



BUL 943

Flowering Rush

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- Flowering rush is listed as a “noxious” weed by the Idaho State Department of Agriculture (ISDA).
- Flowering rush is an invasive, aquatic, perennial weed.
- Idaho has multiple confirmed infestations in major water systems.
- It spreads rapidly, impedes irrigation water flow, outcompetes native plants, and degrades fish habitat.
- Flowering rush disrupts ecosystems and affects farmers, ranchers, natural resource managers, and outdoor enthusiasts.
- It is critical to identify, control, and monitor flowering rush whenever possible.
- Herbicide control methods show a limited degree of effectiveness for flowering rush management.
- Mechanical methods are partially effective and include hand pulling, digging, vacuum dredging, and benthic barriers.

Introduction

FLOWERING RUSH (*Butomus umbellatus*) is an invasive, aquatic, perennial weed (Figure 1). It originated in Eurasia and was first discovered in Idaho in 1949 in the Snake River near Idaho Falls. It has since become a serious problem. As of 2024, nine counties throughout Idaho had confirmed infestations. Flowering rush is listed as a noxious weed by the ISDA. Homeowners, landowners, and natural resource managers are required to control, reduce,



Figure 1. Flowering rush. Photo courtesy of Enoch Houtz

eliminate, and prevent flowering rush infestations on their property.

Flowering rush forms dense **monocultures** (growth of a single plant species that encompasses large areas), alters native habitats, uses large amounts of water, increases water temperature, increases sedimentation, and transfers nutrients from soil to water. These characteristics negatively impact native plant and fish habitat, natural and man-made water systems, and broader ecosystem processes. The weed also provides ideal habitat for piscivorous fish, not native to Idaho, which can decrease native fish populations. Additionally, it negatively affects human and animal use of waterbodies. Left unmanaged, flowering rush infestations disrupt native ecosystems and render irrigation systems essential for food production ineffective.

Plant Identification

Flowering rush roots in waterbody bottoms. It has triangular stems and can be confused with sedges, another group of plants with triangular stems. It is most easily identified from native plants when it flowers.



Figure 2. Leaves are triangular in cross section.

Flowering rush leaves are dark green, narrow, and upright with triangular edges (Figure 2). Unlike sedges, the leaves are spongy and rebound when squeezed. Leaves emerging from water can grow up to 3 feet long and twist in a spiral at the tips. Flowering rush can also grow submersed; submersed leaves may reach up to 10 feet long. Leaves collapse after seasonal fall freezes and when water levels in canals and water bodies are drawn down.

Flowering rush is rhizomatous and rhizomes easily fragment, fostering vegetative reproduction (Figure 3). In addition, there are **bulbils** (small bulbs) on the rhizomes and on the flowers. Roots are fleshy, typically growing to depths of approximately 6 inches. Rhizome fragments are buoyant, enabling them to disperse efficiently over long distances via moving water. Rhizome fragments establish most successfully in shallow, sparsely vegetated silt substrates, where water currents are less than 2 miles/hour.

Flowering occurs from early summer to midfall. Blooms (Figure 4) have 3-petals and 3 petal-like sepals. Petals are $\frac{3}{4}$ -inch to 1-inch wide and are light pink in color. Flowers form umbrella-shaped clusters, containing 20–50 flowers per cluster. Each flower produces approximately two hundred seeds. Seeds are brown and about 1 millimeter long.

There are two genetic types of flowering rush: **diploid** (two sets of chromosomes) and **triploid**



Figure 3. Flowering rush rhizomes. Photo courtesy of Enoch Houtz.

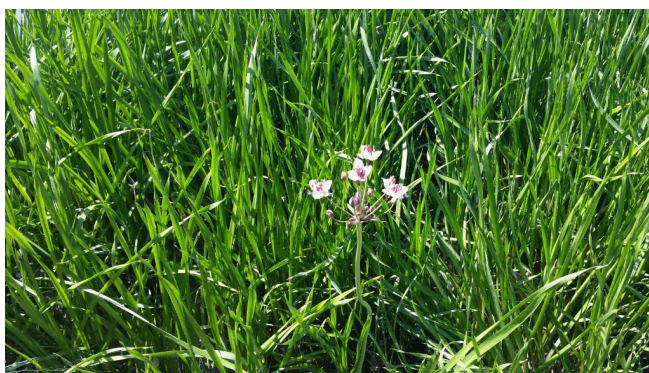


Figure 4. Flowering rush flower. Photo courtesy of Enoch Houtz.

(three sets of chromosomes). The diploid type flowers prolifically and reproduces by seed, vegetative rhizomes, and **flower bulbils** (small, bulblike structures that separate from the parent plant, can reproduce, and are found on rhizomes and flowers), and rhizome fragmentation. The triploid type flowers infrequently and produces sterile seeds. It reproduces primarily through rhizome fragmentation and dispersal.

