

# Invasive Phragmites

(*Phragmites australis*)

## Best Management Practice Technical Document for Land Managers

March 2017

### - DISCLAIMER -

The intent of this document is to relay specific information relating to invasive plant control practices that have been advised by leading professionals across Ontario. This document contains the most up-to-date research and knowledge available at the time of publication and reflects current provincial and federal legislation regarding pesticide usage. It is subject to change as legislation is updated or new research findings emerge and is not intended to provide legal advice. The timing suggested will differ throughout Ontario and should be tailored to your region.

**Use this document after** you have performed monitoring, assessed your priority areas and made sure that the control options listed in this document are allowed and appropriate on your site. For more information, please refer to the Ontario Invasive Plant Council's Best Management Practices document for invasive *Phragmites*.

## Strategy and Cautions

- *Phragmites* is regulated under Ontario's *Invasive Species Act* as a restricted species.
- Preventing the spread and establishment of invasive *Phragmites* is essential for long-term success. Early detection and rapid response is key.
- Remove the outlying populations (isolated plants or satellite populations) first to prevent further spread and treat smaller patches before they develop into larger patches.
- Populations in aquatic environments are most successfully controlled using selective cutting.
- Small populations ( $\leq 1000$  plants) can be controlled manually.
- High density, expansive populations ( $> 1000$  plants) are most effectively controlled using a systemic herbicide combined with cutting.
- Using only cutting as a control method may curtail stand density and plant vigour but this will not kill the below-ground structures. Once a cutting program is discontinued, invasive *Phragmites* will re-establish.
- Cutting plants after they have developed viable seed heads may increase the spread to new areas.
- Targeting only a portion of an invasive *Phragmites* cell with herbicide or cutting is ineffective, wastes funds and over the long-term will increase the required use of herbicide.
- Cutting invasive *Phragmites* shortly before or too soon after herbicide application significantly reduces effectiveness.

## Management of Populations in Aquatic Environments

Because there are no pesticides available in Ontario for use in water, selective cutting is the most effective control option. Under flooded conditions, cutting may also cause downing. First, remove and dispose of seed heads, if present. Use hand-held cutters, pruners, knives or sharp spades for smaller stands, larger cutters for medium stands, and a motorized cutting device for large stands. Reach down under the water and cut the stalk as close to the sediment as possible or even beneath it, ensuring the entire cut plant is still well covered with water. **Caution:** Cut stalks will 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 cut per year is feasible, cut mid-July to mid-August to prevent seed development. All cut stalks must be removed from the water to reduce further spread.



### Management of Small Populations (<1000 plants) in Terrestrial Environments

Cutting the stalk removes photosynthetic capabilities, thereby depriving the below ground structures of energy. This method can be used where the site is accessible by walking, including wet areas. Sandy soil is easiest. In areas where *Phragmites* is growing in sand or other soft substrates the stalk could be cut below the sediment surface at the point where it is attached to the rhizome. This is best done using a sharpened spade with minimal disturbance to the sediment and surrounding plants. Removal using this method is most effective when done between mid-July to mid- August before flowering occurs. Removal twice during this time reduces the density of the stalks more than one cut. Removal below the soil surface makes the area safe to walk on after the stalks are removed.

### Management of High Density, Expansive Populations (>1000 plants) in Terrestrial Environments

Herbicide application combined with manual removal, either before or after treatment depending on the site, yields strongest control results. Pesticide drift may prohibit pesticide use near water.

#### Cutting before herbicide treatment:

If the presence of standing, dead stalks is likely to inhibit herbicide from coming into contact with new growth, pre-herbicide removal of the stalks may be necessary. Cutting, rolling and/or burning of the stalks should be conducted a minimum of four weeks (but preferably in the winter) prior to herbicide applications to allow for re-growth of leaves.

#### 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*, Ontario 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 by using the PMRA's label search tool, which can be found by searching "PMRA label search" in any major search engine. Only licensed pesticide applicators are legally allowed to apply restricted pesticides in Ontario.

Ontario's *Cosmetic Pesticides Ban Act* prohibits the non-essential use of prescribed pesticides (Class 9) on land. Exceptions exist to allow the use of these herbicides for control of plants, such as invasive *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 may be required.

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

<b>Public health or safety:</b>	The negative impacts that invasive <i>Phragmites</i> presents along roads and other transportation corridors include reduced and blocked sightlines, physical damage to asphalt roads from rhizomes, fire hazards from standing dead stalks, and blocked drainage ditches resulting in localized flooding.
<b>Agricultural:</b>	Invasive <i>Phragmites</i> encroach on agricultural fields, impacting crop yields through the disruption of nutrient and water regimes. The roots and rhizome structures can grow dense and obstruct drainage channels, impede water flow, and interfere with or uproot drainage tiles. It also forms dense mats of vegetation in streams and ponds used for drinking water by livestock.
<b>Natural resource:</b>	Invasive <i>Phragmites</i> form monocultures which crowd out native vegetation and hinder native wildlife from using the area, resulting in a decrease in both plant and animal biodiversity.

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





## Herbicide Selection and Application

Professionals consulted for this document recommend using a glyphosate-based or imazapyr-based herbicide (or a mix). The first application can be made after birds have finished nesting, usually late June. A second treatment, if necessary, can be applied in early to late fall, allowing at least 3 weeks between treatments. The plants should reach at least 1.5 m in height and have sufficient leaf surface for herbicide application in order to be effective. Application of herbicide before mid- to late August will generally kill plants before they are able to produce viable seed. Application after seed maturation may reduce viability. Do not spray when temperatures are either too cold or too hot, since the amount of active ingredient taken up by the plant will be significantly reduced, as will plant metabolism. Do not break stems during treatment, as this would also prevent the herbicide from reaching the rhizomes.

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

Chemical Control Method	Chemical and Concentration	Timing and Application	Details
<b>FOLIAR</b>	Glyphosate (4.5 - 5% solution*) with 0.5 - 1% methylated seed oil.	Apply to actively growing plants in late summer. Allow At least 3 weeks before follow-up application. Can be applied until first frost. Apply using highest rate allowed.	First choice in natural environments. If post-treatment cutting is necessary wait a minimum of 3 weeks.
	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.
<b>HAND WICKING / WIPE</b>	Glyphosate (4.5 - 5% solution*) with 0.5 - 1% methylated seed oil.	Apply to actively growing plants in late spring followed by a late summer or early fall application (no later than mid-September).	Effective in areas where non-target species are a concern or for follow-up treatments where native vegetation is recovering.

\*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.

## Disposal

Do not compost viable plant material at home or send to landfill. Place in paper yard waste bags and move to a location to dry out. The bags of dried *Phragmites* can then be safely incinerated, for example in burn barrels or fire pits. Larger amounts of biomass could be piled onto tarps and moved to an appropriate location for disposal. If plants have seed heads it would be best to cut these off first and immediately place into yard waste bags to be burned when dry or solarized by covering with thick plastic and baking in the sun for 1-3 weeks to kill viable plant parts.

## Rehabilitation and Monitoring

In order to promote growth of native species, removal of the biomass is recommended. A long-term management and monitoring plan is imperative to achieve control success. Remove isolated populations as they appear.