

MINNESOTA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
SECTION OF FISHERIES

COMPLETION REPORT LAKE SUPERIOR WINTER CREEL SURVEY 2019

by
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Introduction, Methods, Results, and Discussion

An angler survey was conducted on the Minnesota waters of Lake Superior in winter 2019 due to substantial ice cover on the west end of the lake. An ice fishing survey had not been conducted since 2007. This survey was limited to the area from 21st Avenue in Duluth to Agate Bay in Two Harbors. Anecdotal evidence revealed that relatively little fishing occurred outside of this area. Anglers began to fish on the ice in late January 2019 and the ice fishing survey ran from February 9, 2019 through March 24, 2019, after which the ice was unsafe. The original sampling design established distinct survey locations across the entire area; however, anglers spread out over the ice fishing season and the design was changed to include just 1 survey location for the entire area. The area was counted on 1, 2, or 3 occasions per day, depending on personnel availability. Daily mean counts were estimated and multiplied by the number of hours in the day, which was fixed for the entire survey, and the mean number of anglers in fish houses. Virtually all fish houses were portable style, including a couple that were left overnight on the ice. The basic statistical method and formulas for the private sport survey are described by Bindman and Mach (1997).

Anglers fished for 43,188 hours during the ice fishing season of 2019. Angler effort was 84% from fish houses and 16% from open ice anglers. Fishing effort was concentrated at major access points, especially at the Brighton Beach and Lester River area and at McQuade. Effort was affected by the weather and by ice conditions as well as a slower bite at the end of the season.

Anglers caught 2,093 salmonids, of which 1,389 were harvested. Anglers mostly targeted and caught Lake Trout *Salvelinus namaycush* or Coho Salmon *Oncorhynchus kisutch*. Salmonid catch and harvest rates in Winter 2019 were 0.0485 and 0.0322 fish per angler hour, respectively, which were about one-fifth of the rates in Summer 2018 (Reeves 2019).

Anglers caught 1,485 lean Lake Trout (leans) and harvested 893 leans. Anglers kept just 60% of lean Lake Trout they caught, compared to 96% of the catch in the Summer of 2018. Anglers reported no siscowet Lake Trout (siscowet). Lean Lake Trout accounted for 71% of all salmonids caught and 64% of all salmonids harvested. The harvested leans were 92% wild fish, which was similar to the Summer 2018 rate of 88%. Anglers kept 0.0207 and released 0.0137 leans per angler hour. The harvested leans were 24.6 inches on average.

Anglers also caught Coho Salmon, Chinook Salmon *O. tshawytscha*, Rainbow Trout *O. mykiss*, Brown Trout *Salmo trutta*, Brook Trout *Salvelinus fontinalis*, Cisco *Coregonus artedii*, and Round Whitefish *Prosopium cylindraceum* during the surveyed portion of the ice fishing season. Anglers harvested 407 Coho Salmon at 0.0094 fish per angler hour, which is about half the Summer 2018 rate of 0.0201 fish per hour. Anglers also kept 89 other salmonids, including 8 Chinook Salmon, 8 steelhead Rainbow Trout, 65 Kamloops, and 8 Brown Trout for a combined harvest rate of just 0.0017 fish per angler hour, which was lower than the Summer 2018 rate of 0.007 fish per hour for these species. Anglers also caught 1,139 and kept 985 Cisco, kept 170 Round Whitefish, and released 56 Brook Trout.

Acknowledgements

Andrew Larson collected and entered the data, Josh Blankenheim assisted with data collection, and Cory Goldsworthy reviewed the manuscript.

Literature Cited

Bindman, A. and D. Mach. 1997. GENCREEL, Version 2; General Angler Survey Analysis Program User's Guide. Minnesota Department of Natural Resources.

Reeves, K.A. 2019. Completion Report Lake Superior Creel Survey, 2018. Minnesota Department of Natural Resources, Study 4, Job 1049.

Minnesota
F17AF00190
Segment 33-2
Study 4
Job 1054

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Approved: _____
Area Supervisor Date

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Regional Fisheries Approval Date 6/18/19

Tables

Table 1. Frequency of clerk visits and number of activity counts and interviews, by day type, in the 2019 Lake Superior Winter creel survey.

