

Tools to manage...

Phragmites (Common reed)

Phragmites australis subsp. *australis*



Phragmites is now part of the landscape in the eight states bordering the Great Lakes, in Quebec and in Ontario in the Great Lakes and St. Lawrence Region. It is a formidable invader; because of its early emergence, its allelopathic mechanisms and its thick layer of litter on the ground, phragmites can practically eliminate every other plant species where it grows and highly threaten fauna. It dries and modifies bodies of water, causing ecological and socioeconomic harms, such as undermining activities like swimming and angling. It can even damage infrastructures like pool liners and asphalt. Finally, colonies of common reed present a high risk of fire because of the great amount of dry matter they contain. However, it is possible (and very important!) to control this plant.

What to do?

 **Prevention:** Clean boots and tools after working on a phragmites colony, avoid planting common reed and avoid composting it, encourage measures that limit the amount of nutrients reaching water plants, and educate the population to that problem by, among other things, promoting shoreline restoration with native plants;

 **Early detection and rapid response:** Proceed to control at first signs of phragmites establishment to avoid high costs related to its management;

 **Mapping and inventory:** Map reed sites to prioritize and evaluate the colonies' evolution upon time. Make an inventory of the present biodiversity to help select proper control methods and to facilitate restoration, if appropriate;

 **Management plan:** Set a control plan that will be valid for multiple years and contains various measures such as herbicide application, cutting or prescribed burning. Colonies usually show a resurgence around the third year of control;

 **Monitoring:** Schedule regular follow-ups; they will help determine which control measures should be applied from one year to another. Even after having eliminated a colony, it is necessary to continue monitoring.

Control techniques

Herbicides: Often advised to control phragmites, especially when colonies are tall and very dense. Many application techniques exist, including pulverization, stem injection or hand-swiping application.

Mowing: Not recommended alone, because it could stimulate rhizome growth, unless it is carried out many times per year for many years. However, herbicides and prescribed burns work best when used in combination with mowing.

Compressing or rolling: Often used to prepare a land for a prescribed burn after having applied herbicide to kill plants. However, it is also possible to use this technique without burning (though it is always necessary to kill plants beforehand). After compressing or rolling, it is easier to identify new phragmites sprouts, and light can reach the ground, promoting growth of native species.

Prescribed burning: To be carried out after the use of herbicides when phragmites stems have died. Otherwise, there are risks that the colony may simply expand. Prescribed burning eliminates stems and eases the growth of new species. It is important to plan this activity with fire authorities. Prescribed burning can constitute a nuisance if performed close to an urban area.

Hand-pulling or mechanical excavation: These methods are possible but require many efforts; this is not recommended for tall phragmites stands. This method can be useful to control colonies living in sensitive areas. Care should be taken to remove all fragments of plants from sites after pulling.



Control techniques (ctd.)

Flooding: If it is possible to control the level of water, flooding can be an effective way to eliminate a phragmites colony. Beforehand, all stems (including dead stems) must be cut short prior to covering them with at least 1.5 m (5 ft) of water for at least six weeks.

Tarping: Stems need to be cut to ground level before being covered with geotextile sheets or thick and black plastic tarp for at least six months. Tarping will be the most efficient when used for full-sun colonies. It is necessary to visit the site regularly to limit the eventual expansion of the stolons outside the tarp.

Grazing: The use of livestock to control phragmites colonies is mostly used in Europe and studies are underway to learn about the efficiency of this method and its eventual consequences on wetlands.

? **Allelopathy** : Physiological mechanism by which a plant inhibits the growth of other species nearby

Stolon : Horizontal stem that grows on the ground

Rhizome : Horizontal stem that grows below ground

Invasive Phragmites



Photo : Unknown author, <http://goo.gl/VblcnQ>

Phragmites...

- Perennial grass
- Family: Poaceae (Gramineae)
- 2 subspecies:
 - *americanus* (native)
 - *australis* (invasive)
 It's the exotic subspecies that is invasive and that is discussed here. Both can hybridize (2 colonies known at Lake Erie).
- Native to Eurasia, introduced in North America about 200 years ago.
- Habitats: Wetlands, ditches, roadsides, disturbed areas. Tolerates dry lands.
- Grows on every continent except Antarctica.
- Reproduction:
 - Produces 2000 seeds per seed head (primary means of dispersal)
 - Growth of new stems from rhizomes and stolons
 - Growth of new individuals from rhizome or stolon fragments
- Vectors of dispersal:
 - Natural: wind, watercourses, animals
 - Anthropogenic: dispersal of fragments (boots, tires, tools, soil transportation, etc.), disturbance of areas, horticulture
 - A lowering of water levels and the presence of roads also facilitate the settlement/expansion of new phragmites stands.
- French: Phragmite, roseau commun

