Frequently Asked Questions:
Eurasian Water-Milfoil Invasive Species in Mazinaw Lake

Prepared by the Mazinaw Property Owners Association ('MPOA') Board, with contributions by Parks Canada, the Ministry of Natural Resources and Forestry, Dr. Caleb Hasler, Dr. Keith Solomon and Dr. Kelly Biagi.

Last updated October 2024

PURPOSE & DISCLOSURE STATEMENT

This FAQ document has been prepared for the purpose of informing Mazinaw Property Owners Association ('MPOA') members about the invasive species, Eurasian Water- Milfoil and ways to manage it. It is based on questions that were posed to the MPOA from our members and some local interested parties.

While the MPOA have provided much of this information to its members over the last two years (since Fall 2022, when it was discovered), and at the August 15th, 2024 Information Session, this FAQ provides a central place for questions and comprehensive answers.

The MPOA does not accept responsibility for keeping this FAQ up-to-date beyond this timeline (Summer/Fall 2024); nor for the purpose for which it was created (providing answers to questions posed from MPOA members and the local community to better understand the issues surrounding Eurasian Water Milfoil and management options). Wherever a source has been noted, please always use the original source as the source of record.

This FAQ was prepared by the MPOA in consultation with the same independent experts which includes United Nations and NASA endorsed PhD scientists; as well as the Ministry of Environment, Conservation and Parks who attended the Aug 15th 2024 MPOA recorded information meeting, along with other government agencies, such as Parks Canada. All PhD experts consulted in the preparation of both this FAQ and the Aug 15th 2024 Information Meeting have contributed on a voluntary basis only, unpaid, to comment objectively from the lens of their professional expertise or firsthand experience on the matters at hand. For further information about the experts, please refer to their bios herein.

Both bodies of work (information video and FAQ) have been produced **on a best effort basis,** by volunteers, to collate questions or comments received since Fall 2022, when the MPOA first began to tackle this Eurasian Water-Milfoil Invasive Species Issue; and communicating about it through a spectrum of outlets, at both the 2023 and 2024 AGMs; and the Aug 15th, 2024 Information Meeting.

It is important to note that these facts are not the MPOA's facts. They are facts provided by invasive species authorities and consultation with experts, other Lake Associations facing the same challenges and/or government agencies that have jurisdiction related to the management of invasive species in Ontario. Please note that this does not represent every possible question and was coordinated by the MPOA volunteer Board. We encourage everyone to seek out websites of authority on the subject and scientific experts.

EXECUTIVE SUMMARY:

The provincial government recently classified Eurasian Water Milfoil (EWM) as one of ten prohibited or restricted invasive species in Ontario; under the Invasive Species Act to help prevent, control and reduce their spread; and to protect Ontario's environment, economy, human health and society from its harm.

Our focus is on EWM as it is a growing concern in Mazinaw Lake, which is the headwaters for the Mississippi River Watershed; and a major revenue generating tourist attraction being home to the BonEcho Provincial Park, a National Historic Site of Canada, Crown land, 370+ private properties and many ancillary tourism or seasonal businesses. The EWM infestations in Mazinaw Lake are growing relatively fast (17.4% increase in the quantity of colonies between 2023 and 2024). The issues that EWM can cause are many and that is why we continue to focus on finding solutions to manage it. Please refer to **1.9 What would happen if we did nothing?**

The Mazinaw Property Owners Association's proposed ProcellaCOR FX as a mitigation measure to control the invasive species in Mazinaw Lake was and is still deemed to be a pragmatic step forward, as presented at the AGM in 2024. After the AGM, several members asked why the government wasn't taking the lead on managing this invasive species, since the government owns the lake and the lake floor. The MPOA have engaged with various levels of government individually and to-date, no level of government has intervened to manage the EWM invasive species issue on the Lake, since it was first registered in the Invasive Species of Ontario database by the Conservation Authority on Oct 29th 2019.

Since government action has been extremely difficult, if not impossible for Ontario Lake Associations faced with similar challenges, the MPOA has sought the assistance of government advisors, and will engage our elected officials in new and strategic ways to seek their leadership on this issue. These efforts include requests for multi level government meeting(s) with North Frontenac and Addington Highlands Townships, the MVCA, MNR, together with MPP John Jordan, MPP Rick Breese, MP Shelby Kramp-Newman, MP Scott Reid for government leadership and intervention and in particular to clarify their roles & responsibilities in the hopes of learning which agency could lead this effort.

