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Town of Aurora

General Committee Report

No. OPS22-014

Subject: Phragmites Remediation

Prepared by: Sara Tienkamp, Manager of Parks and Fleet

Department: Operational Services

Date: July 5, 2022

Recommendation

1. That Report No. OPS22-014 be received; and
2. That staff be directed to initiate a Phragmites Control Program utilizing chemical herbicide for treatment and controlled burn where applicable; and
3. That the Phragmites Control Program's incremental annual service costs be included in the Town's future four (4) year operating budget, commencing in 2023 for Council consideration.

Executive Summary

This report provides Council with information and recommendations on Phragmites, an invasive grass in Aurora:

- 'Phragmites australis' is an invasive perennial grass introduced to North America in the 1800s along the Atlantic coast, as a seed contaminant in soil ballast and intentionally introduced through the horticulture trade.
- Impacts of Phragmites are extensive and not specific to plant and wildlife diversity.
- Wellington Street and St. Johns Sideroad both have extensive populations of reed grass in the public right-of-way and beyond.
- Control method for Phragmites growth offer preventable steps, and options for both long term and short-term control; however, chemical herbicide is the most effective control, followed by controlled burn of biomass.
- Phragmites treatment and control occurring within York Region through various stakeholders.

- Support for Phragmites mitigation, grant funding and invasive species expertise available through Green Shovels.

Background

'Phragmites australis' is an invasive perennial grass introduced to North America in the 1800s along the Atlantic coast, as a seed contaminant in soil ballast and intentionally introduced through the horticulture trade.

'Phragmites australis' (common reed grass) is an invasive, aggressive perennial that can grow in aquatic and subaquatic environments, reaching heights of more than 5m and densities of over 200 stems/m². Reproduction is through rhizomes that can grow horizontally several metres per year, creating a significant biomass. Vertical plant growth can reach four (4) centimetres per day and plants can produce thousands of seeds annually. The prolific seed count is dispersed naturally through water, air or animal movement, as well as through human actions and equipment such as horticultural/construction activities, motor vehicles, boats and trailers.

In 2005, it was recognized as Canada's worst invasive plant by scientists at Agriculture and Agri-food Canada. Invasive Phragmites was first introduced along the eastern seaboard but has since been located west and north of the original point of introduction. During the 1990s it spread rapidly throughout Southern Ontario and can now be found as far north as Georgian Bay and Lake Superior. It has become one of the most significant threats to Great Lakes coastal habitats, where it has drastically reduced plant and wildlife diversity, as well as threatened a high number of species at risk.

Analysis

Impacts of Phragmites are extensive and not specific to plant and wildlife diversity.

While Phragmites has a significant affect on native plants and wildlife, along with coastal/wetland and lake habitats, it has many cultural and economic impacts that include:

- Damage to infrastructure;
- Safety hazards (e.g. dead stands create fire hazards and block sightlines along roadways, etc.);
- Increased costs in construction activities, potential delays;
- Aesthetic degradation and blocking of property views;

- Reduced property values;
- Loss of productivity in woodlots and agriculture;
- Impeding access to important infrastructure and utilities (e.g. fire hydrants, hydro corridors, storm water management infrastructure); and
- Recreational values.

Wellington Street and St. Johns Sideroad both have extensive populations of reed grass in the public right-of-way and beyond.

Phragmites is a common sight along Ontario's major highways and secondary roads as can be seen along Aurora's major road arteries. It is also taken hold along and within rail and hydro corridors. These transportation corridors all act as vectors to spread the species along with transport of contaminated soils through construction activities.

Phragmites sites vary in size in Aurora, from 1m² to several hundred m² plots. Staff record locations as they are detected with assistance from residents. Attachment#1 illustrates the identified areas in Aurora, known to staff and includes storm water management areas, private and public lands.

Priority areas of concern include:

- David Tomlinson Nature Reserve (DTNR)
- McKenzie Marsh
- Aurora Community Arboretum (ACA)
- St. John's Sideroad – northside between William Graham Blvd/Leslie St.

These locations are of particular concern because if Phragmites is controlled it will prevent rampant spread in these sensitive ecosystems.

It is well documented that Phragmites changes hydrological and nutrient cycling patterns. This poses a concern for the Town's storm water management ponds and the affect phragmites has on the infrastructure.

During 2020-2021, Operations retained Lake Simcoe Regional Conservation Authority (LSRCA) to inspect all the Storm Water Management (SWM) facilities and infrastructure in Aurora. The study identified deficiencies/outfall blockages/silt buildup/vegetation overgrowth and phragmite presence along with recommendations and prioritization of works. Of the 38 wet SWM ponds, 24 were identified as having phragmites in varying degrees of infestations.

As a result of this report, Operations had included a multi-year Storm Water Management Maintenance project in the Operational Budget starting in 2023 for Council

consideration. If the project is granted approval a portion of the funding is earmarked to deal with the Phragmites in the SWM facilities, identified by LSRCA.

