Myriophyll: An Underwater Battle

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(Google Translate)

After 9 years of battling *myriophyllum (*Eurasian water-milfoil), strategies and sustained efforts to slow its progress are beginning to produce encouraging results in Quebec's lakes and rivers, a *Green Week* team has found.

All fragments of the myriophyllum are removed from the water and sent to landfill.

Thanks to more efficient underwater techniques of covering it and

pulling out by the roots, biologists and divers succeed in slowing the progression of Eurasian water-milfoil. However, the fight against this invasive aquatic plant is fraught with pitfalls.

From aquarium plant to invasive plant

Eurasian water-milfoil is an invasive aquatic plant.

With its long stalk and feathery leaves, Eurasian water-milfoil looks harmless when viewed underwater. In a not so distant time, it was even found in our domestic aquariums, where exotic vegetation served as decoration.

The enemy spawns at high speed

This vascular plant would come from Asia and would have been introduced into our aquatic environments by ballast emptied from ships and by discharges of water from domestic aquariums.

What makes it even tougher is that the plant breeds very easily and quickly. By fragmenting into cuttings, the milfoil will generate other plants, which will quickly invade the bottom of water bodies.

Biologist Claude Lavoie is the expert on invasive plants in Quebec.

"We will never eradicate it. So we are stuck with this species for several decades, not to say several centuries."
Claude Lavoie, biologiste et professeur, Université Laval

The invasive plant disrupts the biodiversity of the water bodies in which it spreads, competing fiercely with its native neighbours for its nutrients and light. According to biologist Claude Lavoie, who has observed and analyzed Eurasian water-milfoil for nearly 15 years, no serious study has yet shown that it poses a threat to human health.

Eurasian watermilfoil meadows on Lake Boivin, in Granby.

However, it is becoming a nightmare for residents and boaters accustomed to enjoying their bodies of water. The presence of Eurasian water-milfoil can also lead to a devaluation of certain properties around lakes or rivers infested by the exotic plant.

Claude Lavoie reminds us that the milfoil is not just a biological problem. It is a problem that has a sociological, economic and political dimension at the same time.

Controlling water-milfoil with synthetic fabrics

At Lac des Abenakis, the means used to subdue the invader is synthetic tarpaulin, also known as Aquascreen.

To slow down the progression of Eurasian water-milfoil, one of the techniques used is tarpaulin with synthetic fabrics such as Aquascreen.

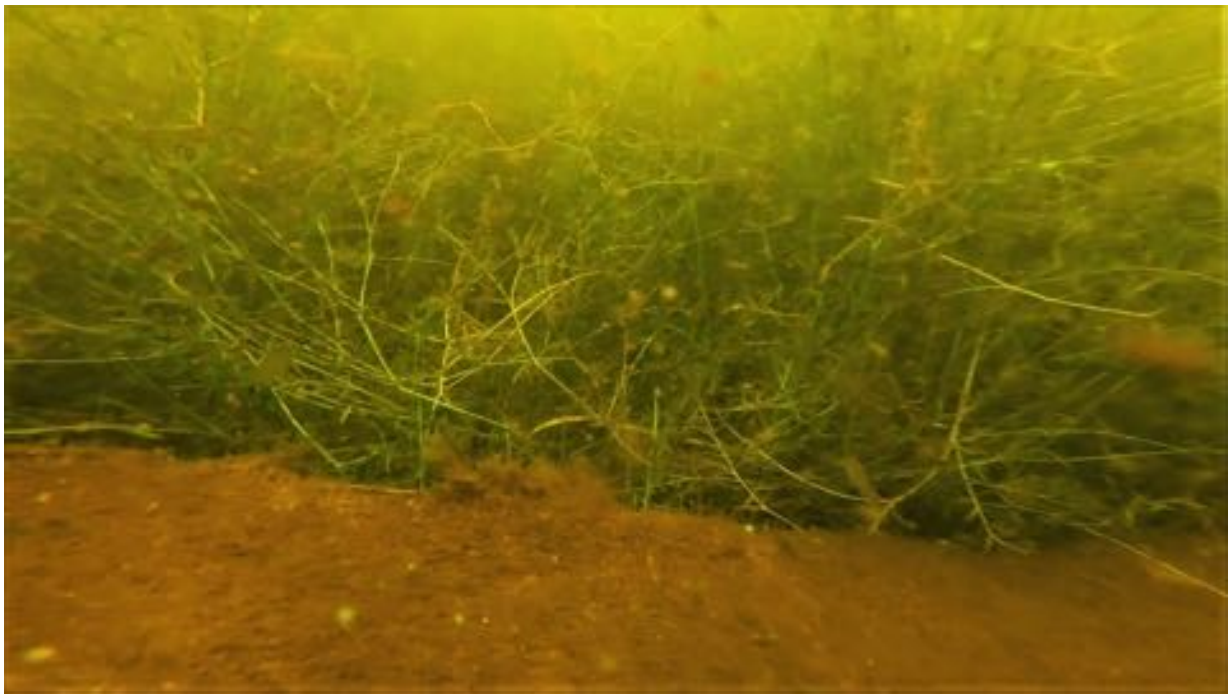
At Lac des Abénaquis, in Beauce, residents opted for this solution, combined with manual lifting using an underwater vacuum cleaner.

