Minnesota
F15AF00162
Segment 32-2
Study 4
Job 1005

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

# COMPLETION REPORT
# LAKE SUPERIOR SUMMER CREEL SURVEY
# 2016

by
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Reimbursed under Federal Aid by the Sport Fish Restoration Act to Minnesota F15AF00162

**Abstract**

Minnesota-based anglers fished for 199,561 hours in the Minnesota waters of Lake Superior in 2016, as measured in the summer access-based creel survey. The effort in 2016 was 2.6% lower than in 2015. Anglers fished 98.2% of the time from boats and 1.8% of the time from the shore. Boat fishing effort was greatest in the Duluth and McQuade-Two Harbors areas in August and slightly less in the McQuade-Two Harbors and Twin Points-Taconite Harbor areas in July. Shore fishing was greatest in the McQuade-Two Harbors area in September. Effort increased relatively quickly at the Twin Points-Taconite Harbor area relative to other areas.

Anglers caught 44,763 salmonids, of which 37,561 were harvested. Anglers caught 21% more salmonids than in 2015, most of which were Lake Trout. Salmonid catch and harvest rates in 2016 were 0.2239 and 0.1883 fish per angler hour, respectively, which were about 14-24% higher than in 2015.

Anglers caught 37,860 Lake Trout, of which 32,402 were harvested. Lake Trout accounted for 85% of all salmonids caught and 86% of all salmonids harvested. The Lake Trout harvest was composed of 91% wild fish, down slightly from 92.1% in 2015. In MN-1, stocked fish comprised just 13.7% of the harvest. Anglers kept 0.1624 and released 0.0273 Lake Trout per angler hour. Anglers caught 0.1897 Lake Trout per angler hour, which was 34% higher than in 2015. The average length of a harvested Lake Trout was 21.4 inches.

Anglers also caught Coho, Chinook, and Pink Salmon, and Rainbow Trout in 2016. Anglers harvested 3,188 Coho Salmon at 0.0159 fish per angler hour, which was 23% lower than the 2015 rate of 0.0196 fish per angler hour. Anglers harvested 630 Chinook Salmon at 0.0032 fish per angler hour, which about 1/3 the rate of 0.0090 fish per angler hour in 2015. Chinook Salmon were 23.9 inches on average when harvested in 2016, which is 0.8 inch shorter than in 2015. Anglers caught fewer salmon in the Upper Shore than in the Lower Shore, as usual. Anglers caught 395 Pink Salmon and the fish were larger than usual. Anglers also kept 103 and released 1,051 steelhead, and kept 127 and released 261 other salmonids which included Brook Trout, Brown Trout, and Kamloops Rainbow Trout. Anglers also kept 25 Northern Pike, 224 Walleye, and 116 Lake Herring and released 41 Northern Pike.

Wisconsin-based sport anglers who fished in the Minnesota Waters of Lake Superior, excluding Charter anglers, fished for an additional 5,966 hours and caught an additional 625 Lake Trout, 11 Siscowet Lake Trout, 73 Coho Salmon, 22 Chinook Salmon, 6 Brown Trout, 2 Rainbow Trout, and 43 Walleyes.

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## Introduction

Lake Superior and the portions of its tributaries available to anadromous fishes offer unique habitats that support fisheries, which contribute to the diversity of angling opportunities in Minnesota. Several salmonids, including Lake Trout *Salvelinus namaycush*, Rainbow Trout *Oncorhynchus mykiss*, Coho Salmon *O. kisutch*, and Chinook Salmon *O. tshawytscha*, provide recreational fisheries along the North Shore of Lake Superior throughout the year.

During the first half of the 20th century, Lake Trout was the mainstay of the Lake Superior sport fishery and, along with Cisco *Coregonus artedi*, supported an important commercial fishery. By the late 1940s the Lake Trout harvest began to decline as a result of overfishing (Hansen et al. 1995). During the 1950s the Sea Lamprey *Petromyzon marinus* became established in Lake Superior and preyed heavily on Lake Trout. Lake Trout could not withstand the additional mortality caused by Sea Lamprey, and both sport and commercial fisheries collapsed. By the early 1960s, effective control of Sea Lamprey had been achieved. Minnesota and other states and provinces began salmonid stocking programs to rehabilitate the depleted Lake Trout stocks and to introduce new strains of salmon species to diversify the fishery. Minnesota suspended stocking of Lake Trout in 2016. Creel surveys have been used to monitor the recreational fishery in Minnesota waters of Lake Superior for more than 40 years. Creel surveys have been conducted annually during late spring–early autumn since 1969. This report presents results from Minnesota's 2016 Lake Superior summer creel survey. All data are from anglers who fished in Minnesota waters and returned to a Minnesota access, unless noted otherwise.

## Methods

The summer Lake Superior creel survey is access-based and follows a stratified random statistical design. The basic statistical method and formulas are described by Bindman and Mach (1997), and more detail of the design of the Lake Superior summer creel survey is described by Halpern (1995a, b). The survey included two types of anglers, which were boaters from charter docks, public accesses, and marinas, and also shore anglers at the public accesses and marinas. The survey included only anglers who fished in Lake Superior and excluded angling that occurred in the St Louis Estuary or in tributaries. The 2016 survey began on Memorial Day weekend (May 28) and ended when the Lake Trout season ended (October 2). May data are included in the June estimates

and October data are included in the September estimates. The creel clerks visited the stations and groups of stations, or Clusters, that are described in Table 1. Clusters 1 and 2 are to the south and comprise the Lower Shore, whereas Clusters 3 and 4 are to the north and comprise the Upper Shore. Halpern (2003) describes the general mechanics of the creel survey in more detail. Slight changes to the design occurred in 2016. One very small public access was dropped at Tofte in the Taconite Harbor area due to low use and high travel times to the access. Also, Harbor Cove was dropped from the Harbor Cove/Lakehead Marina station on 28 July 2016 due to the owner's removal of permission to use the property. The counts from the two stations, Taconite Harbor and Lakehead Marina, were adjusted based on previous estimates of effort at the dropped accesses. Taconite Harbor received 12% of the effort at Station 9 in 2014-2015 and Harbor Cove Marina received 50% of the effort at Station 2 from 2014 through 27 July 2016.

Age distribution of Lake Trout caught in the Lake Superior summer creel survey was determined using an age-length key based on all aged Lake Trout, both stocked and wild, captured in assessments from 2012 through May 2016. References to 2015 creel survey numbers are from Reeves (2016).

## Results and Discussion

### Fishing Effort

Recreational fishing effort (effort) from anglers who used Minnesota accesses or fished from the Minnesota shoreline was estimated from 546 activity counts for the Lower Shore and 502 activity counts for the Upper Shore (Table 2). Effort along the North Shore was measured on 111 out 128 days during the season. The estimated total fishing effort for Minnesota waters of Lake Superior during the 2016 summer creel survey was 205,527 angler hours (AH: Table 3), which includes 199,561 AH from Minnesota-based anglers and 5,966 AH from Wisconsin-based anglers (WIDNR data). Effort decreased by 2% from 2015 to 2016 (Figure 1) and was slightly short of effort in 2015, which was at the highest level since 1993. In 1994, the survey design was changed to exclude shoreline angling at select stations that produced few fish in most years. Since 1994, effort from Minnesota-based anglers has varied from 138,522 to 204,881 AH (Figure 1). Effort in the Lower Shore area in 2016 accounted for 68.3% of total Minnesota summer angling effort on Lake Superior (Table 3).

Lake Superior boat anglers accounted for 98.2% of the effort and shore anglers accounted for 1.8% of the

effort. Overall summer boat effort was similar between the Duluth and McQuade-Two Harbors areas and lowest in the Grand Marais area (Table 4). Monthly effort from boats was greatest from the McQuade-Two Harbor area in the May-June period, was similar between the Duluth and McQuade-Two Harbors areas in July, shifted back to the Duluth area in August, and shifted again to the McQuade-Two Harbors area in the September-October period (Table 3). Boating effort at the northern-most stations was relatively low again in 2016 (Table 3).

Shoreline anglers fished for 3,558 AH in 2016 (Table 3), which is a 28% decrease from 4,545 AH in 2015. Shore angling continues to comprise a small fraction of summer angling effort on Lake Superior. The highest shore angling effort (86%) was observed in the McQuade-Two Harbors area in Cluster 2 (Table 4).

## Catch and Catch Rates

### Salmonids

Anglers caught 44,673 salmonids in 2016, which was 21% higher than the catch of 36,864 salmonids in 2015. Anglers released 19% of their catch (Table 5), which is a relatively high percent of the total catch. Anglers caught 0.2239 salmonids per AH and they kept 0.1883 salmonids per AH (Table 6) in 2016. These rates were 14-24% higher than in 2015 (Figure 2). Wisconsin anglers kept an additional 739 salmonids (WIDNR data).