Control methods for Phragmites growth offer preventable steps, and options for both long term and short-term control; however, chemical herbicide is the most effective control followed by controlled burn of biomass.

Integrated pest management involves monitoring thresholds and utilizing the best method of control for the site conditions and most often than not a combination of control methods is applied. The various methods are described in Table 1 below:

Table 1. Control methods available in Ontario

Method	Site Conditions	Strengths	Limitations
Digging/spading (manual)	Dry land	Easy to implement, cost effective for small sites.	Very labour intensive, need soft soils, efficacy variable and requires repeat treatments, time consuming, slow progress towards restoration objectives, biomass must be disposed of responsibly.
Cut-to-drown (manual)	In water 30cm or greater in depth	Reasonably effective in deep water; most suitable for small sites	Very labour intensive. Not effective in less than 30cm water. Water level must stay high throughout growing season to be effective. Subject to water level fluctuations; may require repeat treatments. Time consuming, slow progress towards restoration objectives, biomass must be disposed of appropriately.
Cut-to-drown (mechanical equipment)	In water 30cm or greater in depth	Reasonably effective in deep water	Requires specialized cutting equipment with trained operators that can be expensive. Not effective in less than 30cm water. Water level must stay high throughout growing season to be effective. Subject to water level fluctuations; may require repeat treatments. Time

Method	Site Conditions	Strengths	Limitations
			consuming to deliver; biomass must be disposed of appropriately. Potential harm to wildlife/adverse ecological effects
Chemical Herbicide Applications	Dry land	Very high efficacy covers large areas quickly, less labour intensive than mechanical methods, and requires less physical disturbance.	Public perceptions of herbicides, multiple authorizations, requires trained exterminators. Best management practices recommend rolling and/or burning of biomass after three (3) weeks. Narrow biological windows for application (fall). Potential harm to wildlife/adverse ecological effects
Chemical Herbicide Applications	Aquatic (in water)	Very high efficacy, covers large areas quickly.	Public perceptions of herbicides, complex licensing/permits, multiple applications, trained exterminators. Best practices recommend rolling and or burning of biomass after three (3) weeks. Narrow windows of application. Potential harm to wildlife/adverse ecological effects
Controlled Burn	Dry sites and aquatic sites (limited to winter).	Effective way to remove dead biomass in spring/winter, allows for early detection of new shoots and the establishment of native plant material/replanting.	Public perception, permits, timing, climatic impacts affect treatment (lack of ice) Potential harm to wildlife/adverse ecological effects.

Biomass removal is an important part of the process as it ensures the adequate containment of seeds/rhizomes and helps with monitoring for new growth on site to

mitigate future infestation. It also allows the opportunity for the reestablishment of native species either through natural regeneration or by replanting efforts. However, transportation and disposal are logistically challenging. Prescribed burning may be suitable for some sites during the dormant season, but in most instances removal and disposal of cut material is necessary.

Biocontrol may become a promising additional tool in Phragmites management. Two moth species have been approved for release in Canada and are currently being trialed in Ontario. Although biocontrol may not replace the need for substantial removal of established phragmites sites it has the potential to be an added method to utilize as part of the integrated pest management plan toolbox.

Phragmites treatment and control occurring within York Region through various stakeholders.

Many Municipalities, Regions, Conservation groups and landowners are dealing with the challenges of Phragmites control throughout Ontario. Currently, these projects range in scale from small, volunteer-driven to large-scale, highly mechanized projects led by professionals in the invasive species industry. Regardless of scale, most projects require a multi-year plan using a combination of tools and techniques to mitigate and manage the issue. The following organizations have worked on phragmites projects to different degrees:

York Region

In 2019 the Regional Municipality of York (the Region) undertook a formal inventory of phragmites and introduced a 'pilot' control program. In 2020 they collaborated with Municipalities and Conservation Authorities on shared populations of phragmites, including a couple sites in Aurora (McKenzie Marsh and Stronach Aurora Recreation Complex). In 2021 the Region focused mainly on populations solely within the road right of ways.

Between 2020 and 2021 they cut and treated approximately 47,000m² with a chemical herbicide, including follow up spring treatments. Costs related to the treatments were approximately \$60,500.

Aurora Community Arboretum

The Aurora Community Arboretum (ACA) initiated treatment of a large area of phragmites just north of the Tim Hortons Plaza (John West Way) in 2015. The area is approximately 1,000m² and after the initial application of chemical herbicide, the area

continues to be monitored and treated yearly. Other small pockets of the reed grass have also been treated in the Arboretum with total expenditures to date total approximately \$40,000.

In addition to chemical treatment, the ACA has done planting of trees in the area, which are intended to grow and shade out the area. This has proved extremely difficult as the biomass was not removed.

