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

**COMPLETION REPORT  
LAKE SUPERIOR SUMMER CREEL SURVEY**

**2013**

by

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## **Abstract**

Fishing pressure in the Minnesota waters of Lake Superior in the summer creel survey for 2013 was 180,072 angler-hours (AH), an increase from 165,600 AH in 2012. Boat anglers accounted for 99.3% of the pressure and shore anglers accounted for 0.7% of the pressure. Boat fishing pressure was greatest in the Duluth Cluster in August, and shore fishing was greatest in the Grand Marais Cluster in June. Spring and early summer fishing pressure was suppressed by the cold spring, especially at the two northern-most Clusters.

Anglers caught 40,340 salmonids, of which 35,912 were harvested. Anglers caught 3.6% more salmonids than in 2012. Salmonid catch and harvest rates in 2013 were 0.224 and 0.1994 fish per AH, respectively, which were slightly less than the high rates observed in 2012.

Anglers caught 23,690 Lake Trout, of which 20,965 were harvested. Lake Trout accounted for 58.7% of all salmonids caught and 58.4% of all salmonids harvested. Wild fish comprised 82.6% of the harvested Lake Trout, down about 5% from 2012, possibly due to the higher proportion of fish caught near Duluth, where Lake Trout were stocked. Anglers caught 0.1316 and released 0.0151 Lake Trout per AH. Anglers harvested 0.1164 Lake Trout per AH, which was similar to catch rates in 2012. Cool water temperatures and bad weather reduced angler effort and Lake Trout catches at the northern-most stations.

Coho, Chinook and Pink Salmon, and steelhead Rainbow Trout also contributed to the 2013 summer Lake Superior fishery. Anglers harvested 7,707 Coho Salmon at a rate of 0.0428 fish per angler hour, which was 50% higher than the rate of 0.0286 in 2012. Anglers harvested 6,312 Chinook Salmon at a rate of 0.0351 fish per angler hour, which was slightly lower than the rate of 0.0531 fish per AH. The Chinook Salmon were 2 inches longer on average in 2013 than in 2012. Anglers harvested 230 Pink Salmon, which was lower than a high harvest of 933 fish in 2012. Anglers also kept 224 and released 1,139 steelhead.

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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 this century, Lake Trout was the mainstay of the Lake Superior sport fishery and, along with Cisco (*Coregonus artedii*), supported an important commercial fishery. By the late 1940s the Lake Trout harvest began to decline as a result of overfishing (Hansen et al. 1996). 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 Pacific salmon species to diversify the fishery. Creel surveys have been used to monitor the recreational fishery in Minnesota waters of Lake Superior for more than 40 years. Creel surveys during the summer months have been conducted annually since 1969. This report presents results from Minnesota's 2013 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 formulae used are given in Bindman and Mach (1997), and more detail of the design of the Lake Superior summer creel survey is given in Halpern (1995a,b). The survey included boaters from charters, public accesses, and marinas. Previous creel surveys have been conducted from the Memorial Day weekend through September 30. However, a regulation change that extended the Lake Trout season through the first full weekend in October was requested by anglers and took effect in 2011. Spring arrived late in 2013, which delayed fishing through May. Thus, the 2013 survey began on June 5 and ended on October 6. October data are included in the September estimates. Clusters and stations visited by creel clerks are described in Table 1. Clusters 1 and 2 comprise the Lower Shore, and Clusters 3 and 4 comprise the Upper Shore. The general mechanics of the creel survey are discussed in detail in Halpern (2003).

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 during 2006-2010. References to 2012 creel numbers are from Reeves and Blankenheim (2013).

## **Results and Discussion**

### Fishing Effort

Estimates of fishing pressure by anglers using Minnesota accesses or fishing from the Minnesota shoreline were made from 527 activity counts for the Lower Shore and 477 activity counts for the Upper Shore. Angling effort along the North Shore was measured on 108 days (Table 2). The estimated total fishing pressure for Minnesota waters of Lake Superior during the 2013 summer creel survey was 186,339 angler-hours (AH), which includes 180,072 (AH) from Minnesota-based anglers and 6,267 AH from Wisconsin-based anglers (WIDNR

data). Effort in 2013 increased 9% from 2012 (Table 3; Figure 1). Since 1994, fishing pressure has varied between about 138,000 and 180,000 AH (Figure 1) except for 2007 when fishing pressure exceeded 202,000 AH. Fishing pressure in the Lower Shore accounted for 72.8% of total Minnesota summer angling effort on Lake Superior (Table 3). In 2012, the Lower Shore accounted for just 63.6% of the overall effort, which reflected the effects of localized flooding in 2012.

Lake Superior boat anglers accounted for 99.3% of the pressure and shore anglers accounted for 0.7% of the pressure. Summer boat pressure was greatest in the Duluth cluster (Cluster 1) and lowest in the Grand Marais cluster (Cluster 4). Monthly boat pressure was greatest in Cluster 1 in June, shifted to Cluster 2 in July, was similar between Clusters 1 and 2 in August, then switched back to Cluster 1 in September (Table 3). Boating pressure at the northern-most stations were relatively low and were likely influenced by the late spring and by foggy and windy summer weather.

The 2013 shore angling pressure was 1,330 AH (Table 3), which is a 7% decrease from the 2012 shore pressure of 1,430 AH. Shore angling continues to make up just a small fraction of angling effort during the summer on Lake Superior. The highest shore angling pressure (53.4%) was observed at Grand Marais in Cluster 4 (Table 4). Fishing pressure at the Two Harbors breakwall in Cluster 2 did not rebound to previously higher levels in 2011 and earlier.

## Catch and Catch Rates

### Salmonids

Anglers caught 40,340 salmonids in 2013, which was 3.8% higher than the total catch of 38,876 salmonids in 2012. Anglers released 11.0% of their catch (Table 5). The salmonid catch rate in 2013 was 0.224 fish per AH and the salmonid harvest rate was 0.1994 fish per AH (Table 6). These rates were

slightly lower than in 2012 and were near the highest rates recorded for creel surveys on the Minnesota portion of Lake Superior (Figure 2). Wisconsin anglers kept an additional 711 salmonids (WIDNR data).

### Lake Trout

Anglers caught 23,690 Lake Trout in 2013, a 9.2% increase from 2012, yet still well below the 32,141 Lake Trout that were caught in 2011. Anglers also released 2,725 fish, or 11.0% of the Lake Trout catch (Table 5). The Lake Trout harvest level of 20,965 fish was similar to harvests that occurred in 1999-2003 (Figure 3). Lake Trout accounted for 58.7% of all salmonids caught and 58.4% of all salmonids harvested. Seventy percent of the Lake Trout harvested were caught in the Lower Shore area. The catch rate (harvest and release) for Lake Trout taken by all anglers was 0.132 fish per AH; and the Lake Trout harvest rate was 0.116 fish per AH (Table 6).

An additional 225 Lake Trout were harvested in Minnesota waters in 2013 by Wisconsin-based anglers (WIDNR data). The Lake Trout harvest rate for Wisconsin-based anglers was 0.038 fish per AH, which was lower than in 2012. Wisconsin-based anglers caught Lake Trout at a lower rate than Minnesota anglers fishing the same area, Cluster 1, which was 0.1354 fish per AH (Table 6). This may occur 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. Among Minnesota boating parties, 55.8% caught one or more Lake Trout, 38.4% caught two or more, and 26.3% caught at least three Lake Trout per trip (Table 7).

Most harvested Lake Trout were between 18.5 and 26.4 inches in length; however, 5.0% were longer than 29.4 inches. The average length of harvested Lake Trout in 2013 was 22.8 in (Table 8) and the average length released was 23.0 inches (Table 9). Anglers released 14.6% of Lake Trout that were 25 inches or longer (Table 9). The average weight of harvested Lake Trout was

4.14 lb. (Table 10), which is a 16% increase from 2012. The average weight of harvested Lake Trout on the Upper Shore, 4.42 lb., was greater than on the Lower Shore, 4.10 lb. (Table 10). Lake Trout yield in the sport fishery increased by 24.6% from 71,256 lb. in 2012 to 88,799 lb. in 2013 (Table 11). Lake Trout yield increased from 2012 to 2013, due to a higher average weight in 2013 and a slight increase in the numbers caught.

The age distribution of harvested Lake Trout was determined for both stocked and wild Lake Trout combined. Seven and eight year old Lake Trout made up the highest proportions of Lake Trout harvested. Seven, eight, nine and ten-year old age-classes each comprised at least 10% of the harvest. (Table 12). Older Lake Trout, at least nine years old, made up 56.2% of the harvest by number, which is more than double the pre-1987 values. The increase of older fish in the harvest and the presence of several large year classes are positive signs that continue to reflect a rehabilitated Lake Trout fishery.

In 2013, creel clerks checked 590 Lake Trout for fin clips and found that 82.6% of harvested Lake Trout were unclipped, indicating that the fish were wild. This was the second-highest percentage observed since Lake Trout rehabilitation efforts began (Figure 4); the percentage was higher only in 2012. The highest percentage of wild Lake Trout, 100%, was observed in Cluster 4. The lowest percentage of wild Lake Trout, 76.8%, was observed in Cluster 1, where stocking continues. Lake Trout stocking was discontinued in statistical district MN-3 in 2003 and in MN-2 in 2007. In MN-2 and MN-3 the criteria 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) to discontinue stocking were met.

