WISCONSIN DEPARTMENT OF NATURAL RESOURCES

LAKE SUPERIOR CREEL REPORT 2024

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INTRODUCTION

The Wisconsin Department of Natural Resources (DNR) Lake Superior Fisheries Management Team conducts an annual creel survey of the open-water and ice fishing seasons in Wisconsin waters of Lake Superior spanning from Superior, WI (Douglas County) to Saxon Harbor (Iron County). In addition, DNR staff gather mandatory daily harvest reports from all charter trips (Sport Trolling License) and from all guided trips (Wisconsin Guide License) in Wisconsin waters of Lake Superior.

The harvest and data from this creel survey are important for numerous reasons. First, lake trout harvest estimates from management unit WI-2 are monitored closely to ensure the sport harvest does not exceed the portion of the quota allotted to sport fishing. Second, lake trout sport harvest, fishing effort and sizes of harvested lake trout are important inputs into a statistical catch-at-age model, which is used to estimate population size and ultimately set the lake trout total allowable catch in WI-2. Third, harvest estimates of all species from the creel survey are used to evaluate the effects of fishing regulation changes on sport fishing harvest. Lastly, harvest results are continually used to monitor "return-to-creel" rates of stocked fish.

METHODS

We estimated the sport fishery harvest in Wisconsin waters of Lake Superior during the normal lake trout sport fishing season (Dec. 1 through Sept. 30). Fishing effort, harvest and harvest rates were determined from 1) a series of randomized creel surveys during the ice fishing season (WI-2 only) and the open-water fishing season and 2) mandatory licensed charter and guided trip reporting.

In summary, the creel survey fishing effort (angler-hours) was estimated through a series of random vehicle/trailer counts at public access locations and then extrapolated those effort values to the total number of fishing days. Creel clerks interviewed anglers, who provided information such as the number of anglers in the party, time spent fishing, relative location fished, species targeted, number of fish harvested and biological characteristics (e.g., length, fin clips, etc.) of harvested fish. From this information, anglers were separated into various “fisheries” (see more details of different fisheries below) in order to allocate the estimated effort to various fisheries. Harvest rates (number of fish per angler-hour) were also calculated from interview information. Harvest rates and total effort were calculated for each fishery by

day type (i.e., weekend/weekday) at each location (e.g., Ashland route) within each month. Harvest estimates were calculated by multiplying the harvest rate by the total effort (angler-hours) within each of these groupings.

Harvested fish were identified and measured to the nearest tenth of an inch. Fin clips and any tags that were present were recorded. Maxillae (or a jawbone) were also sampled from a subset of lake trout to obtain estimates of fish ages. The Wisconsin waters of Lake Superior are divided into two management units: WI-1 or the Western Arm region (west of the line running north-south from Bark Point; 46 deg. 53.21 min. N, 91 deg. 11.16 min. W) and WI-2 or the Apostle Islands region (east of the Bark Point line; Figure 1). Creel results were separated by management unit.

Interview and count (effort) data were entered into a Microsoft Access database and subsequently run through a program in the statistical program R (R version 4.4.2) to obtain harvest and effort estimates. Original functions to calculate creel statistics and randomize creel schedules were developed by Dr. Derek Ogle of Northland College.

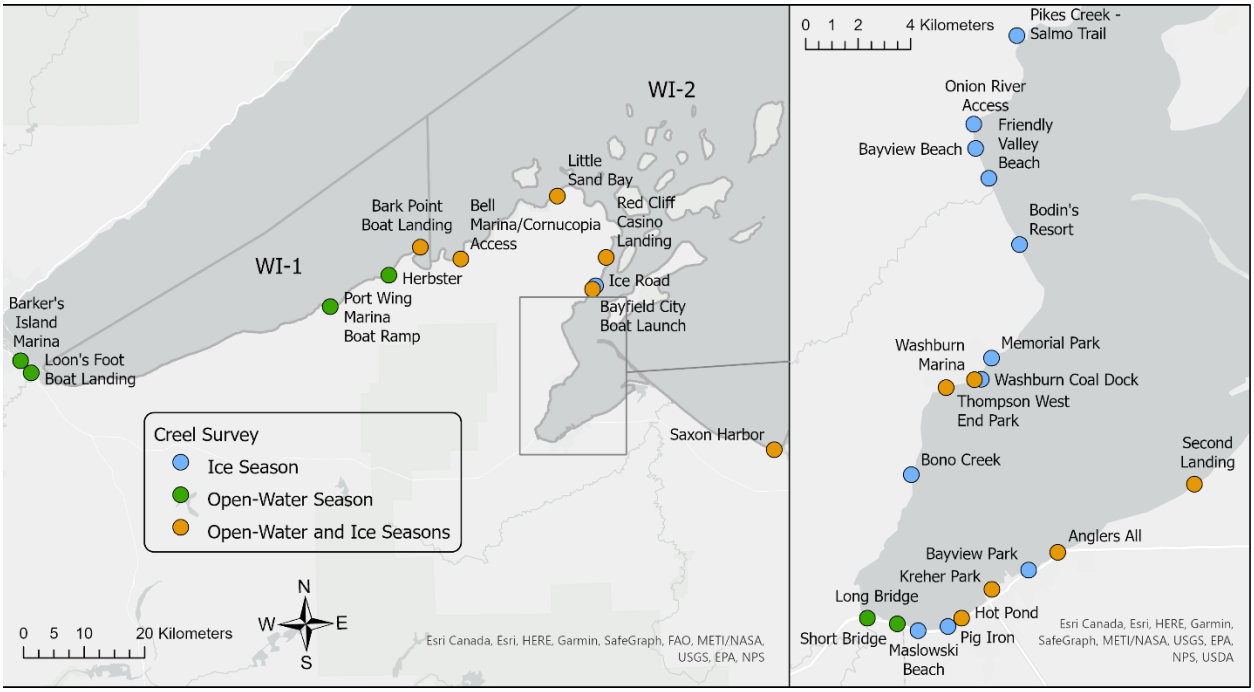

Figure 1. Wisconsin waters of Lake Superior, management units WI-1 and WI-2, and all ports sampled in the DNR Lake Superior Creel Survey (blue - ice season only; green - open-water season only; orange - both ice and open-water seasons).

DECEMBER OPEN-WATER SURVEY

We conducted an open-water creel survey along the main shore from Dec. 1, 2023 through Feb. 2024 at access points near Washburn and Bayfield. Trailer counts and interviews were

obtained using a stratified, access-point survey method. Interviews were conducted in the same manner as the open-water survey method (below).