In June 2020, Vincent Gagné, master's student, and his team

installed 160 canvases on all of the lake's herbaria.

Two divers unroll a synthetic canvas at the bottom of a lake.

To achieve this, two divers unroll the canvas and secure it to the bottom of the lake, covering the water-milfoil beds to stop their growth. “I find it is a canvas that handles well. It is particularly small, so a diver alone can carry it underwater,” explains Vincent Gagné.



The burlap crushes the herbaria.

The goal of his research project: to reduce the areas infested by water-milfoil in lake waters by 95%. It's a long drawn out battle.

At the end of August, all synthetic fabrics are removed from the bottom of Lac des Abénaquis, in Beauce.

At the end of the summer, the synthetic fabrics were removed and cleaned. After four years of interventions, the results are encouraging. We are witnessing a retreat of the herbaria in the lake.

In 2016, the invasive plant covered 36,000 square meters at Lac des Abénaquis. By fall 2020, the infested areas were reduced to 9,000 square meters, a quarter of what they were four years earlier.

At Lac des Abénaquis, in Beauce, Vincent Gagné and his team use synthetic tarpaulin to control Eurasian water milfoil.

"Next year or the year after, we should reach a relatively acceptable level of contamination. And then again, we will have to continue to monitor the emergence of new herbaria to maintain that level."
Vincent Gagné, student researcher, Laval University

Estrie, an active focus of Eurasian water milfoil

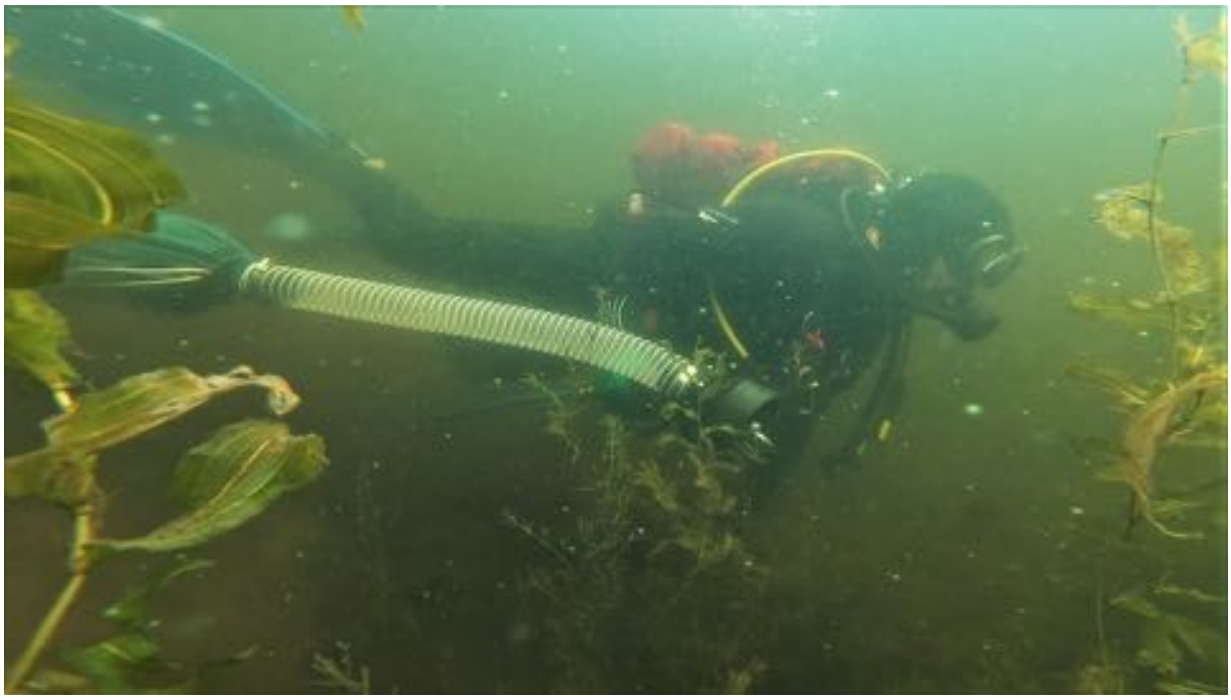
Estrie is one of the regions in Quebec most contaminated by Eurasian water-milfoil.

