

Common Reed – Phragmites

Phragmites australis
Poaceae

**Class B Noxious Weed
Control Required**

Legal Status in King County: According to Washington State Noxious Weed Law, RCW 17.10, common reed, also known as phragmites, is a Class B Noxious Weed. The King County Noxious Weed Control Board requires property owners to control common reed on private and public lands throughout the county (control, as defined by state law, means to prevent all seed production and to prevent the dispersal of all propagative parts capable of forming new plants).

BACKGROUND INFORMATION

Impacts and History

- The species *Phragmites australis* has been a native wetland inhabitant to the United States for over 3,000 years. However, recent research has shown that in the late 19th century, several European genotypes of *Phragmites australis* were introduced and had a competitive advantage over native strains as well as other native species. The introduced genotypes now have a widespread distribution in the United States and can be found in every state.
- The invasive strains of phragmites create tall, dense stands, up to 15 feet tall, which degrade wetlands and coastal areas by competing with native vegetation, (including the native phragmites), for space and resources, creating a monoculture.
- Elimination of native plant diversity and alterations in hydrology affect the food sources and habitat functions for a wide range of fish and wildlife species.
- Both the native and non-native genotypes are found in Washington State, therefore careful identification by an expert is needed before any eradication measures are taken.
- Phragmites spreads rapidly due to its vigorous rhizomes (horizontal roots that produce new shoots) which can exceed 60 feet in length, grow more than six feet per year, and readily grow into new plants when fragmented. The roots form a dense mat underground that can reach a depth of up to 6 feet.
- The rhizomatous roots of phragmites have an allelopathic effect on other plants, inhibiting root growth in the soil thereby weakening the growth neighboring plants.
- Phragmites can invade a new site by wind dispersal of seeds, however, it spreads more readily by rhizomes.



- Stands of phragmites can present a potential fire hazard in fall and winter once the stems have become dormant and dry.

Description

- Clonal, perennial grass species with woody hollow culms (stems) that can grow up to 15 feet in height.
- Primarily grows in coastal and interior wetlands, lake margins, and roadside ditches but can also be found in dry areas.
- Stems are tan, rough and rigid.
- Leaves are flat, stiff and lanceolate, ranging from 8-16 inches long and 0.5- 2.0 inches wide at the base. Foliage is gray-green during the growing season.
- Seed head plumes are purple-brown-silver and are 6 – 20 inches long and up to 8 inches broad. These plumes form at the end of the stalk and flower in July through October.
- The chart below describes the morphological variation between the native and the invasive phragmites:



TRAIT	NATIVE PHRAGMITES	INVASIVE PHRAGMITES
Leaf sheaths	Fall off in the fall or are very easily removed if they stay on the stem.	Leaf sheaths stay on the plant, occasionally basal ones fall off the stem. Leaf sheaths are difficult to remove (use a twisting motion)
Stem color at base (spring/summer) Note: Leaf sheath needs to be removed	 Red to Chestnut	 Tan
Stem texture Note: Run your finger across and up and down the stem after removing the leaf sheath	Smooth and shiny	Rough and dull (Stems are ribbed. Ridges visible with naked eye.)
Stem flexibility	Flexible	Rigid
Stem toughness	Low	High
Time of flowering	Early (July-August)	Intermediate (August - October)

TRAIT	NATIVE PHRAGMITES	INVASIVE PHRAGMITES
Inflorescence	 Sparse	 Dense
Leaf color	Yellow-green	Grey-green
Rhizome density	Low	High
Rhizome color	Yellowish	White to light yellow
Rhizome diameter	Usually under 15mm Almost perfectly round. Occasionally slightly compressed.	Few nodes under 15mm, most >15mm Mostly compressed (oval)
Clonal expansion rate	Slow	Rapid
Habitat requirements	Potentially restricted All examined native populations grow on moist soils. Sites can be under tidal influence but are never continuously inundated.	Wide range of conditions Introduced genotypes can grow on fairly dry sites and on sites where rhizomes are continuously inundated.

