

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

LAKE SUPERIOR WI-1 SUMMER SURVEY REPORT 2025

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INTRODUCTION

The fish community of Lake Superior has gone through a series of dramatic changes over the last 100 years. Agencies responsible for the management of Lake Superior's fishery resources have established a series of fish community objectives, with the overarching goal to "rehabilitate and maintain a diverse, healthy and self-regulating fish community, dominated by native species while supporting sustainable fisheries" (Horns et al. 2003). Information from this survey is used to monitor population dynamics of recreational and commercially important fisheries and to assess progress toward fish community objectives in Wisconsin waters of Lake Superior. The nets in this survey include a wide range of mesh sizes and are fished at a wide range of depths to incorporate as much of the Lake Superior fish community and the life stages of individual species as possible.

There are three primary objectives for this assessment. First, the survey is used to track changes in the Lake Superior fish community (e.g., predators, prey, benthivores, etc.). Second, the survey is used to assess population dynamics (e.g., abundance, age, size) in coregonine species (i.e., lake whitefish, cisco and deepwater chub species) in Wisconsin waters of Lake Superior. Third, the small meshes in the survey are used to monitor lake trout recruitment. This aspect of the survey is part of a larger, lake-wide, small-mesh juvenile lake trout monitoring effort and feeds population modeling efforts.

METHODS

The Wisconsin Department of Natural Resources (DNR) Summer Community Survey rotates between sampling the Western Arm (WI-1) during odd-numbered years and the Apostle Islands region (WI-2) during even-numbered years. In 2025, we sampled 16 stations in the Western Arm region (Figure 1) with 3,600-ft monofilament gill net gangs. Eleven stations were considered index stations for indices of lake trout and coregonine relative abundance, and five stations were considered shallow stations for walleye indices (Table 1). Each gang was composed of a series of 300-ft nets constructed with 1.5 to 7.0-inch mesh (stretch measure) by 0.5-inch increments. We measured the temperature profile at each site after deploying the net. We recorded temperatures at the surface, bottom and 3, 6, 9, 12, 15, 18, 30, 45, 60, 75 and 90-meter depths (Figure 2). We set all nets on the bottom for one night (24 hours) using the R/V Hack Noyes. We collected biological information (e.g., length, weight, sex, etc.) from fish using standardized protocols.

We calculated a time-series of geometric or arithmetic mean catch-per-unit-effort (CPE) using catch data from 1981 to 2025 (Table 1) and stations as replicates (fish per km of net per night). Wild (non-hatchery origin) lean lake trout CPE excluded trout with hatchery fin clips (Table 1). Juvenile wild lean lake trout CPE was indexed using only trout captured in the 2.0, 2.5 and 3.0-inch mesh panels and excluding trout greater than 450 mm. CPE for all ciscoes was assessed by combining all *C. artedi*, *C. hoyi*, *C. kiyi*, *C. zenithicus* and *C. reighardi*.

Table 1. Stations (see Figure 1), mesh sizes (inches), type of mean and any other criteria used to develop the various catch-per-unit-effort (CPE) indices in this report.

CPE Index	Stations	Mesh Sizes (inches)	Mean	Other Criteria
Wild LLT	Index	1.5-7.0	Geometric	Wild
Hatchery LLT	Index	1.5-7.0	Geometric	Hatchery
Juvenile LLT	Index	2.0-3.0	Geometric	Wild, <450 mm
Recruited LLT	Index	3.0-7.0	Geometric	Wild
Siscowet Lake Trout	Index	1.5-7.0	Geometric	
All Walleye	Shallow	1.5-7.0	Arithmetic	
Juvenile Walleye	Shallow	1.5-2.5	Arithmetic	
Recruited Walleye	Shallow	3.0-7.0	Arithmetic	
Cisco	Index	1.5-7.0	Geometric	
Juvenile Cisco	Index	1.5-2.0	Geometric	
Bloater	Index	1.5-7.0	Geometric	
All Ciscoes	Index	1.5-7.0	Geometric	
Lake Whitefish	Index	1.5-7.0	Geometric	
Juvenile Lake Whitefish	Index	1.5-2.5	Geometric	
Recruited Lake Whitefish	Index	3.0-7.0	Geometric	
Other Species	All	1.5-7.0	Arithmetic	

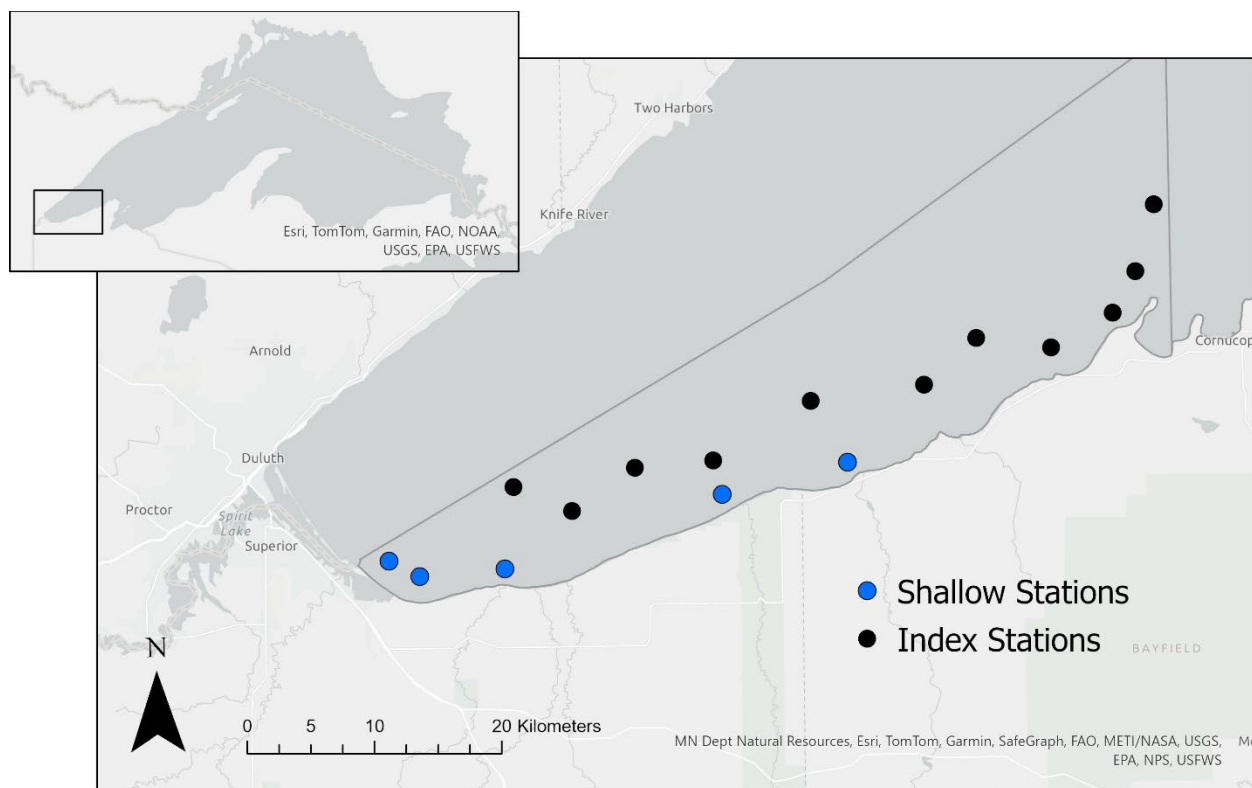


Figure 1. Map of the Western Arm region (WI-1) of Lake Superior and the outside buoy location of the index (black) and shallow (blue) stations used in the DNR Summer Survey.