#### Siscowet

Siscowet Lake Trout (deepwater form) have generally contributed little

to the sport fishery. In 2013, 97 siscowet were kept, all from the Upper Shore Cluster. Only 0.4% of boat angling parties caught one or more siscowet (Table 7). Wisconsin anglers reported keeping 12 siscowet in 2013.

#### Coho Salmon

Anglers kept 7,707 and released 163 Coho Salmon in 2013 (Table 5). The catch increased by 63% from 2012. Angler harvested Coho Salmon at a rate of 0.0428 fish per AH in 2013 (Table 6), which was 50% greater than the rate of 0.0286 fish per AH in 2012. Most Coho Salmon were caught in Cluster 2 and only 447 Coho Salmon were caught in Cluster 4. This represents a shift in Coho Salmon to the Lower Shore area between 2012 and 2013. Among boating parties, 24.2% caught one or more Coho Salmon, and 13.2% caught two or more Coho Salmon (Table 7). Wisconsin anglers harvested 272 Coho Salmon in Minnesota waters in 2013, which is an order-of-magnitude increase from the harvest of 21 Coho Salmon in 2012. The average length of Coho Salmon harvested in Minnesota waters of Lake Superior in 2013 was 18.2 in (Table 8), which was about 1.4 inches shorter than the average length of 19.6 inches in 2012, and the average weight decreased from 2.24 lb. in 2012 to 1.78 lb. in 2013 (Table 10). The Coho Salmon yield in 2013 was 13,964 lb. (Table 11), which is up slightly from 10,676 lb. in 2012 and substantially higher than 5,204 lb. in 2011. The harvest of Coho Salmon has varied considerably among years (Figure 5). These variations reflect natural fluctuations in year-class strength. All agencies discontinued Coho Salmon stocking programs on Lake Superior, and most Coho Salmon harvested in Minnesota are the result of natural reproduction in other jurisdictions on Lake Superior (Schreiner et al. 2006).

#### Chinook Salmon

Anglers caught 6,555 Chinook Salmon in 2013 (Table 5), which was a

decrease of 42% from the peak catch in 2012 (Figure 6). The catch was distributed somewhat evenly between the Lower and Upper Shore areas in 2013. Creel clerks examined 215 fish for stocking clips and nearly all (99%) were unclipped, which indicates that Chinook Salmon stocking in other jurisdictions contributes little to the Minnesota Salmon fishery.

The overall 2013 summer catch rate for Chinook Salmon taken by all anglers was 0.0364 fish per AH, a 35% decrease from 0.0562 fish per AH in 2012 (Table 6). In 2013, catch rates for Chinook Salmon were substantially higher in the Upper Shore, at 0.0729 fish per AH, than in the Lower Shore, at 0.0228 fish per AH. Wisconsin anglers harvested an additional 178 Chinook Salmon in Minnesota waters in 2013, which was about twice as much as their harvest of 94 Chinook Salmon in 2012. The 2013 Chinook Salmon harvest rate for Wisconsin anglers was 0.03 fish per AH (WIDNR data). Among Minnesota boating parties, 33.3% caught one or more Chinook Salmon, 15.4% caught two or more, and 7.5% caught three or more Chinook Salmon per trip (Table 7).

The mean length of harvested Chinook Salmon in 2013 was 22.3 inches (Table 8), which was about 2 inches longer than in 2012. Their average weight increased to 3.60 lb. (Table 10). The yield of Chinook Salmon in 2013 was 22,930 lb., which was almost as high as the highest yield on record of 23,354 lb. in 2012.

#### Rainbow Trout

Minnesota-based anglers caught 1,363 steelhead (anadromous Rainbow Trout) in 2013 (Table 5), which was virtually identical to their catch of 1,362 steelhead in 2012. The largest steelhead catches occurred in Clusters 2 and 3 (Table 5). Anglers kept 224 steelhead in the summer of 2013.

#### Pink Salmon

Anglers caught 364 Pink Salmon in 2013 (Table 5). Pink Salmon catches

fluctuate considerably over time. The Pink Salmon catch generally increased until 2006, when 2,500 fish were caught. The catch and harvest declined until only 120 Pink Salmon were caught in 2008 and none were caught in 2009. Catches increased again in 2010 and have declined since. In 2013, the average length of Pink Salmon was 15.3 inches (Table 8) and the average weight was 0.99 lb. (Table 10). The 2013 Pink Salmon yield was 187 lb. All Pink Salmon in Lake Superior are a result of natural reproduction (Schreiner et al. 2006).

#### Other Species

Other species are sometimes caught in low numbers during the summer creel survey. In 2013, anglers reported keeping six Brown Trout and six Kamloops Trout and releasing two Brook Trout. Catch data for these infrequently-caught species were combined and reported as Other Salmonids, for a total catch of 285 fish. The combined catch rate was estimated at 0.00212 fish per AH. Minnesota anglers also harvested 135 Walleyes (Table 5). Wisconsin-based anglers caught an estimated 23 Brown Trout, 1 Rainbow Trout, and 34 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 of the fishery among Lake Superior fisheries management agencies. The fishery was affected by cold spring weather in all areas and by adverse summer weather in the Upper Shore area. Despite adverse weather conditions, overall fishing success as measured by catch rate in the 2013 Lake Superior creel survey remained near all-time highs. The Lake Trout yield remained high from 2012 to 2013, however the catch and catch rates remained at the lower levels observed in 2012. Of interest in 2014 and beyond is determining the stability of Lake Trout yield in Minnesota waters of Lake Superior. Stocked Lake Trout accounted for about 17.4% of the yield in 2013, probably due to an early summer shift in angler effort toward warmer water near Duluth, which typically contains a higher percentage of stocked Lake Trout. Coho Salmon catch in 2013 was almost twice that in 2012. Chinook Salmon catch decreased 35% from 2012 to 2013, but average size increased and the yield increased. Over the past two years the combined catch of Coho and Chinook Salmon has approached all-time highs. It appears that in recent years when Pacific salmon abundance is high some anglers may increase effort targeted at salmon and decrease effort targeted at Lake Trout.

## **Acknowledgements**

Phil Kunze and Chris Sundmark collected and entered the data and Don Schreiner reviewed the manuscript.

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by

Keith A. Reeves

Approved: \_\_\_\_\_  
Area Supervisor Date

Approved: \_\_\_\_\_  
Regional Fisheries Approval Date

Table 1. Creel survey clusters and stations, 2013 Lake Superior summer creel survey.

| Cluster                          | Station | Description                                                        |
|----------------------------------|---------|--------------------------------------------------------------------|
| Lower Shore                      |         |                                                                    |
| 1 - Duluth                       | 1       | Charter Dock                                                       |
|                                  | 2       | Lakehead Boat Basin                                                |
|                                  | 3       | Rice's Point Landing                                               |
| 2 - McQuade Access - Two Harbors | 4       | McQuade Public Access                                              |
|                                  | 5       | Knife River - Knife River Marina                                   |
|                                  | 6       | Two Harbors - Agate Bay Access                                     |
| Upper Shore                      |         |                                                                    |
| 3 - Twin Points – Tofte          | 7       | Twin Points Access                                                 |
|                                  | 8       | Silver Bay Access and Marina                                       |
|                                  | 9       | Taconite Harbor Access, Temperance and Cross Rivers, Tofte Landing |
| 4 - Grand Marais – 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 for each cluster and day type in the 2013 Lake Superior summer creel survey.

| Cluster                    | Daytype | Days Visited | Activity Counts | Days With Fishing Interviews |       | Number of Interviews <sup>1</sup> |       |
|----------------------------|---------|--------------|-----------------|------------------------------|-------|-----------------------------------|-------|
|                            |         |              |                 | Boat                         | Shore | Boat                              | Shore |
| 1 – Duluth                 | Weekday | 30           | 180             | 25                           | 0     | 96                                | 0     |
|                            | Weekend | 24           | 144             | 23                           | 0     | 82                                | 0     |
|                            | Total   | 54           | 324             | 48                           | 0     | 178                               | 0     |
| 2 – McQuade – Two Harbors  | Weekday | 20           | 120             | 19                           | 2     | 116                               | 7     |
|                            | Weekend | 14           | 83              | 13                           | 0     | 97                                | 0     |
|                            | Total   | 34           | 203             | 32                           | 2     | 213                               | 7     |
| 3 – Twin Points – Tofte    | Weekday | 28           | 168             | 21                           | 6     | 83                                | 6     |
|                            | Weekend | 25           | 144             | 20                           | 7     | 96                                | 10    |
|                            | Total   | 53           | 312             | 41                           | 13    | 179                               | 16    |
| 4 – Grand Marais - Hovland | Weekday | 19           | 95              | 14                           | 14    | 82                                | 21    |
|                            | Weekend | 14           | 70              | 8                            | 10    | 85                                | 14    |
|                            | Total   | 33           | 165             | 22                           | 24    | 167                               | 35    |
| Lower Shore                | Weekday | 50           | 300             | 44                           | 2     | 212                               | 7     |
|                            | Weekend | 38           | 227             | 36                           | 0     | 179                               | 0     |
|                            | Total   | 88           | 527             | 80                           | 2     | 391                               | 7     |
| Upper Shore                | Weekday | 47           | 263             | 35                           | 20    | 165                               | 27    |
|                            | Weekend | 33           | 214             | 28                           | 17    | 181                               | 24    |
|                            | Total   | 80           | 477             | 63                           | 37    | 346                               | 51    |
| Total                      | Weekday | 70           | 563             | 60                           | 22    | 377                               | 34    |
|                            | Weekend | 38           | 441             | 36                           | 17    | 360                               | 24    |
|                            | Total   | 108          | 1004            | 96                           | 39    | 737                               | 58    |

<sup>1</sup> 3 angling parties refused to be interviewed.