Habitat

- Most commonly found in tidal and non-tidal wetlands, brackish and freshwater marshes, river edges, shores of lakes and ponds, roadsides, and disturbed areas. Will occasionally grow in drier areas.
- Can grow in several feet of water.
- Grows in full sun, but can tolerate partial shade.



Reproduction and Spread

- Spreads rapidly by rhizomes. Broken rhizomes can take root and start another infestation.
- Rhizomes can grow up to 60 ft in length and reach a depth of 6 ft beneath the soil surface.
- Flower heads produce great quantities of seed between late September through January that are dispersed by wind, water and/or wildlife. However, seed viability is often low and a secondary source of spread.



Local Distribution

There are currently about 20 known sites of invasive phragmites in King County. The largest site is located under the 1st Avenue South Bridge in south Seattle. This infestation is approximately 4 acres in size. Other sites include the Union Bay Natural Area and Foster Island near the University of Washington; along the Sammamish River; and several ditches along roadsides and highways throughout King County.



Phragmites infestation under the 1st Avenue South Bridge in Seattle.
Photos taken in August 2003.

CONTROL INFORMATION

Integrated Pest Management

- The preferred approach for weed control is Integrated Pest Management (IPM). IPM involves selecting from a range of possible control methods to match the management requirements of each specific site. The goal is to maximize effective control and to minimize negative environmental, economic and social impacts.
- Use a multifaceted and adaptive approach. Select control methods which reflect the available time, funding, and labor of the participants, the land use goals, and the values of the community and landowners. Management will require dedication over a number of years, and should allow for flexibility in method as appropriate.

Planning Considerations

- Survey area for weeds, set priorities and select best control method(s) for the site conditions and regulatory compliance issues (**refer to the King County Noxious Weed Regulatory Guidelines**).
- Control practices in critical areas should be selected to minimize soil disturbance or efforts should be taken to mitigate or reduce impacts of disturbance. Any disturbed areas need to be stabilized to control erosion and sediment deposition. Refer to the King County Surface Design Manual for further information about sediment and erosion control practices (call 206-296-6519 or go to <http://kingcounty.gov/wlr/Dss/Manual.htm> for more information). Minimizing disturbance also avoids creating more opportunities for germination of weeds.
- Areas vulnerable to erosion (steep slopes or shorelines within the zone of influence of wave action) should not be dug up without erosion-prevention measures in place. Large

cleared areas need to be replanted with native or non-invasive vegetation and stabilized against erosion. Infestations in these situations may require more concentrated efforts to control.

- Small areas of seedlings may be effectively dug up, taking care to remove all of the roots and rhizomes, in order to stop them from infesting a larger area. Follow-up is important to control any regrowth from rhizome fragments.
- For larger infestations, the strategy will depend on the site. Generally work first in least infested areas, moving towards more heavily infested areas. On rivers and streams, begin at the infestation furthest upstream and work your way downstream.
- Properly dispose of all parts of the plant (see Disposal Methods section below).
- Minimize disturbance to avoid creating more opportunities for seed germination.

Early Detection and Prevention

- Look for new plants. Get positive plant identification by contacting your local noxious weed control program or extension service.
- Survey for phragmites in disturbed wet areas, such as wetlands, lakeshores, stream banks and ditches. Pay close attention to areas near known infestations
- Optimal timing window for survey is July through September; however, dried stems at established infestations may be visible throughout the winter and into the next growing season.
- Dig up isolated plants and return the following year to check for new seedlings and plants re-sprouting from root fragments.
- Prevent plants spreading from existing infestations by cleaning off equipment, boots, clothing and animals that have been in infested areas.

Manual Control

- The use of hand tools is allowable in unincorporated King County critical areas. Check with the local jurisdiction for regulations in other areas.
- Manual control is feasible for individual plants or small pioneering stands. Carefully dig out as much root and rhizome as possible; this plant doesn't pull well (breaks off from robust rhizomes leaving root fragments behind).
- Optimal timing for manual removal is early fall. Prior to digging, cut and bag flower heads before they seed (mid-summer).
- Care should be taken to minimize erosion when digging in saturated soils on shorelines.
- Brush off boots, clothes and animals before leaving the infested area.
- Effective removal of large stands of phragmites with hand tools has proven to be very labor intensive and is not recommended. Removing the rhizome layer (up to 6 ft in depth) is necessary to have positive results.
- In established stands, removing the mat of dead canes can assist in the growth of native vegetation.
- All manual control sites should be monitored for several years for signs of plants growing from rhizomes and from the seed bank.