RESULTS AND DISCUSSION

The overall mean water temperature profile measured during the 2025 survey was cooler than average near the surface but warmer than average near the middle of the water column (e.g., 20 m; Figure 2).

LAKE TROUT

The relative abundance of total wild lean lake trout in 2025 was the highest since 2005, reversing the decreasing trend of the past few surveys (Figure 3). This quick increase was attributable to a large increase in the juvenile wild lean lake trout index (highest on record), which indicates recruitment may be stronger in coming years. However, relative abundance of recruited lean lake trout was still relatively low and is likely more reflective of current fishery trends. Hatchery lean lake trout relative abundance was slightly higher in 2025 than recent surveys.

We observed several wild lean lake trout between 250 and 400 mm total (Figure 5). Median length of wild lean lake trout was much smaller than the previous survey in 2023 (Figure 6).

Siscowet lake trout relative abundance decreased slightly from the past couple surveys but overall remained relatively high (Figure 3). However, small siscowet (e.g., 250-400 mm) were

underrepresented in the 2025 length distribution, suggesting recruitment in upcoming years may be poor (Figure 5).

WALLEYE

The 2025 summer community survey in the Western Arm region of Lake Superior included the best walleye indices of the entire time series (Figure 4). Total walleye relative abundance was the highest on record, the juvenile walleye index was a similar magnitude to previous high spikes in 2021, 2013 and 1987, and the index of recruited walleye was by far the highest on record, indicating a historical number of fish available to the recreational fishery within the lake proper.

We observed a number of walleye between 225 and 325 mm as well as between 400 and 550 mm (Figure 5), indicating several fish in the harvestable size range and at least one large cohort that will recruit to the fishery over the next couple years. The median length of walleye decreased markedly from the previous survey as several smaller fish recruited to this survey gear (Figure 6).

CISCOES

We observed an increase in total cisco *Coregonus artedii* relative abundance from the previous three surveys, but total cisco abundance was still lower than the late 1980's and 1990's. The juvenile cisco index indicated an increase in recruitment complimentary of the 2022 cohort (Figure 7). However, the magnitude of the juvenile cisco index was not as high as anticipated (Vinson et al. 2024). The median length of cisco substantially decreased in the 2025 survey as the 2022 cohort recruited into this survey (Figures 9 and 10). The current cisco population is dependent on infrequent, large year-classes to maintain the stock. It is primarily maintained by diminishing large cohorts from 2009 and 2015, which make up the majority of the fishery.

The relative abundance of bloater *Coregonus hoyi* was higher in the 2025 survey compared to 2023 (Figure 7). Relative abundance of bloater has recently been higher than the late 1990's-2000's. The relative abundance of all ciscoes combined *C. artedii*, *C. hoyi*, *C. kiyi* *C. zenithicus*, was the highest since 2017 but generally lower than the late 1980's and 1990's (Figure 7).

[Vinson, M.R., Evrard, L., Gorman, O.T., Phillips, S.B., Yule, D.L. 2024. Status and Trends of the Lake Superior Fish Community, 2023. Great Lakes Fishery Commission, Ann Arbor, Michigan.](#)

LAKE WHITEFISH

Total lake whitefish relative abundance in 2025 was lower than the previous three surveys (Figure 8). The relative abundance of recruited lake whitefish also decreased from the previous three surveys but ultimately remained relatively high compared to the rest of the time series. The juvenile lake whitefish index was high, suggesting favorable recruitment in the upcoming couple years. Median length was smaller than the previous survey (Figure 10), as smaller, younger fish recruited to the survey gear (Figures 9 and 10).

OTHER SPECIES

Burbot, longnose sucker and white sucker relative abundance has generally decreased over the time series (Figure 11). The relative abundance of rainbow smelt (gill netting survey only efficiently captures larger adults age 2+) has been stable over the past couple of decades and much lower than in the 1980s. Round whitefish relative abundance recently peaked in 2015 but has since declined. Eurasian ruffe relative abundance was much higher in 2025 than the previous decade. Brown trout relative abundance has been variable throughout the time series. Figure 12 shows the length distributions of these other eight species captured during the 2025 summer community survey.

