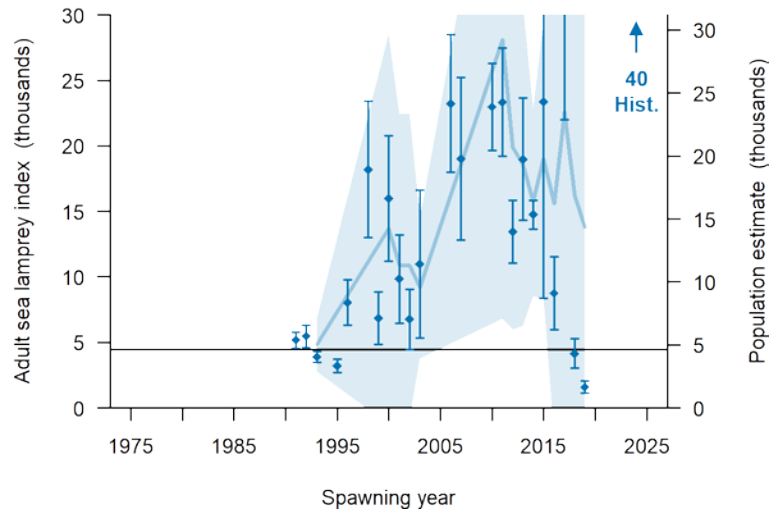
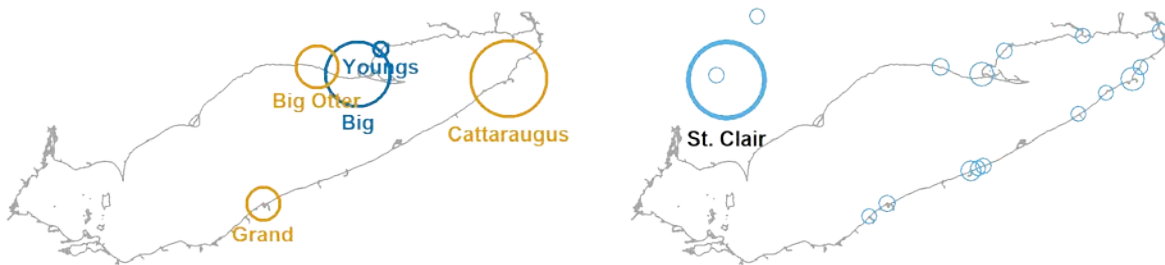


# STATUS OF SEA LAMPREY CONTROL IN LAKE ERIE

## Adult Sea Lamprey:



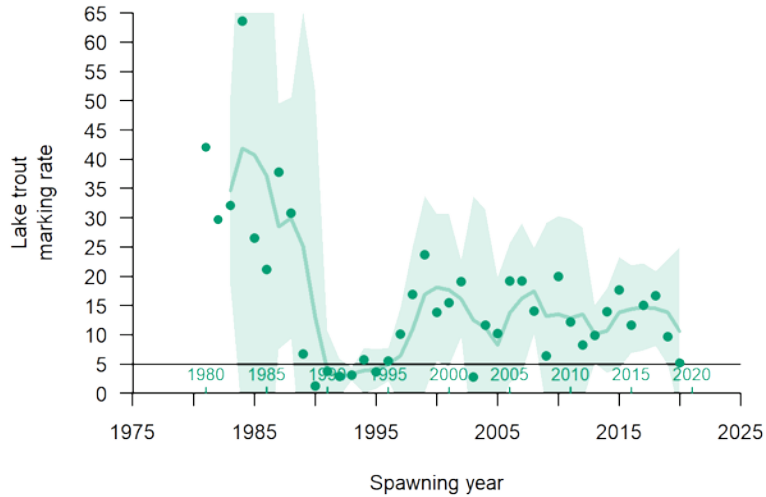
**Figure 1.** Index estimates with 95% confidence intervals (vertical bars) of adult sea lampreys, including historic pre-control abundance (as a population estimate) and the three-year moving average (line) with 95% CIs (shaded area). The population estimate scale (right vertical axis) is based on the index-to-PE conversion factor of 1.04. The adult index in 2019 was 1,600 with 95% confidence interval (1,100-2,100). The three-year average of 14,000 was above the target of 4,400. The index target was estimated as the mean of indices during a period with acceptable marking rates (1991-1995).



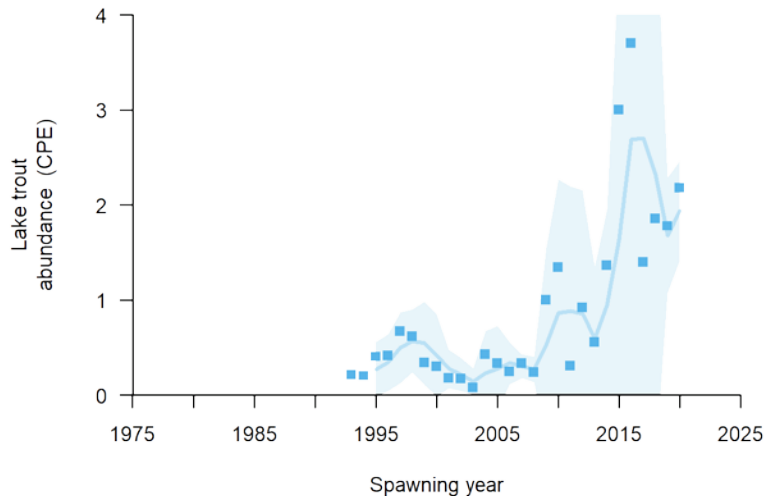
**Figure 2.** LEFT: Estimated index of adult sea lampreys during the spring spawning migration, 2018. Circle size corresponds to estimated number of adults from mark-recapture studies (blue) and model predictions (orange). All index streams are identified. RIGHT: Maximum estimated number of larval sea lampreys in each stream surveyed during 1995-2012. Tributaries composing over half of the lake-wide larval population estimate are identified (St. Clair 920,000).

