SEA LAMPREY CONTROL IN THE GREAT LAKES 2024

ANNUAL REPORT TO
THE GREAT LAKES FISHERY COMMISSION

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Cover: Neebing River Barrier integrated sea lamprey Trap, Thunder Bay, Ontario, October 21, 2024. The permanent trap was installed during the 2024 season and ready to fish for the first time in the spring of 2025. The new trap replaces portable devices previously used at this location (1 of 7 index sites for Lake Superior).
Photo credit: Ryan Booth, Fisheries and Oceans Canada.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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EXECUTIVE SUMMARY

This report summarizes sea lamprey control operations conducted by Fisheries and Oceans Canada and the United States Fish and Wildlife Service in the Great Lakes during 2024, which were consistent with those prescribed in the Great Lakes Sea Lamprey Control Plan (2011) to achieve sea lamprey abundance and marking targets. Lampricide treatments were conducted on 84 tributaries and 22 lentic areas. Operation of 73 barriers, (48 purpose-built, 25 modified to serve as a sea lamprey barrier) to block sea lamprey migration and serve as an alternative control to the use of lampricides. Larval assessment crews surveyed 421 Great Lakes tributaries and 69 lentic areas to assess control effectiveness, plan future lampricide treatments, and establish the capacity of streams to produce sea lampreys. Assessment traps were operated in 29 tributaries across the Great Lakes to estimate the index of adult sea lamprey abundance in each Great Lake.

Indices of adult sea lamprey abundance were evaluated relative to fish community objectives for each of the lakes. In Lake Superior, the index of adult abundance was estimated to be 55,551 (95% CI: 52,498 – 58,604), which is greater than the index target of 10,421. In Lake Michigan, the index of adult abundance was estimated to be 24,799 (95% CI: 23,907 – 25,691), which is greater than the target of 20,526. In Lake Huron, the index of adult abundance was estimated to be 39,974 (95% CI: 38,378 – 41,570), which is greater than the target of 31,274. In Lake Erie, the index of adult abundance was estimated to be 870 (95% CI: 801 – 938), which is less than the target of 3,263. In Lake Ontario, the index of adult abundance was estimated to be 22,374 (95% CI: 20,813 – 23,935), which is greater than the target of 14,065.

INTRODUCTION

The sea lamprey (*Petromyzon marinus*) is a destructive, invasive species in the Great Lakes that contributed to the collapse of lake trout (*Salvelinus namaycush*) and other native species in the mid-20th century and continues to impede efforts to restore and rehabilitate the fish community. Sea lampreys subsist on the blood and body fluids of large-bodied fish. It is estimated that about half of sea lamprey attacks result in the death of their prey and up to 18 kg (40 lbs) of fish production is lost to every sea lamprey that reaches adulthood. The Sea Lamprey Control Program (SLCP) is administered by the Great Lakes Fishery Commission (Commission) and implemented by two control agents: Fisheries and Oceans Canada (DFO; Department) and the United States Fish and Wildlife Service (Service). The SLCP is a critical component of fisheries management in the Great Lakes because it facilitates the rehabilitation of important fish stocks by significantly reducing sea lamprey-induced mortality.

As part of *A Joint Strategic Plan for Management of Great Lakes Fisheries,* the lake committees developed fish community objectives for each of the Great Lakes. The fish community objectives include goals for the SLCP that, if achieved, should help establish and maintain self-sustaining stocks of lake trout and other salmonids by minimizing sea lamprey impacts on these stocks. This report outlines the program's efforts during 2024 to meet these goals.

FISH COMMUNITY OBJECTIVES

Each lake committee has identified qualitative goals for sea lamprey control, which are published in lake-specific fish community objectives. During 2004, each lake committee agreed to explicit sea lamprey suppression targets designed to meet their fish community objectives. In lakes Superior, Michigan and Erie, the targets were developed from a consecutive five-year period when sea lamprey marking rates were closest to 5.0 A1-A3 marks per 100 lake trout >532 mm, considered to represent a tolerable annual rate of sea lamprey induced lake trout mortality. A target of adult sea lamprey abundance was calculated for each lake from the average index of abundance over the same five-year period. Similarly, a target was developed for Lake Ontario from the estimated average sea lamprey abundance over a five-year period when marking rates were closest to 2.0 A1 marks per 100 lake trout >431 mm. In Lake Huron, the abundance target was calculated as 25% of the estimated average during the consecutive five-year period with the lowest sea lamprey marking rate prior to the completion of the fish community objectives (1989–1993).

The annual performance of the SLCP is evaluated by comparing lake-specific adult sea lamprey abundance indices and lake trout marking rates against established targets. Adult sea lamprey abundance indices are estimated by the Service and Department by tallying mark-recapture estimates from a sub-set of streams within each lake that were selected based on a consistent trapping history and reliable sea lamprey spawning runs. Lake trout marking rates are assessed and collected by member agencies that comprise the lake committees and their technical committees.

Lake Superior

The Lake Superior Committee established the following goal for sea lamprey control in Lake Superior:

- *Suppress sea lampreys to population levels that cause only insignificant mortality on adult lake trout.*

Sea lamprey control supports fish community objectives for lake trout and other species:

- *Achieve and maintain genetically diverse self-sustaining populations of lake trout that are similar to those found in the lake prior to 1940, with lean lake trout being the dominant form in nearshore waters, siscowet lake trout the dominant form in offshore waters, and humper lake trout a common form in eastern waters and around Isle Royale.*

- *Maintain self-sustaining populations of lake whitefish within the range of abundance observed during 1990-1999.*

The adult index target for Lake Superior of 10,421 sea lamprey was estimated as the mean of indices during the five-year period, 1994-1998, when marking rates were closest to 5.0 marks per 100 lake trout >532 mm (5.2 A1-A3 marks per 100 fish >532 mm). The 2024 index of adult abundance for Lake Superior was 55,551 (95% CI: 52,498 – 58,604), which is greater than the index target. The number of A1-A3 marks on lake trout from spring assessments in 2023 was 9.6 marks per 100 lake trout >532 mm. The spring 2024 assessment data is being compiled.

Lake Michigan

The Lake Michigan Committee established the following goal for sea lamprey control in Lake Michigan:

- *Suppress sea lamprey abundance to allow the achievement of other fish community objectives.*

Sea lamprey control can have a direct effect on objectives for lake trout and other salmonines:

- *Establish self-sustaining lake trout populations.*

- *Establish a diverse salmonine community capable of sustaining an annual harvest of 2.7 to 6.8 million kilograms (6 to 15 million pounds), of which 20-25% is lake trout.*

The adult index target for Lake Michigan of 20,526 sea lamprey was estimated as the mean of indices during the five-year period, 2016-2021, when marking rates were closest to 5.0 marks per 100 lake trout >532 mm (3.5 A1-A3 marks per 100 fish >532 mm). The 2024 index of adult abundance for Lake Michigan was 24,799 (95% CI: 23,907 – 25,691), which is greater than the index target. The number of A1-A3 marks on lake trout from fall assessments in 2023 was 2.6 marks per 100 lake trout >532 mm. The fall 2024 assessment data is currently being compiled.

Lake Huron

The Lake Huron Committee established the following specific goals for sea lamprey control in Lake Huron:

- *Reduce sea lamprey abundance to allow the achievement of other fish community objectives.*

- *Obtain a 75% reduction in parasitic-phase sea lampreys by the year 2000 and a 90% reduction by the year 2010 from present levels.*

The sea lamprey objective supports the other fish community objectives, specifically the salmonine objective:

- *Establish a diverse salmonine community that can sustain an annual harvest of 2.4 million kg, with lake trout the dominant species and anadromous (stream-spawning) species also having a prominent place.*

The adult index target for Lake Huron of 31,274 sea lamprey was estimated as 0.25 times the mean of indices during the five-year period of lowest sea lamprey abundance prior to the publication of the fish community objectives (1989-1993). Unlike the other Great Lakes, this target was not based on observed consecutive years of marking rates that resulted in a tolerable annual lake trout mortality rate. The 2024 index of adult abundance in Lake Huron was estimated to be 39,974 (95% CI: 38,378 – 41,570), which is greater than the index target. The number of A1- A3 marks on lake trout from spring assessments in 2023 was 6.4 marks per 100 lake trout >532 mm. The spring 2024 assessment data is being compiled.

Lake Erie

The Lake Erie Committee established the following goal and indicator of success for sea lamprey control in Lake Erie:

- *Suppress abundance of sea lamprey to levels that will not impede achievement of any fish community objective, especially for cold-water species of low abundance.*

- *Reduce sea lamprey abundance to levels specified in the sea lamprey management plan administered by the Commission.*

The lake trout management plan for rehabilitation of self-sustaining stocks in the eastern basin of Lake Erie prescribed a maximum annual mortality of less than 40% to permit the establishment and maintenance of suitable stocks of spawning adults. Mortality was to be controlled through management of fishery exploitation and continued suppression of sea lamprey.

The adult index target for Lake Erie of 3,263 sea lamprey was estimated as the mean of indices during the five-year period, 1991-1995, when marking rates were closest to 5.0 marks per 100 lake trout >532 mm (4.4 A1-A3 marks per 100 fish >532 mm). The 2024 index of adult abundance in Lake Erie was estimated to be 870 (95% CI: 801 – 938), which is less than the index target. The number of A1-A3 marks on lake trout from fall assessments in 2023 was 8.3 marks per 100 lake trout >532 mm. The fall 2024 assessment data is being compiled.

Lake Ontario

The Lake Ontario Committee established the following goal and indicators of success for sea lamprey control in Lake Ontario:

- *Control sea lamprey—suppress abundance of sea lamprey to levels that will not impede achievement of objectives for lake trout and other fish.*

- *Spawning-phase adult sea lamprey abundance in Lake Ontario tributaries below targets identified in the sea lamprey management plan.*

- *Number of A1 marks on lake trout and other species below targets.*

The Lake Ontario Committee recognized that continued control of sea lamprey is necessary for lake trout rehabilitation and stated a specific objective for sea lamprey:

- *Control sea lampreys so that fresh wounding rates (A1) of lake trout larger than 431 mm is less than 2.0 marks/100 fish.*

This objective is intended to maintain the annual lake trout survival rate of 60% or greater to support a spawning stock of 0.5 to 1.0 million adults of multiple year classes. Along with sea lamprey control, angler and commercial exploitation will also be controlled so that annual harvest does not exceed 120,000 fish in the near term.

The target for Lake Ontario sea lamprey abundance is calculated using A1 marks exclusively, which have been more consistently recorded on Lake Ontario. The target-marking rate of less than 2.0 A1 marks per 100 lake trout was explicitly identified as producing tolerable mortality in the lake trout rehabilitation plan.

The adult index target for Lake Ontario of 14,065 sea lamprey was estimated as the mean of indices during the five-year period, 1993-1997, when marking rates were closest to 2.0 marks per 100 lake trout >431 mm (1.6 A1 marks per fish >431 mm). The 2024 index of adult abundance in Lake Ontario was estimated to be 22,374 (95% CI: 20,813 – 23,935), which is greater than the index target. The number of A1 marks on lake trout from fall assessments in 2023 was 2.3 marks per 100 lake trout >431 mm. The fall 2024 assessment data is being compiled.

LAMPRICIDE CONTROL

Tributaries harbouring larval sea lamprey are treated periodically with lampricides to eliminate or reduce larval populations before they recruit to the lake as feeding juveniles. During stream treatments, Department and Service control units administer and analyze several lampricide formulations including 3-trifluoromethyl-4-nitrophenol (TFM) or TFM mixed with Bayluscide (20% emulsifiable concentrate; EC). Specialized equipment and techniques are employed to maintain lampricide concentrations at levels that eliminate approximately 93% of resident sea lamprey larvae while minimizing risk to non-target organisms. To control larval populations that inhabit lentic areas and interconnecting waterways, field crews apply a bottom-release formulation of lampricide, granular Bayluscide 3.2% (gB), which is 75% effective on average.

Reporting to the SLCB, the Lampricide Control Task Force (LCTF) was established by the Commission during December 1995 and charged to improve the efficiency of lampricide control, maximize sea lamprey killed in stream and lentic treatments (while minimizing lampricide use, costs, and impacts on aquatic ecosystems), and define lampricide control options for near and long-term stream selection and target setting. Progress on SLCB charges during 2024 is presented in the LCTF section of this report.

During 2024, lampricide treatments were conducted on 84 tributaries and 22 lentic areas of the Great Lakes (Table 1). The time series of control effort metrics are presented in Figure 1.

Table 1. Summary of lampricide applications in tributaries of the Great Lakes in 2024.

Lake	Number of Streams	Number of Lentic Areas	Discharge (m^3/s)	Distance Treated (km)	TFM (kg) [1,2]	Bayluscide (kg) [1,3]
Superior	23	15	198	596	18,693	839
Michigan	25	4	73	508	15,055	175
Huron	20	3	53	595	10,979	1,412
Erie	1	0	2	20	174	0
Ontario	15	0	81	250	10,477	56
Total	**84**	**22**	**407**	**1,969**	**55,378**	**2,483**

[1]Lampricide quantities are reported in kg of active ingredient, [2]Includes solid formulation of TFM, [3]Includes 3.2% granular Bayluscide applied to lentic areas.

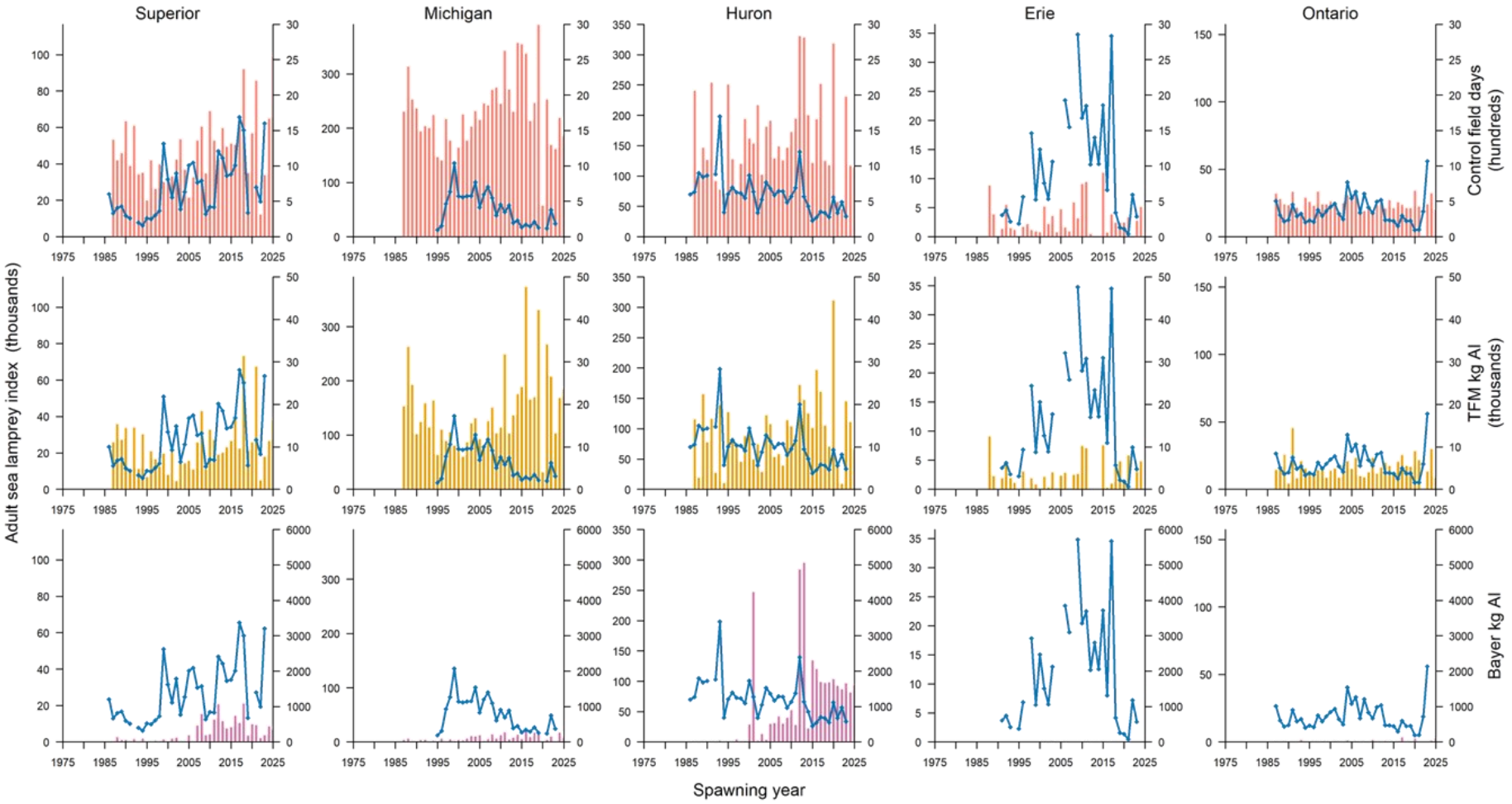

Figure 1. Row 1: Number of control field days (orange bars). Row 2: TFM used (kg active ingredient, yellow bars). Row 3: Bayluscide used (kg active ingredient, purple bars). All rows: Index of adult sea lampreys is shown with blue lines. All metrics plotted against the sea lamprey spawning year. Control metrics are offset by two years, e.g., control applied during 2006 is plotted on the 2008 spawning year - the year the treatment effect would first be observed in the adult sea lamprey population.

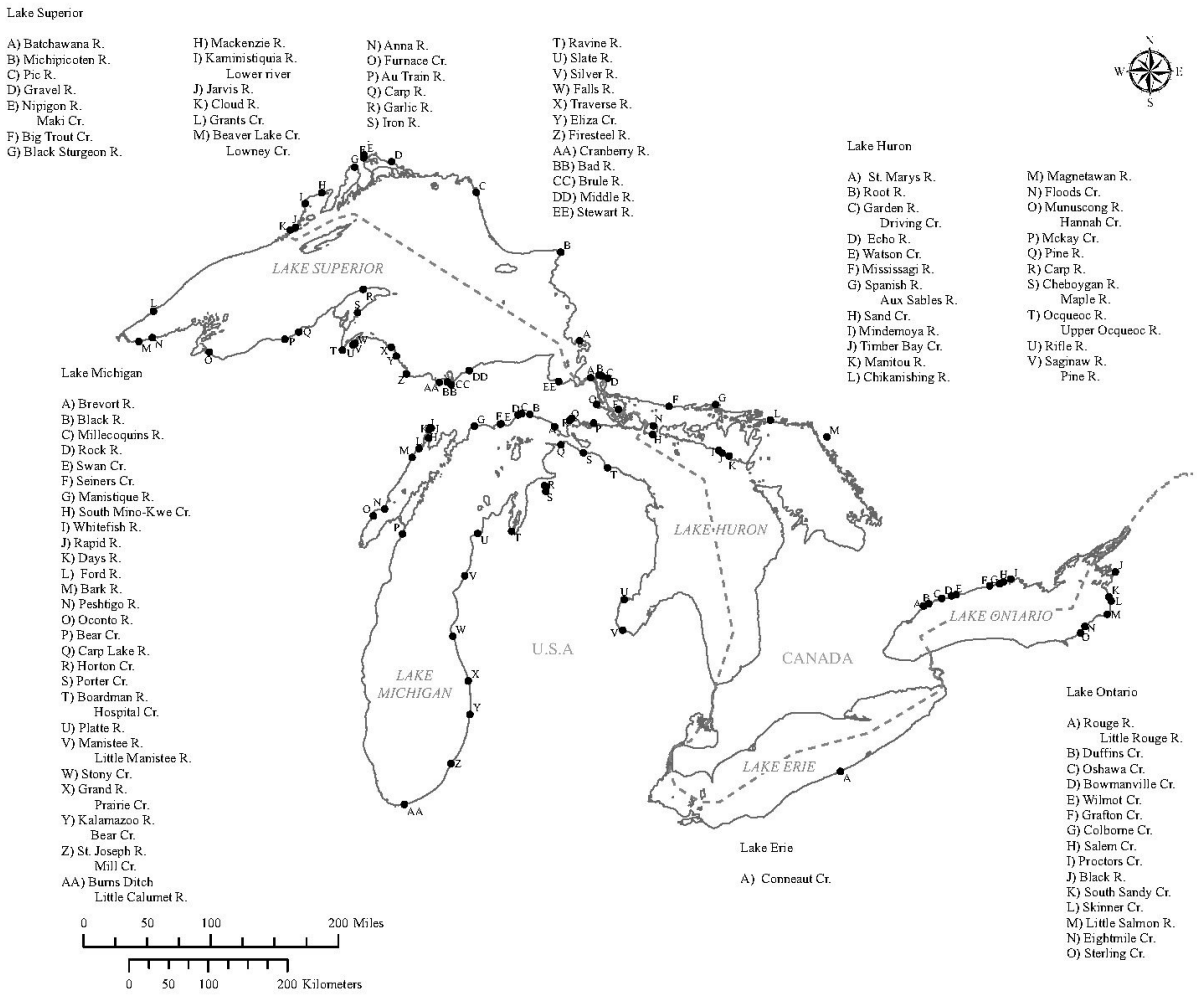

Figure 2. Location of tributaries treated with lampricides during 2024.

Lake Superior

Lake Superior has 1,566 tributaries (833 Canada, 733 U.S.). One hundred seventy-four tributaries (60 Canada, 114 U.S.) have records of larval sea lamprey production. Of these, 129 tributaries (43 Canada, 86 U.S.) have been treated with lampricides at least once during 2015-2024. Sixty-one tributaries (24 Canada, 37 U.S.) are treated every 3-5 years. Details on lampricide applications to Lake Superior tributaries and lentic areas during 2024 and tributary locations are found in Table 2 and Figure 2, respectively.

- Lampricide treatments were conducted in 23 tributaries (7 Canada, 16 U.S.) and 15 lentic areas (6 Canada, 9 U.S.; Table 2).

- The West Sleeping River was scheduled to be treated during 2024 but was removed due to lack of recruitment after the last treatment.

- High densities of sea lamprey larvae and juveniles were observed during treatments of the Firesteel, Traverse, Cranberry, Bad, and Middle rivers.

- Maki Creek (Nipigon River, ON) and Stewart River (North Shore, MN) were treated for the first time. The Middle River was treated upstream from the sea lamprey barrier for the first time since 2002.

- Two lentic plots in Au Train Lake (offshore from Buck Bay and Cole creeks) were treated for the first time.

Table 2. Details on the application of lampricides to tributaries and lentic areas of Lake Superior during 2024 (letter in parentheses corresponds to location of stream in Figure 2). Lampricide quantities are reported as kg of active ingredient.

Tributary	Date	Discharge (m^3/s) [1]	Distance Treated (km)	Liquid TFM (kg)	Solid TFM (kg)	Emulsifiable Concentrate Bayluscide (kg)	Granular Bayluscide (kg)[2]
Canada							
Batchawana R. (A)							
Lentic	Jun-24	---	---	---	---	---	112.67
Michipicoten R. (B)	Aug-17	41.50	22.50	2572.60	1.20	31.80	1.25
Pic R. (C)	Jul-20	21.10	117.80	2672.40	7.50	38.30	1.25
Gravel R. (D)							
Lentic	Aug-14	---	---	---	---	---	151.25
Nipigon R. (E)							
Upper Nipigon R.	Aug-13	74.70	11.60	6640.20	1.90	66.30	0.01
Maki Cr.	Aug-16	0.03	2.10	8.80	---	---	---
Lentic	Aug-9	---	---	---	---	---	69.20
Big Trout Cr. (F)							
Lentic	Aug-10	---	---	---	---	---	12.25
Black Sturgeon R. (G)	Aug-09	19.50	16.90	1219.80	---	17.90	0.20
Mackenzie R. (H)							
Lentic	Oct-19	---	---	---	---	---	91.85
Kaministiquia R. (I)							
Lentic	Oct-16	---	---	---	---	---	35.52
Jarvis R. (J)	Jun-23	0.60	17.50	97.70	2.30	---	0.03
Cloud R. (K)	Jun-21	0.30	12.70	106.20	---	---	---
Total (Canada)		**157.73**	**201.10**	**13,317.70**	**12.90**	**154.30**	**475.48**
United States							
Grants Cr. (L)	Aug-21	0.10	0.30	8.10	---	---	---
Beaver Lake Cr. (M)							
Lowney Cr.	Jul-10	0.60	3.20	72.50	2.80	---	---
Anna R. (N)							
Lentic	Sep-04	---	---	---	---	---	31.80
Furnace Cr. (O)							

Tributary	Date	Discharge (m^3/s) [1]	Distance Treated (km)	Liquid TFM (kg)	Solid TFM (kg)	Emulsifiable Concentrate Bayluscide (kg)	Granular Bayluscide (kg)[2]
Lentic	Sep-03	---	---	---	---	---	45.90
Au Train R. (P)							
Lentic	May-07	---	---	---	---	---	15.30
Carp R. (Q)							
Lentic	Aug-21	---	---	---	---	---	58.20
Garlic R. (R)	Sep-04	0.90	12.90	161.70	2.20	---	---
Iron R. (S)	Jul-01	3.00	4.70	276.60	---	---	---
Ravine R. (T)	Aug-03	0.10	5.60	14.00	0.10	---	---
Lentic	Jul-11	---	---	---	---	---	13.50
Slate R. (U)	Aug-29	0.70	1.00	42.70	---	---	---
Lentic	Jul-10	---	---	---	---	---	12.90
Silver R. (V)	Aug-29	2.10	6.40	188.10	2.40	---	---
Lentic	Jul-09	---	---	---	---	---	15.00
Falls R. (W)	Aug-28	3.10	0.50	330.20	---	---	---
Lentic	May-21	---	---	---	---	---	10.90
Traverse R. (X)	Jun-21	1.40	15.00	83.40	0.40	---	---
Eliza Cr. (Y)	Jun-20	0.20	0.50	16.80	0.20	---	---
Lentic	Jun-31	---	---	---	---	---	6.10
Firesteel R. (Z)	Aug-02	1.00	61.20	360.00	2.80	---	---
Cranberry R. (AA)	Oct-10	0.10	21.70	99.30	---	---	---
Bad R. (BB)	Sep-27	12.00	231.90	2318.40	2.10	---	---
Brule R. (CC)	Jun-21	10.50	10.10	1006.60	---	---	---
Middle R. (DD)	Jun-24	4.30	19.20	313.10	0.20	---	---
Stewart R. (EE)	Jun-25	0.60	1.10	57.20	---	---	---
Total (United States)		**40.70**	**395.30**	**5,348.70**	**13.20**	**---**	**209.60**
Total for Lake		**198.43**	**596.40**	**18,666.40**	**26.10**	**154.30**	**685.08**

Lake Michigan

Lake Michigan has 511 tributaries. One hundred twenty-nine tributaries have records of larval sea lamprey production, and of these, 77 tributaries have been treated with lampricides at least once during 2015-2024. Thirty-one tributaries are treated every 3-5 years. Details on lampricide applications to Lake Michigan tributaries and lentic areas during 2024 and tributary locations are found in Table 3 and Figure 2, respectively.

- Lampricide treatments were completed in 25 tributaries and 4 lentic areas.

- High densities of sea lamprey larvae and juveniles were observed during treatments in the Peshtigo, Bark, Platte, Little Manistee, and East Arm Little Calumet rivers.

- The East Arm Little Calumet River (Burns Ditch) was treated for the first time since 1999 due to escapement upstream of the sea lamprey barrier.

- Prairie Creek (Grand River) was treated for the first time due to escapement upstream of 6th Street Dam.

- Marblehead Creek could not be treated due to insufficient discharge and has been scheduled for treatment during 2025.

- Cedar River tributaries (Forty-Seven Mile, Elwood, and Crooked creeks) were treated in the spring, however the mainstream treatment was not conducted due to unstable flow and flooding in the spring and insufficient discharge in the fall. The mainstream has been scheduled for treatment during 2025.

Table 3. Details on the application of lampricides to tributaries and lentic areas of Lake Michigan during 2024 (letter in parentheses corresponds to location of stream in Figure 2). Lampricide quantities are reported as kg of active ingredient.

Tributary	Date	Discharge (m^3/s) [1]	Distance Treated (km)	Liquid TFM (kg)	Solid TFM (kg)	Emulsifiable Concentrate Bayluscide (kg)	Granular Bayluscide (kg)[2]
Brevort R. (A)	Sep-11	0.80	31.70	197.80	2.60	---	---
Black R. (B)	Sep-28	0.40	24.50	130.70	3.00	---	---
Millecoquins R. (C)	Jul-20	4.70	27.20	1073.60	0.90	---	---
Rock R. (D)	Jul-19	0.10	4.20	29.70	---	---	---
Swan Cr. (E)	Sep-26	0.00	1.10	3.00	---	---	---
Seiners Cr. (F)	May-23	0.10	1.40	14.90	---	---	---
Manistique R. (G)							
Lentic	Jul-01	---	---	---	---	---	68.00
South Mino-Kwe Cr. (H)	May-24	0.50	2.10	40.20	---	---	---
Whitefish R. (I)	Jun-08	13.60	98.50	2872.10	7.00	8.40	---
Rapid R. (J)	May-25	5.70	44.70	973.50	0.90	---	---
Days R. (K)	Aug-28	0.30	6.80	68.80	1.30	---	---
Ford R. (L)							
Lentic	Jun-12	---	---	---	---	---	36.70
Bark R. (M)	Sep-17	0.10	31.90	117.50	0.40	---	---
Peshtigo R. (N)	Sep-13	12.70	19.30	1492.40	1.50	18.00	---
Oconto R. (O)	Sep-16	14.20	76.10	2869.30	1.30	19.70	---
Bear Cr. (P)	Sep-13	0.00	4.30	17.10	0.50	---	---
Carp Lake R. (Q)	Jul-23	0.20	0.50	74.30	---	---	---
Horton Cr. (R)	Jul-19	0.50	0.80	148.30	0.90	---	---
Lentic	Jul-19	---	---	---	---	---	7.40
Porter Cr. (S)	Jul-18	0.30	1.80	92.00	0.20	---	---
Lentic	Jul-18	---	---	---	---	---	8.00
Boardman R. (T)							
Hospital Cr.	Jun-19	0.30	0.20	80.90	---	---	---
Platte R. (U)	Jun-20	6.80	18.50	1563.30	10.20	8.90	---
Manistee R. (V)							
Little Manistee R.	Jul-11	6.50	53.80	1823.60	4.90	---	---
Stony Cr. (W)	Oct-13	1.10	10.80	319.40	7.40	---	---
Grand R. (X)							

Tributary	Date	Discharge (m^3/s) [1]	Distance Treated (km)	Liquid TFM (kg)	Solid TFM (kg)	Emulsifiable Concentrate Bayluscide (kg)	Granular Bayluscide (kg)[2]
Prairie Cr.	Aug-02	3.00	6.30	465.10	4.30	---	---
Kalamazoo R. (Y)							
Bear Cr.	Oct-10	0.10	3.90	31.20	5.10	---	---
St. Joseph R. (Z)							
Mill Cr.	Aug-30	0.70	18.20	250.20	---	---	---
Burns Ditch (AA)							
Little Calumet R.	Sep-03	0.70	19.50	253.80	0.20	---	---
Total for Lake		**73.40**	**508.10**	**15,002.70**	**52.60**	**55.00**	**120.10**

Lake Huron

Lake Huron has 1,761 tributaries (1,334 Canada, 427 U.S.). One hundred thirty tributaries (61 Canada, 69 U.S.) have records of larval sea lamprey production. Of these, 77 tributaries (36 Canada, 41 U.S.) have been treated with lampricide at least once during 2015-2024. Forty-four tributaries (23 Canada, 21 U.S.) are treated every 3-5 years. Details on lampricide applications to Lake Huron tributaries and lentic areas during 2024 and tributary locations are found in Table 4 and Figure 2, respectively.