ICE CREEL SURVEY

We also conducted an ice creel survey near Ashland (i.e., Second Landing-Long Bridge) from Jan. 17, 2024 to Feb. 25, 2024, and near Washburn/Bayfield ("S" Curve-Bono Creek access through the northernmost area of fishing activity) from Jan. 15, 2024 – Feb. 27, 2024. Vehicle counts were obtained using a stratified, access-point survey method. Two separate vehicle counts were made daily, starting at approximately 9 a.m. and 2 p.m. for each site in each random route. Vehicles present in morning and afternoon checks were not counted twice. Interviews for the ice creel survey were conducted at the access point. Any number of anglers in a single vehicle was considered an angling party. Anglers interviewed in the ice fishery were separated into three different fisheries: Ice Shallow Water (less than 60 feet), Ice Deep Water- "Bobbing" (greater than or equal to 60 feet) and Northern Pike Ice Spearing.

OPEN-WATER SURVEY

We conducted a single-loop time interval creel survey during the open-water fishing season in Wisconsin waters of Lake Superior. The following locations were surveyed (start date): Ashland (April 1), Saxon (March 1), Washburn (April 1), Apostle Islands (Bayfield, Red Cliff, Little Sand Bay; March 1), Cornucopia and Port Wing (April 1) and Superior (May 11). The open-water creel survey ended on Sept. 30, 2024.

Creel clerks obtained trailer counts and interviews using a randomized, single-loop time interval method (i.e., bus route). Using the time interval procedure, clerks counted vehicles with boat trailers and harbor boats at each access site. Boats going out to fish or returning from fishing were counted as a fraction of the time the clerk spent at the site (i.e., individual boat count = [creel shift in minutes – minutes at site] / creel shift in minutes). A boat beginning to fish was added to the initial count, and a boat stopping or returning from fishing was subtracted from the initial count.

Creel clerks interviewed angler parties returning from fishing at the access point. We treated the total number of anglers onboard as an angler party and categorized angler parties by fishery. For example, if the boat was fishing for cool-water species such as northern pike, walleye or yellow perch in a predominately cool-water area, we recorded it in the "Open-Water Cool" fishery. If the boat was trolling for trout and salmon (i.e., cold-water species), we recorded it in the "Open-Water Cold" fishery. If the boat was strictly practicing catch-and-release smallmouth bass fishing, we recorded it in the "Smallmouth Bass Only" fishery. If the boat was targeting lake whitefish by jigging, we recorded it in the "Open-Water Whitefish" fishery. If the boat was fishing for "anything that bites," we considered the area the boat fished and determined which fishery to place the interview. Finally, if the party was not fishing, we placed it in the category "Pleasure Boating" and did not apply this effort to harvest estimates.

We did not count boats from chartered or guided trips in effort estimates at a site due to mandatory reporting (see below). We also excluded sailboats from counts unless fishing gear (e.g., downriggers or rods) was present. Saxon Harbor and ports within Superior, Wisconsin are considered boundary waters with Michigan and Minnesota, respectively. We did not

include effort and harvest of parties fishing in non-Wisconsin waters in Wisconsin harvest estimates. We assigned half the effort/harvest to Wisconsin for boats that fished both states' waters.

Lastly, creel clerks also asked anglers for their primary zip code of residence during interviews. We created density maps of the primary residence of anglers fishing Wisconsin waters of Lake Superior using a kernel density function in ArcGIS Pro.

CHARTER AND GUIDED TRIP REPORTING

We collected effort and harvest estimates from chartered trips (Sport Trolling License) in a mandatory online reporting system. Information on the number of anglers, hours fished, location (grid) and the number of various species harvested were included in online reports. Similarly, we collected harvest, catch and effort information from guided trips (Wisconsin Guide License) via an online daily reporting system.

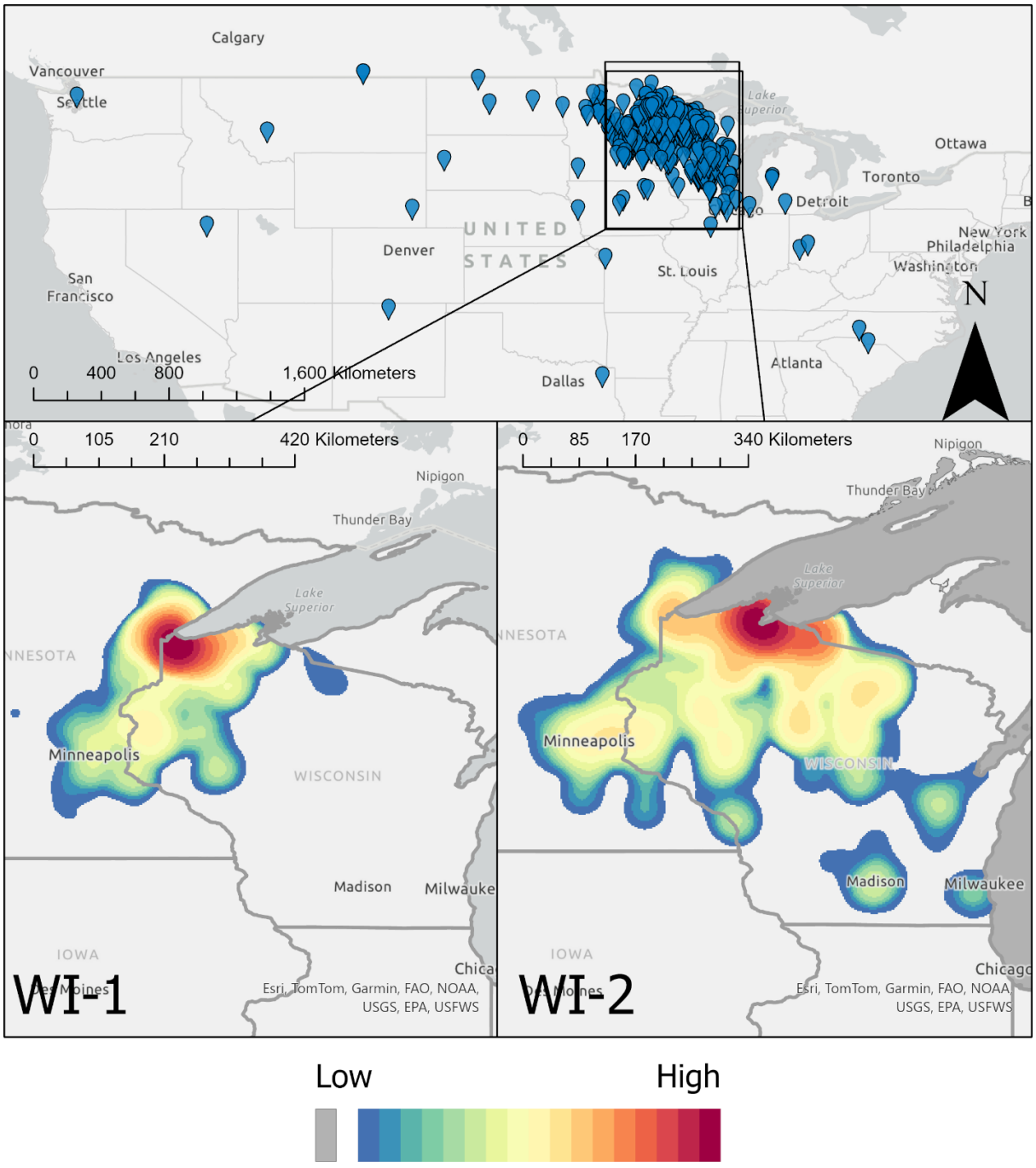

Figure 2. Top map: individual zip code locations of angler primary residences observed during the 2024 DNR Lake Superior creel survey. Bottom maps: density of primary residences of Lake Superior anglers interviewed in the 2024 creel survey fishing in WI-1 (bottom-left) and WI-2 (bottom-right). Red shades represent areas of higher density and blue shades represent areas of lower density.