Plant Habitat and Characteristics

Flowering rush grows on lakeshores, wetlands, and in slow-moving waterbodies. It also grows prolifically in irrigation canals, where it impedes water distribution. Although typically found in shallow

water 2–3-feet deep, the weed adapts to a wide range of water depths. It has been identified on shorelines in as little as 6 inches of water (Steve Howser, Aberdeen Springfield Canal Company, email message to author, 2 July 2019) and submersed at depths of up to 20 feet. Submersed leaves persist but become limp.

Idaho flowering rush populations tolerate temperatures below 0°F and above 90°F (Cole D. Morrison, Idaho State Department of Agriculture, email message to author, 19 June 2019). Warm substrate temperatures above 32°F promote sprouting and accelerated rhizome growth, allowing flowering rush to initiate growth as early as late February. Early growth, combined with seasonal irrigation patterns in Idaho, enables flowering rush to become well established and outcompete native plants that emerge later in the spring.

Control Options

Imazapyr (Habitat), imazamox (Clearcast), glyphosate (Roundup), and diquat are labeled herbicides that can be used to suppress flowering rush by decreasing foliage and root biomass. Imazapyr achieves nearly 90% control if used annually for seven years. Imazamox is nearly as effective as imazapyr, used across the same time frame. These treatments can be foliar or applied prior to plant emergence in areas where plants are seasonally exposed by receding water. Refer to product labels for application timing and rates to avoid use that may injure nontarget plants. Many herbicides cannot be used in certain situations due to irrigation and water-use restrictions. For example, irrigation water from treated canals may harm sensitive crops.

Drone applications of imazapyr and imazamox have shown promising results when applied to flowering rush following seasonal water drawdowns. Emerging precision-application drone platforms offer an efficient and targeted approach, improving herbicide coverage while minimizing disturbance to surrounding habitats. Treated areas should be monitored for thirty days post-treatment for efficacy (Jeremy Varley, Idaho State Department of Agriculture, personal communication, 27 May 2024). Coordination with irrigation districts, landowners, and regulatory agencies is strongly recommended prior to any herbicide application.

Manage small infestations using mechanical methods—for example, hand digging—though take care to remove all rhizome fragments. Unfortunately, digging can break off and spread rhizome fragments, increasing plant density. Dispose of excavated plant material several feet from the waterline in a location where hydration or runoff into water is not possible. Use **bottom barriers** (sheets of geotextile material anchored to water bottoms) in small areas (such as boat docks) to suppress growth and prevent rhizome movement and subsequent establishment of new infestations. Durable, UV-resistant geotextile barrier products designed specifically for aquatic environments provide longer-lasting control and reduce maintenance needs. Extend barriers beyond the edge of existing infestations.

For large infestations, mechanical aquatic vegetation rakes are effective. Commercial-grade aquatic rakes, such as those available through specialized suppliers, are engineered for durability and optimal sediment penetration, improving removal efficiency in dense infestations. For an example of an aquatic rake, please visit <https://maximizedwatermanagement.com/products-services>. Rakes should have teeth 8–10 inches long to reach a digging depth of at least 6 inches. Dispose excavated plant material several feet from the waterline to prevent reestablishment. When properly implemented, this method delivers consistent, multiyear control, often lasting up to five years, making it a cost-effective management option.

A promising biocontrol method is the weevil (*Bagous nodulosus*). The weevil is currently undergoing the petition process and approval for use in Idaho is not expected until approximately 2030 (Joseph Milan, Bureau of Land Management, email message to author 31 May 2024). Earlier releases are anticipated in Montana and Washington (Jennifer Andreas, Washington State University, email message to author 4 June 2024). If approved, this species could provide a sustainable, long-term control solution that complements existing mechanical and chemical strategies. However, release in Idaho will occur later, after establishment in Montana and Washington.

Integrated Weed Management

An integrated weed management program is essential for controlling and preventing the spread of flowering rush. The most effective programs combine chemical, mechanical, and (eventually), biological tools with proactive education and prevention strategies. To protect Idaho's natural resources, educational efforts should emphasize identification, monitoring, mapping, and infestation management. Thoroughly clean recreational equipment, trailers, and tow vehicles of all plant parts and debris and dispose of them away from the shorelines, canals, and other water sources. Utilizing dedicated wash stations or decontamination tools further reduces the risk of unintentional spread.

Regular monitoring helps reduce the negative impacts of flowering rush. Best practices include early detection and rapid control of small infestations; encouraging and protecting healthy native plant species (such as reeds) and their establishment and growth; installation of barriers against flowering rush; and reporting suspected flowering rush infestations to your local Extension office and/or county weed superintendent and the ISDA. Consistent monitoring, paired with high-quality tools and coordinated management efforts, significantly improves long-term control outcomes.

ALWAYS read and follow the instructions printed on the pesticide label. The pesticide recommendations in this UI publication do not substitute for instructions on the label. Pesticide laws and labels change frequently and may have changed since this publication was written. Some pesticides may have been withdrawn or had certain uses prohibited. Use pesticides with care. Do not use a pesticide unless the specific plant, animal, or other application site is specifically listed on the label. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

Trade Names—To simplify information, trade names have been used. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.

Groundwater—To protect groundwater, when there is a choice of pesticides, the applicator should use the product least likely to leach.

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