Should the government take the lead in managing EWM, they will determine the best course of action, whether it is the use of Health Canada approved aquatic herbicides, (consistent with their invasive species management plans in abuting watersheds and nearby federally controlled waters), or a different approach. Until it is known what leadership role the government will take, if at all, the MPOA will wait before pursuing further steps, including seeking ProcellaCOR FX to manage the EWM in the lake. This FAQ is generally based on the same questions that were covered in the 2 hour August 15th Information Session **[link]** however, it does not contain the written form of questions and answers related to ProcellaCOR FX until it may become relevant. Notwithstanding, if anyone who wants to learn more about ProcellaCOR FX for their own information can watch the video, which has already been viewed approx. 215 times to-date and the information meeting itself was attended by 80 people.

The FAQ was prepared **on a best efforts basis** to provide factual information and that is why we engaged leading scientists in the field of invasive species to help answer questions being posed. We all want the best for the beloved lake. The MPOA would like to sincerely thank the experts who came to our

assistance in providing this information and to our lake steward for the countless hours it took to prepare this document.

We are expecting that we will have more information to share after the meeting with the government has concluded, hopefully Q4 2024 or Q1 2025.

As a reminder, no recipient of this FAQ has permission to take the contents in its entirety, or in part, and redistribute this material on social media or elsewhere without the consent of the MPOA.

As always, any questions should be posed to communications@lakemazinaw.ca.

EXPERT'S INTRODUCTION:

In the case of Dr. Solomon, Dr. Biagi, and Dr. Heilman, they were highly recommended or introduced by a trusted Lake Association that we've been liaising with over the last two years of due diligence research of our own re the issues of EWM. Dr. Hasler is a local expert, having grown up in Flinton, Ontario and spent summers learning to swim on Lake Mazinaw. He therefore simply offered his expertise both today and potentially on a go forward basis.

Full PhD expert bios are as follows:

Dr. Solomon, is a Professor Emeritus and Associate Centre of Toxicology and School of Environmental Sciences University of Guelph Director. He is a Fellow of the Academy of Toxicological Sciences and a Fellow of the Society of Environmental Toxicology and Chemistry (SETAC). He has taught in areas of toxicology and pesticides at the University of Guelph and advises graduate students. His research areas are the fate and effects of pesticides and other substances in the environment, exposure of humans to pesticides and industrial chemicals, and risk assessment. He has received awards for teaching, research, and outreach from SETAC, the American Chemical Society, the Canadian Ecotoxicology Workshop, and IUPAC. He has served on several advisory committees on matters related to environmental toxicology and pesticides in Canada, the USA, and internationally. He is a co-author on the Environmental Effects Advisory Panel of the Ozone Secretariat of the United Nations Environmental Programme. He has more than 50 years of experience in research and teaching in pesticide science and toxicology and has contributed to more than 460 scientific publications and reports in the fields of pesticides, environmental toxicology, and risk assessment. He has advised or co-advised eight PDFs, 39 MScs, and 31 PhDs and has given or participated in more than 60 short courses on pesticides and risk assessment in Canada, Latin America, and around the world

Dr. Hasler is an Associate Professor and past Chancellor's Research Chair in the Department of Biology at the University of Winnipeg. Additionally, Dr. Hasler is an adjunct professor at Queen's University and the University of Manitoba. He is a past president of the Canadian Aquatic Resources Section of the American Fisheries Society (AFS) and current president-elect for the physiology section of AFS. His research broadly focuses on understanding the impacts of environmental stressors on aquatic species. Specifically, he has studied a wide range of stressors including carbon dioxide, microplastics, diluted bitumen, elevated temperature, and hypoxia. He has also written several technical papers on aquatic

invasive species, including bigheaded carp, zebra mussels, and several macrophyes as part of a risk assessment report for Fisheries and Oceans Canada. In total, he has published nearly 90 peer-reviewed papers, co-edited two books. He is also an Associate Editor for Conservation Physiology and Transactions of the American Fisheries Society, two international peer-reviewed journals. He grew-up in Flinton, Ontario, where he spent summers learning to swim in the Mazinaw.

Dr. Biagi, Assistant Professor Department of Earth Sciences | Brock University. She specializes in the effect of landscape mitigation practices on ecosystem hydrology and hydrochemistry to provide guidance on the effectiveness of those strategies; and is a Farlain Lake Eurasian Milfoil Committee member. Farlain Lake has extensive lessons learned in combating EWM, including their recent application of ProcellaCOR FX FX. At McMaster University she obtained her M.Sc. (2013 – 2015) and Ph.D. (2016 – 2021) in environmental science with a focus in hydrological sciences. There, her research examined the hydrological and hydrochemical functioning of reconstructed wetland systems in the Athabasca oil sands region of Canada. One of the overall goals of this research was to evaluate the system's trajectory and success potential to guide future design and construction of peatland-watersheds. Following these degrees, Kelly worked as a post-doctoral fellow at the Toronto Metropolitan University where she studied the nutrient loads from Lower Great Lakes headwater streams to better understand the distribution of nutrient loads, their causes and potential mitigation strategies to limit excess nutrients. Currently, Kelly is an Assistant Professor at Brock University where she continues her studies on these topics while incorporating local Niagara wetland restoration work.