- Lampricide treatments were completed in 20 tributaries (12 Canada, 8 U.S.) and in three lentic areas (3 Canada, 0 U.S.).

- A total of 275 hectares of larval habitat in the St. Marys River were treated using gB.

- The Echo River was treated from above the barrier for the first time since 1999.

- Floods Creek on Cockburn Island was treated for the first time in 2024.

- Lampricide treatments did not occur in 16 waterbodies (6 Canada, 10 U.S.).

- The Bighead (lentic), Shebeshekong, Nottawasaga (main), Nottawasaga (Pine River), Naiscoot rivers and Shawanaga Creek were deferred and have been rescheduled for 2025 pending further discussion with First Nation communities.

- Bear Lake Outlet, E. Branch Munuscong River, Beaver Dam, Albany, Prentiss, Joe Straw, Ditch, and Carlton creeks were not treated due to insufficient discharge and have been scheduled for treatment during 2025. Ditch Creek will not be treated in 2025 because current surveys indicated no larval sea lamprey remained in the system.

- Hannah Creek, tributary to the East Branch Munuscong River, was treated. The remainder of this system has been scheduled for treatment during 2025.

- The Tobacco River (Saginaw River) was not treated due to unstable flow produced at the Beaverton hydropower dam. Due to the presence of a genetically significant endangered snuffbox mussel population, unresolved discharge and pH fluctuations from Beaverton hydro dam, and the presence of only one year class of sea lamprey in the river, the Tobacco River will not be treated in 2025.

- The East Branch Maple River (Cheboygan River) was not treated due to the presence of the federally endangered Hungerford’s crawling water beetle.

Table 4. Details on the application of lampricides to tributaries and lentic areas of Lake Huron during 2024 (letter in parentheses corresponds to location of stream in Figure 2). Lampricide quantities are reported as kg of active ingredient.

Tributary	Date	Discharge (m^3/s) [1]	Distance Treated (km)	Liquid TFM (kg)	Solid TFM (kg)	Emulsifiable Concentrate Bayluscide (kg)	Granular Bayluscide (kg)[2]
Canada							
St. Marys R. (A)	May-16	0.35	0.70	27.90	---	---	1301.85
Root R. (B)	May-14	3.29	22.30	184.10	2.50	---	0.22
Garden R. (C)							
Driving Cr.	May-15	1.90	10.80	100.70	2.30	---	---
Echo R. (D)	Jul-10	2.21	23.50	163.90	---	---	0.05
Lentic	Jun-27	---	---	---	---	---	6.74
Watson Cr. (E)	May-13	0.21	1.60	10.80	---	---	0.02
Mississagi R. (F)							
Lentic	Sep-25	---	---	---	---	---	56.95
Spanish R. (G)							
Aux Sables R.	Jul-24	8.77	2.10	381.10	---	---	---
Sand Cr. (H)	Sep-23	0.09	4.80	43.70	1.70	---	---
Mindemoya R. (I)	Jun-21	0.44	3.80	110.30	---	---	---
Timber Bay Cr. (J)	Jun-19	0.06	3.20	20.00	---	---	0.07
Manitou R. (K)	Jun-22	1.04	1.20	248.90	---	---	---
Chikanishing R. (L)	Jun-25	0.73	1.60	21.13	---	---	0.02
Magnetawan R. (M)							
Lentic	Oct-22	---	---	---	---	---	18.37
Floods Cr. (N)	Sep-23	0.01	0.40	1.35	---	---	---
Total (Canada)		**19.10**	**76.00**	**1,313.88**	**6.50**	**---**	**1,384.27**
United States							
Munuscong R. (O)							
Hannah Cr.	Sep-04	0.20	7.20	35.70	---	---	---
Mckay Cr. (P)	Jun-06	0.30	8.50	74.80	---	---	---
Pine R. (Q)	Jun-06	4.80	142.30	1387.00	10.80	---	---
Carp R. (R)	Jul-10	4.30	106.10	1241.60	1.70	---	---
Cheboygan R. (S)							

Tributary	Date	Discharge (m^3/s) [1]	Distance Treated (km)	Liquid TFM (kg)	Solid TFM (kg)	Emulsifiable Concentrate Bayluscide (kg)	Granular Bayluscide (kg)[2]
Maple R.	May-10	5.40	19.80	987.40	---	---	---
Ocqueoc R. (T)							
Upper Ocqueoc R.	Jul-22	2.00	18.00	522.90	1.50	---	---
Rifle R. (U)	Aug-03	9.50	160.00	3781.00	16.60	12.30	---
Saginaw R. (V)							
Pine R.	May-03	7.40	57.50	1597.80	---	15.50	---
Total (United States)		**33.90**	**519.40**	**9,628.20**	**30.60**	**27.80**	**---**
Total for Lake		**53.00**	**595.40**	**10,942.08**	**37.10**	**27.80**	**1,384.27**

Lake Erie

Lake Erie has 842 tributaries (525 Canada, 317 U.S.). Thirty tributaries (11 Canada, 19 U.S.) have records of larval sea lamprey production. Of these, 15 tributaries (5 Canada, 10 U.S.) have been treated with lampricides at least once during 2015-2024. Seven tributaries (2 Canada, 5 U.S.) are treated every 3-5 years. In addition, larval production has been documented in the St. Clair River, three of its U.S. tributaries, and two tributaries to Lake St. Clair (1 Canada, 1 U.S.).

- Lampricide treatments were conducted in one tributary (0 Canada, 1 U.S.; Table 5).

- Conneaut Creek was treated successfully from Conneautville, Pennsylvania to the Ohio state line. The treatment downstream from the state line was deferred due to insufficient discharge and is scheduled for treatment during 2025.

Table 5. Details on the application of lampricides to tributaries and lentic areas of Lake Erie during 2024 (letter in parentheses corresponds to location of stream in Figure 2). Lampricide quantities are reported as kg of active ingredient.

Tributary	Date	Discharge[1] (m^3/s)	Distance Treated (km)	Liquid TFM (kg)	Solid TFM (kg)	Emulsifiable Concentrate Bayluscide (kg)	Granular Bayluscide (kg)[2]
United States							
Conneaut Cr. (A)	Apr-26	2.40	19.60	171.30	2.80	---	---
Total for Lake		**2.40**	**19.60**	**171.30**	**2.80**	**---**	**---**

Lake Ontario

Lake Ontario has 659 tributaries (405 Canada, 254 U.S.). Sixty-six tributaries (31 Canada, 35 U.S.) have historical records of larval sea lamprey production, and of these, 35 tributaries (19 Canada, 16 U.S.) have been treated with lampricides at least once during 2015-2024. Twenty-five tributaries (12 Canada, 13 U.S.) are treated every 3-5 years. Details on lampricide applications to Lake Ontario tributaries and lentic areas during 2024 and tributary locations are found in Table 6 and Figure 2, respectively.

- Lampricide applications were completed in 15 tributaries (9 Canada, 6 U.S.; Table 6).

- The main stem of the Rouge River was not treated in 2024 due to high water flows and will be treated in 2025.

- An additional 2.9 km of an unnamed tributary downstream of the sea lamprey barrier on Grafton Creek was treated for the first time.

- Sage Creek was not treated due to low flow conditions and is re-scheduled for treatment in 2025.

- Little River (Fish Creek, Oswego River) was not treated in 2024 due to lack of access to the river via private property. Little River is scheduled for treatment in 2025.

Table 6. Details on the application of lampricides to tributaries and lentic areas of Lake Ontario during 2024 (letter in parentheses corresponds to location of stream in Figure 2). Lampricide quantities are reported as kg of active ingredient.

Tributary	Date	Discharge[1] (m^3/s)	Distance Treated (km)	Liquid TFM (kg)	Solid TFM (kg)	Emulsifiable Concentrate Bayluscide (kg)	Granular Bayluscide (kg)[2]
Canada							
Rouge R. (A)							
Little Rouge R.	Apr-29	1.48	17.30	467.60	---	---	0.03
Duffins Cr. (B)	Apr-25	1.72	43.20	1072.10	1.25	---	0.45
Oshawa Cr. (C)	Apr-19	2.47	24.00	683.10	0.42	---	0.11
Bowmanville Cr. (D)	Apr-22	2.77	12.20	1012.80	---	---	0.11
Wilmot Cr. (E)	Apr-24	0.36	13.80	405.00	---	---	0.13
Grafton Cr. (F)	Apr-20	0.64	3.20	201.30	---	---	0.12
Colborne Cr. (G)	Apr-18	1.22	0.80	266.30	---	---	---
Salem Cr. (H)	Apr-17	0.26	2.20	87.30	---	---	0.15
Proctors Cr. (I)	Apr-21	0.38	5.90	115.00	---	---	0.18
Total (Canada)		**11.3**	**122.60**	**4,310.5**	**1.67**	**---**	**1.28**
United States							
Black R. (J)	Aug-08	61.70	9.30	4457.20	1.90	53.50	**---**
South Sandy Cr. (K)	Jun-24	3.00	12.70	438.80	---	---	0.10
Skinner Cr. (L)	Jun-02	0.60	12.90	100.50	0.40	---	0.10
Little Salmon R. (M)	May-28	3.30	57.60	612.00	---	---	0.30
Eightmile Cr. (N)	May-24	0.20	8.70	82.10	---	---	---
Sterling Cr. (O)	May-27	0.90	25.70	471.70	---	---	0.40
Total (United States)		**69.70**	**126.90**	**6,162.30**	**2.30**	**53.50**	**0.90**
Total for Lake		**81.00**	**249.50**	**10,472.8**	**3.97**	**53.50**	**2.18**

ALTERNATIVE CONTROL

The Service and Department continue to coordinate with the Commission and other partners to research and develop alternatives to lampricides to provide a broader spectrum of tactics to control sea lamprey. During 2024, barriers and juvenile trapping were the alternative control methods deployed. Other methods that are currently being investigated include attractants (e.g. pheromones), repellents (e.g. alarm cues), and new trap designs.

Barriers

The sea lamprey barrier program priorities are:

1. Operate and maintain existing sea lamprey barriers that were built or modified by the SLCP.
2. Ensure sea lamprey migration is blocked at important barrier sites not operated or maintained by the SLCP.
3. Construct new structures in streams where they:
    a. Provide control where other options are impossible, excessively expensive, or ineffective.
    b. Provide a cost-effective alternative to lampricide control.
    c. Improve cost-effective control in conjunction with attractant and repellent based control, trapping, and lampricide treatments.
    d. Where structures are compatible with a system's watershed plan.

Reporting to the SLCB, the Barrier Task Force (BTF) was established by the Commission during April 1991 to coordinate efforts of the Service, Department, and U.S. Army Corps of Engineers (USACE) on the construction, operation, and maintenance of sea lamprey barriers. Progress on SLCB charges during 2024 is presented in the BTF section of this report.

The Commission has invested in 73 barriers in the Great Lakes basin (Figure 3). Of these, 48 were purpose-built as sea lamprey barriers and 25 were constructed for other purposes but have been modified to block sea lamprey migrations.

Data gathered during field visits to assess the status of other U.S. dams and structures were recorded in the SLCP's Barrier Inventory and Project Selection System (BIPSS) database and may be used to: 1) select barrier projects; 2) monitor inspection frequency; 3) schedule upstream larval assessments; 4) assess the effects of barrier removal or modifications on sea lamprey populations; or 5) identify structures that are important in controlling sea lamprey.

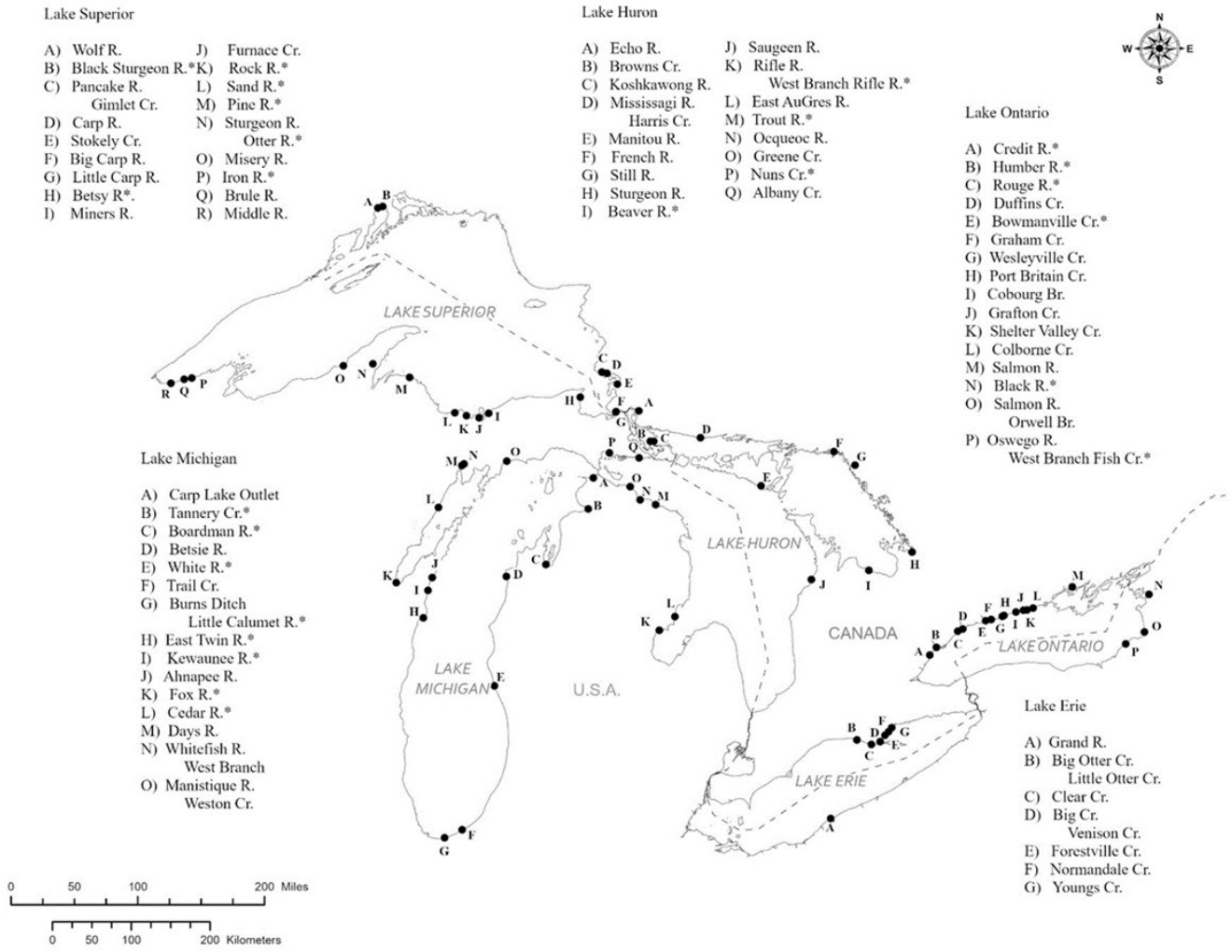

Figure 3. Locations of tributaries with sea lamprey barriers. An asterisk (*) indicates structures that have been modified or constructed by others to prevent the upstream migration of sea lamprey.

Lake Superior

The Commission has invested in 18 barriers on Lake Superior (Figure 3). Of these, 11 were purpose-built as sea lamprey barriers and 7 were constructed for other purposes but have been modified to block sea lamprey migrations.

Barrier Inventory and Project Selection System

Field crews inspected 20 structures in the Lake Superior watershed during 2024. This data will be used to evaluate sea lamprey blocking potential and update the BIPSS.

Ensure Blockage to Sea Lamprey Migration

- The Big Carp barrier was raised as per normal operating times and adult lamprey were noted on the barrier as it inflated suggesting timing of set up was late due to a warm spring. The Little Carp barrier's stoplogs were installed shortly thereafter.

- Middle River - Undermining was discovered at the sea lamprey barrier. An engineering firm was hired to document the existing condition of the barrier, identify structural and operating conditions causing sea lamprey escapement and develop a plan for repair.

- Misery River – Cracking through a concrete abutment wall was identified during a routine maintenance inspection. A structural evaluation determined the cracking was a result of differential movement between the concrete wall and steel sheet pile wall and will be repaired to limit spread and deterioration.

- Sand River – A hydraulic evaluation of the dam indicated the current barrier height is not sufficient to block upstream escapement of sea lamprey during certain flow conditions. Discussion with the MIDNR (Michigan Department of Natural Resources) will occur during 2025 to identify a solution.

- Salmon Trout River – A feasibility study is underway for two Stanton Township owned dams to identify actions that would prevent sea lampreys from reaching upstream spawning habitat and reduce Township liability for the structures.

- Partner agencies were consulted to ensure sea lamprey blockage at barriers at 12 sites in nine streams during 2024 (Table 7).

Table 7. Status of concurrence requests for barrier removals, replacements, or fish passage projects in Lake Superior tributaries during 2024.

Mainstream	Tributary	Lead Agency	Project	SLCP Position	Comments
Au Train R.	Buck Bay Cr.	TU[1]	FR2275 culvert #1	Concur	Ineffective barrier
Au Train R.	Trib to Buck Bay Cr.	TU[1]	FR2275 culvert #2	Concur	Ineffective barrier
Au Train R.	Cole Cr.	TU[1]	FR2481 culvert	Concur	Ineffective barrier
Boston Cr.	Lily Cr.	TU[1]	Salo Rd. culvert	Concur	Ineffective barrier
Brule R.	Sandy Run	TU[1]	Highway 27 culvert	Concur	Upstream of blocking

Mainstream	Tributary	Lead Agency	Project	SLCP Position	Comments
					barrier
Brule R..	Little Bois Brule	TU[1]	Ranger Rd. culvert	Concur	Upstream of blocking barrier
Chicago Cr.	Chicago Cr.	TU[1]	Blueberry Rd. culvert	Concur	Upstream of blocking barrier
Devil Track R.	Woods Cr.	CCHD[2]	County Rd. 60 culverts	Concur	Ineffective barrier
Michigamme R.	Sec. 2NE Cr.	MIDNR[3]	Sec. 2NE Creek Fish barrier	Concur	Ineffective barrier
Pilgrim R.	Conners Cr.	TU[1]	County Rd. 60 culvert	Concur	Ineffective barrier
Sucker R.	Sucker R.	SWP[4]	H-58 Rd. culvert	Concur	Ineffective barrier
St. Louis R.	Chalberg Cr.	SSSWCD[5]	Highway 8 culvert	Concur	Upstream of blocking barrier

[1]Trout Unlimited, [2]Cook County Highway Department, [3]Michigan Department of Natural Resources, [4]Superior Watershed Partnership, [5]South St. Louis Soil and Water Conservation District

New Construction

- Sucker River – The Sucker River (Grand Marais) project includes replacement of perched culverts at the H-58 road crossing with a free-span bridge and a seasonal sea lamprey barrier. A site for the barrier has been determined and project design is at 60%. The project reconnects approximately 32 km (20 miles) of stream while blocking sea lamprey from accessing 152 km (95 miles) of critical spawning and rearing habitat.

- Ontonagon River – The Service has identified a potential location for a sea lamprey barrier in Newholm Creek, a tributary to the East Branch Ontonagon River. An engineering firm has been contracted to complete a feasibility study to determine if site conditions are suitable for constructing an effective barrier.

- Neebing River – The installation of a permanent sea lamprey trap at the Neebing River barrier, in Thunder Bay, was completed during October, 2024 (See cover page).

Lake Michigan

The Commission has invested in 15 barriers on Lake Michigan (Figure 3). Of these, 7 were purpose-built as sea lamprey control barriers and 8 were constructed for other purposes but have been modified to block sea lamprey migrations.

Barrier Inventory and Project Selection System

Field crews contacted owners of 36 sea lamprey barriers in the Lake Michigan watershed during 2024. This outreach focused on confirming ownership and future intentions for each structure rather than structural deficiencies of the barriers.

Operation and Maintenance

- Routine maintenance, spring start-up, and a safety inspection was performed on one barrier.

Ensure Blockage to Sea Lamprey Migration

- Boardman River – The FishPass project has resumed and assessment projects related to fish movement have been ongoing. The project broke ground during summer of 2024 and is expected to be completed by 2026.

- Kalamazoo River – The Service and GLFC have partnered with the MIDNR on a feasibility study to identify alternatives to improve sea lamprey blockage on Swan Creek (tributary to the Kalamazoo River) in conjunction with the removal of the Swan Creek Dam.

- West Branch Whitefish River – A geotechnical evaluation of the sea lamprey barrier determined seepage flowing under the eastern abutment was naturally occurring and does not affect the structural integrity of the dam. The seepage will be monitored for changes over time.

- Barrier removals/modification – Partner agencies were consulted to ensure blockage at barriers at 44 sites in 19 streams (Table 8).

Table 8. Status of concurrence requests for barrier removals, replacements, or fish passage projects in Lake Michigan tributaries during 2024.

Mainstream	Tributary	Lead Agency	Project	SLCP Position	Comments
Baldwin R.	N. Br Cole Cr.	CRA[1]	24th St. culvert	Concur	Upstream of blocking barrier
Fox R.	Casey Cr.	JAWF[2]	Adams Rd. culvert #1	Concur	Limited upstream potential
Fox R	Fox R.	JAWF[2]	Adams Rd. culvert #2	Concur	Limited upstream potential
Grand R.	Grand R	CGR[3]	Low head dam removals	Concur	Ineffective barrier
Grand R.	Grand R.	CGR[3]	Low head dam removals	Concur	Ineffective barrier
Grand R.	Maple R.	DT[4]	Elsie Dam	Concur	Ineffective barrier
Kalamazoo R.	Kalamazoo R.	CBC[5]	Dickman Rd. culverts	Concur	Upstream of blocking barrier
Kalamazoo R.	Kalamazoo R.	CBC[5]	Monroe St. Dam	Concur	Upstream of blocking barrier
Leyland R.	Victoria Cr.	CRA[1]	Good Harbor Trail culvert	Concur	Upstream of blocking barrier
Leyland R.	Cedar Run	CRA[1]	S. Cedar Rd. culvert	Concur	Upstream of blocking barrier
Manistee R.	Fife Lake Cr.	CRA[1]	County Line Rd. culvert	Concur	Upstream of blocking barrier
Manistee R.	Fletcher Cr.	CRA[1]	W. 12 ¾ Rd. culvert	Concur	Upstream of blocking barrier
Manistee R.	Adams Cr.	CRA[1]	W. 14 Rd. culvert	Concur	Upstream of blocking barrier
Menominee R.	Iron R.	ICWC[6]	Wild River Rd. culvert	Concur	Upstream of blocking barrier

Mainstream	Tributary	Lead Agency	Project	SLCP Position	Comments
Menominee R.	Brule Cr.	TU[7]	Brule Cr. Dam	Concur	Upstream of blocking barrier
Menominee R.	Brule Cr.	TU[7]	Brule Springs Dam	Concur	Upstream of blocking barrier
Menominee R.	Elvoy Cr.	TU[7]	Hwy A culvert #1	Concur	Upstream of blocking barrier
Menominee R.	Elvoy Cr.	TU[7]	Hwy A culvert #2	Concur	Upstream of blocking barrier
Menominee R.	Unnamed trib.	TU[7]	Nicolet State Tr. Culvert	Concur	Upstream of blocking barrier
Menominee R.	Chuks Cr.	TU[7]	Unnamed Rd. culvert #1	Concur	Upstream of blocking barrier
Menominee R.	Chuks Cr.	TU[7]	Unnamed Rd. culvert #2	Concur	Upstream of blocking barrier
Menominee R.	Chuks Cr.	TU[7]	Unnamed Rd. culvert #3	Concur	Upstream of blocking barrier
Mile Cr.	E. Mile Cr.	HSCF[8]	E. Beach Rd. culvert	Concur	Ineffective barrier
Millecoquins R.	S. Br. Cold Cr.	HSCF[8]	N. Trail culvert	Concur	Ineffective barrier
Milwaukee R.	Nicols Cr.	MR[9]	Mill Pond Dam	Concur	Upstream of blocking barrier
Muskegon R.	Mitchell Cr.	CBR[10]	Mitchell Cr. culvert	Concur	Upstream of blocking barrier
Pentwater R.	Crystal Cr.	WMSR DC[11]	Crystal Valley Dam	Do Not Concur	First Blocker
Pettibone Cr.	Pettibone Cr.	USN[12]	Pettibone Cr. Dam	Concur	Ineffective barrier
Pike R.	Pike R.	RPWIN[13]	Pike River restoration	Concur	Ineffective barrier
St. Joseph R.	Hayden Cr.	MDNR[14]	Old Masonry Dam	Concur	Ineffective barrier
St. Joseph R.	Hayden Cr.	MDNR[14]	Almena Dam	Concur	Ineffective barrier
Stony Cr.	Stony Cr.	CRA[1]	Marshville Dam	Concur	Ineffective barrier
Thompson Cr.	Thompson Cr.	MDNR[14]	Thompson Cr. Weir	Concur	Ineffective barrier
White R.	Flinton Cr.	TU[7]	N. Spruce St. culvert	Concur	Upstream of blocking barrier
White R.	Skeel Cr.	WMSR DC[11]	Skeel Rd. culvert	Concur	Ineffective barrier
White R.	Carlton Cr.	WMSR DC[11]	Cleveland Rd. culvert	Concur	Ineffective barrier
White R.	Bear Cr.	WMSR DC[11]	124th Ave. culvert	Concur	Ineffective barrier
White R.	Bear Cr.	WMSR DC[11]	136th Ave. culvert	Concur	Ineffective barrier
White R.	Bear Cr.	WMSR DC[11]	Aurther Rd. culvert	Concur	Ineffective barrier
White R.	Knutson Cr.	WMSR DC[11]	168th Ave. culvert	Concur	Ineffective barrier

Mainstream	Tributary	Lead Agency	Project	SLCP Position	Comments
White R.	Knutson Cr.	WMSRDC[11]	Garfield Rd. culvert	Concur	Ineffective barrier
Wolf R.	Silver Cr.	SMC[15]	Silver Cr. culvert #1	Concur	Upstream of blocking barrier
Wolf R.	W. Br. Red R.	SMC[15]	Boehm's Crossing culvert	Concur	Upstream of blocking barrier
Wolf R.	W. Br. Red R.	SMC[15]	Silver Cr. culvert #2	Concur	Upstream of blocking barrier

[1]Conservation Resource Alliance, [2]J.A. Woollam Foundation, [3]City of Grand Rapids, [4]Duplain Township, [5]City of Battle Creek, [6]Iron County Watershed Coalition, [7]Trout Unlimited, [8]HSC Foundation, INC., [9]Milwaukee Riverkeeper, [10]City of Big Rapids, [11]West Michigan Shoreline Regional Development Commission, [12]U.S. Navy, [13]Root-Pike Watershed Initiative Network, [14]Michigan Department of Natural Resources, [15]Stockbridge-Munsee Community

New Construction

- Manistique River – The MIDNR acquired 14.2 ha (35 acres) of land for the Manistique River sea lamprey barrier project. Barrier construction is tentatively scheduled to begin in 2026. The Commission received a grant award of $1.1 million to assist with relocation of the City of Manistique's municipal waterline that runs across the existing dam. Waterline relocation is scheduled to occur during 2025.

- Little Manistee River – The Service continues to work with the MIDNR and USACE staff to improve the blocking capability of the Little Manistee River weir through the construction of a new spillway and permanent sea lamprey trap. The project has been awarded and work will begin in Spring 2025 taking two years to complete.

- Pere Marquette River – The Service, the Village of Baldwin, MIDNR and Conservation Resource Alliance are collaborating to replace the failed Baldwin River Hatchery Dam with a new seasonal sea lamprey barrier. The project is nearing 60% design and includes a barrier tentatively located just upstream of the old dam.

- Grand River - The permit for the lower reach project on the Grand River was recently approved by the Department of Environment, Great Lakes and Energy (EGLE). Project objectives include removal of beautification structures downstream of the 6th Street Dam and habitat augmentation. The improvements will not alter the effectiveness of 6th Street Dam as a sea lamprey blocking structure. Planning for the upper reach project has resumed. Project objectives include increased flood conveyance, public safety, fish passage and recreational features while also maintaining effective sea lamprey control.

Lake Huron

The Commission has invested in 17 barriers on Lake Huron (Figure 3). Of these, 13 were purpose-built as sea lamprey barriers and 4 were constructed for other purposes but have been modified to block sea lamprey migrations.

Barrier Inventory and Project Selection System

Field crews contacted owners of 24 sea lamprey barriers in the Lake Huron watershed during 2024. This outreach focused on confirming ownership and future intentions for each structure rather than structural deficiencies of the barriers.