District ¹	Cluster ²	Day type	Days Visited	Activity Counts	Interviews	
					Fish House	Open Ice
1	1,2	Weekday	23	56	145	20
		Weekend	14	37	267	59
		Total	37	93	412	79

¹Great Lakes Fishery Commission Statistical Districts

²Cluster 1=Duluth, Cluster 2=McQuade-Two Harbors, Cluster 3=Twin Points-Taconite Harbor, Cluster 4=Grand Marais-Hovland.

Table 2. Fishing effort (angler hours¹) for portable fish house and open ice anglers in the 2019 Lake Superior Winter creel survey. SE values are in parentheses.

District ²	Cluster ³	Value	Portable		Total
			Fish House	Open Ice	
1	1,2	Hours	36,359	6,830	43,188
		SE	(4,327)	(1,425)	(5,189)

¹Estimates were rounded to the nearest whole number.

²Great Lakes Fishery Commission Statistical Districts

³Cluster 1=Duluth, Cluster 2=McQuade-Two Harbors, Cluster 3=Twin Points-Taconite Harbor, Cluster 4=Grand Marais-Hovland.

Table 3. Catch by species for portable fish houses and open ice anglers in the 2019 Lake Superior Winter creel survey. SE values are in parentheses.

District ¹	Cluster ²	Fate	Lake Trout	Coho Salmon	Chinook Salmon	Steelhead	Siscowet	Pink Salmon	Other ³ Salmonids	Total Salmonids	Walleye
1	1,2	Kept	893	407	8	8	0	0	73	1,389	0
		(SE)	(619)	(327)	(11)	(12)	(0)	(0)	(60)	(703)	(0)
		Released	592	48	0	8	0	0	56	704	0
		(SE)	(585)	(56)	(0)	(12)	(0)	(0)	(79)	(593)	(0)
		Total	1,485	455	8	16	0	0	129	2,093	0
		(SE)	(852)	(332)	(11)	(16)	(0)	(0)	(99)	(920)	(0)

¹ Great Lakes Fishery Commission Statistical Districts

² Cluster 1=Duluth, Cluster 2=McQuade-Two Harbors, Cluster 3=Twin Points-Taconite Harbor, Cluster 4=Grand Marais-Hovland.

³ Other Salmonids include 8 Brown Trout and 65 Kamloops that were harvested, and 56 Brook Trout that were reported as released. Anglers also kept 985 Cisco and 170 Round Whitefish and reported releasing 154 Cisco.

Table 4. Catch rate (fish hour⁻¹) by species for portable fish house and open ice anglers in the 2019 Lake Superior Winter creel survey. SE values are in parentheses.

District ¹	Cluster ²	Fate	Lake Trout	Coho Salmon	Chinook Salmon	Steelhead	Siscowet	Pink Salmon	Other ² Salmonids	Total Salmonids	Walleye
1	1,2	Kept	0.0207	0.0094	0.0002	0.0002	0.0000	0.0000	0.0017	0.0322	0.0000
		(SE)	(0.0145)	(0.0076)	(0.0030)	(0.0003)	(0.0000)	(0.0000)	(0.0014)	(0.0166)	(0.0000)
		Released	0.0137	0.0011	0.0000	0.0002	0.0000	0.0000	0.0013	0.0163	0.0000
		(SE)	(0.0136)	(0.0013)	(0.0000)	(0.0003)	(0.0000)	(0.0000)	(0.0018)	(0.0138)	(0.0000)
		Total	0.0344	0.0105	0.0002	0.0004	0.0000	0.0000	0.0030	0.0485	0.0000
		(SE)	(0.0201)	(0.0078)	(0.0003)	(0.0004)	(0.0000)	(0.0000)	(0.0023)	(0.0219)	(0.0000)

¹ Great Lakes Fishery Commission Statistical Districts

² Cluster 1=Duluth, Cluster 2=McQuade-Two Harbors, Cluster 3=Twin Points-Taconite Harbor, Cluster 4=Grand Marais-Hovland.

³ Other Salmonids include 8 Brown Trout and 65 Kamloops that were harvested, and 56 Brook Trout that were reported as released. Anglers also kept 985 Cisco and 170 Round Whitefish and reported releasing 154 Cisco.

Table 5. Length-frequency distribution (inches) and sample size of harvested salmonids by portable fish house and open ice anglers in the 2019 Lake Superior Winter creel survey.