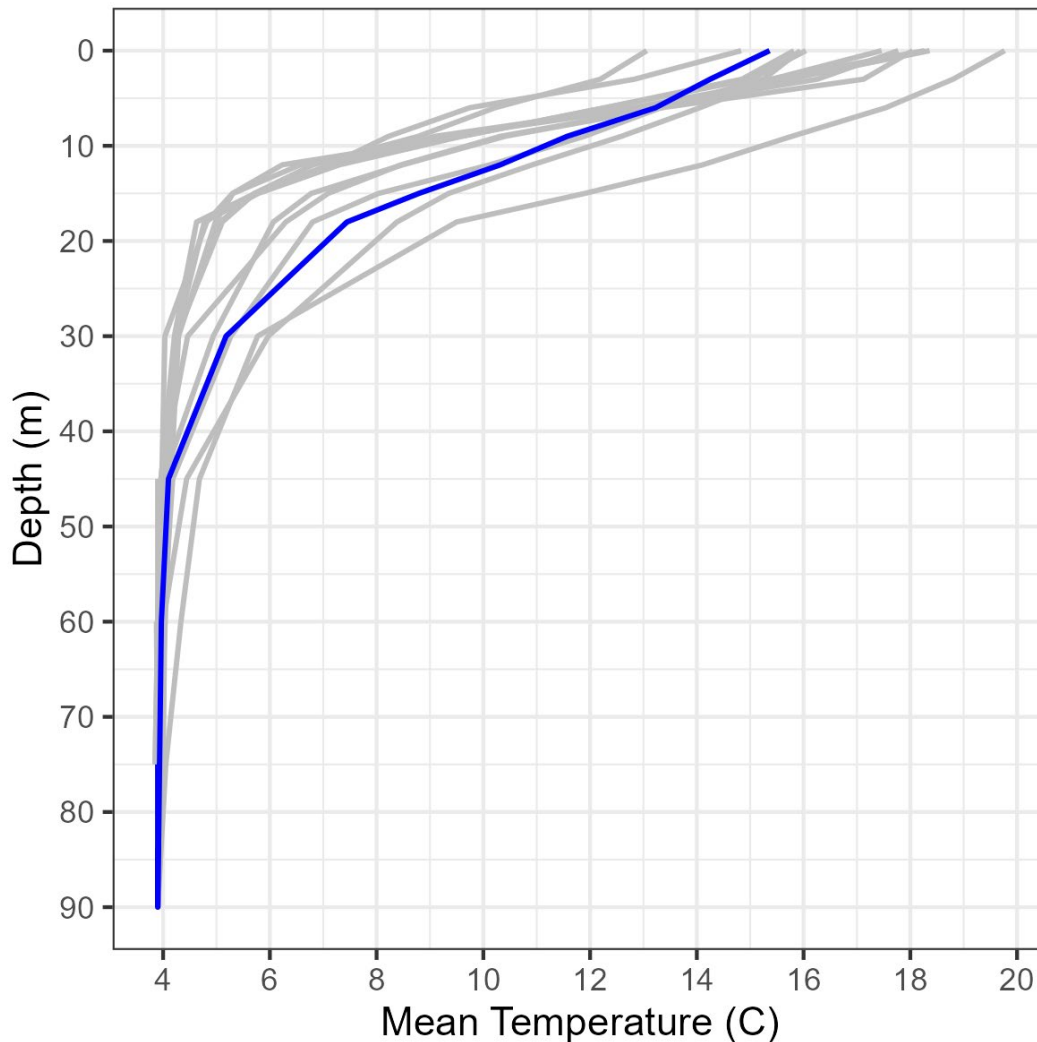


Figure 2. Mean temperature profiles measured from the 39 stations sampled during the summer survey in WI-1 waters of Lake Superior. The blue line represents the mean temperature profile measured in 2025, and the grey lines represent mean temperature profiles measured in odd years from 1999 to 2023.

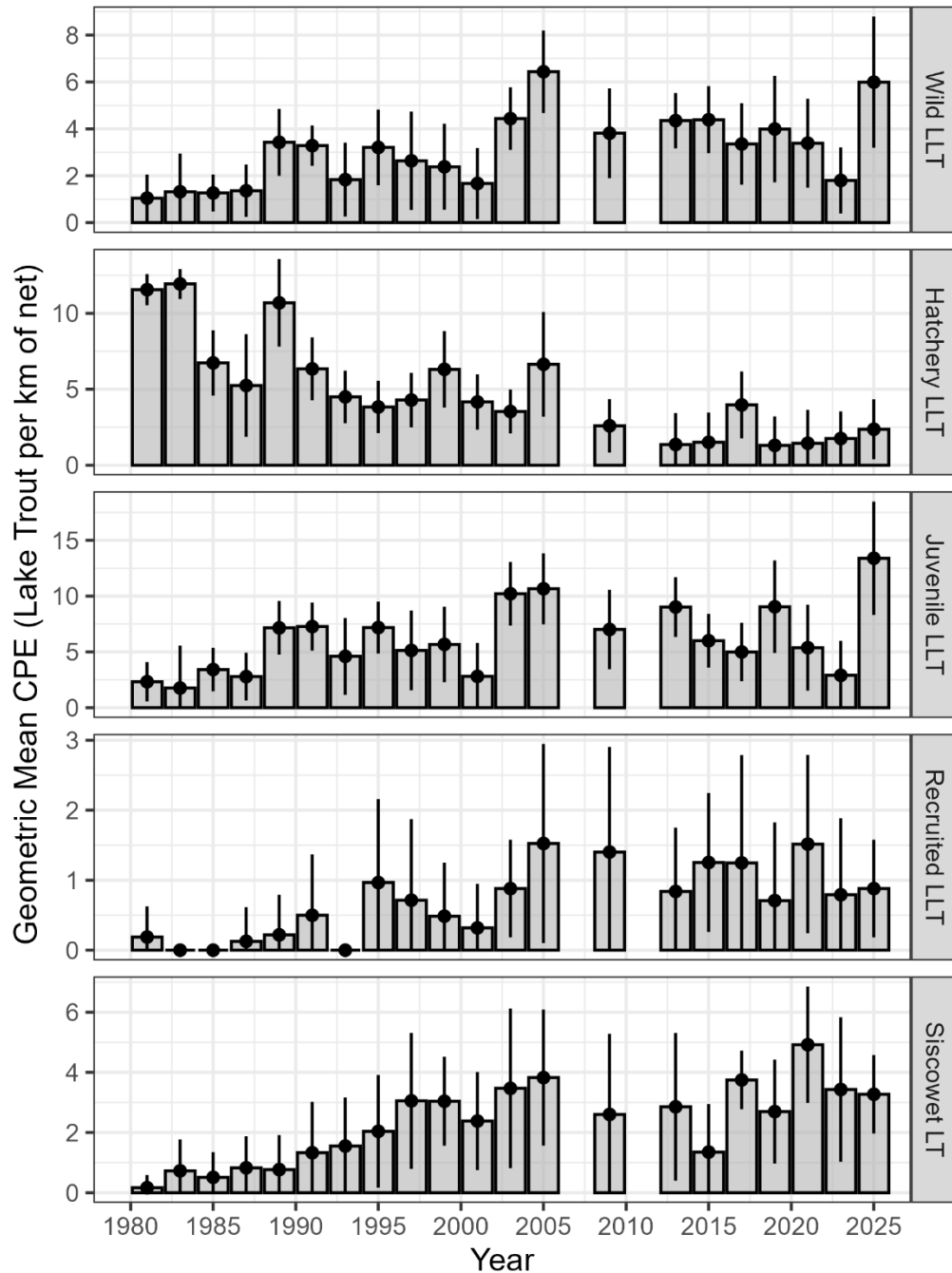


Figure 3. Time series of geometric mean catch-per-unit-effort (CPE) for all wild lean lake trout (all meshes), all hatchery-origin lean lake trout (all meshes), wild juvenile lean lake trout (51 and 64 mm meshes, < 450 mm total length), subadult and older wild lean lake trout (> 64 mm meshes, > 450 mm total length) and siscowet lake trout (all meshes) in the summer survey of the Western Arm region of Lake Superior, 1981-2025. Error bars represent one standard deviation.