SECTION 1: Eurasian Watermilfoil (EWM)

1.1 What is Eurasian Watermilfoil (EWM)?

EWM is an aggressive invasive species aquatic plant, regulated under the *Ontario Invasive Species Act* (ISA) to help prevent, control and reduce their spread within Ontario's economy and biodiversity through early detection, response and eradication measures.

Example colony located in the south basin, Photo Credit: Vern Haggerty, 2023

There are two classes of invasive species regulated under the ISA: Prohibited and Restricted. For prohibited species, it is illegal to import, possess, deposit, release, transport, propagate (breed/grow), buy, sell, lease or trade these invasive species. For restricted species, it is illegal to deposit or release restricted invasive species in Ontario and cannot be brought into a provincial park or conservation reserve. EWM is restricted.

The ISA defines invasive species as: *"a species that is not native to Ontario, or to a part of Ontario, and,*

> *(a) is harming the natural environment of Ontario or of the part of Ontario in which it is present, or*
>
> *(b) is likely to harm the natural environment of Ontario or of a part of Ontario, regardless of whether it is present in Ontario or in a part of Ontario; ("espèce envahissante")*"

According to the Ontario Invasive Plant Council, "*once established, Eurasian water-milfoil is able to form dense underwater mats of vegetation that can negatively impact the ecosystem of a waterbody, including displacing native plant species, altering food-web structures, reducing macroinvertebrate abundance and diversity, and degrading the quality of fish habitat. These thick mats also reduce the aesthetic appeal of a water body, decrease property values and impact recreational activities such as swimming and boating, and can clog industrial and power generation water intakes*". In Mazinaw, it primarily grows in shallow waters (ie 20 ft or less) but can grow in depths of up to 30 ft.

1.2 What does EWM look like?

The Mississippi Valley Conservation Authority EURASIAN WATER-MILFOIL Quick Reference Guide for Landowner Management, provides the following identification guidance:

1.3. How does it spread?

According to all credible sources and from first hand experiences, EWM grows very quickly from seed dispersal, lateral roots, and plant fragments created from physical breakage by boaters, swimmers,

canoes, kayaks, paddleboards, anglers, and other disturbances (e.g., forceful wave action, aquatic animals, fish, waterfowl, etc.). during the summer and early Fall months (when EWM is closest to the water surface).

Plant fragments are the primary means of EWM reproduction; they float on the surface and are dispersed by wind and wave actions to other areas where they sink and colonize into new plants. In optimum water temperatures (15°C–35°C) EWM plants can grow 30 cm per week. Refer to above photo of a weed bed in the south lake that has spread and become very thick.

1.4 What substrate does the milfoil need to grow in? Would it typically not grow in areas with rocky boulder cobble bottoms? What are the factors in terms of where it will grow, both in terms of water depth and the presence of a good sediment substrate.

Dr. Hasler advises at 1 hr 39 m of the Aug 15th 2024 MPOA Information Session that *"it requires inorganic fine sediment, so fairly common substrate throughout the lake. It also requires, of course, sunlight. So, at a place where sun can hit it and find inorganic sediment, which is most of the littoral zone of Mazinaw Lake, you could anticipate that would be an area of concern where it could take over.*"

1.5 What are the issues with EWM?

The Government of Ontario and other credible sources, (i.e. Ontario Invasive Species Plant Council) acknowledges that EWM invasive aquatic plants threaten our environment, economy and society. Some details include, but not limited to:

ENVIRONMENTAL ISSUES:

- The lake's ecosystem will be altered. EWM's dense underwater mats of vegetation can negatively impact the ecosystem by displacing native plant species, altering food-web structures, reducing macroinvertebrate abundance and diversity, and degrading the quality of fish habitat.
- EWM reduces biodiversity by competing aggressively with native plants thus harming fish and wildlife habitat who rely on native plants to thrive.
- Sudden nutrient release caused by late-season die-back of extensive plant beds may cause nuisance algae blooms. Dense floating vegetation becomes breeding habitat for mosquitoes.
- Stagnant oxygen-depleted conditions are often found in association with dense beds of EM. Reduced oxygen levels in the water caused by decomposing plants can kill fish.
- The annual decomposition of aquatic weeds leads to higher phosphorus. In turn phosphorus feeds the weeds the following year. This vicious cycle diminishes the health of the lake, in particular, by lowering the concentration of dissolved oxygen.
- This environmental indicator cycle has a negative impact on cold water species such as Lake Trout.
- By managing EM, we can better manage the phosphorus levels which in turn will slow the aging of the lake from Oligotrophic status to Mesotrophic.
- Mazinaw Lake is the headwater for the Mississippi River watershed. The watershed

encompasses an area of 3,750 km². From its headwaters at Mazinaw Lake to its confluence at the Ottawa River near Fitzroy Harbour, the river drops 210 m in elevation.