Operation and Maintenance

- Routine maintenance, spring start-up, and safety inspections were performed on 9 barriers (5 Canada, 4 U.S.).

- Ocqueoc River – The electrical barrier was activated March 17th, 2024, and operated intermittently throughout the sea lamprey spawning run. The Service, U.S. Geological Survey (USGS), and MIDNR have entered into an agreement where the barrier can be activated between March 15th and April 1st depending on water temperatures. This agreement outlines a chain of communication and operational parameters, including dates and water temperatures, to protect downstream movements of steelhead smolts stocked upstream of the barrier.

- Koshkawong River – Remediation of the barrier was completed in August, 2024.

Ensure Blockage to Sea Lamprey Migration

- Trout River – Project partners completed a feasibility study identifying alternatives for dam replacement on the Trout River. The Presque Isle Conservation District has chosen to remove the dam which will result in a free-flowing system. This project was unique in that barrier replacement costs were similar to lampricide treatment costs so all project partners agreed with the owner's decision.

- Nunns Creek – Planning continued with the Sault Tribe of Chippewa Indians to complete a feasibility for the sea lamprey barrier. Project goals include improving sea lamprey blockage while simultaneously upgrading the attached hatchery complex for possible lake whitefish rearing capabilities.

- Saginaw River (Cass River) – A Caro Dam feasibility study to identify alternatives ranging from dam rehabilitation to removal is nearing completion. Project partners include the Commission, Service, Tuscola County Economic Development Corporation, MIDNR, EGLE, and the dam owner.

- Partner agencies were consulted to ensure blockage at barriers for 21 sites in 8 tributaries during 2024 (Table 9).

Table 9. Status of concurrence requests for barrier removals, replacements, or fish passage projects in Lake Huron tributaries during 2024.

Mainstream	Tributary	Lead Agency	Project	SLCP Position	Comments
Au Sable R.	N. Br. Au Sable R.	Huron Pines	Twin Bridge Rd. culvert	Concur	Upstream of blocking barrier
Au Sable R.	W. Br. Au Sable R.	Huron Pines	FR4433 culvert	Concur	Upstream of blocking barrier

Mainstream	Tributary	Lead Agency	Project	SLCP Position	Comments
Black R.	Black R.	Huron Pines	Beaton Rd. culvert	Concur	Ineffective barrier
Black R.	Black R.	Huron Pines	Black R. Rd. culvert	Concur	Ineffective barrier
Black R.	Black R.	Huron Pines	E. Trask Lake Rd. culvert	Concur	Limited upstream potential
Black R.	Black R.	Huron Pines	Lavargne Rd. culvert	Concur	Ineffective barrier
Boyne R.	S. Br. Boyne R.	CRA[1]	Boyne Falls Dam	Concur	Upstream of blocking barrier
Carp R.	Taylor Cr.	Huron Pines	FR3329 culvert #1	Concur	Ineffective barrier
Carp R.	Taylor Cr.	Huron Pines	FR3329 culvert #3	Concur	Ineffective barrier
Carp R.	Taylor Cr.	Huron Pines	FR330D culvert	Concur	Ineffective barrier
Carp R.	Taylor Cr.	Huron Pines	FR3330 culvert	Concur	Ineffective barrier
Cheboygan R.	Canada Cr.	Huron Pines	Canada Cr. Hwy culvert	Concur	Upstream of blocking barrier
Cheboygan R.	E. Br. Black R.	Huron Pines	Unnamed Rd. culvert	Concur	Upstream of blocking barrier
Cheboygan R.	Black R.	MIDNR[2]	Kleber Dam	Concur	Upstream of blocking barrier
Cheboygan R.	Black R.	MIDNR[2]	Tower Dam	Concur	Upstream of blocking barrier
Little Black R.	Little Black R.	TOTM[3]	Little Black R. water control structures	Concur	Repair
Rifle R.	Houghton Cr.	Huron Pines	Sanback Dam	Concur	Low Chance of Infestation
Rifle R.	Rifle R.	MDNR[2]	Devoe Lake Dam	Concur	Low Chance of Infestation
Thunder Bay R.	Thunder Bay R.	Huron Pines	Hossler Rd. culvert	Concur	Upstream of blocking barrier
Thunder Bay R.	Thunder Bay R.	Huron Pines	Lutz Rd. culvert	Concur	Upstream of blocking barrier
Thunder Bay R.	Sheridan Cr.	Huron Pines	Scenic Rd. 3 culvert	Concur	Upstream of blocking barrier

[1]Conservation Resource Alliance, [2]Michigan Department of Natural Resources, [3]Tip of the Mitt

Lake Erie

The Commission has invested in 7 purpose-built sea lamprey barriers on Lake Erie (Figure 3).

Barrier Inventory and Project Selection System

Field crews contacted owners of 52 sea lamprey barriers in the Lake Erie watershed during 2024. This outreach focused on confirming ownership and future intentions for each structure rather than structural deficiencies of the barriers.

Operation and Maintenance

- Routine maintenance, spring start-up, and safety inspections were performed on 7 barriers (7 Canada, 0 U.S.).

Ensure Blockage to Sea Lamprey Migration

- Clinton River – Project partners completed a geomorphology study upstream of Yates Mill Dam to identify stream channel modifications that would resolve the formation of a bypass channel around the barrier. Project partners are working to acquire the parcel of land adjacent to the barrier for construction and mitigation purposes.

- Huron River – The engineering firm Geotechnical Engineers Inc. (GEI) has completed a draft feasibility study for the Flat Rock & Huroc dams fish passage project. Alternatives for consideration include repair to full removal of the dams, ensuring that effective sea lamprey blockage is considered in each alternative.

- Partner agencies were consulted to ensure blockage at 1 barrier site in 1 tributary (Table 10).

Table 10. Status of concurrence requests for barrier removals, replacements, or fish passage projects in Lake Erie tributaries during 2024.

Mainstream	Tributary	Lead Agency	Project	SLCP Position	Comments
Huron R.	Huron R.	City of Ypsilanti	Peninsular Dam	Concur	Upstream of blocking barrier

New Construction

- Grand River – Harpersfield Dam on the Grand River (OH) was retrofitted with a second steel lip on the upper barrier step remediating a nappe vibration which occurred under certain flow rates. The nappe breaker lip has pulled away from the structure in many sections and requires repair. The Service is working with Stantec Engineering to identify a long-term solution to prevent any further deterioration of the structure.

- Conneaut Creek – A feasibility study is approaching completion for a sea lamprey barrier construction project on this stream. Key landowners impacted by upstream inundation are not supportive of the barrier project, however the project will continue through the design phase should something change. Proceeding through the design phase will also provide a barrier template for use on other Great Lakes streams.

- Big Otter – An existing barrier in Tillsonburg, ON, has been identified for replacement. Feasibility work was completed in 2018 and at that time it was deemed cost prohibitive; however, other recent Aquatic Invasive Species (AIS) considerations may warrant revisiting feasibility.

Lake Ontario

The Commission has invested in 16 barriers on Lake Ontario (Figure 3). Of these, 10 were purpose-built as sea lamprey barriers and 6 were constructed for other purposes but have been modified to block sea lamprey migrations.

Barrier Inventory and Project Selection System

Field crews contacted owners of 15 sea lamprey barriers in the Lake Ontario watershed during 2024. This outreach focused on confirming ownership and future intentions for each structure rather than structural deficiencies of the barriers.

Operation and Maintenance

- Routine maintenance, spring start-up, and safety inspections were performed on 11 barriers (10 Canada, 1 U.S.).

Ensure Blockage to Sea Lamprey Migration

- Partner agencies were consulted to ensure blockage at barriers for 6 sites in 2 tributaries during 2024 (Table 11).

Table 11. Status of concurrence requests for barrier removals, replacements, or fish passage projects in Lake Ontario tributaries during 2024.

Mainstream	Tributary	Lead Agency	Project	SLCP Position	Comments
Black R.	S. Br. Moose R.	TU[1]	Cedar R. Rd. culvert	Concur	Upstream of blocking barrier
Black R.	S. Br. Moose R.	TU[1]	Otter Br. Rd. culvert #1	Concur	Upstream of blocking barrier
Black R.	S. Br. Moose R.	TU[1]	Otter Br. Rd. culvert #2	Concur	Upstream of blocking barrier
Black R.	S. Br. Moose R.	TU[1]	Otter Br. Rd. culvert #3	Concur	Upstream of blocking barrier
Salmon R.	Spring Br.	VP[2]	Bridge St. culvert	Concur	Ineffective barrier
Salmon R.	Spring Br.	VP[2]	Maple St. culvert	Concur	Ineffective barrier

[1]Trout Unlimited, [2]Village of Pulaski

New Construction

- Feasibility studies are being planned for sea lamprey barriers on the main branch of the Little Salmon River and on Grindstone Creek.

- Little Salmon River – The Black Creek Dam (Youngs Mill) was removed and replaced with a stepped naturalized rapids which incorporated 46 cm (18-inch) drops. This work was done in partnership with Trout Unlimited, the Commission, and led by the Service (Region 5).

- South Sandy Creek – The Monitor Mills Dam collapsed in 2022. To date, larval assessment has not found larvae upstream. Project partners including the GLFC, Department, Service,

and New York Department of Environmental Conservation (NYDEC) have contracted an engineering firm to perform a feasibility study to repair the dam.

Juvenile Trapping for Control

Out-migrating juvenile sea lamprey were trapped in 11 tributaries of Lake Superior, 4 tributaries of Lake Michigan, and 7 tributaries of Lake Huron from October through December (Table 12). Elver nets, fyke nets, and screw traps were deployed to mitigate escapement due to ineffective treatments or deferrals, barrier escapement, streams with large larvae present, and assess juvenile production in the Supplemental Control Program Initiative streams.

- The Great Lakes Indian Fish and Wildlife Commission (GLIFWC) and Keweenaw Bay Indian Community (KBIC) supported juvenile trapping efforts in multiple Lake Superior streams through cooperative agreement with the Service (Table 12).

Table 12. Sea lamprey catch from juvenile trapping during 2024.

Lake	Stream	Field Station	Juveniles
Superior	Bad R.*	GLIFWC[2]	5
Superior	Middle R.* (Mouth)	GLIFWC[2]	8
Superior	Cranberry R. (WI)	GLIFWC[2]	4
Superior	Red Cliff Cr.	GLIFWC[2]	12
Superior	Poplar R. (WI)	GLIFWC[2]	2
Superior	Cranberry R.*	KBIC[3]	32
Superior	Potato R. (MI)	KBIC[3]	4
Superior	Traverse R.*	KBIC[3]	2
Superior	Pike R.	KBIC[3]	226
Superior	Mineral R.	KBIC[3]	0
Superior	Furnace Cr.	USFWS[4]	0
Michigan	Bills Cr.*	USFWS[4]	6
Michigan	Furlong Cr.	USFWS[4]	2
Michigan	Bark R.*	USFWS[4]	494
Michigan	Rapid R.	USFWS[4]	0
Huron	Root R.	DFO[1]	7
Huron	Black Mallard Cr.	USGS[5]	0
Huron	Long Lake Outlet	USGS[5]	3
Huron	Maple R.* (Cheboygan R.)	USGS[5]	2
Huron	Pigeon R. (Cheboygan R.)	USGS[5]	2
Huron	Silver Cr.	USGS[5]	0
Huron	Sturgeon R. (Trib. to Cheboygan R.)	USGS[5]	0
Total			**811**

[*] Streams treated with lampricide in 2024, [1] Fisheries and Oceans Canada, [2] Great Lakes Indian Fish and Wildlife Commission, [3] Keweenaw Bay Indian Community, [4] U.S. Fish and Wildlife Service, [5] U.S. Geological Survey

Supplemental Control

Supplemental controls are tactics that supplement the two primary sea lamprey control strategies, lampricides and sea lamprey barriers, by reducing reproduction and capturing transformed sea lamprey. During 2020, the Commission initiated a long-term study to evaluate supplemental control on up to 13 streams (Figure 4). Streams where traditional controls were less effective were selected as study streams so that if supplemental control deployments were effective, sea lamprey control would be improved. During December 2023, the Commission renewed its support for the study and the expanded supplemental control deployments proposed for 2024-2029.

Supplemental control deployments for each study stream are provided below, ordered by the year strategy was first deployed (Figure 5):

- Black Mallard River (Lake Huron) – Adult trapping paired with a seasonal electric sea lamprey barrier has been deployed since 2016. Larval recruitment has not been documented upstream of Black Mallard Lake since 2017, allowing a redirection of roughly $150,000 in lampricide treatment effort to other streams that are easier to treat with lampricide.

- Pigeon, Sturgeon, Maple rivers (Cheboygan River Watershed, Lake Huron) – Adult trapping paired with sterile male release occurred during 2017-2019. The sterilization facility was not operated in 2020 due to COVID-19 travel restrictions. Sterile males were released in 2021 (2,000), 2022 (3,325), 2023 (3,925), and 2024 (3,050). Larval sea lamprey production has been lower during years sterile males were released, allowing a redirection of roughly $600,000 in lampricide treatment to other control priorities.

- Tawas Lake Outlet (Lake Huron) and Traverse River (Lake Superior) – Adult trapping enhanced with chemosensory cues was paired with sterile male release during 2024. Larval sea lamprey assessments occurring during August 2024 found no evidence of sea lamprey recruitment during spring 2024.

- Long Lake Outlet (Lake Huron) – Adult trapping paired with a seasonal electric sea lamprey barrier were deployed during 2024. Larval sea lamprey recruitment was detected upstream of the seasonal electric barrier during 2024. Adjustments were made to the electrical barrier during fall 2024 to reduce the chance of adult sea lamprey escapement in future years.

- Cranberry River (Lake Superior) and Furlong Creek (Lake Michigan) – A seasonal electrical barrier paired with sterile male release will be deployed for the first time during 2025.

- Bills Creek (Lake Michigan) and Root/Crystal Rivers (Lake Huron) – Adult trapping paired with sterile male release will be deployed for the first time during 2025 in Bills Creek and 2026 in Root/Crystal River.

- Potato River (Lake Superior) – Sterile males will be released starting 2026.

To assess the effectiveness of supplemental controls, adult, larval, and juvenile abundance has been assessed since 2020 in all study streams according to an adaptive assessment plan (Table 13). A novel aspect of the assessment work is the application of close-kin mark-recapture to

characterize changes in sea lamprey recruitment and larval growth before and after application of supplemental controls.

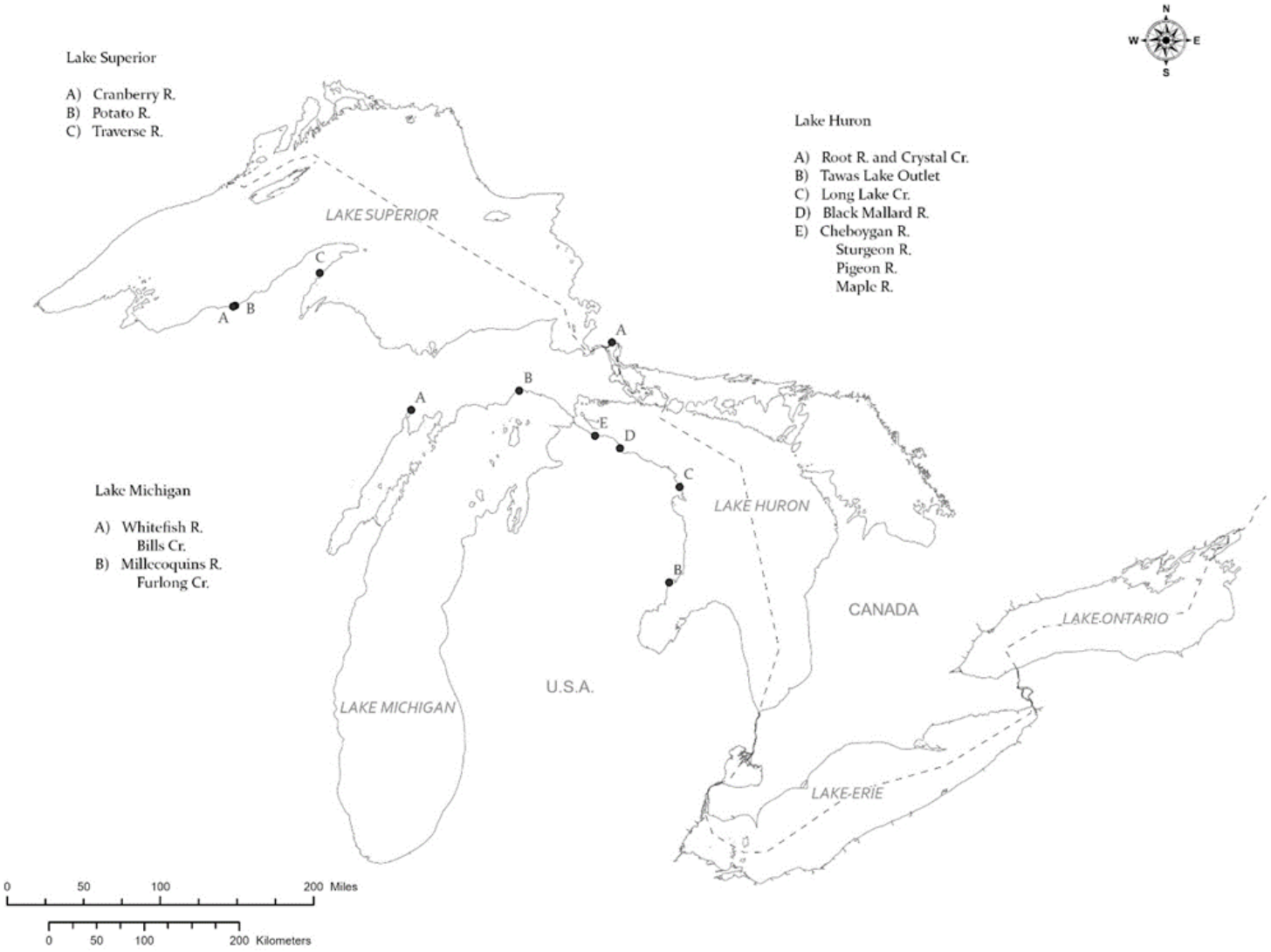

Figure 4. Location of streams where supplemental sea lamprey controls are likely to be tested and evaluated in an adaptive management framework. These streams regularly produce larval sea lamprey, are wadable, near cooperator field offices, and are places where larval production is difficult to control using barriers or lampricides. Furlong Creek is a tributary to the Millecoquins River. Bills Creek is a tributary to the Whitefish River. Crystal Creek is a tributary to the Root River.

		REMOVE	DIVERT	DISRUPT		
Start Year	Stream	50% effective trapping array	Seasonal electric barrier	Sterile males	Antagonist	Replicate
2017	Mallard	1, Physical	1			1
2024	Long Lake	1, Physical	1			2
2025	Furlong		1	100		1
2025	Cranberry		1	300		2
2024	Traverse	2, Chemosensory, Physical		600		1
2024	Silver	1 , Chemosensory		100	1	2
2025	Bills	1, Physical		300		3
2026	Root	1, Physical		350		4
2026	Crystal	1, Physical		350		5
2017	Pigeon			650		1
2017	Sturgeon			650		2
2017	Maple			650		3
2026	Potato			300		4
	Sum	8	4	4350	1	13

Figure 5. Commission approved supplemental control deployment portfolio highlighting the year supplemental controls (SupCons) will be deployed and if adult sea lamprey will be removed, diverted, or disrupted. Replicate number indicates the number of streams using the same combination of SupCon tactics. Alarm cue and 3kPZS are used as components of trapping systems that produce removal rates of 50% or more (Chemosensory). Physical tactics such as screens and rock ramps will be used to produce removal rates of 50% or more (Physical).

Table 13. Streams where adult sea lamprey abundance, larval sea lamprey, juvenile sea lamprey, and habitat were assessed during 2020-2024 to describe effectiveness of ongoing supplemental controls (streams in **bold**) or collect baseline conditions before application of additional supplemental controls.

Lake	Stream	Adult Abundance Range 2020-2023	Larval Surveys 2020-2023	Habitat Surveys 2020-2023	Larvae Captured 2020-2023	Juveniles Trapped 2020-2023	Last Lampricide Treatment	Next Expected Lampricide Treatment
Superior	Cranberry	22-667	82	56	3158	602	Sep-2024	Sep-2026
Superior	Potato	0-33	69	109	24	5	Jun-2021	June-2026
Superior	**Traverse**	72-500	68	24	649	124	May-2024	June-2027
Michigan	Furlong	24-233	98	83	312	178	May-2022	May-2026
Michigan	Bills	14-336	73	74	742	36	Apr-2024	May-2025
Huron	Root/Crystal	47-84	167	79	1597	188	May-2024	May-2027
Huron	**Tawas Lake Outlet**	< 10	97	35	1147	0	Aug-2022	Sep-2026
Huron	**Long Lake Outlet**	37-464	84	22	710	3	Aug-2021	Aug-2026
Huron	**Black Mallard**	51-102	97	35	65	4	May-2019	July-2025
Huron	**Sturgeon**	0-60	169	7	347	7	Aug-2023	TBD
Huron	**Pigeon**	20-107	174	63	904	60	Sep-2022	TBD
Huron	**Maple**	< 20	115	110	248	15	May-2024	TBD
Total			1293	697	9903	1222		

Sterile Male Release Technique

The Sterile Male Release Technique (SMRT) was discontinued as an alternative control method in the St. Marys River in 2012 after being implemented during 1997-2011. Monitoring of embryo viability (proportion of embryos that were alive at stage 12 of development) continues to provide insight into the effectiveness of SMRT.

- In 2024, the mean embryo viability of 8 nests sampled was 78% (Figure 6).

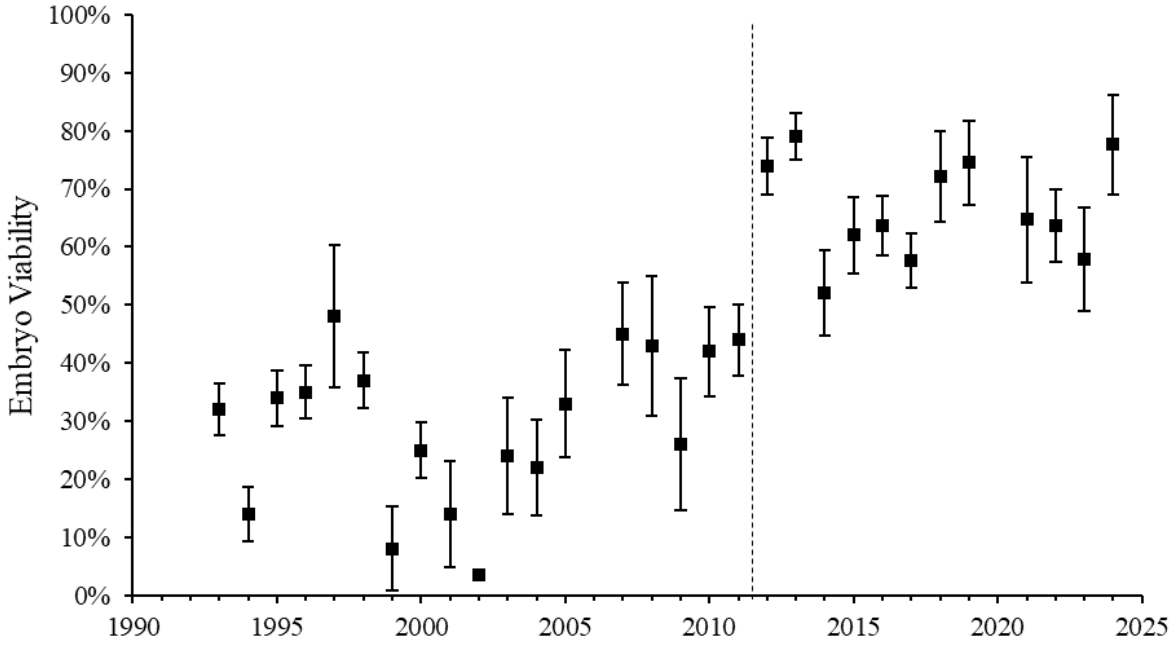

Figure 6. Mean annual embryo viability in the St. Marys River rapids during and after application of the sterile-male release technique (SMRT). The error bars represent SEs (not calculated for 2002 because only one sample was obtained). The vertical dashed line indicates the discontinuation of SMRT after 2011.

ASSESSMENT

The SLCP has three assessment metrics:

- Larval assessment, conducted by the Service and Department, determines the abundance and distribution of sea lamprey larvae in streams and lentic areas. These data are used to predict where larvae greater than 100 mm total length will most likely be found by the end of the growing season during the year of sampling. These predictions are used to prioritize lampricide treatments for the following year.

- Juvenile assessment, undertaken by other fishery management agencies, evaluates the lake-specific rate of lake trout marking inflicted by sea lamprey. These time series data are used in conjunction with adult assessment data to assess the effectiveness of the SLCP for each lake. In addition, several indices of relative abundance of feeding juveniles are used in some lakes to monitor sea lamprey populations over time.

- Adult assessment, conducted by the Service and Department, annually estimates an index of adult sea lamprey abundance in each lake. Because this life stage is comprised of individuals that have either survived or avoided exposure to lampricides, the time series of adult abundance indices is the primary metric used to evaluate the effectiveness of the SLCP.

Reporting to the SLCB, the Larval Assessment Task Force (LATF) and the Trapping Task Force (TTF) were established by the Commission in 2012. The LATF is responsible for ranking streams and lentic areas for sea lamprey control options and evaluating the success of lampricide treatments through assessment of residual larvae. The TTF is responsible for optimizing trapping techniques for assessing adult sea lamprey populations and removing adults and juveniles. Task Force progress on SLCB charges during 2024 are presented in the LATF and TTF sections of this report.

Larval Assessment

Tributaries considered for lampricide treatment during 2025 were assessed during 2023 and 2024 to define the distribution and estimate the abundance and size structure of larval sea lamprey populations. Assessments were conducted with backpack electrofishing units in waters <0.8 m deep, while waters ≥0.8 m in depth were surveyed with gB or by deep-water electrofishing (DWEF). Additional surveys are used to define the distribution of sea lamprey within a stream, detect new populations, or evaluate lampricide treatments.

Lake Superior

- Larval assessments were conducted in 168 tributaries (43 Canada, 125 U.S.) and 39 lentic areas (9 Canada, 30 U.S.). The status of larval sea lamprey populations in historically infested Lake Superior tributaries and lentic areas is presented in Table 14.

- Surveys to estimate larval sea lamprey abundance were conducted in 19 tributaries (17 Canada, 2 U.S.) and seven lentic areas (7 Canada, 0 U.S.).

- Surveys to detect the presence of new larval sea lamprey populations were conducted in 67 tributaries (17 Canada, 50 U.S.). Two new populations of larvae were identified: an unnamed tributary S-461 in Nipigon Bay, Ontario, and Little Carp River in Gogebic County, MI.

- Post-treatment assessments were conducted in 48 tributaries (15 Canada, 33 U.S.) and 14 lentic areas (1 Canada, 13 U.S.) to determine the effectiveness of lampricide treatments conducted during 2023 and 2024. Ankodosh Creek, Roxbury Creek, Furnace Creek, Sand River (Marquette County), and Potato River (Tributary to Bad River) are scheduled for treatment in 2025 based on residual populations following the most recent treatment. The Slate River lentic area is planned for treatment in 2025 based on residual populations.

- Surveys to evaluate barrier effectiveness were conducted in 15 tributaries (6 Canada, and 9 U.S.). Multiple year classes were found upstream of the barriers on Carp River (Ontario), Big Carp River, and Stokely Creek. Young of year larvae were found upstream of the barrier in the Misery River.

- Larval assessment surveys were conducted in non-wadable lentic and lotic areas using 84.76 kg active ingredient of 3.2% gB (20.58 kg Canada, 64.18 kg U.S.; Table 15).

Table 14. Status of larval sea lamprey in Lake Superior tributaries with a history of sea lamprey production.

