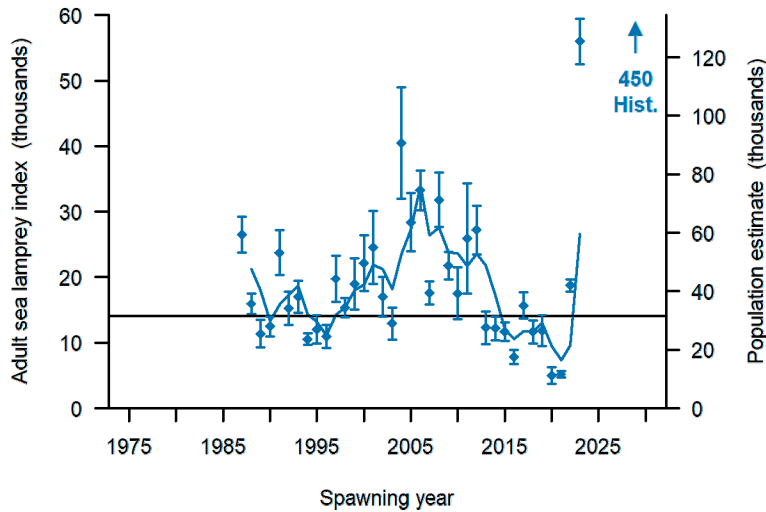
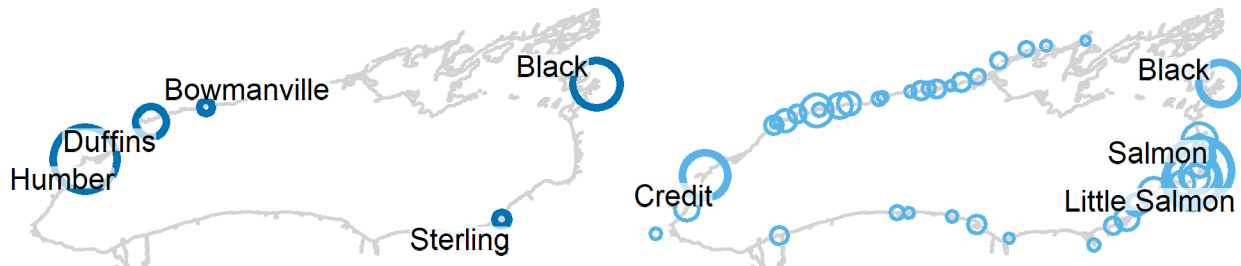


# STATUS OF SEA LAMPREY CONTROL IN LAKE ONTARIO

## Adult Sea Lamprey:



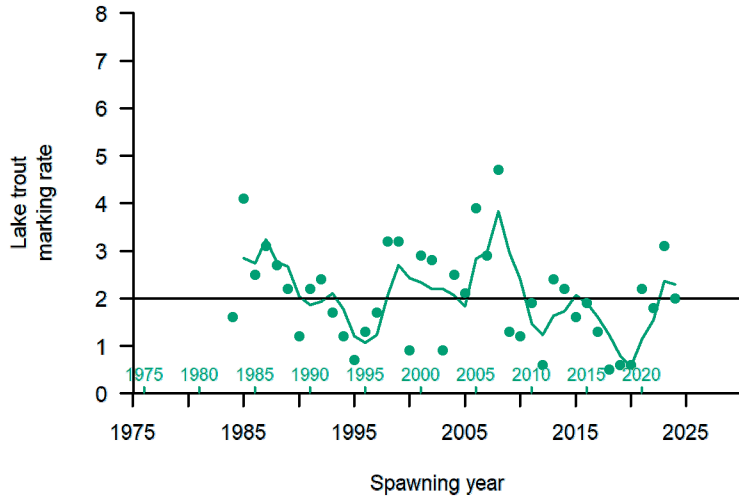
**Figure 1.** Index estimates with 95% confidence intervals (vertical bars) of adult sea lampreys, including historic pre-control abundance (as a population estimate) and the three-year moving average (line). The population estimate scale (right vertical axis) is based on the index-to-PE conversion factor of 2.24. The adult index in 2023 was 56,000 with 95% confidence interval (53,000-59,000). The three-year (2021-2023) average of 27,000 was above the target of 14,000. The index target was estimated as the mean of indices during a period with acceptable marking rates (1993-1997).



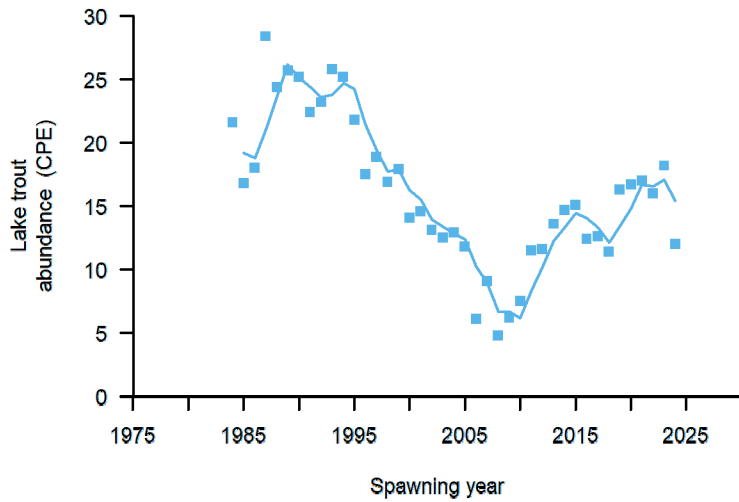
**Figure 2.** LEFT: Estimated index of adult sea lampreys during the spring spawning migration, 2023. Circle size corresponds to estimated number of adults from mark-recapture studies (blue) and model predictions (orange). All index streams are labelled. RIGHT: Maximum estimated number of larval sea lampreys in each stream surveyed during 1995-2012. Tributaries composing over half of the estimated maximum lake-wide larval population are identified (Salmon 1,400,000; Little Salmon 970,000; Credit 590,000; Black 470,000).