- The EWM infestation has the potential to spread to other water bodies, (by boat traffic or fragmentation), that may or may not be even more vulnerable to invasive species damages.

ECONOMIC ISSUES:

- Due to EWM's thick mats, they reduce the aesthetic appeal of a water body, impact recreational activities such as swimming and boating, and can clog water intakes. Taken together, weed infested shorelines depress property values up to 20%, as verified by credible international, North American and local studies. The Blue Lake ecolabel program, which Mazinaw Lake is enrolled in, indicates that "*multiple studies have revealed that water quality has shown to be a significant explanatory variable of lakeshore property prices. The management of lake quality is important in maintaining the natural and economic assets of the region (EPA, 2015, Maryland Counties). As the water quality of a lake increases, so does the potential for higher lakeshore property prices*". Link here
- Mazinaw Lake draws hundreds of thousands of visitors per year resulting in significant economic spinoff for the local and regional area (i.e. 70% or more of local business sales is from Mazinaw's traffic, according to interviews with local businesses). Ensuring positive Lake health is vital for continued economic vitality of local businesses.
- Because of the EWM high growth rate, the more EWM there is, the more costly it is to treat. Mazinaw's 2023 infestation mapping indicated approximately 15 hectares, or 5% of the habitable area water that is ≤ 6 m (20 ft or less), as verified by our orthomosaic and visual mapping completed last year. However, said 5% habitable area coverage may increase to 65% in only 8 years, based on the experience of other Ontario Lakes.

SOCIETAL ISSUES:

- Recreational activities such as boating, fishing, and swimming are impeded by dense growth at or near the surface where the weeds patches have formed. Dense floating vegetation becomes breeding habitat for mosquitoes and algae blooms. Thereby reducing or impeding most forms of outdoor recreation Besides being close to many people's cottages where their family swim, the largest patch on the south lake is located in front of both Bon Echo Beach, representing 11% of the total area of infestation. This patch threatens the Mazinaw Lake Swim Program which has been operating for 50 years.

1.6 Where is EWM found in lake Mazinaw?

During the summer and fall of 2023 the MPOA Board embarked on an orthomosaic surveying and mapping exercise to understand and quantify all locations of Eurasian Milfoil on the Lake.

In summary, our findings conclude that as of the date of the survey (Q4 2023):

- There are approximately 15 hectares of Eurasian Milfoil interspersed throughout the lake.
- This area represents 5% of the habitable area (shoreline of 20 feet or less). However, based on the experiences of other lakes, we can expect 65% coverage in only 8 years.
- In total, 23 patches of EWM were identified across both the north and south lakes. It is also found in the bay above the north lake.
- This year, (Sept 2024) the quantities of colonies have already increased by 17.4% compared to 2023.
- Although Mazinaw is the seventh-deepest lake in Ontario, the lake is very large, with 3969 acres in surface area, meaning there are extensive areas for EWM habitat throughout its shorelines and inlet bays which are ≤ 6–9 m (20 to 30 ft) of habitable EWM area.

Please click here for the location of the mapped colonies (2023): https://www.lakemazinaw.ca/location.php It is important to avoid the EWM colonies to avoid the spread of this invasive species, and refer to flyer below for more details.

Mazinaw Lake

INVASIVE SPECIES ALERT

Eurasian Milfoil Weed Beds Present on Mazinaw Lake

What are the yellow markers on Mazinaw Lake?

The Mazinaw Blue Lakes Committee has installed yellow buoy markers to delineate colonies of Eurasian Milfoil, a very aggressive invasive species. The objective of the markers is to stop or reduce watercraft traffic in these areas.

Boat propellers, oars, and paddles cause the Milfoil to break off, re-root, and further the spread.

Please keep away from the marked areas. When boating, please stay on the deep water side of the markers.

Photo: Ontario Invasive Plant Council

Buoys such as those installed at Bon Echo must meet Transport Canada Guidelines which includes the name and of the owner and their phone number. The MPOA does not have a phone number. Those buoys cost $1,000.00 each. Markers do not require any labeling and cost the MPOA less than $30.00 each. Yellow markers were chosen as they do not require any labeling. Yellow is the Transport Canada warning colour. We also thought that the yellow markers were less obtrusive if one happened to be located near your dock.