Table 3. Fishing pressure estimates, in angler-hours<sup>1</sup>, 2013 Lake Superior summer creel survey<sup>2</sup>. SE in parentheses.

| Cluster                    | Boat Anglers      |                   |                   |                   |                    | Shore Anglers <sup>3</sup> |              |             |             |                | All Anglers       |                   |                   |                   |                    |
|----------------------------|-------------------|-------------------|-------------------|-------------------|--------------------|----------------------------|--------------|-------------|-------------|----------------|-------------------|-------------------|-------------------|-------------------|--------------------|
|                            | June              | July              | Aug               | Sept              | Summer             | June                       | July         | Aug         | Sept        | Summer         | June              | July              | Aug               | Sept              | Summer             |
| 1-Duluth                   | 16,787<br>(2,140) | 12,309<br>(1,758) | 26,993<br>(3,713) | 13,457<br>(2,271) | 69,545<br>(5,159)  | 0                          | 0            | 0           | 0           | 0              | 16,787<br>(2,140) | 12,309<br>(1,758) | 26,993<br>(3,713) | 13,457<br>(2,271) | 69,545<br>(5,159)  |
| 2-McQuade-<br>Two Harbors  | 8,229<br>(3,716)  | 16,955<br>(3,742) | 26,143<br>(2,431) | 9,888<br>(2,217)  | 61,216<br>(6,184)  | 54<br>(54)                 | 264<br>(264) | 0<br>(0)    | 91<br>(68)  | 409<br>(278)   | 8,283<br>(3,700)  | 17,219<br>(3,996) | 26,143<br>(2,431) | 9,979<br>(2,115)  | 61,624<br>(6,327)  |
| 3-Twin Points-Tofte        | 1,293<br>(312)    | 8,721<br>(1,475)  | 15,538<br>(2,182) | 9,181<br>(2,231)  | 34,734<br>(3,465)  | 64<br>(48)                 | 18<br>(18)   | 30<br>(23)  | 100<br>(45) | 211<br>(72)    | 1,357<br>(333)    | 8,739<br>(1,465)  | 15,568<br>(2,176) | 9,280<br>(2,225)  | 34,945<br>(3,456)  |
| 4-Grand Marais-<br>Hovland | 532<br>(232)      | 2,819<br>(890)    | 7,371<br>(1,180)  | 2,525<br>(749)    | 13,247<br>(1,673)  | 272<br>(150)               | 234<br>(128) | 103<br>(25) | 101<br>(42) | 710<br>(203)   | 815<br>(255)      | 3,023<br>(96)     | 7,491<br>(1,201)  | 2,656<br>(780)    | 13,957<br>(1,748)  |
| Lower Shore                | 25,016<br>(4,288) | 29,264<br>(4,135) | 53,136<br>(4,438) | 23,345<br>(3,112) | 130,761<br>(8,054) | 54<br>(54)                 | 264<br>(264) | 0<br>(0)    | 91<br>(68)  | 409<br>(278)   | 25,070<br>(4,274) | 29,528<br>(4,365) | 53,136<br>(4,438) | 23,436<br>(3,104) | 131,169<br>(8,164) |
| Upper Shore                | 1,825<br>(389)    | 11,540<br>(1,722) | 22,910<br>(2,481) | 11,705<br>(2,353) | 47,981<br>(3,848)  | 336<br>(157)               | 252<br>(129) | 133<br>(34) | 200<br>(61) | 921<br>(215)   | 2,161<br>(415)    | 11,793<br>(1,766) | 23,042<br>(2,482) | 11,905<br>(2,355) | 48,902<br>(3,873)  |
| Total Shore                | 26,842<br>(4,306) | 40,804<br>(4,479) | 76,045<br>(5,084) | 35,051<br>(3,901) | 178,743<br>(8,926) | 390<br>(166)               | 516<br>(294) | 133<br>(34) | 291<br>(92) | 1,330<br>(352) | 27,232<br>(4,294) | 41,320<br>(4,709) | 76,178<br>(5,085) | 35,342<br>(3,896) | 180,072<br>(9,036) |

<sup>1</sup> Estimates were rounded to the nearest whole number. Therefore, totals might not equal the sum of the individual estimates.

<sup>3</sup> Wisconsin anglers fished an additional 6,627 hours on the Minnesota waters of Lake Superior.

<sup>3</sup> All shore fishing in Cluster 1 occurs in the St. Louis Estuary and not in Lake Superior.

Table 4. Monthly distribution of fishing pressure, as a percentage of angler-hours<sup>1</sup>, 2013 Lake Superior summer creel survey. SE in parentheses.

| Cluster                | Station | Boat Anglers |      |      |      |        | Shore Anglers <sup>2</sup> |      |      |      |        | All Anglers |      |      |      |        |
|------------------------|---------|--------------|------|------|------|--------|----------------------------|------|------|------|--------|-------------|------|------|------|--------|
|                        |         | June         | July | Aug  | Sept | Summer | June                       | July | Aug  | Sept | Summer | June        | July | Aug  | Sept | Summer |
| 1-Duluth               |         | 62.5         | 30.2 | 35.5 | 38.4 | 38.9   | 0                          | 0    | 0    | 0    | 0      | 61.6        | 29.8 | 35.4 | 38.1 | 38.6   |
|                        | 1       | 40.7         | 17.6 | 22.2 | 27.2 | 24.9   | 0                          | 0    | 0    | 0    | 0      | 40.1        | 17.4 | 22.1 | 27.0 | 24.7   |
|                        | 2       | 7.6          | 7.6  | 10.8 | 10.5 | 9.5    | 0                          | 0    | 0    | 0    | 0      | 7.5         | 7.5  | 10.8 | 10.4 | 9.5    |
|                        | 3       | 14.3         | 5.0  | 2.6  | 0.7  | 4.5    | 0                          | 0    | 0    | 0    | 0      | 14.1        | 4.9  | 2.6  | 0.7  | 4.5    |
| 2-McQuade-Two Harbors  |         | 30.7         | 41.6 | 34.4 | 28.2 | 34.2   | 13.8                       | 51.2 | 0    | 31.3 | 30.8   | 30.4        | 41.7 | 34.3 | 28.2 | 34.2   |
|                        | 4       | 20.5         | 14.9 | 10.9 | 7.8  | 12.7   | 13.8                       | 51.2 | 0    | 31.3 | 30.7   | 20.4        | 15.3 | 10.9 | 8.0  | 12.8   |
|                        | 5       | 8.0          | 17.2 | 12.4 | 9.7  | 12.3   | 0                          | 0    | 0    | 0    | 0      | 7.9         | 17.0 | 12.4 | 9.6  | 12.2   |
|                        | 6       | 2.1          | 9.5  | 11.1 | 10.7 | 9.3    | 0                          | 0    | 0    | 0    | 0      | 2.1         | 9.3  | 11.1 | 10.6 | 9.2    |
| 3-Twin Points-Tofte    |         | 4.8          | 21.4 | 20.4 | 26.2 | 19.4   | 16.4                       | 3.5  | 22.6 | 34.0 | 15.9   | 5.0         | 21.1 | 20.4 | 26.3 | 19.4   |
|                        | 7       | 0.7          | 1.9  | 4.4  | 3.2  | 3.0    | 0                          | 3.5  | 0    | 7.6  | 3.0    | 0.7         | 1.9  | 4.4  | 3.2  | 3.0    |
|                        | 8       | 2.3          | 11.6 | 8.4  | 11.2 | 8.7    | 0                          | 0    | 0    | 0    | 0      | 2.3         | 11.4 | 8.4  | 11.1 | 8.7    |
|                        | 9       | 1.8          | 7.9  | 7.6  | 11.8 | 7.7    | 16.4                       | 0    | 22.6 | 26.6 | 12.9   | 2.0         | 7.8  | 7.7  | 12.0 | 7.7    |
| 4-Grand Marais-Hovland |         | 2.0          | 6.9  | 9.7  | 7.2  | 7.4    | 69.7                       | 45.3 | 77.4 | 34.7 | 53.4   | 3.0         | 7.4  | 9.8  | 7.4  |        |
|                        | 10      | 1.3          | 6.0  | 8.1  | 4.8  | 6.0    | 23.5                       | 45.3 | 77.4 | 34.7 | 39.8   | 1.6         | 6.5  | 8.2  | 5.0  | 6.2    |
|                        | 11      | 0.7          | 0.9  | 1.6  | 2.4  | 1.4    | 46.2                       | 0    | 0    | 0    | 13.6   | 1.4         | 0.8  | 1.6  | 2.4  | 1.5    |
| Lower Shore            |         | 93.2         | 71.7 | 69.9 | 66.6 | 73.2   | 13.8                       | 51.2 | 0    | 31.3 | 30.8   | 92.1        | 71.5 | 69.8 | 66.3 | 72.8   |
| Upper Shore            |         | 6.8          | 28.3 | 30.1 | 33.4 | 26.8   | 86.2                       | 48.8 | 100  | 68.7 | 69.2   | 7.9         | 28.5 | 30.2 | 33.7 | 27.2   |

<sup>1</sup> Estimates have been rounded to the nearest whole number. Therefore, totals might not equal the sum of the individual estimates.