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Canada			
East Davignon Cr.	May-72	Sep-23	May-72
West Davignon Cr.	Jun-14	Jul-24	Jun-23
Little Carp R.	May-23	Jun-24	Jun-22
Big Carp R.	Sep-07	Jun-24	Jun-24
Cranberry Cr.	Aug-22	Jul-23	Jul-21
Goulais R.	Jun-23	Sep-24	Sep-24
Goulais Bay	Oct-16	Aug-24	Aug-24
Boston's Cr.	Never	Oct-23	Aug-20
Horseshoe Cr.	Never	May-24	Aug-59
Havilland Cr.	Oct-19	Jul-24	Jul-24
Havilland Bay	Jun-15	Jun-21	Jun-21
Stokely Cr.	Jun-08	May-24	May-24
Havilland Bay	Aug-11	Jun-21	Jun-21
Tier Cr.	Never	Jul-23	Jun-61
Harmony R.	May-23	May-24	May-24
Batchawana Bay	Oct-22	Jul-21	Jul-21
Government Cr.	Never	Jun-22	Jun-12
Sawmill Cr.	May-23	May-24	May-24
Jones Landing Cr.	Never	May-24	Jun-66
Tiny Cr.	Never	Jul-23	Aug-19
Chippewa R.	Aug-22	Jun-24	Jun-24
Batchawana Bay	Jul-23	Sep-24	Sep-24
Unnamed (S-1009)	Oct-19	Jul-24	Jul-24
Unger Cr.	Jul-10	Jul-24	Jul-24
Batchawana R.	Jun-23	Oct-23	Oct-23
Batchawana Bay	Sep-21	Oct-23	Oct-23
Digby Cr.	Jun-13	Jul-23	Jul-19
Carp R.	Aug-20	Jul-24	Jul-24
Batchawana Bay	Jul-18	Jul-24	Jul-24
Pancake R.	May-23	Jul-24	Jul-24
Pancake Bay	Jun-19	Sep-24	Sep-24
Westman Cr.	Oct-23	Jul-23	Jul-23
Agawa R.	Jul-19	Jul-23	Jul-23
Agawa Bay	Oct-23	Aug-22	Aug-22
Sand R.	Sep-71	Aug-22	Aug-22
Baldhead R.	Never	Jul-23	Jul-23
Gargantua R.	Aug-23	Jun-24	Aug-21
Old Woman R.	Aug-23	Jun-24	Aug-22
Michipicoten R.	Aug-24	Jul-23	Jul-23
Michipicoten R. (Estuary)	Aug-19	Aug-21	Aug-21
Dog R.	Aug-63	Aug-22	Aug-22
White R.	Jul-16	Aug-22	Jul-15
Pic R.	Jul-24	Jul-23	Jul-23
Little Pic R.	Aug-22	Jul-23	Aug-21
Prairie R.	Jul-19	Jun-24	Jun-24
Steel R.	Aug-23	Jun-24	Aug-22

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Aguasabon R.	Never	Jun-24	Jun-24
Pays Plat R.	Jun-22	Aug-24	Aug-24
Pays Plat Bay	Never	Aug-18	Aug-16
Little Pays Plat Cr.	Jun-22	Aug-24	Aug-24
Gravel R.	Jul-23	Aug-24	Sep-22
Mountain Bay	Aug-24	Aug-21	Aug-21
Little Gravel R.	Jul-23	Aug-24	Aug-24
Mountain Bay	Oct-22	Aug-21	Aug-21
Little Cypress R.	Aug-14	Aug-24	Aug-17
Cypress Bay	Aug-16	Aug-15	Aug-15
Cypress R.	Jul-22	Aug-23	Aug-23
Cypress Bay	Jul-19	Aug-24	Aug-24
Jackpine R.	Never	Aug-23	Aug-23
Nipigon Bay	Sep-21	Aug-23	Aug-23
Jackfish R.	Jul-22	Aug-24	Aug-24
Nipigon Bay	Never	Aug-14	Aug-05
Nipigon R.			
Upper Nipigon R.	Aug-19	Aug-23	Aug-23
Maki Creek	Aug-24		
Lake Helen lentic	Oct-22	Aug-23	Aug-23
Lower Nipigon R.	Aug-24	Aug-24	Aug-24
Nipigon R (Lower) lentic	Oct-22	Aug-23	Aug-23
Cash Cr.	Jul-23	Sep-24	Sep-24
Lake Helen lentic	Oct-22	Sep-21	Sep-21
Polly Cr.	Jul-18	Aug-24	Aug-24
Polly Lake lentic	Jul-87	Aug-17	Jul-90
Stillwater Cr.	Jul-23	Aug-24	Aug-24
Nipigon Bay	Oct-23	Aug-23	Aug-23
Big Trout Cr.	Jul-23	Aug-24	Aug-24
Nipigon Bay	Aug-24	Aug-23	Aug-23
Otter Cove Cr.	Aug-23	Aug-23	Aug-23
Black Sturgeon R.	Aug-24	Aug-23	Aug-23
Black Bay	Never	Aug-21	Jul-04
Valley Cr.	Jun-72	Aug-23	Aug-71
Wolf R.	Jul-23	Aug-24	Aug-24
Black Bay	Aug-15	Aug-24	Aug-16
Coldwater Cr.	Jul-23	Aug-23	Aug-23
Black Bay	Aug-19	Aug-23	Aug-18
Pearl R.	Jul-19	Aug-24	Aug-24
D'Arcy Cr.	Jul-19	Aug-23	Aug-18
Black Bay	Jun-17	Aug-17	Aug-16
Blende Cr.	Jul-23	Aug-24	Aug-24
MacKenzie R.	Jul-23	Aug-24	Aug-24
MacKenzie Bay	Oct-24	Aug-23	Aug-23
Wild Goose Cr.	Jul-18	Aug-24	Aug-20
Current R.			
Thunder Bay	Sep-18	Aug-24	Aug-24
Neebing-McIntyre FW	Jul-22	Aug-24	Aug-24
Kaministiquia R.	Oct-22	Aug-24	Aug-24
Slate R.	Oct-22	Aug-24	Aug-24

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Corbett Cr.	Oct-22	Aug-24	Aug-24
Whitefish R.	Oct-22	Aug-24	Aug-24
Oliver Cr.	Oct-22	Aug-24	Aug-24
Jarvis R.	Jun-24	Aug-23	Aug-23
Cloud R.	Jun-24	Aug-23	Aug-23
Pine R.	Jul-18	Aug-23	Aug-17
Pigeon R.	Sep-22	Aug-24	Aug-24
Pigeon Bay	Aug-10	Sep-21	Sep-21
United States			
Waiska R.	Jul-07	Jul-24	Jun-18
West Branch	Jul-21	Oct-24	Jul-24
Sec. 11SW Cr.	Never	Jul-23	Jun-21
Pendills Cr.	Jul-12	May-24	May-24
Tahquamenon Bay	Never	Aug-24	Aug-24
Grants Cr.	Aug-24	Jul-23	Jul-23
Tahquamenon Bay	Sep-23	Aug-24	Aug-24
Halfaday Cr.	Jul-12	Jun-22	Aug-21
Tahquamenon Bay	Never	Sep-22	Jul-12
Mill Creek (Chippewa Co.)	Sep-23	Jul-24	Jun-22
Naomikong Cr.	Sep-23	May-24	Jun-22
Tahquamenon Bay	Never	Sep-23	
Ankodosh Cr.	Oct-23	Oct-24	May-24
Tahquamenon Bay	Jul-18	May-24	May-24
Roxbury Cr.	Oct-23	Aug-24	Aug-24
Tahquamenon Bay	Oct-23	Jul-24	Jul-24
Galloway Cr.	Oct-23	Aug-24	Sep-22
Tahquamenon Bay	Never	Aug-21	Aug-21
Tahquamenon R.	Sep-23	Aug-24	Jul-24
Betsy R.	Sep-22	Oct-24	Oct-24
Three Mile Cr.	Sep-23	Aug-24	May-22
Little Two Hearted R.	Jul-21	Oct-24	Oct-24
Two Hearted R.	Aug-23	Oct-24	Oct-24
Dead Sucker R.	Aug-13	Jun-24	May-19
Sucker R.	Aug-22	Oct-24	Oct-24
Grand Marais Harbor	Never	Oct-23	Sep-18
Chipmunk Cr.	Sep-62	Jun-23	Sep-61
Carpenter Cr.	Aug-23	Jun-24	Jun-22
West Bay	Aug-23	Sep-24	Sep-24
Sable Cr.	Sep-23	Jun-24	Jun-24
Hurricane R.	Never	Jun-24	Aug-08
Sullivans Cr.	Sep-23	Jun-24	Jun-22
Seven Mile Cr.	Aug-23	Jun-24	Jun-22
Beaver Lake Cr.			
Beaver Lk Outlet	Jul-18	Jun-23	Aug-17
Lowney Cr.	Jul-24	Oct-24	Oct-24
Little Beaver Cr.	Aug-23	Jun-24	Jun-24
Arsenault Cr.	Aug-23	Jun-24	Jun-22
Beaver Lake	Never	Jun-24	Jun-24
Little Beaver Lake	Never	Jun-24	Jun-24

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Mosquito R.	Jun-73	Jun-22	Oct-72
Miners R.			
Barrier downstream	Sep-23	Jun-24	Jun-21
Barrier upstream	Jul-13	Jun-21	May-12
Miners Lake Lentic	Jun-11	Sep-13	Sep-13
Munising Falls Cr.	Sep-64	Sep-24	Jun-14
Anna R.	Jun-23	Oct-24	Oct-24
Munising Bay	Sep-24	Jul-24	Jul-24
Tourist Park Cr.	Never	Jul-22	Jul-10
Furnace Cr.			
Lower	Sep-23	May-24	May-24
Upper	Sep-10	Jul-23	Aug-09
Furnace Bay	Aug-22	Jul-24	Jul-24
Furnace Lake – Near Outlet	Never	Jul-20	May-12
Furnace Lake – Offshore Hanson Cr.	Never	Jul-17	Jul-09
Furnace Lake – Offshore Gongeau Cr.	Never	Jul-17	Jul-09
Five Mile Cr.	Jun-23	Sep-23	Jul-22
Five Mile Cr. Lentic	Never	Jul-24	Jul-24
Au Train R.			
Lower	Sep-23	Jul-24	Oct-21
Upper	Sep-23	May-24	May-24
Au Train Lake	May-24	Jul-24	May-23
Rock R.	Jul-02	May-23	Aug-97
Deer Lake Cr.	Oct-23	Jun-24	Oct-23
Laughing Whitefish R.	Jun-23	Sep-23	Sep-23
Sand R.			
Below Dam	Jul-23	Jul-24	Jun-24
Above Dam	Oct-23	Sep-24	May-24
Chocolay R.	Jul-23	Aug-24	May-23
Carp R.	Jul-23	Jul-24	Jul-24
Carp R. lentic	Aug-24	Jul-23	Jul-23
Dead R.	Aug-22	Sep-24	Sep-24
Presque Isle Harbor	Jul-19	Jul-23	Jun-21
Compeau Cr.	Never	Jun-24	Jun-12
Harlow Cr.	May-23	Oct-23	Apr-23
Harlow Lake – offshore Bismark Cr.	May-21	May-23	May-23
Little Garlic R.	Jul-24	May-24	May-24
Little Garlic R. lentic	Jun-12	Jul-20	Jul-20
Garlic R.	Aug-22	Jul-24	Sep-23
Garlic R. lentic	Never	Jul-23	Sep-05
Saux Head Lake	May-22	May-23	May-23
Iron R.	Jul-24	Jul-24	Jul-23
Salmon Trout R.	Aug-23	Jul-24	Jul-22
Pine R. (Marquette Co.)	Aug-23	Jul-24	Jul-22
Huron R.	Jun-23	Oct-23	Oct-23
Ravine R.	Aug-24	Jun-24	Jun-24
Huron Bay	Jul-24	Sep-24	Sep-24
Slate R.	Aug-24	May-24	Jul-22
Huron Bay	Jul-24	Sep-24	Sep-24
Silver R.	Aug-24	May-24	May-23

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Huron Bay	Jul-24	Sep-24	Sep-24
Falls R.	Aug-24	May-24	Jun-06
L'anse Bay	May-24	Sep-24	Sep-24
Six Mile Cr.	Sep-18	Jul-22	Jun-17
L'anse Bay	Never	Jun-23	Jun-18
Little Carp R.	May-22	Sep-24	Jun-21
Keweenaw Bay	Never	Jun-23	
Kelsey Cr.	Never	May-23	Aug-16
Sturgeon R.	Sep-23	Sep-24	Sep-24
Pike River	Never	Oct-24	Sep-30
Pilgrim R.	Aug-21	May-24	Sep-20
Trap Rock R.	Jun-23	Oct-23	Oct-23
Torch Lake	Jun-23	May-24	May-24
McCallum Cr.	Aug-63	Sep-21	May-94
Traverse R.	Jun-24	Oct-23	Oct-23
Little Gratiot R.	Jun-16	May-24	May-15
Eliza Cr.	Jun-24	May-24	Oct-23
Eagle Harbor	Jun-24	Oct-23	Sep-19
Gratiot R.	Jun-23	Oct-23	Jul-22
Smiths Cr.	May-64	Jun-23	May-64
Boston-Lily Cr.	Jun-23	Oct-23	Oct-23
Schlotz Cr.	Oct-21	Sep-24	May-24
Salmon Trout R. (Houghton Co.)	Jun-23	May-24	May-24
Mud Lake Outlet	Sep-18	May-24	Aug-22
Hungarian Cr.	May-22	May-24	May-24
Torch Lake	May-22	Aug-22	Sep-21
Graveraet R.	May-23	Oct-24	Oct-24
Elm R.	Aug-16	Jul-23	Aug-21
Misery R.			
Barrier downstream	Jul-22	Sep-24	Sep-24
Barrier upstream	Aug-00	May-24	Sep-08
East Sleeping R.	Jul-22	Sep-22	Oct-21
West Sleeping R.	Sep-23	Aug-24	Jul-22
Firesteel R.	Aug-24	Aug-24	Sep-23
Flintsteel R.	May-23	Jul-23	Aug-21
Ontonagon R.	Sep-23	Aug-24	Aug-24
Potato R.	Jun-21	Oct-23	Oct-23
Floodwood R.	Never	Aug-22	Aug-85
Cranberry R. (Ontonagon Co.)	Oct-24	Oct-23	Sep-21
Mineral R.	Jul-22	Oct-24	Oct-24
Mineral R. lentic	Never	Aug-19	Sep-11
Big Iron R.	Never	Aug-24	Jul-15
Little Iron R.	Jul-22	May-23	Oct-21
Union R.	May-64	Oct-20	Aug-62
Little Carp R.	Never	Oct-24	Aug-24
Black R.	Sep-21	Aug-24	Aug-24
Black River Harbor	Sep-19	Aug-24	Jul-19
Montreal R.	Jul-75	Aug-22	Jul-10
Washington Cr.	Jun-80	Jul-12	Sep-82
Bad R.	Sep-24	Oct-24	Oct-24

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Fish Cr. (Eileen Twp)	May-22	Oct-24	Oct-24
Chequamegon Bay	Never	Aug-24	Aug-24
Sioux R.	Jul-19	Jun-23	Aug-18
Pikes Cr.	May-16	Aug-23	Aug-18
Red Cliff Cr.	May-22	Aug-24	Aug-24
Buffalo Bay	Never	Aug-11	Aug-03
Raspberry R.	May-16	Jun-23	Sep-15
Sand R. (Bayfield Co.)	Jun-23	Ayg-23	Jun-23
Sand Bay	Aug-10	Jul-21	Aug-15
Cranberry R. (Bayfield Co.)	Jun-17	Aug-24	Aug-24
Iron R.			
Barrier downstream	Jun-23	Jun-24	Aug-22
Barrier upstream	Oct-64	Sep-24	Never
Reefer Cr	Oct-64	Jun-22	Jun-16
Fish Cr. (Orienta Twp)	Oct-64	Aug-23	Aug-63
Brule R.			
Barrier downstream	Jun-24	Aug-24	Aug-24
Barrier upstream	Jun-86	Aug-23	Sep-87
Brule R. lentic	Never	Aug-24	Aug-22
Poplar R.	Jun-22	Aug-24	Aug-24
Middle R.			
Barrier downstream	Jun-24	Sep-24	Sep-24
Barrier upstream	Jun-24	Sep-24	Sep-24
Amnicon R.	Jun-23	Aug-23	Aug-23
Amnicon R. lentic	Never	Aug-22	Aug-18
Nemadji R.	Jun-22	Sep-24	Sep-24
St. Louis R.	Sep-87	Sep-24	Aug-23
Lester R.	Never	Sep-24	Never
Lester R. lentic	Never	Sep-24	Aug-23
Sucker R. (St. Louis Co.)	Never	Aug-22	Sep-89
Knife River	Jun-23	Sep-23	Sep-23
Knife R. lentic	Aug-23	Aug-24	Aug-24
Stewart R.	Jun-24	Sep-24	Sep-24
Gooseberry R.	Jun-23	Sep-23	Aug-22
Gooseberry R. lentic	Aug-23	Aug-24	Aug-22
Splitrock R.	Aug-76	Aug-22	Aug-21
Poplar R.	Jun-18	Aug-23	Aug-21
Poplar R. lentic	Never	Aug-23	Never
Arrowhead R.	Jun-23	Sep-23	Sep-23

Table 15. Details on application of granular Bayluscide to tributaries and lentic areas of Lake Superior for larval assessment purposes during 2024.

Tributary	Bayluscide (kg)[1]	Area Surveyed (ha)
Canada		
Goulais R. (lentic)	2.36	0.50
Chippewa R.	1.42	0.30
Carp R. (lentic)	1.42	0.30
Pancake R. (lentic	1.42	0.30

Tributary	Bayluscide (kg)[1]	Area Surveyed (ha)
Montreal R.	0.71	0.15
Prairie R.	1.42	0.30
Aguasabon R.	0.95	0.20
Cypress R.	0.71	0.15
Jackfish R.	1.42	0.30
Nipigon R.	2.60	0.55
S-461	0.47	0.10
Wolf R. (lentic)	0.71	0.15
Pearl R.	1.42	0.30
Blende R. (lentic)	0.71	0.15
Current R.	0.95	0.20
McVicar R.	0.47	0.10
Kaministiquia R.	0.71	0.15
Pigeon R.	0.71	0.15
Total (Canada)	**20.58**	**4.35**
United States		
Pendills Cr. (lentic)	1.47	0.31
Grants Cr. (lentic)	1.47	0.31
Roxbury Cr. (lentic)	1.47	0.31
Tahquamenon R.	1.96	0.41
Carpenter Cr. (lentic)	1.47	0.31
Beaver Lake Cr.	3.92	0.82
Anna R. (lentic)	6.12	1.30
Furnace Cr. (lentic)	1.47	0.31
Five Mile Cr. (lentic)	1.47	0.31
Au Train R. (Au Train Lake)	1.47	0.31
Harlow Cr. (Harlow Lake)	0.73	0.16
Ravine R. (lentic)	3.43	0.73
Slate R. (lentic)	3.43	0.73
Silver R. (lentic)	2.94	0.62
Falls R. (lentic)	3.43	0.73
Sturgeon R. (lentic)	2.45	0.52
Trap Rock R. (lentic)	1.47	0.31
Schlotz Cr. (lentic)	1.47	0.31
Hungarian Cr. (lentic)	1.47	0.31
Misery R.	1.47	0.31
Ontonagon R.	2.45	0.52
Black R.	1.47	0.31
Black R. (Lentic)	2.45	0.52
Fish Cr. (Lentic)	1.96	0.41
Prentice Park Cr.	1.47	0.31
Brule R. (Lentic)	1.47	0.31
Lester R. (Lentic)	1.47	0.31

Tributary	Bayluscide (kg)[1]	Area Surveyed (ha)
Knife R. (Lentic)	1.47	0.31
Stewart R. (Lentic)	1.47	0.31
Silver Cr. (Lentic)	1.47	0.31
Gooseberry R. (Lentic)	0.98	0.21
Arrowhead R. (Lentic)	1.47	0.31
Total (United States)	**64.18**	**13.57**
Total for Lake	**84.73**	**17.92**

[1]Lampricide quantities are reported in kg active ingredient.

Lake Michigan

- Larval assessments were conducted in 91 tributaries and 11 lentic areas. The status of larval sea lamprey populations in historically infested Lake Michigan tributaries and lentic areas is presented in Table 16.

- Surveys to estimate larval sea lamprey abundance were conducted in five tributaries.

- Surveys to detect the presence of new larval sea lamprey populations were conducted in 14 tributaries. No new infestations were identified.

- Post-treatment assessments were conducted in 19 tributaries and four lentic area to determine the effectiveness of lampricide treatments conducted during 2023 and 2024. Bills Creek (Whitefish R.) and Bark River are scheduled for treatment in 2025 based on residual larval populations.

- Surveys to evaluate barrier effectiveness were conducted in 13 tributaries. Sea lampreys were found upstream of the barrier on the Kewaunee River and in Trail Creek.

- Larval assessment surveys were conducted in 12 non-wadable lentic and lotic areas using 18.4 kg active ingredient of 3.2% gB (Table 17).

Table 16. Status of larval sea lamprey in Lake Michigan tributaries with a history of sea lamprey production.

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Brevort R.			
Upper	Sep-24	Aug-23	Aug-23
Lower	Sep-24	May-23	May-23
Brevort Lake	May-21	May-22	Jun-19
Paquin Cr.	Jun-19	Aug-23	Sep-18
Paquin Cr. lentic	Never	Sep-18	Sep-18
Davenport Cr.	Sep-13	Oct-24	Oct-24
Hog Island Cr.	May-21	Aug-24	Aug-24
Hog Island Cr.	Jun-07	Jul-21	Jul-18
Lentic			
Sucker R.	Jun-61	May-23	Jul-21

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Black R.	Sep-24	Aug-24	Sep-23
Black R. lentic	Jun-76	Sep-22	Aug-11
Mattix Cr.	Aug-15	May-23	Jun-14
Mile Cr.	May-17	Aug-24	Aug-24
Mile Cr. lentic	Aug-68	Jun-18	Jun-08
Millecoquins R.	Jul-24	Aug-23	Aug-23
Furlong Cr.	May-22	Aug-24	Aug-24
Millecoquins Lake	Never	Jun-19	Jun-14
Rock R.	Jul-24	Oct-24	Oct-24
Crow R.	Jun-23	Sep-23	Aug-22
Cataract R.	Sep-19	Aug-24	Aug-24
Cataract R. lentic	Never	Jul-23	Jul-23
Pt. Patterson Cr.	Jul-13	Aug-24	Aug-24
Hudson Cr.	Aug-19	Jun-23	Jun-23
Swan Cr.	Sep-24	Jun-23	Jun-23
Seiners Cr.	May-24	Aug-24	Aug-22
Milakokia R.	Sep-21	Aug-24	Aug-24
Seul Choix Bay	Never	Jul-19	Jul-80
Bulldog Cr.	Jun-13	Jun-23	Sep-13
Gulliver Lake Outlet	Sep-19	Jun-23	Sep-18
Marblehead Cr.	Jun-19	Aug-22	Aug-22
Marblehead Cr. Lentic	Never	Jun-23	Jun-23
Manistique R.	Jun-23	Oct-24	Oct-24
Inside breakwalls	Jul-24	Oct-24	Oct-24
Outside breakwalls	Oct-22	Jun-24	Jun-24
Southtown Cr.	Jul-13	Jun-23	Aug-12
Thompson Cr.	Jun-23	Jun-23	Aug-22
Johnson Cr.	Jun-13	May-22	Sep-12
Deadhorse Cr.	Sep-23	Sep-24	Sep-24
Deadhorse Cr. Lentic	Never	Jun-23	Oct-64
Gierke Cr.	Never	May-22	Jun-04
Bursaw Cr.	May-22	Aug-24	Aug-24
Bursaw Cr. lentic	Never	Jul-11	Jul-11
Parent Cr.	Aug-17	Sep-24	Sep-24
Parent Cr. lentic	Never	Jun-24	Jun-24
Poodle Pete Cr.	Aug-17	Sep-23	Aug-21
Poodle Pete Cr. Lentic	Never	Jun-23	Jun-23
Valentine Cr.	May-21	Sep-23	Jul-19
Big Bay de Noc	Never	Sep-11	Aug-94
Little Fishdam R.	May-01	Jun-23	Jul-04
Big Fishdam R.	Apr-23	Jul-23	Aug-22
Sturgeon R.	Jul-22	Oct-24	Oct-24
Big Bay de Noc	Never	Jul-23	Aug-15
Ogontz R.	Apr-23	Aug-24	Aug-24
Big Bay de Noc	Sep-14	Jul-23	Jul-15
South Mino-kwe Cr.	May-24	Aug-24	Apr-24
Hock Cr.	May-17	Aug-24	Aug-24

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Whitefish R.	May-24	Oct-24	Oct-24
Haymeadow Cr.	May-24	Oct-24	Oct-24
Little Bay de Noc	Jun-83	Jul-23	Jul-11
Rapid R.	May-24	Oct-24	Oct-24
Little Bay de Noc	May-15	Jul-23	Jul-16
Tacoosh R.	Oct-14	Jul-23	Jul-14
Days R.			
Barrier downstream	Aug-24	Aug-24	Aug-24
Barrier upstream	Aug-17	May-23	Aug-17
Little Bay de Noc	Aug-14	Jul-23	Aug-13
Escanaba R.	Never	Jul-23	Jul-06
Portage Cr.	May-17	Sep-23	May-21
Portage Bay	Never	Aug-17	Aug-82
Ford R.	Jun-24	Oct-23	Oct-23
Green Bay	Oct-14	Jul-23	Jul-23
Sunnybrook Cr.	Apr-23	Oct-23	Aug-22
Bark R.	Sep-24	Oct-24	Oct-24
Green Bay	Never	Aug-24	Sep-98
Cedar R.	May-24	Oct-24	Oct-24
Green Bay	May-10	Jul-23	Jul-16
Sugar Cr.	May-21	Sep-23	Sep-21
Fowler Cr.	Never	Apr-23	Aug-22
Arthur Bay Cr.	May-21	Sep-23	Sep-21
Rochereau Cr.	Apr-63	Apr-23	Jul-62
Johnson Cr.	Apr-17	Sep-23	Aug-22
Bailey Cr.	May-23	Sep-23	Aug-22
Green Bay	Never	Aug-18	Aug-18
Beattie Cr.	May-19	Sep-23	May-21
Springer Cr.	May-23	Sep-23	Sep-23
Menominee R.	Jul-16	May-21	Jun-19
Green Bay	Jul-16	Aug-17	Sep-15
Little R.	Aug-77	May-21	Aug-77
Peshtigo R.	Sep-24	Sep-22	Sep-23
Oconto R.	May-24	Sep-24	Sep-23
Pensaukee R.	Nov-77	May-21	Sep-85
Suamico R.	Never	May-21	May-67
Ephraim Cr.	Apr-63	May-22	Apr-61
Hibbards Cr.	May-07	May-22	Oct-09
Whitefish Bay Cr.	May-16	Jun-24	Jun-15
Shivering Sands Cr.	Apr-12	Jun-24	May-14
Lily Bay Cr.	Apr-63	Jun-24	May-63
Bear Cr.	Sep-24	May-23	May-23
Door Co. 23 Cr.	May-19	May-23	May-23
Silver Cr.	Never	Jun-24	Jul-15
Ahnapee R.	Apr-64	Aug-24	Apr-64
Three Mile Cr.	Apr-21	Jun-24	Jun-24
Kewaunee R.			
Barrier downstream	May-75	Jun-24	May-98
Barrier upstream	May-75	Jun-24	Jun-24

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Casco Cr.	May-14	May-22	Aug-14
East Twin R.	Apr-17	Jun-24	Jun-19
Fischer Cr.	May-87	May-22	May-87
French Farm Cr.	Never	Aug-23	Jun-10
Carp Lake Outlet	Jul-24	Sep-24	Sep-24
Big Stone Cr.	Sep-13	Aug-23	Aug-10
Big Sucker R.	Sep-13	May-24	Sep-13
Wycamp Lake Outlet	Jul-17	May-24	May-24
Bear R.	Never	May-24	Never
Bear R. lentic	Jun-07	Sep-23	Jun-08
Horton Cr.	Jul-24	Sep-24	Aug-23
Horton Cr. lentic	Jul-24	Sep-24	Sep-24
Boyne R.	Aug-21	May-24	May-24
Boyne R. lentic	Jun-17	Sep-22	Jun-14
Porter Cr.	Jul-24	Oct-24	Oct-24
Porter Cr. lentic	Jul-24	Sep-24	Oct-23
Jordan R.	Jul-22	Sep-24	May-24
Jordan R. lentic	Jul-18	Oct-23	Jun-14
Monroe Cr.	Aug-13	Jul-24	Jul-24
Monroe Cr. lentic	Never	Jul-24	Jul-24
Loeb Cr.	Aug-13	Jul-24	Jul-24
McGeach Cr.	Oct-99	May-15	Jun-98
Elk Lake Outlet	Jun-17	Jun-24	Jun-23
Yuba Cr.	May-06	Jun-24	Aug-05
Acme Cr.	Aug-63	Jun-22	Jul-73
Mitchell Cr.	Jul-17	Aug-24	Aug-20
Boardman R. (lower)	Aug-15	Jun-24	Jun-14
Boardman R. (middle)	Aug-15	Jun-24	Sep-14
Boardman R. lentic	Jun-17	Jul-24	Jul-24
Hospital Cr.	Jun-24	Sep-24	Jun-23
Leo Cr.	Never	Sep-24	Jul-95
Leland R. lentic	Never	Sep-22	Jun-13
Good Harbor Cr.	Jul-10	Sep-24	Sep-09
Crystal R.	Apr-19	Aug-24	Aug-24
Platte R. (upper)	Jun-24	Sep-24	Sep-24
Platte R. (middle)	Jun-22	Sep-24	Sep-24
Loon Lake lentic	Sep-22	Sep-24	Sep-24
Platte R. (lower)	Jun-24	Sep-24	Apr-24
Betsie R.	Jun-22	Sep-24	Sep-24
Bowen Cr.	Jun-09	Sep-24	Oct-19
Big Manistee R.	Aug-23	Jul-21	Oct-19
Manistee R. lentic	Never	Jul-24	Jul-08
Bear Cr.	Aug-23	Aug-23	Jul-23
Pine Cr.	Aug-23	Jul-23	Jul-23
L. Manistee R.	Jul-24	Sep-24	Sep-24
L. Manistee (lentic)	Never	Jul-24	Jul-05
Gurney Cr.	Jun-16	Jul-24	Jul-15
Cooper Cr.	Jul-08	Jul-24	Sep-07

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Lincoln R.	Jul-20	Jul-24	Jul-24
Pere Marquette R.	Aug-23	Jul-24	Jul-24
Bass Lake Outlet	Aug-78	Jun-22	Aug-75
Pentwater R. (N. Br.)	Jul-23	Jul-24	Jun-18
South Branch	Never	Jul-24	Jun-83
Lambricks Cr.	Sep-84	Jul-24	Sep-84
Stony Cr.	Oct-24	Apr-24	May-23
Flower Cr.	Jul-17	Jul-23	May-17
White R.	Jul-23	Jul-24	Jul-24
Duck Cr.	Jul-84	Jul-23	Aug-95
Muskegon R.	Aug-22	Jul-24	Jul-24
Brooks Cr.	Aug-22	Jul-24	Sep-21
Cedar Cr.	Aug-22	Jul-24	Sep-21
Bridgeton Cr.	Aug-22	Jul-24	Sep-21
Minnie Cr.	Aug-22	Jul-24	Sep-21
Bigelow Cr.	Aug-22	Jul-24	Jul-24
Big Bear Cr.	Aug-70	Jul-24	Aug-70
Mosquito Cr.	Jul-69	Jul-24	Jul-07
Black Cr.	Aug-08	Jul-24	Aug-08
Grand R.	Never	Aug-22	Never
Norris Cr.	Jun-17	Aug-22	Sep-16
Lowell Cr	Sep-65	May-24	Jun-65
Buck Cr.	Sep-65	May-24	Sep-65
Rush Cr.	Sep-65	Aug-22	Sep-62
Sand Cr.	Jun-07	May-24	Jun-07
Crockery Cr.	Jun-23	Sep-23	Apr-23
Bass R.	Aug-04	Aug-22	Sep-03
Rogue R.	Jun-23	May-24	Aug-22
Prairie Cr.	Aug-24	Sep-23	Sep-23
Pigeon R.	Oct-64	Sep-19	May-62
Pine Cr.	Oct-64	Sep-19	May-62
Gibson Cr.	Jul-84	Sep-22	Jun-83
Kalamazoo R.	Oct-65	Aug-20	Never
Bear Cr.	Oct-24	Aug-23	Aug-23
Sand Cr.	Sep-10	Aug-23	May-17
Mann Cr.	Jul-16	Aug-23	Sep-15
Rabbit R.	Sep-15	Sep-23	Jul-14
Swan Cr.	Jun-21	Aug-23	Oct-21
Allegan 3 Cr.	Sep-65	Aug-22	Jun-62
Allegan 4 Cr.	Oct-78	May-24	May-24
Allegan 5 Cr.	Sep-15	May-24	Jul-14
Black R.			
North Branch	Jun-77	May-24	May-21
Middle Branch	Jul-21	May-24	May-24
South Branch	May-17	May-24	May-21
Brandywine Cr.	Aug-85	May-24	May-24
Rogers Cr.	May-18	Sep-24	Jun-16
St. Joseph R.	Never	Jul-19	Never
Lemon Cr.	Oct-65	Jul-23	Jun-65

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Pipestone Cr.	May-21	Sep-24	Jul-21
Meadow Dr.	Oct-65	Sep-24	Apr-62
Hickory Cr.	May-21	Sep-24	Sep-19
Farmers Cr.	May-21	Sep-24	Jul-23
Paw Paw R.	Sep-21	Sep-24	Sep-24
Blue Cr.	Sep-15	Sep-24	Sep-24
Mill Cr.	Sep-24	Sep-24	Jul-23
Brandywine Cr.	Sep-17	Sep-24	Jul-17
Brush Cr.	Sep-15	Sep-24	Jun-15
Hayden Cr.	Sep-21	Sep-24	Sep-24
Campbell Cr.	Sep-18	Sep-24	Sep-18
Ritter Cr.	Sep-17	Sep-24	Oct-16
Galien R. (N. Br.)	Jun-16	Oct-23	Sep-15
E. Br. & Dowling Cr.	Oct-10	Oct-24	Sep-09
S. Br. & Galena Cr.	Aug-21	Oct-24	Oct-23
Spring Cr.	Aug-21	Oct-24	May-16
S. Br. Spring Cr.	Aug-21	Oct-24	Oct-24
State Cr.	Apr-14	Oct-24	Sep-13
Trail Cr.	Apr-14	Oct-24	Aug-18
Donns Cr.	May-66	May-19	May-66
Burns Ditch	Jul-99	Oct-23	Oct-21
Little Calumet R.	Sep-24	Oct-23	Oct-23
Salt Cr.	May-18	Oct-23	Jun-19

Table 17. Details on application of granular Bayluscide to tributaries and lentic areas of Lake Michigan for larval assessment purposes during 2024.

