DETECTION OF EURASIAN WATERMILFOIL BEDS

Lake Temagami, Municipality of Temagami

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Detection of Eurasian watermilfoil beds

Lake Temagami
Municipality Temagami, On

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Acknowledgments

The Fyto team would like to extend our warmest thanks to the Temagami Lakes Association and Temagami Environmental Research and Stewardship for placing their trust in our services. We are particularly proud that Lake Temagami marks Fyto's first project in Ontario, an important milestone in our company's development.

We would like to express our special gratitude to Mr. Scot Paltrow, whose initiative in reaching out to Fyto and connecting us with the Temagami Lakes Association made this first Ontario project possible. His determination, logistical support, and assistance in coordinating with the various parties involved were instrumental in bringing this project to fruition.

We also thank Mr. Dave Ward, director of Finlayson Point Provincial Park, for allowing our team to dock at the park as part of the survey work. A special thank you to Mr. Christopher Brooks for his invaluable assistance with launch logistics and ensuring that field activities ran smoothly.

Finally, we thank the Temagami Shores Inn and Resort for their warm hospitality throughout our stay.

We sincerely hope to continue our collaboration with the Temagami Lakes Association and contribute to the long-term protection and preservation of this remarkable natural environment.

1. Contextualization

Lake Temagami is located in the municipality of Temagami, Ontario, within the Sturgeon River watershed. Its main tributary is Lady Evelyn Lake, and its outlet is a tributary of the Temagami River. With a surface area of 208.53 km², Lake Temagami is surrounded by resort areas, many marinas and is a major attraction for tourists who enjoy boating, wich are conditions that increase the probability of introduction to the Eurasian watermilfoil. The lake's water level is controlled by the Cross Lake Control Dam (Ontario Power Gerenation, 2026).

Temagami Environmental Research and Stewardship (TERAS), a volunteer group affiliated with the Temagami Lake Association, has been running a water testing program that has been collecting data on the lake's health since 2010. Phosphorus levels have been measured at several locations in Lake Temagami since 2003. The phosphorus level in the Matagama Point area was 2.8 µg/L in 2019. The level in the Temagami area was 4.3 µg/L in 2019 (Temagami Lake Association, 2025). These data indicate that the lake is classified as oligotrophic.

The first reported sighting of Eurasian watermilfoil (*Myriophyllum spicatum*) dates back to the summer of 2024 via the iNaturalist app. It was in this context that the Temagami Lakes Association commissioned Fyto in 2026 to characterize Eurasian watermilfoil beds in two areas of Lake Temagami: the Matagama Point area and the Temagami area (Picture 1). In July 2026, a team from Fyto conducted a survey of Eurasian watermilfoil from the marina near Forestry Island to O'Connor Island, covering Portage Bay, Muddy Water Bay, and Inlet Bay, among other areas. A second area was surveyed at the head of the Northeast Arm, near Matagama Point, including the Boatline Bay Marine area and the Temagami Access Road Boat Landing (Appendix 5). This report summarizes the results of the characterization of the Eurasian watermilfoil beds in Lake Temagami.

Picture 1 : Eurasian watermilfoil whorl collected from Lake Temagami in July 2026.

2. Methodology

2.1 Characterization of aquatic plant beds

The survey took place from July 6 to 13, 2026. Two people in a boat traveled along the lake's shoreline (Picture 2). One person steered the boat while an observer identified and quantified the presence of aquatic plants using an aquascope. An aquascope is an instrument that allows one to see underwater from the surface. It eliminates reflections and distortions caused by waves and light refraction.

Inspired by the method used by the MELCCFP's Quebec Volunteer Lake-Monitoring Program, round trips were made between the shore and the center of the lake, maintaining a constant distance between each transect (MDDELCC, 2016). These round trips were conducted in the 1- to 5-meter depth range, which is where aquatic plants grow. Using a Garmin GPSMAP 66s GPS unit, the Eurasian watermilfoil beds were delineated by geolocating their boundaries. The density of Eurasian watermilfoil was estimated as the percentage of the bed's area occupied by the plant. The other dominant or co-dominant species in the bed were also identified, and their coverage percentage was estimated defined as the percentage of all aquatic plants that belong to that species. In addition, the coverage percentage of the bed was estimated (plant coverage relative to the total area of the bed).