<sup>2</sup> All shore fishing in Cluster 1 occurs in the St. Louis Estuary and not in Lake Superior.

Table 5. Catch estimates<sup>1</sup> for boat and shore anglers combined, 2013 Lake Superior summer creel survey. SE in parentheses.

|                                |           | Lake Trout        | Coho Salmon      | Chinook Salmon | Steelhead      | Siscowet   | Pink Salmon  | Other Salmonids | Total Salmonids   | Walleye     |
|--------------------------------|-----------|-------------------|------------------|----------------|----------------|------------|--------------|-----------------|-------------------|-------------|
| <b>1- Duluth</b>               |           |                   |                  |                |                |            |              |                 |                   |             |
|                                | Harvested | 9,363<br>(983)    | 2,025<br>(424)   | 1,853<br>(202) | 25<br>(15)     | 0<br>(0)   | 0<br>(0)     | 83<br>(55)      | 13,475<br>(1,097) | 135<br>(60) |
|                                | Released  | 57<br>(37)        | 11<br>(11)       | 64<br>(47)     | 187<br>(56)    | 0<br>(0)   | 0<br>(0)     | 0<br>(0)        | 319<br>(82)       | 0<br>(0)    |
|                                | Total     | 9,420<br>(984)    | 2,036<br>(424)   | 1,917<br>(208) | 212<br>(58)    | 0<br>(0)   | 0<br>(0)     | 83<br>(55)      | 13,794<br>(1,100) | 135<br>(60) |
| <b>2- McQuade-Two Harbors</b>  |           |                   |                  |                |                |            |              |                 |                   |             |
|                                | Harvested | 5,236<br>(1,301)  | 3,516<br>(1,191) | 1,029<br>(265) | 119<br>(88)    | 0<br>(0)   | 0<br>(0)     | 150<br>(157)    | 10,050<br>(1,793) | 0<br>(0)    |
|                                | Released  | 979<br>(499)      | 103<br>(60)      | 46<br>(30)     | 355<br>(122)   | 0<br>(0)   | 28<br>(30)   | 0<br>(0)        | 1,511<br>(519)    | 0<br>(0)    |
|                                | Total     | 6,215<br>(1,394)  | 3,619<br>(1,192) | 1,075<br>(266) | 474<br>(150)   | 0<br>(0)   | 28<br>(30)   | 150<br>(157)    | 11,561<br>(1,866) | 0<br>(0)    |
| <b>3- Twin Points - Tofte</b>  |           |                   |                  |                |                |            |              |                 |                   |             |
|                                | Harvested | 4,728<br>(881)    | 1,719<br>(372)   | 2,206<br>(351) | 18<br>(13)     | 88<br>(92) | 189<br>(74)  | 9<br>(9)        | 8,957<br>(1,025)  | 0<br>(0)    |
|                                | Released  | 1,058<br>(421)    | 18<br>(13)       | 105<br>(70)    | 406<br>(108)   | 0<br>(0)   | 97<br>(66)   | 11<br>(19)      | 1,695<br>(446)    | 0<br>(0)    |
|                                | Total     | 5,786<br>(976)    | 1,737<br>(372)   | 2,311<br>(358) | 424<br>(109)   | 88<br>(92) | 286<br>(100) | 20<br>(21)      | 10,652<br>(1,118) | 0<br>(0)    |
| <b>4- Grand Marais-Hovland</b> |           |                   |                  |                |                |            |              |                 |                   |             |
|                                | Harvested | 1,638<br>(321)    | 447<br>(135)     | 1,224<br>(222) | 62<br>(34)     | 9<br>(10)  | 41<br>(30)   | 9<br>(7)        | 3,430<br>(416)    | 0<br>(0)    |
|                                | Released  | 631<br>(194)      | 31<br>(33)       | 28<br>(17)     | 191<br>(63)    | 0<br>(0)   | 9<br>(7)     | 13<br>(20)      | 903<br>(208)      | 0<br>(0)    |
|                                | Total     | 2,269<br>(375)    | 478<br>(139)     | 1,252<br>(223) | 253<br>(71)    | 9<br>(10)  | 50<br>(31)   | 22<br>(21)      | 4,333<br>(465)    | 0<br>(0)    |
| <b>Lower Shore</b>             |           |                   |                  |                |                |            |              |                 |                   |             |
|                                | Harvested | 14,599<br>(1,631) | 5,541<br>(1,264) | 2,882<br>(333) | 144<br>(89)    | 0<br>(0)   | 0<br>(0)     | 243<br>(166)    | 23,525<br>(2,102) | 0<br>(0)    |
|                                | Released  | 1,036<br>(500)    | 114<br>(61)      | 110<br>(55)    | 542<br>(134)   | 0<br>(0)   | 28<br>(30)   | 0<br>(0)        | 1,830<br>(525)    | 135<br>(60) |
|                                | Total     | 15,635<br>(1,706) | 5,655<br>(1,266) | 2,992<br>(338) | 686<br>(161)   | 0<br>(0)   | 28<br>(30)   | 243<br>(166)    | 25,355<br>(2,166) | 135<br>(60) |
| <b>Upper Shore</b>             |           |                   |                  |                |                |            |              |                 |                   |             |
|                                | Harvested | 6,366<br>(938)    | 2,166<br>(395)   | 3,430<br>(415) | 80<br>(37)     | 97<br>(92) | 230<br>(80)  | 18<br>(18)      | 12,387<br>(1,106) | 0<br>(0)    |
|                                | Released  | 1,689<br>(464)    | 49<br>(35)       | 133<br>(71)    | 597<br>(125)   | 0<br>(0)   | 106<br>(67)  | 24<br>(30)      | 2,598<br>(492)    | 0<br>(0)    |
|                                | Total     | 8,055<br>(1,046)  | 2,215<br>(397)   | 3,563<br>(421) | 677<br>(130)   | 97<br>(92) | 336<br>(104) | 42<br>(35)      | 14,985<br>(1,211) | 0<br>(0)    |
| <b>Total</b>                   |           |                   |                  |                |                |            |              |                 |                   |             |
|                                | Harvested | 20,965<br>(1,881) | 7,707<br>(1,325) | 6,312<br>(532) | 224<br>(96)    | 97<br>(92) | 230<br>(80)  | 261<br>(53)     | 35,912<br>(2,375) | 135<br>(60) |
|                                | Released  | 2,725<br>(682)    | 163<br>(70)      | 243<br>(90)    | 1,139<br>(183) | 0<br>(0)   | 134<br>(73)  | 24<br>(28)      | 4,428<br>(720)    | 0<br>(0)    |
|                                | Total     | 23,690<br>(2,001) | 7,870<br>(1,326) | 6,555<br>(540) | 1,363<br>(207) | 97<br>(92) | 364<br>(109) | 285<br>(170)    | 40,340<br>(2,482) | 135<br>(60) |

<sup>1</sup> Wisconsin anglers who fished Minnesota waters of Lake Superior also caught an estimated 225 Lake Trout, 12 Siscowet, 272 Coho Salmon, 178 Chinook Salmon, 1 Rainbow Trout, 23 Brown Trout, and 34 Walleyes.

