

STATUS OF SEA LAMPREY CONTROL IN LAKE HURON

Adult Sea Lamprey:

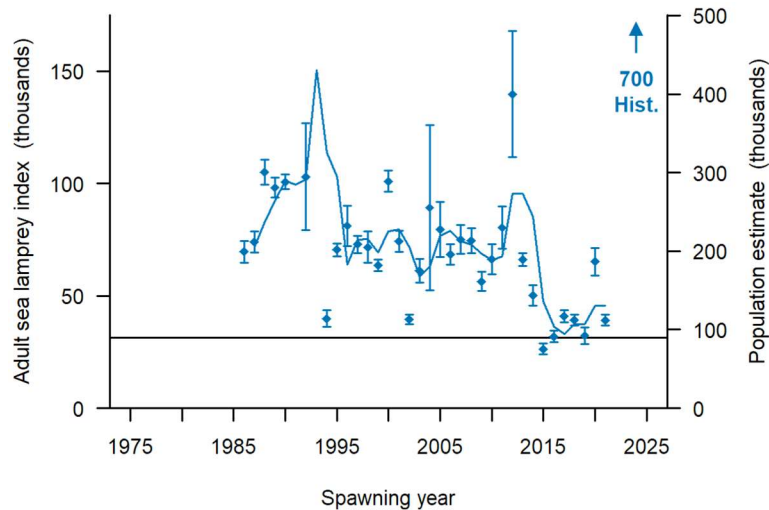


Figure 1. Index estimates with 95% confidence intervals (vertical bars) of adult sea lampreys, including historic pre-control abundance (as a population estimate) and the three-year moving average (line). The population estimate scale (right vertical axis) is based on the index-to-PE conversion factor of 2.86. The adult index in 2021 was 39,000 with 95% confidence interval (37,000-42,000). The three-year (2019-2021) average of 46,000 was above the target of 31,000. The index target was estimated as 0.25 times the mean of indices (1989-1993).

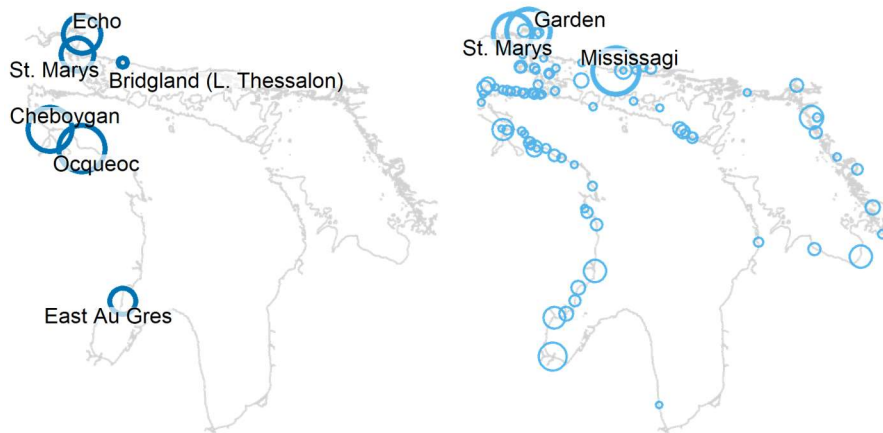


Figure 2. LEFT: Estimated index of adult sea lampreys during the spring spawning migration 2021. Circle size corresponds to estimated number of adults from mark-recapture studies (blue) and model predictions (orange). All index streams are identified. RIGHT: Maximum estimated number of larval sea lampreys in each stream surveyed during 1995-2012. Tributaries composing over half of the lake-wide larval population estimate are identified (Mississagi 8,100,000; Garden 7,000,000; St. Marys 5,200,000).

- The 3-year average adult index estimate is above the target and the adult index has been holding steady over the past five years.
- Mark-recapture estimates were generated for all six index streams.
- Sources to watch include the St. Marys River, productive tributaries in the northern portion of the lake (e.g. Cheboygan and Mississagi rivers), and the Manistique River (Lake Michigan).

Lake Trout Marking and Relative Abundance:

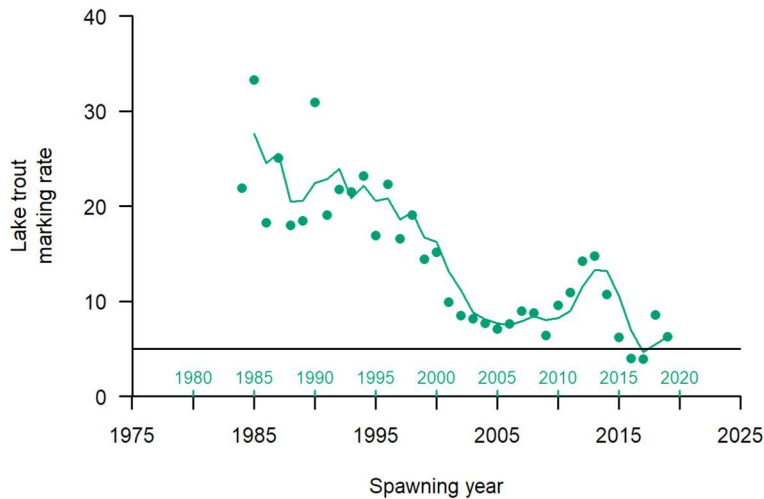


Figure 3. Number of A1-A3 marks per 100 lake trout > 532 mm from standardized assessments plotted against the sea lamprey spawning year, including the three-year moving average (line). The three-year average marking rate could not be calculated due to missing data due to COVID-19 restrictions. The target is 5 A1-A3 marks per 100 lake trout > 532 mm (horizontal line). A second x-axis shows the year the lake trout were surveyed.