Picture 2 : Field team at Temagami Lake in July 2026.

2.2 Cartography

All field observations were compiled using the Qfield app, and QGIS software was used to visualize this data. The aquatic plant communities are expressed as a percentage of total coverage, which includes both native plants and Eurasian watermilfoil combined (Appendix 1). Aquatic plant beds containing Eurasian watermilfoil are represented according to the dominant species (Appendix 2). Eurasian watermilfoil beds are represented according to the percentage of coverage by EWM across five classes (Appendix 3). Data

with a coverage of 0–10% are shown in blue, those with 10–25% in green, those with 25–50% in yellow, those with 50–75% in orange, and those with 75–100% in red. A descriptive table of the surveyed plant communities is also available (Appendix 4). The route traveled by boat during the characterization is also shown (Appendix 5).

3. Results

3.1 Eurasian watermilfoil beds

Eurasian watermilfoil was identified in 33 aquatic plant communities covering an area of 10 873 m², which represents 0,005% of the total area of Temagami Lake (Chart 1 ; Appendix 4). Considering only communities in the (75–100%) density class, the area is 1 055 m². In addition, 60 individual plants were observed.

The Eurasian watermilfoil beds observed are mainly concentrated near the **marina in the municipality of Temagami** and around **Forestry Island** (Appendix 3). Indeed, Forestry Island is bordered by shallow areas that provide favorable conditions for the species to establish itself. Some of the observed beds there are particularly dense, such as bed #21 (Picture 4). Frequent boat traffic near these stands greatly increases the risk of fragmentation and the spread of Eurasian watermilfoil to other areas of the lake. **Isolated plants** have also been observed along the north and south shores, between the Temagami Marina, Portage Bay, and Muddy Water Bay, indicating that the species is beginning to spread westward. The Temagami Marina therefore appears to be the point of introduction of this invasive alien species into the lake.

The small marina in the provincial park has Eurasian watermilfoil covering nearly its entire surface area (Appendix 3). This area should be given special attention, especially if boats are regularly launched or removed from the lake there. Water activities can cause the stems to break apart and facilitate their spread to new areas (Picture 3).

Density class B (10–25%) of Eurasian watermilfoil covers the largest area (Chart 1). It is represented by extensive beds, such as bed #1 (765 m²), bed #7 (2,343 m²), bed #14 (661 m²), and bed #29 (2,936 m²). This predominance of low-density colonies is consistent with the early stage of the invasion, since the presence of Eurasian watermilfoil in the lake has only been known for about two years.

According to field observations, bed #27 is located near large, dense beds of native plants. It is much more difficult to control Eurasian watermilfoil when it is found in these plant communities. Rapid control of this stand would reduce the complexity of future interventions. Conversely, bed #32, which is isolated to the west and near a dock, appears to have originated from the accidental transport of a fragment by boat.

Most Eurasian watermilfoil beds are dominated by this species (23 beds). However, there are a few beds dominated by non-linear submerged pondweeds (Chart 2 ; *Potamogeton sp.* ; Picture 6), Canadian elodea (Chart 2 ; *Elodea canadensis*), Robbins' pondweed (Chart 2), water lily (Chart 2 ; Picture 7) and submerged-leaved pondweed without limb (Chart 2 ; *Potamogeton sp.*).

Conversely, no Eurasian watermilfoil plants were detected in the Matagama Point area during the survey. Despite this finding, regular inspections near marinas and boat ramps are recommended due to heavy boat traffic and the risk of fragments being introduced.

