

Update on Eurasian Watermilfoil at McGregor Lake (2019)

- Highlights -

BACKGROUND

Water-milfoil (*Myriophyllum spicatum*) is a perennial aquatic plant that lives submerged between 0.5 and 7 m (especially between 0.5 and 4.5 m) deep. The plant takes root at the bottom and grows to the surface where it branches and forms a carpet. Native to Europe, Asia and North Africa, it would have been accidentally introduced in the 1940s in North America. This plant suits a variety of environments which makes it very invasive, is more competitive than other plant species, it develops in mass and eliminates the others plants little by little by competition.

In infested lakes its presence therefore generates strong disturbances of the environment and a significant decrease of biodiversity. The formation of a dense herbarium prevents native plant species from growing. Milfoil beds can even be established in fish spawning grounds and lead to their destruction, threatening the fish populations. A high density of plants leads to high oxygen consumption which results in problems of anoxia (i.e. lack of oxygen in the water) deep lakes.

Theoretically, Eurasian watermilfoil can reproduce in two ways, seeds or asexual by fragmentation of the stems (cuttings). The peculiarity of this species is that it produces roots on its stems in the aerial part of the plant and that these ramifications come off naturally afterwards. These cuttings with roots move by following with the current and the waves. They quickly establish themselves in the lake so create a new herbarium or strengthen the original herbarium. In practice, water milfoil ear spawns essentially in this way and this is the main cause of its spread. Human activities such as fishing, water sports, navigation and transportation of boat from one lake to another are the main vectors of dissemination.

McGregor Lake is a lake with complex morphology and high activity pressure in its catchment area, particularly with regard to existing waterfront development around the lake and motorized traffic on the lake. These activities make McGregor Lake vulnerable to premature aging if prevention and awareness measures are not adequate and supported. This is particularly relevant as Eurasian watermilfoil is now present everywhere in the lake (2019), whereas in 2015 it was located in only 6 places.

The expansion of this plant is the consequence of lack of protection and control to prevent the plant from spreading.

If aquatic plants are important to the ecological balance of McGregor Lake, then remember that the conservation and restoration of the riparian strip, the fight against the erosion of watershed soils and the reduction of nutrient inputs are the only measures effective in limiting their proliferation at too great a rate.

OVERALL CONCLUSION

It can therefore be concluded that the presence of monospecific meadow of Eurasian watermilfoil is well represented in the lake and that this proportion, without being alarming, demonstrates that the lake must now be subject to increased surveillance where taking control measures is necessary to avoid an increase in the area of seagrass beds, in particular the threat very present of Eurasian Watermilfoil. The increase in the number, area and localization of monospecific Eurasian Milfoil meadows in McGregor Lake relative to what was estimated in 2015 is an eloquent sign that we must act.

DETAILS OF STUDY FINDINGS

It is in the southwest portion of the lake that are found the largest herbarium over 1000 m². This area of the lake is probably one of the busiest and the importance of seagrass beds is probably due to accelerated fragmentation by motorized traffic. These areas are therefore, more sensitive and should be considered as priorities.

In summary, the observations of the Herbarium distribution are as follows:

- Monospecific seagrasses: Eurasian Watermilfoil generally occupies areas shallow lake at depths less than 3.5 m, but may go beyond. There it forms dense and monospecific mats in many places, but these carpets are not yet widespread in general except for five herbaria over 1000 m² the largest of which occupies an area of approximately 3249 m² (Herbarium 4, north of Île aux Sheep).
- In the case of dense monospecific seagrasses, Eurasian watermilfoil dominates in strong majority (more than 80%) by leaving little place for other native species or totally dominates. Overall, monospecific seagrasses occupy an area total of 14,666 m and are 33 in number.
- The smallest herbarium has an area of 10 m² and the largest of 3249 m² (herbarium 4). Four other herbaria are large enough to adopt as preventive measures.
 - 2,888 m² (Herbarium 28),
 - 1,322 m² (herbarium 26),
 - 1,171 m² (Herbarium 16) and
 - 1,164 m² (Herbarium 9)
- There are 4 small herbaria in Mud Bay but the largest Herbarium 12 (620m²) is of significant size for the size of the bay. It surrounds a rocky reef and may constitute an important dispersal island of milfoil in this bay.
- No herbaria of milfoil were observed in Courville Bay. However, we observed several floating milfoil fragments that can eventually colonize this bay, particularly vulnerable because of its low depth.