Table 6. Catch rate (number of fish per hr) estimates for boat and shore anglers combined, 2013 Lake Superior summer creel survey. SE in parentheses.

|                                |           | Lake<br>Trout      | Coho<br>Salmon     | Chinook<br>Salmon   | Steelhead          | Siscowet           | Pink<br>Salmon     | Other<br>Salmonids | Total<br>Salmonids | Walleye            |
|--------------------------------|-----------|--------------------|--------------------|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| <b>1- Duluth</b>               |           |                    |                    |                     |                    |                    |                    |                    |                    |                    |
|                                | Harvested | 0.1346<br>(0.0173) | 0.0291<br>(0.0065) | 0.0266<br>(0.0035)  | 0.0004<br>(0.0002) | 0<br>(0)           | 0<br>(0)           | 0.0013<br>(0.0008) | 0.1938<br>(0.0213) | 0.0019<br>(0.0009) |
|                                | Released  | 0.0008<br>(0.0005) | 0.0002<br>(0.0002) | 0.0009<br>(0.0007)  | 0.0027<br>(0.0008) | 0<br>(0)           | 0<br>(0)           | 0<br>(0)           | 0.0046<br>(0.0012) | 0<br>(0)           |
|                                | Total     | 0.1354<br>(0.0174) | 0.0293<br>(0.0065) | 0.0276<br>(0.0036)  | 0.0030<br>(0.0009) | 0<br>(0)           | 0<br>(0.0)         | 0.0013<br>(0.0008) | 0.1983<br>(0.0216) | 0.0019<br>(0.0009) |
| <b>2- McQuade-Two Harbors</b>  |           |                    |                    |                     |                    |                    |                    |                    |                    |                    |
|                                | Harvested | 0.085<br>(0.0228)  | 0.0571<br>(0.0202) | .0167<br>(0.0046)   | 0.0019<br>(0.0014) | 0<br>(0)           | 0<br>(0)           | 0.0024<br>(0.0026) | 0.1631<br>(0.0334) | 0<br>(0)           |
|                                | Released  | .0159<br>(0.0083)  | 0.0017<br>(0.001)  | 0.0007<br>(0.0005)  | 0.0058<br>(0.0021) | 0<br>(0)           | 0.0005<br>(0.0005) | 0<br>(0)           | 0.0245<br>(0.0088) | 0<br>(0)           |
|                                | Total     | 0.1009<br>(0.0248) | 0.0587<br>(0.0202) | 0.0174<br>(0.0047)  | 0.0077<br>(0.0026) | 0<br>(0)           | 0.0005<br>(0.0005) | 0<br>(0.0)         | 0.1876<br>(0.0357) | 0<br>(0)           |
| <b>3- Twin Points - Tofte</b>  |           |                    |                    |                     |                    |                    |                    |                    |                    |                    |
|                                | Harvested | 0.1353<br>(0.0286) | 0.0492<br>(0.0117) | 0.0631<br>(0.0118)  | 0.0005<br>(0.0004) | 0.0025<br>(0.0026) | 0.0054<br>(0.0022) | 0.0003<br>(0.0)    | 0.2457<br>(0.0421) | 0<br>(0)           |
|                                | Released  | 0.0303<br>(0.0124) | 0.0005<br>(0.0004) | 0.003<br>(0.002)    | 0.0116<br>(0.0033) | 0<br>(0)           | 0.0028<br>(0.0019) | 0.0009<br>(0.0014) | 0.0647<br>(0.0168) | 0<br>(0)           |
|                                | Total     | 0.1656<br>(0.0325) | 0.0497<br>(0.0117) | 0.0661<br>(0.0122)  | 0.0121<br>(0.0033) | 0.0025<br>(0.0026) | 0.0082<br>(0.003)  | 0.0012<br>(0.0014) | 0.3104<br>(0.0501) | 0<br>(0)           |
| <b>4- Grand Marais-Hovland</b> |           |                    |                    |                     |                    |                    |                    |                    |                    |                    |
|                                | Harvested | 0.1173<br>(0.027)  | 0.032<br>(0.0104)  | 0.0877<br>(0.0191)  | 0.0044<br>(0.0025) | 0.0006<br>(0.0007) | 0.0029<br>(0.0022) | 0.0006<br>(0.0005) | 3,430<br>(416)     | 0<br>(0)           |
|                                | Released  | 0.0452<br>(0.0149) | 0.0022<br>(0.0024) | 0.002<br>(0.0012)   | 0.0137<br>(0.0048) | 0<br>(0)           | 0.0006<br>(0.0005) | 0<br>(0)           | 903<br>(208)       | 0<br>(0)           |
|                                | Total     | 0.1625<br>(0.0333) | 0.0342<br>(0.0108) | 0.0897<br>(0.0193)  | 0.0181<br>(0.0056) | 0.0006<br>(0.0007) | 0.0036<br>(0.0023) | 0.0006<br>(0.0005) | 4,333<br>(465)     | 0<br>(0)           |
| <b>Lower Shore</b>             |           |                    |                    |                     |                    |                    |                    |                    |                    |                    |
|                                | Harvested | 0.1113<br>(0.0142) | 0.0422<br>(0.01)   | 0.0220<br>(0.0029)  | 0.0011<br>(0.0011) | 0<br>(0)           | 0<br>(0)           | 0.0019<br>(0.0013) | 0.1793<br>(0.0194) | 0.0010<br>(0.0005) |
|                                | Released  | 0.0079<br>(0.0038) | 0.0009<br>(0.0005) | 0.0008<br>(0.0004)  | 0.0041<br>(0.0011) | 0<br>(0)           | 0.0002<br>(0.0002) | 0<br>(0)           | 0.014<br>(0.0041)  | 0<br>(0)           |
|                                | Total     | 0.1192<br>(0.0149) | 0.0431<br>(0.01)   | 0.0228<br>(0.0029)  | 0.0052<br>(0.0013) | 0<br>(0)           | 0.0002<br>(0.0002) | 0.0019<br>(0.0013) | 0.1933<br>(0.0203) | 0<br>(0)           |
| <b>Upper Shore</b>             |           |                    |                    |                     |                    |                    |                    |                    |                    |                    |
|                                | Harvested | 0.1302<br>(0.0217) | 0.0443<br>(0.0088) | 0.07801<br>(0.0101) | 0.0016<br>(0.0008) | 0.0020<br>(0.0019) | 0.0047<br>(0.0017) | 0.0004<br>(0.0002) | 0.2533<br>(0.0302) | 0<br>(0)           |
|                                | Released  | 0.0345<br>(0.099)  | 0.0010<br>(0.0007) | 0.0027<br>(0.0015)  | 0.0122<br>(0.0027) | 0<br>(0)           | 0.0022<br>(0.0014) | 0.0005<br>(0.0006) | 0.0531<br>(0.0109) | 0<br>(0)           |
|                                | Total     | 0.1647<br>(0.025)  | 0.0453<br>(0.0089) | 0.0729<br>(0.0104)  | 0.0138<br>(0.0029) | 0.002<br>(0.0019)  | 0.0069<br>(0.0022) | 0.0009<br>(0.0006) | 0.3064<br>(0.0346) | 0<br>(0)           |
| <b>Total</b>                   |           |                    |                    |                     |                    |                    |                    |                    |                    |                    |
|                                | Harvested | 0.1164<br>(0.0119) | 0.0428<br>(0.0077) | 0.0351<br>(0.0034)  | 0.0012<br>(0.0005) | 0.0005<br>(0.0005) | 0.0013<br>(0.0005) | 0.0014<br>(0.0009) | 0.1994<br>(0.0165) | 0.0007<br>(0.0003) |
|                                | Released  | 0.0151<br>(0.0039) | 0.0009<br>(0.0004) | 0.0013<br>(0.0005)  | 0.0063<br>(0.0011) | 0<br>(0)           | 0.0007<br>(0.0004) | 0.0007<br>(0.0004) | 0.0246<br>(0.0042) | 0<br>(0)           |
|                                | Total     | 0.1316<br>(0.0129) | 0.0437<br>(0.0077) | 0.0364<br>(0.0035)  | 0.0076<br>(0.0012) | 0.0005<br>(0.0005) | 0.002<br>(0.0006)  | 0.0021<br>(0.0009) | 0.224<br>(0.0177)  | 0.0007<br>(0.0003) |

Table 7. Percent of angling parties catching specific numbers of fish, 2013 Lake Superior summer creel survey.

| Number of Fish Caught | 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                     | 44.2       | 87.5  | 75.8        | 100   | 66.7           | 100   | 77.1      | 87.5  | 99.6     | 100   | 97.5        | 100   | 26.5            | 75    |
| 1                     | 17.4       | 0     | 11          |       | 17.9           |       | 8.4       | 12.5  | 0.2      |       | 1.8         |       | 15.3            | 0     |
| 2                     | 12.1       | 12.5  | 5.1         |       | 7.9            |       | 1.5       |       | 0        |       | 0.4         |       | 12.1            | 12.5  |
| 3                     | 7.1        |       | 2.7         |       | 4.0            |       | 0.5       |       | 0        |       | 0.3         |       | 10.8            | 12.5  |
| 4                     | 5.8        |       | 1.9         |       | 1.9            |       |           |       | 0.2      |       |             |       | 8.6             |       |
| 5                     | 3.3        |       | 1.4         |       | 0.8            |       |           |       |          |       |             |       | 5.5             |       |
| 6                     | 2.2        |       | 0.3         |       | 0.4            |       |           |       |          |       |             |       | 4.4             |       |
| 7                     | 1.4        |       | 0.3         |       | 0.3            |       |           |       |          |       |             |       | 2.9             |       |
| 8                     | 1.8        |       | 0.4         |       | 0.1            |       |           |       |          |       |             |       | 3.2             |       |
| 9                     | 1.1        |       | 0.4         |       |                |       |           |       |          |       |             |       | 2.1             |       |
| 10                    | 1          |       | 0.3         |       |                |       |           |       |          |       |             |       | 1.6             |       |
| 11                    | 0.8        |       | 0.3         |       |                |       |           |       |          |       |             |       | 2.1             |       |
| >=12                  | 1.8        |       | 0.1         |       |                |       |           |       |          |       |             |       | 4.9             |       |

Table 8. Length-frequency distribution of salmonid fish harvested by boat and shore anglers combined, 2013 Lake Superior summer creel survey.