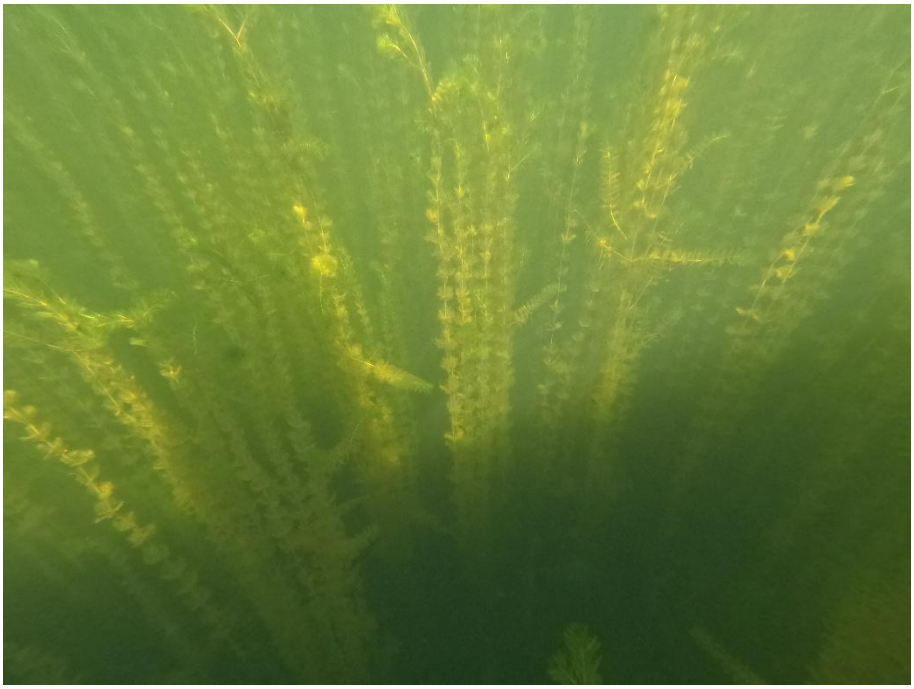
Chart 1. Classification and area of Eurasian milfoil beds observed at Tamagami Lake in July 2026

Eurasian watermilfoil density class	Area (m^2)
A (0-10%)	635
B (10-25%)	4 989
C (25-50%)	1 933
D (50-75%)	2 261
E (75-100%)	1 055
TOTAL	**10 873**

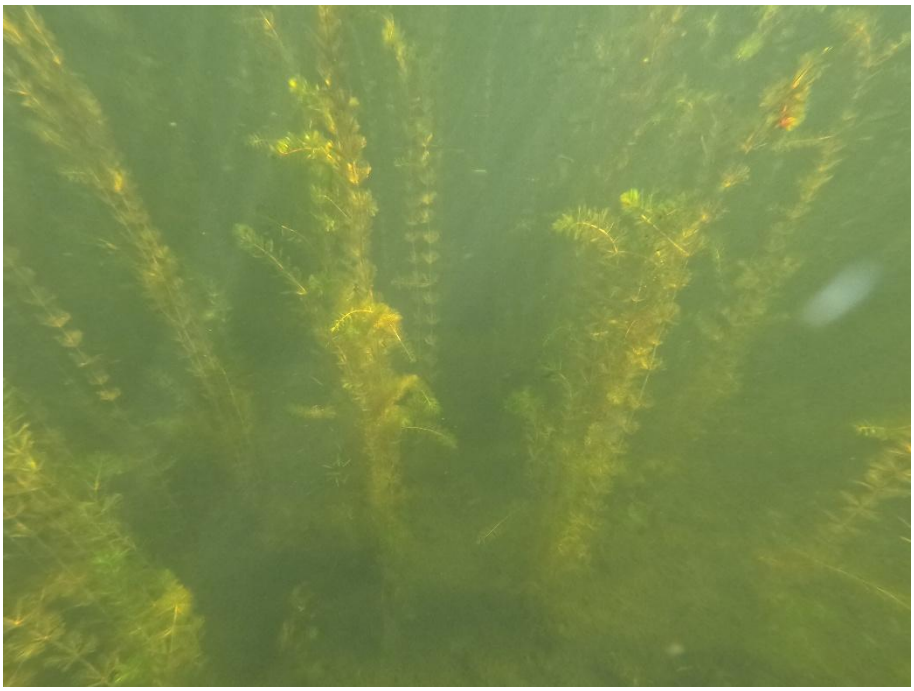
Chart 2. List of native species observed at Lake Temagami in July 2026.