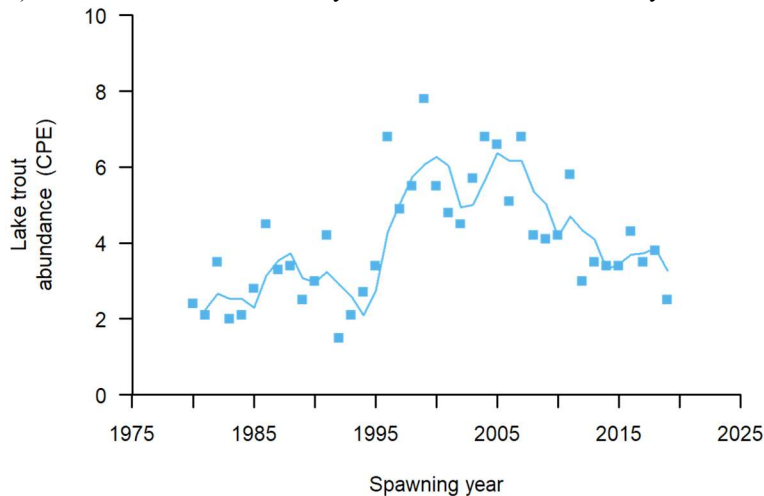


Figure 4. Lake trout relative abundance from standardized surveys (spring 2-6 inch mesh) in U.S. waters of the main basin plotted against sea lamprey spawning year, including the three-year moving average (line). CPE = geometric mean of fish/km/net night of lean lake trout > 532 mm (21") total length.

- The 3-year average marking rate could not be calculated due to missing data due to COVID-19 restrictions.
- During the early 1990s, marking and mortality on lake trout were so large that restoration efforts were suspended until the 1999 large-scale treatment of the St. Marys River.
- Lake trout relative abundance has been holding steady over the past five years, but relative abundance of wild lake trout has increased dramatically in many areas during recent years.
- Marking rates on corigonids has been increasing and may be important initial hosts for juvenile sea lampreys.
- The FishLamp workgroup is working to provide clarity to the often murky relationship between sea lamprey abundance, lake trout abundance, and sea lamprey marking rate on lake trout.

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

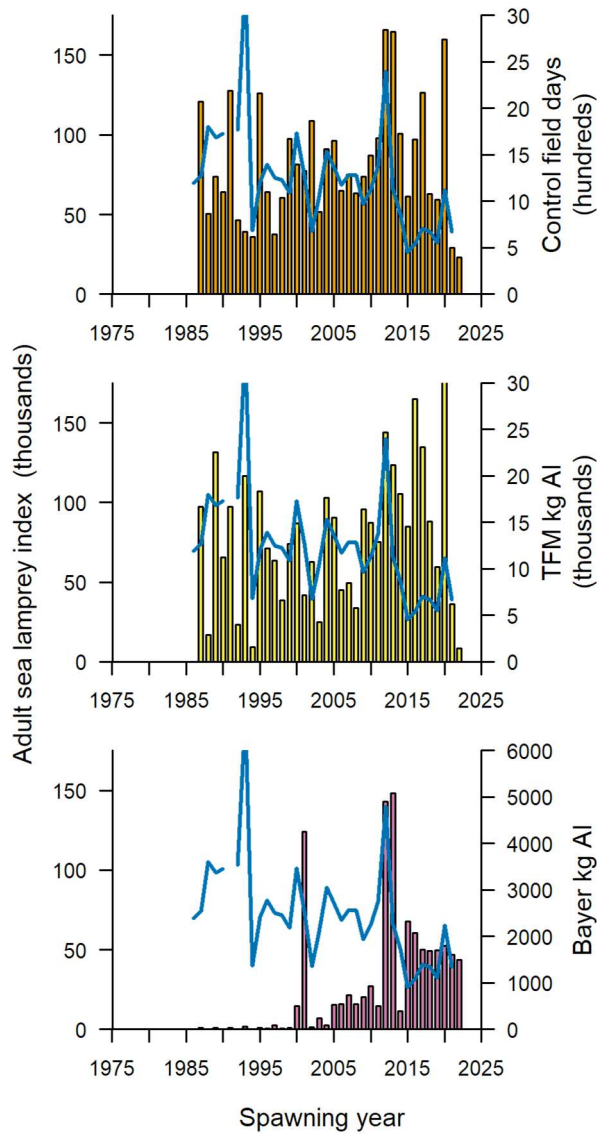


Figure 5. Index of adult sea lampreys (blue lines) and number of control field days (orange bars), TFM used (kg active ingredient; yellow bars), and Bayluscide used (kg active ingredient; purple bars). Field days, TFM, and Bayluscide are offset by 2 years (e.g., field days, TFM, and Bayluscide applied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

- 2021 lampricide treatment information will be available soon.
- Five tributaries were treated with TFM and the St. Marys River were treated with granular Bayluscide during 2020 (2022 sea lamprey spawning year).
- Sixteen tributaries were treated during 2017, 34 during 2018, and thirteen during 2019 (2019 to 2021 sea lamprey spawning years)
- Two lentic areas were treated during 2017, six during 2018, and four during 2019 (2019 to 2021 sea lamprey spawning years).
- Targeted treatment effort since 2010 has likely resulted in historically low sea lamprey abundance.
- Lake Huron likely benefits from the treatment of large producers in the northern part of Lake Michigan.