic boat counts on North, Muddy, and East bays.

The lookout towerman counted fishing boats on the main body of the lake, but not on North, Muddy and East bays. The tower was usually manned from 9:00 a.m. to 5:00 p.m. on all except rainy days. Counts were made at two-hour intervals on the odd hour at 9:00, 11:00, 1:00, 3:00 and 5:00, giving five counts per day. Counts could be limited to boats engaged in fishing because pleasure boats on "joy-rides," water skiers, or boats merely traveling across the lake could be identified by the wake of the boat, or by their obvious activities.

Counts of fishing boats on the main body of the lake were made from a plane on July 19 (at 10:30 a.m.), July 25 (at 11:00 a.m., 1:00 p.m., 3:00 p.m. and 5:00 p.m.), and July 26 (at 1:00 p.m., 3:00 p.m. and 5:00 p.m.), concurrently with counts from the tower. Every plane count was higher than the concurrent tower count. As totals for the eight counts, 1,926 boats were counted from the air and 1,327 from the tower. Thus an estimate of fishing effort for the main body of the lake, based on tower counts, was increased by 45 percent to adjust to the higher plane counts.

Although 295 boat counts were made from the lookout tower on the 65 days that the tower was manned, these counts could not be used as the sole basis for an estimate of fishing on the main body of the lake, due to the lack of early morning and evening counts. The counts of boats on the bays, however, encompassed the fishing day sufficiently to permit an estimate of boat hours on each bay. Therefore, estimates of total boat hours for the main lake were obtained by correlating the counts made from the tower and the boat counts made by the census clerk in each of the three separate bays.

In Muddy Bay, for example, the census clerk made 141 counts of boats in the 30 days that he worked in this area. Estimates of boat hours of fishing were made for each of the 8 hours when counts were made and these estimates were expanded to include 13 hours of angling time for each day of the 109-day season. The resulting estimate of total fishing for Muddy Bay was 8,469 boat hours. Of the 141 boat counts made in Muddy Bay by the creel census clerk, 55 were made at the same time that counts of boats in the main lake were made from the tower. It was determined from these simultaneous counts that the ratio of boats on the main body of the lake to boats on Muddy Bay was 12.0:1. Therefore, the value for the total boat hours for Muddy Bay was multiplied by the factor 12.0 to give an estimate of 101,628 boat hours for the main lake.

Similar evaluations of fishing intensity on the main body of Houghton Lake were made from the boat counts for North Bay and for East Bay. These estimates were 111,678 and 138,168 boat hours, respectively. The average of the three values, 117,158 boat hours, was taken as the best estimate. The correction factor introduced by the counts made from the airplane (45 percent) raised this estimate to 169,879 boat hours for the main body of the lake.

The estimates of angling pressure in Muddy, North, and East bays (based on the clerk's counts) were 8,469, 15,954, and 11,514 boat hours, respectively. The addition of these estimates to the estimate for the main body of the lake gave the total estimate of the angling pressure for the summer season on Houghton Lake as 205,816 boat hours.

The creel census clerk interviewed anglers in 248 boats on the west half of the lake, including 132 boats landing in the southwest zone, 72 in North Bay, and 44 along the north shore; and he censused anglers in 175 boats on the east half, including 69 along the south shore, 47 from East Bay, and 59 from the northeast shore.

Data were obtained from 910 angler trips. The following averages, with confidence limits of 95 percent, were calculated from the census data: anglers per boat, 2.15 (± 0.044); hours per boat, 2.63 (± 0.128); and fish per boat hour, 1.13 (± 0.094). The 205,816 boat hours, when multiplied by 2.15 anglers per boat, gives an estimate of 443,000 angling hours; when divided by 2.63 hours per boat, gives an estimate of 78,000 boat trips; when multiplied by 1.13 fish per boat hour, gives an estimated harvest of 233,000 fish, for the summer season (Table 1).

The combined creel census records, from all zones of the lake, were used to determine the relative abundance of each species in the estimated total catch. The common pan fishes were bluegills, perch, pumpkinseeds, and rock bass, which made up 81 percent of the fish caught. Northern pike

Table 1.--Summary of data and estimates of angling on Houghton Lake, Roscommon County, for winter, 1956-57 and summer, 1957

	Winter, 1956-57	Summer, 1957	Winter plus summer ¹
Length of season (days)	89	109	198
Man hours of fishing	344,000	443,000	786,000
Total catch	250,000	233,000	483,000
Bluegill	127,500	55,920	183,420
Perch	62,500	48,930	111,430
Pumpkinseed	5,000	41,940	46,940
Black crappie	7,500	4,660	12,160
Rock bass	10,000	41,940	51,940
Largemouth bass	Tr. ²	4,660	4,660
Smallmouth bass	...	2,330	2,330
Walleye	5,000	11,650	16,650
Northern pike	32,500	18,640	51,140
Bullhead	...	2,330	2,330
Bowfin	...	Tr. ²	Tr. ²
Catch per hour	0.73	0.53	0.61
Fish caught per acre	12.5	11.6	24.1
Hours fished per acre	17.2	22.2	39.4

¹The amount of fishing done at other seasons would add little to a yearly total.

²Tr. = not more than 0.5 percent of total catch.

and walleyes made up 13 percent of the catch. The remaining 6 percent were black crappies, largemouth bass, smallmouth bass, bullheads and bowfins. The estimated summer catch from Houghton Lake included the following: 55,920 bluegills, 48,930 perch, 41,940 pumpkinseeds, 4,660 black crappies, 41,940 rock bass, 4,660 largemouth bass, 2,330 smallmouth bass, 11,650 walleyes, 18,640 northern pike, 2,330 bullheads, and a relatively small number of bowfins.

The 1957 summer fishing is compared with the previous winter's fishing¹ in Table 1. The winter fishing pressure (1956-57) represented an effort of 17.2 hours per acre, compared to 22.2 hours per acre for the summer season. The harvest amounted to 12.5 fish per acre in the winter and 11.6 fish per acre in the summer. The combined winter and summer harvest was 24.1 fish per acre from a total pressure of 39.4 hours per acre. The catch per hour for the winter season was 0.73 fish per hour; for the summer season, 0.53 fish per hour.

Thirty-three of Michigan's 81 counties, and 8 other states were represented in the summer census data on 910 completed angler trips. Wayne County provided the most anglers (22%), followed by the state of Ohio (18%), Ingham County (8%), Roscommon County (6%), and the state of Indiana (6%).

Private boats, either from private landings or launched across the public fishing site, constituted 161 of the 423 boats from whose occupants the census data were recorded. The remaining 262 boats were rented, or a part of the accommodations at resorts, motels or boat liveries.

Approved by G. P. Cooper

Typed by M. S. McClure

¹Christensen, K. E. Census of angling, Houghton Lake, Roscommon County, winter of 1956-1957. Institute for Fisheries Research Report No. 1515 (MS.).