RESULTS

MANAGEMENT UNIT WI–1

The 2024 Lake Superior Creel Survey in WI-1 included 982 creel interviews of angler parties (2,289 anglers interviewed) resulting in an estimated 66,927 angler-hours in WI-1, including charter and guide trip reporting (Figure 3). The total harvest in management unit WI-1 was 12,549. Walleye (7,945), lake trout (2,789) and coho salmon (900) were the top three species harvested and accounted for 93% of the harvest (Figure 4). The total trout and salmon harvest was 3,953.

The 2024 total effort in WI-1 was similar to last year but higher than the recent average effort (59,891 angler-hours). Total harvest was slightly lower than last year but 30% higher than the recent average of 9,643. Walleye harvest increased for the third consecutive year (Figure 4) and was the highest since 2002. Lake trout harvest was lower than the recent average (Figure 7). Coho salmon harvest was lower than last year and 35% lower than the recent average (1,378). The total trout and salmon harvest was lower than recent seasons (Figure 4).

ANGLER DEMOGRAPHICS

During the 2024 survey, we interviewed anglers from 7 different U.S. states and 53 U.S. counties fishing in WI-1 (Figure 2). Approximately 76% of anglers were Wisconsin residents, and 23% were Minnesota residents (Figure 2). Highest densities of WI-1 anglers were from the Superior-Duluth area (Figure 2). WI-1 anglers were represented by 23 of 72 (32%) Wisconsin counties in 2024 (Figure 2).

OPEN-WATER COLD (targeting trout and salmon)

The Open-Water Cold fishery accounted for 28,965 angler-hours in WI-1 (43% of the total fishing effort). The total harvest in this fishery was 4,386. Lake trout (2,512), coho salmon (879) and walleye (515) were the top three species harvested and accounted for 89% of the harvest in this fishery. The total trout and salmon harvest in this fishery was 3,860. Lake trout harvest rate was highest (0.0867), followed by coho salmon (0.0303) and walleye (0.0178). The trout and salmon harvest rate was 0.1254 fish per angler-hour and similar to recent years (Figure 5).

The 2024 Open-Water Cold effort was the lowest since 2017 and 14% lower than the recent average (33,761 angler-hours). Lake trout harvest was lower than last year and 10% lower than the recent average (2,784). Lake trout harvest rate was higher than last year and similar to the recent average (Figure 7).

OPEN-WATER COOL (targeting cool-water species)

The Open-Water Cool fishery accounted for 36,752 angler-hours in WI-1 (55% of the total fishing effort). The total harvest in this fishery was 7,803. Walleye was the top species harvested (7,350) and accounted for 94% of the harvest in this fishery. Walleye harvest rate was 0.2000 fish per angler-hour.

The 2024 Open-Water Cool effort was higher than last year and 52% higher than the recent average (24,210 angler-hours). Walleye harvest was higher than last year and was 109% higher than the recent average (3,512 fish). The last time the Open-Water Cool effort and walleye

harvest was near this level was in 2002. Walleye harvest rate was lower than last year but higher than the recent average (0.1363).

CHARTER

The 2024 Charter fishery accounted for 981 angler-hours in WI-1 (<2% of the total fishing effort). The total harvest in this fishery was 284. Lake trout was the top species harvested (246) and accounted for 87% of the harvest in this fishery. Lake trout harvest rate was 0.2508 fish per angler-hour.

The 2024 Charter effort was the lowest since 2014 and 53% lower than the recent average (2,106 angler-hours). Lake trout harvest was slightly higher than last year but lower than the recent average (418).

Please refer to the DNR Lake Superior Charter Fishing Report 2024 for a more detailed account of the 2024 Charter fishery.

MANAGEMENT UNIT WI–2

The 2024 Lake Superior Creel Survey in WI-2 included 2,066 creel interviews of angler parties (4,146 anglers interviewed) resulting in an estimated 175,030 angler-hours, including charter and guide trip reporting (Figure 3). The total harvest in management unit WI-2 was 36,826. Coho salmon (10,790), lake trout (8,943), yellow perch (5,368), brown trout (3,809), lake whitefish (3,017), splake (1,368) and walleye (1,150) were the top seven game species harvested and accounted for 94% of the harvest (Figure 4). Total trout and salmon harvest was 25,092.

The WI-2 2024 total effort declined for the fourth year in a row after a peak in 2020/2021 and was lower than the recent average of 228,560 angler-hours. Coho salmon harvest was near the highest of all time. Brown trout harvest was the highest since 2020 (4,353). Lake trout harvest was the lowest in recent years. The harvest of lake whitefish, splake, walleye and yellow perch were all lower than last year and the recent average. The total trout and salmon harvest was near the average of recent years (Figure 4).

ANGLER DEMOGRAPHICS

During the 2024 survey, we interviewed anglers from 15 different U.S. states and 107 U.S. counties fishing in WI-2 (Figure 2). Approximately 87% of anglers were Wisconsin residents, and 9% were Minnesota residents (Figure 2). Highest densities of WI-2 anglers were from the Chequamegon region (Figure 2). WI-2 anglers were represented by 50 of 72 (69%) Wisconsin counties in 2024 (Figure 2).

DECEMBER OPEN-WATER

The December Open-Water fishery accounted for 5,581 angler-hours in WI-2 (3% of the total fishing effort; Figure 3), almost five times the average effort of recent years. The total harvest in this fishery was 2,522, almost five times the average harvest of recent years. Coho salmon harvest was highest (1,501), followed by brown trout (676) and splake (237). The trout and salmon harvest was 2,441 with a harvest rate of 0.4401 fish per angler-hour, which was near average (Figure 5).

Harvest of coho salmon, brown trout and splake in this fishery were all higher than last year and their recent averages. The harvest rate for coho salmon was higher than last year and the

recent average. The harvest rate for brown trout and splake were higher than last year but lower than their recent averages.

