

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

COMPLETION REPORT LAKE SUPERIOR SUMMER CREEL SURVEY 2018

by
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Abstract

Anglers fished for 197,957 hours in the Minnesota waters of Lake Superior in 2018 as measured in the summer access-based creel survey and charter census. The effort in 2018 was 10.5% higher than in 2017. Angler effort was 98.2% from boats and 1.8% from shore. Overall 70% of angler effort occurred in the Lower Shore area from Duluth to Two Harbors. Across the four clusters of stations, effort was greatest in the McQuade-Two Harbors area in July and was consistently high from June through August in the Duluth and McQuade-Two Harbors areas. Shore fishing was greatest in the McQuade-Two Harbors area in June. Angling effort in the Upper shore area peaked in August.

Anglers caught 45,162 salmonids, of which 38,849 were harvested. Anglers caught 5% more salmonids than in 2017, most of which were Lake Trout *Salvelinus namaycush*. Salmonid catch and harvest rates in 2018 were 0.2284 and 0.1962 fish per angler hour, respectively, which were about 5-6% lower than in 2017.

Anglers caught 31,694 lean Lake Trout (leans) and 2,484 siscowet Lake Trout (siscowet) and harvested 27,744 leans and 2,157 siscowets. Lean Lake Trout accounted for 72% of all salmonids caught and 77% of all salmonids harvested. The harvested leans were 88% wild fish, down slightly from 90% in 2017. In MN-1 near Duluth, stocked fish comprised 17% of the harvest. Anglers kept 0.1403 and released 0.0202 leans per angler hour. The total catch rate for leans was 13% lower than in 2017. The harvested leans were 22.0 inches on average.

Anglers also caught Coho *Oncorhynchus kisutch*, Chinook *O. tshawytscha*, and Pink Salmon *O. gorbuscha*, and Rainbow *O. mykiss*, Brown *Salmo trutta*, and Brook Trout *Salvelinus fontinalis* in 2018. Anglers harvested 6,725 Coho Salmon at 0.0337 fish per angler hour, which was 31% higher than the 2017 rate of 0.0257 fish per angler hour. Anglers harvested 1,797 Chinook Salmon at 0.0091 fish per angler hour, about 4 times more than in 2017. Chinook Salmon were 22.7 inches on average when harvested in 2018, which is 0.3 inch longer than in 2017. Anglers caught 6% more salmon in the Upper Shore than in the Lower Shore. Anglers caught just 373 Pink Salmon. Anglers kept 62 and released 936 steelhead Rainbow Trout, and kept 328 and released 365 other salmonids which included Brook Trout, Brown Trout, and Kamloops Rainbow Trout. Anglers kept 58 Northern Pike, 588 Walleye, and 70 Cisco *Coregonus artedii* (local name is lake herring) and released 292 Northern Pike, 70 Walleyes, and 9 lake herring.

Forty-nine charter captains were licensed to fish in Minnesota waters of Lake Superior in 2018; one captain did not report any trips. Beginning in 2018, charter results are reported as a separate angler type in the annual Lake Superior summer creel survey report.

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Introduction

Lake Superior and the portions of its tributaries available to anadromous fishes offer unique habitats that support fisheries, which contributes 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 artedii* (also called lake herring) 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 populations declined precipitously due to mortality from 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 2018 Lake Superior summer creel survey and charter fishing census. All data are from anglers who fished in Minnesota waters, which includes Minnesota-based private sport fishing from boats or shore (i.e. summer creel survey) and Minnesota or Wisconsin-based charter fishing that occurs in Minnesota (i.e. charter census).

Lake Superior Management Plans (Schreiner et al. 1995; Schreiner et al. 2006; Goldsworthy et al. 2016) have suggested periodic diet sampling for salmonids to evaluate changes in the fish community and the impact of limited forage on the salmonid populations. Lake Trout, a primary predator species in Lake Superior, historically persisted on a forage base of lake herring and other coregonines. Establishment of Rainbow Smelt *Osmerus mordax* (smelt) and over-fishing of lake herring stocks led to the replacement of coregonines by smelt as the primary forage of Lake Trout (Dryer et al. 1965). Conner et al. (1993) found that smelt was the most important forage item for various salmonids in Minnesota waters of Lake Superior. Smelt abundance declined in the early 1980s (Geving 1998) and remains low, however Lake Trout diet is comprised mostly of smelt in May (Blankenheim 2018), most likely due to lack of Cisco recruitment in recent years (Goldsworthy et al. 2016). Diet samples from salmonids were collected from angler-caught fish in 2017-2018 to determine if and how forage resources have changed for salmonids in the Minnesota waters of Lake Superior.

Methods

This report for summer Lake Superior fishing is comprised of two primary components and a subcomponent. The primary components include 1) a survey of private sport anglers, which is access-based and follows a stratified random statistical design, and 2) a census of chartered anglers. The subcomponent includes a survey of chartered trips to determine

specific catch characteristics that are not reported in the charter census. The basic statistical method and formulas for the private sport angler survey 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 private sport angling survey includes private sport boaters, charter captains' personal trips, and shore anglers. The charter census includes data that are supplied by charter captains in monthly fishing reports. These data are required of charter captains (State Statute 97C.311) and include location and time of fishing, number of anglers and lines, number of each species that were kept or released, and the number of fish with clipped fins that indicate stocking. Being a census, no measurement error exists with these data; however, reporting error does exist and is not readily calculated, is presumed to be unbiased, and is ignored in this report. In previous years, charter trips were included in the creel survey, which is somewhat redundant and may increase variance estimates. Beginning in 2018 as a subcomponent to the charter census, charter trips are also surveyed to determine angler demographics and fish attributes such as length and weight, number of Sea Lamprey wounds, and location of clipped fins. The survey and census components included only anglers who fished in Lake Superior (Figure 1) and excluded angling that occurred in the St Louis Estuary or in tributaries. The 2018 survey began on Memorial Day weekend (May 26) and ended when the Lake Trout season ended (October 7). 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 Southwest and comprise the Lower Shore, whereas Clusters 3 and 4 are to the Northeast and comprise the Upper Shore. Two clerks work on the creel survey, one in each Shore area. Halpern (2003) describes the general mechanics of the creel survey in more detail. The sampling design was revised in 2017 when sampling effort was dropped from two locations. 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 2017 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 88% 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 2017.

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 captured in assessments from 2013 through May 2017. References to 2017 creel survey numbers are from Reeves (2018).

Results from the creel survey and charter census are reported separately within tables in this report and are also combined to produce attributes of total catch and effort. Figures generally include combined data, except for angler effort and for charter-specific attributes of number of captains and their number of trips.

Stomach contents were collected from angler-caught lean Lake Trout, siscowet Lake Trout, Chinook Salmon, and Coho Salmon during late June 2017 to July 2018. Angler-caught fish were obtained from charter-boat captains, boat anglers who were interviewed during the summer

creel survey, and from fish that were retrieved from fish cleaning facilities. The samples were removed from the fish, placed in a plastic bag, labeled with the fish sample number, and placed on ice and then frozen or processed. Diet items were classified into similar organisms and the weight and frequency of occurrence was calculated for each diet item class.

Results and Discussion

Fishing Effort

Private sport fishing effort in Minnesota from Minnesota-based anglers was estimated from 608 activity counts for the Lower Shore and 489 activity counts for the Upper Shore in 2018 (Table 2). Effort along the North Shore was measured on 118 out of 135 days during the season. Private sport anglers fished for 135,805 hours in 15,426 trips which lasted 4.02 hours on average and contained 2.19 anglers on average. Charter anglers fished for 59,944 hours in 2,224 trips which lasted 5.08 hours on average and contained 5.34 anglers on average (Table 4). Wisconsin-based anglers who fished in Minnesota waters of Lake Superior took 194 fishing trips fished for an additional 2,011 hours (WIDNR data). Overall effort increased by 10.5% from 2017 to 2018 (Figure 2). Beginning in 1994, the survey excluded 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 hours (Figure 2). Effort in the Lower Shore area in 2018 accounted for 70% of total Minnesota summer angling effort on Lake Superior (Table 4).

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 greatest in the McQuade-Two Harbors area and lowest in the Grand Marais-Hovland area (Table 4). Monthly effort from private sport boats was greatest from the McQuade-Two Harbors area in July, similar among months from June through August in the Duluth and McQuade-Two Harbors areas except for the McQuade-Two Harbors in July, and was low in the Upper shore areas in the June period and then again in September (Table 5). In any month, charter boats from Duluth or Superior comprised at least 75% of the charter effort (Table 6). Charter boats in the Upper Shore area comprised at least 15% of charter effort in July and August. Overall, private sport and charter effort tended to occur in different areas of the lake, resulting in a wider distribution of effort.

Shore angling continued to comprise a small fraction of summer angling effort on Lake Superior. Shoreline anglers fished for 3,538 hours in 2018 (Table 3), which is a 15% decrease from 4,157 hours in 2017. The highest shore angling effort (71%) was observed in the McQuade-Two Harbors area in Cluster 2 (Table 4).

Each captain chartered anywhere from 0 to 192 trips in 2018 (Figure 9). Several captains chartered over 100 trips in 2018, which is similar to previous years. Wisconsin-based charters accounted for 360 of the 2,224 charter trips and for 11,205 angler hours, which was considerably higher than in previous years due to a displacement of some charter captains from the Duluth Waterfront Plaza charter docks during re-construction of the marina. Some of the captains anticipate returning to the Waterfront Plaza in 2019.

Catch and Catch Rates

Salmonids

Salmonids include all trout and salmon species. Private sport anglers caught 29,624 salmonids (Table 7) and charter anglers caught 15,129 salmonids (Table 8), for a total catch of

44,753 salmonids in 2018 (Table 9). The salmonid catch in 2018 was 5% higher than the catch of 42,684 salmonids in 2017. Anglers released 14% of their catch (Table 9). Wisconsin-based private sport anglers caught 405 salmonids in 2018. Private sport anglers caught 0.1697 salmonids per hour and harvested 0.1290 salmonids per hour (Table 11). Charter anglers caught 0.2524 salmonids per hour and harvested 0.2396 fish per hour (Table 12). Overall, anglers caught 0.2284 salmonids per hour and harvested 0.1962 salmonids per hour (Table 13). These rates were 5-6% higher than in 2017 (Figure 3). Wisconsin anglers caught 0.2014 salmonids per hour (WIDNR data).

Lean Lake Trout

Private sport anglers caught 20,524 and kept 17,106 lean Lake Trout, whereas charter anglers caught 10,927 and kept 10,395 lean Lake Trout in 2018. Overall, anglers caught 31,451 fish, which was 2% less than in 2017. Anglers caught 27% more fish in 2018 than the average of 24,681 fish in 2007-2017. Anglers also released 3,950 fish, or 14% of their catch (Table 5). Anglers harvested 27,501 fish, which was 2% lower than in 2017 and was a moderately high harvest (Figure 3). Lean Lake Trout accounted for 70% of all salmonids caught and 72% of all salmonids harvested. Eighty-seven percent of the harvested lean Lake Trout were from the Lower Shore area. Overall, anglers caught 0.1605 and kept 0.1403 fish per hour. Among private sport parties, 61% caught one or more, 42% caught two or more, and 31% caught at least three fish per trip (Table 7). Success rates were much higher for charter angling parties; 98.4% of parties caught at least one fish, 92.1% caught at least two fish, and 81.8% caught at least three fish.

Wisconsin-based private sport anglers kept an additional 243 lean Lake Trout in Minnesota waters in 2018 (WIDNR data) at a rate of 0.1243 fish per AH, which was 3% lower than the rate of 0.1276 fish per AH in 2017. Catch rates for Wisconsin-based private sport anglers was considerably higher than the rate of 0.0756 fish per hour for Minnesota-based private sport anglers in Cluster 1. In previous years the catch rate estimates included charter anglers, which catch fish at higher rates than private sport anglers.

Private sport anglers kept lean Lake Trout that were 22.4 inches long on average (Table 16) and most of the fish (73%) were between 18.5 and 25.4 inches in length. Charter anglers kept fish that were 21.5 inches long on average (Table 17) and most of the fish (71%) were also between 18.5 and 25.4 inches in length. Overall, mean length and length distributions were similar to harvested fish in 2017, and the clerks measured no fish longer than 37.4 inches again this year. Private sport anglers released 29% of fish that were ≥ 25 inches long (Tables 16 & 18) and charter anglers released none longer than 25 inches (Table 19). Private sport anglers kept fish that were 3.65 pounds on average (Table 20) and charter anglers kept fish that were 3.18 pounds on average (Table 21). Average weights differed by angler type in the Upper Shore; private sport anglers kept fish that on average were 0.96 pounds heavier than fish that charter anglers kept. Yield of lean Lake Trout was 62,447 pounds by private sport anglers and 33,103 pounds by charter anglers. The total yield of 95,550 pounds in 2018 was very close to the yield of 95,839 pounds in 2017 (Table 24).