Tributary	Bayluscide (kg)[1]	Area Surveyed (ha)
Manistique R.	1.47	0.31
Manistique R (lentic)	2.45	0.52
Parent Cr. (lentic)	1.22	0.26
Bark R. (lentic)	1.47	0.31
Horton Cr. (lentic)	2.36	0.50
Porter Cr. (lentic)	0.94	0.20
Monroe Cr. (lentic)	1.66	0.35
Loeb Cr. (lentic)	0.49	0.10
Boardman R. (lentic)	1.42	0.30
Platte R. (Loon Lake lentic)	2.36	0.50
Betsie R. (lentic)	0.71	0.15
Manistee R. (lentic)	1.89	0.40
Total for Lake	**18.44**	**3.90**

[1] Lampricide quantities are reported in kg of active ingredient.

Lake Huron

- Larval assessments were conducted in 96 tributaries (43 Canada, 53 U.S.) and 19 lentic areas (5 Canada, 14 U.S.). The status of larval sea lamprey populations in historically infested Lake Huron tributaries and lentic areas is presented in Table 18.

- Surveys to estimate larval sea lamprey abundance were conducted in eight tributaries (7 Canada, 1 U.S.) and three lentic areas (3 Canada, 0 U.S.).

- Surveys to detect the presence of new larval sea lamprey populations were conducted in 24 tributaries (17 Canada, 7 U.S.). No new infestations were discovered.

- Post-treatment assessments were conducted in 14 tributaries (5 Canada, 9 U.S.) and two lentic areas (0 Canada, 2 U.S.) to determine the effectiveness of lampricide treatments conducted during 2023 and 2024. Albany Creek lentic area is scheduled for treatment in 2025 based on residual larval populations.

- Surveys to evaluate barrier effectiveness were conducted in Sauble River and Bighead River (Canada) and one U.S. tributary. Sea lamprey infestations were not discovered upstream of their respective barriers.

- Larval sea lamprey surveys were conducted in the St. Marys River according to a stratified, systematic sampling design. Using a deep-water electrofishing unit, 860 geo-referenced sites were sampled. The larval sea lamprey population in the St. Marys River was estimated to be 1,520,000 (95% CI: 940,000 – 2,100,000). The river population estimate methodology is currently under review.

- Larval assessments were conducted in non-wadable lentic and lotic areas using 47.95 kg active ingredient of 3.2% gB (19.57 kg Canada, 28.38 kg U.S.; Table 19).

Table 18. Status of larval sea lamprey in Lake Huron tributaries with a history of sea lamprey production.

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Canada			
St. Marys R.	Jul-24	Jul-24	Sep-23
Whitefish Channel	Jun-24	Sep-23	Sep-23
Root R.	May-24	Aug-24	Aug-24
Garden R.	Aug-23	Jul-24	Jul-24
Maud & Driving Cr.	May-24	Aug-23	Aug-23
Echo R.			
Main	Jul-24	Oct-23	Oct-23
Bar & Iron Cr.	Aug-20	Sep-24	Sep-24
Austin Cr.	Oct-23	Sep-23	Sep-23
Elm Cr.	May-13	Sep-24	Sep-24
Echo Lake	Sep-20	Oct-23	Oct-23
Solar Lake	Jul-87	Jul-06	May-90
Stuart Lake	Jul-80	May-90	May-90
Bar R.	Oct-11	Jul-23	Jul-10
Sucker Cr.	May-18	Jul-23	Sep-17

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Sucker Cr. (lentic)	Jul-84	Sep-16	Jun-13
Two Tree R.	May-15	Jun-24	Jun-24
Two Tree R. (lentic)	Never	Aug-81	Aug-81
Richardson Cr.	Sep-16	Jun-22	Jul-16
Watson Cr.	May-24	Sep-23	Jul-23
Gordon Cr.	May-18	Jul-24	Jul-24
Gordon Cr. (lentic)	Jul-84	Jul-24	Aug-91
Browns Cr.	May-23	Jun-23	Jun-23
Browns Cr. (lentic)	Aug-87	Jul-24	Aug-91
Koshkawong R.	May-23	Aug-23	Sep-22
Koshkawong R. (lentic)	Never	Jul-17	Aug-91
No Name (H-65)	May-22	Jun-23	Jul-21
No Name (H-68)	Jun-19	Aug-23	Jul-18
North Channel	Never	Apr-12	May-95
MacBeth Cr.	Jun-19	Oct-24	Jun-18
Thessalon R.			
Upper	Sept-18	Jun-24	Sep-17
Lower	Oct-22	Oct-24	Oct-24
Livingstone Cr.	May-22	Jul-23	Jul-23
Mississagi R.	Aug-23	Oct-24	Oct-24
Harris/Bolton Cr.	Aug-19	Jun-23	Sep-20
North Channel	Sep-24	Oct-24	Oct-24
Blind R.	May-84	Jun-19	Jun-05
Lauzon R.	May-23	Sep-23	Jul-22
North Channel	Jun-19	Jul-22	Jul-22
Spragge Cr.	Oct-95	Jul-24	Jun-98
No Name (H-114)	May-22	Aug-23	Jul-21
North Channel	Jun-15	Sep-18	Sep-14
Marcellus Cr.	Jun-13	Aug-23	Sep-11
Serpent R.			
Main	Jun-21	Sep-23	Sep-23
Grassy Cr.	May-23	Oct-24	Oct-24
Spanish R.			
Main	Sep-15	Jun-23	Jun-23
LaCloche Cr.	Oct-18	Jun-23	Sep-17
Birch/Beaudin Cr.	Oct-23	Oct-24	Sep-22
Aux Sables R.	Jul-24	Jun-23	Jun-23
Kagawong R.	Aug-67	Jul-24	Aug-16
Mudge Bay	Aug-87	Jun-19	Jun-15
Unnamed (H-267)	Apr-17	Jul-24	Sep-20
Silver Cr.	Sep-22	Jun-23	Jul-21
Floods Cr.	Sep-24	Aug-23	Aug-23
Sand Cr.	Sep-24	Aug-23	Aig-23
Mindemoya R.	Jun-24	Jul-23	Jun-23
Providence Bay	Jul-81	Jul-22	Jul-88
Timber Bay Cr.	Jun-24	Jul-23	Jun-23
Hughson Cr.	Sep-20	Jul-24	Jul-24
Manitou R.	Jun-24	Jun-23	Jun-23
Michael's Bay	Oct-20	Jul-24	Sep-17
Blue Jay Cr.	Sep-22	Jun-23	Jul-21

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Blue Jay Cr. (lentic)	Jun-18	Jul-24	Jul-24
Kaboni Cr.	Oct-78	Jul-24	Jul-78
Chikanishing R.	Jun-24	Jun-23	Jun-23
French R. System			
O.V. Channel	Jun-12	Jul-24	Sep-15
Wanapitei R.	Jun-11	Jul-24	Jul-24
Key R. (Nesbit Cr.)	Sep-72	May-24	Aug-73
Still R.	Jul-17	May-23	May-16
Byng Inlet	Jun-12	May-23	May-23
Magnetawan R.	Jul-22	May-24	May-24
Byng Inlet	Oct-24	May-23	May-23
Naiscoot R.	May-18	Sep-23	Sep-23
Shawanaga Landing Cr.	Never	Sep-23	Sep-23
Shebeshekong R.	Never	May-23	May-23
Boyne R.	Sep-18	May-23	May-18
Georgian Bay	Never	Jun-23	May-16
Musquash R.	Aug-13	May-24	May-24
Simcoe/Severn System	Never	Jun-22	May-19
Georgian Bay	Aug-18	Jun-22	May-19
Sturgeon R.	Apr-12	May-24	Sep-09
Sturgeon Bay	Never	May-14	Jun-99
Hog Cr.	Sep-78	Jun-22	Aug-78
Lafontaine Cr.	Jun-68	Jun-22	May-67
Nottawasaga R.			
Mainstream	Jul-21	Oct-21	Oct-21
Boyne R.	Jul-21	May-23	May-19
Bear Cr.	Jun-13	May-23	Apr-11
Pine R.	Jul-21	May-23	May-23
Marl Cr.	Apr-13	May-23	May-11
Pretty R.	May-72	May-24	May-72
Silver Cr.	Sep-82	Jun-23	Sep-82
Bighead R.	Jun-22	May-24	May-24
Bighead R. (lentic)	Aug-18	May-22	May-22
Bothwells Cr.	Jun-79	May-22	Aug-83
Sydenham R.	Jun-72	May-22	Jul-71
Sauble R.	Jun-04	May-24	May-18
Saugeen R.	Jun-71	May-22	May-95
Bayfield R.	Jun-70	May-22	Sep-73
United States			
Mission Cr.	Never	Sep-23	Sep-23
Frechette Cr.	Never	Jul-24	Jul-81
Ermatinger Cr.	Never	Jul-24	Jul-24
Ditch Cr	Never	Sep-23	Sep-23
Charlotte R.	Oct-11	Jul-24	May-24
Beaver Dam Cr.	Never	Sep-23	Jun-22
Little Munuscong R.	Oct-21	Oct-24	Jul-24
Big Munuscong R.	Sep-24	Oct-24	May-24
Taylor Cr.	Sep-23	Sep-21	May-24
Gogomain R.	Jul-16	Sep-23	Jun-18

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Carlton Cr.	Oct-18	Sep-23	Sep-23
Canoe Lake Outlet	May-70	Apr-13	May-69
Caribou Cr.	Oct-19	Jul-24	Jul-24
Caribou Cr. (lentic)	May-18	Aug-23	Jul-21
Bear Lake Outlet	Sep-16	Oct-24	Sep-22
Bear Lake Outlet (lentic)	Never	Jul-24	Jul-24
Carr Cr.	Jun-13	Oct-24	May-23
Joe Straw Cr.	Jun-13	May-23	May-23
Saddle Cr.	Never	Jul-24	May-02
Huron Point Cr.	May-18	Aug-23	Aug-23
Albany Cr.			
Barrier downstream	May-21	May-23	May-23
Barrier upstream	Sep-01	May-24	Aug-23
Albany Bay	Sep-23	Jul-24	Jul-24
Trout Cr.	Jul-15	Oct-24	Oct-24
Trout Cr. lentic	Never	Jul-24	Jul-24
Beavertail Cr.	Jul-18	Oct-24	Oct-24
Prentiss Cr.	Oct-19	Aug-23	Aug-23
McKay Cr.	Jun-24	Oct-24	Oct-24
McKay Bay	Never	Jul-24	Jul-11
Flowers Cr.	Jun-13	May-23	May-11
Flowers Bay	Never	Jun-12	Jul-80
Ceville Cr.	Jul-16	May-23	Jul-15
Hessel Cr.	Sep-21	Jul-24	Jul-24
Steeles Cr.	Sep-21	Jul-24	Aug-19
Nunns Cr.			
Barrier downstream	Jul-16	Jul-24	May-14
Barrier upstream	Jul-16	May-19	Jun-15
St. Martin Bay	Never	Jul-23	Aug-87
Pine R.	Jun-24	Oct-24	Oct-24
St. Martin Bay	Jun-21	Jul-24	Jul-17
McCloud Cr.	Jul-15	Jul-24	May-17
St. Martin Bay	Never	Aug-15	Aug-15
Carp R.	Jul-24	Oct-24	Oct-24
St. Martin Bay	Jul-21	Jul-24	Jul-24
Martineau Cr.	Jul-16	May-23	May-17
Horseshoe Bay	Never	Aug-19	Sep-14
Hoban Cr.	Jun-12	Jul-24	May-11
266-20 Cr.	Aug-76	May-22	Sep-94
Beaugrand Cr.	Jun-16	Sep-24	Jul-15
Little Black R.	Oct-21	Sep-24	Sep-23
Cheboygan R.	Oct-83	Aug-23	Aug-23
Cheboygan R. (lentic)	Never	Jun-19	Aug-93
Laperell Cr.	May-00	Aug-24	Sep-22
Meyers Cr.	Sep-23	Aug-24	Sep-22
Maple R.	May-24	Aug-24	Aug-24
Pigeon R.	Sep-22	Aug-24	Aug-24
Little Pigeon R.	Aug-12	Aug-24	Jun-10
Sturgeon R.	Sep-23	Aug-24	Sep-22
Sturgeon R. (lentic)	Sep-23	Aug-24	Sep-22

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Elliot Cr.	Oct-21	Sep-24	Sep-24
Duncan Bay	Never	Sep-22	Jul-12
Greene Cr.			
Barrier downstream	Sep-23	Oct-24	Jun-24
Barrier upstream	Jun-07	May-22	Jun-13
Grass Cr.	Aug-22	Oct-24	Sep-24
Mulligan Cr.	Jun-16	Oct-24	Jun-18
Mulligan Cr. (lentic)	Never	Aug-21	Aug-16
Grace Cr.	Oct-18	Aug-24	Aug-24
Black Mallard Cr.	Jun-18	Aug-24	Aug-24
Lower			
Black Mallard Lake	Never	Jun-23	Jun-10
Upper	May-19	Aug-24	Aug-21
Seventeen Cr.	Jul-12	Oct-24	Jul-12
Ocqueoc R.			
Hammond Bay (lentic)	Never	Jun-23	Aug-21
Barrier upstream	Jul-24	Sep-24	Jun-23
Barrier downstream	Aug-22	Sep-24	Sep-24
Johnny Cr.	Sep-70	Jun-23	Jun-23
Hammond Bay Cr. (lentic)	Never	Jun-23	Sep-17
Schmidt Cr.			
Lower	Apr-23	Oct-24	May-22
Upper	May-08	Oct-24	May-08
Nagels Cr.	Never	Jul-21	Jun-09
Trout R.			
Barrier downstream	Oct-21	Aug-24	Aug-24
Barrier upstream	Oct-07	Oct-24	Jun-07
Swan R.	Jun-10	Oct-24	Jun-10
Grand Lake Outlet	Never	Jun-23	May-03
Middle Lake Outlet	Jun-67	Oct-23	Aug-66
Long Lake Outlet	Aug-21	Oct-24	Oct-24
Devils Lake (lentic)	Never	Jun-24	Jun-24
Cranberry Cr.	Jun-13	Oct-23	Oct-11
Devils R.	Oct-14	Oct-24	Aug-13
Thunder Bay	Never	Jun-21	Aug-76
Black R.	Apr-23	Oct-24	Oct-24
Mill Cr.	Never	Aug-24	May-98
Au Sable R.	Aug-22	Aug-24	Aug-24
Au Sable. R (lentic)	Aug-15	Sep-21	Sep-14
Pine R.	May-87	Sep-19	Sep-94
Tawas Lake Outlet	Jun-15	Aug-24	Jun-14
Cold Cr.	Aug-18	Aug-24	May-24
Sims Cr.	Jul-09	May-24	Aug-08
Grays Cr.	Sep-05	Aug-24	Jul-04
Silver Cr.	Aug-22	Aug-24	Aug-24
East Au Gres R.	Oct-22	Sep-24	Sep-24
East Au Gres R. (lentic)	Never	Jun-22	Jun-86
Au Gres R.	Sep-18	Sep-24	Jun-19
Rifle R.	Aug-24	May-24	Aug-24
Saginaw R.			

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Shiawassee R.	May-21	Sep-24	May-24
Cass R.	Jun-22	Oct-24	Oct-24
Flint R.	Never	Jun-22	Jul-14
Armstrong Cr.	May-15	May-24	Jul-14
Tittabawassee R.	Jun-18	Aug-23	Aug-22
Sanford Dam upstream	Never	Sep-22	Sep-22
Black Creek	May-23	Jul-23	Aug-22
Molasses River	May-23	Oct-24	Oct-24
Chippewa R.	May-23	Oct-24	Oct-24
Chippewa R. gravel pits	May-23	Jun-24	Jun-24
Pine R.	Jun-22	Aug-24	Jul-23
Carroll Cr.	May-23	Aug-24	Aug-22
Big Salt R.	Jun-22	Aug-24	Oct-21
Rock Falls Cr.	Never	Jul-24	Jun-69
Elm Creek	Never	Jul-23	Jul-63
Cherry Cr.	Never	May-23	Jul-77
Mill Cr.	May-85	May-23	Sep-13

Table 19. Details on application of granular Bayluscide to tributaries and lentic areas of Lake Huron for larval assessment purposes during 2024.

Tributary	Bayluscide(kg)[1]	Area Surveyed (ha)
Canada		
Root R. (lentic)	1.42	0.30
Garden R. (lentic)	0.71	0.15
Watson Cr.	1.42	0.30
Thessalon R.	0.71	0.15
Mississagi R.	2.84	0.60
Whitefish R.	0.71	0.15
H-267	0.71	0.15
Blue Jay Cr.	1.42	0.30
French R.	7.97	1.68
Seguin R.	0.71	0.15
Musquash R.	0.95	0.20
Total (Canada)	**19.57**	**4.13**
United States		
Bear Lake Outlet (lentic)	1.96	0.41
Joe Straw Creek (lentic)	1.71	0.36
Albany Creek (lentic)	1.47	0.31
Trout Creek (lentic)	1.96	0.41
McKay Creek (lentic)	1.96	0.41
Hessel Creek (lentic)	1.96	0.41
Steeles Creek (lentic)	0.98	0.21
Pine River (lentic)	2.45	0.52
Carp River (lentic)	2.45	0.52

Tributary	Bayluscide(kg)[1]	Area Surveyed (ha)
Cheboygan River	1.68	0.30
Greene Creek (lentic)	0.28	0.05
Long Lake Creek (Devils Lake)	4.48	0.80
Black River (lentic)	1.68	0.30
Saginaw River (Chippewa River)	3.36	0.60
Total (United States)	**28.38**	**5.61**
Total for Lake	**47.95**	**9.74**

[1]Lampricide quantities are reported in kg active ingredient.

Lake Erie

- Larval assessments were conducted in 55 tributaries (7 Canada, 48 U.S.). The status of larval sea lamprey in historically infested Lake Erie tributaries and lentic areas is presented in Table 20.

- Surveys to estimate larval sea lamprey abundance were conducted in three tributaries (1 Canada, 2 U.S.) and zero lentic areas.

- Surveys to detect the presence of new larval sea lamprey populations were conducted in 38 tributaries (1 Canada, 37 U.S.). No new infestations were found.

- Surveys to evaluate barrier effectiveness were conducted in Big Creek, Big Otter Creek, Forestville Creek, and Young's Creek (Canada), and Black, Clinton, Huron, and Sandusky rivers and River Raisin (U.S.). An infestation in Paint Creek was found in the Clinton River upstream of Yates Dam. Paint Creek is scheduled for treatment in 2025.

- Larval assessment surveys were conducted in non-wadable lotic areas including the St. Clair River and Young's Creek using 8.98 kg active ingredient of 3.2% gB (6.14 kg Canada, 2.84 kg U.S.; Table 21).

Table 20. Status of larval sea lamprey in Lake Erie tributaries with a history of sea lamprey production.

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Canada			
East Cr.	Jun-87	Jun-22	Jun-13
Catfish Cr.	Apr-16	Jul-24	Apr-15
Bradley Cr.	Apr-16	Jul-24	Oct-15
Silver Cr.	May-18	Jul-23	Jun-17
Big Otter Cr.	Sep-21	Jul-24	Jul-24
South Otter Cr.	Aug-10	Jun-22	Aug-09
Clear Cr.	May-91	Jun-22	May-91
Big Cr.	Jul-21	Jul-24	Jul-24
Forestville Cr.	Aug-13	Jul-24	Jun-13
Normandale Cr.	Jun-87	Jul-21	Apr-08
Fishers Cr.	Jun-87	Jun-22	May-04
Young's Cr.	Aug-13	Jul-24	Jul-24
Ussher's Cr.	Never	Jul-21	Jun-17

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
United States			
Buffalo R.			
Buffalo Cr.	Apr-19	Aug-23	Jul-18
Cayuga Cr.	Apr-19	Aug-23	Jul-18
Cazenovia Cr.	Apr-19	Aug-23	Jul-18
Big Sister Cr.	Apr-15	Aug-24	Jun-14
Delaware Cr.	Jun-13	Jul-21	Jul-12
Cattaraugus Cr.	May-22	Aug-24	Aug-24
Lentic Lake Erie	Never	Aug-24	Aug-12
Halfway Br.	Oct-86	Jul-21	Jul-85
Canadaway Cr.	May-16	Aug-23	May-16
Chautauqua Cr.	Never	Aug-23	Jul-12
Crooked Cr.	Apr-19	Aug-24	Aug-24
Racoon Cr.	May-22	Aug-23	Jul-21
Conneaut Cr.	Apr-24	Aug-24	Aug-24
Conneaut harbor	Never	Sep-19	Jul-16
Wheeler Cr.	Never	Jul-19	Oct-87
Grand R.	Apr-22	Aug-24	Aug-23
Fairport harbor	Never	Sep-19	Jun-87
Chagrin R.	Never	Sep-24	Sep-21
Huron R.	May-18	Jun-24	May-18
River Raisin	Never	Jun-24	Sep-23
Lake St. Clair			
St. Clair R.	Never	Jun-24	Jun-24
Black R.	Never	Jul-24	Jul-07
Pine R.	Apr-88	Jul-24	Jun-16
Belle R.	Never	Jun-24	May-96
Clinton R.	Never	Jun-24	May-17
Paint Cr.	May-15	Jun-24	Jun-24

Table 21. Details on application of granular Bayluscide to tributaries and lentic areas of Lake Erie for larval assessment purposes during 2024.

Tributary	Bayluscide(kg)[1]	Area Surveyed (ha)
Canada		
St. Clair R.	5.67	1.20
Young's Cr.	0.47	0.10
Total (Canada)	**6.14**	**1.30**
United States		
Cattaraugus Cr. (lotic)	1.66	0.35
St. Clair R.	1.18	0.25
Total (United States)	**2.84**	**0.60**
Total for Lake	**8.98**	**1.9**

[1]Lampricide quantities are reported in kg active ingredient.

Lake Ontario

- Larval sea lamprey in historically infested Lake Ontario tributaries and lentic areas is presented in Table 22.

- Surveys to estimate larval sea lamprey abundance were conducted in 11 tributaries (6 Canada, 5 U.S.).

- Surveys to detect new larval sea lamprey populations were conducted in eight tributaries (7 Canada, 1 U.S.). A new sea lamprey population was detected on the Ganaraska River (Canada).

- Surveys to evaluate barrier effectiveness were conducted in Bronte Creek, Credit River, Port Britain Creek, Salmon River, Shelter Valley (Canada), Catfish Creek, Little Salmon River, Scriba Creek, and Oswego River (U.S.). Sea lampreys were caught upstream of the sea lamprey barrier on Shelter Valley Creek.

- Larval assessment surveys were conducted in non-wadable lotic areas including the Welland River, Humber River, Ganaraska River, Trent River, Moira River, Salmon River (Canada), Scriba Creek, and Oswego River (U.S.) 8.27 kg active ingredient of 3.2% gB (7.56 kg Canada, 0.71 kg U.S.; Table 23).

Table 22. Status of larval sea lamprey in Lake Ontario tributaries with a history of sea lamprey production.

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Canada			
Niagara R.	Never	May-22	Jun-14
Ancaster Cr.	May-03	Jul-24	Jun-15
Grindstone Cr.	Never	Jul-23	Jun-14
Bronte Cr.	May-22	Sep-24	Sep-24
Sixteen Mile Cr.	Jun-82	Aug-23	May-05
Credit R.	Jul-22	Sep-24	Sep-24
Humber R.	Never	May-24	Never
Rouge R.	Jun-11	Oct-23	Oct-23
Little Rouge. R.	May-24	Oct-23	Oct-23
Petticoat Cr.	Sep-04	Aug-23	Jun-16
Duffins Cr.	Apr-24	Aug-23	Aug-23
Duffins Cr. (lentic)	Never	Aug-15	Aug-15
Carruthers Cr.	Sep-76	Aug-23	Jul-78
Lynde Cr.	Apr-22	Sep-24	Sep-24
Oshawa Cr.	Apr-24	Aug-23	Aug-23
Oshawa Cr. (lentic)	Never	Jul-13	Oct-81
Farewell Cr.	Apr-22	Sep-24	Sep-24
Bowmanville Cr.	Apr-24	Aug-23	Aug-23
Wilmot Cr.	Apr-24	Aug-23	Aug-23
Wilmot Cr. (lentic)	Never	Aug-11	Aug-11
Graham Cr.	Aug-21	Aug-23	Jul-21
Wesleyville Cr.	Oct-02	Jun-21	May-04
Port Britain Cr.	Apr-19	May-24	Jun-21
Ganaraska R.	Never	May-24	May-24

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Gage Cr.	May-71	Jun-22	Apr-71
Cobourg Br.	Oct-96	Aug-23	Jul-18
Covert Cr.	Jul-22	Aug-23	Jun-21
Grafton Cr.	Apr-24	Oct-23	Oct-23
Shelter Valley Cr.	Oct-21	Aug-24	Aug-24
Colborne Cr.	Apr-24	Jun-21	Jun-21
Salem Cr.	Apr-24	Aug-23	Aug-23
Proctor Cr.	Apr-24	Oct-23	Oct-23
Smithfield Cr.	Sep-86	Jun-22	May-86
Trent R. (canal)	Sep-11	May-24	May-24
Mayhew Cr.	Jul-20	Aug-23	Jun-21
Moira R.	Jun-15	May-24	May-24
Salmon R.	Jun-16	May-24	May-24
Napanee R.	Never	Jun-22	Jul-15
United States			
Black R.	Aug-24	May-23	May-23
Black R. (lentic)	May-23	Aug-18	Aug-18
Stony Cr.	Sep-82	Jun-23	May-81
Sandy Cr.	Never	June-23	Apr-10
South Sandy Cr.	May-24	May-23	May-23
Skinner Cr.	Jun-24	Apr-24	Apr-24
Lindsey Cr.	Jun-22	Aug-24	Aug-24
Blind Cr.	May-76	May-23	Oct-75
Little Sandy Cr.	Jun-23	Aug-24	Aug-24
Little Sandy Cr. (lentic)	Never	Aug-18	Aug-18
Deer Cr.	Apr-04	Aug-24	Aug-24
Salmon R.	Jun-23	Jul-22	Jul-22
Orwell Brook	Aug-21	Apr-23	Apr-14
Trout Brook	Jun-23	Aug-24	Aug-24
Altmar Cr.	Jun-18	Apr-23	Aug-19
Grindstone Cr.	May-23	Aug-24	Apr-23
Snake Cr.	May-22	Aug-24	Aug-24
Sage Cr.	May-78	Apr-24	Apr-24
Little Salmon R.	Jun-24	Apr-24	Apr-24
Butterfly Cr.	May-72	May-23	Jun-70
Catfish Cr.	Jun-22	Aug-24	Jun-23
Oswego R.			
Black Cr.	May-81	Aug-21	Jun-04
Big Bay Cr.	Sep-93	Aug-21	Aug-94
Scriba Cr.	May-19	Aug-24	Aug-24
Fish Cr.	Jun-23	Aug-24	Aug-24
Carpenter Br.	May-94	Aug-21	Apr-94
Putnam Br.			
Coldsprings Cr.	May-96	Jul-22	Apr-05
Hall Br.	Never	Aug-21	Aug-77
Crane Br.	Never	Aug-21	Jun-81
Owasco Outlet	Jun-19	Jul-22	Jul-22
Rice Cr.	May-72	May-23	Jun-70
Eight Mile Cr.	May-24	Apr-24	Apr-24
Nine Mile Cr.	Jun-22	Aug-24	Aug-24

Tributary	Last Treated	Last Surveyed	Last Survey Showing Infestation
Sterling Cr.	May-24	Apr-24	Apr-24
Unnamed Cr.	May-24	Apr-24	Apr-24
Blind Sodus Cr.	May-78	May-23	May-23
Red Cr.	Apr-18	May-23	May-23
Wolcott Cr.	May-79	Jun-23	Jun-23
Sodus Cr.	Apr-15	Aug-24	Jun-23
Forest Lawn Cr.	Never	Jun-23	Aug-21
Irondequoit Cr.	Never	Jul-22	Apr-09
Larkin Cr.	Never	Jul-22	May-07
Northrup Cr.	Never	Jul-22	Aug-78
Salmon Cr.	Apr-05	Jun-23	Aug-17
Sandy Cr.	Apr-14	Jun-23	Aug-14
Oak Orchard Cr.			
Marsh Cr.	Apr-14	Jun-23	Aug-14
Johnson Cr.	Apr-10	Jun-23	Jun-09
Third Cr.	May-72	Jun-23	Sep-72
First Cr.	May-95	Jun-23	Sep-94

Table 23. Details on application of granular Bayluscide to tributaries and lentic areas of Lake Ontario for larval assessment purposes during 2024.