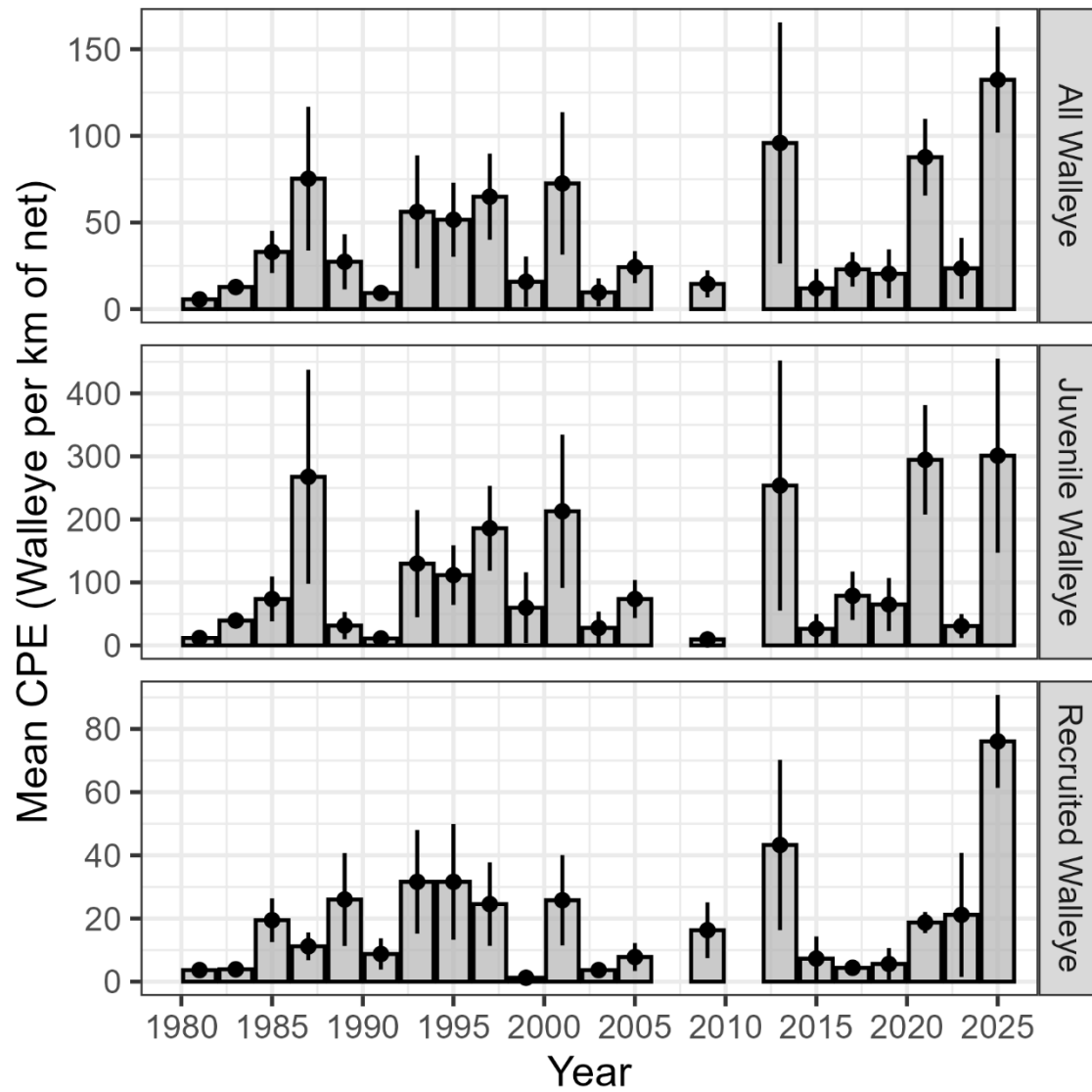


Figure 4. Time series of arithmetic mean catch-per-unit-effort (CPE) for all walleye (all meshes), juvenile walleye (1.5, 2.0, and 2.5-inch meshes) and recruited walleye (3.0-inch and larger meshes) in the summer survey of the Western Arm region of Lake Superior, 1981-2025. Error bars represent one standard deviation.

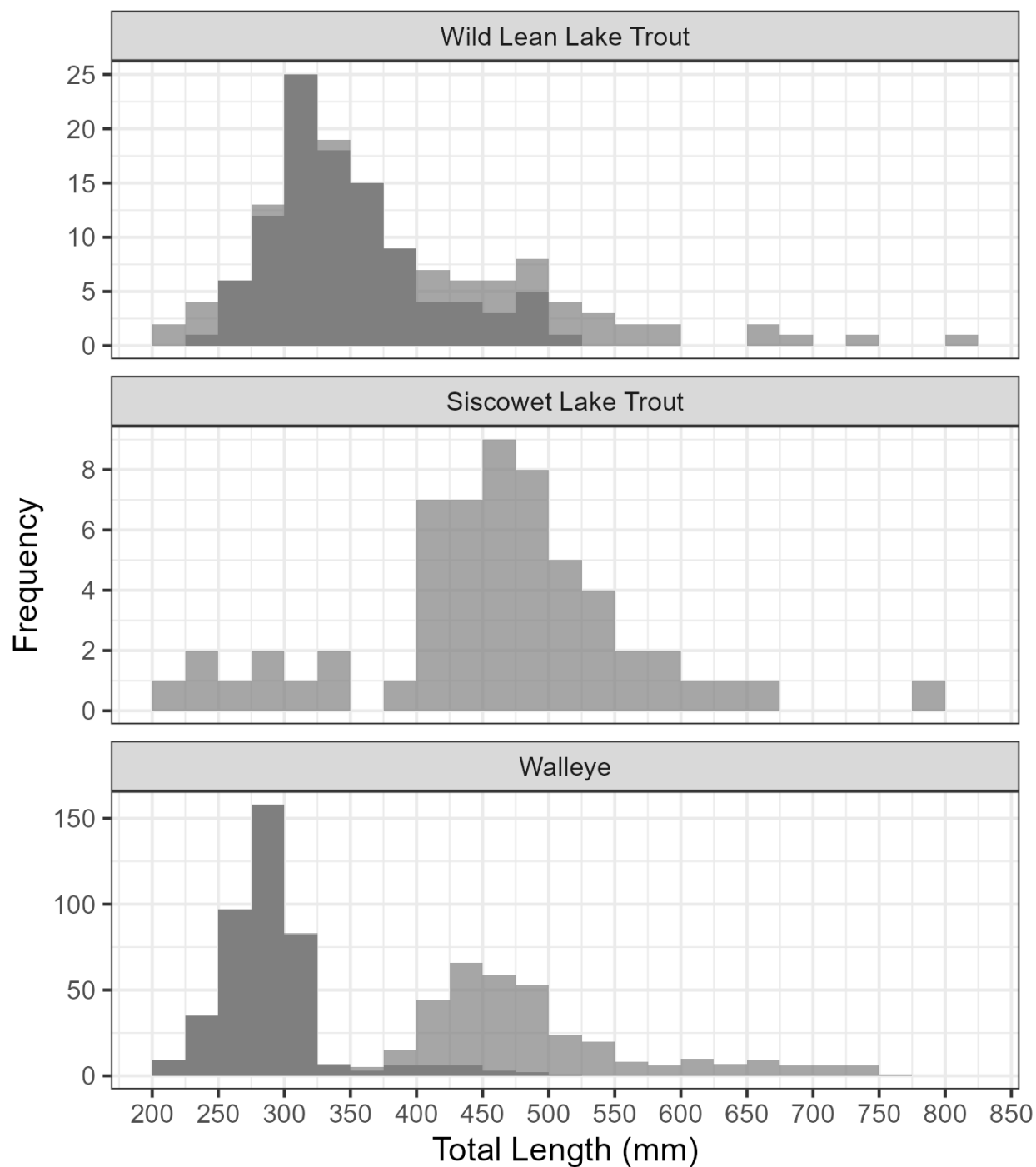


Figure 5. Length frequency histograms of wild lean lake trout (top), siscowet lake trout (middle) and walleye (bottom) caught in the Western Arm region of Lake Superior during the 2025 summer survey. Darker grey bars represent fish that were counted in the juvenile lean lake trout CPE index (i.e., wild origin, caught in 2.0, 2.5, or 3.5-inch meshes, and < 450 mm total length) or juvenile walleye index (i.e., caught in 1.5, 2.0, or 2.5-inch meshes).