### Lake Trout

Anglers caught 37,860 Lake Trout in 2016, a 30% increase from 2015. Anglers caught 42% more Lake Trout in 2016 than the average of 26,680 fish in 2006-2015. Anglers also released 5,458 fish, or 14% of their catch of Lake Trout (Table 5). Anglers harvested 32,402 Lake Trout, which was 22% higher than in 2015 and was the highest harvest since 1983 (Figure 3). Lake Trout accounted for 85% of all salmonids caught and 86% of all salmonids harvested. Sixty-five percent of the harvested Lake Trout were from the Lower Shore area. Anglers caught 0.1897 Lake Trout per AH and harvested 0.1624 fish per AH (Table 6). Among Minnesota boating parties, 64% caught one or more Lake Trout, 45% caught two or more, and 30% caught at least three Lake Trout per trip (Table 7).

Wisconsin-based anglers harvested an additional 625 Lake Trout in Minnesota waters in 2016 (WIDNR data) and these fish were harvested at a rate of 0.1056 fish per AH, which was 18% lower than the rate of 0.1248 fish per AH in 2015. Wisconsin-based anglers caught Lake Trout at a lower rate than Minnesota anglers fishing the

same area, Cluster 1, which was 0.1559 fish per AH (Table 6). This may have occurred because Minnesota's creel survey includes charter boats, whereas Wisconsin's creel survey does not, and the catch rates from charter boats are typically higher than for other boats.

Most harvested Lake Trout were between 17.5 and 24.4 inches in length, which is similar to 2015, and the clerks measured no fish longer than 38.4 inches. The average length of harvested Lake Trout in 2015 was 21.4 inches (Table 8) and the average length released was 19.3 inches (Table 9). Anglers released 12% of Lake Trout that were 25 inches or longer (Tables 8 & 9). The average harvested Lake Trout weighed 3.14 pounds (Table 10), which was a 5% decrease from 2015. The average harvested Lake Trout on the Upper Shore weighed 2.83 pounds, compared to a heavier average weight of 3.35 pounds on the Upper Shore (Table 10). Lake Trout yield in the sport fishery increased by 17% from 89,846 pounds in 2015 to 104,997 pounds in 2016 (Table 11). The increased yield was due to substantially more fish in 2016 than in 2015, despite smaller fish in 2016. The yield in 2016 was the fourth highest yield since estimates began in 1980.

The age distribution of harvested Lake Trout was determined for stocked and wild Lake Trout combined. Six, seven and eight year old fish made up about half (55%) of the Lake Trout that were harvested. Each age class from six through nine years comprised at least 10% of the harvest (Table 12), which is similar to 2015 and represents a shift to younger ages since at least 2014. Older Lake Trout, at least nine years old, made up only 39% of the harvest by number, which is a substantial decline from 56% of older fish in 2013, 47% in 2014, and 49% in 2015. The presence of many adult year classes indicates that the Lake Trout population has been rehabilitated. However, the decline in proportion of older age classes warrants closer monitoring to ensure that spawner abundance is adequate to sustain the fishery.

In 2015, creel clerks checked 1,160 Lake Trout and observed no fin clips on 91% of harvested fish, which indicates that the fish were wild and not stocked. By catch location, wild fish comprised 99% of Lake Trout from the Grand Marais area, 97% from the McQuade-Two Harbors and the Twin Points-Tofte areas, and 86% from the Duluth area. Overall, the proportion of wild fish in the summer creel survey remained well above the threshold of criteria to discontinue stocking, as established in the Lake Trout Rehabilitation Plan (Hansen 1996) and the Fisheries Management Plan for the Minnesota Waters of Lake Superior (Schreiner et al. 2006). Lake Trout were

stocked in the Lower Shore area through 2015 and were not stocked in the Upper Shore area after 2003.

Siscowet

Siscowet Lake Trout (deepwater form) have generally contributed little to the sport fishery; however, anglers in 2016 noted more siscowet than average, although fewer than in 2015. In 2016, anglers kept 738 siscowet, mostly (698) in the Lower Shore area. Only 4.7% of boat angling parties caught at least one siscowet in 2016, compared to 12% of boating parties in 2015 (Table 7). Wisconsin anglers reported keeping just 11 siscowet in 2016.

Coho Salmon

Anglers kept 3,166 and released 22 Coho Salmon in 2016 (Table 5). The catch decreased by 27% from 2015. Anglers harvested 0.0159 Coho Salmon per AH in 2016 (Table 6), which was 23% lower than the rate of 0.0196 fish per AH in 2015 and less than half of the maximum rate of 0.0428 Coho Salmon per AH in 2013. Catches were spread out more evenly across the McQuade-Two Harbors and Twin Points-Taconite Harbor areas than in the past. Generally, Coho Salmon are first caught in the Lower Shore area and then later in the Upper Shore; this pattern was repeated in 2016. Among boating parties, only 13% caught one or more Coho Salmon and only 3% caught two or more Coho Salmon (Table 7). Wisconsin anglers harvested 73 Coho Salmon in Minnesota waters in 2016, which was only 33% of the catch from 2015. The average length of Coho Salmon harvested in Minnesota waters of Lake Superior in 2015 was 20.8 inches (Table 8), which was about 0.7 inches longer than in 2014, and the average weight increased slightly from 2.54 pounds in 2015 to 2.67 pounds in 2016 (Table 10). Anglers harvested 8,430 pounds of Coho Salmon in 2015 (Table 11), which is a decrease of 19% from the yield of 10,033 pounds in 2015. The harvest of Coho Salmon has varied considerably among years (Figure 5). The variations reflect naturally fluctuating year-class strength. Coho Salmon were last stocked in 2006 by the Michigan DNR and last stocked in Minnesota waters in 1974; thus, all Coho Salmon caught in Lake Superior are the product of natural reproduction.

Chinook Salmon

Anglers kept 630 and released 46 Chinook Salmon in 2016 (Table 5). The catch decreased by 64% from the 1,880 fish in 2015 (Figure 6). The Lower Shore accounted for 84% of the catch of Chinook Salmon in 2015; within the Lower Shore, catches were mostly from the Duluth area. Creel clerks examined 24 fish for stocking clips and

observed 2 clipped fish, which indicates that Chinook Salmon stocking in other jurisdictions contributes little to the Minnesota salmon fishery. However, the presence of clipped fish warrants attention in future surveys.

Anglers kept 0.0032 Chinook Salmon per AH in 2016, which is a noticeable decline from the harvest rates of about 0.009 fish per AH in 2014 and 2015 (Figure 6). Chinook Salmon harvest rates in 2016 were greatest, at 0.007 fish per AH, in the Duluth area. Wisconsin anglers harvested an additional 22 Chinook Salmon in Minnesota waters in 2016, which was slightly lower than their catch of 67 Chinook Salmon in 2015. The 2016 Chinook Salmon harvest rate for Wisconsin anglers was 0.0076 fish per AH (WIDNR data). Among Minnesota boating parties, only 2.6% caught one or more Chinook Salmon per trip (Table 7).

The mean length of harvested Chinook Salmon in 2016 was 23.9 inches (Table 8), which was 0.8 inch shorter than in 2015. Their average weight increased to 5.57 pounds (Table 10). Anglers kept 3,810 pounds of Chinook Salmon in 2016, which was 44% lower than the yield of 8,702 pounds in 2015.

Steelhead Rainbow Trout

Minnesota-based anglers caught 1,154 steelhead (anadromous Rainbow Trout) in 2016 (Table 5), which was a three-fold increase from their catch of 380 steelhead in 2015. The largest steelhead catches occurred in the Twin Points-Tofte area (Table 5). Anglers kept 103 steelhead in the summer of 2016, despite the ban on harvest of steelhead in the Minnesota waters of Lake Superior.

Pink Salmon

Anglers caught 395 Pink Salmon *Oncorhynchus gorbuscha* in 2016 (Table 5). Pink Salmon catches have fluctuated considerably over time, ranging from 0 fish in the late 1980s to 4,139 fish in 2010. Pink Salmon reproduce naturally in Lake Superior (Schreiner et al. 2006) and the fluctuations in catch reflect the fluctuations in reproductive success of Pink Salmon along the North Shore. The fish were larger than usual, averaging 1.54 lb. per fish, and anglers reported that they kept all the Pink Salmon that they caught.

Other Species

Other species are generally caught in low numbers during the summer creel survey. In 2016, anglers reported keeping two Brown Trout *Salmo trutta* and three Kamloops Rainbow Trout and releasing seven Brook Trout *Salvelinus fontinalis*. Catch data for the infrequently-caught salmonids were combined and reported as 388

other salmonids (Table 5). The combined catch rate for other salmonids was 0.0019 fish per AH. Minnesota anglers also kept an estimated 224 Walleye *Sander vitreus*, 116 Cisco, and 25 Northern Pike (Table 5) and released 41 Norther Pike. Wisconsin-based anglers caught an estimated 6 Brown Trout, 2 Rainbow Trout, and 43 Walleyes.