| Length(in)          | N= | Lake<br>Trout | Coho<br>Salmon | Chinook<br>Salmon | Pink<br>Salmon | Steelhead |
|---------------------|----|---------------|----------------|-------------------|----------------|-----------|
|                     |    | 600           | 208            | 220               | 9              | 10        |
| 6.5 - 7.4           |    |               |                |                   |                |           |
| 7.5 - 8.4           |    |               |                |                   |                |           |
| 8.5 - 9.4           |    |               |                |                   |                |           |
| 9.5 - 10.4          |    |               |                |                   |                |           |
| 10.5 - 11.4         |    |               | 1              | 1                 |                |           |
| 11.5 - 12.4         |    |               | 1              |                   |                |           |
| 12.5 - 13.4         |    | 1             | 2              | 2                 | 1              |           |
| 13.5 - 14.4         |    |               | 5              | 3                 | 2              |           |
| 14.5 - 15.4         |    | 3             | 5              | 3                 | 2              |           |
| 15.5 - 16.4         |    | 7             | 12             | 3                 | 2              |           |
| 16.5 - 17.4         |    | 11            | 32             | 5                 | 2              |           |
| 17.5 - 18.4         |    | 32            | 49             | 4                 |                |           |
| 18.5 - 19.4         |    | 52            | 48             | 8                 |                |           |
| 19.5 - 20.4         |    | 56            | 35             | 15                |                |           |
| 20.5 - 21.4         |    | 76            | 12             | 29                |                |           |
| 21.5 - 22.4         |    | 61            | 3              | 26                |                |           |
| 22.5 - 23.4         |    | 72            | 2              | 42                |                |           |
| 23.5 - 24.4         |    | 56            | 1              | 36                |                | 2         |
| 24.5 - 25.5         |    | 37            |                | 17                |                | 2         |
| 25.5 - 26.4         |    | 43            |                | 16                |                | 1         |
| 26.5 - 27.4         |    | 29            |                | 6                 |                | 4         |
| 27.5 - 28.4         |    | 21            |                | 1                 |                | 1         |
| 28.5 - 29.4         |    | 11            |                |                   |                |           |
| 29.5 - 30.4         |    | 10            |                |                   |                |           |
| 30.5 - 31.4         |    | 7             |                | 1                 |                |           |
| 31.5 - 32.4         |    | 5             |                | 1                 |                |           |
| 32.5 - 33.4         |    | 1             |                |                   |                |           |
| 33.5 - 34.4         |    | 1             |                | 1                 |                |           |
| 34.5 - 35.4         |    | 2             |                |                   |                |           |
| 35.5 - 36.4         |    | 1             |                |                   |                |           |
| 36.5 - 37.4         |    | 2             |                |                   |                |           |
| 37.5 - 38.4         |    |               |                |                   |                |           |
| 38.5 - 39.4         |    | 1             |                |                   |                |           |
| 39.5 - 40.4         |    |               |                |                   |                |           |
| 40.5 - 41.4         |    |               |                |                   |                |           |
| Average Length (in) |    | 22.8          | 18.2           | 22.3              | 15.3           | 26.0      |

Table 9. Length-frequency distribution of salmonid fish released by boat and shore anglers combined, 2013 Lake Superior summer creel survey.

| Length(in)          | N = | Lake Trout<br>108 | Coho Salmon<br>4 | Chinook Salmon<br>8 | Pink Salmon<br>6 | Steelhead<br>54 |
|---------------------|-----|-------------------|------------------|---------------------|------------------|-----------------|
| 6.5 - 7.4           |     |                   |                  |                     |                  |                 |
| 7.5 - 8.4           |     |                   |                  |                     |                  |                 |
| 8.5 - 9.4           |     | 1                 |                  |                     |                  |                 |
| 9.5 - 10.4          |     |                   |                  |                     | 1                |                 |
| 10.5 - 11.4         |     |                   |                  |                     |                  |                 |
| 11.5 - 12.4         |     | 3                 |                  | 3                   |                  |                 |
| 12.5 - 13.4         |     |                   |                  |                     |                  |                 |
| 13.5 - 14.4         |     | 2                 |                  | 1                   | 1                |                 |
| 14.5 - 15.4         |     | 3                 |                  | 3                   | 3                | 1               |
| 15.5 - 16.4         |     | 5                 |                  | 1                   | 1                | 1               |
| 16.5 - 17.4         |     | 10                | 1                |                     |                  | 1               |
| 17.5 - 18.4         |     | 12                | 2                |                     |                  |                 |
| 18.5 - 19.4         |     | 3                 |                  |                     |                  |                 |
| 19.5 - 20.4         |     | 24                | 1                |                     |                  | 2               |
| 20.5 - 21.4         |     |                   |                  |                     |                  | 1               |
| 21.5 - 22.4         |     | 8                 |                  |                     |                  | 4               |
| 22.5 - 23.4         |     | 4                 |                  |                     |                  | 1               |
| 23.5 - 24.4         |     | 8                 |                  |                     |                  | 7               |
| 24.5 - 25.5         |     | 6                 |                  |                     |                  | 15              |
| 25.5 - 26.4         |     | 2                 |                  |                     |                  | 5               |
| 26.5 - 27.4         |     | 1                 |                  |                     |                  | 10              |
| 27.5 - 28.4         |     | 1                 |                  |                     |                  | 2               |
| 28.5 - 29.4         |     |                   |                  |                     |                  | 2               |
| 29.5 - 30.4         |     | 6                 |                  |                     |                  | 2               |
| 30.5 - 31.4         |     |                   |                  |                     |                  |                 |
| 31.5 - 32.4         |     | 1                 |                  |                     |                  |                 |
| 32.5 - 33.4         |     |                   |                  |                     |                  |                 |
| 33.5 - 34.4         |     | 1                 |                  |                     |                  |                 |
| 34.5 - 35.4         |     |                   |                  |                     |                  |                 |
| 35.5 - 36.4         |     | 3                 |                  |                     |                  |                 |
| 36.5 - 37.4         |     | 2                 |                  |                     |                  |                 |
| 37.5 - 38.4         |     |                   |                  |                     |                  |                 |
| 38.5 - 39.4         |     |                   |                  |                     |                  |                 |
| 39.5 - 40.4         |     | 2                 |                  |                     |                  |                 |
| 40.5 - 41.4         |     |                   |                  |                     |                  |                 |
| Average Length (in) |     | 23.0              | 18.2             | 14.0                | 13.8             | 24.8            |

Table 10. Average weight (lbs) of fish harvested, 2013 Lake Superior summer creel survey.  
SE in parentheses.

| Cluster                    | N= | Lake<br>Trout  | Coho<br>Salmon | Chinook<br>Salmon | Pink<br>Salmon |
|----------------------------|----|----------------|----------------|-------------------|----------------|
|                            |    | 411            | 172            | 157               | 5              |
| 1 - Duluth                 |    | 4.30<br>(0.15) | 1.53<br>(0.08) | 3.75<br>(0.26)    | -<br>-         |
| 2 - McQuade - Two Harbors  |    | 3.71<br>(0.24) | 1.75<br>(0.05) | 3.20<br>(0.31)    | -<br>-         |
| 3 - Twin Points - Tofte    |    | 4.70<br>(0.75) | 2.15<br>(0.17) | 3.71<br>(0.23)    | 0.99<br>(0.11) |
| 4 - Grand Marais - Hovland |    | 4.19<br>(0.63) | 2.24<br>(0.09) | 3.68<br>(0.23)    | -<br>-         |
| Lower Shore                |    | 4.10<br>(0.13) | 1.68<br>(0.04) | 3.51<br>(0.2)     | -<br>-         |
| Upper Shore                |    | 4.42<br>(0.48) | 2.20<br>(0.09) | 3.69<br>(0.17)    | 0.99<br>(0.11) |
| Total Shore                |    | 4.14<br>(0.13) | 1.78<br>(0.04) | 3.60<br>(0.13)    | 0.99<br>(0.11) |

Table 11. Yield (lb) estimates<sup>1</sup> for boat and shore anglers combined, 2013 Lake Superior summer creel survey. SE values are in parentheses.

| Cluster                    | Lake Trout        | Coho Salmon     | Chinook Salmon  | Siscowet   | Pink Salmon <sup>2</sup> | Total Salmonids <sup>3</sup> |
|----------------------------|-------------------|-----------------|-----------------|------------|--------------------------|------------------------------|
| 1 - Duluth                 | 40,258<br>(3,369) | 3,096<br>(300)  | 6,957<br>(546)  | -<br>-     | -<br>-                   | 50,312<br>(3,375)            |
| 2 - McQuade - Two Harbors  | 19,451<br>(2,876) | 6,174<br>(604)  | 3,291<br>(489)  | -<br>-     | -<br>-                   | 28,916<br>(2,894)            |
| 3 - Twin Points - Tofte    | 22,226<br>(2,866) | 3,692<br>(273)  | 8,179<br>(584)  | 372<br>(-) | 187<br>(33)              | 34,656<br>(2,828)            |
| 4 - Grand Marais - Hovland | 6,863<br>(1,285)  | 1,001<br>(131)  | 4,504<br>(539)  | 38<br>(-)  | 41<br>(-)                | 12,447<br>(1,281)            |
| Lower Shore                | 59,710<br>(3,188) | 9,271<br>(481)  | 10,248<br>(528) | -<br>-     | -<br>-                   | 79,228<br>(3,196)            |
| Upper Shore                | 29,089<br>(2,455) | 4,694<br>(249)  | 12,682<br>(567) | 410<br>(-) | 187<br>(-)               | 47,103<br>(2,403)            |
| Total Shore                | 88,799<br>(2,892) | 13,964<br>(389) | 22,930<br>(545) | 410<br>(-) | 187<br>(-)               | 126,331<br>(2,866)           |

<sup>1</sup> Estimates are rounded to the nearest pound.