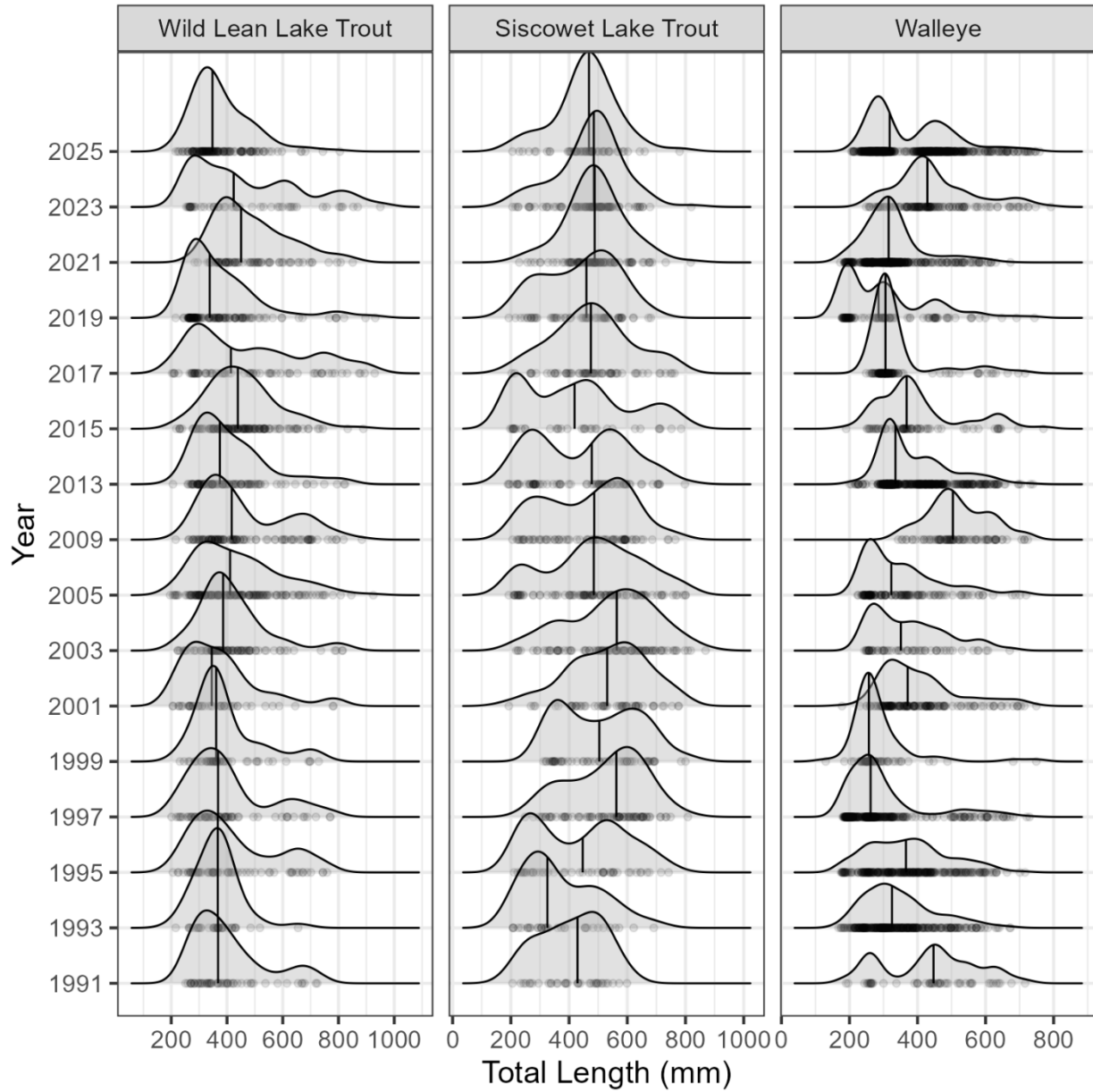


Figure 6. Time series of wild lean lake trout (left), siscowet lake trout (middle) and walleye (right) length distributions from 1991 to 2025 captured during the summer survey in the Western Arm region of Lake Superior. Vertical lines represent the median total length sampled each year.

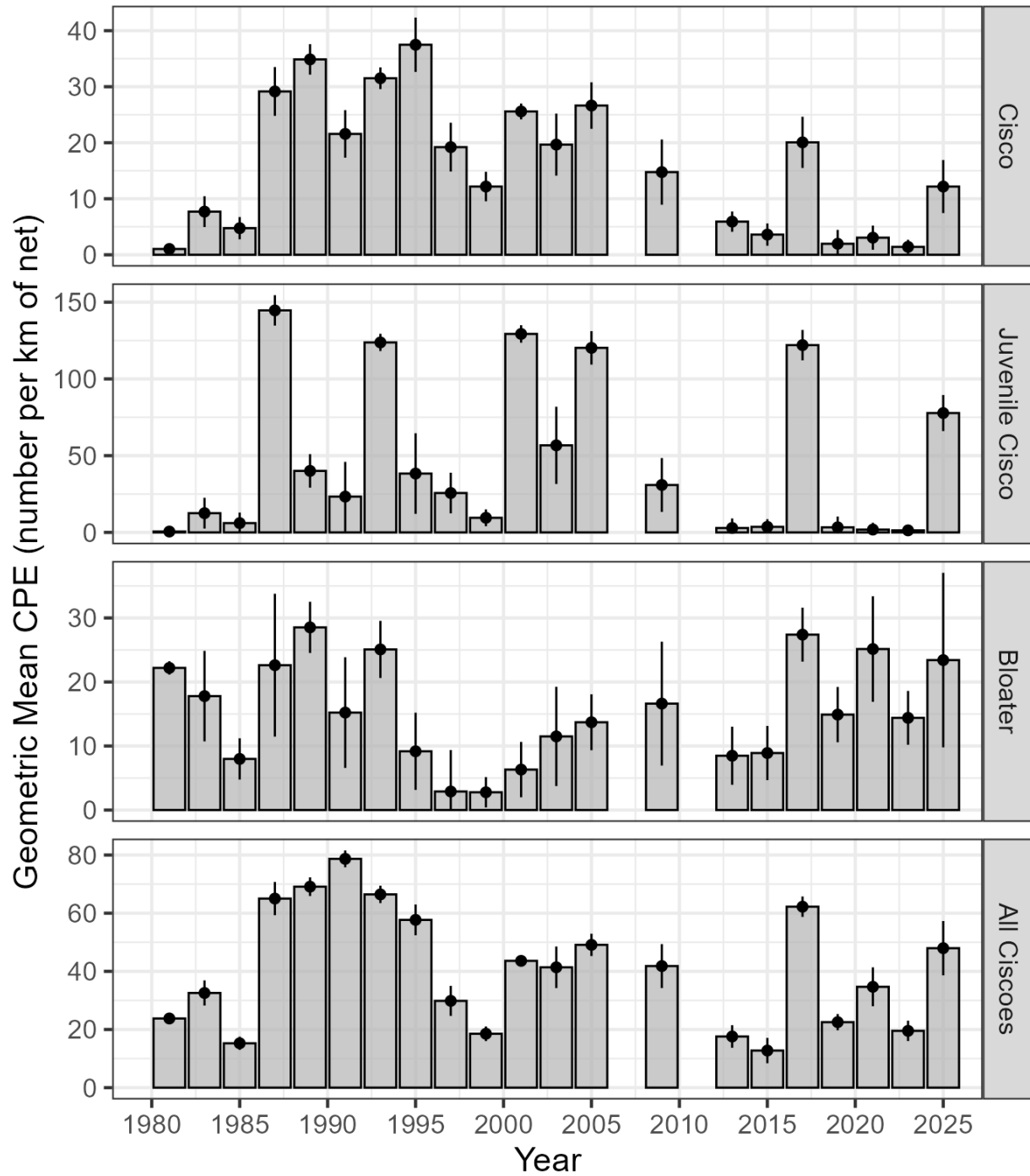


Figure 7. Time series of geometric mean catch-per-unit-effort (CPE) for all cisco *C. artedi* (all meshes), juvenile cisco (fish captured in the 1.5 or 2.0-inch meshes), bloater *C. hoyi* (all meshes), and all ciscoes, including *C. artedi*, *C. hoyi*, *C. kiya* and *C. zenithicus* (all meshes) in the summer survey of the Western Arm region of Lake Superior, 1981-2025. Error bars represent one standard deviation.

