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Efficacy of Benthic Barriers as a Control Measure for Eurasian Watermilfoil (*Myriophyllum spicatum*)

Karen L. Laitala, Timothy S. Prather, Donn Thill, Brian Kennedy, and Chris Caudill*

*Graduate Student, Associate Professor, and Professor, Department of Plants, Soil, and Entomological Sciences, University of Idaho, P.O. Box 442339, Moscow, ID 83844-2339; Assistant Professor, Department of Fish and Wildlife Resources, University of Idaho, P.O. Box 441136, Moscow, ID 83844-1136; Research Scientist, Department of Fish and Wildlife Resources, University of Idaho, P.O. Box 441141, Moscow, ID 83844-1141. Present address of first author: Coordinator, Powell County Weed District, 210 Fair St., Deer Lodge, MT 59722. Corresponding author's E-mail: tprather@uidaho.edu

Abstract

The use of benthic barriers alone or in combination with other control methods could initiate the eradication of pioneer populations of Eurasian watermilfoil and facilitate maintenance of acceptable population levels in water bodies where the weed is widely established. We evaluated the effects of duration of geotextile fabric panel placement on small Eurasian watermilfoil population control and nontarget plant abundance. In 2006, benthic barriers were placed over Eurasian watermilfoil infestations and removed at intervals of 4, 8, 10, and 12 wk. The 4-wk duration reduced Eurasian watermilfoil biomass 75%, and all other duration treatments reduced Eurasian watermilfoil biomass 100%. The 4-wk treatment had no effect on native plant biomass, whereas other treatments reduced native plant biomass by 79 to 93%. At the conclusion of the 12-wk study, Eurasian watermilfoil biomass had increased in the 4-wk treatment but did not reestablish within treatment plots of longer duration. Native plant biomass had increased to 21% of the untreated control in the 8-wk barrier treatment. Results suggest the 8-wk duration is sufficient for removal of Eurasian watermilfoil while allowing regrowth of native aquatic plants. A walk-in growth chamber experiment was established to evaluate the effect of sediment accumulation on the benthic barrier. Eurasian watermilfoil fragments grown on sediment depths of 0 to 3 cm (0 to 1.2 in) did not differ for shoot or root biomass. At sediment depths of 4 and 5 cm, Eurasian watermilfoil root and shoot biomass increased when compared with the control, suggesting benthic barrier maintenance should include sediment removal when sediment reaches a depth of 4 cm.

None nclature: Eurasian watermilfoil, *Myriophyllum spicatum* L.


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Interpretive Summary: Exotic weeds have invaded and impaired aquatic ecosystems in western North America. Restoring native aquatic habitats degraded by exotic plants should decrease invader abundance and also result in a return to preinvasion levels of desirable vegetative communities and native diversity. Eurasian watermilfoil is a submersed, aquatic, Eurasian perennial plant that has invaded waterways throughout the United States and Canada, forming dense mats of vegetation on the water's surface, which interfere with water-based recreational activities, inhibit water flow, and impair critical fish and wildlife habitat. Bottom modification treatments, including the use of portable panels of synthetic weed fabric placed on the bottom of ponds and lakes can be an effective control measure for widely established populations of Eurasian watermilfoil and can be used to remove small populations. Although the effectiveness of bottom barriers for the control of nuisance aquatic plants in confined areas has been shown in previous studies, evaluation of optimum coverage time, maintenance requirements, and nontarget plant community response is lacking. We recorded the weight of Eurasian watermilfoil and native plants in 40 plots on the bottom of Round Lake in 2006 and Chatcolet Lake in 2007 near Plummer, ID. We also recorded shoot weight, root weight and length, and sediment depth during an aquarium-based study conducted at the University of Idaho in Moscow, ID, in 2007. The results of this study suggest that the 8-wk barrier placement is sufficient for removal of Eurasian watermilfoil while allowing regrowth of native aquatic plants. Our results also suggest that barriers should be cleaned of sediment when deposition reaches a depth of 4 cm to prevent weed establishment.

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Keywords: *Myriophyllum spicatum*, benthic barriers, biomass reduction, native aquatic plants, sediment accumulation

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