

Controlling Eurasian Watermilfoil in Minnesota Lakes: An Examination of Methods and Management

Courtney Millaway

Advisors: Dr. Jean Lavigne and Dr. Troy Knight
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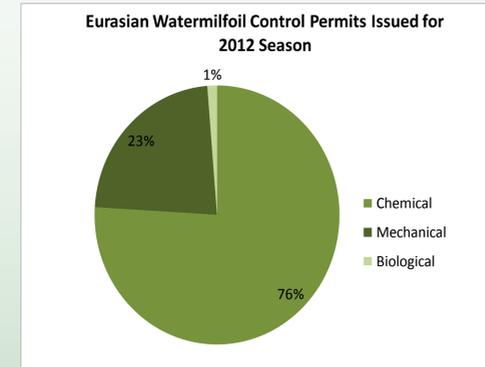


Abstract

Eurasian watermilfoil (*Myriophyllum spicatum* L.) is an invasive aquatic plant that is threatening Minnesota's waterways. It spreads mainly via fragmentation, and can be spread to different lakes by hitching a ride on boats, trailers, and other water-related equipment. Once introduced, it grows dense canopies of matted vegetation that can out-compete native vegetation, decrease property values, and inhibit water recreation. Currently, there are three control options for Eurasian watermilfoil: chemical, mechanical and biological. I conducted a literature review examining the different control methods and interviewed an Invasive Species Specialist and Lake Association member who had direct experience with the process and implementation of Eurasian watermilfoil control. Currently in Minnesota, chemical control is the method most often utilized for control, with mechanical control being the second. Biological control using *Eurhychiopsis lecontei*, a milfoil weevil still under review, is being utilized in only one lake in the 2012 season. I conclude that the best approach for Eurasian watermilfoil control in Minnesota is not a one-solution, catch-all method, but rather scenario specific based on differing lake characteristics. The decision table I created may thus be used as a supplemental resource to assist Lake Association members in their control method decision process.

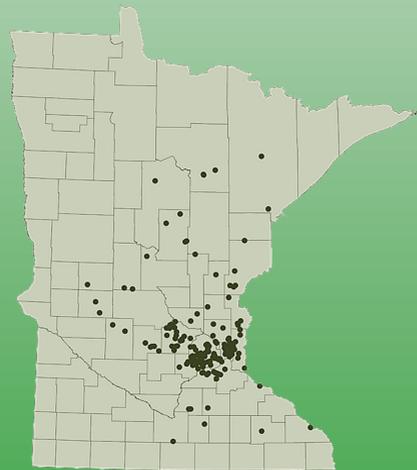


Eurasian watermilfoil growing in dense mats on a lake and forming a canopy layer on the water surface. www.saveblacklake.org



Above: Data compiled from MN DNR

Right: Sign posted at public boat accesses by the MN DNR to help prevent the spread of aquatic invasive species such as Eurasian watermilfoil.



Eurasian watermilfoil was first discovered in Minnesota in 1987 in Lake Minnetonka. As of July 30, 2012, it was identified in over 260 lakes, rivers, and streams. [Www.dnr.state.mn.us](http://www.dnr.state.mn.us)



METHOD	OVERVIEW
Chemical (Triclopyr and 2,4 D)	Effective for large, well-established milfoil. Not permitted in areas of floating-leaf or emergent vegetation. May be detrimental to human health—2,4 D is a possible endocrine disruptor. Anywhere from \$350-600 per acre depending on dose rate, volume treated, labor costs, etc. Commercial services easily accessible.
Mechanical (Hand-pulling or Harvester)	Hand-pulling: effective for small, localized populations. Best method for areas containing native milfoil and floating-leaf and emergent vegetation. Time-intensive. Harvesters: non-selective therefore, native vegetation may be harmed. High risk for fragmentation, therefore, not the best method for reducing milfoil populations. Costs \$300-\$600 per acre, must be done periodically throughout the summer.
Biological (Milfoil Weevil <i>E. lecontei</i>)	Shown to reduce milfoil populations in the long term, but not as predictable in its effectiveness. Native to North America and specializes in milfoil herbivory. High bluegill populations can decrease the effectiveness of weevils. Population of weevils most likely need to be continually re-stocked to manage an effective population. Weevils are typically stocked for 2 to 5 years with a minimum cost for stocking of \$6,000 to \$20,000 per year every 2 to 3 years. Companies providing this service commercially are limited. This method is still under research.



Milfoil weevil. Photo by Robert L. Johnson, Cornell University

Conclusion

I conclude that Eurasian watermilfoil control in Minnesota lakes needs to be evaluated on a case-by-case basis depending on the differing lake and infestation characteristics. In addition, cost, duration of control, environmental and human health impacts, and goals of management must be evaluated personally by those implementing control. Below is a brief overview of a recommendation plan I have created based on the extensive literature review and interviews conducted.

- Chemical control seems to be the most viable option for lake owners looking for dependable control of a large and well-established milfoil population with the knowledge that application will need to occur on a yearly basis.
- Mechanical control using the hand-pulling method is most effective for small, localized milfoil populations or in areas of high native milfoil, floating-leaf vegetation, or emergent vegetation. Harvesters are not effective in decreasing milfoil populations.
- Biological control is in need of more research to make it a more predictable, effective control method. It has been found to be successful in decreasing milfoil, but there is difficulty in maintaining adequate weevil populations. This method, however, is promising for long-term control.

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