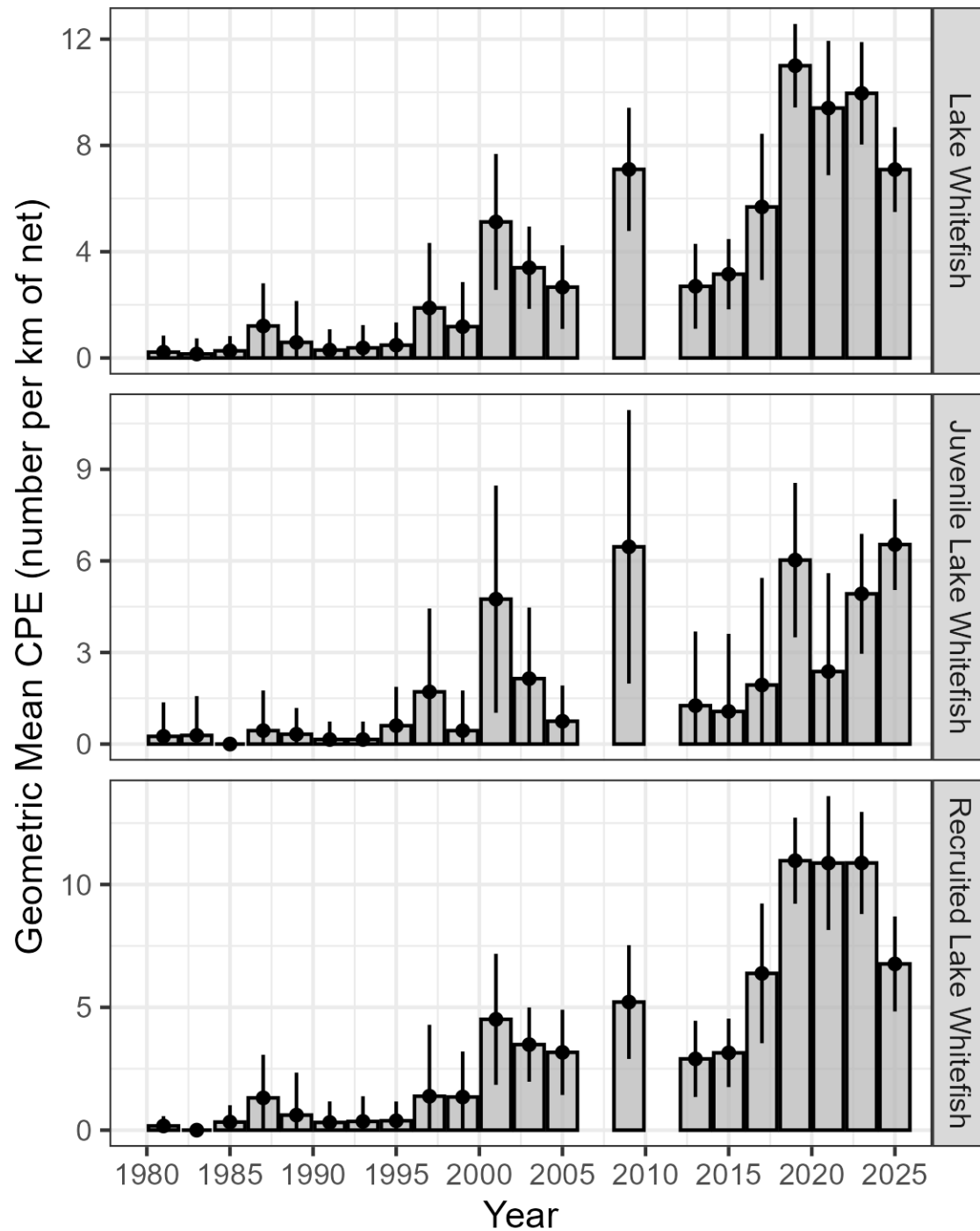


Figure 8. Time series of geometric mean catch-per-unit-effort (CPE) for all lake whitefish *C. clupeaformis* (all meshes), juvenile lake whitefish (fish captured in the 1.5, 2.0, or 2.5-inch meshes) and recruited lake whitefish (3.0-inch meshes and larger) in the summer survey of the Western Arm region of Lake Superior, 1981-2025. Error bars represent one standard deviation.