## Summary

The Lake Superior creel survey continues to provide essential information on the fishery in Minnesota waters of Lake Superior. This is vital to the future management of Lake Superior fish stocks and for coordinated management among Lake Superior fisheries management agencies. Effort and catch were relatively high in 2016, although catches of salmon were lower than in 2012 and 2013. The Lake Trout catches and catch rates were not as high as their maximum levels in 2011 or in 1983, and the salmon catches and catch rates were also not at their maximum levels, however the combination of high effort and decent fishing led to high catches of salmonids overall. The Lake Trout are now mostly (91%) wild, not clipped, and this is especially true in the Upper Shore where 99% of the harvested fish were wild. Salmon and nonnative trout are less adapted to the cold waters of Lake Superior than are native Lake Trout and their catch was lower overall than prior to 2013.

## Acknowledgements

Phil Kunze and Andrew Larson collected and entered the data and Cory Goldsworthy reviewed the manuscript.

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Lake Superior Fisheries Office

Approved: _____ 1/25/2017
Area Supervisor Date

Approved: _____ 5-11-17
Regional Fisheries Approval Date

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**Table 1. Creel survey clusters and stations, by shore area, in the 2016 Lake Superior summer creel survey.**

| Shore | Cluster | Station | Description |
|---|---|---|---|
| Lower | 1-Duluth | 1 | Charter Dock |
| | | 2 | Lakehead Boat Basin |
| | | 3 | Rice's Point Landing |
| | 2-McQuade to Two Harbors | 4 | McQuade Public Access |
| | | 5 | Knife River-Knife River Marina |
| | | 6 | Two Harbors-Agate Bay Access |
| Upper | 3-Twin Points to Tofte | 7 | Twin Points Access |
| | | 8 | Silver Bay Access and Marina |
| | | 9 | Taconite Harbor, Tofte |
| | 4-Grand Marais to Hovland | 10 | Grand Marais Access and Marina |
| | | 11 | Devil Track and Brule Rivers, Hovland Access |

**Table 2. Frequency of visits and number of activity counts and interviews, by day type, cluster, shore area, and total area, for each cluster and day type in the 2016 Lake Superior summer creel survey.**

| Cluster | Day type | Days Visited | Activity Counts | Number of Days With Fishing Interviews | | Number of Interviews[1] | |
|---|---|---|---|---|---|---|---|
| | | | | Boat | Shore | Boat | Shore |
| 1 – Duluth | Weekday | 26 | 156 | 23 | 0 | 48 | 0 |
| | Weekend | 21 | 126 | 20 | 0 | 76 | 0 |
| | Total | 47 | 282 | 43 | 0 | 124 | 0 |
| 2 – McQuade to Two Harbors | Weekday | 24 | 144 | 19 | 15 | 143 | 38 |
| | Weekend | 20 | 120 | 19 | 15 | 184 | 35 |
| | Total | 44 | 264 | 38 | 30 | 327 | 73 |
| 3 – Twin Points to Tofte | Weekday | 26 | 156 | 22 | 3 | 65 | 4 |
| | Weekend | 21 | 126 | 17 | 1 | 66 | 2 |
| | Total | 47 | 282 | 39 | 4 | 131 | 6 |
| 4 – Grand Marais to Hovland | Weekday | 24 | 120 | 17 | 14 | 99 | 22 |
| | Weekend | 20 | 100 | 18 | 14 | 123 | 27 |
| | Total | 44 | 220 | 35 | 28 | 222 | 49 |
| Lower Shore | Weekday | 50 | 300 | 42 | 15 | 191 | 38 |
| | Weekend | 41 | 246 | 39 | 15 | 260 | 35 |
| | Total | 91 | 546 | 81 | 30 | 451 | 73 |
| Upper Shore | Weekday | 50 | 276 | 39 | 17 | 164 | 26 |
| | Weekend | 41 | 226 | 35 | 15 | 189 | 29 |
| | Total | 91 | 502 | 74 | 32 | 353 | 55 |
| Total | Weekday | 70 | 576 | 60 | 29 | 395 | 64 |
| | Weekend | 41 | 472 | 41 | 24 | 449 | 64 |
| | Total | 111 | 1048 | 101 | 53 | 804 | 128 |

[1] 4 angling parties refused to be interviewed. Beginning on July 28, 2016, the clerk was excluded from ½ of Station 2, which reduced the number of interviews from that station and cluster.

**Table 3. Fishing effort estimates by angler type, cluster, shore area, and total area, in angler-hours[1], in the 2016 Lake Superior summer creel survey[2]. SE in parentheses.**

| | Boat Anglers | | | | | Shore Anglers[2] | | | | | All Anglers | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cluster | June | July | Aug | Sept | Summer | June | July | Aug | Sept | Summer | June | July | Aug | Sept | Summer |
| 1-Duluth | 15,550 | 13,453 | 20,759 | 18,302 | 68,064 | 0 | 0 | 0 | 0 | 0 | 15,550 | 13,453 | 20,759 | 18,302 | 68,064 |
| | (1,762) | (1,892) | (2,576) | (4,525) | (5,813) | (0) | (0) | (0) | (0) | (0) | (1,762) | (1,892) | (2,576) | (4,525) | (5,813) |
| 2-McQuade- Two Harbors | 10,125 | 19,401 | 21,088 | 14,622 | 65,236 | 455 | 760 | 719 | 1,108 | 3,042 | 10,580 | 20,161 | 21,807 | 15,730 | 68,278 |
| | (3,832) | (4,390) | (4,508) | (3,777) | (8,279) | (217) | (271) | (151) | (375) | (533) | (3,831) | (4,503) | (4,491) | (3,856) | (8,366) |
| 3-Twin Points-Tofte | 2,051 | 19,437 | 11,431 | 8,110 | 41,029 | 44 | 45 | 0 | 0 | 89 | 2,095 | 19,482 | 11,431 | 8,110 | 41,118 |
| | (575) | (3,534) | (1,394) | (2,064) | (4,361) | (44) | (45) | (0) | (0) | (63) | (575) | (3,562) | (1,394) | (2,064) | (4,385) |
| 4-Grand Marais-Hovland | 2,057 | 6,338 | 9,800 | 3,479 | 21,674 | 75 | 190 | 115 | 47 | 427 | 2,132 | 6,528 | 9,915 | 3,526 | 22,101 |
| | (520) | (1,318) | (2,228) | (1,286) | (2,936) | (27) | (40) | (51) | (17) | (72) | (538) | (1,333) | (2,246) | (1,298) | (2,966) |
| Lower Shore | 25,675 | 32,854 | 41,847 | 32,924 | 133,300 | 455 | 760 | 719 | 1,108 | 3,042 | 26,130 | 33,614 | 42,566 | 34,032 | 136,342 |
| | (4,217) | (4,781) | (5,192) | (5,894) | (10,116) | (217) | (271) | (151) | (375) | (533) | (4,217) | (4,884) | (5,177) | (5,945) | (10,188) |
| Upper Shore | 4,108 | 25,775 | 21,231 | 11,589 | 62,703 | 119 | 235 | 115 | 47 | 516 | 4,227 | 26,010 | 21,346 | 11,636 | 63,219 |
| | (775) | (3,771) | (2,628) | (2,431) | (5,258) | (51) | (60) | (51) | (17) | (96) | (787) | (3,804) | (2,644) | (2,438) | (5,293) |
| Total Shore | 29,783 | 58,629 | 63,078 | 44,513 | 196,003 | 574 | 995 | 834 | 1,155 | 3,558 | 30,357 | 59,624 | 63,912 | 45,668 | 199,561 |
| | (4,288) | (6,089) | (5,819) | (6,376) | (11,401) | (223) | (277) | (159) | (375) | (541) | (4,290) | (6,190) | (5,813) | (6,426) | (11,481) |

[1] Estimates were rounded to the nearest whole number.

[2] Wisconsin anglers fished an additional 5,966 hours on the Minnesota waters of Lake Superior.

[3] All shore fishing in Cluster 1 occurs in the St. Louis Estuary, not in Lake Superior, and is not included.