Mechanical Control

- Removal of phragmites with hand-held mechanical tools is allowable in critical areas and their buffers within unincorporated King County. Check with the local jurisdiction for regulations in other areas.
- In unincorporated King County, riding mowers and light mechanical cultivating equipment may be used in critical areas if conducted in accordance with an approved forest management plan, farm management plan, or rural management plan, or if prescribed by the King County Noxious Weed Control Program.
- Cutting or mowing phragmites is most effective after herbicide application (see **Chemical Control** section below), however, repeated annual cuttings without herbicide can reduce spread.
- Depending on site wetness, mowing or cutting treated plants once after an herbicide treatment is recommended during late summer to fall (August to first hard frost) or in winter when the ground is frozen.
- Cutting/mowing without use of herbicide should be done in late July (before tassel set) when most of the energy is in the stalk and not the roots. **Cutting during other times may stimulate growth.**
- Cutting can be done using brush cutters (weed whackers), hedge trimmers, or loppers. Stems should be cut 4 inches above ground to minimize impact to wildlife and native plants.
- Cut stems should be collected immediately, bagged and removed from site to prevent possible seed spread and allow sunlight to reach the soil surface to promote germination of native plants.
- Bagged plant material should be thrown away with the trash or taken to a sanitary landfill. **Do not compost.**
- An annual regime of cutting and removing stems at the end of July for several years may result in successful control.

Chemical Control

- **Precautions:**
 - o Herbicides should only be applied at the rates and for the site conditions and/or land usage specified on the label of the product being used. **Follow all label directions.**
 - o For herbicide use in critical areas and their buffers, certain restrictions apply depending on the site and jurisdiction. In unincorporated King County, refer to the **King County Noxious Weed Regulatory Guidelines** for a summary of current restrictions and regulatory compliance issues. Elsewhere, check with the local jurisdiction.
 - o Aquatic formulations of herbicides are not available for sale over the counter to anyone without an aquatic pesticide license. State permits are normally required whenever there is a likelihood that herbicide will enter any waterbody or wetland area. **NEVER apply non-aquatic herbicide formulations to water since many include ingredients toxic to aquatic organisms.**

- o For your personal safety, at a minimum wear gloves, long sleeves, long pants, closed toe shoes, and appropriate eye protection. Follow label directions for any additional personal protection equipment needed.
- Herbicides should be applied in early to late summer (June – September) when using imazapyr, or late summer (August – September) when using either glyphosate or a glyphosate/imazapyr mixture, to achieve effective control (see next section for details).
- Treated infestations should not be cut or mowed until after the herbicide has had a chance to work, which may take several weeks.
- Mowing or cutting individual stands to remove dead plant material after herbicide treatment is an important step toward achieving phragmites control. This encourages native plant growth and allows for identification of phragmites re-growth for herbicide spot treatment.
- Herbicide application methods for scattered plants or isolated plant stands include hand swiping or selective hand spraying.
- For at least three years following treatment, monitor areas for new plants germinating from rhizomes or the seed bank.

Specific Herbicide Information

- **Glyphosate** (e.g. Rodeo® or AquaMaster®) Apply to actively growing plants at full to late flowering stage. Application to pre-flowering plants or seedlings may also be effective, but unless the extent of the infestation is well known, plants can be difficult to locate when not in flower. Apply to foliage but avoid runoff. Caution: Glyphosate is non-selective and it will injure or kill other vegetation contacted by the spray including grasses, cattails and other monocots.
- **Imazapyr** (e.g. Habitat®) Apply to actively growing foliage. Caution: Imazapyr is non-selective: it will injure or kill other vegetation contacted by the spray including grasses, cattails and other monocots.

