



Understanding the Process for Selecting Great Lakes Tributaries for Lampricide Treatment

Sea lampreys, native to the Atlantic Ocean, are invasive predatory fish in the Great Lakes. They feed on the blood and body fluids of other fish species such as lake trout, whitefish, and salmon, but are quite opportunistic and have been documented feeding on a wide variety of fish species. Each sea lamprey is capable of killing up to 40 pounds (18 kilograms) of Great Lakes fish.

The Great Lakes Fishery Commission (Commission) delivers sea lamprey control in partnership with the U.S. Fish and Wildlife Service, Fisheries and Oceans Canada, and the U.S. Army Corps of Engineers.

Lampricides—chemicals used to kill sea lampreys—are the foundation of the Sea Lamprey Control Program; they target filter-feeding larval sea lampreys in Great Lakes tributaries before they metamorphose and prey on fish. Of the approximate 5,300 tributaries to the Great Lakes, surveys have indicated about 10% are infested with sea lampreys. Of these, 337 have been treated with lampricides at least once since treatments began in 1958, while approximately 184 tributaries require regular treatments. Because so many systems are infested, it is impossible to treat them all in any given year. Hence, most tributaries are treated on a 3 to 5-year cycle, which coincides with the minimum amount of time that larvae spend filter-feeding in tributaries before migrating to a Great Lake as parasitic juveniles.

Sea Lamprey Larvae

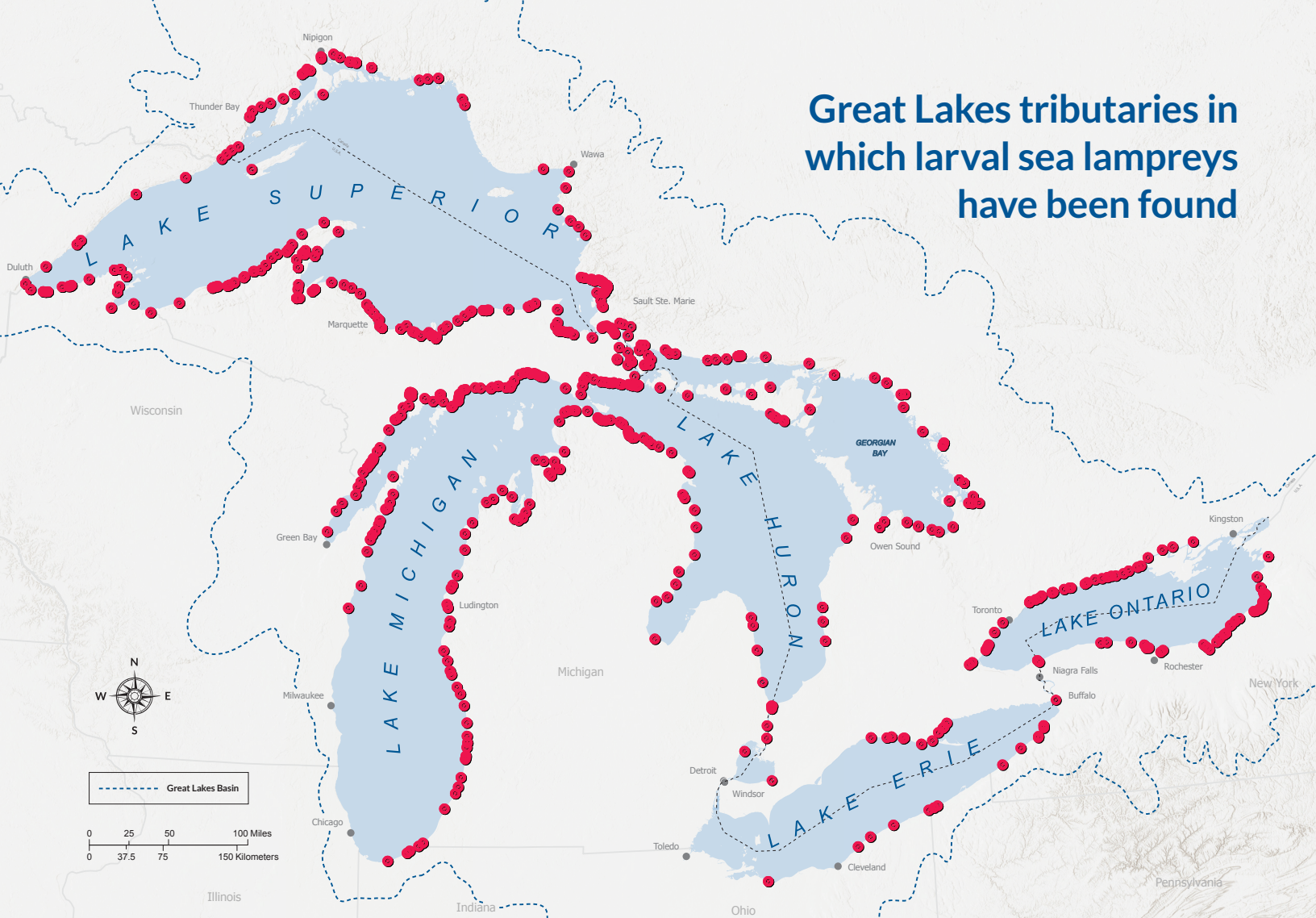
Actual Size



Of the more than 180 non-native species in the Great Lakes basin, sea lampreys are the only invaders that can be controlled basin-wide and are the target of the world's most successful aquatic vertebrate pest control program at an ecosystem scale.



