

Management of flowering rush in the Detroit Lakes, Minnesota  
John D. Madsen, Bradley Sartain, Gray Turnage, and Michelle Marko\* ..... 61

Flowering rush (*Butomus umbellatus*) is an invasive aquatic plant introduced to North America from Eurasia in 1897. Flowering rush can grow either submersed or emergent from wet soil habitats to waters that are up to 5 m deep. Flowering rush was first observed in the Detroit Lakes system in the 1960s, causing significant impact to shoreline and recreational use. Flowering rush is currently found in five basins of the Detroit Lakes system: Big Detroit, Little Detroit, Curfman, Sallie, and Melissa Lakes. Submersed treatments with diquat were used during 2012 on an operational scale to control the nuisance impacts of flowering rush in waters from 0 to 1.3 m deep. We evaluated the response of native plant communities with the use of a point intercept method on 30 or more predetermined points in each of nine treatment plots, with four untreated reference plots. Treatment plots were sampled before treatment (June), and 4 wk after each of the two treatments. We also sampled 20 biomass cores ( $0.018 \text{ m}^{-2}$ ) in each of four treatment and four untreated reference plots. Although some species declined after treatment, most native species did not change significantly after treatments compared to untreated reference plots. Treatments with diquat not only significantly reduce flowering rush distribution (60%) and aboveground biomass (99%), but also significantly reduced belowground biomass (82%) and rhizome bud density (83%). As flowering rush is an herbaceous perennial that propagates predominantly by rhizome buds, reductions in rhizome bud density indicate that this approach can be used for long-term reduction in flowering rush populations.