The age distribution of all harvested lean Lake Trout was similar between private sport anglers (Table 25) and charter anglers (Table 26). Age seven and eight year old fish made up

52% of the private sport anglers' harvest and 59% of the charter anglers' harvest. Seven year old fish were the most abundant year class in the catch overall. Overall, each age class from six through nine years comprised at least 10% of the harvest (Table 27), which indicates fairly consistent recruitment. Older Lake Trout, at least nine years old, made up 40% of the harvest by number, which is similar to 42% in 2017. The presence of many adult year classes indicates that the Lake Trout population has been rehabilitated and the proportion of older age classes is stable which indicates a stable population.

In 2018, creel clerks checked 836 Lake Trout and observed no fin clips on 88% of harvested fish, which indicates that the fish were wild and not stocked. By area, wild fish comprised 74% from the Duluth area, 91% from the McQuade-Two Harbors area, 97% from the Twin Points-Tofte area, and 99% of Lake Trout from the Grand Marais area. Lake Trout were stocked in the Lower Shore area through 2015 and were not stocked in the Upper Shore area after 2003. Stocked fish from year classes in 2009 through 2014 were poorly represented in the recreational fishery in 2018, which indicates that stocking produced few of the fish that anglers harvested.

Siscowet

Siscowet Lake Trout, a deepwater form, have generally contributed little to the sport fishery; however, anglers in 2015 through 2018 caught more siscowet than average. In 2018, private sport anglers kept 1,006 and released 293 siscowet (Table 7) and charter anglers kept 1,151 and released 34 siscowet. Most (2,296) of the siscowet were caught in the Lower Shore area (Table 9). Anglers caught the same number of siscowet, 2,484, in 2018 as in 2017 and both years' catches are the highest on record. Only 4.9% of private sport angling parties caught at least one siscowet in 2018, compared to 19% of charter parties (Table 14 and 15). Wisconsin anglers reported keeping no siscowet in 2018.

Coho Salmon

Private sport anglers caught 4,806 and kept 4,660 Coho Salmon, whereas charter anglers caught 1,955 and kept 1,941 fish in 2018. Overall, anglers caught 6,761 fish, which was 38% more than in 2017 and 84% more than the average for the previous 10 years. Anglers also released 160 fish, or 2% of their catch (Table 9). Coho Salmon accounted for 15% of all salmonids caught and 17% of all salmonids harvested. Fifty-three percent of the fish were caught in the Upper Shore area, which is considerably higher than in past years. Harvest rates were 0.0343 fish per hour for private sport anglers and 0.032 fish per hour for charter anglers, or 0.0337 fish per hour overall. Among private sport parties, 16% caught one or more, 4.5% caught two or more, and 4.1% caught at least three fish per trip (Table 14). Success rates were much higher for charter angling parties; 32% of parties caught at least one fish, 20% caught at least two fish, and 13.3% caught at least three fish. Seasonally, Coho Salmon are first caught in the Lower Shore area and then later in the Upper Shore; this pattern was repeated in 2018. Wisconsin-based private sport anglers caught 124 Coho Salmon in Minnesota waters in 2018 (Table 10). Anglers kept Coho Salmon that were, on average, 17.0-17.5 inches long (Tables 16 and 17), which is smaller than the average length of 18.7 inches in 2017. Average weight also decreased from 1.92 pounds in 2017 to 1.47-1.56 pounds in 2018 (Tables 20 and 21). Anglers harvested 10,127 (804) pounds of Coho Salmon in 2018 (Table 11), which is a 16% increase from 2017. 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

Private sport anglers caught 1,233 and kept 1,005 Chinook Salmon, whereas charter anglers caught 785 and kept 775 fish in 2018. Overall, anglers caught 2,018 fish, which is more than 3 times the number of fish that anglers caught in 2017. Anglers caught about 60% of the average of 3,350 fish for 2008-2017. Anglers also released 10 fish, which was a minimal proportion of their catch (Table 9). Chinook Salmon accounted for 4.5% of all salmonids caught and 4.6% of all salmonids harvested. Fifty-five percent of the fish were caught in the Lower Shore area. Private sport anglers kept 0.0054 fish per hour and charter anglers kept 0.0129 fish per hour, or 0.0091 fish per hour overall. Among private sport parties, 8.6% caught one or more, 1.1% caught two or more, and 0.4% caught at least three fish per trip (Table 14). Success rates were much higher for charter angling parties; 26% of parties caught at least one fish, 6.9% caught at least two fish, and 2.1% caught at least three fish. Wisconsin anglers caught 17 Chinook Salmon in Minnesota waters in 2018 (Table 10). Anglers kept fish that were, on average, 22.6-22.7 inches long (Tables 16 and 17), which is about the same size as the mean length of 22.4 inches in 2017. Anglers harvested 7,019 pounds of Chinook Salmon in 2018 (Table 24), which is more than 3 times the yield in 2017. Creel clerks examined 53 fish for stocking clips and observed 4 clipped fish, which indicates that Chinook Salmon stocking in other jurisdictions contributes less than 10% of the fish to catches in Minnesota.

Steelhead Rainbow Trout

Minnesota-based anglers caught 998 steelhead Rainbow Trout *Oncorhynchus mykiss* in 2018 (Table 9), which was 70% more than in 2017. Steelhead catches were highest in the McQuade-Two Harbors area, whereas in 2017 the catches were highest in the Grand Marais-Hovland area. Anglers kept 56 steelhead in the summer of 2018, despite the ban on harvest of steelhead in the Minnesota waters of Lake Superior.

Pink Salmon

Anglers caught only 373 Pink Salmon *Oncorhynchus gorbuscha* in 2018 (Table 5). Pink Salmon catches vary 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 mostly smaller than in 2017 and anglers released most of the fish.

Other Species

Other species are generally caught in low numbers during the summer creel survey and standard errors are sometimes not calculated. Catch data for the infrequently-caught salmonids were combined and reported as 668 other salmonids (Table 9). The combined species include harvests of 143 Brown Trout *Salmo trutta*, 41 Brook Trout *Salmo fontinalis*, 122 Kamloops Rainbow Trout, and 1 Atlantic Salmon *Salmo salar* and releases of 2 Brown Trout, 263 Brook Trout, 59 Kamloops Rainbow Trout, and 41 Atlantic Salmon. Anglers caught other salmonids at a rate of 0.0034 fish per hour. Minnesota anglers also kept an estimated 638 Walleye *Sander vitreus*, 70 Cisco *Coregonus artedii*, and 58 Northern Pike *Esox lucius* and

released 292 Northern Pike and 9 Cisco. Wisconsin-based anglers caught an estimated 21 Brown Trout and 20 Walleyes.

Diet Analysis

Creel clerks and biologists collected stomach samples from 850 fish, 521 that contained at least one prey item and 329 that contained no diet items. The collection included diets from 321 Lake Trout, 114 Coho Salmon, 26 Chinook Salmon, 37 Pink Salmon, 14 Siscowet (Table 28), and 9 other fish that were not included in analyses. Size of prey items differed considerably, therefore all values are reported as percentage by wet weight. The predominant identifiable prey item, Rainbow Smelt (smelt), comprised 9.7-62.4% of all items in predator diets. Smelt made up 62.4% of Chinook Salmon, 28.4% of Lake Trout, 22.9% of Pink Salmon, 13% of Coho Salmon, and 9.7% of siscowet Lake Trout. Unidentified fish remains made up 27.1-40.1% of diets by species, except siscowet diets included 88.7% unidentified fish. Coregonines comprised only 0-14.9% of the diet by species. This proportion is lower than from Lake Trout diets in the May lake assessment (Blankenheim 2018). In the creel survey, stomach samples were rarely collected in May and especially from early to mid May. The discrepancy between the prevalence of smelt in assessment samples and the creel survey samples reflects the quick decline of smelt as prey through the late Spring period. Siscowet are a minor and incidental part of the recreational fishery and were minimally sampled in this survey. Coho Salmon diet consisted of a substantial amount, 32% by weight, of terrestrial insects, as well as 9.2% of Mysids *Mysis relicta*. Pink Salmon diet included 38% zooplankton and 8.3% Mysids. Predator fishes continue to rely on smelt and coregonines were uncommon in the diet.

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 2018, 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 the highest catch rate for salmonids overall since accurate data collection began in 1980. The Lake Trout are now mostly (88%) wild, not clipped, and this is especially true in the Upper Shore where 98% 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.

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Minnesota
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Segment 33-2
Study 4
Job 1049

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DIVISION OF FISH AND WILDLIFE
SECTION OF FISHERIES

COMPLETION REPORT
LAKE SUPERIOR SUMMER CREEL SURVEY
2018

by
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Lake Superior Fisheries Office

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Table 1. Creel survey clusters and stations in the 2018 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 clerk 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 2018 Lake Superior summer creel survey.

District ²	Cluster ³	Day type	Days Visited	Activity Counts	Days			Interviews ¹		
					Boat	Shore	Charter	Boat	Shore	Charter
MN-1	1	Weekday	25	150	13	0	17	17	0	42
		Weekend	22	132	18	0	15	34	0	37
		Total	47	282	31	0	32	51	0	79
MN-1	2	Weekday	28	168	24	20	6	178	39	7
		Weekend	21	126	18	17	4	183	71	6
		Total	49	294	42	37	10	361	110	13
MN-2	3	Weekday	29	174	17	2	7	55	2	7
		Weekend	21	126	15	1	8	62	1	8
		Total	50	300	32	3	15	117	3	15
MN-3	4	Weekday	24	120	18	15	9	105	28	10
		Weekend	20	100	16	15	7	90	34	10
		Total	44	220	34	30	16	195	62	20
Lower	1,2	Weekday	53	321	37	20	23	195	39	49
		Weekend	43	252	36	17	19	216	71	43
		Total	96	573	73	37	42	411	110	92
Upper	3,4	Weekday	53	287	35	17	16	160	30	17
		Weekend	41	237	31	16	15	152	35	18
		Total	94	524	66	33	31	312	65	35
Total		Weekday	75	608	52	33	38	355	69	66
		Weekend	43	489	37	27	32	368	106	61
		Total	118	1097	89	60	70	723	175	127

¹ 3 angling parties refused to be interviewed. The clerk was excluded from ½ of Station 2 in 2018.

² Great Lakes Fishery Commission Statistical Districts

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

Table 3. Fishing effort (angler hours¹) for private sport and shore anglers by angler type, location, and shore area in the 2018 Lake Superior summer creel survey². SE in parentheses.

District ³	Cluster ⁴	Value	Boat					Shore ⁵					Captain Trips ⁶
			June	July	Aug	Sept	Summer	June	July	Aug	Sept	Summer	
MN-1	1	Hours	3,466	5,736	3,992	2,130	15,325	0	0	0	0	0	892
		SE	(885)	(1,038)	(934)	(831)	(1,850)	0	0	0	0	0	(418)
MN-1	2	Hours	18,583	19,870	17,893	10,002	66,349	855	605	349	689	2,498	196
		SE	(6,416)	(3,336)	(1,800)	(3,439)	(8,207)	(240)	(194)	(108)	(182)	(374)	(92)
MN-2	3	Hours	2,634	10,319	11,500	6,265	30,719	0	0	29	11	39	696
		SE	(752)	(2,179)	(2,869)	(2,552)	(4,479)	0	0	(29)	(11)	(31)	(326)
MN-3	4	Hours	1,669	6,227	8,121	1,905	17,921	293	240	168	300	1,000	370
		SE	(601)	(860)	(2,351)	(913)	(2,732)	(114)	(33)	(41)	(110)	(167)	(173)
Lower	1,2	Hours	22,049	25,606	21,885	12,133	81,673	855	605	349	689	2,498	1,088
		SE	(6,477)	(3,493)	(2,028)	(3,538)	(8,413)	(240)	(194)	(108)	(182)	(374)	(428)
Upper	3,4	Hours	4,303	16,545	19,621	8,170	48,640	293	240	197	311	1,040	1,066
		SE	(963)	(2,343)	(3,709)	(2,711)	(5,246)	(114)	(33)	(50)	(110)	(169)	(369)
Total		Hours	26,352	42,151	41,506	20,303	130,313	1,148	845	545	1,000	3,538	2,154
Total		SE	(6,548)	(4,206)	(4,227)	(4,457)	(9,915)	(266)	(197)	(119)	(213)	(411)	(565)

¹ Estimates were rounded to the nearest whole number.

² Wisconsin anglers fished an additional 2,011 (SE=282) hours on the Minnesota waters of Lake Superior.

³ Great Lakes Fishery Commission Statistical Districts

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

⁵ All shore fishing in Cluster 1 occurs in the St. Louis Estuary, not in Lake Superior, and is not included.

⁶ Includes only unchartered fishing trips with charter captains.

Table 4. Fishing effort (angler hours¹) for charter anglers and for all anglers, by location and shore area, in the 2018 Lake Superior summer creel survey². SE in parentheses.