Tributary	Bayluscide(kg)[1]	Area Surveyed (ha)
Canada		
Welland R.	0.95	0.20
Humber R.	1.42	0.30
Ganaraska R.	0.95	0.20
Trent R.	1.42	0.30
Moira R.	1.42	0.30
Salmon R.	1.42	0.30
Total (Canada)	**7.56**	**1.60**
United States		
Scriba Cr., Oswego R.	0.71	0.15
Total (United States)	**0.71**	**0.15**
Total for Lake	**8.27**	**1.75**

Juvenile Assessment

The juvenile life stage is assessed through the interpretation of marking rates by feeding juvenile sea lamprey on lake trout. Used in conjunction with adult sea lamprey abundance to annually evaluate the performance of the SLCP, marking rates on lake trout are contrasted against the target set for each lake. Marking rates on lake trout are estimated from fisheries assessments conducted by state, provincial, tribal, and federal fishery management agencies associated with each lake, and are updated when the

data become available. These data provide a metric of the mortality inflicted on lake trout on a lake-wide basis.

Lake Superior

- Lake trout marking data for Lake Superior are provided by the MIDNR, Minnesota Department of Natural Resources (MNDNR), Wisconsin Department of Natural Resources (WIDNR), GLIFWC, Chippewa-Ottawa Resource Authority (CORA), Keweenaw Bay Indian Community (KBIC), Grand Portage Band of Lake Superior Chippewa Indians, and the Ministry of Natural Resources (MNR). Due to COVID-19 travel restrictions, lake trout marking data was not collected in 2020. Spring assessment data from 2024 is being analyzed.

- Based on standardized spring assessment data, the marking rate during 2023 was 9.6 A1-A3 marks per 100 lake trout >532 mm, which is greater than the target of 5.0 marks per 100 fish (Figure 7).

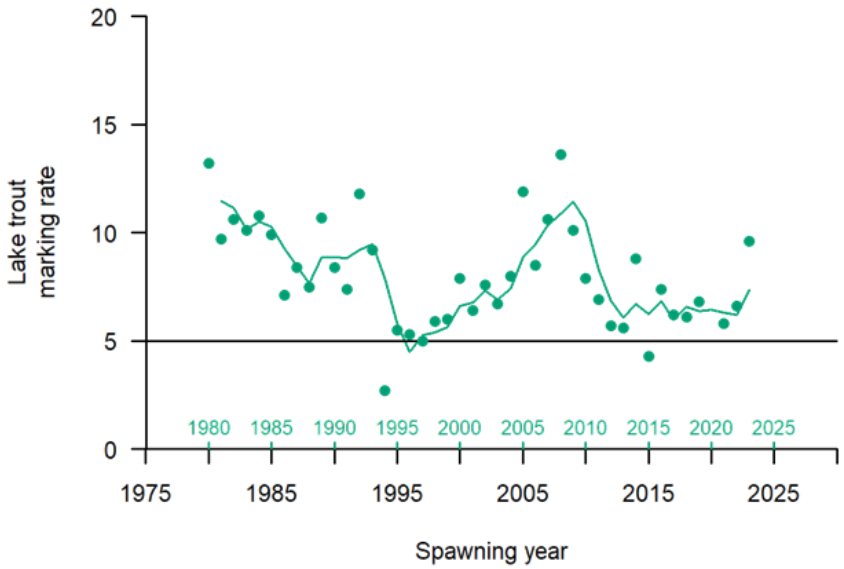

Figure 7. Number of A1-A3 marks per 100 lake trout >532 mm from standardized assessments on Lake Superior plotted against the sea lamprey spawning year, including the three-year moving average (line). The three-year (2021-2023) average marking rate of 7.3 was above the target of 5.0 A1-A3 marks per 100 lake trout >532 mm (horizontal line). A second x-axis shows the year the lake trout were sampled.

Lake Michigan

- Lake trout marking data for Lake Michigan are provided by MIDNR, WIDNR, Illinois Department of Natural Resources, Indiana Department of Natural Resources, CORA, Service, and USGS.

- Based on standardized fall assessment data, the marking rate during 2023 was 2.6 A1-A3 marks per 100 lake trout >532 mm, which is less than the target of 5.0 marks per 100 fish (Figure 8). Fall assessment data from 2024 is being analyzed.

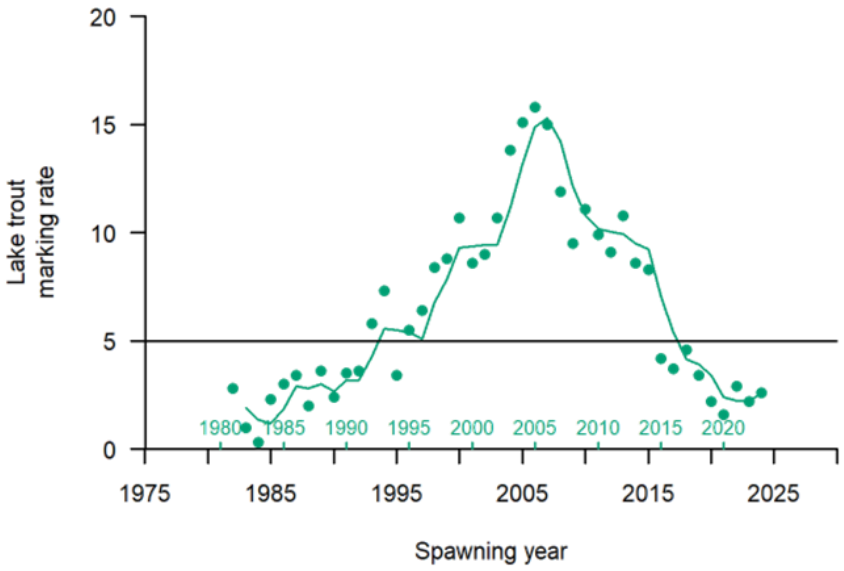

Figure 8. Number of A1-A3 marks per 100 lake trout >532 mm from standardized assessments on Lake Michigan during August-November plotted against the sea lamprey spawning year, including the three-year moving average (line). The three-year (2021-2023) average marking rate of 2.6 is less than the target of 5.0 A1-A3 marks per 100 lake trout >532 mm (horizontal line). A second x-axis shows the year the lake trout were sampled.

Lake Huron

- Lake trout marking data for Lake Huron are provided by the MIDNR, CORA, USGS, and MNR. Spring assessment data from 2024 is being analyzed.

- Based on standardized spring assessment data, the marking rate during 2023 was 6.4 A1-A3 marks per 100 lake trout >532 mm, which is greater than the target of 5.0 marks per 100 fish. Spring assessment data from 2024 is being analyzed. (Figure 9).

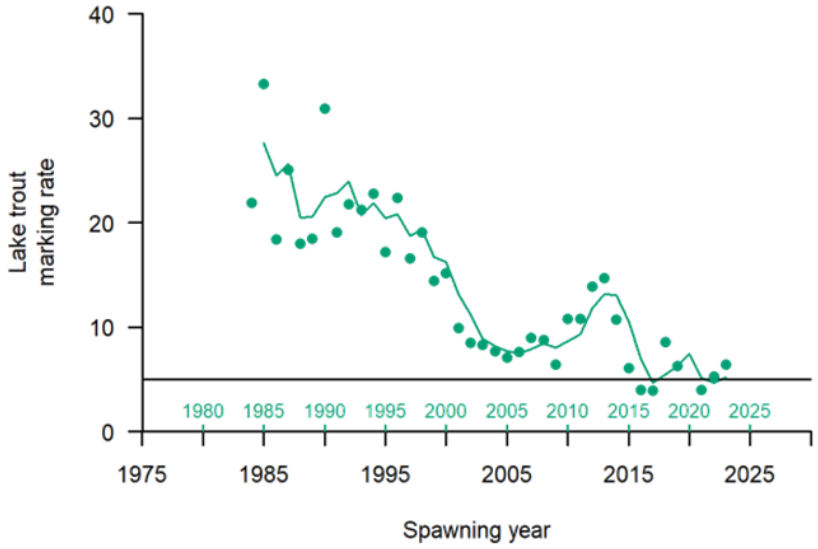

Figure 9. Number of A1-A3 marks per 100 lake trout >532 mm from standardized assessments on Lake Huron plotted against the sea lamprey spawning year, including the three-year moving average (line). The three-year (2021-2023) average marking rate of 5.2 is greater than the target of 5.0 A1-A3 marks per 100 lake trout >532 mm (horizontal line). A second x-axis shows the year the lake trout were sampled.

- Canadian commercial fisheries in northern Lake Huron continued to provide parasitic juvenile sea lamprey data in 2024, along with associated catch information including date, location, and host species. The total number of sea lamprey captured each year, along with effort data provided by commercial fishers to the MNR, is used as an index of juvenile sea lamprey abundance in northern Lake Huron. The effort data from 2024 has yet to be analyzed (Figure 10).

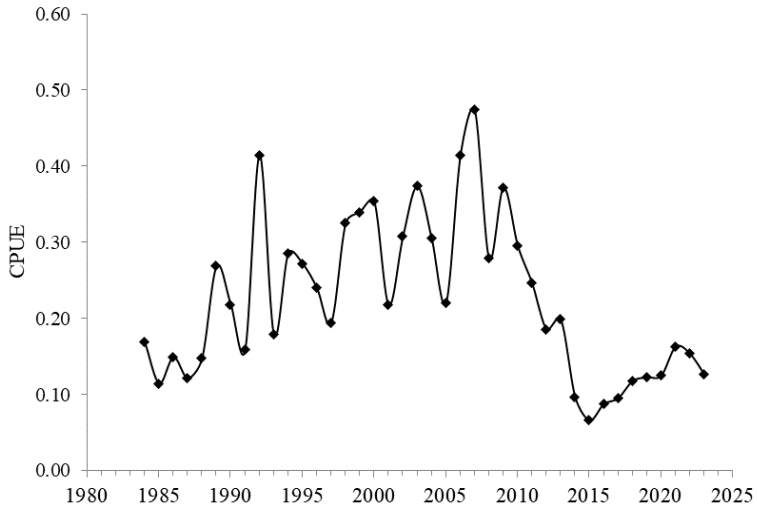

Figure 10. Northern Lake Huron commercial fisheries index showing catch per unit effort (CPUE) (number of parasitic juvenile sea lamprey per km of gillnet per night) for 1984-2023.

Lake Erie

- Lake trout marking data for Lake Erie are provided by the NYDEC, Pennsylvania Fish and Boat Commission (PAFBC), USGS, and MNR.

- Based on standardized fall assessment data, the marking rate during 2023 was 8.3 A1-A3 marks per 100 lake trout >532 mm, which is less than the target of 5.0 marks per 100 fish. Fall assessment data from 2024 is being analyzed (Figure 11).

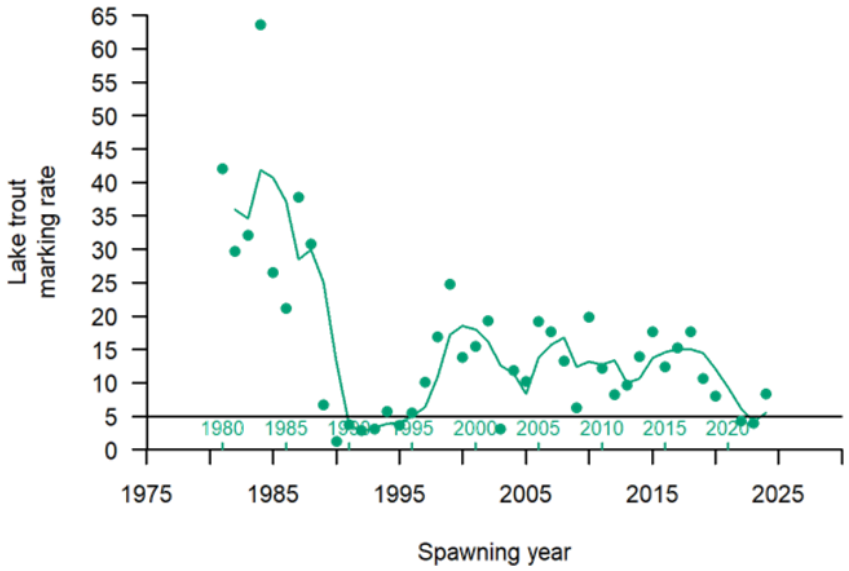

Figure 11. Number of A1-A3 marks per 100 lake trout >532 mm from standardized assessments on Lake Erie plotted against the sea lamprey spawning year, including the three-year moving average (line). The three-year (2021-2023) average marking rate of 5.5 is greater than the target of 5.0 A1-A3 marks per 100 lake trout >532 mm (horizontal line). A second x-axis shows the year the lake trout were sampled.

Lake Ontario

- Lake trout marking data for Lake Ontario are provided by USGS, MNR, and NYDEC.

- Based on standardized fall assessment data, the marking rate during 2023 was 2.3 A1 marks per 100 lake trout >431 mm which is greater than the target of 2.0 A1 marks per 100 lake trout target. Fall assessment data from 2024 is being analyzed (Figure 12).

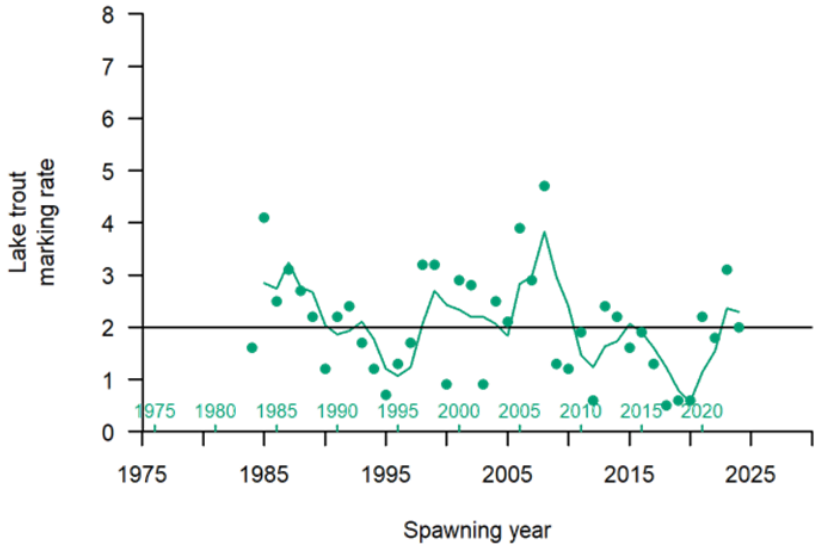

Figure 12. Number of A1 marks per 100 lake trout >431 mm from standardized assessments on Lake Ontario plotted against the sea lamprey spawning year, including the three-year moving average (line). The three-year (2021-2023) average marking rate of 2.3 is greater than target of 2.0 A1 marks per 100 lake trout >431 mm (horizontal line). A second x-axis shows the year the lake trout were surveyed.

Adult Assessment

Assessment traps used to intercept adult sea lampreys during the spawning migration are operated throughout the Great Lakes basin, to remove sea lamprey from rivers, facilitate passage of native fish, and generate mark-recapture estimates of adult sea lamprey populations (Figure 13). An annual lake-wide index of adult sea lamprey abundance is derived by summing individual abundance estimates from assessment traps operated in a specific suite of streams (index streams) during spring and early summer. Stream-specific abundance estimates are derived using Petersen mark-recapture methods. In the absence of a stream-specific estimate due to an insufficient number of marked or recaptured sea lamprey, population abundance for that stream and year is estimated using a model based on trap efficiency and dynamics of abundance from other tributaries. The index targets are estimated as the mean of indices during a period within each lake when marking rate was considered acceptable or the percentage of the mean that would be deemed acceptable.

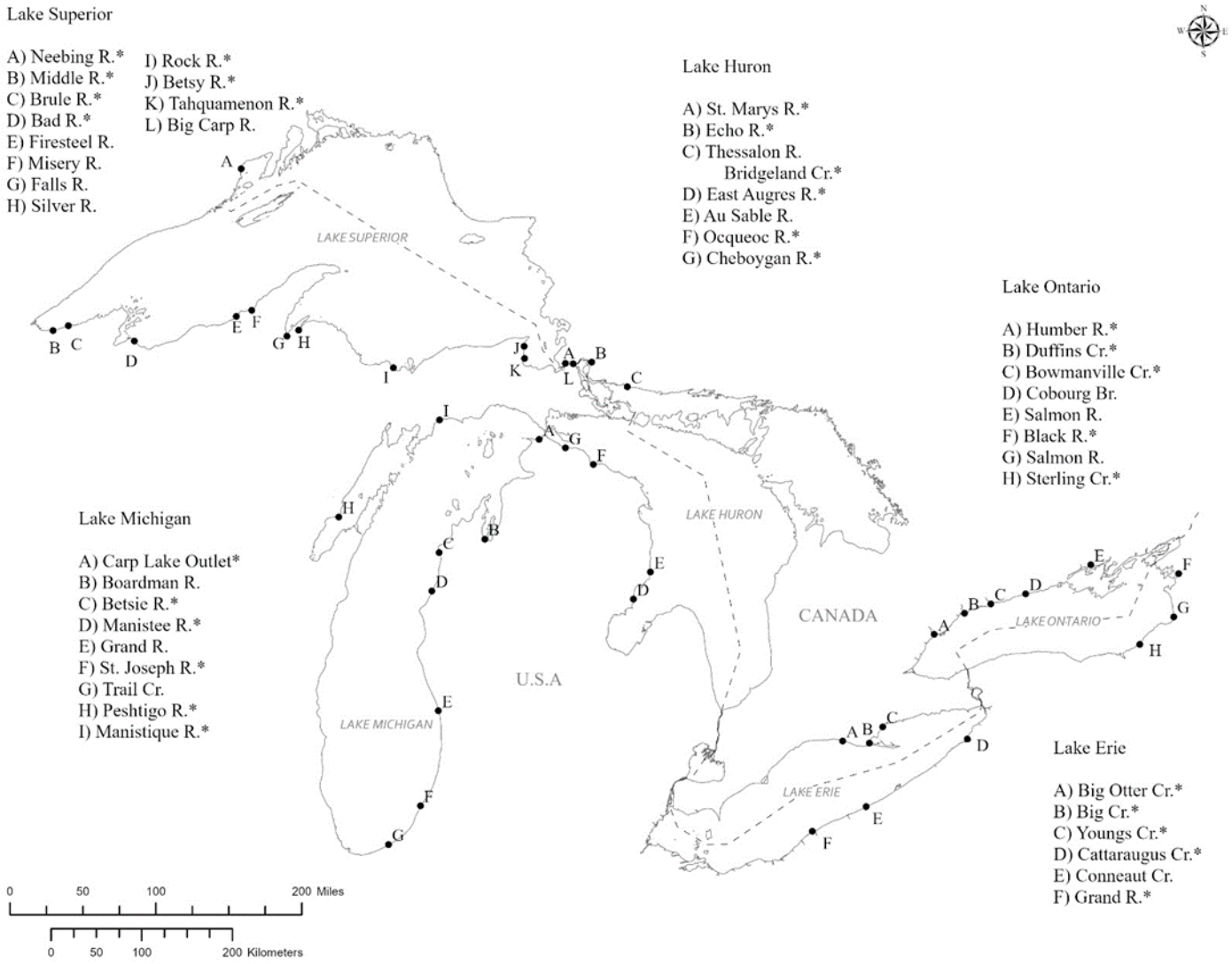

Figure 13. Locations of tributaries where assessment traps were operated during 2024. An asterisk (*) indicates index locations.

Lake Superior

- Adult sea lampreys (n=8,876) were captured in 12 tributaries during 2024, 7 of which were index locations (Table 24, Figure 13). Adult population estimates based on mark-recapture data were obtained from all seven index streams.

- The index of adult sea lamprey abundance was 55,551 (95% CI: 52,498 – 58,604*)*, which is greater than the target of 10,421 (Figure 14).

- Adult sea lamprey migrations were assessed in the Bad, Brule, Firesteel, Middle, Misery, and Silver rivers through cooperative agreements with GLIFWC and KBIC.

- A barrier-integrated permanent trap will replace portable traps on the Neebing River for the 2025 trapping season to improve trapping efficiency and safety (cover photo).

Table 24. Information regarding adult sea lamprey captured in assessment traps or nets in tributaries of Lake Superior during 2024 (letter in parentheses corresponds to streams in Figure 13).

Tributary	Number Caught	Adult Estimate	Trap Efficiency (%)	Number Sampled[1]	Percent Males[2]	Mean Length (mm)		Mean Weight (g)	
						Males	Females	Males	Females
Canada									
Neebing R. (A)	35	53	65	23	61	412	430	161	202
Big Carp R.[3] (L)	13	---	---	8	75	484	444	269	242
Total or Mean (Canada)	**48**	---	---	**31**	**65**	**434**	**432**	**194**	**209**
United States									
Tahquamenon R. (K)	1,906	10,714	17	78	81	458	440	225	222
Betsy R. (J)	514	2,179	20	75	60	459	447	231	220
Rock R. (I)	327	705	46	68	57	439	444	186	206
Silver R.[3] (H)	2	---	---	---	---	---	---	---	---
Falls R.[3] (G)	5	---	---	---	---	---	---	---	---
Misery R.[3] (F)	198	---	---	1	100	439	---	208	---
Firesteel R.[3] (E)	35	---	---	---	---	---	---	---	---
Bad R. (J)	1,017	12,848	8	28	25	415	409	158	161
Brule R. (K)	4,149	19,442	21	123	47	434	438	208	206
Middle R. (B)	675	9,765	7	29	31	447	423	235	202
Total or Mean (U.S.)	**8,828**	---	---	**402**	**55**	**447**	**435**	**213**	**204**
Total or Mean (for Lake)	**8,876**	**---**	**---**	**433**	**56**	**446**	**435**	**212**	**204**

[1]The number of recaptured adult sea lamprey used to determine percent males, mean length, and mean weight, [2]Gender was determined using external characteristics, [3]Not an index location

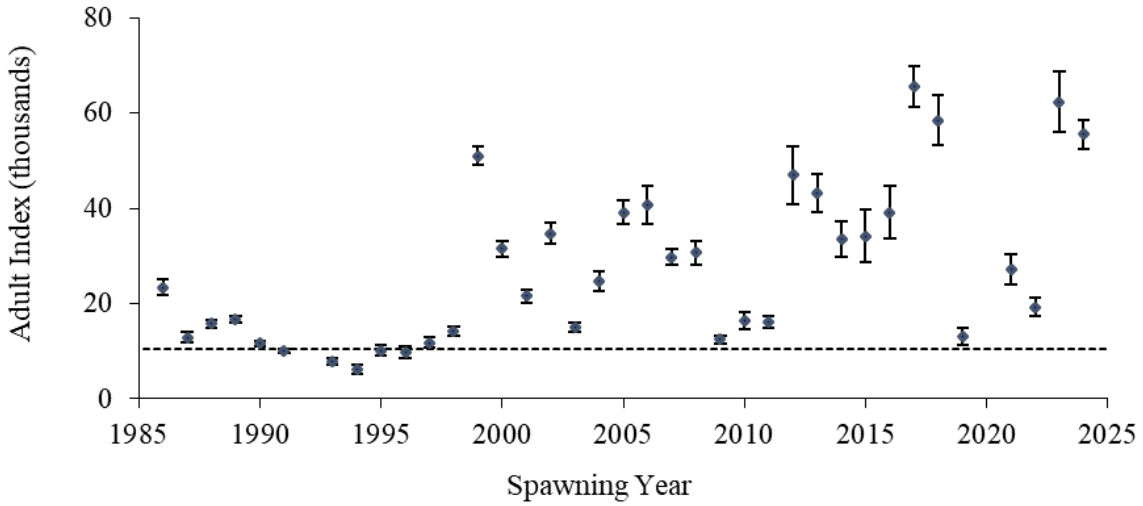

Figure 14. Index estimates with 95% confidence intervals of adult sea lampreys in Lake Superior. The target of 10,421 is represented by the dotted horizontal line. The index target was estimated as the mean of indices during a period with acceptable marking rates (1994-1998).

Lake Michigan

- Adult sea lampreys (n=11,016) were captured in 9 tributaries during 2024, 6 of which were index locations (Table 25, Figure 13). Adult population estimates based on mark-recapture data were obtained from all six index streams.

- The index of adult sea lamprey abundance was 24,799 (95% CI: 23,907 – 25,691), which is greater than the target of 20,526 (Figure 15). The adult index target for Lake Michigan decreased from 34,982 in 2023 to 20,526 in 2024. This revision was made to reflect the time from 2015-2019 when wounding was below 5.0 marks per 100 lake trout >532 mm and adult index estimates were available. The revised target was approved by the during the December 2023 Commission interim meeting and instituted in SLCP reports in fall of 2024.

- Adult assessment traps and fyke nets set on the Grand River captured 193 sea lampreys resulting in a stream-wide population estimate of 675 lampreys. The 6th Street Dam trap attributed to 100% of the total catch.

- Adult assessment traps were operated in the Boardman-Ottaway River through a cooperative agreement with the Grand Traverse Band of Ottawa and Chippewa Indians.

- Service staff modified operations at the Big Manistee River trap site to improve recapture rates. The mid-stream trap entrance was reopened, and a divider was added to the trap to determine the number of animals captured from both trap entrances. A total of 960 migrating adult sea lamprey were captured in 2024 with the reopened entrance capturing 24% of the total catch. Recapture rates improved from 3% in 2023 to 17% in 2024. The 2024 design modifications will be used during the 2025 trapping season.

- The Little Manistee River permanent trap construction will begin during 2025 as part of the weir spillway renovation. The project is expected to be completed in 2026.

Table 25. Information regarding adult sea lamprey captured in assessment traps or nets in tributaries of Lake Michigan during 2024 (letter in parentheses corresponds to stream in Figure 13).

Tributary	Number Caught	Adult Estimate	Trap Efficiency (%)	Number Sampled [1]	Percent Males[2]	Mean Length (mm) Males	Mean Length (mm) Females	Mean Weight (g) Males	Mean Weight (g) Females
Manistique R.(I)	5,972	11,630	51	203	49	504	504	272	291
Peshtigo R. (H)	1,570	3,216	49	81	43	510	515	277	285
Carp Lake Outlet (A)	1,081	1,797	60	85	52	482	472	236	231
Boardman R.[3] (B)	90	277	31	27	70	477	465	251	246
Betsie R. (C)	692	1,658	42	105	59	487	494	261	279
Big Manistee R. (D)	960	5,558	17	69	55	488	503	262	301
Grand R.(E)[3]	193	675	27	53	45	509	507	287	285
St. Joseph R. (F)	256	1,529	16	36	42	488	504	259	273
Trail Cr.[3] (G)	202	---	---	---	---	---	---	---	---
Total or Mean (for lake)	**11,016**	**---**	**---**	**659**	**51**	**495**	**499**	**264**	**279**

[1]The number of sea lamprey used to determine percent males, mean length, and mean weight, [2]Gender was determined by using external characteristics, [3]Not an index location.

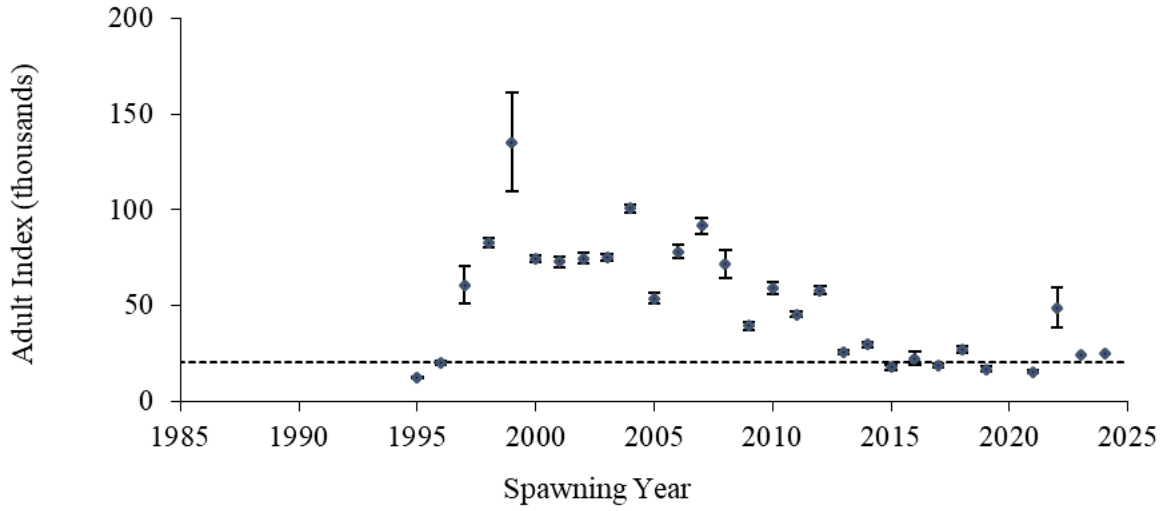

Figure 15. Index estimates with 95% confidence intervals of adult sea lampreys in Lake Michigan. The dotted horizontal line represents the target of 20,526. The index target was estimated as the mean of indices during a period with acceptable marking rates (2015-2019)**.**

Lake Huron

- Adult sea lampreys (n=20,483) were trapped in 6 tributaries during 2024, all of which were index locations (Table 26, Figure 13). Adult population estimates were generated for all six index streams using mark-recapture data.