1.7 When was EWM first reported in Mazinaw Lake?

EWM was first officially discovered in Mazinaw Lake several years ago and reported in the Invasive Species Ontario mapping database Oct 29, 2019 by the Conservation Authority, but unfortunately the MPOA did not receive a notice of this discovery. Later, in 2022, our former Lake Steward of 10 years alerted the Board to the large colonies developing in a variety of locations throughout the Lake.

1.8 Does EWM have a life cycle, like the LDD moth?

The Invasive Species Centre explains that EWM is a perennial plant, meaning it comes back every year, Link here

1.9 What would happen if we did nothing?

As noted in this FAQ, EWM has a high growth rate, which is exacerbated by disturbances and the associated fragmentation, among other factors. The more EWM there is, the more the environmental, economic, and social issues, detailed in the section above, will be exacerbated and the problems will worsen. We are in a unique position to advance management efforts, before it grows to a scale that sees significant damages in all three categories of environmental, social, and economical.

In the MPOA Aug 15th Information Meeting, (link here) from 38 m to 41 m, the PhD experts advised as follows:

Dr. Hasler stated that, "*the do-nothing approach will mean that it will spread to all corners of the lake that it can survive in which is a significant, probably, if not all, of the littoral zone. Then what you will have is very dense weed beds which will be problematic for the rest of the native plants as well as the rest of the biota. There was a question about whether this would lead to decomposition of dead millfoil, and what that would mean essentially, you would have decomposing plants so thick that the oxygen would be reduced throughout the lake which would seriously impact fish health. Bentham, Macroinvertebrates, and so forth, as well as there would probably be a new smell associated with the noxia. Thus, the do-nothing approach would be poor. And someone questioned, if there would be a natural cycle where it would eventually, you know, die out. I believe what usually happens with invasive species, and this is probably no exception. There's this brief period, this sort of several year period, where it hits a peak abundance or density, and then it starts to level out. It levels out at a level that's still very much a nuisance. It doesn't actually go down to a level that would be considered back to normal. We see this with zebra mussels, we see it with all the other invasive species. Therefore, the do-nothing approach would not be the natural approach that we may wish. That would only apply before it invaded the scenario"*.

While Dr. Biagi added that, "*from a recreational perspective. The habitable area will be unusable. The Eurasian watermilfoil will get caught in motorboat propellers, swimming will become extremely difficult. I don't know of cases in Canada, but there have been cases of people drowning in it. We've had a couple of people on the lake the last couple of years, who couldn't swim off their dock because it was so thick they had to anchor out in the middle of the lake to swim.[...] which impacts property values. So, it is not only ecologically bad, but also bad from a property owner perspective.*

1.10 Would mandatory septic inspections alone fix the EWM issue?

During the MPOA Aug 15th Information Meeting, from 27 m to 32 m the topic was discussed by Dr. Hasler, who shared: "*certainly reducing phosphorus leaks from septic systems would help reduce*

phosphorus levels in the lake. But there are various other inputs, such as waterfowl excrement, human use of the beaches, things of that nature that would increase phosphorus as well.[....]. Therefore, controlling phosphorus at any level would be important, not only for EWM, but the overall health of the of the lake"

Dr. Biagi added, *"Phosphorus contributes to all sorts of plant growth, not just EWM. But the nature of invasive species is that they grow in any sort of conditions. So, while fixing the septic tank issues may help limit some nutrients entering the lake, once the milfoil is established, it will snowball on its own. That's the issue with invasive species is they grow wherever they can in extreme conditions"*

At the 1 hr 29 m point, elected official Councillor Yanch added that *"At this time our Council hasn't made a point of having a septic system inspections, but I certainly don't mind bringing that to council at some future meeting"*.

1.11 What other factors contribute to the proliferation of EWM once established?

Nutrients that aid in the growth of the EWM derive from a spectrum of different sources such as agricultural land uses which have run off that ends up in our waterways, certain aquatic animals, sediment, or human use of the Lake. Therefore, if we can control for source contaminants, we should certainly do that, where feasible.

At 30m, of the MPOA Aug 15th Information Meeting, Dr. Hasler explains that *"Nitrogen and phosphorus are important nutrients for all aquatic plants. In this case they get the phosphorus and nitrogen mostly from the sediment through the roots. There are some older papers that show relative abundance for EWM is higher in more eutrophic lakes, and then, as the lake becomes super eutrophic, it goes down, where all the biomass down. But we're at the point where it would be definitely within the range, where there's enough nitrogen and phosphorus to support high growth of the EWM. As said in the response to the other question, there's plenty of other sources of those nutrients, including things like waterfowl excrement, other human use of the water body. Thus, there's many sources as well as overland sources, too. Additionally, there is also internal loading of phosphorus which comes into play here. So, when the lake becomes agnostic, particularly because of those really high dense weed beds which eat up oxygen in the evening, but also when they're decomposing in the fall. that will cause Anoxia at the sediment level, which actually facilitates the release of more phosphorus into the ecosystem. S,o it's a cyclical activity whereby the worse it gets, then it gets even more worse, because more phosphorus is added to the lake."*