- Mixed beds are herbaria where Eurasian watermilfoil is present but mixed less than 80% but more than 50% with other native aquatic species. In this proportion, we observed only 3 mixed seagrass beds in the lake. These occupy a total area of 510 m². The largest covers an area of 64 m² (herbarium 1) and the smallest less than 5 m² (herbarium 6).
- However, mixed meadows whose proportion of Eurasian Watermilfoil is between 10 and 50% are much more numerous but they were not within the Mandate to raise them.
- In total, the area of herbaria observed in 2019 covers 15 176 m², which represents approximately 0.28% of the total area of the lake. The 2015 surveys indicated that the total area of seagrass covered 34 439 m² but according to our findings, this area has since been considerably modified. *Refer to Table 4 which gives the comparison of the results obtained in 2015 compared to those of 2019.*

RECOMMENDATIONS

To limit the spread of aquatic plants in McGregor Lake and to improve the water quality, the following recommendations should be applied:

- **Monitoring aquatic grass beds:** An inventory at least every two years of the density aquatic meadows is recommended in order to characterize the evolution of In addition, there should be annual monitoring to ensure more specifically that invasive plants do not spread more. Monitoring the evolution of Herbarium can also be done by georeferencing the tags on an annual basis.
- **Control method for Eurasian watermilfoil:** As a method of control, the method having demonstrated the best efficiency at lower cost is the laying of burlap on the monospecific herbaria in the places most likely to cause fragmentation. This is done manually on the selected sites with the help of volunteers on the surface and certified divers that ensure that the jute is correctly laid over the plants.

Several complementary measures may be place and are suggested below:

- **Awareness raising:** Public awareness of this issue with leaflets and / or presentations educates the population and allows them to take responsibility for themselves as a user of the lake to avoid its degradation. This awareness can be done in warning the lake users of the risks of venturing into large herbaria and inform about the fragility of the environment.
- **Tagging:** Pending protocols, more convenient methods and reducing costs for the control of aquatic invasive plants, certain associations and municipality pose specific color buoys and floating signs identifying problematic meadows by encouraging people not to frequent the area that has been marked. It is therefore necessary to make an annual containment plan and set up the type of signaling chosen.

- **Grubbing:** Avoid uprooting and cutting of plants on the shore and in the littoral, to avoid fragmentation of certain plants such as Eurasian watermilfoil. In this chapter, the prohibition of the use of motorized gasoline craft at specific locations is a good measure to take: propellers can cause fragmentation when passing over the meadows.
- **Boat cleaning:** Some municipalities and associations in others regions operate cleaning stations to encourage users to clean up their boat. The Val des Monts Municipality performs some monitoring at the public launch located west of the lake but it is very targeted and incomplete.

Awareness is needed on an annual basis.

- It is also highly recommended to **clean canoes, kayaks or other floating recreational equipment** on which plants could stick and be transported from one lake to another lake to prevent the introduction of new aquatic invasive species, both prior to entry and, if possible, when exiting the lake.
- **Revitalisation of banks and potential sedimentation zones:** In order to retain sedimentation, revegetation of certain shorelines, such as abandoned roads, road works that have exposed the soil and certain lands where the grass reaches the lake is needed. To facilitate this task and to establish requirements, it is useful to consult the mapping of the bank characterization and, if necessary, to update, not only at the lake level, but at the tributary level too.
- **Invasive alien species: If the presence of other exotic plants invasive species occur, these should be eradicated before they invade the lake or shoreline** and be replaced by native species as appropriate. The Association could keep a list of threats and raise awareness and advise its members to any new presence of these species.