<sup>2</sup> Pink Salmon yield in Cluster 4 was estimated as Cluster 4 harvest \* average weight from Cluster 3 (0.99 lb).

<sup>3</sup> Siscowet yield in Clusters 3 & 4 were estimated as Cluster harvest \* average weight (4.23 lb), which was from 120 Siscowet that were weighed during the summer creel surveys of 2003-2012.

Table 12. Age distribution, in percent, of harvested Lake Trout (wild and stocked), 2013 Lake Superior summer creel survey, n=600.

|   | Age  |      |      |       |       |       |       |      |      |      |      |      |      |
|---|------|------|------|-------|-------|-------|-------|------|------|------|------|------|------|
|   | IV   | V    | VI   | VII   | VIII  | IX    | X     | XI   | XII  | XIII | XIV  | XV   | XVI+ |
| % | 0.17 | 1.16 | 9.15 | 15.14 | 18.14 | 12.65 | 11.48 | 9.32 | 7.32 | 4.16 | 2.33 | 2.33 | 6.66 |

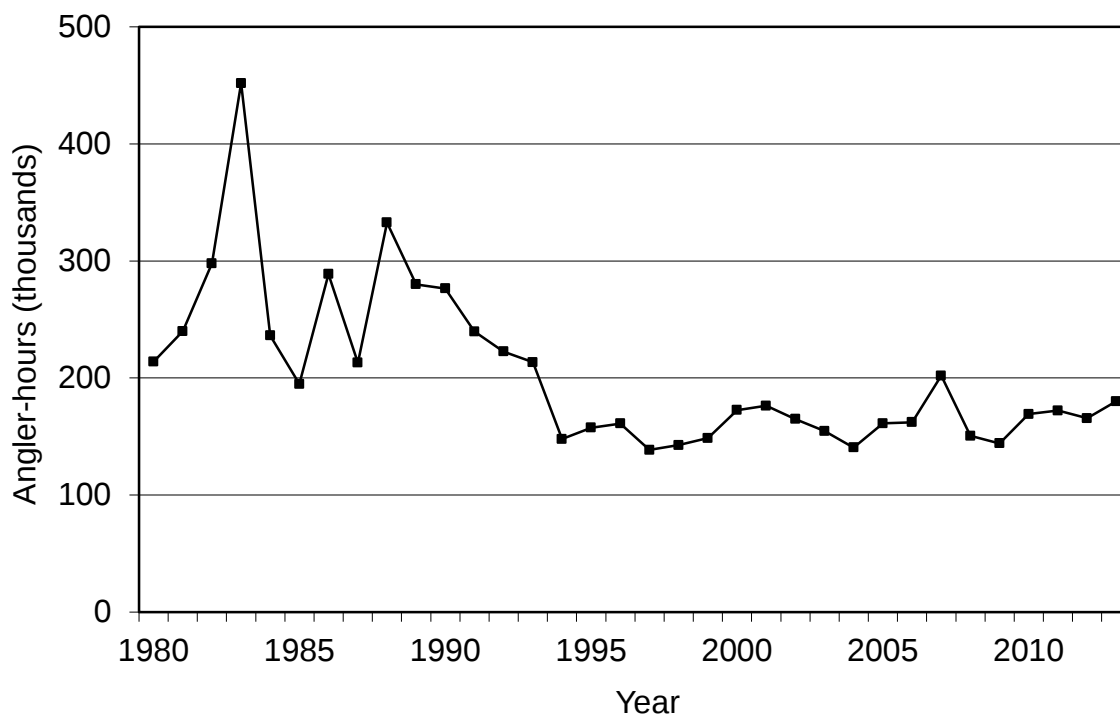


Figure 1. Angling pressure in the Lake Superior summer creel survey, 1980-2013. The design of the summer Lake Superior creel survey was changed in 1994 (Halpern 1995a,b).

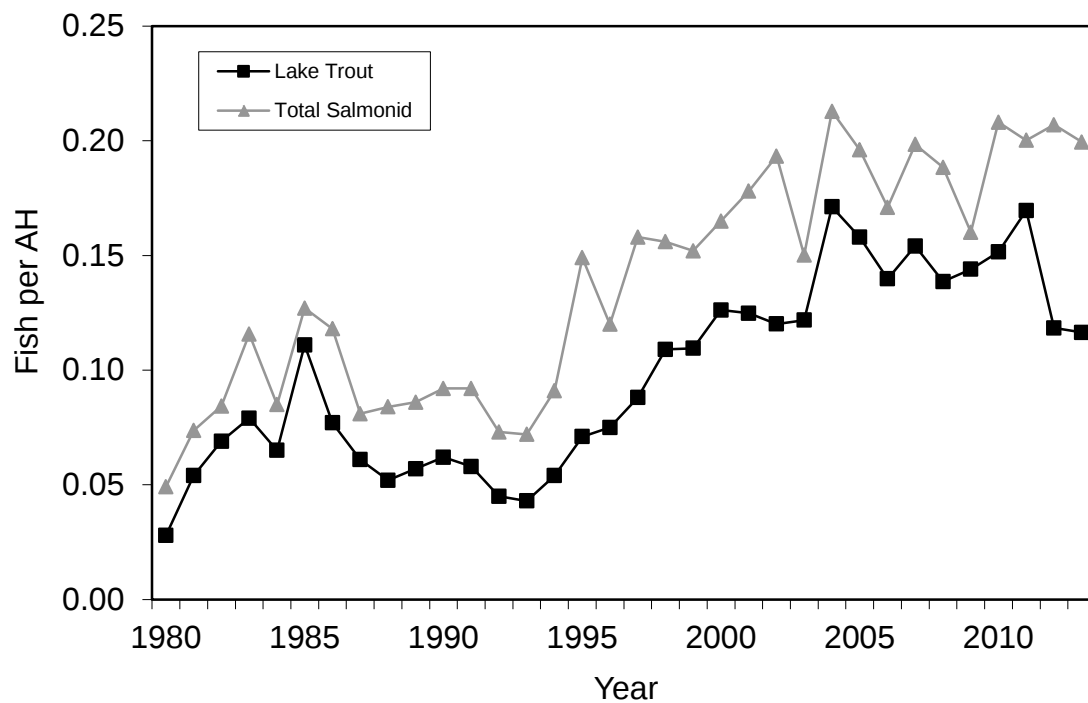


Figure 2. Harvest rate for Lake Trout and all Salmonids combined in the Lake Superior summer creel survey, 1980-2013.

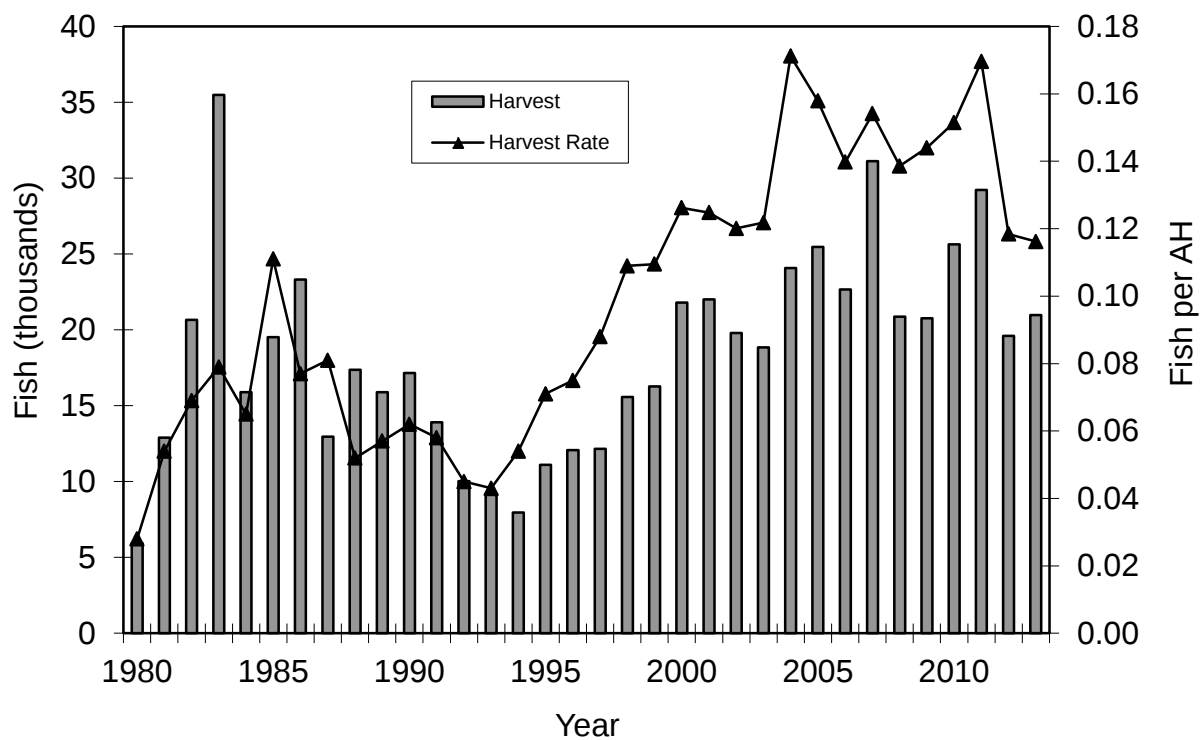


Figure 3. Lake Trout harvest and harvest rate in the Lake Superior summer creel survey, 1980-2013.