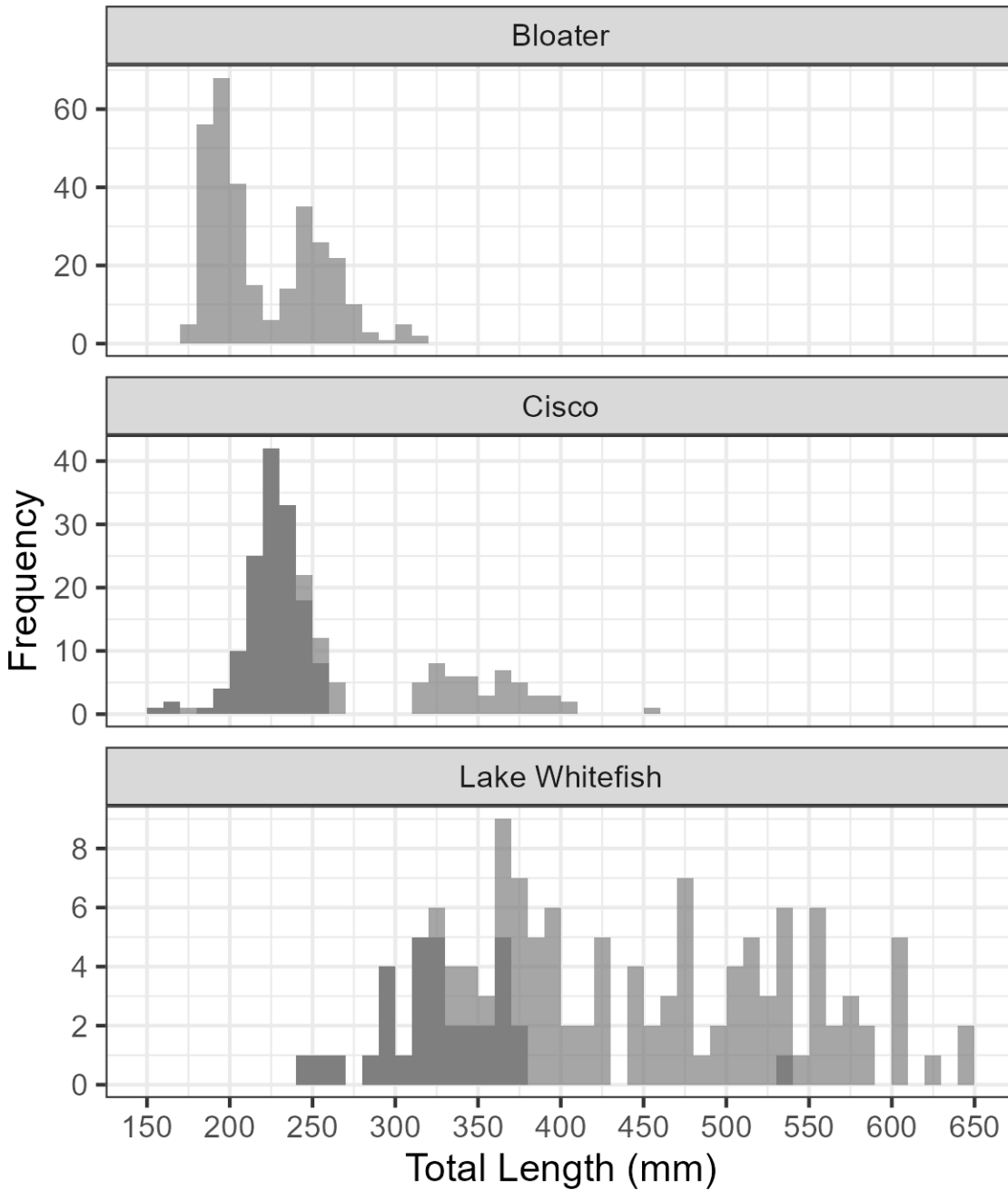


Figure 9. Length frequency histograms of bloater *C. hoyi* (top), cisco *C. artedi* (middle) and lake whitefish *C. clupeaformis* (bottom) caught in the Western Arm region of Lake Superior during the 2025 summer survey. Darker grey bars represent fish that were counted in the juvenile cisco or juvenile lake whitefish indices.

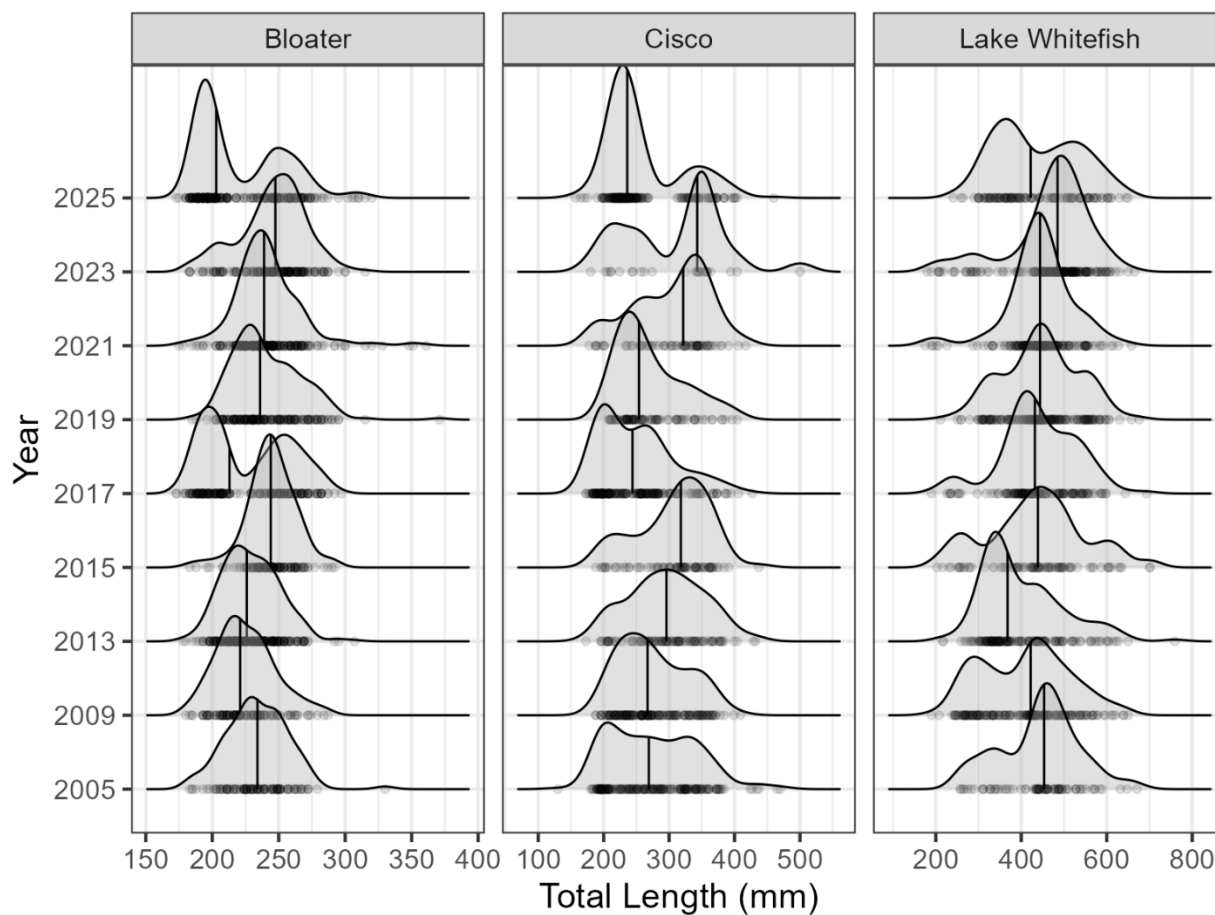


Figure 10. Time series of bloater, cisco and lake whitefish length distributions from 2005 to 2025 captured during the summer community survey in the Western Arm region of Lake Superior. Vertical lines represent the median total length sampled each year.