- The index of adult sea lamprey abundance was 39,974 (95% CI: 38,378 – 41,570), which is greater than the target of 31,274 (Figure 16).

Table 26. Information regarding adult sea lamprey captured in assessment traps or nets in tributaries of Lake Huron during 2024 (letter in parentheses corresponds to stream in Figure 13).

Tributary	Number Caught	Adult Estimate	Trap Efficiency (%)	Number Sampled[1]	Percent Males[2]	Mean Length (mm) Males	Mean Length (mm) Females	Mean Weight (g) Males	Mean Weight (g) Females
Canada									
St. Marys R. (A)	2,553	6,507	39	81	64	492	479	256	252
Echo R. (B)	1,929	6,183	31	101	51	481	492	247	261
Thessalon R. (C) Bridgeland Cr.	2,512	3,410	73	163	66	475	476	227	230
Total or Mean (Canada)	**6,994**	---	---	**345**	**61**	**480**	**482**	**239**	**246**
United States									
Cheboygan R. (G)	10,923	14,832	74	283	54	491	490	249	259
Ocqueoc R. (F)	2,210	4,550	48	84	48	467	476	223	234
East Au Gres R. (D)	356	4,401	7	10	90	489	460	241	190
St. Marys R. (A)	(Canada)	(Canada)	(Canada)	---	---	---	---	---	---
Total or Mean (U.S.)	**13,489**	---	---	**377**	**54**	**486**	**486**	**244**	**253**
Total or Mean (for Lake)	**20,483**	**---**	---	**722**	**57**	**483**	**485**	**241**	**250**

[1]The number of sea lamprey used to determine percent males, mean length, and mean weight, [2]Gender was determined using external characteristics.
[3] Not an index location.

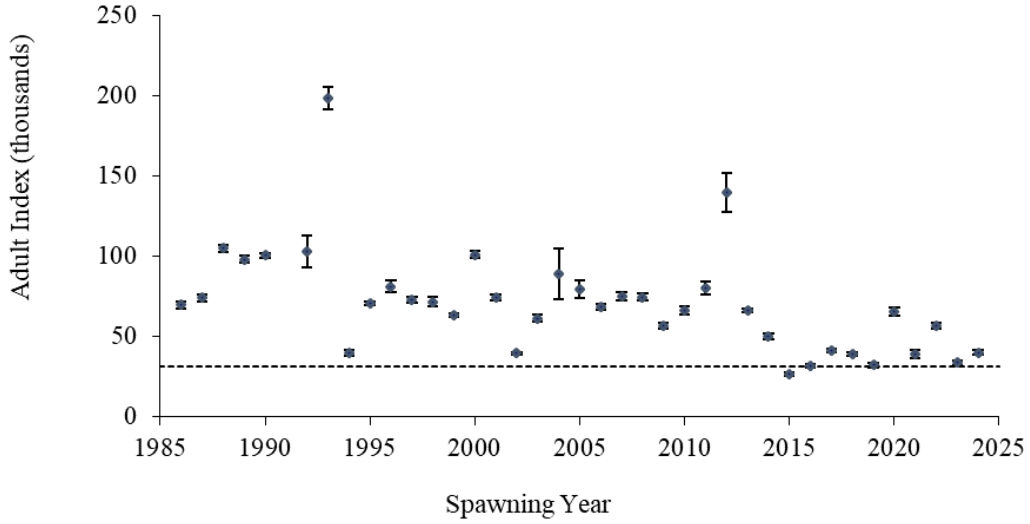

Figure 16. Index estimates with 95% confidence intervals of adult sea lampreys in Lake Huron. The horizontal dotted line represents the index target of 31,274. The index target was estimated as 0.25 times the mean of indices between 1989 and 1993.

Lake Erie

- Adult sea lampreys (n=410) were trapped in 5 index streams in 2024 (Table 27, Figure 13). Adult population estimates based on mark-recapture data were obtained from four index streams. The population estimate was modeled for Cattaraugus Creek due to insufficient recaptures of marked sea lamprey.

- The index of adult sea lamprey abundance was 870 (95% CI: 801 – 938), which is less than the target of 3,263 (Figure 17).

- Fyke nets were deployed in Conneaut Creek during the spawning migration; no lampreys were captured. A seasonal electric barrier was operated from 2022 to 2024 to determine if it would be a feasible alternative control tool to block lamprey from infesting the upper reaches of the creek. Larval sea lampreys have not been found upstream of the seasonal electric barrier since it was deployed in 2022.

Table 27. Information regarding adult sea lamprey captured in assessment traps or nets in tributaries of Lake Erie during 2024 (letter in parentheses corresponds to stream in Figure 13).

Tributary	Number Caught	Adult Estimate	Trap Efficiency (%)	Number Sampled[1]	Percent Males[2]	Mean Length (mm) Males	Mean Length (mm) Females	Mean Weight (g) Males	Mean Weight (g) Females
Canada									
Big Otter Cr. (A)									
Little Otter Cr.[4]	21	77	24	5	60	462	490	223	282
Big Cr. (B)	155	244	61	22	73	505	503	262	273
Young's Cr. (C)[4]	24	116	17	4	75	517	493	357	303

Total or Mean (Canada)	**200**	**---**	**---**	**31**	**71**	**501**	**499**	**269**	**278**
United States									
Cattaraugus Cr. (D)	159	4,710	2	2	50	515	545	256	158
Grand R. (E)	51	121	41	21	90	526	540	353	327
Conneaut Cr. (X)	0	---	---	---	---	---	---	---	---
Total or Mean (U.S.)	**210**	**---**	**---**	**23**	**87**	**526**	**542**	**348**	**270**
Total or Mean (for Lake)	**410**	**---**	**---**	**54**	**78**	**513**	**509**	**307**	**276**

[1]The number of sea lamprey used to determine percent males, mean length, and mean weight. [2] Gender was determined using external characteristics. [3] Not an index location. [4] Model used for population estimate.

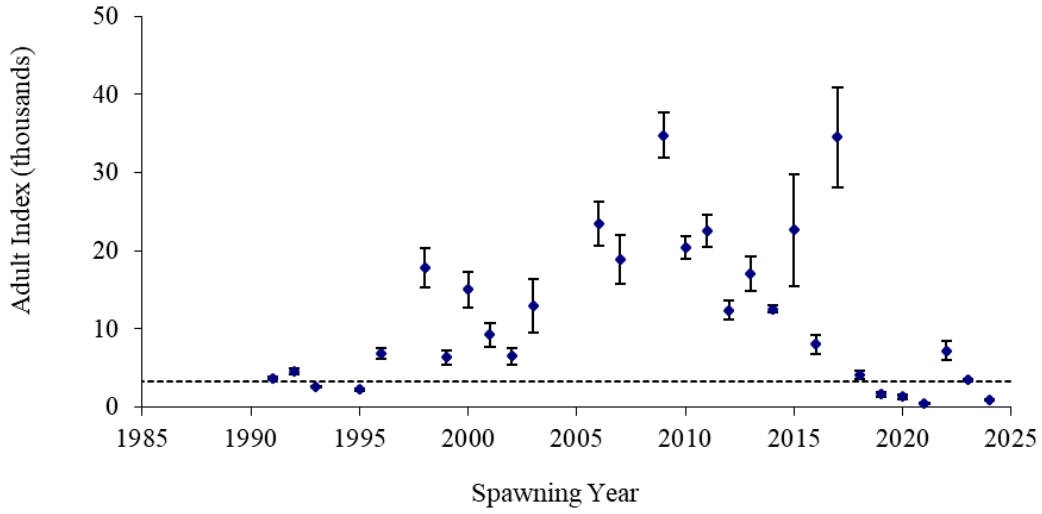

Figure 17. Index estimates with 95% confidence intervals of adult sea lampreys in Lake Erie. The dotted horizontal line represents the index target of 3,263. The index target was estimated as the mean of indices during a period with acceptable marking rate (1991-1995).

Lake Ontario

- Adult sea lampreys (n=7,225) were trapped in eight tributaries during 2024, 5 of which were index locations (Table 28, Figure 13). Adult population estimates based on mark-recapture data were obtained from four index streams. The population estimate was modeled for Duffins Creek due to insufficient recaptures of marked sea lamprey.

- The index of adult sea lamprey abundance was 22,374 (95% CI: 20,813 – 23,935), which is greater than the target of 14,065 (Figure 18).

Table 28. Information regarding adult sea lamprey captured in assessment traps or nets in tributaries of Lake Ontario during 2024 (letter in parentheses corresponds to stream in Figure 13).

Tributary	Number Caught	Adult Estimate	Trap Efficiency (%)	Number Sampled[1]	Percent Males[2]	Mean Length (mm) Males	Mean Length (mm) Females	Mean Weight (g) Males	Mean Weight (g) Females
Canada									
Humber R. (A)	5,609	10,500	53	149	60	491	478	278	263
Duffins Cr. (B)	45	2,603	---	1	100	500	---	327	---
Bowmanville Cr. (C)	317	726	---	64	61	500	501	279	310
Cobourg Cr.[3] (D)	490	---	---	123	54	495	494	269	269
Salmon R.[3] (E)	0	---	---	---	---	---	---	---	---
Total or Mean (Canada)	**6,461**	**---**	**---**	**337**	**58**	**494**	**488**	**275**	**274**
United States									
Black R.[4] (F)	668	7,348	9	41	56	528	435	280	217
Salmon R.(G) Orwell Br.[3]	0	---	---	---	---	---	---	---	---
Sterling Cr. (H)	96	1,197	7	6	17	491	486	301	315
Total or Mean (U.S.)	**764**	**---**	**---**	**47**	**47**	**527**	**446**	**281**	**238**
Total or Mean (for lake)	**7,225**	**---**	**---**	**384**	**57**	**498**	**482**	**276**	**269**

[1]The number of sea lamprey used to determine percent males, mean length, and mean weight, [2]Gender was determined using external characteristics, [3]Not an index location, [4]Model used for population estimate

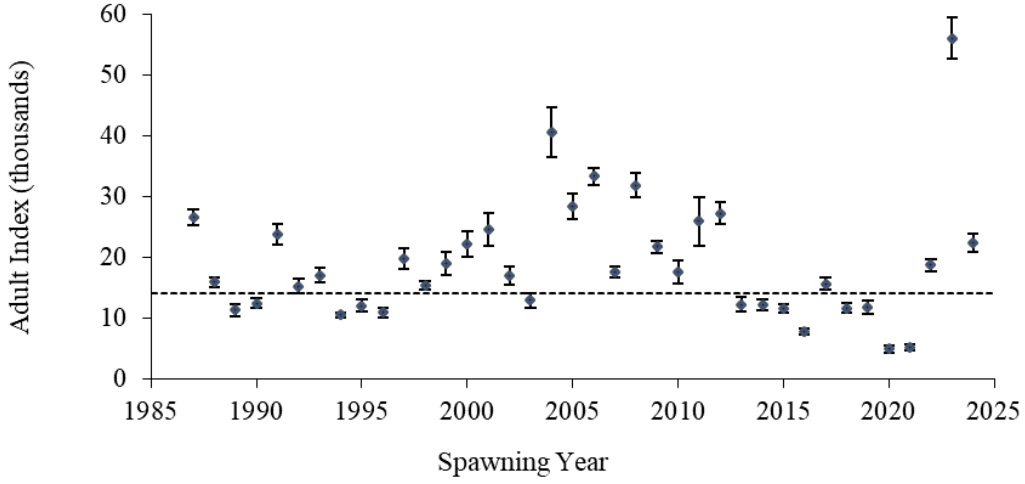

Figure 18. Index estimates with 95% confidence intervals of adult sea lamprey in Lake Ontario. The dotted horizontal line represents the index target of 14,065. The index target was estimated as the mean of indices during a period with acceptable marking rates (1993-1997).

RISK MANAGEMENT AND ENVIRONMENTAL ASSESSMENT

The Risk Management [Service – United States] and Environmental Assessment [DFO (Department) – Canada] teams address environmental and non-target issues related to the implementation of the SLCP in the United States and Canada. This involves coordination with many federal, provincial, and state agencies, tribes, first nations, and others to minimize risk to non-target organisms.

Species at Risk Act (Canada)

Section 73 of the Species at Risk Act (SARA) enables the competent minister to issue permits for activities that may affect threatened and endangered species provided that (a) all alternatives have been considered, (b) all feasible measures have been taken to minimize the impact on the species and its critical habitat, and (c) the activity will not jeopardize the survival or recovery of the species. During 2024, the Department sought and was issued a permit for lampricide applications in 31 waterbodies that overlapped with the known occurrence of the following species at risk:

- Black Redhorse (*Moxostoma duquesnei*), Threatened
- Channel Darter (*Percina copelandi*; Lake Erie/Ontario populations), Endangered
- Northern Madtom (*Noturus stigmosus*), Endangered
- Redside Dace (*Clinostomus elongatus*), Endangered
- Shortnose Cisco (*Coregonus reighardi*), Endangered
- Silver Chub (*Macrohybopis storeriana;* Great Lakes/Upper St. Lawrence populations), Endangered
- Hickorynut (*Obovaria olivaria*), Endangered
- Lilliput (*Toxolasma parvum*), Endangered

Monitoring for sick and dead organisms was conducted during and immediately after each lampricide application. No species at risk were observed.

Endangered Species Act (U.S.)

Section 7 of the Endangered Species Act (ESA) requires that all federal agencies consult with the Service's Ecological Services (ES) to ensure that actions that are federally funded, authorized, permitted, or otherwise carried out will not jeopardize the continued existence of any federally listed (threatened, endangered, proposed, candidate) species or adversely modify designated critical habitat.

Annual Reviews

Endangered species reviews are conducted annually with ES to assess the potential risk of proposed lampricide applications to federally listed species and develop procedures to protect and avoid disturbance.

During 2024, the following ES offices reviewed the effect of scheduled lampricide applications to listed species within their jurisdiction. Concurrence with proposed conservation measures and determinations of "no effect", "may affect, but not likely to adversely affect", or "not likely to jeopardize candidate or proposed species/critical habitat" was received by:

- Michigan Ecological Services Field Office
- Minnesota-Wisconsin Ecological Services Field Office
- Indiana Ecological Services Field Office
- Pennsylvania Ecological Services Field Office
- Ohio Ecological Services Field Office

Programmatic Review

Due to the broad scope of the SLCP, consultation under Section 7 of the ESA involves several states, many listed species, and hundreds of streams. To streamline the consultation process and add predictability for project planning, an informal, draft, SLCP-wide (programmatic) Section 7 review was prepared in coordination with the East Lansing Field Office and submitted to the Midwest Region ES Program for consideration during 2007. The programmatic review evaluates all SLCP activities, identifies potential impacts to protected species and critical habitats, and specifies conservation measures to eliminate or minimize disturbance. No further action has been taken on the review due to limited staffing within the ES Program.

State-Listed Species (U.S.)

Annual Reviews

Reviews are annually conducted with state agencies to fulfill regulatory permit requirements, assess the potential risk to state listed (threatened, endangered, special concern) species, and develop procedures that protect and avoid disturbance.

During 2024, the following state regulatory offices reviewed listed species within their jurisdiction and issued permits to conduct lampricide applications:

- Michigan Department of Natural Resources
- Wisconsin Department of Natural Resources
- Minnesota Department of Natural Resources
- Indiana Department of Natural Resources
- Pennsylvania Department of Environmental Protection
- Ohio Department of Natural Resources

Field Protocols (U.S.)

Field protocols are reviewed and revised annually to protect and avoid disturbance to federal and state listed species located near scheduled SLCP activities. The protocols provide information on each species, their known locations, and detailed conservation measures to be followed:

- Protocol to protect and avoid disturbance to federal- and state-listed endangered, threatened, candidate, proposed, and special concern species, and critical and proposed critical habitats in or near Great Lakes streams scheduled for lampricide treatments in the United States during 2024.

- Protocol to protect and avoid disturbance to federal- and state-listed endangered, threatened, candidate, proposed, and special concern species, and critical and proposed critical habitats in or near Great Lakes streams scheduled for gB assessments in the United States during 2024.

During 2024, 22 federally listed species, one candidate species, one proposed species, the federally de-listed bald eagle (*Haliaeetus leucocephalus*), and three critical habitats were identified in the protocols.

National Environmental Policy Act (U.S.)

Title I and Section 102 of the National Environmental Policy Act (NEPA) requires U.S. federal agencies to incorporate environmental considerations in their planning and decision making, which includes the details of the environmental impact of, and alternatives to, major federal actions significantly affecting the environment. During 2024, NEPA was required for cooperative agreements for the following actions:

- Bad River lampricide treatment
- Trapping for adult sea lampreys on the following streams:
    - Brule River (Lake Superior)
    - Middle River (Lake Superior)
    - Bad River (Lake Superior)
    - Cranberry River (Lake Superior)
    - Potato River (Lake Superior)
    - Boardman River (Lake Michigan)
    - Traverse River (Lake Michigan)
    - St. Marys River (Lake Huron)
    - Cattaraugus Creek (Lake Erie)

Federal Insecticide, Fungicide and Rodenticide Act (U.S.)

Adverse incident reports are prepared to comply with the U.S. Environmental Protection Agency's June 16, 1998, ruling of Section 6(a)(2) of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). This section of FIFRA requires pesticide registrants to report unreasonable adverse effects of their products to the EPA. The Service and Department must report unreasonable adverse effects on humans, domestic animals, fish, wildlife, plants, other non-target organisms, water, and damage to property. Adverse incident reports are required with the observed mortality of a single federally listed threatened, endangered, or candidate species,

and with observed mortalities of ≥50 non-schooling or ≥1,000 schooling fish of any non-target species or taxa during a lampricide application (Table 29).

Table 29. Summary of 6(a)(2) adverse incident reports submitted to the U.S. Environmental Protection Agency during 2024.

Lake	Stream	Species	Number	Comments
Superior	Silver River[2]	Trout-perch (*Percopsis omiscomaycus*)	177	Sensitive
Michigan	Manistique River[2]	Trout-perch	128	Sensitive
	Peshtigo River[1]	Pink salmon (*Oncorhynchus gorbuscha*)	64	Spawning
	Black River[1]	Burrowing mayflies (*Hexagenia limbata*)	106	Sensitive
	Indian River[3]	Rock bass (*Ambloplites rupestris*)	70	Concentrated lampricide[4]
Erie	Conneaut Creek[1]	Stonecat (*Noturus flavus*)	65	Sensitive species
		Rainbow darter (*Etheostoma caeruleum*)	171	Application site
Champlain	Missisquoi River[1]	American bullfrog (*Lithobates catesbeianus*)	97	Cold air temp/ pre-hibernation
		Northern leopard frog (*Lithobates pipiens*)	110	
Seneca	Keuka Outlet	Margined madtom (*Noturus insignis*)	950	Sensitive species/pH shift

[1] TFM, [2]granular Bayluscide, [3]Bayluscide suspension concentrate field test, [4]Bayluscide concentrated downstream of application site by a dead deer in the stream.

Studies and Fieldwork (U.S. and Canada)

Field Investigations

- Hungerford's crawling water beetle – The federally endangered Hungerford's crawling water beetle (*Brychius hungerfordi*) is extant in the East Branch Maple River (EBMR; Emmet County, Michigan). The EBMR is a Supplemental Control Project stream, and the U.S. Geological Survey-Hammond Bay Biological Station requested permission to electrofish for larval sea lampreys. A risk assessment was submitted to the U.S. Fish and Wildlife Service-Michigan Ecological Services Office and included conservation measures to avoid and protect the beetles. ES concurred with the conservation measures but asked that drift nets be placed downstream of the electrofishing sites to capture beetles, so they would not drift into unfavorable habitat. No beetles were collected in the nets during electrofishing.

- Snuffbox mussel – The snuffbox mussel (SBM; *Epioblasma triquetra*) is federally listed as endangered and is extant in the Grand River (Michigan). There is a documented SBM occurrence 300m downstream of Prairie Creek which ranked for a 2024 treatment. A risk assessment was drafted and estimated a concentration ratio reduction from 1.5×MLC (minimum lethal concentration) in Prairie Creek to 0.009×MLC at the SBM site in the Grand River. This was based on the historic average discharge of Prairie Creek (18.6 cfs) and the Grand River (1,924 cfs) during August. During the treatment, alkalinity, pH, and

TFM concentrations were measured at the mouth of Prairie Creek and five sites in the Grand River (along the stream bank) downstream 300m to the SBM site. Concentration ratios averaged 1.24×MLC in Prairie Creek and 1.02×MLC at the SBM site over the five-hour sampling period. The concentration ratio was greater than estimated but did not pose a risk to the SBM or logperch (*Percina caprodes*), the mussel's primary host. Additionally, a pre-treatment fluorescein dye study demonstrated that TFM hugged the stream bank and migrated 5 – 15 feet out into the Grand River. The Grand River is about 400 feet in width at this location and only a small portion (3.75%) of the stream was exposed to TFM.

Non-target Surveys (Treatment)

- Conneaut Creek – The Risk Management Team participated with the Pennsylvania Department of Environmental Protection to conduct non-target mortality surveys in Pennsylvania waters before, during, and after the TFM treatment (April 24 - 28) of Conneaut Creek. About 10 miles of treated stream was surveyed. A total of 324 dead fish and 17 dead mudpuppies (Necturus maculosus) were collected. This included 171 rainbow darters (Etheostoma caeruleum) that died immediately downstream of the primary application site. A total of three live mudpuppies were observed/collected. No glochidia were observed on live and dead mudpuppies.

Non-target Surveys (Barriers)

- The Environmental Assessment Unit sampled four Lake Ontario watersheds in New York (South Sandy Creek, Salmon River; Trout Brook, Little Salmon River and Grindstone Creek) that are being considered for new low-head sea lamprey barriers. The purpose of this sampling is to determine whether there are threatened, endangered, or vulnerable fish species in the watersheds prior to proceeding with barrier planning. No species at risk were found during 2024. Sampling will continue during 2025.

- Streams with purpose-built low-head barriers: sampling was conducted upstream and downstream of barriers on streams in Lake Ontario (2), Lake Erie (3), Lake Huron (1) and Lake Superior (3). The purpose of this periodic sampling is to track long-term changes in fish community composition. Additional data is required before meaningful comparisons can be made.

Toxicity Tests – Salamander Mussel

The U.S. Geological Survey–Upper Midwest Environmental Sciences Center (UMESC) conducted tests to determine the toxicity of TFM to larval (glochidia) and juvenile life stages of the salamander mussel (*Simpsonaias ambigua*). Results are pending.

Garden River First Nations Aquatic Ecosystem Study

In conjunction with the Garden River First Nation (GRFN), the Environmental Assessment Unit continued a multi-year study on Garden, Root, and Echo rivers (northern Lake Huron, Ontario). The purpose of the study is to establish a baseline understanding of these aquatic ecosystems. To

accomplish this, data collection and analyses of habitat, physical characteristics of the systems, invertebrate species, water quality (water chemistry, temperature, and levels), sediment transport, biological characteristics (fish assemblage, distribution, and contaminant concentrations), sea lamprey distribution, and fisheries exploitation measures of species that are important to the GRFN will occur.

- During 2024, fyke nets were deployed in the mainstream of the Echo River before, during, and after the July lampricide treatment to collect fish and larval sea lampreys that were drifting downstream.

TASK FORCE REPORTS

The Commission has four task forces (Lampricide Control, Barrier, Larval Assessment and Trapping). The task forces include agents with expertise in specific program areas, researchers and academics, outside experts, Lake Committee representatives, Commission staff, and other experts as needed. The task forces report to the SLCB, which established their terms of reference and works with them to recommend program direction and funding to the Commission.

The following sections report the purpose, membership, and progress on objectives charged to each task force by the SLCB. Information in parentheses refers to Goals (G) and Strategies (S) from the GLFC Vision 2021-2025 **(https://www.glfc.org/pubs/misc/StrategicVision2021.pdf)**, or Objectives (Obj) for the Task Force, found in Terms of Reference.

Lampricide Control Task Force

Purpose
Maximize the number of sea lamprey killed in individual streams and lentic areas while minimizing costs and impacts on aquatic ecosystems.

2024 Membership
Lori Criger (Chair), Cheryl Kaye, Chris Gagnon, Benson Solomon, Lauren Freitas, Chris Eilers, Aaron Jubar (Service); Bruce Morrison, Shawn Robertson, Christine Boston, Fraser Neave (Department); Jim Luoma, Nick Schloesser, Emma Wickert, Sean Lewandoski (USGS); Michael Wilkie (Wilfred Laurier University); Mike Siefkes, Ted Treska, Chris Freiburger (Commission Secretariat).

Progress towards task force objectives and goals described in the Commission Vision:

Field Season Accomplishments (G:1, S:1; Obj:1,2,4)
- 85/102 stream treatments were completed.
  - Superior: 23/23; Michigan: 25/27; Huron: 21/34; Erie: 1/1; Ontario: 15/17
  - The West Sleeping R. was removed from the treatment list due to lack of recruitment since the last treatment.
  - A total of 15 streams in their entirety have been deferred until 2025 as well as the mainstream portions of the E. Branch Munuscong, Rouge, and Cedar rivers and the lower Conneaut R.
- 28/29 lentic treatments were completed.

- Superior: 21/21; Michigan: 4/4; Huron: 3/4; Erie: 0/0; Ontario: 0/0
- One lentic plot has been deferred until 2025.

- St. Marys River
  - A total of 304.1 ha of high-density larval habitat was scheduled for treatment with gB. Some areas could not be treated due to shallow water or obstructions such as ships or barges. The total area treated was 275 ha which included three plots that were re-treated to address potential residuals.
  - DFO and USFWS staff collaborated to increase efficiency.
  - Plots with heavy vegetation were treated early to increase efficacy and reduce risk to non-target species.
  - Plots located in the State of Michigan were treated after July 1 to protect young lake sturgeon.

Measure effectiveness of lampricide applications (G:1, S:3; Obj:2)

- Lampricide analysis and water chemistry data from treatments completed in 2024 were/are to be reviewed to identify potential areas that did not receive theoretical lethal TFM concentrations during stream treatments. Information is provided to larval assessment to help guide treatment evaluation survey effort and if required, may result in re-treatment.
- Bioassays were conducted on new systems or select streams where there is concern that lampricide concentrations may not be effective late in the season due to elevated water temperatures and/or seasonality effects.
  - A bioassay was initially scheduled to be completed on the Rifle R. to confirm that predicted minimum lethal lampricide concentrations would be effective during the late season treatment. However, it was later decided that there was enough confidence in the historical treatment data to determine effective treatment concentrations.
- Granular Bayluscide Workgroup
  - Issue: Control agents expressed concern about the efficacy of gB (estimated at 75%)
  - Key questions:
    1) What is the field efficacy of gB?
    2) What abiotic and biotic factors affect gB?
  - Workgroup formed to identify specific research needs and potential field studies.
  - Additional laboratory and field tests are necessary to determine the range of gB efficacy. and the most influential/predictive abiotic/biotic factors.
  - Status:
    - Existing field and experimental data continue to be consolidated and reviewed.
    - The Technical Assistance Program (TAP) funded a workshop to encourage collaboration between agents and researchers (workshop held December 2024).
    - Goals of the workshop:
      - Identify internal research capacity
      - Identify appropriate external researchers
      - Identify and prioritize needed laboratory and field research
      - Develop TAPs for the most significant external research needs
- Prediction Chart Expansion
  - Issue: Data to predict MLC in waters of very low or very high alkalinity were not available.
  - Status:

- During 2023, UMESC completed tests to expand the lower end of the prediction chart.
- The upper end of the prediction chart was expanded during 2024.
- The data have compared using the same linear regression as Bills *et al*. (2003) and with more advanced modeling approaches.
- To model and revise the chart as precisely as possible, additional data are required to fill in gaps in the chart where the original regressions extrapolated beyond the bounds of the data.
- Additional tests require the collection of 2,000 larval sea lamprey in the spring of 2025. Source stream TBD.

Evaluate environmental effects of lampricides (Obj:5)

- Sensitive Species – Internal Communication
  - To ensure consistency in both internal and external communication around the expected effects of lampricides on non-targets, the LCTF developed and agreed to the following definition for a sensitive species:

    A species is considered sensitive if the toxicity ratio for that species is <2.0. Toxicity ratio expresses a species sensitivity compared to sea lamprey and is determined by the following equation: observed species LC50/predicted sea lamprey LC99.9. Additionally, if a sensitive species is present in a system during treatment, some mortality is expected even at concentrations < 2.0xMLC.
  - LCTF has added a standing agenda item to discuss species-specific toxicity at each meeting. These discussions will help the task force become more familiar with available research, identify research gaps, and reach consensus on the sensitivity of specific species.
  - Mudpuppies were slated for discussion at the 24-02 meeting.
  - Status: Due to the absence of some key members, the discussion around the sensitivity of mudpuppies was postponed until the 25-01 meeting.
- Salamander Mussel
  - The salamander mussel (SM) was proposed for federal listing in August 2023 and is extant in Conneaut Cr. (PA/OH).
  - Studies results on the toxicity of TFM to the common mudpuppy (SM host) and other freshwater mussels were used to assess the risk of TFM exposure. A biological assessment (BA) was submitted to Ecological Services (ES) ahead of the 2024 treatment of Conneaut Cr. The BA suggests that TFM treatments are not likely to affect the mussel. ES concurred and supported the treatment at proposed concentration ratio of <1.3xMLC.
  - During fall 2024, Genoa Fish Hatchery will collect gravid adult SM from the Chippewa River, WI and aspirate glochidia. Some of the glochidia will be raised to the juvenile life stage.
  - During 2024/2025, UMESC will conduct toxicity tests on SM glochidia and juveniles. The SM is the only species in its genus. Therefore, there is no suitable surrogate mussel species to test glochidia, juvenile, and adult life stages.
  - Funding is requested ($35K) to conduct the work above.

- Snuffbox Mussel (SBM)
  - The SBM is federally listed as endangered and is extant in the Grand R.,MI. There is a documented occurrence of the mussel in the Grand R. ~300 m downstream from the confluence with Prairie Cr.