Dr. Biagi acknowledged and added that, *"plants dying will add phosphorus, but human factors add phosphorus as well, especially in southern Ontario, where agriculture is abundant which is adding nutrients everywhere. The nutrients are not just promoting EWM growth but other damaging plants such as algae blooms so there's other negative effects as well. Therefore, it's just useful to nip those in the bud"*

1.12 What treatment options have been considered?

Since Fall of 2022, the MPOA have investigated possible treatment options which are noted below. In each case, the pros & cons considerations are explained. Dr. Biagi, of Farlain Lake, who has been combating EWM for 12 years explains their firsthand experience with the alternatives as follows, which is aligned with our broad findings (refer to 32m in the video)

Diver Assisted Suction Harvesting (DASH): The diver assisted suction harvesting involves hiring professional scuba divers to pull the plants by their roots, place them into an underwater vacuum which then sucks the harvested plants to a barge. Once on the barge, the harvested plans are unloaded on land. Biagi reports that it can remove the plants well, but during the process, the plant fragments really easily. So, you just end up with fragments of EWM floating away and re-colonizing elsewhere.

Furthermore, this technique is cost prohibitive because there are no companies that offer DASH. Most Lake Associations, therefore, have to build their own DASH makeshift boats. Combined with hiring commercial divers, which has to be completed through a commercial licensed company. Taken together, the two components make it cost prohibitive. With large colonies, there is just not enough time in the day to even come close to harvesting what you would need to manage the problem.

The MPOA has experienced these issues firsthand, through some trial dive days. We found that it was more damaging, if anything, because the fragmentation was severe, and in addition, when the divers got down to the Lake bottom, the sediment was stirring up visibility was nil. We found the amount of manpower that would be required to do a 1 m² patch would be near impossible to tackle 15 hectares of dense colonies. The MPOA would need the Canadian Army for months to remove the volumes in the Lake. Therefore, DASH is deemed not feasible at all, both logistically and financially.

Burlap mats: This involves placing a burlap mat over the EWM held down by sandbags so that the sun can't reach the EWM and it dies. However, the EWM just continues to grow around the benthic mats, as invasive species do. They found a way to continue to grow, and you can't put benthic mats all over the whole lake. Also, just logistically speaking, putting out those mats is really hard. If you think about trying to swim down to the bottom of the water, place it, and then put a sandbag over it. It's very challenging. Attempts were also made to drag the benthic mats out with a boat and deploying sandbags. But it's very labor intensive. And it simply didn't work.

MPOA cost estimates at $1.5 per sq ft equates to **$2.4 million dollars** to cover the entirety of the known colonies.

Hand harvesting: This method is used for small patches but it has much of the same issues with the DASH method noted above. If you see one weed, hand pulling may work, but it's just not feasible for any more than a few plants.

Reward™: This is a product that kills the leaves of the plant so it can't photosynthesize and grow but it doesn't attack the rest of the plant like the roots and the stem. So, the plant just ends up coming back. Farlain Lake applied Reward for several years, and the patches were just getting bigger, so low return on investment relative to the costs.

Mechanical Harvesting: The MPOA has also investigated mechanical harvesting, but its widely deemed to be very environmentally damaging, ineffective, and is cost prohibitive (i.e. $5K per day plus disposal and the machine cost is $1M).

ProcellaCOR FX: ProcellaCOR FX offers a proven method to swiftly and effectively manage the Milfoil infestation. It is the most recommended management option validated by 2 years of due diligence consultation with experts and reputable Lake Associations, etc. ProcellaCOR FX is approved globally; and locally is approved by the United States Environmental Protection Agency and Health Canada's Pest Management Regulatory Agency (PMRA), which is responsible for pesticide regulation in Canada. There is no higher safety bar than said stamps of approvals. ProcellaCOR FX has been successfully used in water bodies worldwide to control the EWM invasive species, ensuring the health of the lake is protected and recreational areas remain accessible and enjoyable by visitors, property owners, and businesses who rely on the health of the lake. The extremely low potential risks associated with the herbicide are extremely small compared to the immediate benefits of restoring the Lake's health and usability for the community. Furthermore, addressing the invasive species with ProcellaCOR FX does not preclude other measures. In fact, it can complement hybrid efforts like public awareness campaigns, boat washing stations, septic inspections and the promotion of environmentally friendly practices among lake users. By reducing the presence of the invasive EWM invasive species, we can more effectively focus on mitigating nutrient input without the immediate pressure of an unusable lake. The assertion that localized herbicide application is impractical fails to consider modern application techniques, extremely strict health and safety standards set out by the government and the successful precedents in other lakes. With careful, targeted application, we can manage the EWM invasive species without significant risk to the broader ecosystem. In conclusion, while long-term solutions to preventative measures must be pursued, immediate action is required to control the current EWM outbreak. ProcellaCOR offers a safe and effective solution, ensuring that Mazinaw Lake remains a vibrant and usable resource for all members of the community.