District ³	Cluster ⁴	Value	Charter					All		Captain Trips ⁵	Total Summer		
			June	July	Aug	Sept	Summer	June	July			Aug	Sept
MN-1	1	Hours	16,028	12,727	14,042	6,428	49,225	19,494	18,463	18,034	8,558	892	65,442
		SE	(0)	(0)	(0)	(0)	(0)	(885)	(1,038)	(934)	(831)	(418)	(1,897)
MN-1	2	Hours	386	918	546	1,050	2,900	19,824	21,393	18,788	11,741	196	71,942
		SE	(0)	(0)	(0)	(0)	(0)	(6,366)	(3,364)	(1,799)	(3,464)	(92)	(8,191)
MN-2	3	Hours	732	1,958	1,832	431	4,953	3,366	12,277	13,361	6,707	696	36,408
		SE	(0)	(0)	(0)	(0)	(0)	(752)	(2,179)	(2,859)	(2,550)	(326)	(4,483)
MN-3	4	Hours	378	982	1,019	484	2,863	2,339	7,448	9,308	2,689	370	22,154
		SE	(0)	(0)	(0)	(0)	(0)	(642)	(851)	(2,360)	(970)	(173)	(2,771)
Lower	1,2	Hours	16,414	13,645	14,588	7,478	52,125	39,318	39,856	36,822	20,300	1,088	137,384
		SE	(0)	(0)	(0)	(0)	(0)	(6,427)	(3,521)	(2,027)	(3,562)	(428)	(8,407)
Upper	3,4	Hours	1,110	2,942	2,852	915	7,819	5,706	19,725	22,669	9,396	1,066	58,562
		SE	(0)	(0)	(0)	(0)	(0)	(989)	(2,339)	(3,707)	(2,728)	(369)	(9,337)
Total		Hours	17,524	16,587	17,443	8,393	59,944	45,024	59,581	59,492	29,696	2,154	195,946
Total		SE	(0)	(0)	(0)	(0)	(0)	(6,503)	(4,227)	(4,225)	(4,487)	(565)	(9,923)

¹ Estimates were rounded to the nearest whole number.

² Wisconsin anglers fished an additional 2,011 (SE=282) hours on the Minnesota waters of Lake Superior. The Minnesota results exclude Wisconsin-based non-chartered trips.

³ Great Lakes Fishery Commission Statistical Districts

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

⁵ Includes only unchartered fishing trips with charter captains.

Table 5. Monthly distribution of fishing effort for private sport boat and shore anglers by angler type, location, and shore area as a percentage of angler hours in the 2018 Lake Superior summer creel survey. SE in parentheses.

District ¹	Cluster ²	Station	Boat ³					Shore ⁴					Captain Trips Summer
			June	July	Aug	Sept	Summer	June	July	Aug	Sept	Summer	
MN-1	1		13.2	13.7	9.7	10.5	11.8	0	0	0	0	0	41.4
		1	0	0	0	0	0	0	0	0	0	0	
		2	3.2	8.4	8.3	7.3	7.1	0	0	0	0	0	
		3	10.0	5.3	1.4	3.2	4.7	0	0	0	0	0	
MN-1	2		70.5	47.1	43.1	49.2	51.1	74.5	71.6	63.9	68.9	70.6	9.1
		4	54.6	9.7	10.1	21.6	20.9	64.1	10.6	29.2	16.3	32.4	
		5	9.9	15.5	12.3	13.1	13.0	1.3	0	15.8	0	2.9	
		6	6.0	21.9	20.7	14.5	17.2	9.2	61.0	18.9	52.6	35.3	
MN-2	3		10.0	24.4	27.7	30.9	23.4	0	0	5.3	1.1	1.1	32.3
		7	1.4	4.2	4.9	1.4	3.4	0	0	5.3	0	0.8	
		8	4.5	13.3	15.5	17.0	12.6	0	0	0	0	0	
		9	4.1	6.9	7.3	12.5	7.4	0	0	0	1.1	0.3	
MN-3	4		6.3	14.8	19.5	9.4	13.7	25.5	28.4	30.8	30.0	28.3	17.2
		10	5.4	13.0	17.1	8.1	11.9	12.4	22.5	30.8	16.1	18.7	
		11	0.9	1.8	2.4	1.3	1.8	13.1	5.9	0	13.9	9.6	
Lower	1,2		84.6	60.8	52.8	29.5	63.9	74.5	71.6	63.9	68.9	70.6	50.0
Upper	3,4		15.4	39.2	47.2	40.5	36.2	25.5	28.4	36.1	31.1	29.4	50.0

¹ Great Lakes Fishery Commission Statistical Districts

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

³ Excludes charter fishing effort.

⁴ All shore fishing in Cluster 1 occurs in the St. Louis Estuary, not in Lake Superior, and is not included.

Table 6. Monthly distribution of fishing effort for charter anglers and for all anglers, by angler type, location, and total area, as a percentage of angler hours in the 2018 Lake Superior summer creel survey. SE in parentheses.

District ¹	Cluster ²	Station	Charter ³					All				
			June	July	Aug	Sept	Summer	June	July	Aug	Sept	Summer
MN-1	1		91.5	77.0	80.7	76.6	82.2	42.8	31.0	30.2	29.8	33.5
		1	70.0	63.3	58.2	58.0	63.0	26.9	17.7	17.1	17.0	19.8
		2	21.5	13.7	22.5	18.6	19.2	10.2	9.7	12.1	10.6	10.6
		3	0	0	0	0	0	5.7	3.6	1.0	2.2	3.1
MN-1	2		2.2	5.6	3.2	12.5	4.9	45.4	36.2	32.6	39.2	37.4
		4	0	0	0	0	0	34.7	7.1	7.6	15.1	14.9
		5	2.2	2.8	2.9	12.5	4.0	7.0	11.9	10.1	12.6	10.2
		6	0	2.8	0.3	0	0.9	3.7	17.3	14.9	11.5	12.3
MN-2	3		4.2	11.9	10.6	5.2	8.3	7.1	20.2	21.6	21.4	17.9
		7	0	0.1	0.1	0	0.1	0.8	3.0	3.4	1.1	2.6
		8	0.3	4.7	3.9	1.5	2.7	2.4	10.2	11.5	11.5	8.9
		9	3.9	7.1	6.6	3.7	5.5	3.9	7.0	6.7	8.8	6.4
MN-3	4		2.2	5.6	5.6	5.8	4.6	4.7	12.6	15.6	9.6	11.2
		10	2.2	5.6	5.6	5.8	4.6	3.8	11.3	13.6	8.2	9.8
		11	0	0	0	0	0	0.9	1.4	2.0	1.4	1.4
Lower	1,2		93.7	82.6	83.9	89.1	87.1	88.2	67.2	62.8	69.0	70.9
Upper	3,4		6.3	17.4	16.1	10.9	12.9	11.8	32.8	37.2	31.0	29.1

¹Great Lakes Fishery Commission Statistical Districts

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

³Includes charter fishing effort that was based in Wisconsin.

Table 7. Catch by species, location, and shore area for private sport boat and shore anglers in the 2018 Lake Superior summer creel survey. SE in parentheses.

District ¹	Cluster ²	Fate	Lake	Coho	Chinook	Steelhead	Siscowet	Pink	Other ³	Total	Walleye
			Trout	Salmon	Salmon			Salmon	Salmonids	Salmonids	
MN-1	1	Kept	1,121 (736)	273 (215)	72 (59)	10 (14)	189 (124)	0 (0)	25 (30)	1,690 (780)	183 (219)
		Released	105 (82)	0 (0)	0 (0)	53 (43)	57 (78)	0 (0)	0 (0)	215 (121)	27 (30)
		Total	1,094 (740)	273 (215)	72 (59)	63 (45)	246 (147)	0 (0)	25 (30)	1,905 (789)	210 (221)
MN-1	2	Kept	9,251 (3,898)	1,441 (709)	345 (211)	43 (43)	801 (373)	0 (0)	135 (87)	12,016 (3,986)	40 (31)
		Released	2,506 (1,420)	62 (51)	9 (11)	336 (168)	109 (90)	0 (0)	43 (39)	3,065 (1,434)	0 (0)
		Total	11,757 (4,148)	1,503 (711)	354 (211)	379 (173)	910 (384)	0 (0)	178 (95)	15,081 (4,236)	40 (31)
MN-2	3	Kept	4,108 (1,833)	2,048 (1,103)	207 (152)	0 (0)	0 (0)	32 (53)	55 (65)	6,450 (2,147)	0 (0)
		Released	321 (184)	70 (78)	136 (168)	233 (148)	95 (100)	230 (342)	184 (127)	1,269 (483)	0 (0)
		Total	4,429 (1843)	2,118 (1106)	343 (227)	233 (148)	95 (100)	262 (346)	239 (143)	7,719 (2,201)	0 (0)
MN-3	4	Kept	2,626 (1,184)	898 (556)	381 (287)	6 (8)	16 (21)	0 (0)	0 (0)	3,927 (1,339)	0 (0)
		Released	448 (240)	14 (19)	83 (68)	140 (76)	32 (53)	107 (90)	130 (106)	992 (305)	0 (0)
		Total	3,112 (1,209)	912 (556)	456 (295)	131 (73)	48 (57)	107 (90)	130 (106)	4,919 (1,374)	0 (0)
Lower	1 & 2	Kept	10,372 (3,966)	1,714 (741)	417 (219)	53 (45)	990 (393)	0 (0)	160 (92)	13,706 (4,061)	223 (221)
		Released	2,611 (1,422)	62 (51)	9 (11)	389 (173)	166 (119)	0 (0)	43 (39)	3,280 (1,439)	27 (30)
		Total	12,983 (4214)	1,776 (743)	426 (219)	442 (179)	1,156 (411)	0 (0)	203 (100)	16,986 (4,309)	250 (223)
Upper	3 & 4	Kept	6,734 (2,149)	2,946 (1,235)	588 (325)	6 (8)	16 (21)	32 (53)	55 (65)	10,377 (2,530)	0 (0)
		Released	807 (307)	84 (80)	219 (181)	373 (166)	127 (113)	337 (354)	314 (165)	2,261 (572)	0 (0)
		Total	7,541 (2,204)	5,134 (1,238)	1,067 (372)	472 (166)	206 (115)	524 (358)	478 (178)	19,365 (2,594)	0 (0)
Total	1,2,3,4	Kept	17,106 (4,527)	4,660 (1,440)	1,005 (392)	59 (46)	1,006 (394)	32 (53)	215 (113)	24,083 (4,785)	223 (221)
		Released	3,418 (1,455)	146 (95)	228 (182)	762 (239)	293 (144)	337 (354)	357 (170)	5,541 (1,549)	27 (30)
		Total	20,524 (4,729)	4,806 (1,443)	1,233 (427)	821 (233)	1,299 (423)	369 (346)	572 (174)	29,624 (5,020)	250 (223)

¹ Great Lakes Fishery Commission Statistical Districts

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

³ Other Salmonids include 62 Brown Trout, 41 Brook Trout, and 112 Kamloops that were harvested, and 263 Brook Trout, 53 Kamloops, 41 Atlantic Salmon that were reported as released. Anglers also kept 57 and released 289 Northern Pike, reported keeping 67 and releasing 9 Lake Herring.

Table 8. Catch by species, location, and shore area for chartered anglers¹ in the 2018 Lake Superior summer creel survey. SE=0 for all values.

District ²	Cluster ³	Fate	Lake	Coho	Chinook	Steelhead	Siscowet	Pink	Other ⁴	Total	
			Trout	Salmon	Salmon			Salmon	Salmonids	Salmonids	Walleye
MN-1	1	Kept	7,312	1,310	644	3	1,036	0	87	10,392	344
		Released	205	6	5	98	23	0	7	344	43
		Total	7,517	1,316	649	100	1059	0	94	10,736	387
MN-1	2	Kept	668	58	30	0	75	0	1	832	1
		Released	57	0	1	18	6	0	1	83	0
		Total	725	58	31	18	81	0	2	9,154	1
MN-2	3	Kept	1,358	393	52	0	12	4	2	1,821	0
		Released	170	8	3	36	2	0	0	219	0
		Total	1,528	401	55	36	14	4	2	2,040	0
MN-3	4	Kept	1,057	180	49	0	28	0	2	1,315	0
		Released	100	0	1	22	3	0	0	126	0
		Total	1,157	180	50	22	31	0	2	1,441	0
Lower	1,2	Kept	7,980	1,368	674	3	1,111	0	88	11,224	345
		Released	262	6	6	116	29	0	8	427	43
		Total	8,242	1,374	680	119	1,140	0	96	11,651	388
Upper	3,4	Kept	2,415	573	101	0	40	4	4	3,136	0
		Released	270	8	4	58	5	0	0	345	0
		Total	2,685	581	105	58	41	4	4	3,481	0
Total		Kept	10,395	1,941	775	3	1,151	4	92	14,361	345
		Released	532	14	10	174	34	0	8	772	43
		Total	10,927	1,955	785	177	1,185	4	100	15,133	388

¹ The Minnesota results include all charter fishing, including trips that originated from Wisconsin.

