M.L. 2017 Minnesota Aquatic Invasive Species Research Center Subproject Abstract
For the Period Ending June 30, 2022

SUBPROJECT TITLE: MAISRC Subproject 30: Managing Midwestern aquatic invasions in a changing climate
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FUNDING SOURCE: Environment and Natural Resources Trust Fund (ENRTF)
LEGAL CITATION: M.L. 2017, Chp. 96, Sec. 2, Subd. 06a

SUBPROJECT BUDGET AMOUNT: $39,000
AMOUNT SPENT: $38,866
AMOUNT REMAINING: $134

Sound Bite of Project Outcomes and Results

Managing AIS in Minnesota's water requires integrating ecological science to understand invaders' impacts and how they respond to different management strategies, climate science to understand changes under changing conditions, and social science to understand the preferences of communities and how they make decisions. This project helps us understand all three.

Overall Subproject Outcome and Results

Nitellopsis obtusa (starry stonewort) is a freshwater alga that is a key emerging invader in Minnesota and the upper Midwest that displaces native aquatic plant communities and restructures lake ecosystems. We conducted an interdisciplinary project to evaluate how starry stonewort will respond to climate change and to understand community decision-making about management options incorporating both ecological and social factors. We did this by utilizing a latitudinal gradient in the range of starry stonewort, from Indiana to Minnesota, as well as inter-annual variability as proxies for potential climate change. Across the region we monitored invasions to evaluate community effects of starry stonewort and conducted interviews with stakeholders to evaluate perceptions of starry stonewort impacts and management preferences. We found that starry stonewort can expand rapidly, but invasion dynamics were highly variable and influenced by climatological conditions. In some particular circumstances expansion was very limited and, in some years, native species were able to recover in areas where starry stonewort abundances decreased. From stakeholder interviews we learned that current management strategies, perceptions about the importance of addressing invasive species, and stakeholders' goals differed between states and stakeholder types. We also found that there were two distinct sets of values that motivated stakeholders, where individuals either viewed lakes as a public good or an exclusive resource.

This information can help predictions of further spread of starry stonewort and of the potential impacts of starry stonewort invasions once established. Additionally, our results can help local stakeholders understand invasion dynamics and impacts to inform their decisions about management options. At the same time our social science efforts can help inform state and regional resource managers about how they can best assist stakeholders in their decisions and our ecological efforts can help develop standards (such as monitoring protocols) that should be included in permitting for treatments.

Subproject Results Use and Dissemination

We have presented results from this project in a number of academic, governmental, and public presentations including at the MAISRC Showcase, a MAISRC detectors webinar, the Indiana Invasive Species Council, the Indiana University Environmental Resilience Institute Symposium, Hoosier Flyfishers, Boston University, and the University of Buffalo. We are also currently drafting a policy brief based on our social science efforts (in coordination with a manuscript about to be submitted) that will be shared with MAISRC.

Presentation Recordings/Videos
- 2021 MAISRC Research & Management Showcase Presentation
  https://z.umn.edu/2020ShowcaseStarryClimate

- AIS Detectors Webinar: Understanding Starry Stonewort Invasions in a Changing Climate
  https://z.umn.edu/DetectorsWebinarStarryClimate