ICE FISHING SEASON

The 2024 winter season was one of the mildest winters on record, which meant very limited ice formation in the Chequamegon Bay and Apostle Islands regions. There were approximately 44 days (Jan. 15-Feb. 27, 2024) of fishable ice this season, which was unofficially one of the shortest seasons on record with unofficial record lows in effort and harvest.

ICE < 60 FEET - SHALLOW

The Ice < 60 feet - Shallow fishery accounted for 13,823 angler-hours in WI-2 (8% of the total fishing effort; Figure 3). The total harvest in this fishery was 5,628. Yellow perch (4,301; 76% of harvest), rainbow smelt (392), splake (277), coho salmon (143), lake whitefish (129) and brown trout (119) were the top six species harvested and accounted for 95% of the total harvest in this fishery. The total trout and salmon harvest was 539. Yellow perch harvest rate was highest (0.3111 fish per angler-hour), followed by rainbow smelt (0.0284), splake (0.0200), coho salmon (0.0103), lake whitefish (0.0093) and brown trout (0.0086). The trout and salmon harvest rate was 0.0390 fish per angler-hour.

The 2024 Ice < 60 feet - Shallow fishery total effort and harvest of all species was lower than last year and the recent average. Yellow perch harvest rate was higher than last year and the recent average. The harvest rate for coho salmon and splake were higher than last year but lower than their recent averages. The harvest rate for brown trout, lake whitefish and rainbow smelt were lower than last year and their recent averages. The trout and salmon harvest rate was slightly higher than last year but lower than the recent average (Figure 5).

ICE ≥ 60 FEET - BOBBING

The Ice ≥ 60 feet - Bobbing fishery accounted for 337 angler-hours in WI-2 (0.2% of the total fishing effort; Figure 3). The total harvest in this fishery was 115. Coho salmon (61), lake whitefish (17), lake herring (11), splake (8) and brown trout (4) were the top species harvested in this fishery. The total trout and salmon harvest was 73. Coho salmon harvest rate was highest (0.1810), followed by lake whitefish (0.0504), lake herring (0.0326), splake (0.0237) and brown trout (0.0119). The trout and salmon harvest rate was 0.2166 fish per angler-hour.

The 2024 Ice ≥ 60 feet - Bobbing fishery total effort and total harvest was the lowest it has been in recent years.

OPEN-WATER COLD (targeting trout and salmon)

The Open-Water Cold fishery accounted for 101,878 angler-hours in WI-2 (58% of the total fishing effort; Figure 3). The total harvest in this fishery was 18,235. Coho salmon (8,204), lake trout (5,925) and brown trout (2,468) were the top three species harvested and accounted for 91% of the total harvest in this fishery. The trout and salmon harvest was 17,492. Coho salmon harvest rate (0.0805 fish per angler-hour) was the highest followed by lake trout (0.0582) and brown trout (0.0242). The trout and salmon harvest rate was 0.1717 fish per angler-hour.

The 2024 Open-Water Cold fishery total effort was the highest effort in recent years and 18% higher than the recent average. The total harvest was the highest since 2019. Coho salmon harvest was higher than last year and 76% higher the recent average (4,665). Coho salmon

harvest rate was higher than last year and higher than the recent average (0.0535). Lake trout harvest and harvest rate were lower than last year and lower than the recent average (8,230 and 0.0974; Figure 7). Brown trout harvest was the highest since 2019 and 28% higher than the recent average (1,928). Brown trout harvest rate was the highest since 2019 but slightly lower than the recent average (0.0223). The trout and salmon harvest rate was similar to the recent average (Figure 5).

OPEN-WATER COOL (targeting cool-water species)

The Open-Water Cool fishery accounted for 21,066 angler-hours in WI-2 (12% of the total fishing effort; Figure 3). The total harvest in this fishery was 3,034. Yellow perch (1,029), walleye (808) and northern pike (582) were the top three species harvested and accounted for 80% of the harvest in this fishery. Yellow perch harvest rate was highest (0.0488 fish per angler-hour), followed by walleye (0.0384) and northern pike (0.0276).

The 2024 Open-Water Cool fishery effort was lower than last year and 32% lower than the recent average (30,802). Total harvest was similar to last year and similar to the recent average (2,968). Walleye harvest and harvest rate were both lower than last year and lower than the recent average. Yellow perch and northern pike harvest and harvest rates were higher than last year and higher than recent averages.

OPEN-WATER WHITEFISH

The Open-Water Whitefish fishery accounted for 5,089 angler-hours in WI-2 (3% of the total fishing effort in WI-2; Figure 3). The total harvest in this fishery was 2,751. Lake whitefish harvest was 2,688 with a harvest rate of 0.5282 fish per angler-hour.

The 2024 Open-Water Whitefish fishery effort was lower than last year and 8% lower than the recent average. Lake whitefish harvest was lower than last year and 28% lower than the recent average (3,743). Lake whitefish harvest rate was lower than last year and lower than the recent average (0.6569 fish per angler-hour).

SMALLMOUTH BASS

The smallmouth bass fishery accounted for 13,103 angler-hours in WI-2 (7% of the total fishing effort; Figure 3). This was lowest effort since it was distinguished as its own fishery in 2019. Most of this effort occurs in May and June from anglers fishing the eastern side of Chequamegon Bay. No smallmouth bass harvest was observed during the 2024 survey.

CHARTER

The Charter fishery accounted for 12,907 angler-hours in WI-2 (7% of the total fishing effort; Figure 3). The total charter harvest was 4,435. Lake trout (2,953), coho salmon (862) and brown trout (501) were the top three species harvested and accounted for 97% of the harvest in this fishery. The total trout and salmon harvest was 4,431. Lake trout harvest rate was the highest (0.2288 fish per angler-hour), followed by coho salmon (0.0668) and brown trout (0.0388). The trout and salmon harvest rate was 0.3433 fish per angler-hour.

The 2024 Charter fishery effort in WI-2 was higher than last year and 44% higher than the recent average. Lake trout harvest was higher than last year and 33% higher than the recent average (2,221). Coho salmon harvest was higher than last year and 92% higher the recent average (450). Brown trout harvest was higher than last year and 88% higher than the recent

average (267). Lake trout, coho salmon and brown trout harvest rates were all higher than last year and their recent averages. The trout and salmon harvest rate was similar to the last two seasons (Figure 5).

Please refer to the DNR Lake Superior Charter Fishing Report 2024 for a more detailed account of the 2024 Charter fishery.

LAKE TROUT FISHERY

MANAGEMENT UNIT WI-1

Daily bag limit: 3, minimum length limit: 15 inches, only one > 25 inches

The estimated lake trout harvest by sport anglers in WI-1 was 2,789. This was lower than last year and slightly lower than the long-term average (Figure 7). The Open-Water Cold fishery represented the most lake trout harvest (2,512), followed by the Charter (246) and the Open-Water Cool fisheries (31).