1.13 Does Salt work to kill EWM?

Salt is not used to treat EWM. Both Dr. Biagi and Hasler have indicated it would not kill the plant and the amount required would have so many negative impacts on all the other Lake biota. Dr. Hasler explained "*Salinization of fresh waters is actually a fairly hot topic these days, because of the use of road salt. And we're finding it's having some impacts on phytoplankton, zooplankton fishes, plants, everything. So going out with buckets of salt would not solve this problem".* (refer to 37 m in the video)

1.14 What has the MPOA been doing to manage EWM?

EWM was first officially discovered in Mazinaw Lake several years ago and reported in the Invasive Species Ontario mapping database Oct 29, 2019 by the Conservation Authority, but unfortunately the MPOA did not receive a notice of this discovery. Later in 2022, our former Lake Steward of 10 years notified the Board of the large colonies developing in a variety of locations throughout the Lake.

Since then, the MPOA has been researching and implementing control methods to manage EWM and keeping members informed via a mix of Facebook, emails, Newsletters, the AGM, Calls for Volunteers, etc.

Spring/Summer 2023 (completed)

- Developed the draft Eurasian Milfoil Action Plan and an implementation model, communicated in the MPOA newsletter, at the 2023 AGM and beyond
- Researched treatment options

- Participated in FOCA Isample programs
- Spoke before Council re EM issues and requested support
- Advanced orthomosaic mapping to confirm all locations and quantify areas of EM
- Arranged 3 diver assisted EM removal days to better understand how much EM could be removed by diver hand pulling methods
- Applied for $200K grant at the end of July 2023 (not successful)
- Investigated fundraising by donation options via the township
- Installed new land signs re Notice of Invasive species and water markers
- Executed significant communication efforts by emails, flyers, social media, land and water signs etc
- Updated the website with key information

Fall 2023/Winter 2023 (completed)

- Finalized mapping - Approval to spend $6K, actual cost = $1,522.
- Applied to and/or researched several Grants
- Obtained the Blue Lakes Designation
- Advanced ongoing investigation of improved makers to delineate milfoil
- Formation of Grant and Fundraising Committee (underway)
- Monitoring of emerging EM research
- Preparation of the Spring Newsletter re Milfoil Spring/Summer 2024
- Obtained quote for ProcellaCOR FX treatment option
- Received Board approval to form a Grant and Fundraising Committee
- Re-install markers
- Continuation of the above noted on-going actions to manage EM
- Determined that ProcellaCOR FX is the most effective treatment option

Spring/Summer 2024 (completed in part)

- Received Board approval to form a Grant and Fundraising Committee
- Held Fundraising brainstorming session
- Re-install markers
- Continuation of the above noted on-going actions to manage EM
- Presented ProcellaCOR FX as the most effective treatment option and presented at the July 2024 AGM
- Met with Brown's camp to provide education on EWM
- Held Aug 15th 2024 Information meeting with world renowned PhD scientists and biologists
- Worked with local elected officials re EWM on the Joint Council meeting agenda
- Further mapping of new EWM colonies

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- Submitted letters to North Frontenac and Addington Highlands Councils asking for a meeting with various government agencies to clarify leadership of EWM management, roles and responsibilities.
- Completed FAQ in consultation with experts in the field of Invasive Species.
- Monitoring grant options

SECTION 2.0 Government Questions:

2.1 Is there a case to be made for the government, whether it's local, provincial, or federal, to undertake the treatment of this invasive species?

By MPOA email response, The Ministry of Natural Resources states that they *"have regulated Eurasian watermilfoil as a restricted species in Ontario, under the Invasive Species Act – which makes activities such as buying, selling, deposit/release, and propagation, illegal in Ontario. In addition, to prevent the spread of Eurasian milfoil and other invasive species to new waters in the province, the ministry has regulated watercraft as a carrier under the Invasive Species Act, 2015. It is illegal to place a boat, boating equipment, or a trailer, into any body of water if aquatic plants, animals, or algae are attached.*

Unfortunately, Eurasian watermilfoil has been present in Ontario in many lakes within the province. As such, the Ministry does not directly provide funding to support its control and management in individual lakes and waterways.