² Great Lakes Fishery Commission Statistical Districts

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

⁴ Other Salmonids includes 81 Brown Trout, 10 Kamloops, and 1 Atlantic Salmon that were harvested, and 2 Brown Trout and 6 Kamloops that were released. Anglers also kept 1 and released 3 Northern Pike, and kept 3 Herring (Cisco) and 9 Lake Whitefish.

Table 9. Catch¹ by species, location, and shore area for all anglers in the 2018 Lake Superior summer creel survey. SE in parentheses.

District ²	Cluster ³	Fate	Lake Trout	Coho Salmon	Chinook Salmon	Steelhead	Siscowet	Pink Salmon	Other ⁴ Salmonids	Total Salmonids	Walleye
MN-1	1	Kept	8,433	1,583	716	13	1,225	0	112	12,082	527
		(SE)	(736)	(215)	(59)	(14)	(124)	0	(30)	(780)	(219)
		Released	310	6	5	151	80	0	7	559	70
		(SE)	(82)	0	0	(43)	(78)	0	0	(121)	(30)
		Total	8,743	1,589	721	164	1,305	0	119	12,641	597
		(SE)	(740)	(215)	(59)	(45)	(147)	0	(30)	(789)	(221)
MN-1	2	Kept	9,919	1,499	375	43	876	0	136	12,848	41
		(SE)	(3,898)	(709)	(211)	(43)	(373)	0	(87)	(3,986)	(31)
		Released	2,563	62	10	354	115	0	44	3,148	0
		(SE)	(1,420)	(51)	(11)	(168)	(90)	0	(39)	(1,434)	0
		Total	12,482	1,561	385	397	991	0	180	15,996	41
		(SE)	(4,148)	(711)	(211)	(173)	(384)	0	(95)	(4,236)	(31)
MN-2	3	Kept	5,466	2,441	259	0	12	36	57	8,271	0
		(SE)	(1,833)	(1,103)	(152)	0	0	(53)	(65)	(2,147)	0
		Released	491	78	139	269	97	230	184	1,488	0
		(SE)	(184)	(78)	(168)	(148)	(100)	(342)	(127)	(483)	0
		Total	5,957	2,519	398	269	109	266	241	9,759	0
		(SE)	(1,843)	(1,106)	(227)	(148)	(100)	(346)	(143)	(2,201)	0
MN-3	4	Kept	3,683	1,078	430	6	44	0	1	5,242	0
		(SE)	(1,184)	(556)	(287)	(8)	(21)	0	0	(1,339)	0
		Released	586	14	84	162	35	107	130	1,118	0
		(SE)	(245)	(19)	(68)	(76)	(53)	(90)	(106)	(305)	0
		Total	4,269	1,092	514	168	79	107	131	6,360	0
		(SE)	(1,209)	(556)	(295)	(76)	(57)	(90)	(106)	(1,374)	0
Lower	1 & 2	Kept	18,352	3,082	1,091	56	2,101	0	248	24,930	568
		(SE)	(3,966)	(741)	(219)	(45)	(393)	0	(92)	(4,061)	(221)
		Released	2,873	68	15	505	195	0	51	3,707	70
		(SE)	(1,422)	(51)	(11)	(173)	(119)	0	(39)	(1,439)	(30)
		Total	21,225	3,150	1,106	561	2,296	0	299	28,637	638
		(SE)	(4,214)	(743)	(219)	(179)	(411)	0	(100)	(4,309)	(223)
Upper	3 & 4	Kept	9,149	3,519	689	6	56	36	58	13,513	0
		(SE)	(2,182)	(1,235)	(325)	(8)	(21)	(53)	(65)	(2,530)	0
		Released	1,077	92	223	431	132	337	314	2,606	0
		(SE)	(307)	(80)	(181)	(166)	(113)	(354)	(165)	(572)	0
		Total	10,226	3,611	912	437	188	373	372	16,119	0
		(SE)	(2,204)	(1,238)	(372)	(166)	(115)	(358)	(178)	(2,594)	0
Total	1,2,3,4	Kept	27,501	6,601	1,780	62	2,157	36	307	38,444	568
		(SE)	(4,527)	(1,440)	(392)	(46)	(394)	(53)	(113)	(4,785)	(221)
		Released	3,950	160	238	936	327	337	365	6,313	70
		(SE)	(1,455)	(95)	(182)	(240)	(164)	(354)	(170)	(1,549)	(30)
		Total	31,451	6,761	2,018	998	2,484	373	672	44,757	638
		(SE)	(4,749)	(1,443)	(427)	(233)	(423)	(346)	(174)	(5,020)	(223)

¹ The Minnesota results include all charter fishing and excludes Wisconsin-based private sport anglers.

² Great Lakes Fishery Commission Statistical Districts

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

⁴ Other Salmonids include harvest estimates of 143 Brown Trout, 41 Brook Trout, 122 Kamloops Rainbow Trout, and 1 Atlantic Salmon, and release estimates of 2 Brown Trout, 263 Brook Trout, 59 Kamloops Rainbow Trout, and 41 Atlantic Salmon. Anglers were also estimated to keep 58 Northern Pike and 70 lake herring and to release 292 Northern Pike and 9 Lake Herring.

Table 10. Catch¹ by species, cluster, and shore area for private sport boats from Wisconsin in the 2018 Lake Superior summer creel survey. SE in parentheses.

District ²	Cluster ³	Fate	Lake	Coho	Chinook	Steelhead	Siscowet	Pink	Other ⁴	Total	Walleye
			Trout	Salmon	Salmon			Salmon	Salmonids	Salmonids	
MN-1	1	Kept	243 (53)	124 (30)	17 (7)	0 (0)	0 (0)	0 (0)	21 (8)	405 (62)	20 (9)

¹ Wisconsin anglers who were surveyed by Wisconsin DNR.

² Great Lakes Fishery Commission Statistical Districts

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

⁴ Anglers who fished Minnesota waters also caught an estimated 21 Brown Trout.

Table 11. Catch rate (fish hour⁻¹) by species, location, and shore area for private sport and shore anglers in the 2018 Lake Superior summer creel survey. SE in parentheses.

District ¹	Cluster ²	Fate	Lake Trout	Coho Salmon	Chinook Salmon	Steelhead	Siscowet	Pink Salmon	Other ² Salmonids	Total Salmonids	Walleye
MN-1	1	Kept	0.0691	0.0168	0.0044	0.0006	0.0117	0	0.0015	0.1042	0.0113
		(SE)	(0.0472)	(0.0142)	(0.0035)	(0.0009)	(0.0074)	(0)	(0.0019)	(0.0507)	(0.0144)
		Released	0.0065	0	0	0.0033	0.0035	0	0	0.0133	0.0017
		(SE)	(0.0054)	(0)	(0)	(0.0028)	(0.0035)	(0)	(0)	(0.0062)	(0.0020)
MN-1	2	Total	0.0756	0.0168	0.0044	0.0039	0.0152	0	0.0015	0.1175	0.0130
		(SE)	(0.0475)	(0.0142)	(0.0035)	(0.0029)	(0.0082)	(0)	(0.0019)	(0.0511)	(0.0145)
		Kept	0.1340	0.0209	0.0050	0.0006	0.0116	0	0.0020	0.1740	0.0006
		(SE)	(0.0588)	(0.0106)	(0.0031)	(0.0006)	(0.0056)	(0)	(0.0013)	(0.0615)	(0.0001)
MN-2	3	Released	0.0363	0.0008	0.0001	0.0049	0.0015	0	0.0006	0.0444	0
		(SE)	(0.0211)	(0.0007)	(0.0002)	(0.0025)	(0.0013)	(0)	(0.0006)	(0.0215)	(0)
		Total	0.1703	0.0218	0.0051	0.0055	0.0132	0	0.0026	0.2184	0.0006
		(SE)	(0.0625)	(0.0106)	(0.0031)	(0.0026)	(0.0093)	(0)	(0.0014)	(0.0651)	(0.0005)
MN-3	4	Kept	0.1306	0.0651	0.0066	0	0	0.0010	0.0017	0.2051	0
		(SE)	(0.0621)	(0.0376)	(0.0051)	(0)	(0)	(0.0018)	(0.0021)	(0.0758)	(0)
		Released	0.0102	0.0022	0.0043	0.0074	0.0030	0.0073	0.0058	0.0403	0
		(SE)	(0.0059)	(0.0026)	(0.0056)	(0.0050)	(0.0033)	(0.0113)	(0.0043)	(0.0168)	(0)
MN-3	4	Total	0.1408	0.0673	0.0109	0.0074	0.0030	0.0083	0.0076	0.2454	0
		(SE)	(0.0624)	(0.0377)	(0.0076)	(0.0050)	(0.0033)	(0.0114)	(0.0048)	(0.0776)	(0)
		Kept	0.1361	0.0465	0.0198	0.0003	0.0008	0	0.0000	0.2036	0
		(SE)	(0.0653)	(0.0305)	(0.0156)	(0.0004)	(0.0011)	(0)	(0.0000)	(0.0766)	(0)
Lower	1 & 2	Released	0.0252	0.0007	0.0043	0.0073	0.0017	0.0055	0.0067	0.0514	0
		(SE)	(0.0133)	(0.0010)	(0.0037)	(0.0040)	(0.0017)	(0.0049)	(0.0057)	(0.0172)	(0)
		Total	0.1613	0.0473	0.0241	0.0076	0.0025	0.0055	0.0067	0.2550	0
		(SE)	(0.0666)	(0.0305)	(0.0160)	(0.0040)	(0.0020)	(0.0049)	(0.0057)	(0.0785)	(0)
Upper	3 & 4	Kept	0.1217	0.0201	0.0049	0.0006	0.0116	0	0.0019	0.1608	0.0026
		(SE)	(0.0486)	(0.0090)	(0.0026)	(0.0005)	(0.0048)	(0)	(0.0011)	(0.0508)	(0.0026)
		Released	0.0306	0.0007	0.0001	0.0046	0.0019	0	0.0005	0.0385	0.0003
		(SE)	(0.0172)	(0.0006)	(0.0001)	(0.0021)	(0.0011)	(0)	(0.0005)	(0.0175)	(0.0004)
Upper	3 & 4	Total	0.1523	0.0208	0.0050	0.0052	0.0136	0	0.0024	0.1992	0.0029
		(SE)	(0.0516)	(0.0090)	(0.0026)	(0.0022)	(0.0049)	(0)	(0.0012)	(0.0548)	(0.0026)
		Kept	0.1327	0.0581	0.0116	0.0001	0.0003	0.0006	0.0011	0.2045	0
		(SE)	(0.0458)	(0.0259)	(0.0067)	(0.0002)	(0.0004)	(0.0011)	(0.0013)	(0.0552)	(0)
Total	1,2,3,4	Released	0.0159	0.0017	0.0043	0.0074	0.0025	0.0066	0.0062	0.0446	0
		(SE)	(0.0062)	(0.0016)	(0.0037)	(0.0034)	(0.0020)	(0.0072)	(0.0034)	(0.0123)	(0)
		Total	0.1486	0.0597	0.0159	0.0075	0.0028	0.0073	0.0073	0.2490	0
		(SE)	(0.0462)	(0.0259)	(0.0077)	(0.0034)	(0.0020)	(0.0073)	(0.0036)	(0.0566)	(0)
Total	1,2,3,4	Kept	0.1258	0.0343	0.0074	0.0004	0.0074	0.0002	0.0016	0.1771	0.0016
		(SE)	(0.0350)	(0.0111)	(0.0030)	(0.0003)	(0.0030)	(0.0004)	(0.0009)	(0.0381)	(0.0017)
		Released	0.0251	0.0011	0.0017	0.0056	0.0022	0.0025	0.0026	0.0407	0.0002
		(SE)	(0.0111)	(0.0007)	(0.0014)	(0.0018)	(0.0010)	(0.0027)	(0.0013)	(0.0119)	(0.0002)
Total	1,2,3,4	Total	0.1509	0.0354	0.0091	0.0060	0.0096	0.0027	0.0042	0.2178	0.0018
		(SE)	(0.0367)	(0.0111)	(0.0033)	(0.0018)	(0.0032)	(0.0027)	(0.0016)	(0.0399)	(0.0017)

¹ Wisconsin anglers who fished Minnesota waters of Lake Superior also caught an estimated 243 Lake Trout, 124 Coho Salmon, 17 Chinook Salmon, 21 Brown Trout, and 20 Walleyes.

² Other Salmonids include Brown Trout (38), Brook Trout (134), and Kamloops Rainbow Trout (13). Anglers also kept an estimated 73 Northern Pike and 111 Lake Herring and released 43 Northern Pike and 19 Lake Herring.

Table 12. Catch rate (fish* hour⁻¹) by species, location, and shore area for charter anglers in the 2018 Lake Superior summer creel survey. SE in parentheses.