	<i>Phragmites australis</i> subsp. <i>americanus</i> Native subspecies	<i>Phragmites australis</i> subsp. <i>australis</i> Invasive subspecies
Stand Height	Maximum 2 m (6 ft)	Maximum 5 m (15 ft)
Stem	Reddish-purple and shiny, flexible 	Green/tan and dull, rigid 
Leaves	Yellow-green, fall before winter 	Bluish-green, persist on the stem through winter 
Seed-head	Brown, sparse, much smaller than non-native 	Purple-brown or silver, large and dense 
Stand density	Sparse, interspersed with vegetation. Most dead stems break and fall, allowing new vegetation to grow each spring.	Very dense, trend to become a monoculture. Dead stems remain vertical.

Some differences between native and invasive phragmites

Photo : Unknown author, <http://goo.gl/9vz9ba>



..... **Some examples of good practices**



Tarpping and signboard on the banks of Saint-Charles River, Ville de Québec.

Photo : unknown author, <https://goo.gl/fvXRCK>

→ **Involvement of the municipal sector**

Cities can intervene directly in the control of common reed, as is the case in Quebec City, where the environment department plans and carries out control activities along Saint Charles River. Many methods have been used: hand-pulling, tarping, repeated mowing, herbicide application, cutting off the seedheads and planting trees and shrubs. The city is assisted by the Phragmites group, an interuniversity research group.

Cities can also control this grass indirectly by playing a facilitator role in the approaches undertaken by non-profit or citizen organisations. The Municipality of Lambton Shores, Ontario, has supported the Port Franks Community Phragmites Control Project by providing partial funding and space for holding information sessions. Lambton Shores also sent a phragmites newsletter with the tax notices. Finally, some employees also received training about phragmites.

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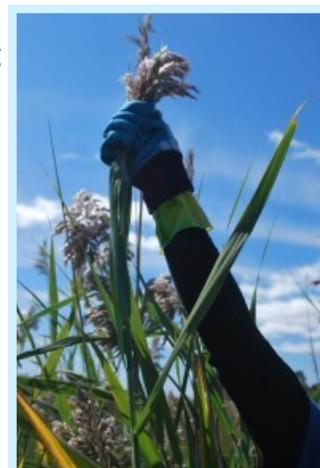
→ **The control on private lands**

The conservation organization Huron Pines, which works mostly on the Michigan side of Lake Huron offers a phragmites management service for private landowners: a 10-year-long agreement is signed by each landowner and the organization. Through the agreement, Huron Pines takes on a part of the treatment costs and the follow up until the invasion may be easily controlled by the landowner himself.

The Watershed Center Grand Traverse Bay, an organization also working in Michigan, has asked for ordinances from the townships affected by phragmites so that its personnel could carry out inspections and treatments on private lands. Also, in order to facilitate treatment and follow-up of the phragmites stands around inland lakes, the organization created agreements with lake associations when it was possible.

→ **Communication and education**

A good eradication plan must often be accompanied by a communication strategy to be fully effective, particularly if it will be necessary to rely on some audience participation. The *Anchor Bay & St. Clair Flats Phragmites Control and Education Project*, led by Ducks Unlimited in Michigan, included a strong educational component; information papers about phragmites



Hand-swiping application of herbicide by Huron Pine organization
Photo : Northwest CWMA, <http://goo.gl/88a6jd>

have been distributed to private landowners; information has been sent to local, regional and federal stakeholders; a professional workshop intended for teachers has been implemented; and a campaign on social networks has been planned.



Follow-up of a phragmites colony by Lambton Shores Phragmites Community Group

Photo : Unknown author, <http://goo.gl/oEc2zX>

→ **Follow-up of treated phragmites stands**

It is necessary to follow-up annually on the colonies that have been treated in order to spot new phragmites sprouts and make sure that sites are restoring adequately. Also, it can be very useful to measure the impacts of a control project. In Port Franks, in the municipality of Lambton Shores, in Ontario, specific indicators have been determined in order to quantify the success of the project: the reduction of the phragmites stands and the growth of various indigenous species, but also the increase of the community engagement, the importance of volunteer participation and the increase and solidification of the relations with partners. It is great to note that it is volunteers that make the follow-up on the phragmites sites.