English	Latin	Type of macrophyte
Canadian waterweed	*Elodea canadensis*	Submerged
Aquatic eriocaulon	*Eriocaulon aquaticum*	Emerged
Alternate-flowered myriophyllum	*Myriophyllum alterniflorum*	Submerged
Water lily	*Nymphaea sp.*	Floating
Linear-leaved submerged pondweed (group)	*Potamogeton sp.*	Submerged
Non-linear submerged-leaved pondweed (group)	*Potamogeton sp.*	Submerged
Submerged-leaved pondweed without limb (group)	*Potamogeton sp.*	Submerged
Robbins' pondweed	*Potamogeton robbinsii*	Submerged
American vallisneria	*Vallisneria americana*	Submerged

Picture 3 : A cluster of Eurasian watermilfoil fragments found in the provincial park's marina on Lake Temagami in July 2026.



Picture 4 : Beds #21, density class E (75 to 100%), at Lake Temagami in July 2026.



Picture 5 : Beds #27 at Lake Temagami in July 2026.

Picture 6 : Plants of non-linear submerged-leaved pondweed in Lake Temagami in July 2026.

Picture 7 : Plants of water lilies in Lake Temagami in July 2026.

3.2 Description of the invasive exotic species observed

Eurasian watermilfoil

Eurasian watermilfoil is an aquatic vascular plant in the Haloragaceae family. In North America, it is considered an invasive exotic aquatic plant (IEAP) because it reproduces very efficiently and forms large, dense, monospecific beds. Native to Eurasia, it was likely introduced to the United States in the 1940s as an aquarium plant (Lavoie, 2019). In Canada, the first specimens were discovered in 1958 in Lake Saint-Pierre, a widening of the St. Lawrence River, and in 1961 in Lake Erie.

Eurasian watermilfoil is a submerged aquatic plant whose roots anchor shallowly in fine-textured inorganic sediments (Smith and Barko, 1990; Hussner and al., 2017). Eurasian watermilfoil is generally found at depths ranging from 1 to 4 m, but it can grow at depths of up to 10 m in oligotrophic lake. Water transparency is the primary factor influencing the depth at which Eurasian watermilfoil grows. The growth of Eurasian watermilfoil is limited more by the amount of nitrogen in the water than by the amount of phosphorus. It can still grow in relatively nutrient-poor environments (Anderson et Kalff, 1986).

Eurasian watermilfoil begins to grow in early spring. When its stems reach the surface, they continue to grow on the water's surface, forming a cover of plants (Picture 8). The leaves resemble feathers arranged in groups of 4 to 5 around the stem, in a whorl. Each leaf is divided into 5 to 24 pairs of filiform leaflets (Picture 9; Aiken and al., 1979). The flowers are small and are arranged in racemes that emerge 4 to 10 cm above the water's surface.

Picture 8 : Cover of Eurasian watermilfoil on the water's surface

Picture 9 : Whorl's Eurasian watermilfoil.

Eurasian watermilfoil can reproduce sexually through its flowers, but it primarily reproduces vegetatively in North America (Grace and Wetzel, 1978; Aiken et al., 1979; Madsen et al., 1988). In fact, the plant produces rhizomes that allow it to create new plants and increase the density of the stands. However, fragmentation of the plant is the most effective method of propagation for Eurasian watermilfoil.

Eurasian watermilfoil naturally fragments starting in mid-July (Lavoie, 2019; Picture 10). Stem fragments develop roots that allow them to take hold in the sediments. The fragments can travel some distance, settle on the sediment, and, if the site is suitable, establish a new bed. A few Eurasian watermilfoil plants can produce thousands of fragments in a single summer, making this mode of propagation highly efficient (Madsen and al., 1988; Gagné, 2021). Although fragmentation occurs naturally, human disturbances can accelerate the fragmentation of Eurasian watermilfoil, such as boat traffic through Eurasian watermilfoil beds.

Picture 10 : Fragments of Eurasian watermilfoil with its roots, ready to break off.

Eurasian watermilfoil can also spread from lake to lake through the movement of boats or trailers carrying fragments of the plant (Bruckerhoff and al., 2015). The presence of a boat ramp is, in fact, an important factor in predicting the presence of Eurasian watermilfoil in a lake (Tamayo and Olden, 2014). It is therefore important to clean equipment that enters and exits lake.

