

Invasive Phragmites

(*Phragmites australis*)

Best Management Practice Technical Document for Land Managers

March 2021

- DISCLAIMER -

This document conveys specific information relating to invasive plant control practices that have been recommended by leading professionals across Ontario. It contains the most up-to-date research and knowledge available at the time of publication and reflects current provincial and federal legislation. It is subject to change as legislation is updated or new research findings emerge and is not intended to provide legal advice. Tailor the timing of control to your region.

Use this document after you have monitored, assessed your area and ensured that the control options listed in this document are permitted and appropriate on your site. For more information, please refer to the Ontario Invasive Plant Council's Best Management Practices document for invasive *Phragmites* (Edition 2.1 - April 2021).

Strategy and Cautions

- Invasive *Phragmites australis* subsp. *australis* (herein called *Phragmites*) is regulated under Ontario's *Invasive Species Act* as a Restricted species.
- Preventing the spread and establishment of *Phragmites* is essential for long-term success. Early detection and rapid response are key.
- Remove outlying populations (isolated plants or satellite populations) first to prevent further spread and treat smaller patches before they develop into larger patches.
- Populations in water and on land can be successfully controlled using selective cutting. This includes underwater cutting at the sediment level with a cane cutter or saw and terrestrial cutting under the soil with a spade.
- Large (> 300 m² or > 100 plants) or small populations (≤ 300 m² or ≤ 1000 plants) in terrestrial environments can be most effectively controlled using an approved systemic herbicide and/or cutting. Smaller populations can be controlled using selective cutting and spading.
- Apply herbicide before mid- to late-August to kill plants before they produce viable seed. Do not cut after viable seed heads have developed, as this may facilitate spread. If cutting seed heads is the only option to control the spread of *Phragmites*, do so before they are viable in late summer. Herbicide application after seed set may help reduce seed viability.
- Targeting only a portion of a *Phragmites* cell with herbicide or cutting is not recommended as it can be ineffective, waste resources and over the long term will increase the need for herbicide.
- Regardless of the control method, Species at Risk and other native wildlife may be disturbed and endangered by *Phragmites* management activities. Control activities should be strategically timed to reduce potential harm to wildlife, and other mitigative actions should be taken to minimize adverse ecological impacts.
- Confirm that *Phragmites* stands are of the invasive subspecies and not the desired native subspecies (*Phragmites australis* subsp. *americanus*). Hybrids have not yet been described in Ontario but may be present. Consult the Ontario Invasive Plant Council's Best Management Practices document for invasive *Phragmites* for identification information.



Selective Cutting in Terrestrial or Aquatic Environments:

Management of Small ($\leq 300 \text{ m}^2$) or Large ($> 300 \text{ m}^2$) Populations in Aquatic Environments:

Selective stalk cutting to drown during the growing season is the most effective control option if herbicides are not available. In suitable water depths ($> 30 \text{ cm}$), cutting beneath the waterline can drown the plant by inhibiting the supply of oxygen to the lower plant parts. Cut small stands using handheld tools such as raspberry cane cutters, sharpened spades, brush cutters, and/or mechanical cutters. For large stands, an amphibious cutting vehicle can be used. **For handheld tools:** First, remove and dispose of seed heads, if present. Insert tool under the water and cut the stalk as close to the sediment as possible or beneath it, ensuring the entire cut plant is still well covered with water to improve efficacy. **Caution:** Cut stalks are sharp and can be hazardous if stepped on. Use proper footwear. Depending upon water depths, this may need to be repeated throughout the growing season and for several consecutive years. If only one treatment per year is feasible, cut mid-July to mid-August to prevent seed development. Cutting can also be effective on dead stalks during late winter or early spring in open water, where safely accessible. All cut stalks must be removed from the water and disposed of properly to reduce further spread.

Management of Small Populations ($\leq 300 \text{ m}^2$) in Terrestrial Environments:

Cutting the stalk reduces photosynthetic capabilities, thereby depriving the belowground structures of oxygen. This method minimizes soil disturbance and can be used where the site is accessible by walking, including wet areas. On sandy substrates, spading is recommended. Using a sharpened spade, cut the *Phragmites* stalk below the sediment surface where it attaches to the rhizome. Do not apply lateral pressure on the spade; pull the spade straight out from the substrate to prevent soil disturbance. Removal below the soil surface makes the area safe to walk on after the stalks are removed. This method is most effective when done between mid-July to mid-August before flowering occurs, over a period of about five years. If cutting can only occur once, the best time is when the plant reaches peak height, just as the seed head emerges. If seed heads are present, carefully remove and dispose of them first.

Herbicide Application and Cutting:

Management of Large or High Density, Expansive Populations (> 1000 plants) in Terrestrial Environments:

Herbicide application combined with manual removal (such as cutting), either before or after treatment depending on the site, yields the strongest control results. The potential for drift may prevent the use of pesticides near water.

Cutting before herbicide treatment:

Pre-herbicide removal of standing, dead stalks may be needed to allow the herbicide to contact fresh growth. Cutting, rolling and/or burning of the stalks should be conducted a minimum of four weeks prior to herbicide applications to allow for re-growth of leaves (but preferably in the winter).