- The 3-year average adult index estimate is above the target and the adult index has been holding steady over the past 5 years; the reasons for the above target and variable index estimates are not yet apparent.
- Poor trap catches during 2019 due to challenging trapping conditions only allowed for mark-recapture estimates to be calculated on two of the five index streams and contributed to a low adult index.
- Near record walleye year classes may be increasing, thereby creating predatory pressure on recently metamorphosed juvenile sea lamprey, especially from the Huron-Erie corridor.
- Sources to watch include hard to treat tributaries like Cattaraugus Creek and the potential for unidentified sea lamprey producing tributaries and lentic areas (i.e. the Detroit and St. Clair rivers, and western basin of Lake Erie).

**Lake Trout Marking and Relative Abundance:**



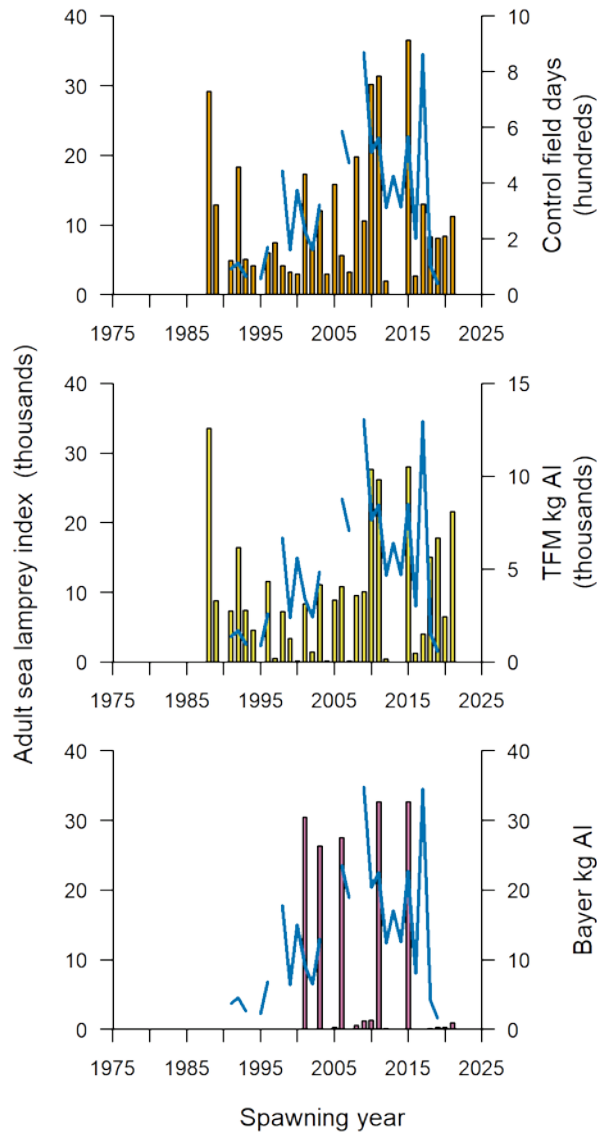
**Figure 3.** Number of A1-A3 marks per 100 lake trout > 532 mm from standardized assessments plotted against the sea lamprey spawning year, including the three-year moving average (line) with 95% CIs (shaded area). The marking rate of 11 in spawning year 2017-2019 was above the target of 5 A1-A3 marks 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 from standardized spring surveys plotted against sea lamprey spawning year, including the three-year moving average (line) with 95% CIs (shaded area). CPE = number per lift of lean lake trout age 5 and older.

- The 3-year average marking rate is above the target and marking rates have been holding steady over the past 5 years.
- Lake trout relative abundance has been holding steady over the past 5 years.
- Marking rates on burbot and steelhead have been increasing and are a concern.
- The Commission, in collaboration with management agencies, maintains lake trout marking and abundance data sets to advance assessment and guidance of the program.
- A workgroup (FishLamp) 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 - Abundance 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).

- Six tributaries were treated with TFM during 2019 (2021 sea lamprey spawning year).
- Three tributaries were treated during 2016, four during 2017, and three during 2018 (2018 to 2020 sea lamprey spawning year).
- Increased control effort has been implemented since 1999 (2001 spawning year) and a large-scale treatment strategy in which all known sea lamprey producing streams are treated in consecutive years was implemented during 2008 - 2010.
- Unidentified sources of sea lampreys remains a concern and more intense assessment survey plans have been proposed, especially in the Huron – Erie Corridor.