4. Conclusion

The survey conducted in 2026 confirmed that Eurasian watermilfoil is primarily concentrated near the Temagami marina and around Forestry Island. Although some beds already exhibit high density, most beds fall into the low-to-moderate density category.

However, the detection of isolated plants between the Temagami marina, Portage Bay, and Muddy Water Bay indicates that the species is beginning to spread beyond the point of introduction. It would therefore be advisable to undertake control measures targeting all identified beds as early as next season. If a comprehensive intervention cannot be carried out in a single season, the work could proceed from west to east to limit the spread of Eurasian watermilfoil. A decision should be made promptly to allow sufficient time to obtain the necessary permits before proceeding with detailed planning and implementation of the work.

No Eurasian watermilfoil plants were detected in the Matagama Point area during the survey. However, regular monitoring of this area is still recommended due to the presence of marinas and boat ramps. Early detection of new colonies would allow for intervention before they become more widespread and harder to control.

Finally, it is recommended that mandatory boat washing be implemented before boats are launched. Since Eurasian watermilfoil is already present in the lake, this measure would primarily serve to prevent the introduction of other invasive aquatic species or new introduction of EWM as well as the transport of new fragments from other bodies of water, but also to limit the species' spread to other areas of Lake Temagami. Raising awareness among users about inspecting and cleaning boats, trailers, and boating equipment would also help limit the spread of these species. (Picture 11).

Picture 11 : Awareness poster about boat washing at the Temagami Marina.

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Appendix 1

Location of Eurasian watermilfoil beds based on the percentage of total coverage

Location of aquatic plant beds based on total coverage percentage (%)

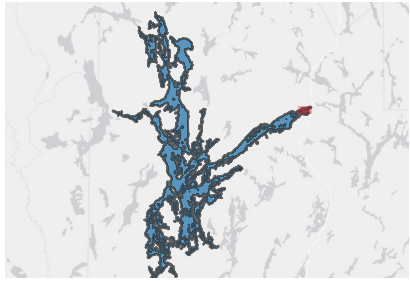
--

Northeast arm- Temagami sector
Temagami Lake
2026

Legend

Complete coverage of the seagrass bed

- 0 à 10%
- 10 à 25%
- 25 à 50%
- 50 à 75%
- 75 à 100%



Sources -- ONH 2017, GMS 2026, Fyto 2025
Projection -- NAD83 MTM Zone 10
Production -- Marie-Anne Thibodeau, 14/07/2026

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Appendix 2

Location of Eurasian watermilfoil beds by dominant species

Location of aquatic plant beds based on the dominant species in the bed- Temagami sector

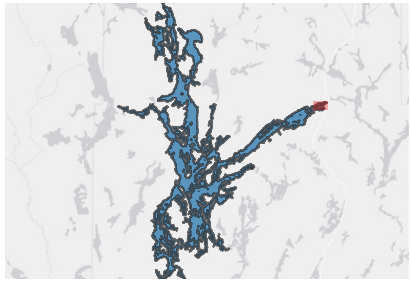
--

Northeast arm
Temagami Lake
2026

Legend

Dominant species in the bed (code)

- Elca
- Mysp
- Nysp
- Pfsnl
- Pfssl
- Poro



Sources -- OHN 2017, GMS 2026, Fyto 2025
Projection -- NAD83 MTM Zone 10
Production -- Marie-Anne Thibodeau, 14-07-2026

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Appendix 3

Locations of Eurasian watermilfoil beds and isolated plants

Location of aquatic plant beds based on the density of Eurasian watermilfoil

--

Temagami Lake

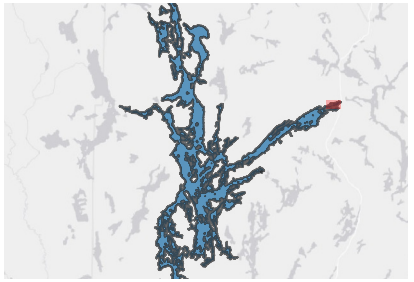
2026

Legend

Density of Eurasian watermilfoil (%)

- 0 - 10%
- 10 - 25%
- 25 - 50%
- 50 - 75%
- 75 - 100%

\+ Isolated Eurasian watermilfoil plants



Sources -- OHN 2017,
GMS 2026, Fyto 2026
Projection -- NAD83 MTM Zone 10
Production -- Marie-Anne Thibodeau,
14/07/2026

Appendix 4

Chart 3 : Key to the names of aquatic plants found in Temagami Lake in July 2026.