- Population estimates were generated for all 5 index streams using mark-recapture data.
- Stream specific estimates from the Humber River contributed most to the lake-wide index estimate in 2023 (52%).
- The population estimates for all Lake Ontario index streams increased substantially from 2022 index estimates. Humber River and Bowmanville Creek both had historical record setting trap catches in 2023.
- Several Lake Ontario stream treatments were deferred in recent years due mostly to COVID-19 travel restrictions. Several of these have a history of residual larval lamprey after lampricide treatment.

**Lake Trout Marking and Relative Abundance:**



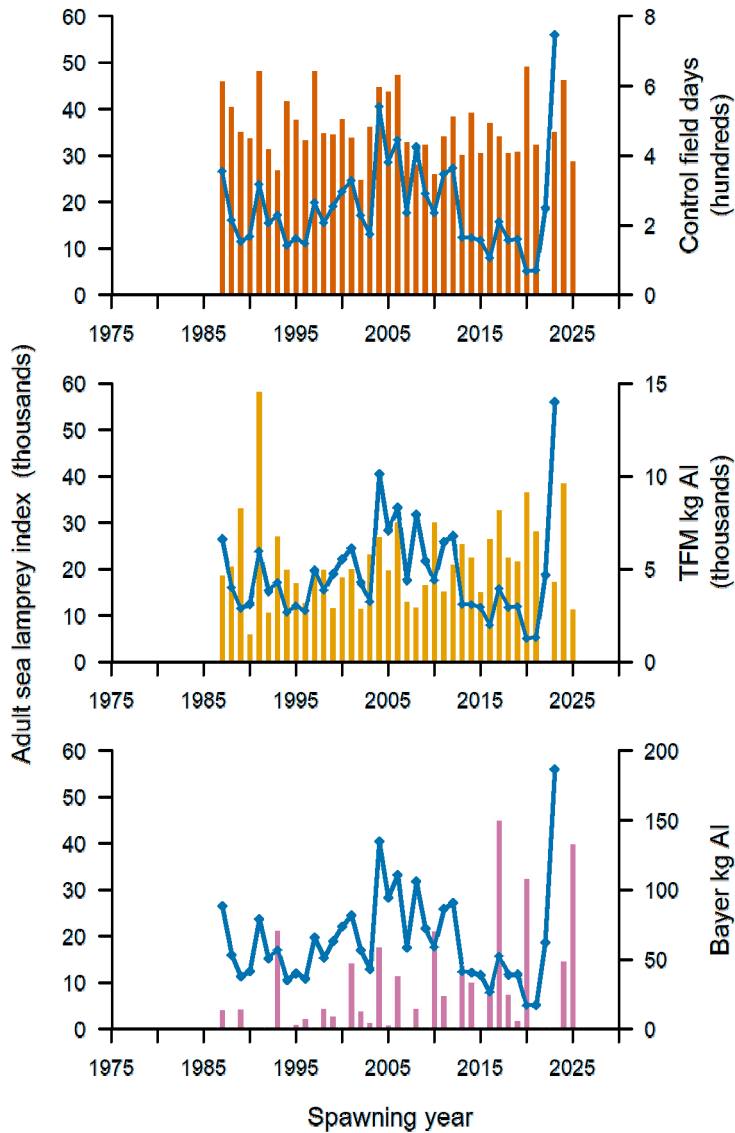
**Figure 3.** Number of A1 marks per 100 lake trout > 431 mm from standardized assessments plotted against the sea lamprey spawning year, including the three-year moving average (line). The three-year (spawning years 2022-2024) average marking rate of 2.3 was above the target of 2 A1 marks per 100 lake trout > 431 mm (horizontal line). A second x-axis shows the year the lake trout were surveyed.



**Figure 4.** Lake trout relative abundance plotted against sea lamprey spawning year, including the three-year moving average (line). CPE = fish/km/net night of lean lake trout > 431 mm (17") total length.

- Marking in Ontario returned to recent levels in 2023, and likely will lead to a decreased index in spring of 2024.
- Lake trout CPE has been relatively consistent over the last decade.

**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 applications were completed in 4 tributaries (0 Canada, 4 U.S) and in 1 lentic area (0 Canada; 1 U.S.; Table 5).
- The Little Salmon River and the Little River (Fish Creek, Oswego River) were not treated due to insufficient discharge and have been rescheduled for treatment in 2024.
- The Black River lentic plot, deferred in 2022, was successfully treated with granular Bayluscide.