STATUS OF SEA LAMPREY CONTROL IN LAKE SUPERIOR

Adult Sea Lamprey:

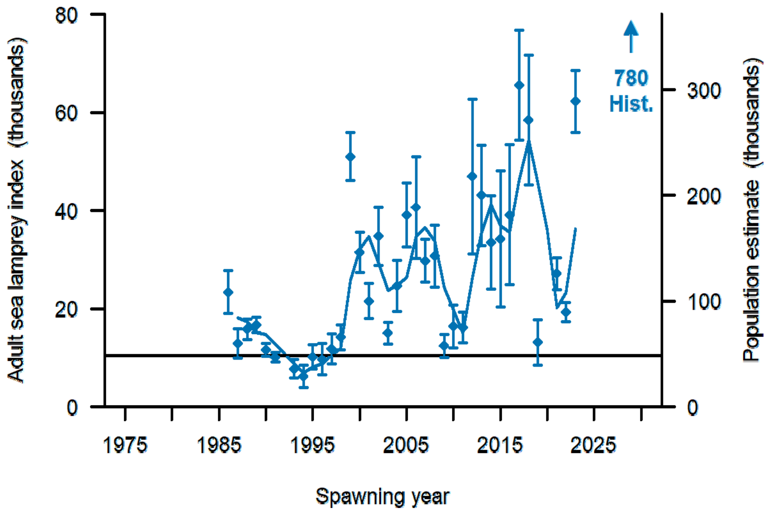

Figure 1. Index estimates with 95% confidence intervals (vertical bars) of adult sea lampreys, including historic pre-control abundance (as a population estimate) and the three-year moving average (line). The population estimate scale (right vertical axis) is based on the index-to-PE conversion factor of 4.64. The adult index in 2023 was 62,000 with 95% confidence interval (56,000-69,000). The three-year (2021-2023) average of 36,000 was above the target of 10,000. The index target was estimated as the mean of indices during a period with acceptable marking rates (1994-1998).

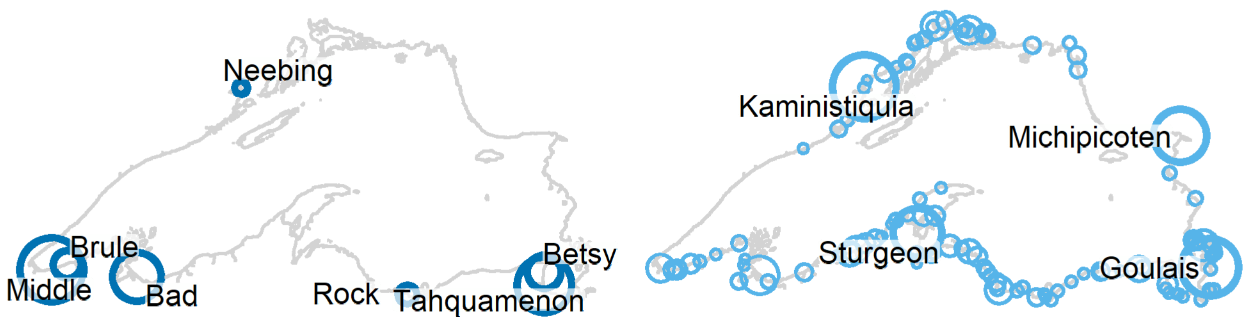

Figure 2. LEFT: Estimated index of adult sea lampreys during the spring spawning migration, 2023. Circle size corresponds to estimated number of adults from mark-recapture studies (blue) and model predictions (orange). All index streams are labelled. RIGHT: Maximum estimated number of larval sea lampreys in each stream surveyed during 1995-2012. Tributaries composing over half of the estimated maximum lake-wide larval population are identified (Kaministiquia 6,600,000; Goulais 5,000,000; Michipicoten 4,100,000; Sturgeon 3,300,000).

- Population estimates were generated for all 7 index streams for Lake Superior using mark-recapture data.
- The Middle River population estimate contributed most to the lake-wide index estimate in 2023 (40%).
- Several factors could be contributing to the increase in the index such as treatment deferrals due to COVID-19 related travel restrictions and low water conditions; untreated residual sea lamprey populations due to changes in distribution; newly discovered infestations; escapement past sea lamprey barriers; and fully recruited larval populations within index streams.

Lake Trout Marking and Relative Abundance:

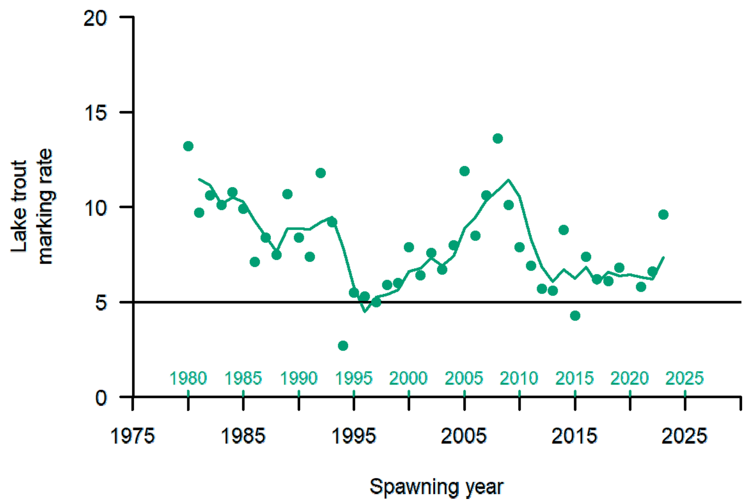

Figure 3. Number of A1-A3 marks per 100 lake trout > 532 mm from standardized assessments plotted against the sea lamprey spawning year, including the three-year moving average (line). The three-year (spawning years 2021-2023) average marking rate of 7.3 was above the target of 5 A1-A3 marks per 100 lake trout > 532 mm (horizontal line). A second x-axis shows the year the lake trout were surveyed.