District ¹	Cluster ²	Fate	Lake Trout	Coho Salmon	Chinook Salmon	Steelhead	Siscowet	Pink Salmon	Other ³ Salmonids	Total Salmonids	Walleye
MN-1	1	Kept	0.1485	0.0266	0.0131	0.0001	0.0210	0.0000	0.0018	0.2111	0.0070
		Released	0.0042	0.0001	0.0001	0.0020	0.0005	0.0000	0.0001	0.0069	0.0009
		Total	0.1527	0.0266	0.0132	0.0020	0.0215	0.0000	0.0018	0.2180	0.0079
MN-1	2	Kept	0.2303	0.0200	0.0103	0.0000	0.0259	0.0000	0.0003	0.2869	0.0003
		Released	0.0197	0.0000	0.0003	0.0062	0.0021	0.0000	0.0003	0.0286	0.0000
		Total	0.2500	0.0200	0.0107	0.0062	0.0279	0.0000	0.0017	0.3155	0.0003
MN-2	3	Kept	0.2742	0.0793	0.0105	0.0000	0.0024	0.0008	0.0006	0.3677	0.0000
		Released	0.0343	0.0016	0.0006	0.0073	0.0004	0.0000	0.0000	0.0442	0.0000
		Total	0.3085	0.0809	0.0111	0.0073	0.0028	0.0008	0.0006	0.4119	0.0000
MN-3	4	Kept	0.3692	0.0629	0.0171	0.0000	0.0098	0.0000	0.0003	0.4593	0.0000
		Released	0.0349	0.0000	0.0003	0.0077	0.0010	0.0000	0.0000	0.0440	0.0000
		Total	0.4041	0.0629	0.0174	0.0077	0.0108	0.0000	0.0003	0.5033	0.0000
Lower	1,2	Kept	0.1531	0.0262	0.0129	0.0001	0.0213	0.0000	0.0017	0.2153	0.0066
		Released	0.0050	0.0001	0.0004	0.0022	0.0006	0.0000	0.0001	0.0081	0.0008
		Total	0.1581	0.0263	0.0130	0.0023	0.0219	0.0000	0.0021	0.2235	0.0074
Upper	3,4	Kept	0.3090	0.0733	0.0129	0.0000	0.0051	0.0005	0.0004	0.4012	0.0000
		Released	0.0345	0.0010	0.0005	0.0075	0.0006	0.0000	0.0000	0.0441	0.0000
		Total	0.3435	0.0743	0.0134	0.0074	0.0058	0.0005	0.0004	0.4454	0.0000
Total	1,2,3,4	Kept	0.1734	0.0324	0.0129	0.0001	0.0192	0.0001	0.0015	0.2396	0.0058
		Released	0.0089	0.0002	0.0002	0.0029	0.0006	0.0000	0.0001	0.0128	0.0007
		Total	0.1823	0.0326	0.0131	0.0030	0.0198	0.0001	0.0017	0.2524	0.0065

¹ Great Lakes Fishery Commission Statistical Districts

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

³ Other Salmonids include Brown Trout, Brook Trout, Kamloops Rainbow Trout, and Atlantic Salmon (although the identification was not verified). Anglers also kept an estimated 57 Northern Pike and 67 Lake Herring and released 277 Northern Pike and 9 Lake Herring.

Table 13. Catch rate (fish* hour⁻¹) by species, location, and shore area for all anglers in the 2018 Lake Superior summer creel survey. SE in parentheses.

District ¹	Cluster ²	Fate	Lake Trout	Coho Salmon	Chinook Salmon	Steelhead	Siscowet	Pink Salmon	Other ³ Salmonids	Total Salmonids	Walleye
MN-1	1	Kept	0.1289	0.0242	0.0109	0.0002	0.0187	0	0.0017	0.1846	0.0081
		(SE)	(0.0472)	(0.0142)	(0.0035)	(0.0009)	(0.0074)	(0)	(0.0020)	(0.0507)	(0.0144)
		Released	0.0047	0.0001	0.0001	0.0023	0.0012	0	0.0001	0.0085	0.0011
		(SE)	(0.0054)	(0)	(0)	(0.0028)	(0.0035)	(0)	(0)	(0.0062)	(0.0020)
MN-1	2	Total	0.1336	0.0243	0.0110	0.0025	0.0199	0	0.0018	0.1932	0.0091
		(SE)	(0.0475)	(0.0142)	(0.0035)	(0.0029)	(0.0082)	(0)	(0.0020)	(0.0511)	(0.0145)
		Kept	0.1379	0.0208	0.0052	0.0006	0.0122	0	0.0019	0.1786	0.0006
		(SE)	(0.0588)	(0.0106)	(0.0031)	(0.0006)	(0.0074)	(0)	(0.0013)	(0.0615)	(0.0005)
MN-2	3	Released	0.0356	0.0009	0.0001	0.0049	0.0016	0	0.0006	0.0438	0
		(SE)	(0.0211)	(0.0007)	(0.0002)	(0.0025)	(0.0056)	(0)	(0.0006)	(0.0215)	(0)
		Total	0.1735	0.0217	0.0054	0.0055	0.0138	0	0.0025	0.2223	0.0006
		(SE)	(0.0625)	(0.0106)	(0.0031)	(0.0026)	(0.0093)	(0)	(0.0014)	(0.0651)	(0.0005)
MN-3	4	Kept	0.1501	0.0670	0.0071	0	0.0003	0.0010	0.0016	0.2272	0
		(SE)	(0.0621)	(0.0376)	(0.0051)	(0)	(0)	(0.0018)	(0.0021)	(0.0758)	(0)
		Released	0.0135	0.0021	0.0038	0.0074	0.0027	0.0063	0.0051	0.0409	0
		(SE)	(0.0059)	(0.0026)	(0.0056)	(0.0050)	(0.0033)	(0.0113)	(0.0043)	(0.0168)	(0)
MN-3	4	Total	0.1636	0.0692	0.0109	0.0074	0.0030	0.0073	0.0066	0.2680	0
		(SE)	(0.0624)	(0.0377)	(0.0076)	(0.0050)	(0.0033)	(0.0114)	(0.0048)	(0.0776)	(0)
		Kept	0.1909	0.0559	0.0223	0.0003	0.0023	0	0.0001	0.2717	0
		(SE)	(0.0653)	(0.0305)	(0.0156)	(0.0004)	(0.0011)	(0)	(0)	(0.0766)	(0)
Lower	1 & 2	Released	0.0304	0.0007	0.0044	0.0084	0.0018	0.0055	0.0067	0.0580	0
		(SE)	(0.0133)	(0.0010)	(0.0037)	(0.0040)	(0.0017)	(0.0049)	(0.0057)	(0.0172)	(0)
		Total	0.2213	0.0566	0.0266	0.0087	0.0041	0.0055	0.0068	0.3297	0
		(SE)	(0.0666)	(0.0305)	(0.0160)	(0.0040)	(0.0020)	(0.0049)	(0.0057)	(0.0785)	(0)
Upper	3 & 4	Kept	0.1336	0.0224	0.0079	0.0004	0.0153	0	0.0018	0.1815	0.0041
		(SE)	(0.0486)	(0.0090)	(0.0026)	(0.0005)	(0.0048)	(0)	(0.0011)	(0.0508)	(0.0026)
		Released	0.0209	0.0005	0.0001	0.0037	0.0014	0	0.0004	0.0270	0.0005
		(SE)	(0.0172)	(0.0006)	(0.0001)	(0.0021)	(0.0011)	(0)	(0.0005)	(0.0175)	(0.0004)
Upper	3 & 4	Total	0.1545	0.0229	0.0081	0.0041	0.0167	0	0.0022	0.2084	0.0046
		(SE)	(0.0516)	(0.0090)	(0.0026)	(0.0022)	(0.0049)	(0)	(0.0012)	(0.0548)	(0.0026)
		Kept	0.1562	0.0601	0.0118	0.0001	0.0010	0.0006	0.0010	0.2307	0
		(SE)	(0.0458)	(0.0259)	(0.0067)	(0.0002)	(0.0004)	(0.0011)	(0.0013)	(0.0552)	(0)
Total	1,2,3,4	Released	0.0184	0.0016	0.0038	0.0074	0.0023	0.0058	0.0054	0.0445	0
		(SE)	(0.0062)	(0.0016)	(0.0037)	(0.0034)	(0.0020)	(0.0072)	(0.0034)	(0.0123)	(0)
		Total	0.1746	0.0617	0.0156	0.0075	0.0032	0.0064	0.0064	0.2752	0
		(SE)	(0.0462)	(0.0259)	(0.0077)	(0.0034)	(0.0020)	(0.0073)	(0.0012)	(0.0548)	(0)
Total	1,2,3,4	Kept	0.1403	0.0337	0.0091	0.0003	0.0110	0.0002	0.0016	0.1962	0.0029
		(SE)	(0.0035)	(0.0111)	(0.0030)	(0.0003)	(0.0030)	(0.0004)	(0.0009)	(0.0381)	(0.0017)
		Released	0.0202	0.0008	0.0012	0.0048	0.0017	0.0017	0.0019	0.0322	0.0004
		(SE)	(0.0111)	(0.0007)	(0.0014)	(0.0018)	(0.0010)	(0.0027)	(0.0013)	(0.0119)	(0.0002)
Total	1,2,3,4	Total	0.1605	0.0345	0.0103	0.0051	0.0127	0.0019	0.0034	0.2284	0.0033
		(SE)	(0.0116)	(0.0111)	(0.0033)	(0.0018)	(0.0032)	(0.0027)	(0.0016)	(0.0399)	(0.0017)

¹ Great Lakes Fishery Commission Statistical Districts

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

³ Other Salmonids include Brown Trout, Brook Trout, Kamloops Rainbow Trout, and Atlantic Salmon.

Table 14. Percent of private sport angling parties, by angler type, that caught specific numbers of fish in the 2018 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	38.8	98.2	83.7	100	91.4	100	94.7	94.2	95.1	100	99.3	100	34.4	94.3
1	19.1	1.8	11.8	0	7.5	0	4.5	5.8	3.7	0	0.4	0	18.0	5.8
2	11.4	0	5.1	0	0.7	0	0.3	0	1.1	0	0	0	16.2	1.9
3	6.0	0	2.4	0	0.4	0	0	0	0	0	0	0	10.4	1.9
4	5.9	0	0.7	0	0	0	0	0	0.1	0	0.3	0	6.6	0
5	3.0	0	0.6	0	0	0	0	0	0	0	0	0	4.8	0
6	1.8	0	0.3	0	0	0	0	0	0	0	0	0	3.1	0
7	1.1	0	0	0	0	0	0	0	0	0	0	0	2.5	0
8	0.4	0	0	0	0	0	0	0	0	0	0	0	1.4	0
9	0.7	0	0	0	0	0	0	0	0	0	0	0	0.7	0
10	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0.4	0
11	0.4	0	0	0	0	0	0	0	0	0	0	0	0.1	0
>=12	0.9	0	0	0	0	0	0	0	0	0	0	0	1.4	0

Table 15. Percent of chartered angling parties that caught specific numbers of fish in the 2018 Lake Superior summer creel survey.

Number of Fish Caught	Lake Trout	Coho Salmon	Chinook Salmon	Steelhead	Siscowet	Pink Salmon	Other Salmonids	Total Salmonids
0	1.6	69.3	73.5	93.1	81.0	99.9	97.1	2.9
1	6.3	11.1	19.6	5.8	5.6	0.1	2.9	5.7
2	10.3	6.3	4.8	0.8	3.2	0	0	6.1
3	15.1	3.9	1.4	0.2	0.8	0	0	8.7
4	7.9	3.4	0.4	0	1.6	0	0	10.1
5	12.7	2.0	0.2	0	0.8	0	0	9.1
6	14.3	0.9	0	0	0	0	0	9.2
7	8.7	1.2	0	0	0	0	0	8.7
8	4.0	0.9	0	0	0	0	0	7.3
9	5.6	0.5	0	0	0	0	0	5.6
10	6.3	0.3	0	0	0	0	0	5.6
11	1.6	0.2	0	0	0	0	0	3.8
>=12	5.6	0.1	0	0	0	0	0	17.2

Table 16. Length-frequency distribution (inches) and sample size of harvested salmonids by private sport boat and shore anglers in the 2018 Lake Superior summer creel survey.

Species	Lake Trout	Coho Salmon	Chinook Salmon	Kamloops	Steelhead	Siscowet	Pink Salmon
Sample Size	543	150	35	3	3	46	0
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		1					
11.5 to 12.4		2					
12.5 to 13.4		1	1				
13.5 to 14.4		2	2				
14.5 to 15.4	2	6					
15.5 to 16.4	5	20	1		1		
16.5 to 17.4	19	37					
17.5 to 18.4	36	46	1		1	1	
18.5 to 19.4	52	19	1			4	
19.5 to 20.4	50	8	1			5	
20.5 to 21.4	65	6	1			15	
21.5 to 22.4	69	2	2	1	1	5	
22.5 to 23.4	66		12	1		6	
23.5 to 24.4	59		4			4	
24.5 to 25.4	36		2			4	
25.5 to 26.4	32		3	1			
26.5 to 27.4	14		1			1	
27.5 to 28.4	13		2			1	
28.5 to 29.4	12						
29.5 to 30.4	2						
30.5 to 31.4	1						
31.5 to 32.4	1		1				
32.5 to 33.4	2						
33.5 to 34.4	4						
34.5 to 35.4	1						
35.5 to 36.4	1						
36.5 to 37.4	1						
37.5 to 38.4							
38.5 to 39.4							
39.5 to 40.4							
>40.4							
Average Length (inch)	22.4	17.5	22.7	23.5	18.8	21.8	0

Table 17. Length-frequency distribution (inches) and sample size of harvested salmonids by charter anglers¹ in the 2018 Lake Superior summer creel survey.