The total lake trout harvest rate in WI-1 was 0.0417 fish per angler-hour. The Charter fishery had the highest lake trout harvest rate (0.2508 fish per angler-hour) followed by the Open-Water Cold (0.0867) and the Open-Water Cool fisheries (0.0053). The lake trout harvest rate in the Open-Water Cold fishery was slightly higher than last year and the long-term average (Figure 7).

MANAGEMENT UNIT WI-2

Daily bag limit: 2, minimum length limit: 15 inches, only one > 25 inches

The estimated lake trout harvest by sport anglers fishing in WI-2 was 8,943. This was lower than last year and lower than the long-term average (Figure 7). The Open-Water Cold fishery represented the most harvest (5,925) followed by the Charter (2,953), Open-Water Cool fishery (38) and December Open-Water fishery (27).

The total lake trout harvest rate was 0.0511 fish per angler-hour, which was slightly higher than last year (0.0497) and lower than the recent average (0.0522). The Charter fishery had the highest lake trout harvest rate of all fisheries in WI-2 (0.2288), followed by the Open-Water Cold (0.0582), December Open-Water fishery (0.0048) and the Open-Water Cool fishery (0.0018). The lake trout harvest rate in the Open-Water Cold fishery was considerably lower than the long-term average (Figure 7).

Note: For more detailed breakdowns of the DNR Lake Superior Creel Survey results, please refer to the Lake Superior Supplemental Creel Report 2024.

ACKNOWLEDGEMENTS

We thank the creel clerks. They work hard obtaining accurate data for the survey, and they also play an important role by having positive interactions with the angling public. Their effort is greatly appreciated. The creel clerks involved for this report were: Emily Hutler (Winter Creel-Ashland), Devin Engel (December Open-Water, Winter Creel: Washburn; Open-Water: Bayfield, Red Cliff, Little Sand Bay, Cornucopia-Port Wing, Saxon), Charlie McBain (December Open-Water, Winter Creel: Washburn; Open-Water: Bayfield, Red Cliff, Little Sand Bay, Cornucopia-Port Wing), Dean Kolpin (Open-Water: Saxon), Meg Ellias (Open-Water: Ashland and Washburn), Chris Wedding (Open-Water: Bayfield, Red Cliff, Little Sand Bay, Cornucopia-Port Wing, Saxon) and Josh Revolinsky (Open-Water: Superior). We also thank Dr. Derek Ogle, formerly of Northland College, who developed the functions to calculate creel statistics and randomize creel schedules in the statistical program R.

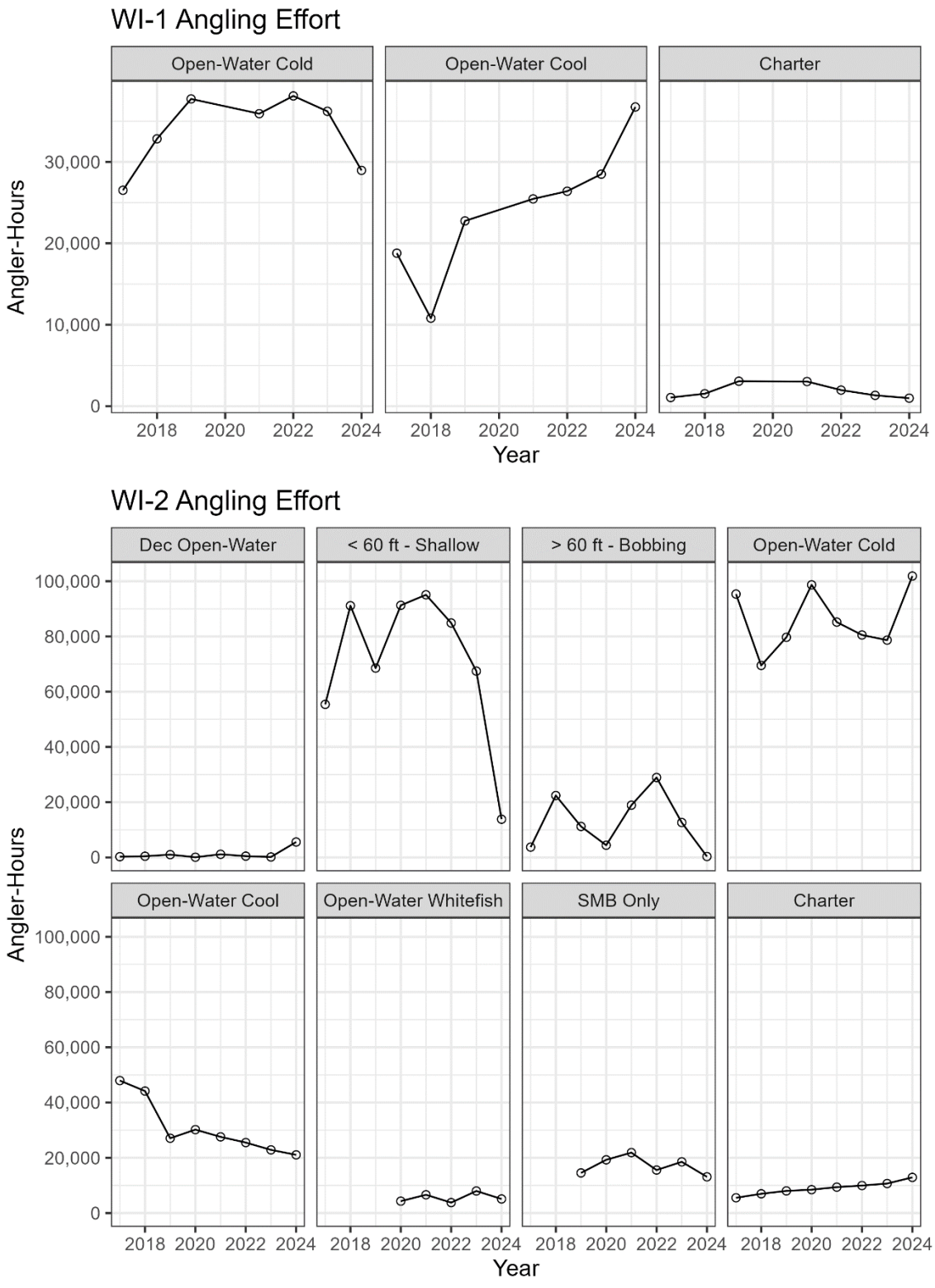

Figure 3. Total estimated fishing effort (angler-hours) by each fishery sampled in the DNR Lake Superior Creel Survey within each management unit (WI-1 and WI-2) from 2017 to 2024.