In Estrie, 50% of lakes are affected by Eurasian water milfoil.

At Brompton Lake, the areas of herbaria can even exceed 10,000 square meters. Residents and the three municipalities involved have spent more than $320,000 in three years to fight against the invader.

Divers install huge hessian cloths in the bottom of a lake.

Due to the large area of the lake, the biologist and diver Jean-François Martel favoured tarpaulin with huge jute cloths. “It is really better to go with the jute, which will biodegrade in the bottom of the lake, while with the synthetic canvas, you have to remove it from the lake after a few months and clean it. That's a lot of handling, and therefore, several hours of diving.”



The divers will pull out the plants manually, but will use the aspiriophyll (underwater vacuum) to bring up the fragments.

Underwater, divers also combine jute sheeting operations with manual lifting and an underwater vacuum.

All water-milfoil fragments that are removed from bodies of water

are sent to the landfill, as they are considered to be contaminated material.

The tons of fragments that are removed from the lake each summer are then sent to landfill, a requirement of the Ministry of the Environment and the Fight against Climate Change (MELCC).

Jean-François Martel, biologist for the RAPPEL cooperative, helps local residents' associations fight against Eurasian water-milfoil in Estrie.

"It would be compostable, but it's considered contaminated material, so you reduce the risk of contamination in another body of water."
Jean-François Martel, biologist and diver, coop RAPPEL

Jean-François Martel is satisfied with the results of his submarine operations at Lake Brompton. Covering with hessian cloth, combined with manual pulling with aspiriophyll, has reduced the areas infested by Eurasian water-milfoil by at least 75%.

"We have come to believe that in the next two to three years, we will be able to control effectively. But we cannot speak of eradication. With milfoil, there can always be recolonization!"
Jean-François Martel, biologist and diver, coop RAPPEL

The various boats that ply our waterways are believed to be the main culprits in the spread of water-milfoil from one lake to another.

In Quebec, nearly 200 lakes are invaded by Eurasian water-milfoil. Agricultural pollutants promote this propagation by stimulating the growth of the plant, specifies Claude Lavoie. They enrich our rivers and lakes with nitrogen and phosphorus, which will contribute to the problem.

In addition to agricultural pollution, the many boats that sail from one lake to another are also singled out as an agent of contamination.

Infestation in a protected environment

Located in the heart of Mont Saint-Hilaire, Lake Hertel is beginning to be invaded by Eurasian water-milfoil.

The invader is not limited to resort lakes. It also attacks protected bodies of water, such as Lake Hertel, located in the heart of Mont Saint-Hilaire. What makes Lake Hertel unique is that it is part of McGill University's Gault Nature Reserve, a UNESCO-recognized sanctuary.

For nearly 50 years, aquatic activities such as swimming, boating or fishing have been prohibited to visitors. Despite everything, the lake was also invaded by Eurasian water-milfoil.

We can see that the Eurasian water-milfoil infestation is significant in Lake Hertel.

Biologist Hélène Godmaire works frequently with researchers at McGill University, who manage Lake Hertel and the natural environment that surrounds it.

During the summer of 2020, she observed hundreds of fragments of water-milfoil washed up on the shores of the lake. If there are no farms around the lake and no boats, then what is the explanation for this infestation?

Biologist Hélène Godmaire suspects migratory birds of having transported fragments of Eurasian water-milfoil into Lake Hertel.

The biologist suspects migratory birds.

"These birds also travel short distances. Here at Lake Hertel, we are quite close to the Richelieu River, where Eurasian water-milfoil is found. Migrating birds could carry water-milfoil fragments here."
Hélène Godmaire, biologist Quebec Council for Invasive Alien Species (CQEEE)

While walking on the shore of Lake Hertel, biologist Hélène

Godmaire found many fragments of Eurasian water-milfoil.

But for several researchers, the spread of water milfoil by birds is marginal compared to that caused by humans.

For more than 40 years, Lake Hertel has been part of McGill University's Gault Nature Reserve, a sanctuary recognized by UNESCO.

While waiting for the first scientific reports to explain this invasion in the waters of Lake Hertel, Hélène Godmaire will propose an intervention method to fight it, and it will be tarpaulin with synthetic canvas.

A challenge: aiming for a balanced ecosystem

The associations of residents of Lake Brompton have mandated Jean-François Martel and his team of divers to combat the undesirable weed.

While strategies to combat the aquatic Invader are refining, the battle to slow its progress is still far from won. And this submarine struggle will be long and costly. This is the price to pay to effectively and sustainably protect our ecosystems, whether underwater or on land.

“When people realize just how fragile ecosystems lakes are, and water milfoil is just one problem among many, there will have been real progress in the science of the lake environment.”
Claude Lavoie, biologist and professor, Laval University