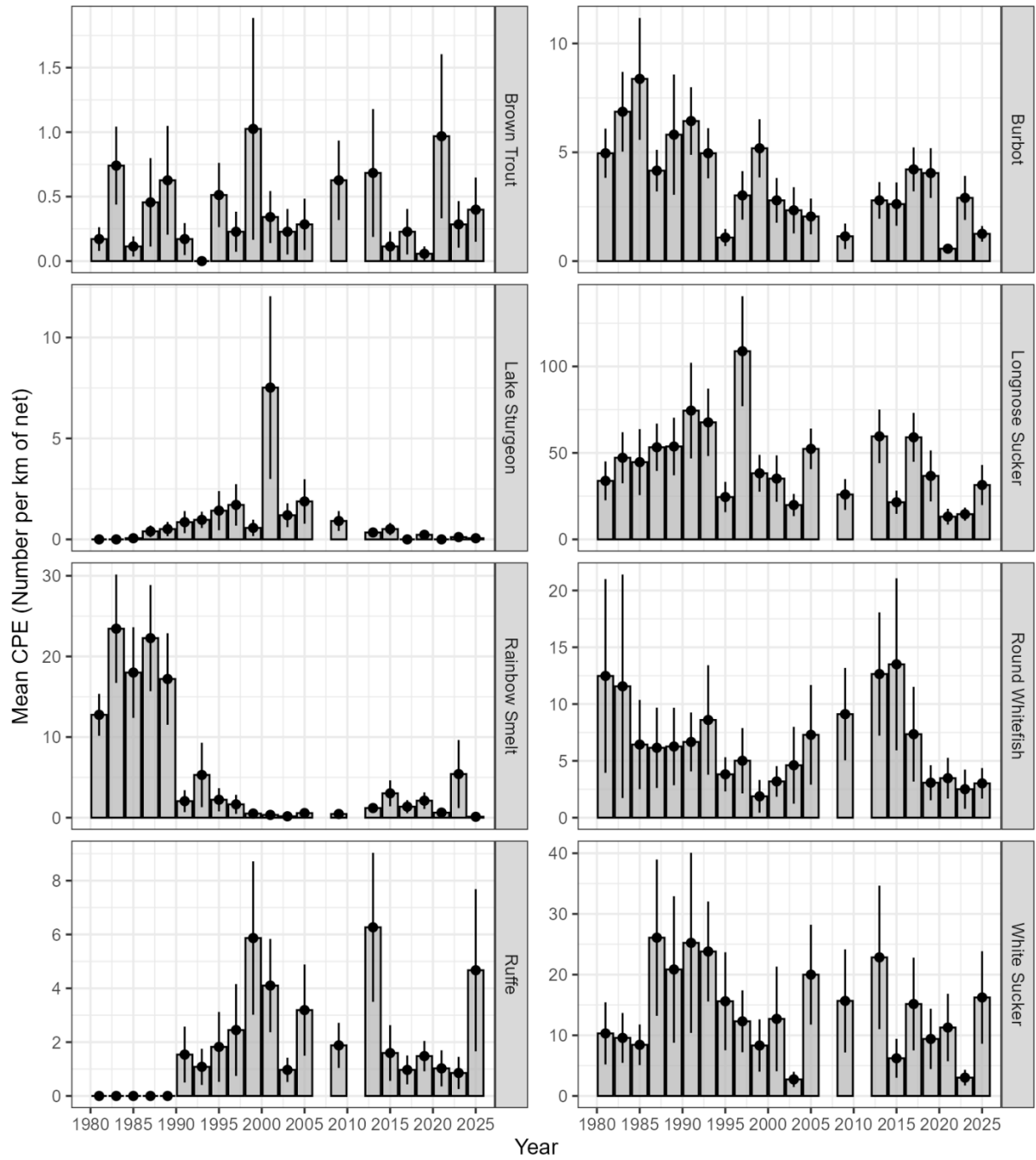


Figure 11. Time series (1981-2024) of mean catch-per-unit-effort (CPE) in the DNR summer survey for eight common species in the Western Arm region of Lake Superior including: brown trout, burbot, lake sturgeon, longnose sucker, rainbow smelt, round whitefish, Eurasian ruffe and white sucker. Error bars represent one standard error.

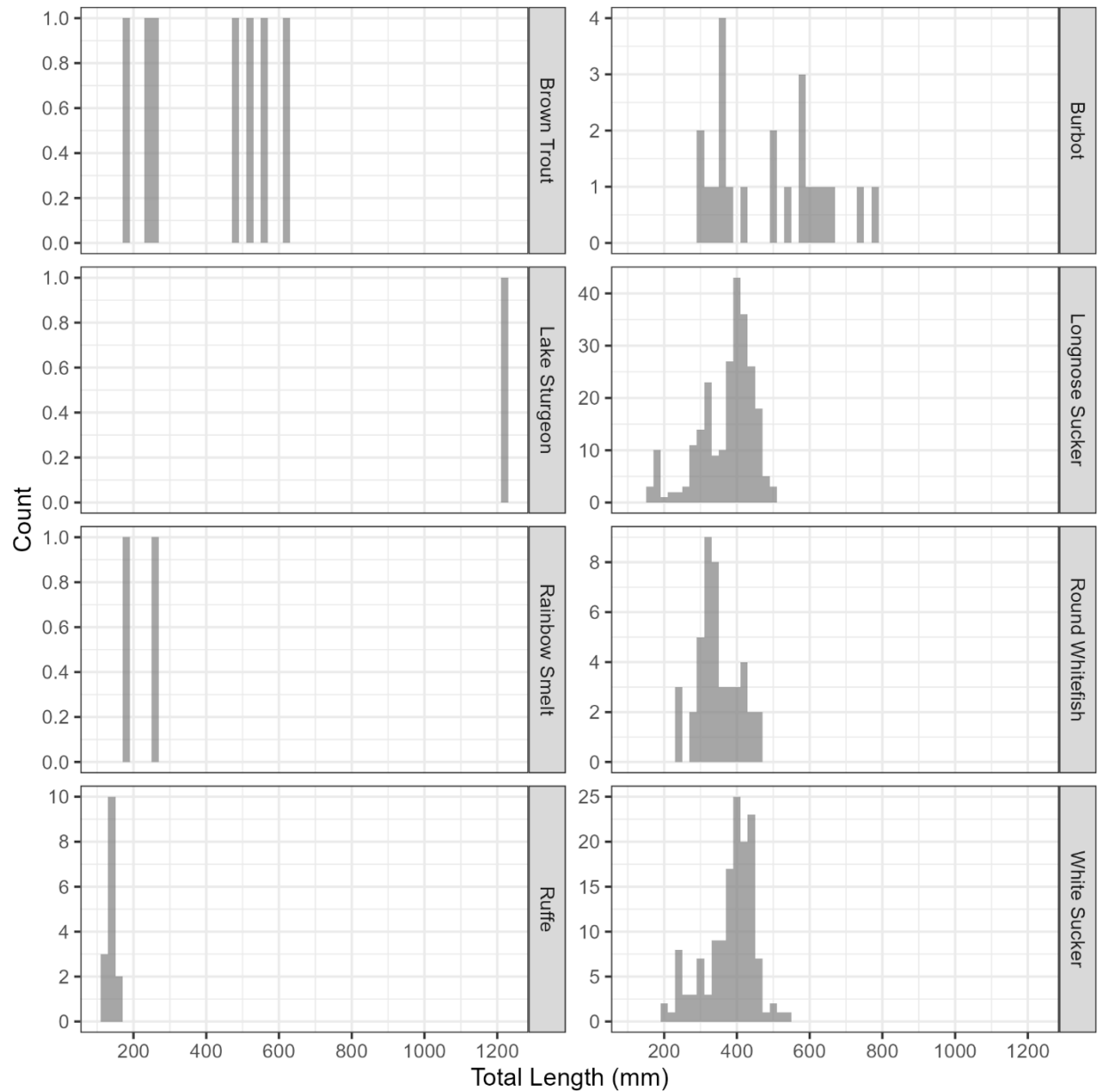


Figure 12. Length frequency histograms of eight common species captured in the Western Arm region of Lake Superior in the 2025 summer survey including: brown trout, burbot, lake sturgeon, longnose sucker, rainbow smelt, round whitefish, Eurasian ruffe and white sucker.