Code	Latin name	Code	Latin name
Elca	*Elodea canadensis*	Pfsl	Linear-leaved submerged pondweed (group)
Eraq	*Eriocaulon aquaticum*	Pfsnl	Non-linear submerged-leaved pondweed (group)
Myal	*Myriophyllum alterniflorum*	Pfssl	Submerged-leaved pondweed without limb (group)
Mysp	*Myriophyllum spicatum*	Poro	*Potamogeton robinsii*
Nysp	*Nymphaea sp.*		

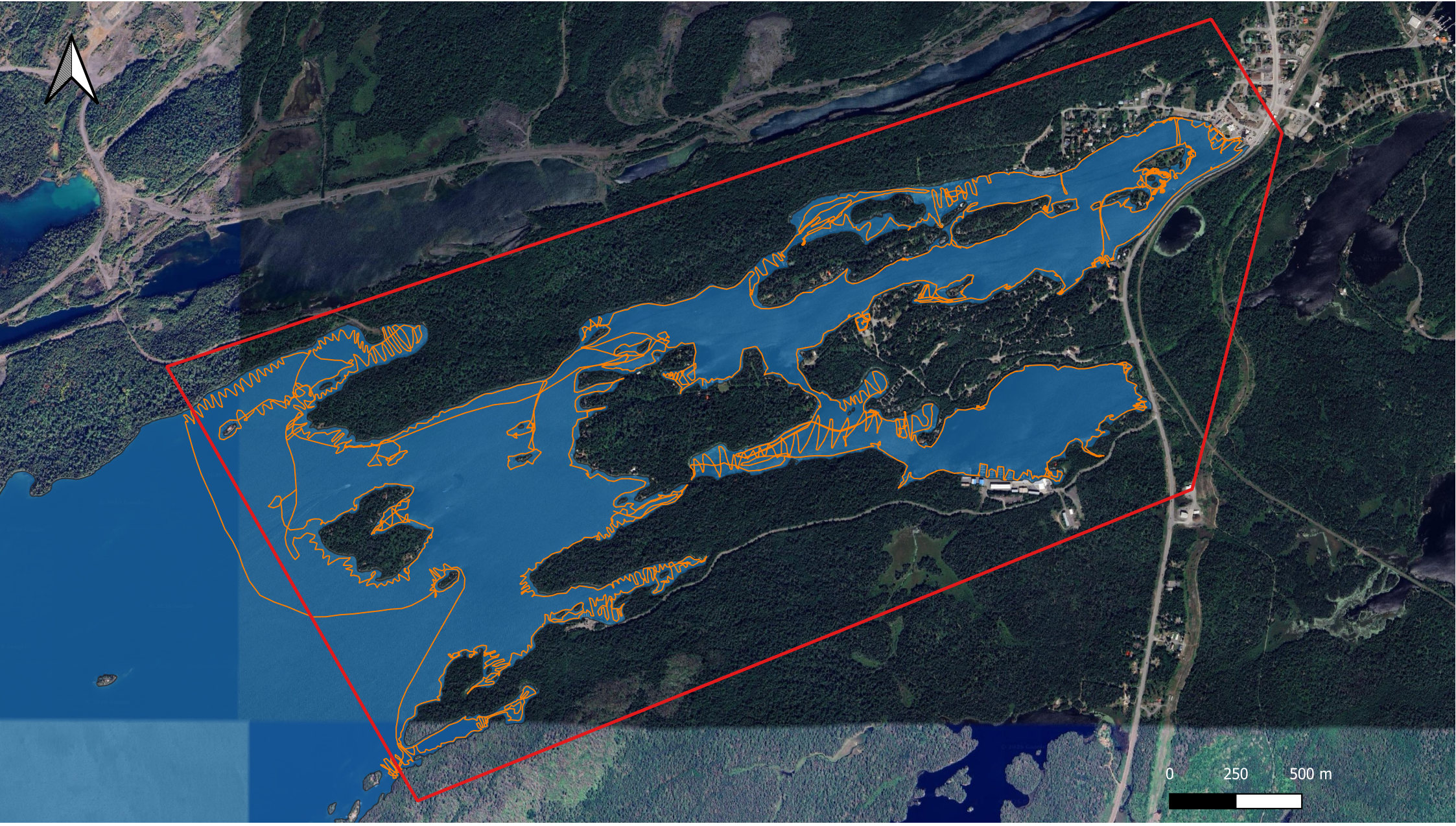
Chart 4 : Eurasian watermilfoil beds at Temagami Lake in July 2026