Township of King

The Township of King has been working on a couple small scale phragmites management projects which were grant funded with the assistance of Green Shovels. The primary area of focus has been in the Dufferin Marsh in Schomberg, in which they have been working with the Dufferin Marsh Nature Connection group to implement management controls to prevent the phragmites from spreading further. King was able to achieve good results through manual removal with success in eliminating a couple of patches, however the location has been challenging due to the fluctuating water levels. Staff will monitor the site and continue to implement measures to ensure there is no further spread.

King Township also has a couple larger locations situated in sensitive wetlands that they have been monitoring but simply do not have the funding to support treatment currently. Staff have plans to create an Invasive Species Strategy soon, which will act as a guiding document, to support a larger scale plan with associated funding.

Support for Phragmites mitigation, grant funding and invasive species expertise available through Green Shovels Collaborative.

Green Shovels Collaborative is a network of organizations with a common goal of preventing and managing invasive species. They provide a wide variety of expertise and available funding opportunities. Their programming is designed to achieve job creation in the communities they support, economic recovery and environmental progress while addressing invasive species.

Phragmites control is a focus of the group and in 2021 they supported King Township in their efforts. The coalition of conservation groups includes Ducks Unlimited Canada, Federation of Ontario Cottagers Association, Invasive Species Centre, Nature Conservancy of Canada, Ontario Federation of Anglers and Ontario Turtle Conservation Centre.

Advisory Committee Review

Not applicable.

Legal Considerations

Herbicides must be applied in accordance with the federal Pest Control Products Act, S.C. 2002, c. 28, the Ontario Pesticides Act, R.S.O. 1990, c. P.11, Ontario Regulation 63/09 and in accordance with all label directions. 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 Ontario ministry approval is required.

Financial Implications

Operations has included a new Storm Water Management Maintenance program within the draft the 2023 Operational Budget for Council's consideration. This new maintenance program will include the active management of phragmites within the Town's storm water management network, principally relating to its storm ponds. This work will be performed based upon the prioritization schedule as defined from the Storm Water Management 2020-2021 Inspection, Maintenance and Prioritization study.

For the control of phragmites outside of the SWM network staff propose that an incremental funding requirement of \$75,000/year be included in the draft 2023 operating budget for Council's consideration. This amount would fund the engagement of a contractor for this purpose. Further, it is anticipated that there will be an incremental requirement for a seasonal staff member with expertise in invasives to spearhead this initiative. As the active control of phragmites within the Town represents a service enhancement, these incremental funding requirements would be a new tax pressure that would need to be addressed as part the proposed 2023 operating budget.

On an ongoing basis, staff will continue to explore grant funding opportunities as they become available, which could offset funding needs phragmites control projects. In addition, any possible partnerships with other government agencies and regional counterparts to collaborate on identified phragmite sites that have common borders will be explored.

Communications Considerations

There are mandatory, legislative, public notification requirements that must be adhered to when applying chemical herbicides. Staff will coordinate this notification process via the Town of Aurora's Communications Department who will use "inform" as the level of communication related to this initiative. Communications will implement an education campaign targeted to residents and visitors on the Phragmites Control Program when implemented. The campaign will be multifaceted, and include among others a media release, website content, social media, print advertising, Newsletters and park signage.

Climate Change Considerations

The recommendations from this report will result in the mitigation of long-term effects of Phragmites within Aurora's natural environment and to SWM facilities by implementing measures to control the invasive reed grass.

In addition, the recommendations will increase the Town's ability to adapt to a changing climate by decreasing additional stressors to our hydrological infrastructure and sensitive wetland environments. With rising temperature trends, windstorms and storm intensity, it's more important than ever for the Town to protect and restore the Town's natural heritage assets and SWM infrastructure, as they play an important role in mitigating the impacts of a changing climate from air/water quality to stormwater management.

Link to Strategic Plan

Treatment of Phragmites reinforces the Strategic Plan goal of Supporting Environmental Stewardship and Sustainability for all through its accomplishment in satisfying requirements in the following key objectives within this goal statement:

Encouraging the stewardship of Aurora's natural resources: Assess the merits of measuring the Town's natural capital assets.

Alternative(s) to the Recommendation

1. Council may choose to not proceed with the approval of treating Phragmites with a chemical herbicide.
2. As directed by Council.

Conclusions

A sustainable long-term program will be required to manage phragmites to gain effective control. While there are several methods to mitigate the spread, the most efficient solution is the use of a chemical herbicide, appropriate to the site conditions, in conjunction with a controlled burn of the biomass.

Successful control of Phragmites over the long-term will require an integrated, large scale implementation plan that includes all necessary partners and stakeholders within a region. The plan will require sustained, multi-year funding, utilizing grant opportunities when available, to match the realities of Phragmites control applying integrated pest management techniques.

Attachments

Attachment # 1 – Location Map of Phragmites in Aurora

Attachment # 2 – Township of King Phragmites Control

Previous Reports

None.

Pre-submission Review

Agenda Management Team review on June 16, 2022

Approvals

Approved by Allan D. Downey, Director, Operational Services

Approved by Doug Nadorozny, Chief Administrative Officer