Recognizing the significant impacts milfoil can have on recreation and navigation, the ministry has enabled shoreline residents to manually or mechanically control invasive aquatic vegetation, without obtaining a work permit under the Public Lands Act, in certain scenarios. The rules for controlling invasive aquatic plants are summarized here. Depending on the type of control proposed, additional authorizations may be required, and the proponent must obtain the necessary authorizations and permits to proceed with management. For example, for plans that involve the use of herbicide, the Ministry of Environment, Conservation and Parks, and Fisheries and Oceans Canada should be engaged.

The Ministry of Natural Resources supports the Invasive Species Centre's Invasive Species Action Fund to help Lake Associations or other similar organizations coordinate on-the-ground action to address invasive species that threaten the natural environment, including Eurasian watermilfoil. The MNRF encourages Lake Associations to apply to this grant program to undertake control actions to manage the population of Eurasian watermilfoil in the lake. Control actions that are planned at this scale, should consider application of best management practices to address this invasive plant. The MNR has worked with partners such as the Invasive Species Centre to summarize information on this plant from a variety of sources across North America. Information on Eurasian Watermilfoil is available on the Invasive Species Centre's Best Management Practices' Database.

Locally, the municipal government does not have jurisdiction to advance treatment of invasive species on water bodies that they do not own, nor have jurisdiction over.

Should property owners wish to address any invasive aquatic species issue permits will be required by the Ministry of Environment, Conservation and Parks. Refer to their website here for more information: https://www.ontario.ca/page/remove-invasive-aquatic-plants or the comments by the MECP at 1hr 18m in the MPOA Aug 15th information meeting here: https://www.youtube.com/watch?v=EBC_Po1AatM

2.2 Why is it contingent on the property owners and not the BonEcho Provincial Park?

Mr. Clark Richards, BonEcho Park Superintendent explained "*the park is responsible for the regulated park boundary. Historically, any stewardship initiatives, and we'll certainly continue with any approved stewardship initiatives, would be responsible for funding those and also implementing them. Outside of the regulated park boundary, it's outside of the provincial parks mandate, and also jurisdiction and authority*".

2.3 Has Parks Canada been notified about the EWM invasive species issue?

A representative the MPOA contacted at Parks Canada advised as follows: "*While Mazinaw Pictographs is a National Historic Site of Canada (NHS), it is not administered by Parks Canada. There are more than 1000 designated National Historic Sites in Canada of which Parks Canada administers 171. Their capacity to provide support outside of Parks Canada administered places is limited. It means they prioritize and plan conservation services for the places they administer according to the legal obligations and capacity available. It also means that:*

- *On the natural side of things, their services are limited to National Parks or similar parks where legal agreement or federal obligations are in place. This also means that any extra support or advice is subject to internal capacity. Any direct support for Lake Mazinaw we have been advised is best discussed with Ontario provincial authorities.*
- *The designation of a national historic site, such as Mazinaw Pictographs NHS, is honorific. It does not legally protect the site, or transfer site ownership or management to Parks Canada. In Canada, protection of heritage property not owned by the federal government is the responsibility of each provincial and territorial government under its respective legislation. Only provincial and territorial governments have jurisdiction over private property, which enables them to pass and enforce legislation extending legal protection to designated properties.*
- *Designations under the National Program of Historical Commemoration, Parks Canada, do not come with federal financial support nor heritage conservation resources other than a heritage value statement and the Standards and Guidelines for the Conservation of Historic Places in Canada. Owners of national historic sites are encouraged to follow these guidelines for any alterations or maintenance of their site. You can download an electronic copy on the Parks Canada website under the Policy and Guidelines section or at the Canadian Register of Historic Places website.*

- *Parks Canada's National Cost-Sharing Program for Heritage Places helps ensure the protection and presentation of national historic sites, heritage railway stations, and heritage lighthouses that have been formally recognized by the Government of Canada, but that it does not administer. Funding is made available to eligible owners and lessees on an annual basis through a competitive call process.*
- *Eligible applicants include not-for-profit organizations, Indigenous organizations, and provincial, territorial, regional, or municipal governments who are either owners or long-term lessees of heritage places that have been formally recognized by the federal government, including associated lands, or parts of a heritage place or national historic site district. Private individuals are not eligible to apply.*
- *In the present Lake Mazinaw context, the conservation of the petroglyphs is not at stake, but the management of invasive species is, hence why the best they can provide in terms of support is best practices by reaching out to their network on the natural conservation side. Should you want more information on the National Program of Historical Designation or the network of NHS, you can either visit Parks Canada's website at https://parks.canada.ca/lhn-nhs, or contact the Historic Sites and Monument Board of Canada Secretariat at clmhc-hsmbc@pc.gc.ca."*