Sector	Vegetation cover (%)	Dominant species	Density (%)	Co-dominant species	Density (%)	Co-dominant species	Density (%)	Area
1	75	Pfsnl	30	Poro	22	Mysp	15	765
2	60	Mysp	42	Pfsnl	18			556
3	90	Poro	50	Mysp	36	Pfsl	4	37
4	20	Mysp	20					201
5	15	Mysp	15					111
6	10	Mysp	10					29
7	100	Pfssl	75	Mysp	20	Pfsnl	5	1334
8	60	Mysp	60					178
9	85	Elca	38	Mysp	26	Pfsnl	13	85
10	90	Mysp	90					604
11	90	Mysp	32	Pfsnl	32	Poro	22	429
12	100	Pfsnl	55	Mysp	25	Poro	10	257
13	90	Mysp	54	Myal	14	Pfsnl	14	64
14	75	Pfsnl	30	Mysp	15	Poro	15	661
15	100	Mysp	60	Pfsnl	25	Poro	10	101
16	100	Poro	65	Mysp	25	Elca	10	117
17	9	Mysp	9					129
18	100	Mysp	40	Poro	40	Pfsnl	10	225
19	100	Mysp	65	Poro	25	Pfsnl	10	22
20	90	Mysp	63	Poro	9	Elca	9	427
21	100	Mysp	100					451
22	90	Elca	27	Eraq	18	Pfsl	18	60
23	100	Mysp	60	Pfsl	30	Pfsnl	10	74
24	90	Mysp	36	Eraq	22	Pfsnl	18	134
25	9	Mysp	9					122
26	80	Pfsnl	32	Mysp	20	Poro	20	60
27	90	Mysp	54	Pfsnl	32	Nysp	4	1067
28	50	Nysp	30	Pfsnl	10	Mysp	5	324
29	40	Mysp	20	Pfsnl	8	Elca	6	1671
30	80	Mysp	40	Elca	32	Pfsl	8	15

31	90	Mysp	68	Poro	14	Pfsnl	4	328
32	75	Mysp	45	Pfsnl	30			78
33	20	Mysp	20					157

Appendix 5

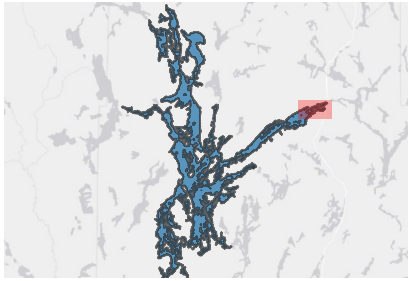
Maps of Boat Routes Surveyed for Eurasian Watermilfoil Detection