**Table 4. Monthly distribution of fishing effort by angler type, cluster, shore area, and total area, as a percentage of angler-hours[1], in the 2016 Lake Superior summer creel survey. SE in parentheses.**

| | | Boat Anglers | | | | | Shore Anglers[2] | | | | | All Anglers | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cluster | Station | June | July | Aug | Sept | Summer | June | July | Aug | Sept | Summer | June | July | Aug | Sept | Summer |
| 1-Duluth | | 52.2 | 22.9 | 32.9 | 41.2 | 34.7 | 0 | 0 | 0 | 0 | 0 | 51.2 | 22.6 | 32.5 | 40.1 | 34.1 |
| | 1 | 28.0 | 16.3 | 17.7 | 25.1 | 20.5 | 0 | 0 | 0 | 0 | 0 | 27.4 | 16.1 | 17.5 | 24.5 | 20.2 |
| | 2 | 11.3 | 4.4 | 11.4 | 10.6 | 9.1 | 0 | 0 | 0 | 0 | 0 | 11.1 | 4.3 | 11.2 | 10.3 | 8.9 |
| | 3 | 12.9 | 2.2 | 3.8 | 5.5 | 5.1 | 0 | 0 | 0 | 0 | 0 | 12.7 | 2.2 | 3.8 | 5.3 | 5.0 |
| 2-McQuade-Two Harbors | | 34.0 | 33.1 | 33.4 | 32.8 | 33.3 | 79.1 | 76.4 | 86.2 | 95.9 | 85.5 | 34.9 | 33.8 | 34.1 | 34.4 | 34.2 |
| | 4 | 22.3 | 9.3 | 15.8 | 15.0 | 14.7 | 47.2 | 17.4 | 26.4 | 16.3 | 24.0 | 22.8 | 9.4 | 15.9 | 15.0 | 14.8 |
| | 5 | 7.1 | 13.7 | 8.6 | 9.5 | 10.1 | 0 | 0 | 0 | 0 | 0 | 7.0 | 13.4 | 8.5 | 9.3 | 9.9 |
| | 6 | 4.6 | 10.1 | 9.0 | 8.3 | 8.5 | 32.0 | 58.9 | 59.8 | 79.6 | 61.5 | 5.1 | 11.0 | 9.7 | 10.1 | 9.5 |
| 3-Twin Points-Tofte | | 6.9 | 33.2 | 18.1 | 18.2 | 20.9 | 7.7 | 4.5 | 0 | 0 | 2.5 | 6.9 | 32.7 | 17.9 | 17.8 | 20.6 |
| | 7 | 0.8 | 5.78 | 1.8 | 3.0 | 3.1 | 7.7 | 0 | 0 | 0 | 1.2 | 0.9 | 5.6 | 1.8 | 2.9 | 3.0 |
| | 8 | 2.8 | 16.9 | 8.8 | 9.6 | 10.5 | 0 | 0 | 0 | 0 | 0 | 2.7 | 16.6 | 8.7 | 9.4 | 10.3 |
| | 9 | 3.3 | 10.5 | 7.5 | 5.6 | 7.3 | 0 | 4.5 | 0 | 0 | 1.3 | 3.3 | 10.4 | 7.4 | 5.5 | 7.3 |
| 4-Grand Marais-Hovland | | 6.9 | 10.8 | 15.6 | 7.8 | 11.1 | 13.2 | 19.1 | 13.8 | 4.1 | 12.0 | 7.0 | 10.9 | 15.5 | 7.7 | 11.1 |
| | 10 | 6.4 | 9.3 | 11.5 | 6.4 | 8.9 | 13.2 | 19.1 | 13.8 | 4.1 | 12.0 | 6.5 | 9.4 | 11.5 | 6.3 | 8.7 |
| | 11 | 0.5 | 1.5 | 4.1 | 1.4 | 2.2 | 0 | 0 | 0 | 0 | 0 | 0.5 | 1.5 | 4.0 | 1.4 | 2.3 |
| Lower Shore | | 86.2 | 56.0 | 66.3 | 74.0 | 68.0 | 79.1 | 76.4 | 86.2 | 95.9 | 85.5 | 86.1 | 56.4 | 66.6 | 74.5 | 68.3 |
| Upper Shore | | 13.8 | 44.0 | 33.7 | 26.0 | 32.0 | 20.9 | 23.6 | 13.8 | 4.1 | 14.5 | 13.9 | 43.6 | 33.4 | 25.5 | 31.7 |

[1] Estimates were rounded to the nearest whole number. Therefore, totals might not equal the sum of the individual estimates.

[2] All shore fishing in Cluster 1 occurs in the St. Louis Estuary and not in Lake Superior.

**Table 5. Catch estimates[1] by species, cluster, shore area, and total area, for boat and shore angling combined, in the 2016 Lake Superior summer creel survey. SE in parentheses.**

| | | Lake Trout | Coho Salmon | Chinook Salmon | Steelhead | Siscowet | Pink Salmon | Other[2] Salmonids | Total Salmonids | Walleye |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Duluth | Harvested | 10,310 | 538 | 476 | 0 | 349 | 0 | 29 | 11,702 | 178 |
| | | (2,166) | (187) | (177) | (0) | (119) | (0) | (33) | (2,184) | (140) |
| | Released | 299 | 0 | 0 | 55 | 161 | 0 | 0 | 515 | 0 |
| | | (161) | (0) | (0) | (56) | (93) | (0) | (0) | (194) | (0) |
| | Total | 10,609 | 538 | 476 | 55 | 510 | 0 | 29 | 12,217 | 178 |
| | | (2,171) | (187) | (177) | (56) | (151) | (0) | (33) | (2,193) | (140) |
| 2-McQuade-Two Harbors | Harvested | 10,788 | 1,199 | 44 | 0 | 349 | 0 | 43 | 12,423 | 46 |
| | | (2,640) | (556) | (28) | (0) | (128) | (0) | (43) | (2,702) | (53) |
| | Released | 1,913 | 0 | 46 | 206 | 92 | 0 | 0 | 2,257 | 0 |
| | | (629) | (0) | (53) | (129) | (61) | (0) | (0) | (647) | (0) |
| | Total | 12,701 | 1,199 | 90 | 206 | 441 | 0 | 43 | 14,680 | 46 |
| | | (2,714) | (556) | (60) | (129) | (142) | (0) | (43) | (2,778) | (53) |
| 3-Twin Points – Tofte | Harvested | 7,432 | 1,005 | 65 | 82 | 18 | 217 | 55 | 8,874 | 0 |
| | | (1,648) | (336) | (53) | (49) | (19) | (109) | (53) | (1,723) | (0) |
| | Released | 2,253 | 0 | 0 | 536 | 21 | 0 | 206 | 3,016 | 0 |
| | | (688) | (0) | (0) | (166) | (25) | (0) | (249) | (750) | (0) |
| | Total | 9,685 | 1,005 | 65 | 618 | 39 | 217 | 261 | 11,890 | 0 |
| | | (1,819) | (336) | (53) | (174) | (31) | (109) | (255) | (1,880) | (0) |
| 4-Grand Marais-Hovland | Harvested | 3,872 | 424 | 45 | 21 | 22 | 178 | 0 | 4,562 | 0 |
| | | (807) | (124) | (28) | (15) | (18) | (77) | (0) | (821) | (0) |
| | Released | 993 | 22 | 0 | 254 | 0 | 0 | 55 | 1,324 | 0 |
| | | (295) | (17) | (0) | (76) | (0) | (0) | (26) | (306) | (0) |
| | Total | 4,865 | 446 | 45 | 275 | 22 | 178 | 55 | 5,886 | 0 |
| | | (859) | (125) | (28) | (78) | (18) | (77) | (26) | (876) | (0) |
| Lower Shore | Harvested | 21,098 | 1,737 | 520 | 0 | 698 | 0 | 72 | 24,125 | 224 |
| | | (3,415) | (587) | (179) | (0) | (175) | (0) | (50) | (2,174) | (149) |
| | Released | 2,212 | 0 | 46 | 261 | 253 | 0 | 0 | 2,772 | 0 |
| | | (649) | (0) | (53) | (141) | (111) | (0) | (0) | (556) | (0) |
| | Total | 23,310 | 1,737 | 566 | 261 | 951 | 0 | 72 | 26,897 | 224 |
| | | (2,162) | (537) | (155) | (141) | (174) | (0) | (50) | (2,244) | (149) |
| Upper Shore | Harvested | 11,304 | 1,429 | 110 | 103 | 40 | 395 | 55 | 13,436 | 0 |
| | | (1,867) | (358) | (60) | (52) | (26) | (133) | (50) | (1,196) | (0) |
| | Released | 3,246 | 22 | 0 | 790 | 21 | 0 | 261 | 4,340 | 0 |
| | | (748) | (17) | (0) | (183) | (25) | (0) | (234) | (698) | (0) |
| | Total | 14,550 | 1,451 | 110 | 893 | 61 | 395 | 316 | 17,776 | 0 |
| | | (1,328) | (231) | (57) | (157) | (34) | (114) | (239) | (1,385) | (0) |
| Total | Harvested | 32,402 | 3,166 | 630 | 103 | 738 | 395 | 127 | 37,561 | 224 |
| | | (2,397) | (584) | (158) | (37) | (146) | (114) | (71) | (2,481) | (138) |
| | Released | 5,458 | 22 | 46 | 1,051 | 274 | 0 | 261 | 7,112 | 0 |
| | | (830) | (16) | (48) | (200) | (102) | (0) | (234) | (892) | (0) |
| | Total | 37,860 | 3,188 | 676 | 1,154 | 1,012 | 395 | 388 | 44,673 | 224 |
| | | (2,537) | (585) | (165) | (203) | (177) | (114) | (245) | (2,636) | (138) |

[1] Wisconsin anglers who fished Minnesota waters of Lake Superior also caught an estimated 625 Lake Trout, 11 Siscowet, 73 Coho Salmon, 22 Chinook Salmon, 6 Brown Trout, 2 Rainbow Trout, and 43 Walleyes.

[2] Other Salmonids include Brown Trout (70), Brook Trout (261), and Kamloops Rainbow Trout (57). Anglers also kept an estimated 25 Northern Pike and 116 Lake Herring and released 41 Northern Pike.

