

M.L. 2013 Minnesota Aquatic Invasive Species Research Center Subproject Abstract

For the Period Ending June 30, 2019

SUBPROJECT TITLE: MAISRC Subproject 18: Eurasian and hybrid watermilfoil genotype distribution in Minnesota

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FUNDING SOURCE: Environment and Natural Resources Trust Fund (ENRTF)

LEGAL CITATION: M.L. 2013, Chp. 52, Sec. 2, Subd. 06a

SUBPROJECT BUDGET AMOUNT: \$221,375

AMOUNT SPENT: \$220,412

AMOUNT REMAINING: \$963

Sound bite of Subproject Outcomes and Results

We determined the distribution of hybrid, Eurasian, and northern watermilfoil in Minnesota and assessed factors related to this distribution. We also assessed genetic variation (diversity) and distribution of specific genotypes and began an assessment of the response of watermilfoil and genotypes to management with herbicides.

Overall Subproject Outcome and Results

Eurasian watermilfoil (*Myriophyllum spicatum*) is one of the most problematic invasive aquatic plants in Minnesota. It can hybridize with the native northern watermilfoil (*M. sibiricum*) and reproduce sexually. Previous studies show that some genotypes of hybrid are resistant to specific herbicides and some may be more invasive. We determined the distribution of hybrid, Eurasian, and northern watermilfoil in Minnesota and assessed factors related to this distribution. We also assessed genetic variation (diversity) and distribution of specific genotypes and began an assessment of the response of watermilfoil and genotypes to management with herbicides. We sampled 64 lakes across the state stratified by county, size, and duration of infestation and collected milfoil from random points. The DNA from the milfoil samples was analyzed to determine taxon (Eurasian, northern or hybrid) and specific genotypes.

We found Eurasian in 43 lakes, hybrid in 28 lakes, and northern in 23 lakes. Hybrid was much more common in the metro, whereas Eurasian was broadly distributed. Northern watermilfoil was the most diverse with 84 genotypes, none shared across lakes. In contrast, we found one widespread genotype of Eurasian and six others found in individual lakes. Hybrid was intermediate in diversity with 53 genotypes; most lakes had only 1 unique genotype but 40% had multiple hybrid genotypes. Several genotypes were found in multiple lakes indicating clonal spread. The high diversity of hybrid watermilfoil indicates there is much potential for selection of problematic genotypes that are resistant to herbicides or that are competitively superior. There are numerous hybrid genotypes that could become problematic, but few have been widely distributed. We have not yet identified any clearly problematic genotypes in Minnesota but lakes with unexplained treatment failures, and populations with high diversity should be assessed. We will implement a strategy to identify and test problematic genotypes in Phase II of this project – MAISRC Subproject 18.2: Genetics to improve hybrid and Eurasian watermilfoil management.

Subproject Results Use and Dissemination

We disseminated our results with presentations at the MAISRC Research & Management Showcase, several regional meetings and the national Aquatic Plant Management Society. We met with DNR Specialists, lake managers, consultants and other stakeholders twice to present results and to seek input on further work. In conjunction with MAISRC staff, we developed a Google Map indicating the locations we sampled and found Eurasian, hybrid and northern watermilfoil (<https://www.maisrc.umn.edu/hybrid-distribution>). This map will be updated as we get new information. We also generated a preliminary report in March 2019 and a final report detailing the background, methods, results and conclusions for distribution to managers and stakeholders and posting on the MAISRC website. The DNR and managers are starting to take this information into account when planning control activities.