..... For more information about these practices

Exotic phragmites elimination program, Quebec City, QC

<https://goo.gl/fvXRCk>

<http://goo.gl/Haljmr>

Port Francks Community Phragmites Control Project, Lambton Shores, ON

<http://goo.gl/oEc2zX>

<http://goo.gl/T4II9s>

Anchor Bay & St. Clair Flats Phragmites Control and Education Project
(Ducks Unlimited), MI

<http://goo.gl/7i4wAZ>

<http://goo.gl/2L2o17>

Northeast Michigan Cooperative Weed Management Area (Huron Pine), MI

<http://goo.gl/88g6jd>

Phragmites Management in Grand Traverse County (Watershed Center
Grand Traverse Bay), MI

<http://goo.gl/E9tzN9>

For more practices

Great Lakes Phragmites Collaborative

<http://goo.gl/kLZGVX>

Great Lakes Information Network

<http://goo.gl/QIWwhv>

National park's example of hand-pulling (SÉPAQ), QC

<http://goo.gl/D3mlt4>

Phragmites control on roadsides, Phragmites Working Group

<http://goo.gl/JJuLfy>

If your municipality's phragmites control strategy is successful, don't hesitate to share your plans and reports with us at laura.brethem@glslcities.org. The Initiative will post this document on its website. Sharing best practices is indeed a good way to help each other fighting against this invasive grass.

..... 3 tips

- 1 Make sure to correctly identify which phragmites subspecies you are dealing with in order to avoid spending time and money into fighting the native one.
- 2 It is necessary to be well informed before applying any of the techniques. Some of them must be applied at a specific time of the year (for efficiency reasons, to limit disturbance on other species, etc.) and a few others require permits.
- 3 Sometimes, it is better to leave a colony in place if the site can't be restored (naturally or by re-planting native species). Phragmites stands still furnish some interesting ecosystem services.

..... Useful Resources

Guides and other documentation

A Guide to the Control and Management of Invasive Phragmites 3rd Edition

<http://goo.gl/k4nACy>

Invasive *Phragmites* – Best Management Practices

<http://goo.gl/fGiwJ3>

Creating an Invasive Plant Management Strategy

<http://goo.gl/cfpDy>

Clean Equipment Protocol for Industry

<http://goo.gl/CqHqzK>

Websites

Great Lakes Phragmites Collaborative

<http://goo.gl/uARI3O>

Ontario Phragmites Working Group

<http://goo.gl/TrAiYr>

Phragmites Research Group

<http://goo.gl/IYX9iL>

References

- [1] Great Lakes Phragmites Collaborative, 2015. *Phragmites basics : info*. Retrieved from <http://greatlakesphragmites.net/basics/phragmites-basics-intro/>
- [2] Le groupe PHRAGMITES, 2012. Le roseau envahisseur : la dynamique, l'impact et le contrôle d'une invasion d'envergure. *Le Naturaliste canadien*, 136(3):33-39.
- [3] Ontario Ministry of Natural Resources, 2011. *Invasive Phragmites – Best Management Practices*. Retrieved from http://www.ontarioinvasiveplants.ca/files/Phragmites_BMP_July_13.pdf
- [4] Ontario Ministry of Natural Resources, N.D. *Invasive Phragmites*. Retrieved from http://greatlakesphragmites.net/files/Phragmites_Fact_Sheet_ontario.pdf
- [5] Great Lakes Phragmite Collaborative, 2014, 30 September. *Phragmites Management in the US : 40 years of Methods and Outcomes*. Retrieved from <https://www.youtube.com/watch?v=zeQOI7Wgtc&list=UUQTBY78DoCJhTpiMtr1Mi4A>
- [6] Michigan Department of Environmental Quality, Water Resources Division, 2014. *A Guide to the Control and Management of Invasive Phragmites, 3rd Edition*. Retrieved from http://www.michigan.gov/documents/deq/deq-ogl-ais-guide-PhragBook-Email_212418_7.pdf

..... About us



The Great Lakes and St. Lawrence Cities Initiative (glslcities.org) is a binational coalition of over 100 mayors that works actively to advance the protection, restoration and promotion of the Great Lakes and St. Lawrence River basin. During its 2010 and 2015 Meetings, it adopted resolutions to actively fight against phragmites (2010, R2: <http://goo.gl/wujeqv>; 2015, R6: <http://goo.gl/lu30Ua>).