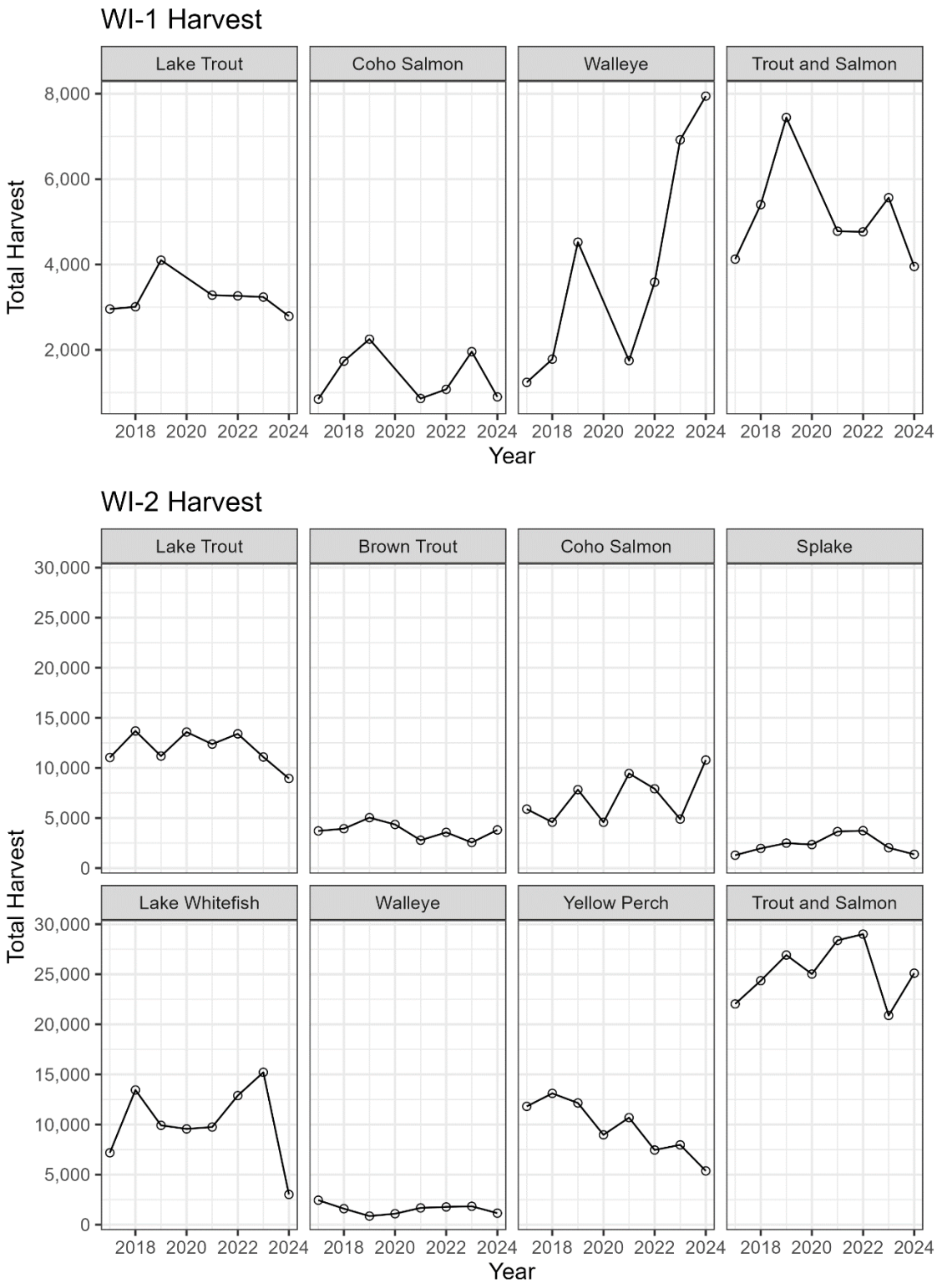

Figure 4. Total estimated harvest of the main species in the DNR Lake Superior Creel Survey within each management unit (WI-1 and WI-2) from 2017 to 2024. All trout and salmon combined are represented in the Trout and Salmon category.

