

# Drawdown herbicide applications for control of flowering rush on dewatered littoral sites

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## ABSTRACT

Flowering rush (*Butomus umbellatus* L.) is an invasive weed in shallow water and moist soil environments. It thrives in reservoirs and rivers, and is able to tolerate significant water level fluctuations. In the western United States, it is spreading along the Flathead, Clark Fork, Pend Oreille, and Columbia river systems in Washington, Idaho, and Montana. In this study, we evaluated the efficacy during several herbicides applied to moist soil sites of a scheduled drawdown in Lake Pend Oreille, Idaho. Fifteen plots (0.1 ha) were established in the Clark Fork River delta, Lake Pend Oreille, with three replicates each of four treatments, including a nontreated reference. Herbicide treatments included imazapyr (1.68 kg ae ha<sup>-1</sup>) and imazamox (0.56 kg ae ha<sup>-1</sup>), with and without the addition of 2,4-D (1.06 kg ae ha<sup>-1</sup>). All applications included a nonionic surfactant at 2.8 L ha<sup>-1</sup>. Herbicides were made by all-terrain vehicle prior to predicted rain event, and immediately following emergence of new flowering rush growth in the spring (late April). Plots were evaluated using estimated percentage of cover and biomass samples ( $n = 10$ ) within each plot using a 0.18-m<sup>2</sup> core sampler before treatment and 1 and 2 yr after treatment (YAT). Only imazapyr-treated plots had a significant reduction in rhizome bud density, but not until 2 YAT. Rhizome and root biomass were significantly reduced in plots treated with imazamox and imazapyr by years, but not by other treatments. Midsummer cover was significantly lower in imazamox- and imazapyr-treated plots at 1 YAT, but not by 2 YAT. Both imazapyr and imazamox drawdown treatments are promising approaches to control flowering rush, but treatments will likely have to be done in two or three consecutive years.

*Key words:* 2,4-D, *Butomus umbellatus*, drawdown, imazamox, imazapyr.

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