STATUS OF SEA LAMPREY CONTROL IN LAKE ONTARIO
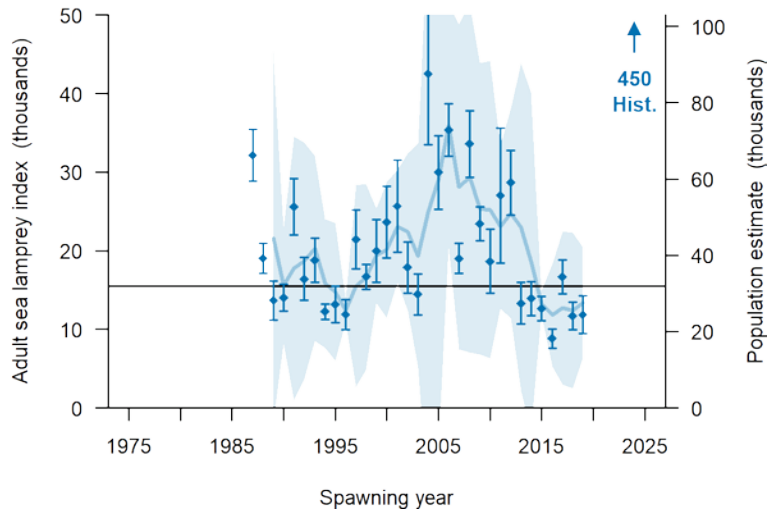
Adult Sea Lamprey:

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) with 95% CIs (shaded area). The population estimate scale (right vertical axis) is based on the index-to-PE conversion factor of 2.06. The adult index in 2019 was 12,000 with 95% confidence interval (9,500-14,000). The three-year average of 13,000 met the target of 16,000. 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, 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 (Salmon 1,400,000; Little Salmon 970,000; Credit 590,000; Black 470,000).

- The 3-year average adult index estimate is meeting the target and the adult index has been holding steady over the past 5 years.
- There are no known sources of concern to report. The Niagara River and Niagara Bar were evaluated in 2009 and harbor very low density populations of sea lamprey larvae. This source will continue to be monitored for increased production.
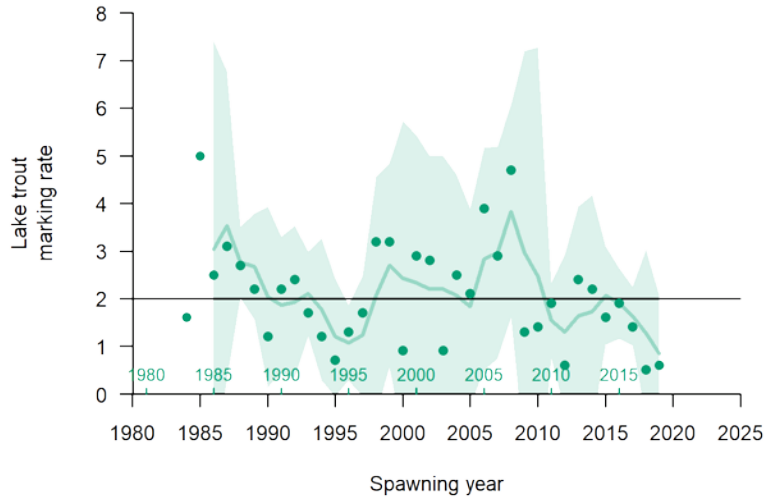
Lake Trout Marking and Relative Abundance:

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) with 95% CIs (shaded area). The marking rate of 0.6 in spawning year 2018 met 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.
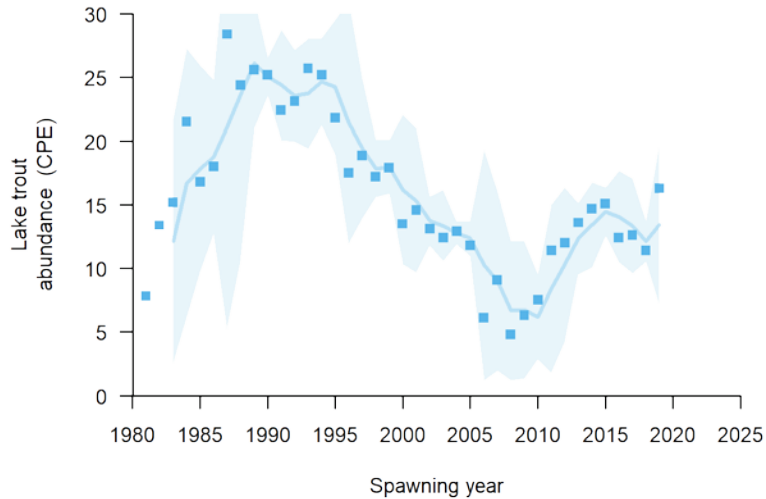

Figure 4. Lake trout relative abundance plotted against sea lamprey spawning year, including the three-year moving average (line) with 95% CIs (shaded area). CPE = fish/km/net night of lean lake trout > 431 mm (17") total length.

- The 3-year average marking rate is meeting the target and the marking rate has been holding steady over the past 5 years.
- Lake trout abundance has been steady over the past 5 years.
- Marking rates on steelhead and chinook have been increasing and are a concern.
- The Commission, in collaboration with management agencies, is building lake trout marking and abundance databases to further advance the assessment and guidance of the program.

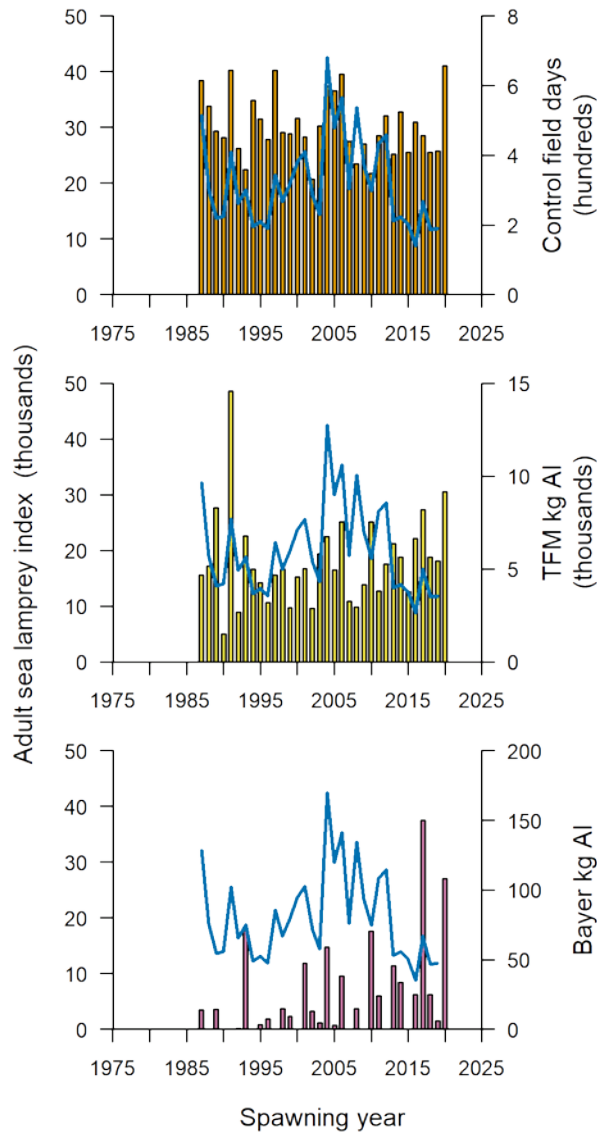**Lampricide Control - Abundance vs. Field Days, TFM, and Bayluscide:**

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).

- Sixteen tributaries were treated with TFM and one lentic area was treated with granular Bayluscide during 2018 (2020 spawning year).
- 19 tributaries were treated during 2015, 10 during 2016, and eight during 2017 (2017 to 2019 spawning years).
- Control effort has remained steady for more than 25 years.