**Table 6. Catch rate (number of fish per hour) estimates by species, cluster, shore area, and total area, for boat and shore angling combined, in the 2016 Lake Superior summer creel survey. SE in parentheses.**

| | | Lake Trout | Coho Salmon | Chinook Salmon | Steelhead | Siscowet | Pink Salmon | Other[2] Salmonids | Total Salmonids | Walleye |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Duluth | Harvested | 0.1515 | 0.0079 | 0.0070 | 0 | 0.0051 | 0 | 0.0004 | 0.1719 | 0.0026 |
| | | (0.0343) | (0.0028) | (0.0027) | (0) | (0.0018) | (0) | (0.0005) | (0.0234) | (0.0021) |
| | Released | 0.0044 | 0 | 0 | 0.0008 | 0.0024 | 0 | 0 | 0.0076 | 0 |
| | | (0.0024) | (0) | (0) | (0.0008) | (0.0014) | (0) | (0) | (0.0026) | (0) |
| | Total | 0.1559 | 0.0079 | 0.0070 | 0.0008 | 0.0075 | 0 | 0.0004 | 0.1795 | 0.0026 |
| | | (0.0346) | (0.0028) | (0.0027) | (0.0008) | (0.0023) | (0) | (0.0005) | (0.0240) | (0.0021) |
| 2-McQuade-Two Harbors | Harvested | 0.1580 | 0.0176 | 0.0006 | 0 | 0.0051 | 0 | 0.0006 | 0.1819 | 0.0007 |
| | | (0.0432) | (0.0084) | (0.0004) | (0) | (0.0020) | (0) | (0.0006) | (0.0342) | (0.0008) |
| | Released | 0.0280 | 0 | 0.0006 | 0.0030 | 0.0014 | 0 | 0 | 0.0331 | 0 |
| | | (0.0098) | (0) | (0.0005) | (0.0019) | (0.0009) | (0) | 0 | (0.0087) | (0) |
| | Total | 0.1860 | 0.0176 | 0.0012 | 0.0030 | 0.006 | 0 | 0.0006 | 0.2150 | 0.0007 |
| | | (0.0457) | (0.0084) | (0.0009) | (0.0019) | (0.0022) | (0) | (0.0006) | (0.0377) | (0.0008) |
| 3-Twin Points – Tofte | Harvested | 0.1807 | 0.0244 | 0.0016 | 0.0020 | 0.0004 | 0.0053 | 0.0013 | 0.2158 | 0 |
| | | (0.0452) | (0.0086) | (0.0013) | (0.0012) | (0.0005) | (0.0027) | (0.0012) | (0.0337) | (0) |
| | Released | 0.0548 | 0 | 0 | 0.0130 | 0.0005 | 0 | 0.005 | 0.0733 | 0 |
| | | (0.0177) | (0) | (0) | (0.0043) | (0.0006) | (0) | (0.0057) | (0.0175) | (0) |
| | Total | 0.2355 | 0.0244 | 0.0016 | 0.0015 | 0.0009 | 0.0053 | 0.0063 | 0.2892 | 0 |
| | | (0.0508) | (0.0086) | (0.0013) | (0.0045) | (0.0008) | (0.0027) | (0.0062) | (0.0424) | (0) |
| 4-Grand Marais-Hovland | Harvested | 0.1752 | 0.0192 | 0.0020 | 0.0010 | 0.0010 | 0.0081 | 0 | 0.2064 | 0 |
| | | (0.0433) | (0.0062) | (0.0013) | (0.0007) | (0.0008) | (0.0036) | (0) | (0.0394) | (0) |
| | Released | 0.0449 | 0.0010 | 0 | 0.0115 | 0 | 0 | 0.0025 | 0.0599 | 0 |
| | | (0.0146) | (0.0008) | (0) | (0.0038) | (0) | (0) | (0.0011) | (0.0146) | (0) |
| | Total | 0.2201 | 0.0202 | 0.0020 | 0.0124 | 0.0010 | 0.0081 | 0.0025 | 0.2663 | 0 |
| | | (0.0486) | (0.0063) | (0.0013) | (0.0039) | (0.0008) | (0.0036) | (0.0012) | (0.0470) | (0) |
| Lower Shore | Harvested | 0.1547 | 0.0127 | 0.0039 | 0 | 0.0051 | 0 | 0.0005 | 0.1770 | 0.0016 |
| | | (0.0192) | (0.004) | (0.0011) | (0) | (0.0011) | (0) | (0.0004) | (0.0207) | (0.0010) |
| | Released | 0.0162 | 0 | 0.0003 | 0.0019 | 0.0019 | 0 | 0 | 0.0203 | 0 |
| | | (0.0041) | (0) | (0.0004) | (0.001) | (0.0007) | (0) | (0) | (0.0044) | (0) |
| | Total | 0.1710 | 0.0127 | 0.0042 | 0.0019 | 0.0070 | 0 | 0.0005 | 0.1973 | 0.0016 |
| | | (0.0203) | (0.004) | (0.0012) | (0.001) | (0.0014) | (0) | (0.0004) | (0.0220) | (0.0010) |
| Upper Shore | Harvested | 0.1788 | 0.0227 | 0.0017 | 0.0016 | 0.0006 | 0.0062 | 0.0009 | 0.2125 | 0 |
| | | (0.0237) | (0.0041) | (0.0009) | (0.0006) | (0.0004) | (0.0007) | (0.0008) | (0.0259) | (0) |
| | Released | 0.0513 | 0.0003 | 0 | 0.0125 | 0.0004 | 0 | 0.0041 | 0.0686 | 0 |
| | | (0.011) | (0.0003) | (0) | (0.0026) | (0.0004) | (0) | (0.0037) | (0.0124) | (0) |
| | Total | 0.2301 | 0.0230 | 0.0017 | 0.0041 | 0.0010 | 0.0062 | 0.0050 | 0.2811 | 0 |
| | | (0.0284) | (0.0041) | (0.0009) | (0.0027) | (0.0005) | (0.0007) | (0.0038) | (0.0320) | (0) |
| Total | Harvested | 0.1624 | 0.0159 | 0.0032 | 0.0005 | 0.0037 | 0.0020 | 0.0006 | 0.1883 | 0.0011 |
| | | (0.0216) | (0.0036) | (0.0010) | (0.0003) | (0.0009) | (0.0007) | (0.0004) | (0.0164) | (0.0008) |
| | Released | 0.0273 | 0.0001 | 0.0002 | 0.0053 | 0.0014 | 0 | 0.0013 | 0.0356 | 0 |
| | | (0.0052) | (0.0001) | (0.0003) | (0.0012) | (0.0006) | (0) | (0.0012) | (0.0049) | (0) |
| | Total | 0.1897 | 0.0160 | 0.0034 | 0.0058 | 0.0051 | 0.002 | 0.0019 | 0.2239 | 0.0011 |
| | | (0.0167) | (0.0031) | (0.0009) | (0.0011) | (0.0009) | (0.0007) | (0.0012) | (0.0184) | (0.0008) |

[1] Wisconsin anglers who fished Minnesota waters of Lake Superior also caught an estimated 625 Lake Trout, 11 Siscowet, 73 Coho Salmon, 22 Chinook Salmon, 6 Brown Trout, 2 Rainbow Trout, and 43 Walleyes.

[2] Other Salmonids include Brown Trout (70), Brook Trout (261), and Kamloops Rainbow Trout (57). Anglers also kept an estimated 25 Northern Pike and 116 Lake Herring and released 41 Northern Pike.

**Table 7. Percent of angling parties, by angler type, that caught specific numbers of fish in the 2016 Lake Superior summer creel survey.**

| | Lake Trout | | Coho Salmon | | Chinook Salmon | | Steelhead | | Siscowet | | Pink Salmon | | Total Salmonids | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Boat | Shore | Boat | Shore | Boat | Shore | Boat | Shore | Boat | Shore | Boat | Shore | Boat | Shore |
| 0 | 36.2 | 94.1 | 86.6 | 100 | 97.4 | 100 | 93.6 | 100 | 95.3 | 100 | 97.7 | 100 | 31.1 | 94.1 |
| 1 | 18.6 | 5.9 | 10.1 | | 1.9 | | 5.4 | | 4.0 | | 1.9 | | 17.4 | 5.9 |
| 2 | 15.4 | | 2.5 | | 0.6 | | 0.5 | | 0.6 | | 0.1 | | 14.0 | |
| 3 | 8.8 | | 0.5 | | 0.1 | | 0.5 | | 0.1 | | 0.3 | | 11.4 | |
| 4 | 4.0 | | 0.1 | | | | | | | | | | 5.8 | |
| 5 | 3.1 | | | | | | | | | | | | 3.3 | |
| 6 | 4.0 | | 0.1 | | | | | | | | | | 3.3 | |
| 7 | 1.9 | | | | | | | | | | | | 3.4 | |
| 8 | 2.4 | | | | | | | | | | | | 2.0 | |
| 9 | 1.9 | | | | | | | | | | | | 2.5 | |
| 10 | 0.9 | | 0.1 | | | | | | | | | | 1.0 | |
| 11 | 0.6 | | | | | | | | | | | | 1.3 | |
| >=12 | 2.2 | | | | | | | | | | | | 3.5 | |