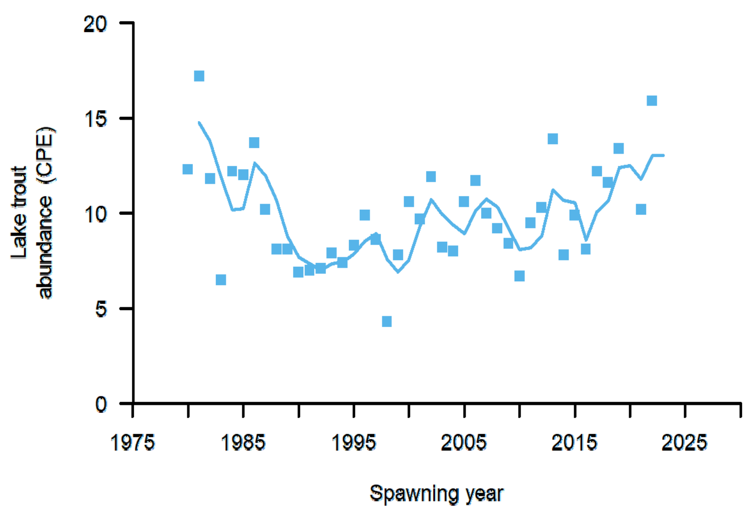

Figure 4. Lake trout relative abundance (May assessments using 4.5 inch gillnets) plotted against sea lamprey spawning year, including the three-year moving average (line). CPE = fish/km/net night of lean lake trout > 532 mm (21") total length.

- Marking rates in Superior increased in 2023, corresponding to the increase we saw in adult index values.
- Lake trout CPE data was not available at the time of report generation.

Lampricide Control - Adults vs. Field Days, TFM, and Bayluscide:

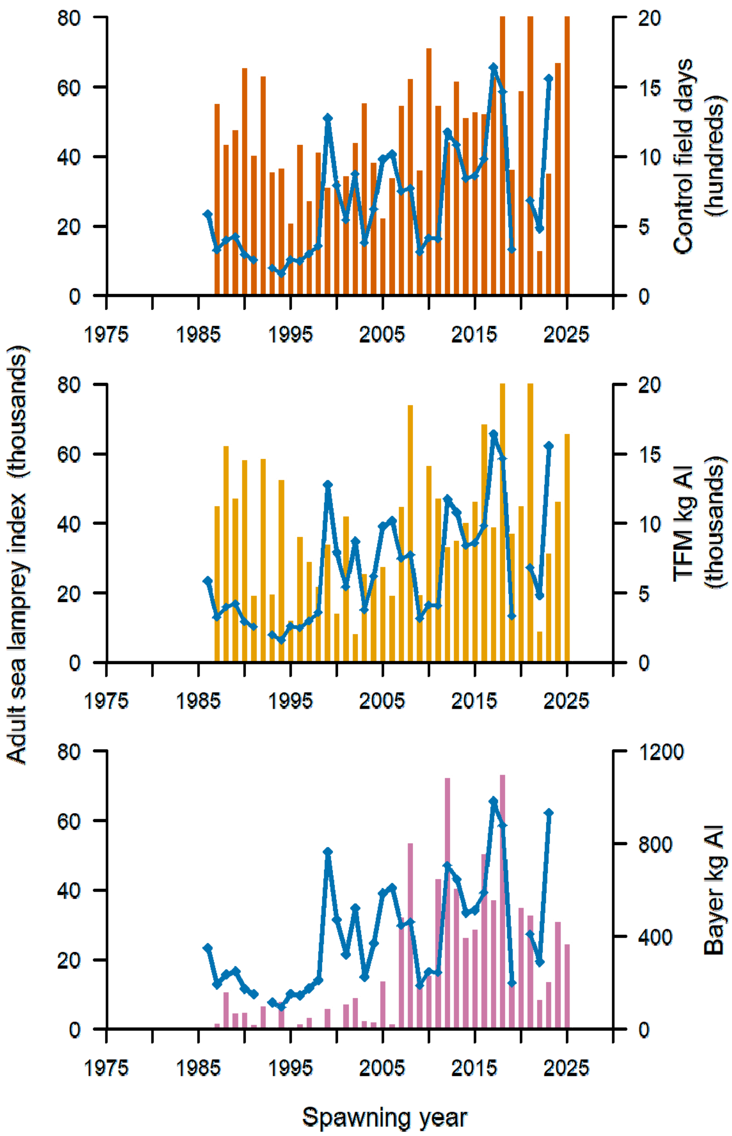

Figure 5. Index of adult sea lampreys (blue lines) and number of control field days (orange bars), TFM used (kg active ingredient; yellow bars), and Bayluscide used (kg active ingredient; purple bars). Field days, TFM, and Bayluscide are offset by 2 years (e.g., field days, TFM, and Bayluscide applied during 1985 is plotted on the 1987 spawning year, when the treatment effect would first be observed in adult sea lamprey populations).

- Lampricide treatments were conducted in 71 tributaries (20 Canada, 51 U.S.) and 16 lentic areas (8 Canada, 8 U.S.)
- Low water conditions presented challenges throughout the field season. Several streams were treated under historically low stream discharge. The Jarvis River and a portion of the Cloud River were not treated due to insufficient flow and are rescheduled for treatment in 2024.
- High densities of large larvae/transformers were observed during treatments of Harlow Creek and the Flintsteel, Firesteel, Iron, Sand, and Ontonagon rivers (western Lake Superior).