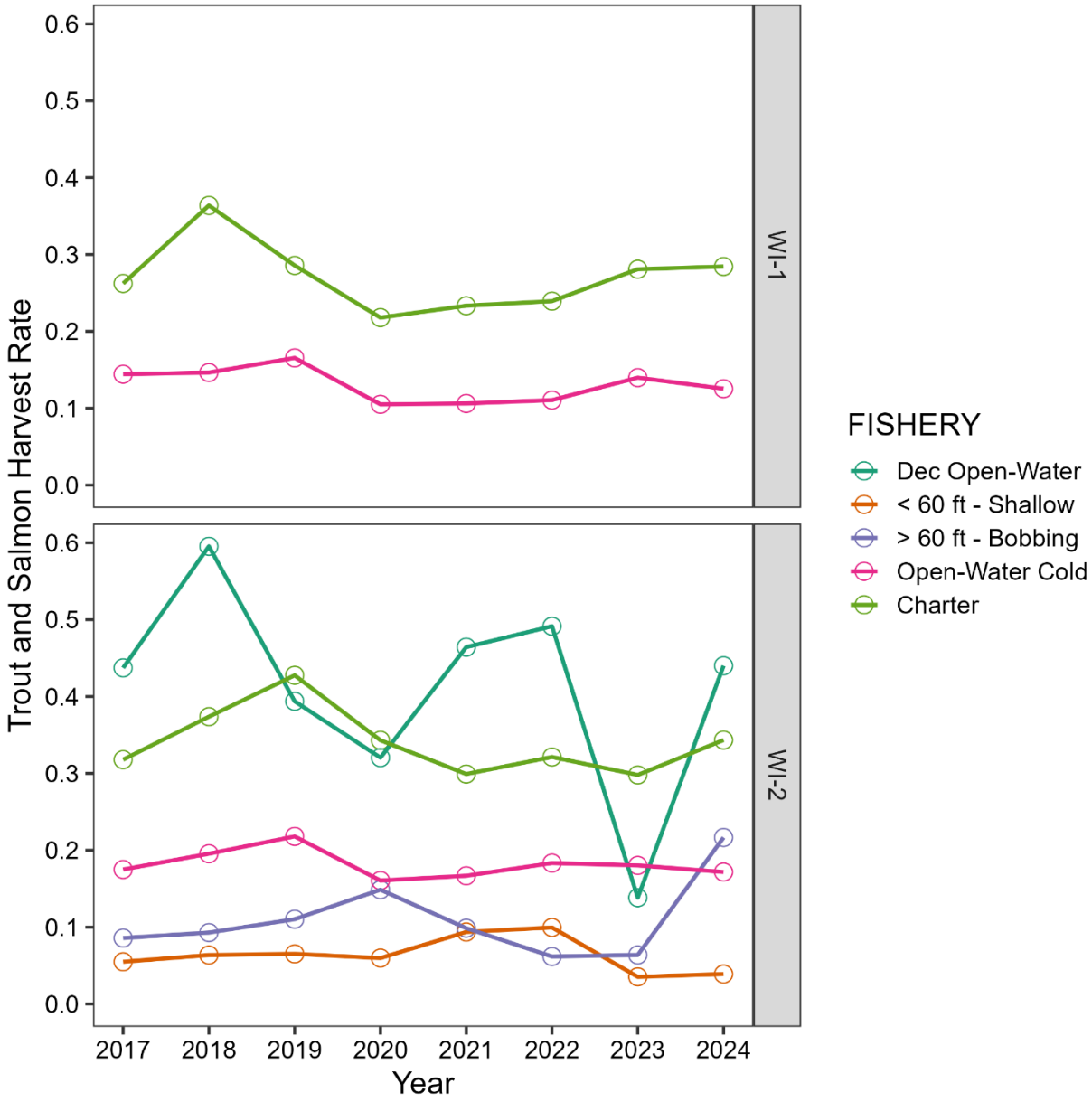

Figure 5. Estimated harvest rate (fish per angler-hour) of all trout and salmon from each fishery sampled in the DNR Lake Superior Creel Survey within each management unit (WI-1 and WI-2) from 2017 to 2024.

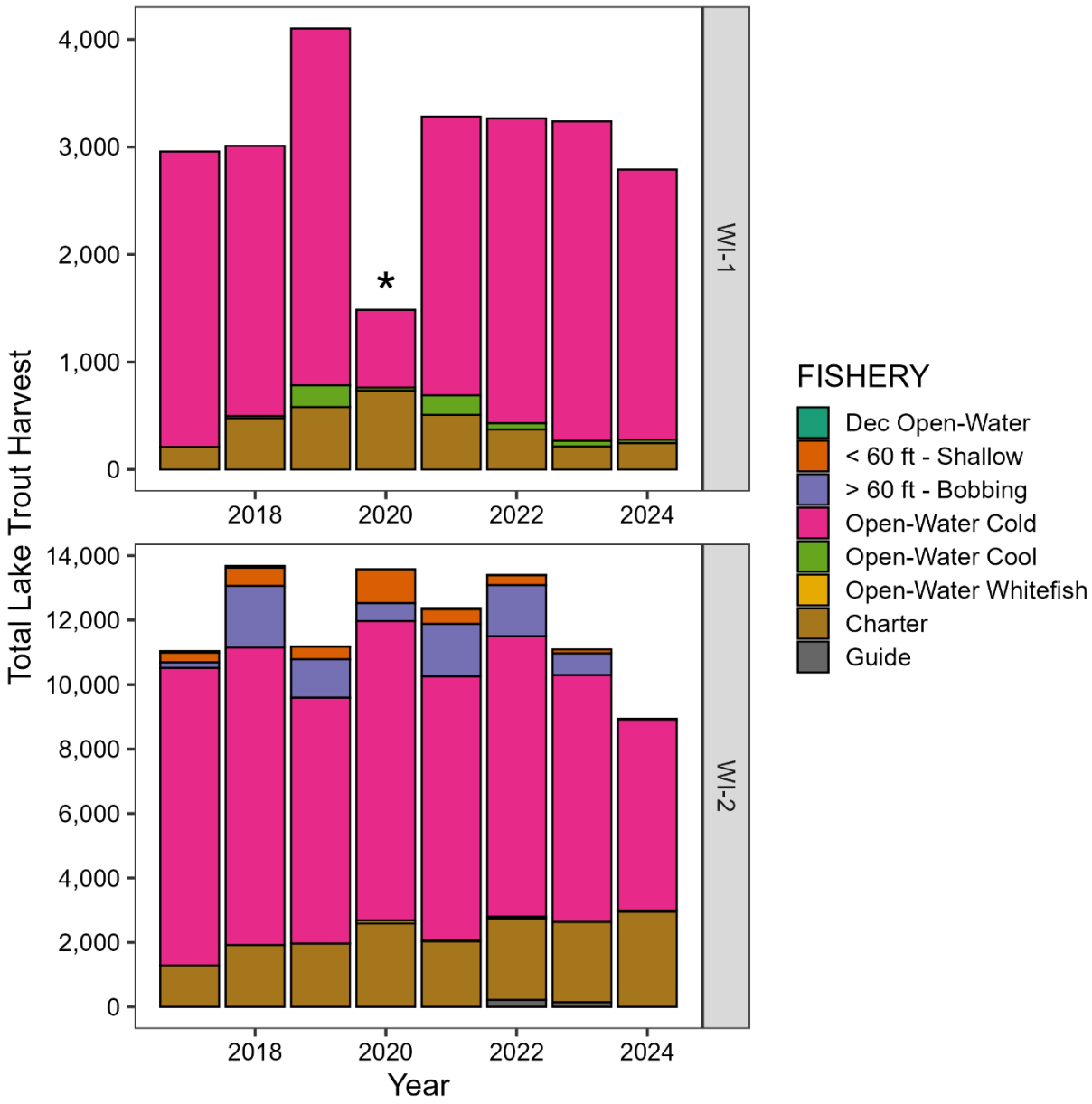

Figure 6. Total estimated harvest of lake trout by each fishery sampled in the DNR Lake Superior Creel Survey within each management unit (WI-1 and WI-2) from 2017 to 2024.

*Note: In WI-1, the Superior creel route was not completed in 2020.