**Table 8. Length-frequency distribution (inches) and sample size of harvested salmonids, by boat and shore angling combined, in the 2016 Lake Superior summer creel survey.**

| | Lake Trout | Coho Salmon | Chinook Salmon | Kamloops | Steelhead | Siscowet | Pink Salmon |
|---|---|---|---|---|---|---|---|
| | 1156 | 136 | 23 | 3 | 4 | 31 | 19 |
| 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 | | 2 | | | | | |
| 11.5 to 12.4 | | 2 | | | | | |
| 12.5 to 13.4 | 2 | | | | | | |
| 13.5 to 14.4 | 10 | 2 | | | | | |
| 14.5 to 15.4 | 22 | 1 | 1 | | | | |
| 15.5 to 16.4 | 47 | | 1 | | | 1 | 4 |
| 16.5 to 17.4 | 70 | | | | | | 4 |
| 17.5 to 18.4 | 94 | 3 | 1 | 1 | | 1 | 8 |
| 18.5 to 19.4 | 117 | 17 | 5 | | | 1 | 1 |
| 19.5 to 20.4 | 132 | 21 | | | | 4 | 1 |
| 20.5 to 21.4 | 153 | 27 | 1 | | | 6 | |
| 21.5 to 22.4 | 128 | 32 | 1 | | | 7 | 1 |
| 22.5 to 23.4 | 111 | 21 | 4 | | | 5 | |
| 23.5 to 24.4 | 64 | 7 | | 1 | | 1 | |
| 24.5 to 25.4 | 43 | 1 | | | 1 | 3 | |
| 25.5 to 26.4 | 42 | | | 1 | | | |
| 26.5 to 27.4 | 33 | | 1 | | 1 | 2 | |
| 27.5 to 28.4 | 28 | | 2 | | 1 | | |
| 28.5 to 29.4 | 15 | | | | | | |
| 29.5 to 30.4 | 11 | | 4 | | | | |
| 30.5 to 31.4 | 13 | | | | | | |
| 31.5 to 32.4 | 5 | | | | | | |
| 32.5 to 33.4 | 5 | | 2 | | | | |
| 33.5 to 34.4 | 6 | | | | | | |
| 34.5 to 35.4 | 3 | | | | | | |
| 35.5 to 36.4 | | | | | | | |
| 36.5 to 37.4 | | | | | | | |
| 37.5 to 38.4 | 2 | | | | | | |
| 38.5 to 39.4 | | | | | | | |
| 39.5 to 40.4 | | | | | | | |
| >40.4 | | | | | | | |
| Average Length (in) | 21.4 | 20.8 | 23.9 | 22.7 | 26.5 | 21.9 | 17.8 |

**Table 9. Length-frequency distribution (inches) and sample size of released salmonids, by boat and shore angling combined, in the 2016 Lake Superior summer creel survey.**

| | Lake Trout | Coho Salmon | Chinook Salmon | Pink Salmon | Brook Trout | Steelhead | Siscowet |
|---|---|---|---|---|---|---|---|
| | 278 | 3 | 1 | 0 | 12 | 60 | 12 |
| 6.5 to 7.4 | 2 | | | | | | |
| 7.5 to 8.4 | | | | | 1 | 1 | |
| 8.5 to 9.4 | | | | | | | |
| 9.5 to 10.4 | 1 | | | | 3 | | |
| 10.5 to 11.4 | | | | | | | |
| 11.5 to 12.4 | 9 | 1 | | | | | |
| 12.5 to 13.4 | 8 | | | | | 1 | |
| 13.5 to 14.4 | 15 | 2 | | | 3 | | |
| 14.5 to 15.4 | 19 | | | | 1 | | |
| 15.5 to 16.4 | 51 | | | | 2 | | 2 |
| 16.5 to 17.4 | 19 | | | | | | 1 |
| 17.5 to 18.4 | 33 | | | | 1 | 3 | 1 |
| 18.5 to 19.4 | 14 | | | | | 1 | 6 |
| 19.5 to 20.4 | 32 | | | | | 1 | |
| 20.5 to 21.4 | 4 | | | | 1 | | 2 |
| 21.5 to 22.4 | 19 | | | | | 2 | |
| 22.5 to 23.4 | 12 | | | | | | |
| 23.5 to 24.4 | 12 | | | | | 10 | |
| 24.5 to 25.4 | 6 | | | | | 8 | |
| 25.5 to 26.4 | 5 | | | | | 10 | |
| 26.5 to 27.4 | 1 | | | | | 12 | |
| 27.5 to 28.4 | 4 | | | | | 4 | |
| 28.5 to 29.4 | | | 1 | | | 4 | |
| 29.5 to 30.4 | 3 | | | | | 3 | |
| 30.5 to 31.4 | | | | | | | |
| 31.5 to 32.4 | 2 | | | | | | |
| 32.5 to 33.4 | | | | | | | |
| 33.5 to 34.4 | 1 | | | | | | |
| 34.5 to 35.4 | | | | | | | |
| 35.5 to 36.4 | 3 | | | | | | |
| 36.5 to 37.4 | 2 | | | | | | |
| 37.5 to 38.4 | | | | | | | |
| 38.5 to 39.4 | | | | | | | |
| 39.5 to 40.4 | 1 | | | | | | |
| >40.4 | | | | | | | |
| Average Length (in) | 19.3 | 13.0 | 29.0 | 0 | 13.8 | 25.0 | 19.5 |

**Table 10. Average weight (pounds) by species, cluster, shore area, and total area, of harvested fish in the 2016 Lake Superior summer creel survey. SE in parentheses.**

| | Lake Trout | Coho Salmon | Chinook Salmon | Pink Salmon | Siscowet |
|---|---|---|---|---|---|
| Sample Size (n) | 1156 | 136 | 23 | 19 | 31 |
| 1 – Duluth | 3.37 | 2.36 | 6.63 | - | 2.24 |
| | (0.14) | (0.20) | (1.07) | - | (0.40) |
| 2 - McQuade - Two Harbors | 3.34 | 2.65 | 7.42 | - | 3.60 |
| | (0.11) | (0.11) | (3.25) | - | (0.35) |
| 3 - Twin Points - Tofte | 3.23 | 2.78 | 2.66 | 1.46 | - |
| | (0.19) | (0.13) | (0.62) | (0.18) | - |
| 4 - Grand Marais - Hovland | 2.64 | 2.79 | 3.48 | 1.58 | 2.38 |
| | (0.11) | (0.13) | (0.95) | (0.11) | (0.69) |
| Lower Shore | 3.35 | 2.55 | 6.77 | - | 3.44 |
| | (0.09) | (0.10) | (1.00) | - | (0.26) |
| Upper Shore | 2.83 | 2.79 | 3.17 | 1.54 | 2.38 |
| | (0.09) | (0.09) | (0.62) | (0.09) | (0.69) |
| Total Shore | 3.14 | 2.67 | 5.57 | 1.54 | 3.37 |
| | (0.06) | (0.07) | (0.78) | (0.09) | (0.25) |

**Table 11. Yield (pounds) estimates[1] by species, cluster, shore area, and total area, for boat and shore angling combined, in the 2016 Lake Superior summer creel survey. SE values are in parentheses.**

| | Lake Trout | Coho Salmon | Chinook Salmon | Steelhead | Siscowet | Pink Salmon | Other Salmonids[2] | Total Salmonids | Non-Salmonids[3] |
|---|---|---|---|---|---|---|---|---|---|
| 1-Duluth | 34,782 | 1,270 | 3,154 | 0 | 1,131 | 0 | 262 | 40,599 | 624 |
| | (4,294) | (189) | (687) | (0) | (202) | (0) | (332) | (4,370) | (559) |
| 2-McQuade-Two Harbors | 35,979 | 3,179 | 326 | 0 | 1,258 | 0 | 205 | 40,947 | 366 |
| | (4,231) | (404) | (188) | (0) | (224) | (0) | (227) | (4,266) | (237) |
| 3-Twin Points-Tofte | 24,005 | 2,797 | 173 | 555 | 0 | 317 | 437 | 28,284 | 151 |
| | (3,102) | (319) | (90) | (236) | (0) | (83) | (509) | (3,171) | (123) |
| 4-Grand Marais–Hovland | 10,231 | 1,184 | 157 | 108 | 52 | 282 | 0 | 12,014 | 0 |
| | (1,352) | (117) | (69) | (56) | (33) | (45) | (0) | (1,361) | (0) |
| Lower Shore | 70,761 | 4,449 | 3,480 | 0 | 2,389 | 0 | 467 | 81,546 | 990 |
| | (6,028) | (446) | (712) | (0) | (302) | (0) | (402) | (6,106) | (607) |
| Upper Shore | 34,236 | 3,981 | 330 | 663 | 52 | 599 | 437 | 40,298 | 151 |
| | (3,384) | (340) | (113) | (243) | (33) | (94) | (509) | (3,447) | (123) |
| Total Shore | 104,997 | 8,430 | 3,810 | 663 | 2,441 | 599 | 904 | 121,844 | 1,141 |
| | (6,913) | (561) | (721) | (243) | (304) | (94) | (649) | (7,012) | (619) |

[1] Estimates are rounded to the nearest pound.