All the above listed herbicides require the addition of an approved surfactant. Follow label directions for selecting the correct type of surfactant. Be sure that the selected surfactant is approved for aquatic use in Washington State.

The mention of a specific product brand name in this document is not, and should not be construed as an endorsement or as a recommendation for the use of that product. Chemical control options may differ for private, commercial and government agency users. **For questions about herbicide use, contact the King County Noxious Weed Control Program at 206-296-0290.**

Biological Control

- There are no effective biocontrol agents for phragmites at this time.

Cultural

- Generally, prescribed burning does not reduce the growing ability of phragmites unless root burn occurs. Root burn seldom occurs, however, because the rhizomes are usually covered by a layer of soil, mud and/or water.
- Prescribed burning in late summer, before seed dispersal, can be effective in slowing the spread of phragmites.
- Burning of dead/decaying canes will allow space and light for other plant species to germinate and take hold. Phragmites tends to burn very hot and fast, and prescribed burns should be performed only by trained personnel.
- Burning in King County, outside the Puget Sound Clean Air Agency boundaries, requires a permit from your local fire district and certain regulations apply.

SUMMARY OF BEST MANAGEMENT PRACTICES

Small Infestations in Native and/or Desirable Vegetation

- Hand digging is recommended for very young plants not yet established, when vegetative spread is less likely to occur. Take care to remove and properly dispose of all rhizome fragments.
- Replace any divots created when removing the plants to lessen the amount of disturbed soil.
- If the plants are in seed, **cut off and bag all seed heads**. It is very difficult to remove the plants without dispersing the seeds.
- Repeated cutting in late July (before tassel set) for several years may be effective to prevent spreading.
- If manual control is not possible due to site conditions or available labor, apply appropriate herbicide with wick wiper or spot spray to minimize off target injury.
- Monitor site throughout growing season and remove any new plants.

Large Infestations

- A comprehensive management strategy is most effective for controlling large stands of phragmites. Herbicide treatment in conjunction with prescribed burning and/or mechanical removal of dead stems has the best results.
- Regardless of the chosen management strategy, the control work will require a long-term commitment of at least several years.

Control on Shorelines or Riparian Areas

- Additional permits may be required for control of infestations in riparian areas. See the Noxious Weed Regulatory Guidelines for more information or contact your local jurisdiction.
- In some cases, the cleared area will need to be replanted with native or non-invasive vegetation and stabilized against erosion. See the King County Surface Water Design Manual for further information about sediment and erosion control practices

(<http://www.kingcounty.gov/environment/waterandland/stormwater/documents/surface-water-design-manual> or call 206-296-6519).

- Focus on manual removal for small infestations if possible.
- When removing vegetation on shorelines (by lakes, streams and wetlands) use barriers to prevent sediment and vegetative debris from entering the water system.
- Cutting or mowing will not eradicate large stands of phragmites but it can serve in the interim until more effective control measures can be utilized (see **Mechanical Control** section above).
- For larger areas where herbicide use is warranted, spray using low pressure and large droplet size to reduce drift. If herbicide could potentially drift into the water or a wetland area, use only approved aquatic herbicides and surfactants.
- When large areas of weeds are removed, the cleared area should be replanted with native or non-invasive vegetation to prevent re-invasion by weeds and stabilized against erosion.
- Infested areas will need to be monitored for several years to control plants growing from root fragments and germinating from the extensive seed bank.

Control along Road Rights-of-Way

- Dig up small infestations if possible.
- Spot spray with imazapyr or glyphosate if digging is not practical due to soil, site conditions, or size of infestation.
- If plants are in grassy areas, re-seed after control is completed.
- If plants are sprayed, wait until the herbicide has had a chance to work (up to several weeks) before cutting or mowing.

Disposal Methods

- Roots, rhizomes and seed heads should be placed in sturdy plastic bags and disposed of with trash or taken to a sanitary landfill for disposal. **Do not compost or put in yard waste.**
- Stems can be left on site to be composted or burned, but bagging and removing is recommended.

References

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