- Prairie Cr. ranked for treatment in 2024. ES requested a risk assessment for the SBM in the Grand R.
- Concentrations were monitored in the Grand R. downstream from the confluence of Prairie Cr. during treatment. The SBM, if present, would only have been exposed to 1.02xMLC for five hours. No risk posed.

- Hungerford Crawling Water Beetle
  - The federally endangered Hungerford's crawling water beetle (HCWB) is extant in the E. Br. Maple R. (Emmet County, MI).
  - ES did not concur with a 2024 treatment because beetle numbers have declined, and the stream is considered critical habitat. Therefore, the E. Br. was not treated.

- Conneaut Creek: Non-Target Surveys
  - The USFWS Risk Management Team (RMT) participated with the PA Department of Environmental Protection to conduct non-target mortality surveys before, during, and after the TFM treatment (April 24 - 28).
    - About 10 miles of stream were surveyed.
    - 324 fish were collected. The highest non-target mortality was observed immediately below the initial application. Minimal mortality was observed throughout remainder of treatment extent.
  - 22 mudpuppies (19 dead; 3 alive) were collected and checked for glochidia. No glochidia were found.

- Wild Rice
  - Tribal communities both in the U.S. and Canada have recently expressed concern regarding the effects of lampricide on wild rice. Specifically, do lampricides affect seed germination and if the plant uptakes TFM will there be residue in the plant at the time of harvest?
  - Status:
    - Luoma obtained quote from Fort Environmental Studies to conduct early life-stage study on wild rice after exposure to lampricides and hosted a call with USFWS, DFO, and indigenous stakeholders to discuss study design and objectives.
    - The study is to be initiated late 2024/early 2025 and will assess multiple endpoints to wild rice after exposure to various concentrations of TFM.
    - Logistics for field sampling sample wild rice were also explored. The Bad River Tribe plans to expose a sample of wild rice during the 2024 treatment of the Bad River. UMESC will analyze the samples for TFM residue.

Lampricide production and inventory

- Treatment supervisors used the TFM/niclosamide mixture in several streams during 2024 to lessen TFM usage.
- The LCTF continues to support UMESC in the development of a liquid niclosamide formulation that is safer and more suitable for field application.
  - Studies comparing the toxicity of the EC(current formulation) to that of a suspension concentrate (SC; new formulation) have been conducted at UMESC. Report was recently published.
  - UMESC has begun a long-term storage stability study.

    - An Experimental Use Permit (EUP) waiver request was recently approved to field test the new product.
    - Field test will be conducted the first week of October in the Indian R. (Manistique R.). Field crews will examine feasibility for application with existing equipment, compatibility with TFM, and ease of cleanup.
- Liquid TFM
    - Weylchem TFM registration process is ongoing. The product is currently approved for use in the U.S. Approval in Canada is expected July 2025.
    - Iofina TFM has a new manufacturing location in Budapest which will require a registration amendment. The process for the amendment will likely simulate the process required for the Weylchem amendment.
- TFM Bars
    - Availability of the surfactant F-38 is uncertain.
    - Agents continue to stock a two year supply in case there are production issues.
    - UMESC is working to develop an F-38 free formulation and has completed tests with approximately 50 prototypes with 12 different surfactants. Results look promising.

Support research and technical assistance projects in the Lampricide Theme (G:2, Obj: 8,9)
- Continue to support the RMT with conducting studies that evaluate the risk of lampricides to non-target species.
- Revised research priorities in the lampricide theme area. Criger, Treska, and Baker to finalize the top three priorities then present to the SLCB.
- Continue to support Wilkie *et al.* and Schueller *et al.* as they examine temperature and seasonality effects on lampricide efficacy.
- Continue to support and assist with development of research in the lampricide theme area including but not limited to next generation lampricides, lampricide resistance, and species-specific sensitivity to lampricides.

Larval Assessment Task Force

The task force was established in 2012 and combined some objectives from the LATF and the Larval Assessment Work Group (LAWG).

Purpose:
Rank streams and lentic areas for sea lamprey control options and evaluate success of lampricide treatments through assessment of residual larvae.

2024 Membership
Fraser Neave (Chair); Tonia Van Kempen, and Lexi Sumner (Department); Lori Criger, Aaron Jubar, and Becca Philipps (Service); John Hume (MSU); Chris Cahill (Quantitative Fisheries Center, MSU); Sean Lewandoski (USGS); Mike Siefkes, Ted Treska, Carrie Baker, and Chris Freiburger (Commission Secretariat).

Larval Assessment Task Force Objectives:

Identify all sources of larval sea lampreys (G:1; S:2; Obj:1)

- Detection and distribution surveys were conducted in 2024. Field crews delineated infested areas and recommended application points for streams being considered for treatment in 2025. Scheduled surveys on both the Canadian and U.S. sides of the St. Clair River were conducted.
- In 2024, new sea lamprey producing tributaries were detected in Lake Superior (Unnamed Stream S461, and Little Carp River in the Porcupine Mountains) and Lake Ontario (Ganaraska River). In Lake Ontario, Deer Creek was positive for the first time in 18 years; prior to 2006 it was a regular producer.
- Larval surveys conducted in the lentic areas of Munising Bay (Lake Superior) yielded sea lamprey ammocoetes up to 5 km (3 miles) from the river mouth. Additional sampling effort required delineate sea lamprey distributions in the bay.

Measure the efficacy of lampricide applications (G:1; S:3; Obj:1)

- Post-treatment assessments were conducted on streams treated during 2023 and early 2024.
- The 2023 treatment of West Sleeping River was anticipated to have low effectiveness based on treatment observations and was included in the FY24 treatment list as an EJ2. Post-treatment assessments completed in 2024 yielded no sea lamprey catch. Consequently West Sleeping River will not be treated in 2024.

Refine existing protocols for larval assessment and develop new methods (G:2; S:3; Obj:2, 3 and 4)

- Habitat training for full time (all offices) and career-seasonal staff (FWS Marquette and Ludington) offered in-person and led by FWS Ludington staff in March 2024
- LAWG tasked with reviewing the wadable and non-wadable protocols, which will be completed by a subset of larval staff from each office
- Larval Assessment staff continue to work with GLFC Communications staff on the development of a larval lamprey identification guide, which will serve as an important resource for both new and experienced staff at all agent offices. Draft descriptions were reviewed by assessment staff and returned to the GLFC Communications team. A final draft should be available by Fall 2024 or early 2025.
- Larval Assessment staff collected >10,000 larvae to support a variety of GLFC-funded research projects during the spring and summer.

Rank streams and lentic areas for lampricide control (G:2; S:4; Obj:1)

- Ranking surveys, distribution surveys, and where required, habitat assessments were conducted for all streams identified as candidates for treatment in 2025. A new treatment strategy will be implemented in 2025, whereby effort (1,400 staff days) formerly reserved for the Targeted Treatment Strategy of the Upper Lakes will be applied to tributaries further down the Rank List, regardless of lake basin.

- Larval assessment staff from Marquette, Ludington, and Sault Ste. Marie assisted with larval and habitat surveys on streams that are part of the Supplemental Control (SupCon) research project.

Plans for 2025:

Identify all sources of larval sea lampreys (G:1; S:2, Obj:1)

- Conduct detection surveys as possible given higher priority survey needs. When new infestations are found, rank streams for treatment as larval population and size structure warrant.
- Prioritize and conduct distribution surveys on all streams scheduled for treatment during 2025. Conduct distribution surveys on all streams expected to be treated during 2026.
- Conduct granular Bayluscide surveys in the US waters of the St.Clair River delta during 2025.

Measure the efficacy of lampricide applications (G:1; S:3; Obj:1)

- Continue to conduct post-treatment assessments on all treated streams and rank streams when problematic populations of residual sea lampreys are detected

Refine existing protocols for larval assessment and develop new methods (G:2; S:3; Obj:2 and 4)

- Control agents will complete a review of larval assessment protocols and operating procedures; the updated documents will be finalized by early 2025.
- Provide larval assessment support to new and ongoing GLFC-funded research projects including, but not limited to: development of eDNA techniques, TFM seasonality, larval lamprey identification, and other larval procurement needs,
- Work with GLFC Communications staff to finalize the larval lamprey identification guide and facilitate distribution to control agents and partner agencies

Rank streams and lentic areas for lampricide control (G:2; S:4; Obj:1)

- Develop the 2025 treatment list, using the effort formerly reserved for the Targeted Treatment Strategy of the upper lakes towards tributaries further down the Rank, regardless of lake basin
- Continue to work with the Trapping Task Force to identify and target streams for trapping out-migrating juveniles for control. Marquette larval staff identified Cranberry River, Poplar River, and Red Cliff Creek as potential sources for transformers.
- Continue to work with HBBS and Alternative Control and Evaluation staff to survey and evaluate SupCon project streams.

Barrier Task Force

Purpose
The task force was established during April 1991 to coordinate efforts of the Department, the Service, and the USACE on the construction, operation, and maintenance of sea lamprey barriers.

2024 Membership
Matt Symbal (Chair), Pete Hrodey, Kevin Mann, Cheryl Kaye (Service); Bruce Morrison, Gale Bravener, and Tom Pratt (Department); Kevin Meyer and Carl Platz (USACE); Jessica Mistak (MIDNR); David Gonder (OMNRF); Chris Holbrook and Ted Castro-Santos (USGS); Dan Zielinski (Commission); Mike Siefkes, Chris Freiburger, Ted Treska, Carrie Baker (Commission Secretariat).

Progress towards goals described in the Commission Vision:

Goal 1: Suppress sea lamprey populations to target levels.

> **Strategy 5:** Construct and maintain a network of barriers to limit sea lamprey access to spawning habitats.

Construction, Monitoring, and Maintenance Activities of Sea Lamprey Barriers:

- Infrastructure Funding:
    - For FY25, a total of $8.1M has been allocated to US infrastructure projects and $1.9M to Canadian projects. (G:1, S:5)

- Construction:
    - The Sea Lamprey Control Program agents are involved in over 70 sea lamprey barrier projects ranging from feasibility to construction (see attached agency status reports for details). (G:1, S:5)

- Monitoring:
    - Members of the BTF continue to work on organizing barrier project information in a centralized database. The Service is revising the Barrier Inventory and Project Selection System, relational database, to house relevant barrier and project information. This database will define the framework for organizing this information. Retrieving relevant data and project information is on hold until the database and framework has been developed. (G:1, S:5)

    - Members remain engaged in monitoring the status for relicensing Consumers Energy hydro-dams throughout Michigan. Consumers Energy has solicited bids to purchase the dams. Consumers Energy is only interested in selling the dams to companies that are willing to operate them for energy production. The Federal Energy Regulatory Commission is required to approve the any sale of dams and has specific criteria for the company buying the property before the sale can be finalized. Task force member Lisa Walter, GLFC, has established a meeting with

partners directed toward improving information sharing between the groups (G:1, S:5)

- BTF members continue to participate in meetings pertaining to the 6th Street Dam located on the Grand River, Michigan. (G:1, S:5)

- The Great Lakes Aquatic Habitat Framework has been relocated from University of Michigan to Michigan State University and has been updated to an ArcGIS Hub platform. Visual front-end aspects of the platform are being upgraded by a web designer. SLCP agents will be asked annually to provide data used within the framework to keep it updated and relevant. (G:1, S:5)

- Maintenance:
  - SLCP agents continue to complete routine maintenance, inspection, and repair of sea lamprey barriers (see attached agency status reports for details) (G:1, S:5)

- Ensuring Sea Lamprey Blockage at Barriers:
  - SLCP agents continue to pursue projects to limit sea lamprey infestation in Great Lakes tributaries (see attached agency status reports for details) (G:1, S:5)

Protocol Review and Updates

- Safety protocols need to be drafted for all 400+ barriers important to the SLCP. These are high-level business process that provide up-to-date barrier information containing safety, operations, and management practices. These sorts of protocols help to reduce dam owner liability by improving safety. These protocols will be used to guide us and our partners in making decisions on investing into dams as sea lamprey barriers. The GLFC with agents will pursue hiring experienced consultants to assist in drafting these protocols. (G:1, S:5)

Sea Lamprey Barrier Project Prioritization:

- The Service and GLFC continue to refine the infrastructure project list by defining criteria to rank barrier projects within the list. The objective of this is to clearly communicate projects of SLCP interest to partners as well as direct funding allocation. (G:1, S:5)

Goal 2: Increase the effectiveness and efficiency of sea lamprey control to further reduce sea lamprey populations in each Great Lake.

Strategy 4: Implement integrated sea lamprey control strategies for each lake and evaluate their effectiveness.

Sea Lamprey Barrier Research:

- Members of the BTF are working with Heather Dawson's Lab in MSU to investigate the use of the Sea Lamprey Management Strategy Evaluation (SLaMSE) Model for evaluating Great Lakes sea lamprey population responses to barrier removals. A small-

scale investigation on using data from either the Muskegon or Au Sable Rivers (Consumer Energy Dams) is being considered for the modeling exercise. (G:2, S:4)

- The task force completed a close-out discussion on the SLCP Barrier and Trapping Research Theme Review Workshop. Products of this workshop will include a synthesis paper for publication and completion report to the GLFC. (G:2, S:4)

- Members reviewed, commented, and rated the Heisey et al. proposal titled "Assessing the effect of thiamine concentrations on swimming performance in a comparative study of anadromous and landlocked sea lamprey (Petromyzon marinus)." Rating scores and comments were compiled and delivered to Carrie Baker for SLRB consideration.

Plans for 2025:

Goal 1: Suppress sea lamprey populations to target levels.

Strategy 5: Construct and maintain a network of barriers to limit sea lamprey access to spawning habitats.

- Continue managing over 70 sea lamprey barrier projects for the Sea Lamprey Control Program and prioritize future barrier projects.
- Identify, coordinate, and plan for priority GLFER barrier projects with the US Army Corp of Engineers: Bad River and others.
- Deliver barrier program operation and maintenance.
- Periodically inspect existing, purpose built, and modified barriers to ensure blockage to spawning habitat.
- Conduct electrofishing and habitat assessment upstream of barriers of concern to quantify potential infestation risk; barrier inspections will be completed at locations not currently represented in the barrier database.

Goal 2: Increase the effectiveness and efficiency of sea lamprey control to further reduce sea lamprey populations in each Great Lake.

Strategy 4: Implement integrated sea lamprey control strategies for each lake and evaluate their effectiveness.

- Barrier Task Force members, participants, and control agents will participate in alarm cue research in the Ocqueoc River (Lake Huron) and Carp Lake Outlet (Lake Michigan).
- Several Barrier Task Force members and participants will remain involved in technical sub-groups to investigate management and engineering Grand River (Lake Michigan).
- Barrier Task Force members, participants, and control agents will implement an adaptive research plan for deploying supplemental control strategies in difficult to treat streams.

- Engage partner agencies in barrier removal discussions and request notification of project proposals.

Status of outstanding SLCB/GLFC charges:

- None at this time.

Items that require SLCB decision or action:

- None at this time

Proposed Modifications to TOR or Task Force Membership:

- The BTF has accepted the proposed revisions to the task force TOR provided by the SLCP Secretariat.

Emerging program needs that may require addition of more than $10,000 to next year's budget:

- None at this time.

Trapping Task Force

Purpose

Coordinate optimization of trapping techniques for assessing adult sea lamprey populations and removing adult and transforming sea lampreys from spawning and feeding populations.

2024 Membership

Scott Miehls (Chair), Ted Castro-Santos and Carrie Link (USGS), Ryan Booth and Tonia Van Kempen (Department), Sean Lewandoski and Matt Symbal (Service), Weiming Li, Anne Scott, and Michael Wagner (Michigan State University), Heather Dawson (University of Michigan), Rob McLaughlin (University of Guelph), Carrie Baker, Chris Freiburger, Mike Siefkes, and Ted Treska (Commission Secretariat).

Trapping Task Force Objectives:

Assessment of Sea Lamprey Abundance (G:1; S:4).

- 2024 Adult trapping was conducted at 55 trap sites throughout the Great Lakes. These include the 29 index streams for which population estimates were used to establish the 2024 adult abundance index (see Adult Assessment section). Additionally, 13 non-index streams, and 13 supplemental control streams were trapped.
    - In total 48,468 adult sea lamprey were captured. (O:1)
- DFO and USFWS agents continue to develop a standard operating protocol to keep trapping consistent across index locations and work to optimize the adult index. (O:1,6,7)
- Trap entrance modifications were completed for the Manistee River trap, Lake Michigan where efficiency had recently declined. The trap efficiency was 17% during 2024 which is the highest observed in over 20 years. (O:1)
- Trap deployment options at the north side of the St. Marys River compensation gates are being investigated to bolster the St. Marys River trap network and index estimates. Site safety modifications are being made prior to installing a trap at this location. (O:1)

Conduct or develop methods to trap adults and juveniles for control (G:1; S:6; G:2; S:4).

- As part of the supplemental control initiative, control trapping efforts were deployed for adult lamprey in seven streams – Pigeon, Sturgeon, and Maple rivers as part of ongoing work in the upper Cheboygan River system and additionally in Black Mallard River, Silver Creek, Long Lake Outlet (Lake Huron) and Traverse River (Lake Superior). (O:3)
    - In total 520 adult lamprey were captured from the six SupCon streams trapped for control with 401 of those from Traverse River alone.
- During spring 2024 mark-recapture was discontinued on Cobourg Brook (a non-index Lake Ontario tributary) in favor of a catch and kill approach. In total, 490 adult sea lamprey were removed from that stream. This approach will be evaluated periodically to confirm trap catch is sufficient to monitor the population of this stream. (O:3)
- Juvenile sea lamprey trapping occurred in the fall (Oct-Dec) as part of assessment, SupCon, or research collection efforts. Collections were conducted by GLIFWC, KBIC, USFWS, DFO, and USGS personnel, where nearly 900 out-migrating juveniles were captured. (O:3)
- SupCon partners tested new elver nets for juvenile lamprey collection in 2023. These elver nets worked well for capturing out-migrating sea lamprey juveniles. After discussion among users, some modifications were suggested, and new nets were fabricated and tested during the 2024 fall trapping season. (O:4)
- Workshop to identify and test effective means to trap lamprey in large, open river environments was held June 28. (O:4)
- A technical assistance proposal resulted from that workshop and has been submitted for consideration to conduct a literature review of all possible open water trapping techniques that might be useful to the program as well as helping to build capacity within the control agent shops to survey rivers based on recent observations of upstream migration preferences.
- Work continues to identify outstanding questions to be addressed and/or development of a proposal for trapping juvenile sea lamprey for control and assessment. Literature review and data mining historic catch data continues. Discussion held at most recent TTF; workgroup is developing a framework to first model available data and second work with agency personnel to device an approach for targeting streams.. (O:4)

Facilitation of program operations and research (G:2; S:1, S:2, S:4).

- UMESC continue to support implementation of chemosensory cues through registration and experimental use permits for pheromone and alarm cue. (O:5)
- The task force evaluated and provided feedback for one pilot proposal for the Science Program. (O:10)
- Members continue to participate in research to address SLCB research priorities. (O:9)
- No new tools were implemented into the control program from research projects, but new elver nets have been deployed for SupCon juvenile lamprey trapping. (O:4)
- Genetic pedigree analysis is proving an exciting tool in SupCon to reconstruct adult lamprey spawning population estimates. The task force will continue to monitor how that tool develops. (O:4)

Plans for 2025:

In addition to work described in Part I, control agents will:

- Collect and transport live adult sea lamprey from traps at Bridgeland Creek and St. Marys, Cheboygan, Ocqueoc, and Carp Lake rivers to HBBS for research.
- Continue with plans to maintain, repair and replace traps as necessary, to maintain or improve trap efficiency and safety.
- Continue to review and implement trapping protocols to ensure consistent methodology of adult trapping in Canada and the United States.
- Continue to work with LATF to identify and target streams for trapping transformers for control.

Status of outstanding SLCB/GLFC charges:

- SLCB Action Item (from 22-01): The SLCB supports the TTF continuing current transformer trapping efforts and directs the TTF to develop a proposal (including costs) for how transformer trapping could be included in the program for both assessment and control purposes. If a proposal is premature, what information is needed to help make decisions on deploying transformer trapping?

  Status: As previously reported, a team of volunteers consisting of researchers and control program agents representing trapping, barrier, larval assessment, and lampricide control elements of the program, has been assembled to address the charge. Team members are Ryan Booth (DFO), Sam Hultberg (USFWS), Sean Lewandoski (USFWS/MSU), Chris Gagnon (USFWS), Nick Johnon (USGS), Scott Miehls (USGS) and John Hume (MSU). The group has held one meeting so far which produced a large list of questions that need to be addressed prior to moving forward – the list of questions essentially amounts to a thorough literature review – Miehls is working on this review as well as data mining historic catch data to better describe the window of downstream migration and has reached out to the Pacific Lamprey Conservation Initiative (PLCI) research team (Ralph Lampman et al.) to determine if collaboration is possible. The PLCI is starting a new initiative to improved trapping for downstream migrant juvenile Pacific lamprey.

COMMUNICATIONS AND OUTREACH

The GLFC and its partners, the United States Fish and Wildlife Service's Ludington and Marquette Biological Stations (LBS, MBS), the Department of Fisheries and Oceans Canada's Sea Lamprey Control Centre, and USGS- Hammond Bay Biological Station, conducts a comprehensive education and outreach program. The following is an update about recent activities.

Outreach and Education Events:

As part of the outreach and education program to inform the public about the Commission's programs, the health of the Great Lakes, and the importance of the fisheries to the region, the following is partial list of the shows and events that were attended:

Shows, events, and programs:

Troller's Unlimited Presentation, Schiller Park, IL—October 5 (GLFC)
Besser Fall Harvest Fossil Fest, Alpena, MI—October 7 (HBBS)
Toledo Zoo Sturgeon Release, Toledo, OH—October 7 (GLFC)
Cheboygan Brewing Lamprey Killer Ale Release, Cheboygan, MI—October 13 (HBBS)
Penn State University Extension Webinar, Virtual—November 11 (LBS)
Wisconsin Lakes and Rivers Partnership Presentation, Virtual—December 5 (GLFC)
Riverside Fishing Club Presentation, Berwyn, IL—January 11 (GLFC)
Keweenaw Unitarian Universalist Fellowship Forum, Virtual—January 14 (MBS)
OCBS Fishing Workshop, Lakewood, OH—January 25 (LBS)
Chicagoland Fishing Expo, Schaumburg, IL—January 25-28 (MBS, GLFC)
New York Sportsmen's Expo Syracuse, NY January 26-28 (SLCC, HBBS, GLFC)
Black Lake Sturgeon Shivaree, Black Lake, MI—February 3 (HBBS)
Gratiot Ashtabula Conneaut Partnership, Virtual—February 6 (LBS)
Greater Niagara Fishing and Outdoor Expo, Niagara, NY—February 15-18 (LBS, SLCC, GLFC)
Duluth Boat, Sports, Travel show, Duluth, MN—February 15-18 (MBS, GLFC)
Rogers City High School Career Fair, Rogers City, MI—February 22 (HBBS)
MIDNR OAC Invasive Species Awareness Day, Detroit, MI—February 24 (GLFC)
Northern Ohio Fly Fishing Expo, Kirtland, OH—March 2 (LBS)
Ohio Charter Captains Conference, Huron, OH—March 2 (GLFC)
Ultimate Sport Show, Grand Rapids, MI—March 7-10 (LBS, GLFC)
Chargrin River Watershed Partners Presentation, Virtual—March 7 (GLFC)
Conneaut Creek Wild and Scenic River Advisory Council, Conneaut, OH—March 12 (LBS)
PA Steelheaders, Erie, PA—March 13 (LBS)
Toronto Sportsmen's Show, Mississauga, ON—March 14-17 (SLCC, GLFC)
Cranbrook Institute: Spring Into Science, Bloomfield Hills, MI—March 29 (GLFC)
SON Community Meeting, Wiarton, ON—April 3-4 (SLCC, GLFC)
AFFEW Earth Day Event, Ludington, MI—April 20 (LBS)
Cheboygan Earth Week Expo, Cheboygan, MI—April 20 (HBBS)
IL/IN Sea Grant Virtual Career Panel, Virtual—April 30 (HBBS)
Great Lakes Day in Ottawa, Ottawa, ON—May 6 (GLFC)
Chippewa Nature Center Invasive Species Education Day, Midland, MI—May 13 (LBS)
Native American Fish and Wildlife Society Annual Meeting, Welch, MN—May 13-16 (GLFC)
International Conference on Aquatic Invasive Species, Halifax, NS—May 13-15 (GLFC)
Lake St. Clair Water Festival, Macomb, MI—May 14 (GLFC)
Michigan Works! and MiCareerQuest Career Fair, Gaylord, MI—May 16 (HBBS)
Bay Cliff Health Camp, Big Bay, MI—May 20-24 (MBS)
IALGR Conference, Windsor, ON—May 20-24 (GLFC)
Batchawana First Nation Outreach, Sault Ste. Marie, ON—May 21-22 (SLCC)
Shedd Aquarium World Fish Migration Day, Chicago, IL—May 25 (GLFC)
Conneaut Creek Public Meeting, Conneaut, OH—May 30 (LBS, GLFC)
Blue Water Sturgeon Festival, Port Huron, MI—May 30-June 1 (HBBS)
Flint Youth Kids Fishing Day, Flint, MI—June 1 (GLFC)
Detroit Riverfront Kids Fishing Day, Detroit, MI—June 9 (GLFC)
Gwinn Fun Daze Parade, Gwinn, MI—June 22 (MBS)
Ohio Governor's Fish Ohio Day, Port Clinton, OH—June 24-25 (GLFC)
Grovefest, Fremont, OH—June 25 (GLFC)
International Conference on the Biology of Fish, Ann Arbor, MI—June 25 (GLFC)
Montcalm County Fair, Greenville, MI—June 28 (LBS)

Engineer's Day, Sault Ste. Marie, MI—June 28 (MBS, HBBS)
Art in the Garden Festival, Gaylord, MI—June 29 (HBBS)
Skandia Days Parade, Skandia, MI—July 20 (MBS)
Michigan Brown Trout Festival, Alpena, MI—July 21 (HBBS)
Porcupine Mountain's State Park Fish Exploration Day, Silver City, MI—July 24 (MBS)
Bad River Community Meeting, Odanah, WI—August 3 (MBS, GLFC)
Sands Speedway Kids Day, Marquette, MI—August 4 (MBS)
Sterling Sportsmen's Club, Sterling, MI—August 6 (LBS)
Red Rock First Nation Outreach, Nipigon, ON—August 7 (SLCC)
UP State Fair, Escanaba, MI—August 12-18 (MBS, HBBS, GLFC)
Red Cliff Natural Resource Department Open House, Red Cliff, WI—August 14 (MBS)
Brule River Family Fun Days, Brule WI—August 17 (MBS)
Owen Sound Salmon Spectacular, Owen Sound, ON—August 23-September 1 (GLFC)
Fish Field Day, Erie, PA—August 24 (GLFC)
Sportsmen for Youth, Muskegon, MI—September 7 (GLFC)
Great Outdoors Youth Jamboree, Lake Hudson, MI—September 8 (GLFC)
Trail Creek Week/Creekness Stakes, Michigan City, IN—September 16-21 (GLFC)
Rouge River Water Festival, Bloomfield Hills, MI—September 17-18 (GLFC)
Detroit Historical Society Midtown Educator's Night—September 24 (GLFC)
Agri-palooza, Chatham, MI—September 27 (GLFC)

PERMANENT EMPLOYEES OF THE SEA LAMPREY CONTROL PROGRAM

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Department of Fisheries and Oceans Canada

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Christine Boston - Treatment Supervisor
Barry Scotland - Assistant Supervisor
Joseph Lachowsky - Assistant Supervisor

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Fraser Neave - Larval Supervisor (Upper Lakes)
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Jeff Turcotte - Barrier Engineering Technician

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Kimberly Rose - Administrative Clerk

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Brian Greene Maintenance Supervisor

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Nathan Coombs - Technician

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Will Ligon (CS)	

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APPENDIX 1: LIST OF ACRONYMS

AIS – Aquatic Invasive Species

BA – Biological Assessment

BIPSS – Barrier Inventory and Project Selection System

BTF – Barrier Task Force

CORA – Chippewa-Ottawa Resource Authority

CPUE – Catch per unit effort

DFO – Fisheries and Oceans Canada

DWEF – Deep-Water Electrofishing

EBMR – East Branch Maple River

EC – emulsifiable concentrate

EGLE – Department of Environment, Great Lakes and Energy

ES – Ecological Services

ESA – Endangered Species Act

EUP – Experimental Use Permit

FIFRA – Federal Insecticide, Fungicide, and Rodenticide Act

GEI – Geotechnical Engineers Inc.

GLFC – Great Lakes Fishery Commission

GLIFWC – Great Lakes Indian Fish and Wildlife Commission

GRFN – Garden River First Nations

HBBS – Hammond Bay Biological Station

HCWB – Hungerfords' Crawling Water Beetle

KBIC – Keweenaw Bay Indian Community

LATF – Lake Assessment Task Force

LAWG – Larval Assessment Work Group

LBS – Ludington Biological Station

LCTF – Lampricide Control Task Force

MBS – Marquette Biological Stations

MIDNR – Michigan Department of Natural Resources

MLC – Minimum Lethal Concentration

MNDNR – Minnesota Department of Natural Resources

MNR – ON Ministry of Natural Resources

NEPA – National Environmental Policy Act

NYDEC – New York Department of Environment and Conservation

PAFBC – Pennsylvania Fish and Boat Commission

PLCI – Pacific Lamprey Conservation Initiative

RMT – Risk Management Team

SARA – Species at Risk Act

SBM – Snuffbox Mussel

SC – suspension concentrate

SLCB – Sea Lamprey Control Board

SLCP – Sea Lamprey Control Program

SM – Salamander Mussel

SMRT – Sterile-Male Release Technique

SupCon – Supplemental Controls

TAP – Technical Assistance Program

TFM – 3-trifluoromethyl-4-nitrophenol

TTF – Trapping Task Force

UMESC – Upper Midwest Environmental Sciences Center

USACE – United States Army Corps of Engineers

USFWS – United States Fish and Wildlife Service

USGS – United States Geological Survey

WIDNR – Wisconsin Department of Natural Resources