	Lake Trout	Coho Salmon	Chinook Salmon	Kamloops	Steelhead	Siscowet	Pink Salmon
Length(in)	432	99	18	0	1	45	0
6.5 to 7.4							
7.5 to 8.4							
8.5 to 9.4							
9.5 to 10.4		1					
10.5 to 11.4		1					
11.5 to 12.4							
12.5 to 13.4							
13.5 to 14.4	2						
14.5 to 15.4	7	12					
15.5 to 16.4	12	27	1		1		
16.5 to 17.4	18	27				1	
17.5 to 18.4	35	10	1			3	
18.5 to 19.4	48	7				3	
19.5 to 20.4	54	5	1			8	
20.5 to 21.4	65	5	2			4	
21.5 to 22.4	36	3	1			12	
22.5 to 23.4	39		3			5	
23.5 to 24.4	28		4			4	
24.5 to 25.4	31		4			4	
25.5 to 26.4	19		1			1	
26.5 to 27.4	15						
27.5 to 28.4	13						
28.5 to 29.4	4						
29.5 to 30.4	2						
30.5 to 31.4	1						
31.5 to 32.4	2						
32.5 to 33.4	1						
33.5 to 34.4							
34.5 to 35.4							
35.5 to 36.4							
36.5 to 37.4							
37.5 to 38.4							
38.5 to 39.4							
39.5 to 40.4							
>40.4							
Average	21.5	17.0	22.6	0	15.9	21.5	0
Length (inch)							

¹Includes clients of chartered boat trips and excludes personal trips by licensed charter captains.

Table 18. Length-frequency distribution (inches) and sample size of released salmonids by private sport boat and shore anglers in the 2018 Lake Superior summer creel survey.

	Lake Trout	Coho Salmon	Chinook Salmon	Kamloops	Steelhead	Siscowet	Pink Salmon	Brook Trout
Length(in)	185	11	12	3	44	9	7	14
6.5 to 7.4		1						
7.5 to 8.4								
8.5 to 9.4								
9.5 to 10.4	1	4	1		1			
10.5 to 11.4	1		1		1			
11.5 to 12.4			5		1			2
12.5 to 13.4			1					
13.5 to 14.4	5		1		1			
14.5 to 15.4	2			1			4	2
15.5 to 16.4	17	5			1			
16.5 to 17.4	7	1			2		3	2
17.5 to 18.4	20				2			1
18.5 to 19.4	7					2		1
19.5 to 20.4	24				5	2		
20.5 to 21.4	12				1	1		
21.5 to 22.4	14		2		5	1		
22.5 to 23.4	10				3			
23.5 to 24.4	15				3	1		
24.5 to 25.4	13		1	2	4	2		
25.5 to 26.4	5				2			
26.5 to 27.4	8				4			
27.5 to 28.4	10				6			
28.5 to 29.4	1							
29.5 to 30.4	8							
30.5 to 31.4	2				1			
31.5 to 32.4	1							
32.5 to 33.4								
33.5 to 34.4	1							
34.5 to 35.4					1			
35.5 to 36.4								
36.5 to 37.4								
37.5 to 38.4								
38.5 to 39.4								
39.5 to 40.4								
>40.4								
Average Length (inch)	21.4	11.7	14.9	21.7	22.7	21.2	14.7	13.0

Table 19. Length-frequency distribution (inches) and sample size of released salmonids by charter anglers¹ in the 2018 Lake Superior summer creel survey.

	Lake Trout	Coho Salmon	Chinook Salmon	Kamloops	Steelhead	Siscowet	Pink Salmon
Length(in)	22	1	0	0	8	7	0
6.5 to 7.4							
7.5 to 8.4							
8.5 to 9.4							
9.5 to 10.4		1					
10.5 to 11.4							
11.5 to 12.4							
12.5 to 13.4							
13.5 to 14.4	2						
14.5 to 15.4	1						
15.5 to 16.4	7						
16.5 to 17.4	5						
17.5 to 18.4	2					4	
18.5 to 19.4	2					1	
19.5 to 20.4					2	2	
20.5 to 21.4					1		
21.5 to 22.4							
22.5 to 23.4	1						
23.5 to 24.4	1						
24.5 to 25.4					1		
25.5 to 26.4					1		
26.5 to 27.4							
27.5 to 28.4					1		
28.5 to 29.4							
29.5 to 30.4					2		
30.5 to 31.4							
31.5 to 32.4							
32.5 to 33.4							
33.5 to 34.4							
34.5 to 35.4							
35.5 to 36.4							
36.5 to 37.4							
37.5 to 38.4							
38.5 to 39.4							
39.5 to 40.4							
>40.4							
Average	18.9	10.0	0	0	25.9	19.0	0
Length (inch)							

¹Includes clients of chartered boat trips and excludes personal trips by licensed charter captains.

Table 20. Average weight (pounds) of harvested fish by species, location, and shore area for private boat and shore anglers in the 2018 Lake Superior summer creel survey. SE in parentheses.

District ²	Cluster ³	Lake Trout	Coho Salmon	Chinook Salmon	Siscowet	Pink Salmon
	Sample size (n)	521	150	34	45	0
MN-1	1	3.66 (0.32)	1.30 (0.16)	4.31 (1.63)	1.19 (1.09)	- -
MN-1	2	3.55 (0.11)	1.44 (0.05)	4.15 (0.42)	3.19 (1.79)	- -
MN-2	3	4.45 (0.39)	1.52 (0.09)	4.72 (0.59)	0.00 0.00	- -
MN-3	4	2.76 (0.14)	1.92 (0.06)	3.80 (0.75)	1.94 (1.39)	- -
MN-1	Lower Shore	3.56 (0.34)	1.42 (0.17)	4.18 (1.68)	2.81 (2.10)	- -
MN-2 & 3	Upper Shore	3.79 (0.41)	1.64 (0.11)	4.13 (0.95)	6.56 (1.39)	- -
	Total Shore	3.65 (0.53)	1.56 (0.20)	4.15 (1.93)	0.00 0.00	- -

Table 21. Average weight (pounds) of harvested fish by species, location, and shore area for charter anglers¹ in the 2018 Lake Superior summer creel survey. SE in parentheses.

District ²	Cluster ³	Lake Trout	Coho Salmon	Chinook Salmon	Siscowet	Pink Salmon
	Sample size (n)	432	99	18	45	0
MN-1	1	3.23 (0.10)	1.33 (0.06)	3.60 (0.36)	3.14 (0.14)	- -
MN-1	2	3.96 (0.34)	1.86 (0.48)	0.00 0.00	3.46 (0.52)	- -
MN-2	3	2.91 (0.16)	1.84 (0.14)	4.38 (0.77)	3.67 (1.92)	- -
MN-3	4	2.73 (0.20)	1.57 (0.22)	3.76 (0.10)	2.36 (0.16)	- -
MN-1	Lower Shore	3.29 (0.35)	1.35 (0.48)	3.62 (0.36)	3.16 (0.54)	- -
MN-2 & 3	Upper Shore	2.83 (0.26)	1.75 (0.26)	4.08 (0.78)	2.75 (1.93)	- -
	Total Shore	3.18 (0.44)	1.47 (0.55)	3.68 (0.86)	3.15 (2.00)	- -

¹ Includes clients of chartered boat trips and excludes personal trips by licensed charter captains.

² Great Lakes Fishery Commission Statistical Districts

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

Table 22. Yield¹ (pounds) by species, location, and shore area for private sport boat and shore anglers in the 2018 Lake Superior summer creel survey. SE values are in parentheses.

District ²	Cluster ³	Lake Trout	Coho Salmon	Chinook Salmon	Steelhead	Siscowet	Pink Salmon	Other Salmonines ⁴	Total Salmonines	Non-Salmonines ⁵
MN-1	1	4,098 (590)	355 (75)	310 (78)	12 (14)	595 (595)	0 0	101 (124)	5,470 (854)	528 (773)
MN-1	2	32,819 (3,653)	2,073 (238)	1,433 (294)	137 (110)	2,670 (338)	0 0	541 (371)	39,673 (3,707)	78 (114)
MN-2	3	18,275 (2,642)	3,121 (473)	977 (247)	0 0	0 0	0 0	58 (66)	22,431 (2,696)	0 0
MN-3	4	7,256 (873)	1,721 (285)	1,449 (452)	12 (18)	43 (27)	0 0	0 0	10,480 (1,024)	0 0
MN-1	1 & 2	36,917 (3,700)	2,428 (250)	1,743 (304)	149 (111)	3,265 (684)	0 0	642 (391)	45,144 (3,803)	606 (781)
MN-2 & 3	3 & 4	25,530 (2,782)	4,842 (552)	2,426 (515)	12 (18)	43 (27)	0 0	58 (66)	32,911 (2,883)	0 0
Total		62,447 (4,630)	7,270 (606)	4,169 (598)	161 (113)	3,308 (685)	0 0	700 (397)	77,894 (4,773)	606 (781)

¹ Estimates are rounded to the nearest pound.

² Great Lakes Fishery Commission Statistical Districts

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

⁴ Other Salmonines included Brown Trout (171 lb.).

⁵ Anglers harvested Walleye (102 lb.), Northern Pike (220 lb.), and Herring (214 lb.).

Table 23. Yield¹ (pounds) by species, location, and shore area for charter anglers in the 2018 Lake Superior summer creel survey.

District ²	Cluster ³	Lake Trout	Coho Salmon	Chinook Salmon	Steelhead	Siscowet	Pink Salmon	Other Salmonines ⁴	Total Salmonines	Walleye
MN-1	1	23,621	1,744	2,321	14	3,252	0	368	31,319	992
		(7,470)	(427)	(1,393)	0	(1,217)	(0)	(282)	(7,712)	(504)
MN-1	2	2,645	108	117	0	260	0	6	3,135	3
		(1,542)	(75)	0	(0)	(187)	(0)	(13)	(1,555)	(1)
MN-2	3	3,952	722	228	0	44	4	8	4,959	0
		(1,581)	(270)	(200)	(0)	(61)	(2)	(4)	(1,617)	(0)
MN-3	4	2,885	283	184	0	66	0	4	3,422	0
		(1,290)	(133)	(58)	(0)	(26)	(0)	(2)	(1,299)	(0)
MN-1	1 & 2	26,265	1,852	2,438	14	3,511	0	374	34,454	995
		(7,627)	(434)	(1,393)	(0)	(1,231)	(0)	(282)	(7,867)	(504)
MN-2 & 3	3 & 4	6,838	1,005	412	0	110	4	12	8,381	0
		(2,041)	(301)	(208)	(0)	(67)	(2)	(4)	(2,074)	(0)
Total		33,103	2,857	2,850	14	3,622	4	386	42,835	995
		(7,895)	(528)	(1,408)	0	(1,233)	(2)	(282)	(8,136)	(504)

¹ Estimates are rounded to the nearest pound.

² Great Lakes Fishery Commission Statistical Districts

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

⁴ Other Salmonines included Brown Trout (233 lb.) and Kamloops Rainbow Trout (467 lb.).

⁵ Anglers harvested Walleye (641 lb.), Northern Pike (310 lb.), and Herring (87 lb.).

Table 24. Yield¹ (pounds) by species, location, and shore area for all anglers in the 2018 Lake Superior summer creel survey. SE values are in parentheses.

District ³	Cluster ⁴	Lake Trout	Coho Salmon	Chinook Salmon	Steelhead	Siscowet	Pink Salmon	Other Salmonines ²	Total Salmonines	Walleye	Others
MN-1	1	27,719 (7,493)	2,099 (434)	2,631 (1,395)	26 (14)	3,847 (1,354)	0 0	469 (590)	36,790 (854)	1,520 (922)	22 (9)
MN-1	2	35,463 (3,965)	2,181 (249)	1,550 (294)	137 (110)	2,930 (386)	0 0	547 (3,653)	42,808 (3,707)	81 (114)	352 (191)
MN-2	3	22,227 (3,079)	3,844 (545)	1,205 (318)	0 0	44 (61)	37 (15)	66 (2,642)	27,423 (2,696)	0 0	0 0
MN-3	4	10,141 (1,558)	2,004 (314)	1,633 (456)	12 (18)	109 (38)	0 0	4 (873)	13,902 (1,024)	0 0	2 (1)
MN-1	1 & 2	63,182 (8,477)	4,280 (501)	4,181 (1,425)	163 (111)	6,776 (1,408)	0 0	1,016 (391)	79,598 (3,803)	1,601 (929)	374 (191)
MN-2 & 3	3 & 4	32,368 (3,450)	5,847 (629)	2,838 (555)	12 (18)	153 (72)	37 (15)	70 (66)	41,325 (2,884)	0 0	2 (1)
Total		95,550 (9,153)	10,127 (804)	7,019 (1,530)	175 (113)	6,929 (1,410)	37 (15)	1,086 (4,630)	120,923 (4,774)	1,601 (929)	376 (191)

¹ Estimates are rounded to the nearest pound.