Species	Lake Trout	Coho Salmon	Chinook Salmon	Kamloops	Steelhead	Cisco	Round Whitefish
Sample Size	55	32	1	3	1	50	8
6.5 to 7.4							
7.5 to 8.4							
8.5 to 9.4							
9.5 to 10.4							
10.5 to 11.4							
11.5 to 12.4						1	
12.5 to 13.4		1				1	1
13.5 to 14.4		2				3	
14.5 to 15.4		10				9	1
15.5 to 16.4	2	14				16	5
16.5 to 17.4	1	4				11	1
17.5 to 18.4		1				4	
18.5 to 19.4	1					2	
19.5 to 20.4	4					3	
20.5 to 21.4	2			1			
21.5 to 22.4	4			1			
22.5 to 23.4	3						
23.5 to 24.4	10				1		
24.5 to 25.4	8						
25.5 to 26.4	5						
26.5 to 27.4	6			1			
27.5 to 28.4	1						
28.5 to 29.4	4		1				
29.5 to 30.4	1						
30.5 to 31.4	1						
31.5 to 32.4							
32.5 to 33.4	1						
33.5 to 34.4							
34.5 to 35.4							
35.5 to 36.4	1						
36.5 to 37.4							
37.5 to 38.4							
38.5 to 39.4							
39.5 to 40.4							
>40.4							
Average Length (inch)	24.6	15.7	28.8	23.2	23.5	16.3	15.6

Table 6. Length-frequency distribution (inches) and sample size of released salmonids by portable fish house and open ice anglers in the 2019 Lake Superior Winter creel survey.

	Lake Trout	Coho Salmon	Chinook Salmon	Kamloops	Steelhead	Cisco	Round Whitefish
Length(in)	33	3	0	0	1	14	0
6.5 to 7.4							
7.5 to 8.4							
8.5 to 9.4		1					
9.5 to 10.4							
10.5 to 11.4		1					
11.5 to 12.4	4	1					
12.5 to 13.4	4						
13.5 to 14.4	5					2	
14.5 to 15.4	3					7	
15.5 to 16.4							
16.5 to 17.4					1	1	
17.5 to 18.4						3	
18.5 to 19.4						1	
19.5 to 20.4	2						
20.5 to 21.4							
21.5 to 22.4							
22.5 to 23.4	3						
23.5 to 24.4	1						
24.5 to 25.4							
25.5 to 26.4							
26.5 to 27.4	1						
27.5 to 28.4							
28.5 to 29.4	4						
29.5 to 30.4	4						
30.5 to 31.4	1						
31.5 to 32.4							
32.5 to 33.4	1						
33.5 to 34.4	1						
34.5 to 35.4					1		
35.5 to 36.4							
36.5 to 37.4							
37.5 to 38.4							
38.5 to 39.4							
39.5 to 40.4							
>40.4							
Average Length (inch)	23.1	10.7			17.0	16.6	

Table 7. Average weight (pounds) of harvested fish species by portable fish house and open ice anglers in the 2019 Lake Superior Winter creel survey. SE values are in parentheses.

District ¹	Cluster ²	Fate	Lake Trout	Coho Salmon	Cisco	Round Whitefish
		Sample size (n)	54	32	50	8
MN-1	1,2	Value (SE)	4.75 (0.89)	1.15 (0.04)	1.78 (0.09)	1.51 (0.12)

¹Great Lakes Fishery Commission Statistical Districts

²Cluster 1=Duluth, Cluster 2=McQuade-Two Harbors, Cluster 3=Twin Points-Taconite Harbor, Cluster 4=Grand Marais-Hovland.

Table 8. Yield¹ (pounds) of harvested fish species by portable fish house and open ice anglers in the 2019 Lake Superior Winter creel survey. SE values are in parentheses.

District ²	Cluster ³	Fate	Lake Trout	Coho Salmon	Steelhead	Kamloops	Cisco	Round Whitefish
MN-1	1,2	Value (SE)	4,238 (1,001)	469 (116)	30 (48)	289 (279)	1,731 (1,454)	293 (361)

¹Estimates were rounded to the nearest whole number.

²Great Lakes Fishery Commission Statistical Districts

³Cluster 1=Duluth, Cluster 2=McQuade-Two Harbors, Cluster 3=Twin Points-Taconite Harbor, Cluster 4=Grand Marais-Hovland