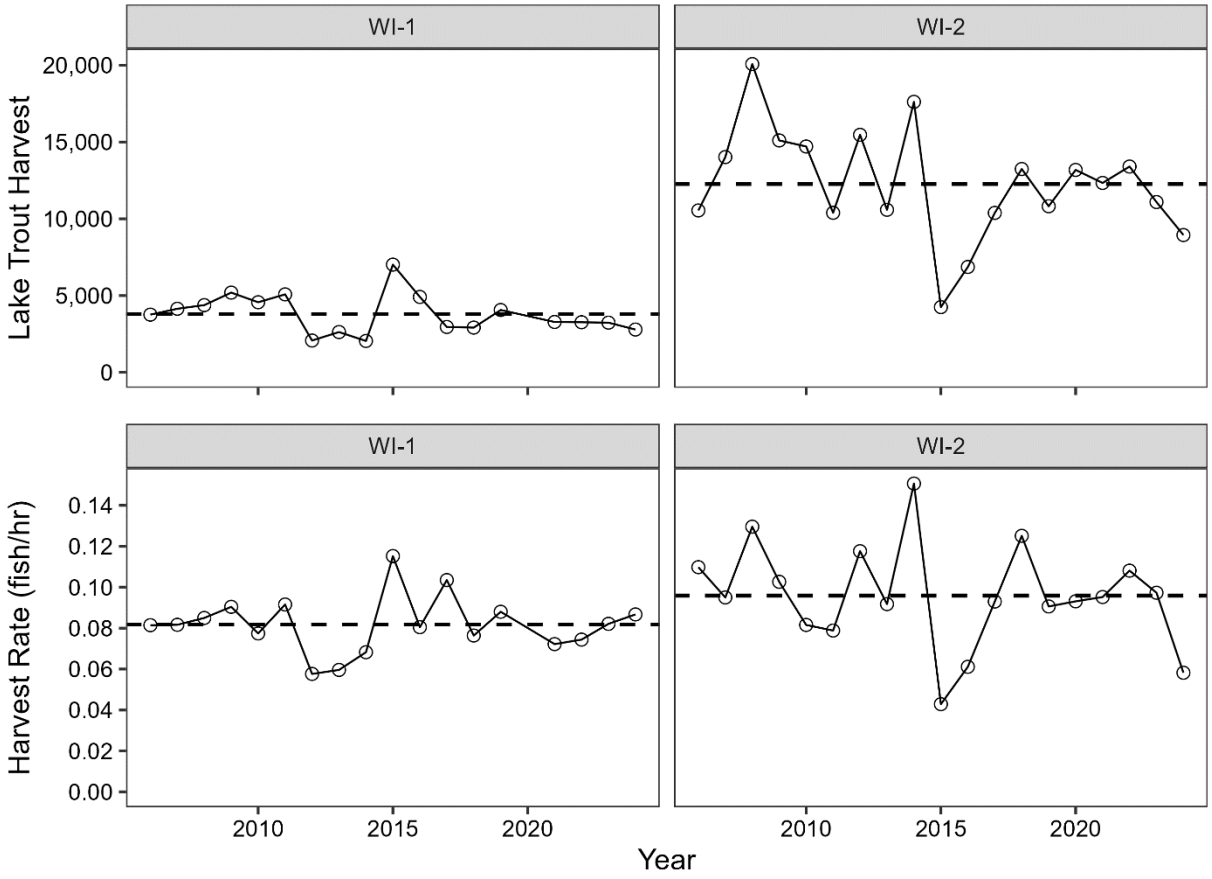

Figure 7. Estimated lake trout harvest (top) and harvest rate (bottom; fish per angler-hour) in management unit WI-1 (left) and WI-2 (right) from 2006 to 2024. Total harvest is from all fisheries sampled in the DNR Lake Superior Creel Survey, and the harvest rate is from the Open-Water Cold fishery. Dashed lines are average values from throughout the time series.

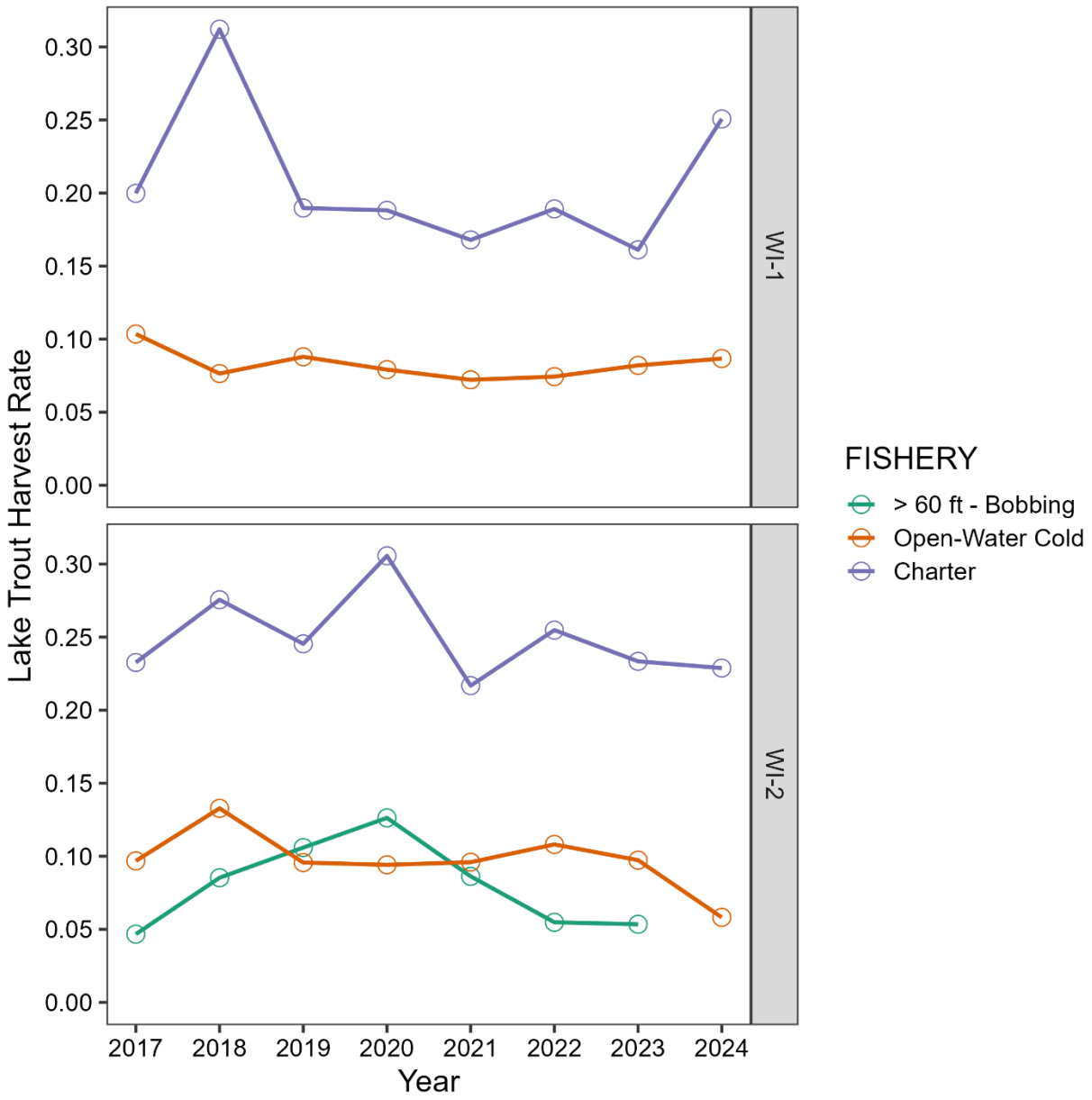

Figure 8. Estimated harvest rate (fish per angler-hour) of lake trout by fishery sampled in the DNR Lake Superior Creel Survey within each management unit (WI-1 and WI-2) from 2017 to 2024.