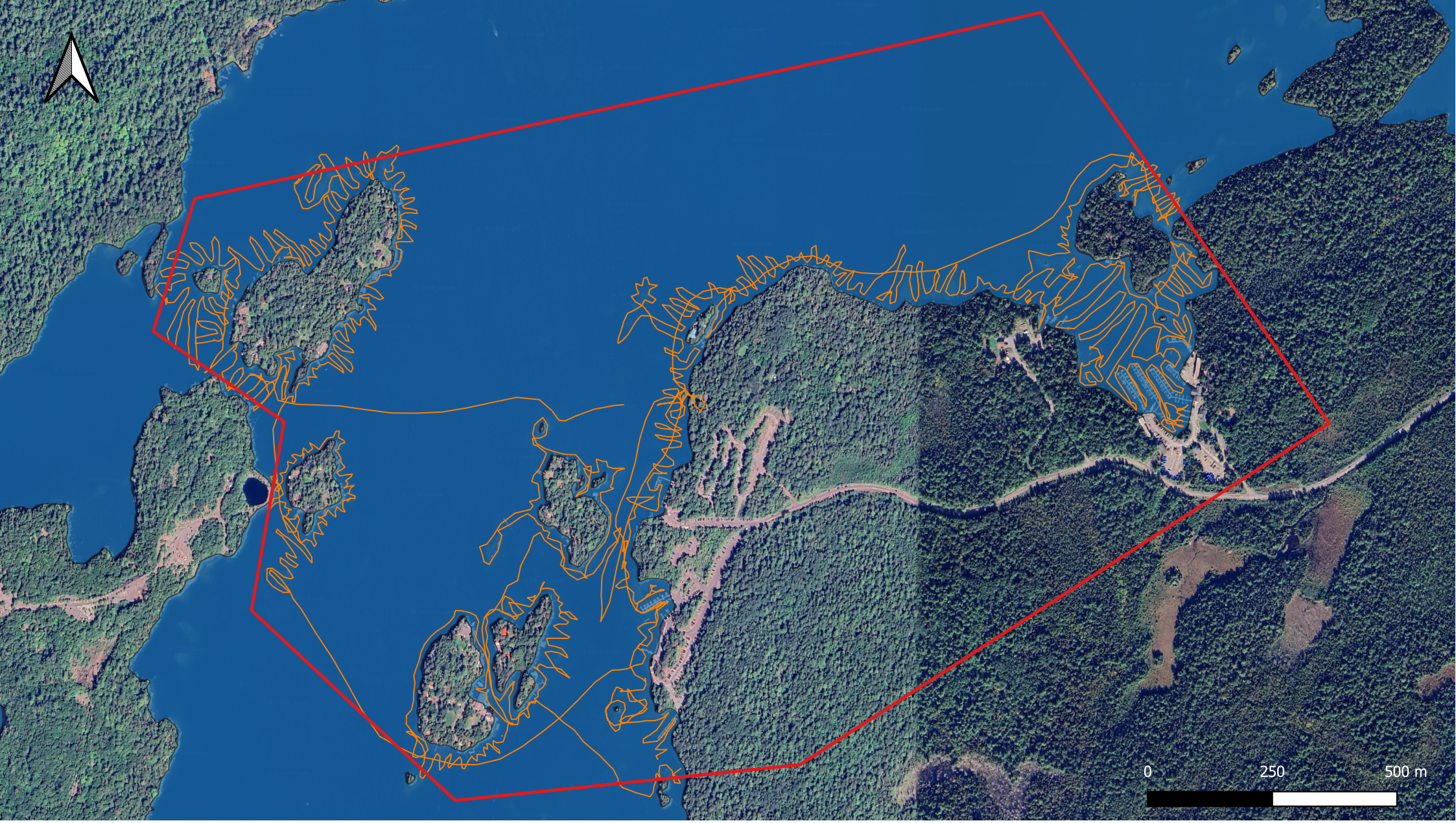
Map 1
Shoreline- Temagami sector
--
Northeast arm
Temagami Lake
2026

Legend

- Proposed detection area of Eurasian watermilfoil- Temagami sector
- Surveyed route



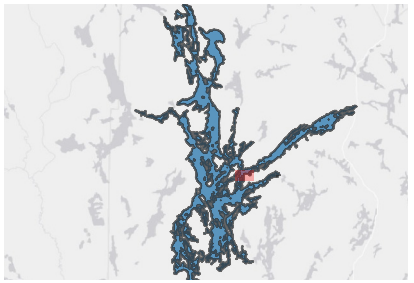
Sources -- OHN 2017,
GMS 2026, Fyto 2026
Projection -- NAD83 MTM Zone 10
Production -- Marie-Anne Thibodeau,
14/07/2026



Map 2
Shoreline- Matagama Point sector
--
Northeast arm
Temagami Lake
2026

Legend

- Proposed detection area of Eurasian watermilfoil
- Surveyed route



Sources -- OHN 2017, GMS 2026, Fyto 2026
Projection -- NAD83 MTM Zone 10
Production -- Marie-Anne Thibodeau, 14/07/2026