

Common Reed (*Phragmites australis*): Native vs. Introduced Species

The native common reed has occurred in North America for over 40,000 years. It is traditionally used as a source of materials for weaving mats and baskets, and thatching roofs. This plant inhabits wetlands in undisturbed ecosystems and is in balance with its environment. It grows to 5 meters in height in moderately dense stands. The plant's stems and leaves provide cover for wildlife in the summer as well as the winter, and muskrats feed on its rhizomes. However, over the past century, a European strain of *Phragmites australis* has been introduced to North America. As studies in Quebec show, the European species has been present in the province since the early 1900's. Since the 1970's, it is dominant in 95% of common reed colonies in the province. It is thought that development of highway networks in the 1960's and 1970's was an important contributor to the spread of the European species and its invasion to wetlands. While similar in appearance, the introduced species is more aggressive, chokes wetlands, and displaces the native common reed, leading to degradation of wetland habitats. Adopt-A-Pond recommends that homeowners and communities first identify the species of reed and be vigilant to remove new arrivals and small stands of the introduced species before they become unmanageable. This will prevent spread or expansion of reed from roadsides to adjacent wetlands.

Invading Plant Species Threatening the Health of Ontario's Wetlands

In Canada, the health of our wetlands is being threatened by the invasion of the European species of common reed. The problem in the case of the common reed is complicated since the European species is almost undistinguishable in appearance (i.e. cryptic) from the native species.



Diagram

Key differences between the native and European species include:

Trait	Native Species	Introduced Species
Leaf Sheaths	Fall off in the fall, easily removable	Stay on, difficult to remove
Stem Colour at the Base (when leaf sheath is removed in spring/summer)	Red to chestnut	Tan
Stem Colour at the Base (when leaf sheath is removed in winter)	Light chestnut to light brown/gray	Tan
Stem Texture	Smooth and shiny	Rough and dull
Stem Flexibility	Highly flexible	Rigid
Leaf Colour	Yellow-green	Yellow-green to dark green/gray
Time of Flowering	July – August	August-September
Rhizomes	Partially submerged in water	Submerged in water

Ecological Threats

Negative impacts on ecosystems, due to the wide spread of the invasive reed, include:

- **Changing plant species composition and decreasing biodiversity**

The invasive plant displaces native plants and the wetland turns into a single- species habitat. Ecosystems with a wide variety of species are considered more stable, with a higher capacity to sustain more species, and more resistant to disease. The European reed’s invasion dominates the ecosystem, which may no longer be able to support other species.

- **Loss of habitat**



For a turtle, emerging out of her winter- long hibernation into a wetland that has been taken over by the European common reed can be dangerous. Imagine the turtle trying to push through the dense stands of rigid stems in order to get to her nesting beach or feeding ponds.

The European species grows in much denser stands than the native species, preventing animals from passing through or taking cover under the reed’s stems and leaves. Animal species relying on plant species displaced by the European reed are subject to habitat loss.

In addition, the rhizomes of the European common reed are usually fully submerged underwater, while the native species grows in drier areas. In early fall, nutrients move from leaves and stems to the rhizome system. The leaves die and fall off, with only the dead brown vertical shoots remaining. The accumulation of dead leaves and stems, as well as the rapidly spreading rhizome system, prohibits the growth of other plant species. Therefore, the European species fills in critical water habitat, lowering the watertable and pushing out aquatic species.

- **Fire**

In the fall, when the reeds' leaves and stems dry out, the chance of fire in the wetland and surrounding areas increases due to the European species' dense and wide spread growth.

Control and Restriction

Controlling the spread of the common reed is particularly challenging because it spreads via rhizomes, a stem that gives rise to underground roots and above ground shoots. This means that even chopped fragments of stems can develop into plants. Alternatively, common reed may germinate fragments dispersed by wind, water, wildlife and machinery.

However, the common reed can be controlled by an initial herbicide treatment followed by mechanical removal (e.g. mowing, disking, and cutting) and annual maintenance.