After herbicide treatment:

If required and appropriate, post-treatment cutting should not occur until at least three weeks after the herbicide has been applied, to give adequate time for the herbicide to be translocated into the below-ground structures. To remove the dead and dry stalks after herbicide application, cut, roll and/or burn the stalks between early fall and early spring.

Legal Considerations and Regulatory Tools for Chemical Control

Herbicides must be applied in accordance with the federal *Pest Control Products Act*, the *Ontario Pesticides Act*, ON Regulation 63/09 and in accordance with all label directions. Ensure you have the most current label and are aware of any re-evaluation decisions. The easiest way to find a chemical label is to type "PMRA label search" in any major search engine. Only licensed pesticide applicators may legally apply restricted pesticides in Ontario. Ontario's Cosmetic Pesticides Ban prohibits the non-essential use of pesticides (Commercial or Restricted) on land. Exceptions exist to allow the use of these herbicides for control of plants, such as *Phragmites*, that are detrimental to the environment, economy, agriculture and/or human health. To qualify for these exceptions specific criteria must be met and appropriate ministry approval is required.



Table 1: Exceptions to the Cosmetic Pesticides Ban, which may be applicable for control of invasive *Phragmites*.

Public health and safety:	<i>Phragmites</i> reduces or blocks sightlines and clogs drainage ditches, the rhizomes damage asphalt as they break through to the surface, and the dead stalks are a fire hazard.
Agricultural:	Encroachment of <i>Phragmites</i> on agricultural fields reduces crop yields by disrupting nutrient and water regimes, obstructs drainage channels, damages drainage tiles, and obstructs drinking water access for livestock.
Natural resource:	<i>Phragmites</i> forms monocultures that crowd out native vegetation and hinder native wildlife from using the area or travelling through the area, resulting in a decrease in both plant and animal diversity.

For more information on these exceptions and applicable procedures, please refer to the Ontario Invasive Plant Council's Best Management Practices document for *Phragmites* (Edition 2.1 - April 2021).

Herbicide Selection and Application

Professionals recommend using a glyphosate-based or imazapyr-based herbicide (or a mix of them both). The plants should reach at least 1.5 m in height and have sufficient leaf surface for the herbicide to be effective. Application of herbicide before mid- to late August or early fall will generally kill plants before they can produce viable seed. Spray when temperatures are between 4°C and 25°C. Outside of this range, plant metabolism drops, thus reducing the amount of active ingredient taken up by the plant. Do not break stems during treatment, as this would also prevent the herbicide from reaching the rhizomes. Do not treat plants over open water. Herbicide application in sensitive habitats where Species at Risk may be present should be restricted to late summer through to early fall. This timing coincides with reduced activity of native wildlife and allows for the herbicide to be translocated into the root system. Refer to species timing windows for more detail before applying herbicides to reduce potential impacts on Species at Risk and native wildlife.

Table 2: Chemical control techniques recommended by experts for *Phragmites*.

Chemical Control Method	Chemical and Concentration	Timing and Application	Details
Foliar spray	Glyphosate (4.5 - 5% solution*) with 0.5 – 1% methylated seed oil.	Apply to actively growing plants in late summer or early fall. Allow at least 3 weeks before follow-up application. Subsequent applications can occur until first frost. Apply using highest rate allowed. May need multiple treatments.	First choice in natural environments.
	Imazapyr (2% solution**) with 0.5 – 1% methylated seed oil.	Treat in late summer or early fall when translocation of nutrients is directed towards the roots of the plants.	Extreme caution should be exercised when using in natural environments. After 3 weeks following application, cut stalks to stimulate growth of other plants. May be tank-mixed with glyphosate provided all recommendations and restrictions for both labels are followed.

* Based on a product containing 540 g/L of chemical. **Based on a product containing 240 g/L of chemical. Please read the label in full before use to ensure that these recommendations meet the requirements of the herbicide you have selected.



Glyphosate-based or imazapyr-based herbicides are not to be applied using the hand-wicking/wiping method. These are no longer approved methods in accordance with the pesticide label.

Herbicide Application in Aquatic Environments:

At the time of document publication, a new imazapyr product (Habitat Aqua) has been registered for use in Canada. It has been approved for the treatment of *Phragmites* in and around water. Only those with the appropriate aquatic pesticide license are permitted to use this product, and a permit may be required. Refer to the PMRA label for more details.

Disposal:

Viable plant material must be solarized before disposal at landfill. Place material into thick, industrial-grade garbage bags (to prevent stems from piercing the bag) or paper waste bags and tie securely, or pile cut stalks under a dark-coloured tarp, paper lawn bag, or dark plastic bag, and leave in the sun for 1-3 weeks until the material has dried or decayed and is no longer viable. Bags can then be sent to a municipal landfill that will accept invasive plant waste. Alternatively, dried *Phragmites* can be safely incinerated in burn barrels or fire pits, where bylaws permit. The cut biomass should be piled and left in a dry location on higher ground, away from watercourses.

Rehabilitation and Monitoring:

Remove *Phragmites* biomass to promote native plant growth. Develop a long-term monitoring and management plan and remove isolated plants and populations as they appear. Revegetate the site with competitive native grasses, forbs and woody plants to resist future *Phragmites* invasions.