[3] Other Salmonines included Brown Trout (632 lb.) and Kamloops (272 lb.).

[3] Anglers harvested Walleye (785 lb.), Northern Pike (91 lb.), and Herring (265 lb.).

**Table 12. Age distribution, in percent, of harvested lake trout (wild and stocked), 2016 Lake Superior summer creel survey. n=1156.**

| Age | IV | V | VI | VII | VIII | IX | X | XI | XII | XIII | XIV | XV | XVI+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | 0.17 | 5.36 | 12.28 | 24.48 | 18.51 | 11.59 | 8.56 | 4.24 | 4.24 | 2.51 | 1.47 | 1.21 | 5.45 |

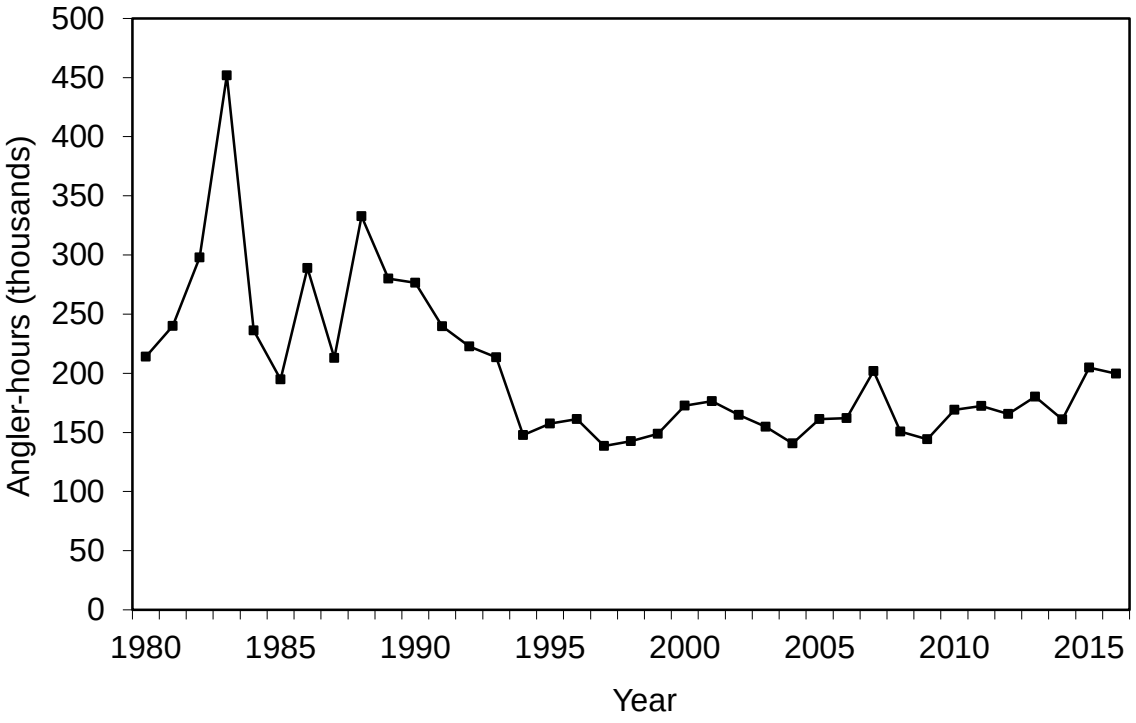


**Figure 1. Angling effort in the Lake Superior summer creel survey, 1980-2016. The design of the summer Lake Superior creel survey was changed in 1994 (Halpern 1995a,b).**

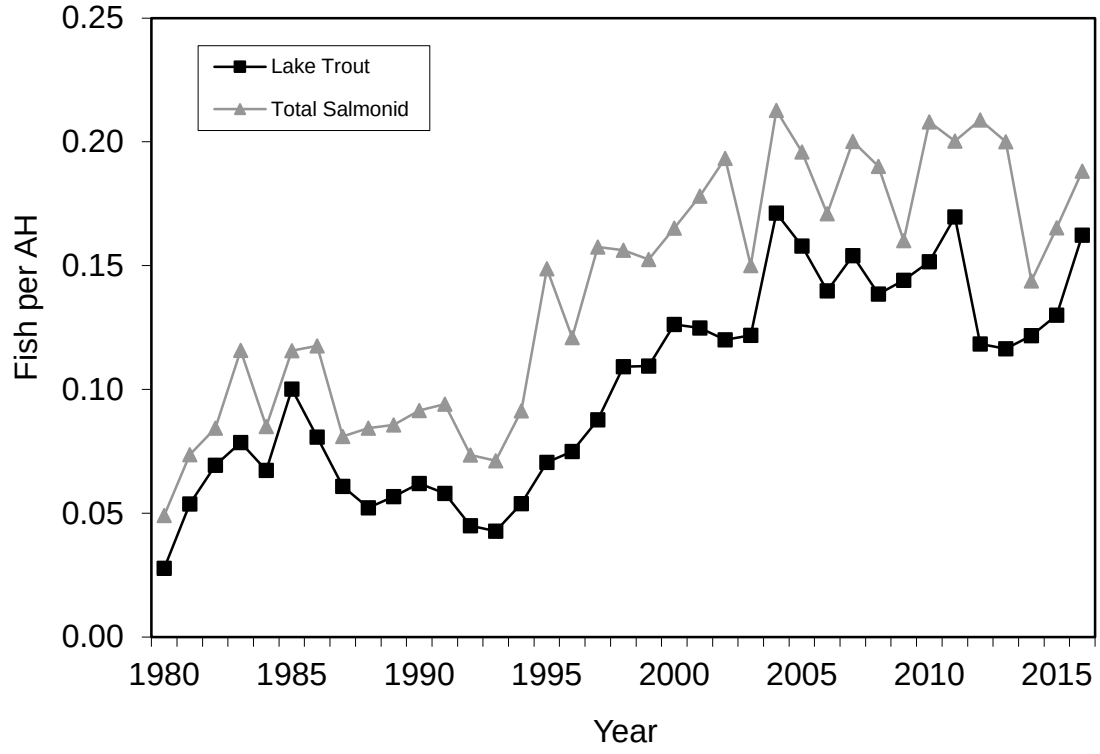


**Figure 2. Harvest rate for Lake Trout and all Salmonids combined in the Lake Superior summer creel survey, 1980-2016.**