Great Lakes tributaries in which larval sea lampreys have been found



Selecting which tributaries will receive a lampricide treatment each year is a lengthy and complicated process.

The rationale behind individual stream treatments and the timing of their application is based on extensive current and historical data. These data include information on larval sea lamprey density, survival, and growth parameters; stream habitat information; infested area; and stream size and shape.

To guide the process, infested tributaries and nearshore lakebed areas are identified by current program goals and objectives that may focus on a specific program target or geographic area; these specific objectives are based on factors such as population model outputs or larval size distribution.

Yearly categorization of infested tributaries and nearshore lakebed areas allows the program to strategically reduce treatment expenses and enhance program effectiveness.

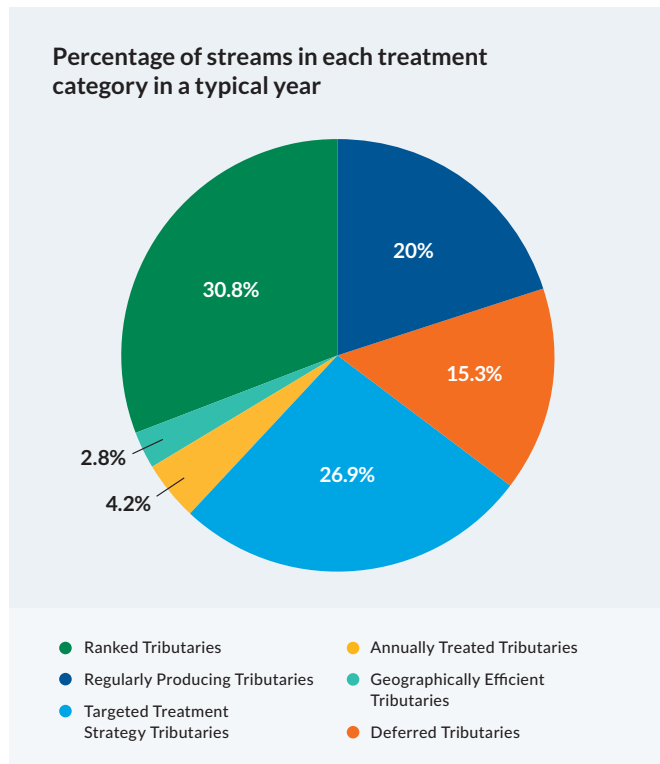


Top: Control agent holding dead sea lamprey larvae



Right: Control agent surveying tributary for sea lamprey larvae

Federal funding from both the U.S. and Canada directly determines the level of control that can be applied each year.



Ranked Tributaries have been recently assessed for an abundance of larval sea lampreys greater than 100 mm, and have had the overall treatment cost calculated. Based on these data, these systems are ranked on the cost-per-kill for large larvae.

The St. Marys River is the largest tributary, by water volume, in the Great Lakes basin that is treated with lampricide. Each year, assessment crews conduct hundreds of survey plots to evaluate larval sea lamprey abundance and size structure. The highest-ranking plots are slated for treatment the following year. A minimum of 300 hectares (741 acres) are treated annually using Bayluscide®, a granular lampricide. Despite being ranked similarly on a cost-per-kill basis, these plots are treated as a distinct subset of ranked tributaries due to the focused effort on the St. Marys River system.

Regularly Producing Tributaries have a consistent population of larval sea lampreys ready to transition to the next life stage, where they will begin to parasitize Great Lakes fish. These systems demonstrate consistent larval growth and require lampricide treatments on a fixed cycle (typically every 3 to 5 years).

Targeted Treatment Strategy Tributaries are identified by the Sea Lamprey Control Program goals and objectives, which focus on a specific geographic area or program target and may be based on factors such as model outputs or larval size structure.

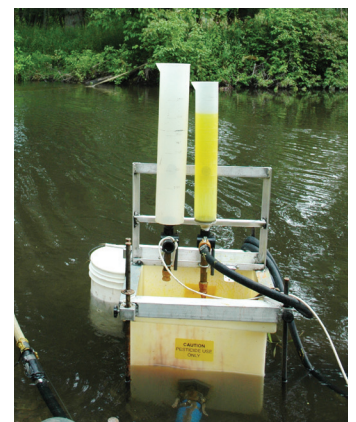
Annually Treated Tributaries are streams that regularly harbor large populations of sea lampreys in riverine areas and in estuarine and near-shore areas that are difficult to treat. The goal of yearly treatments is to prevent the establishment of robust sea lamprey populations that will likely be flushed downstream and out of reach of typical treatments.

Geographically Efficient Tributaries are ranked tributaries that failed to make the initial cutoff but are in close geographic proximity to a tributary already scheduled for treatment. In these situations, they may be added to the annual treatment list because they have larval sea lampreys present and do not incur significant additional resources to treat.

Deferred Tributaries are those that were slated for treatment but could not be treated during their originally scheduled year due to extenuating circumstances such as water level, water chemistry, or lack of partner concurrence. These systems are prioritized for treatment the following year.



Left: Control agent preparing lampricide for application
Right: A typical lampricide application setup





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