- **Hand Pulling/ Cutting**

Individual plants may be pulled or cut by hand and their rhizomes dug out. However, the reed's root system is extensive and it is very likely fragments of rhizomes will still be left behind. Continued pulling is required each year until they are all removed. Disturbance to the soil, such as digging, may result in expansion of the reed's root system by encouraging the development of these rhizomes. Cutting the shoots during the growth season may increase stand density.

- **Herbicides**

Despite our preference for pesticide- free environments, this method is the first step in the most effective control of the common reed. We must weight the cost of herbicide use vs. wetland loss. Hand application on individual plants is our recommendation to ensure no environmental contamination. Two types of herbicides, known to be most effective, are glyphosate based and imazapyr based. However, if sprayed, these are non-selective and will also kill surrounding plants. For this reason, Adopt-A-Pond recommends hand application with a sponge or a paint brush directly on the green leaves or cut stems of young reeds. The herbicide will be absorbed and transferred to the root system, inhibiting growth. The herbicides should not be applied if it might rain on the same day, as the herbicide will wash away before absorbance. Anyone performing the application should wear disposable gloves and protective clothing. This, and carefully following the manufacturers' instructions, will minimize the risk for native plants and wildlife. Glyphosate based herbicides (e.g. Credit®, Roundup™) are most effective when applied late in the summer (August to September) solely or in combination with imazapyr based herbicides. Imazapyr based herbicides (e.g. Polaris™, Habitat) should be applied early in the summer (June to September) and typically result in longer lasting control.

IMPORTANT NOTE:

A certificate in pesticide use is required for using imazapyr based herbicides and is recommended for using glyphosate based herbicides. Use of herbicides off your property must be approved by your community and municipal government. For treatments in wetlands, it is recommended the herbicides are applied by a licensed professional, who is certified in aquatic pest management.

For homeowners, who want to control a colony of reeds, we recommend to restrict the treatment area to your own private property, receive an approval from your community or neighbors prior to herbicide application, and treat by hand only small stands or individual plants while following the manufacturer's instructions very carefully.

- **Mowing/ Disking**

The second step for effective treatment is mowing individual stands, not earlier than 2 weeks after the herbicide treatment. This encourages growth of native plants and recurrent growth of reed can be identified and treated individually. The mowing or cutting of the dead reeds after treatment should take place annually, during late summer to fall or in the winter, when the ground is frozen. The rhizomes may be removed by disking, which may initially result in the spread of the root system due to the development of fragments left behind.

*****NOTE:** Mowing at the wrong time of year, or mowing without first applying a herbicide will stimulate plant growth and contribute to further spread of the reed.***

- **Burning**

In order for this method to be effective the roots must be burnt. However, since the extensive root system of the common reed is usually submerged under water or covered by soil, this method on its own is not usually sufficient. It can be beneficial when used 2 weeks after chemical treatment. Burning is effective in removing accumulated leaf litter, clearing space for germination of seeds of other species. Burning should also take place in late summer, rather than during the growing season, in the spring, when burning may increase stand density. Since burning of reed is difficult to keep under control, it should be performed by professionals.

- **Other methods**

Covering a cut patch with opaque black plastic sheeting will generate high temperatures that will kill the stand. Flooding can be used, but the roots must be submerged for extended periods of time and under significant depth. Flooding is not very practical also because it may destroy other, native species as well. Lastly, no biological control (i.e. other animals that will feed on the reed) has been proven this far to be effective.

To reduce the spread of the common reed

1. Clean equipment after mowing/cutting the reed.
2. Collect plant cuttings to prevent rhizomes from spreading.
3. Do NOT compost the clippings as some seeds may survive and germinate.
4. Limit disturbing the soil of removal sites since this may encourage expansion of the reed.
5. Combine chemical and mechanical control methods and repeat annually.

To learn more about *Phragmites* and its effect on wetlands please see:

- http://www.qc.ec.gc.ca/csl/inf/inf038_e.html
- www.invasiveplants.net/phragmites/
- http://michigan.gov/documents/deq/deq-ogl-Guide-Phragmites_204659_7.pdf
- http://www.massaudubon.org/Kids/Lively_Lessons/Saltmarsh/restoration.html
- <http://aquat1.ifas.ufl.edu/ie6/index.html>