² Other Salmonines included Brown Trout (171 lb.).

³ Anglers harvested Northern Pike (226 lb.), Herring (129 lb.), and Lake Whitefish (20 lb.).

Table 25. Age distribution, in percent, of harvested lean Lake Trout (wild and stocked) for private sport boat and shore anglers in the 2018 Lake Superior summer creel survey. n=546.

Age	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI+
%	0	0.37	8.24	25.09	19.41	13.00	8.97	5.86	5.49	3.30	2.38	1.65	6.41

Table 26. Age distribution, in percent, of harvested lean Lake Trout (wild and stocked) for all chartered anglers in the 2018 Lake Superior summer creel survey. n=432.

Age	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI+
%	0	1.39	12.04	28.94	18.06	11.57	7.64	5.09	4.63	2.78	1.85	1.39	4.86

Table 27. Age distribution, in percent, of harvested lean Lake Trout (wild and stocked) for all anglers in the 2018 Lake Superior summer creel survey. n=978.

Age	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI+
%	0	1.39	12.04	28.94	18.06	11.57	7.64	5.09	4.63	2.78	1.85	1.39	4.86

Table 28. Percent diet composition by weight of prey items in salmonid stomachs in the Lake Superior summer creel survey in 2017-2018. Species-specific sample sizes of stomachs with contents are also listed.

Species	Lake Trout	Coho Salmon	Chinook Salmon	Pink Salmon	Siscowet
Fish sampled	321	114	26	37	14
Artificial	1.0	0	0	0	0
Bloater	4.5	0	0	0	0
Burbot	2.9	0	0	0	0
Coregonine	6.8	5.5	5.1	0	0
Insect, Aquatic	0.5	0	0	0	0
Insect, Terrestrial	1.8	31.7	0	4.2	1.6
Kiyi	5.2	0	0	0	0
Larval fish	0	0.4	0	0	0
Leech	0	0.4	0	0	0
Mysis	1.5	9.2	0	8.3	0
Rainbow Smelt	28.4	13.0	62.4	22.9	9.7
Salmonid	1.0	0	0	0	0
Sculpin	0.2	0	0	0	0
Sea Lamprey	3.4	0	0	0	0
Snail	0.1	0	0	0	0
Stickleback	0	1.0	0	0	0
Cisco	2.3	0	0	0	0
White perch	0	0	0	0	0
Zooplankton	0.03	1.4	0	37.5	0
Fish Remains	40.1	37.4	32.5	27.1	88.7

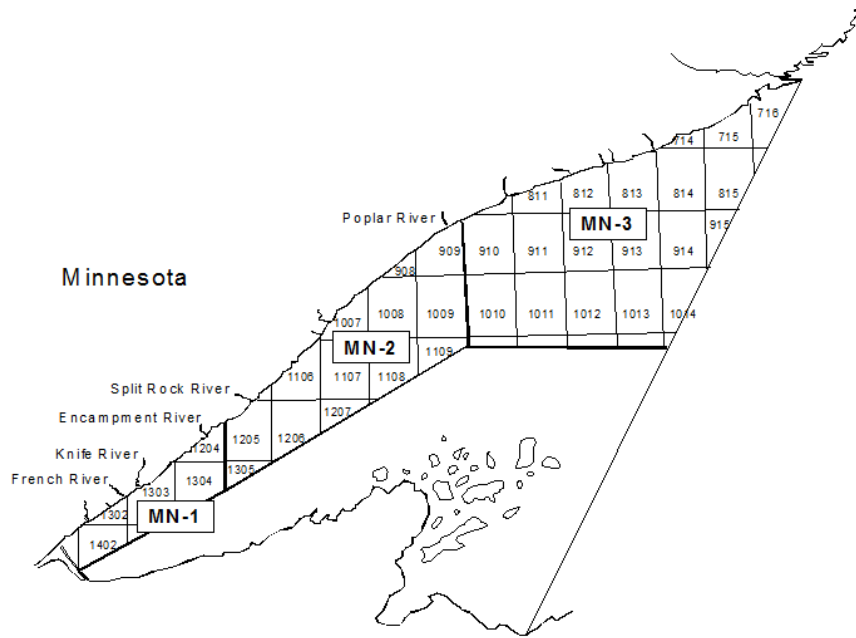


Figure 1. Statistical districts in Minnesota waters of Lake Superior.

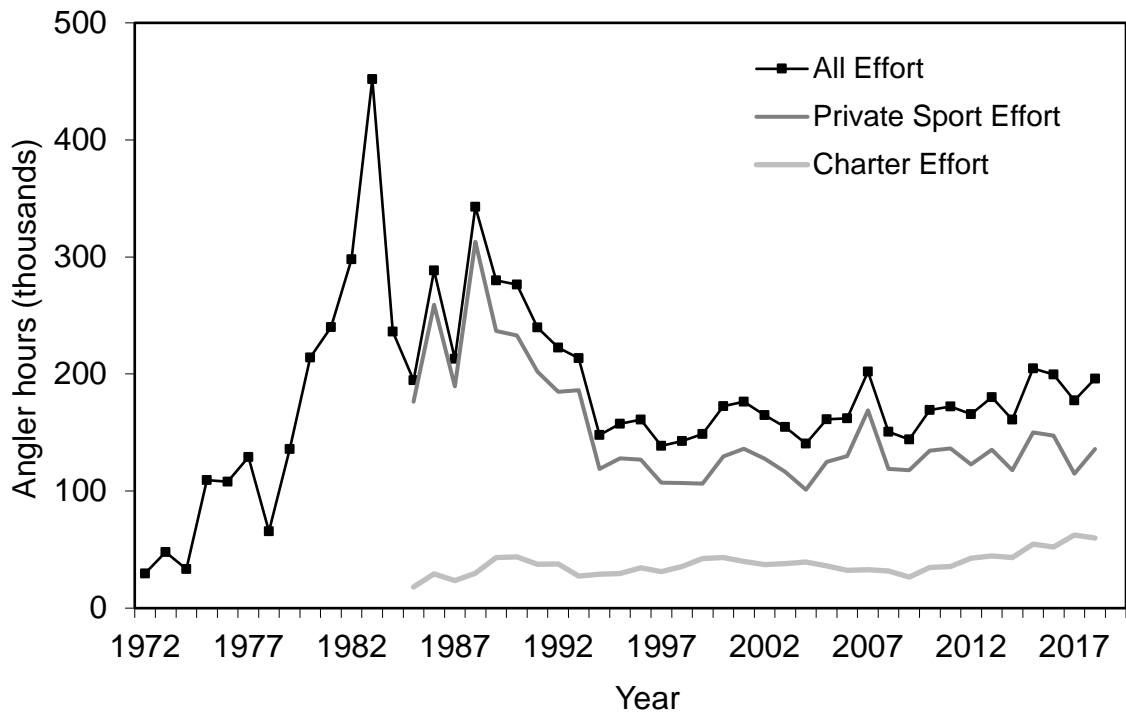


Figure 2. Angling effort in the Lake Superior summer creel survey, 1980-2018. The design of the summer Lake Superior creel survey was changed in 1994 (Halpern 1995a,b).

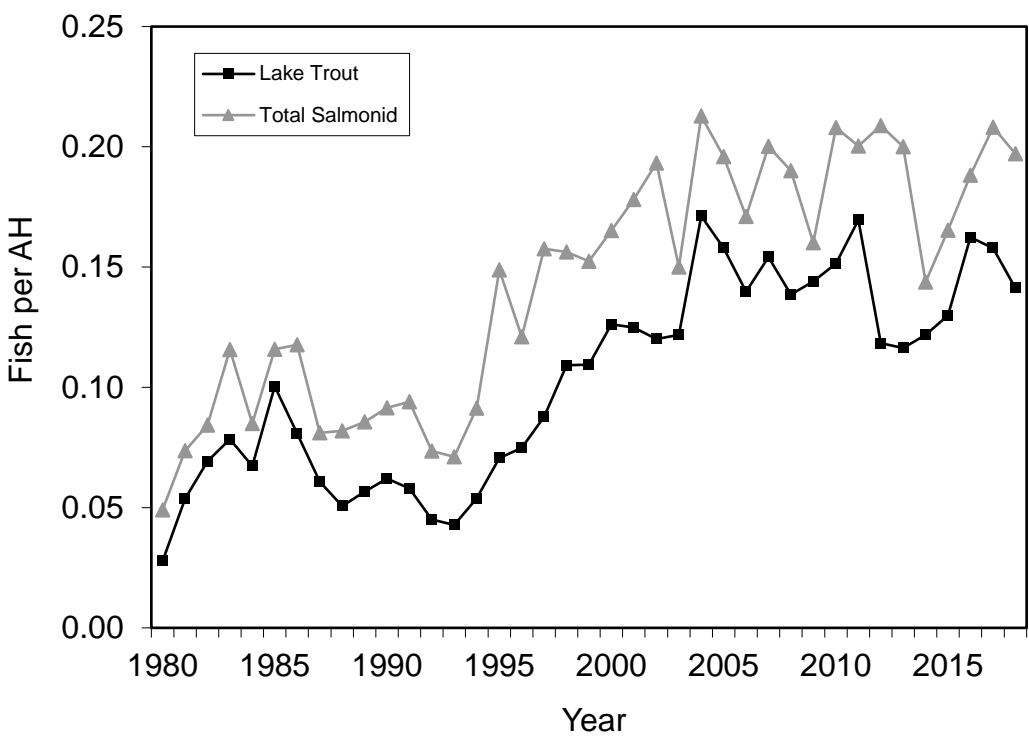


Figure 3. Harvest rate for Lake Trout and all Salmonids combined in the Lake Superior summer creel survey, 1980-2018.

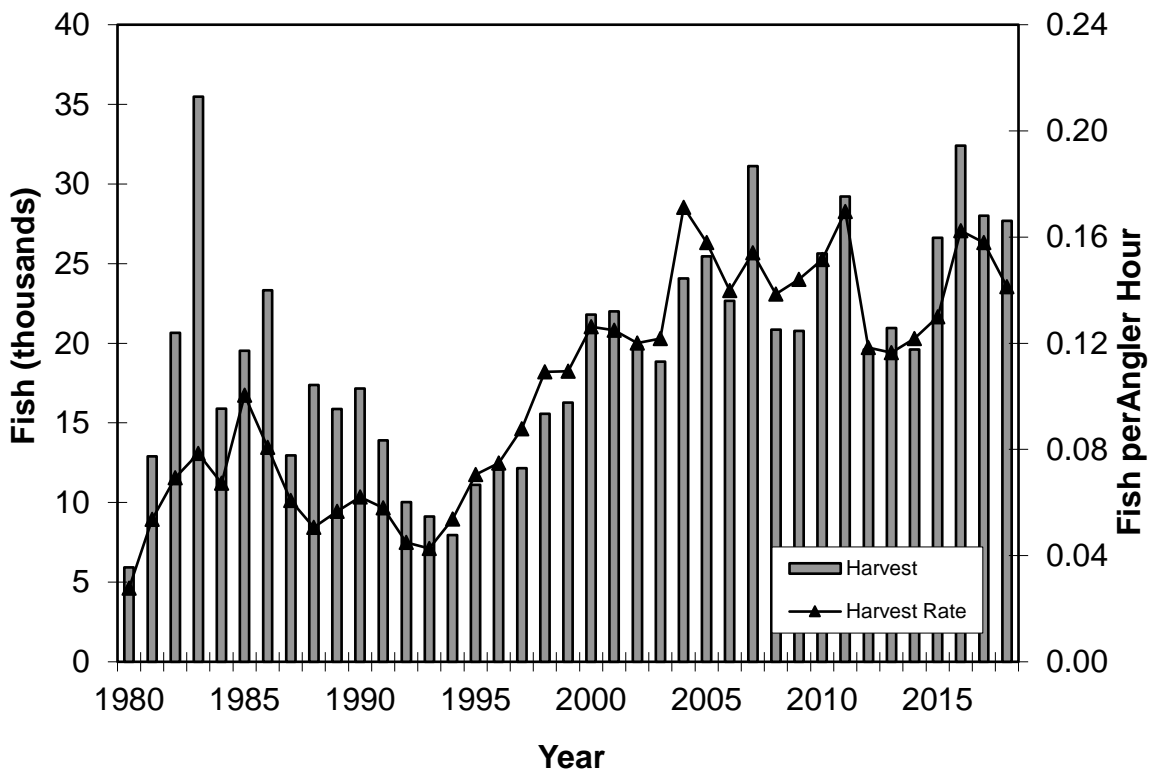


Figure 4. Lake Trout harvest and harvest rate in the Lake Superior summer creel survey, 1980-2018.