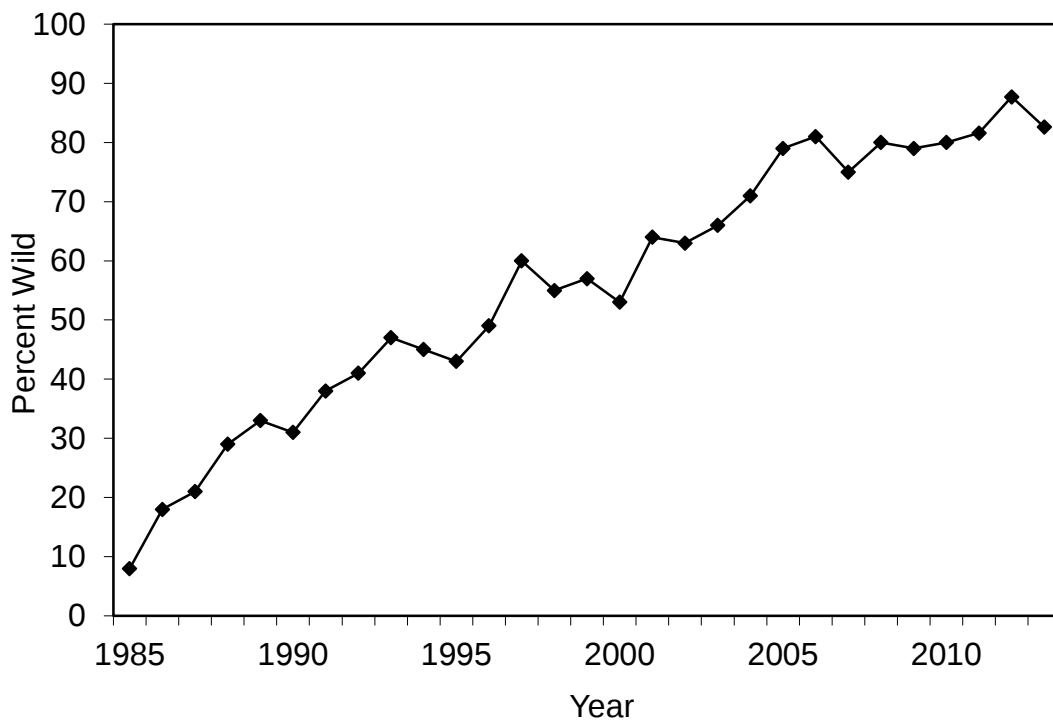


Figure 4. Percent wild Lake Trout observed by creel clerks in the Lake Superior summer creel survey, 1985-2013.

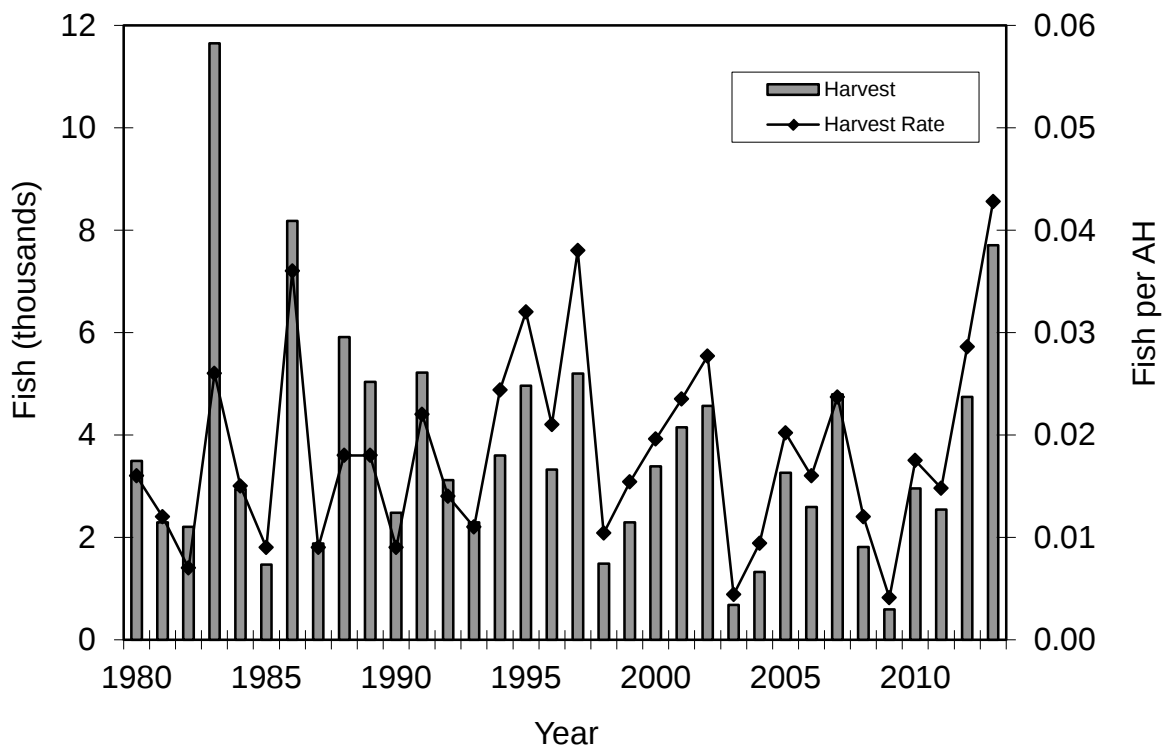


Figure 5. Coho Salmon harvest and harvest rate in the Lake Superior summer creel survey, 1980-2013.

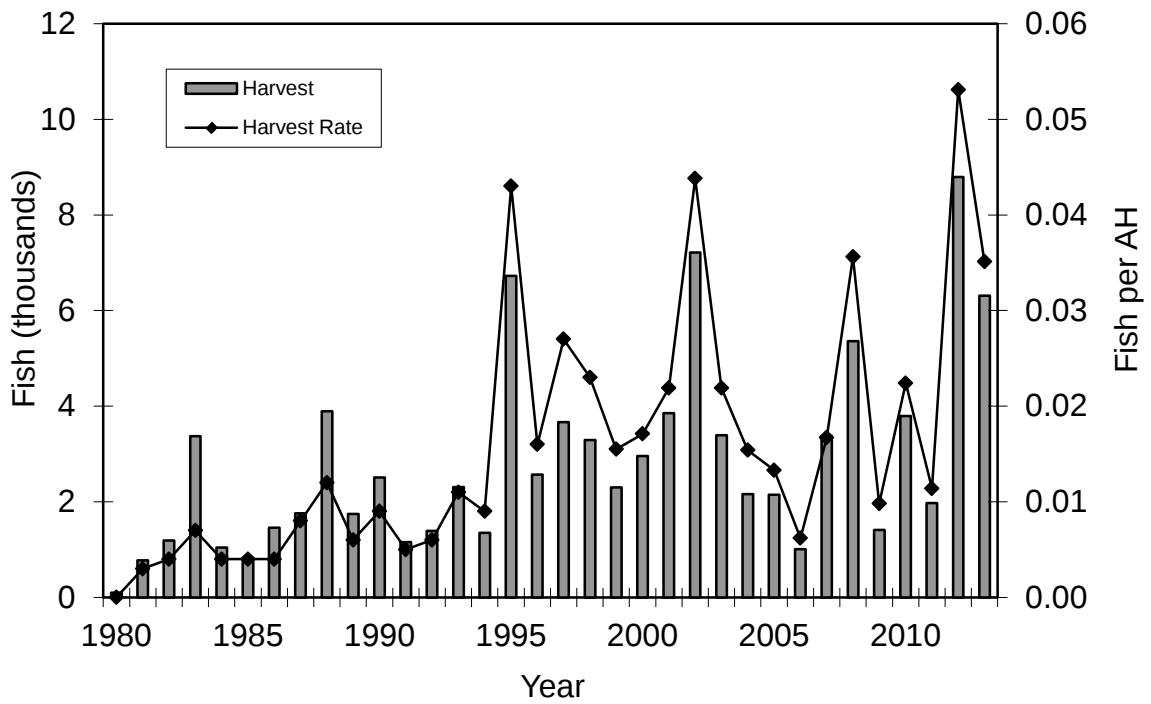


Figure 6. Chinook Salmon harvest and harvest rate in the Lake Superior summer creel survey, 1980-2013.