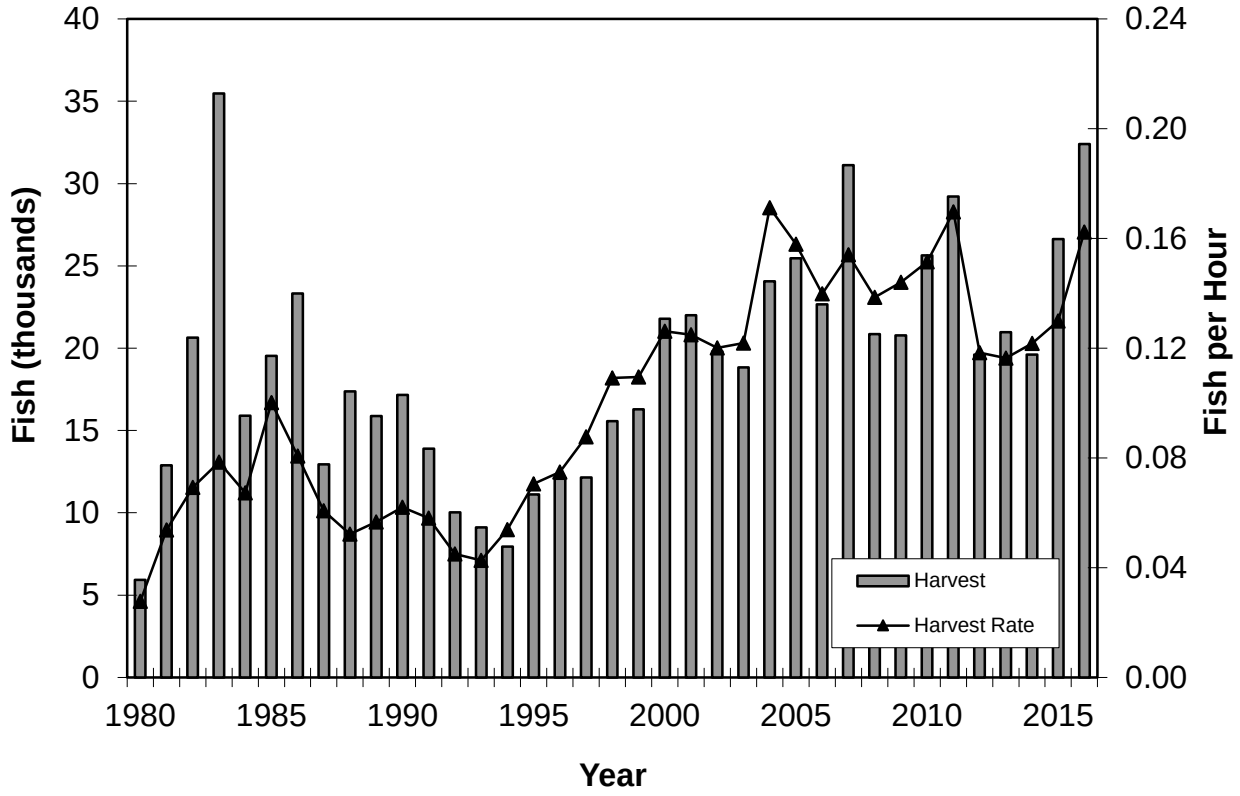


**Figure 3. Lake Trout harvest and harvest rate in the Lake Superior summer creel survey, 1980-2016.**

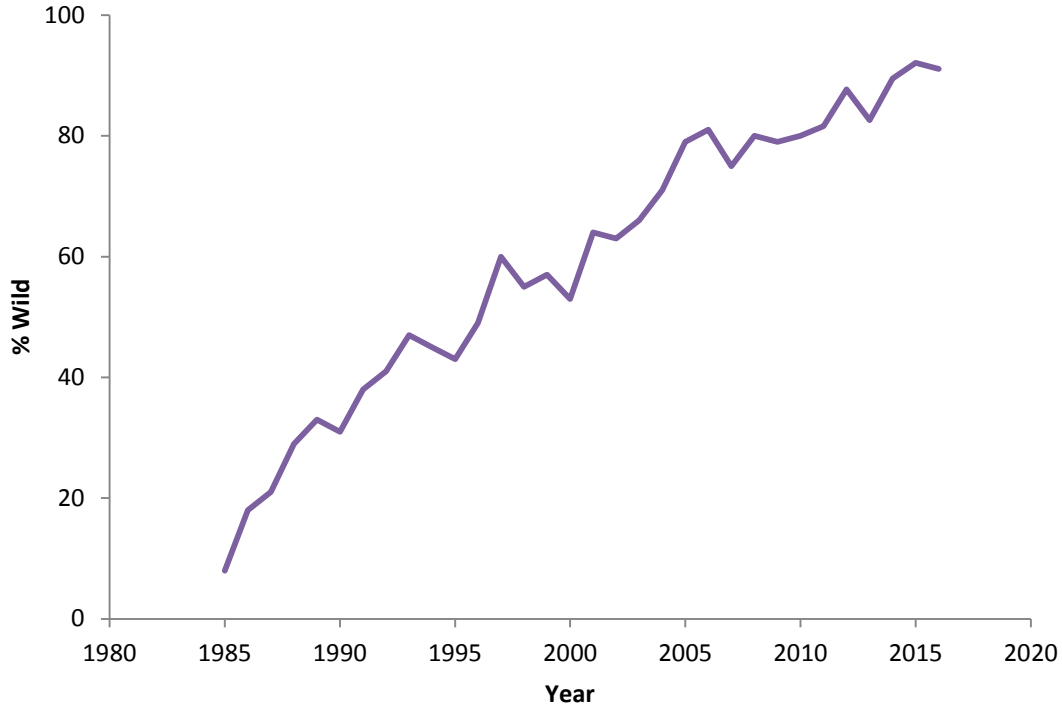


**Figure 4. Percent wild Lake Trout observed by creel clerks in the Lake Superior summer creel survey, 1985-2016.**

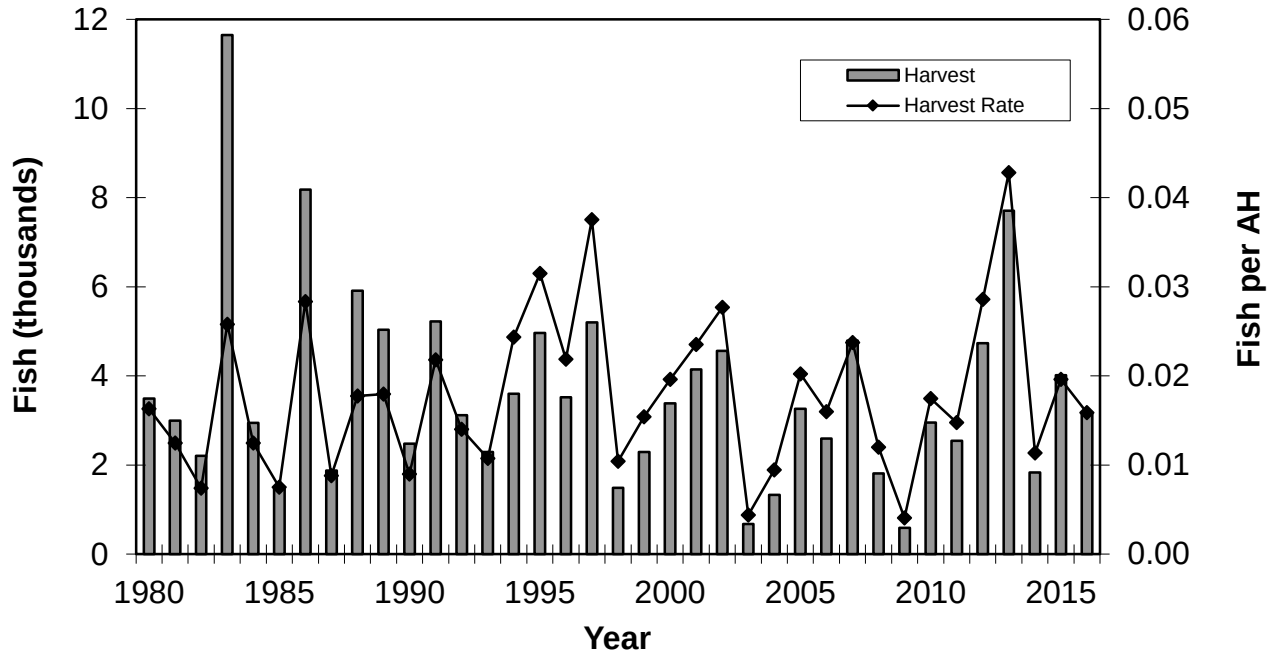


**Figure 5. Coho Salmon harvest and harvest rate in the Lake Superior summer creel survey, 1980-2016.**

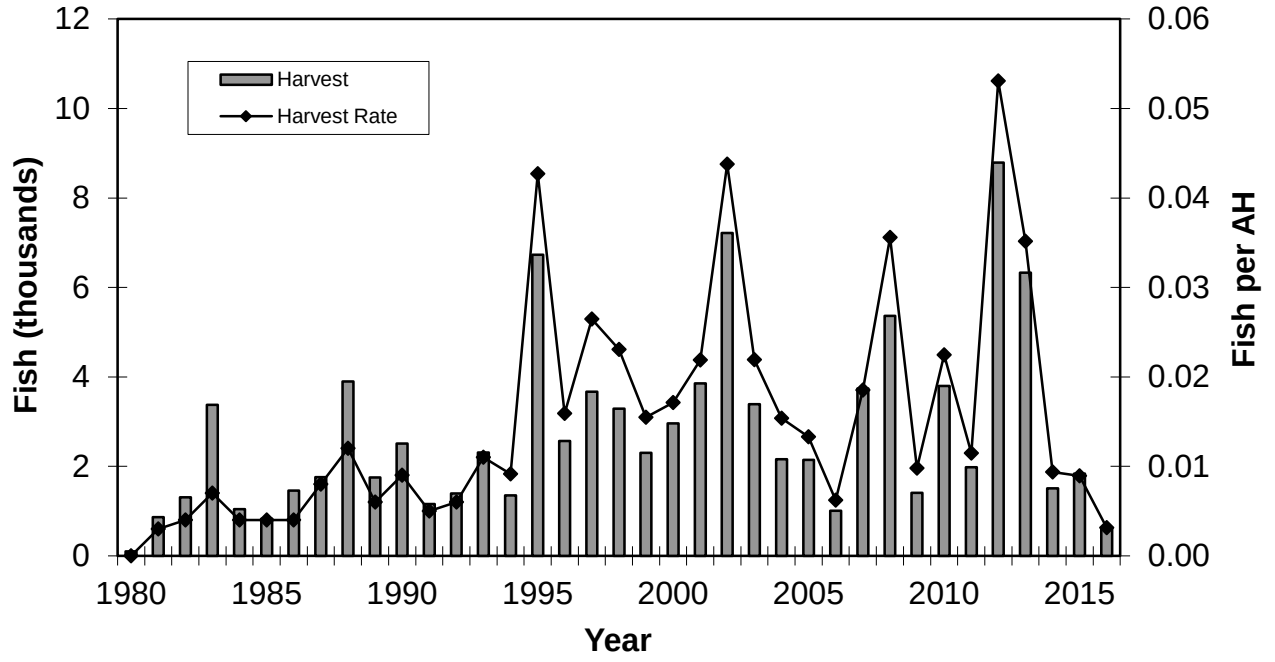


**Figure 6. Chinook Salmon harvest and harvest rate in the Lake Superior summer creel survey, 1980-2016.**