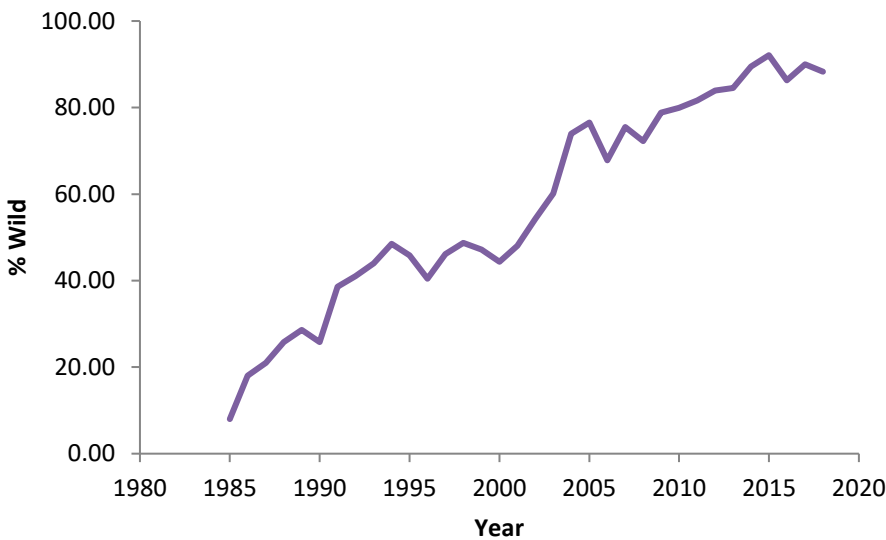


Figure 5. Percent wild Lake Trout observed by creel clerks in the Lake Superior summer creel survey, 1985-2018.

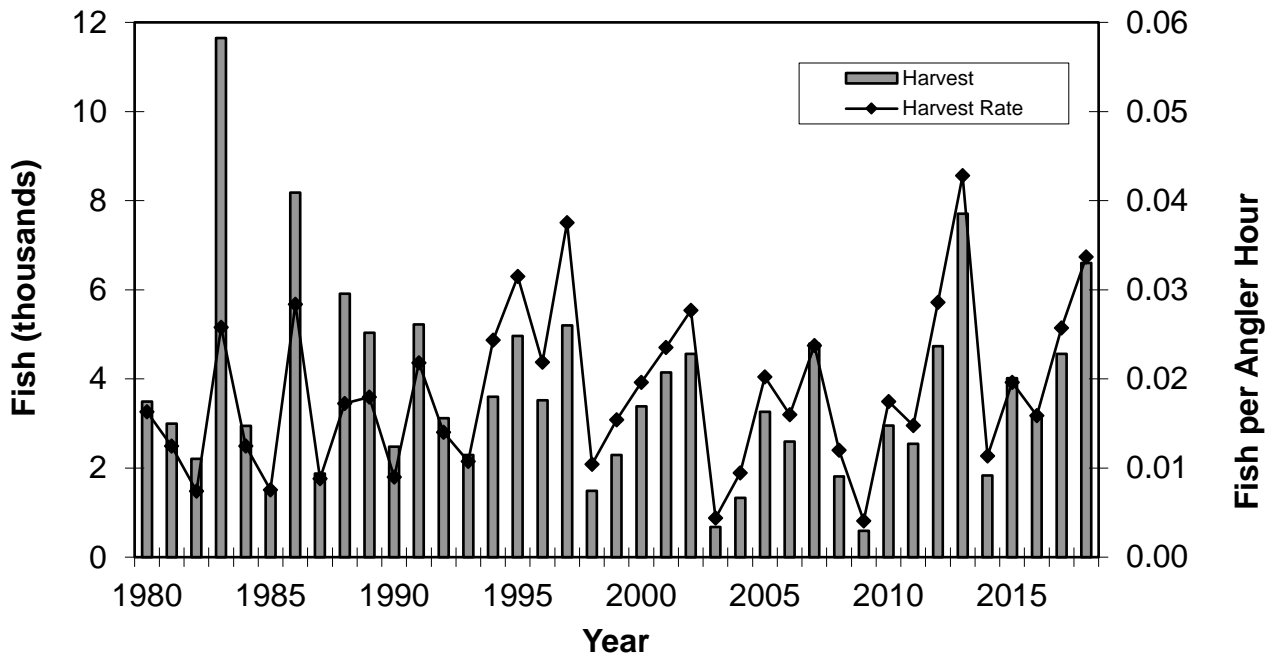


Figure 6. Coho Salmon harvest and harvest rate in the Lake Superior summer creel survey, 1980-2018.

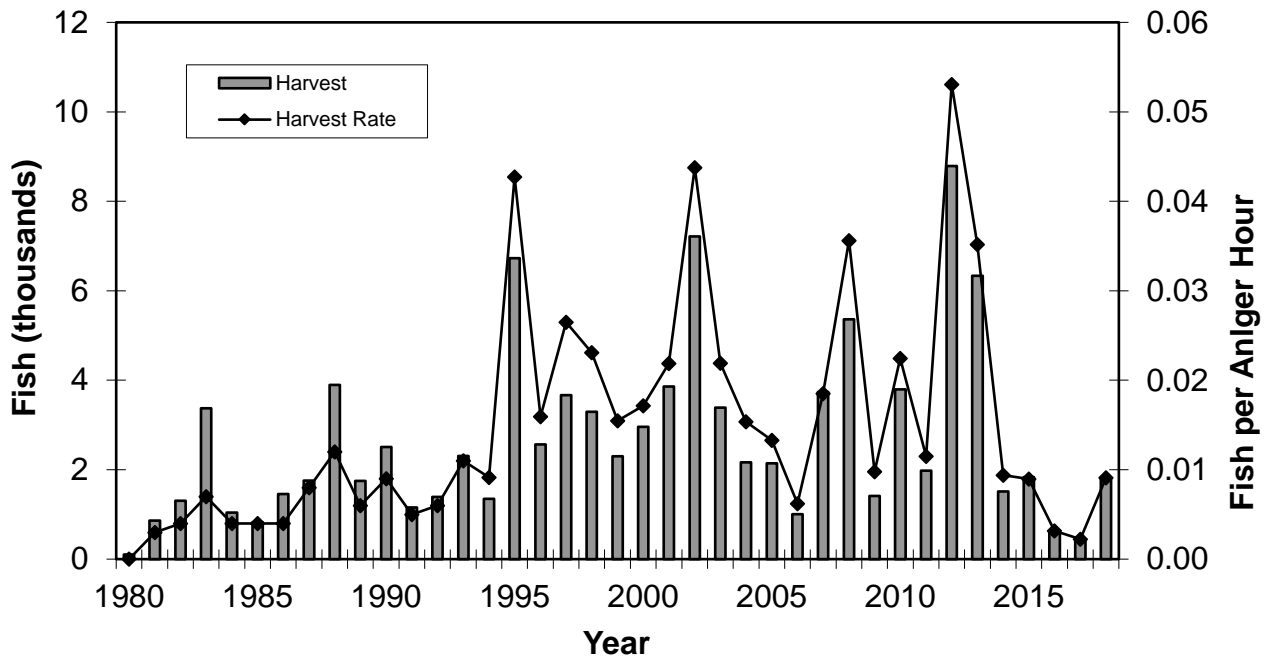


Figure 7. Chinook Salmon harvest and harvest rate in the Lake Superior summer creel survey, 1980-2018.

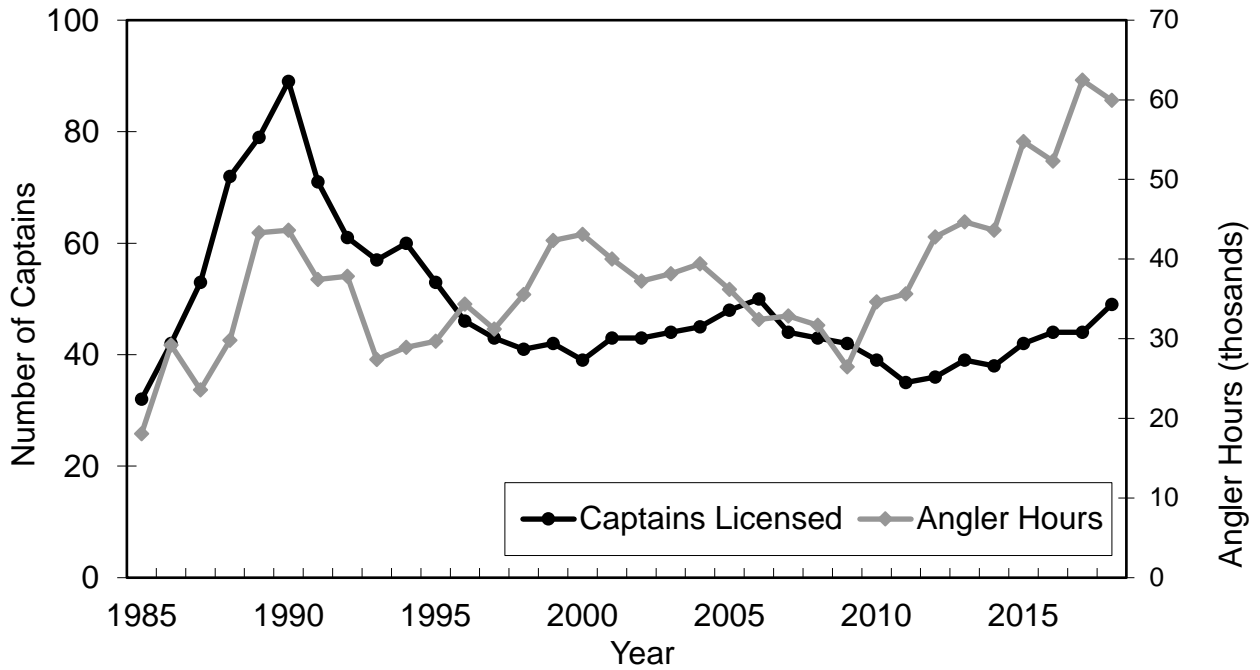


Figure 8. Number of licensed charter captains and fishing effort (angler hours) in the charter fishery; Minnesota waters of Lake Superior, 1985-2018.

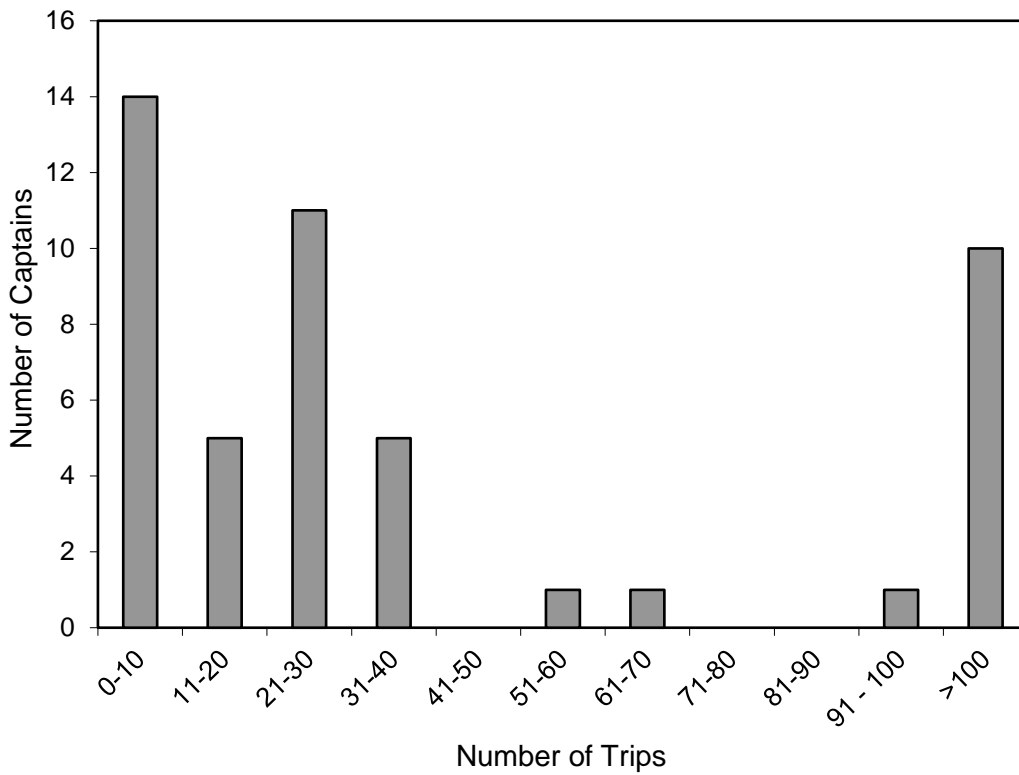


Figure 9. Number of charter captains making specific numbers of trips in Minnesota waters of Lake Superior, 2018.