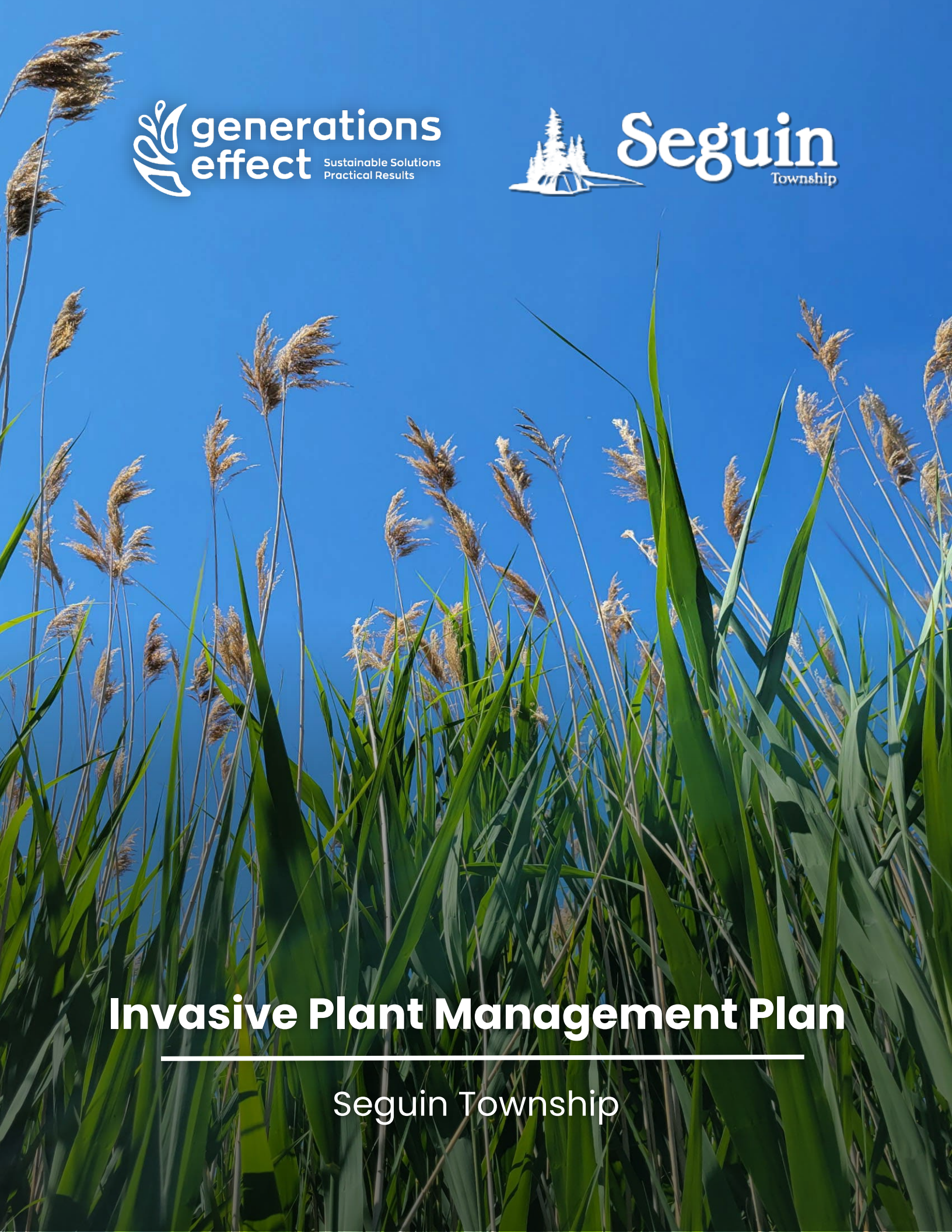

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Seguin
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Invasive Plant Management Plan

Seguin Township

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DECEMBER 2024

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LAND ACKNOWLEDGEMENT

Seguin Township is situated within the traditional territory of the Anishinaabe peoples within the Huron-Robinson Treaty of 1850 and the Williams Treaty of 1923. This acknowledgment honors the enduring presence and rich history of First Nations and Métis peoples on this land, which remains home to vibrant Indigenous communities who have lived on and stewarded Turtle Island since time immemorial.

This Invasive Plant Management Plan (IPMP) reflects Seguin Township's recognition and respect of Indigenous knowledge, practices, and stewardship values that support the health of natural landscapes. Seguin Township remains dedicated to continuous learning, responsible stewardship of the land, and fostering relationships that help build a brighter future for generations to come.

ABOUT GENERATIONS EFFECT

Generations Effect (GenE) is a social enterprise dedicated to sustainable development and building the capacity of clients and communities to implement practical, sustainable solutions. GenE provide consulting and technical services that promote ecological, social, and economic well-being.

As a social enterprise, GenE focuses on using commercial strategies to benefit society. Unlike traditional businesses, GenE reinvest profits back into the community rather than paying dividends to shareholders. GenE is committed to operating with a deep respect for community, environmental, and cultural values. The goal is to maximize benefits to both society and ecosystems, while giving back to the communities GenE serves. GenE reinvests its profits into local initiatives and projects in the Georgian Bay Mnidoo Gamii Biosphere Region (GBB).

Each project is viewed through the lens of the United Nations Sustainable Development Goals (SDGs). Consulting services include organizational development, climate adaptation strategies, and technical expertise in areas such as water quality monitoring and species at risk protection. By applying a collaborative, innovative, and values-based approach, GenE helps communities achieve meaningful outcomes that support long-term environmental and social health.

EXECUTIVE SUMMARY

Invasive plant species pose significant threats to Seguin Township's natural environment, community well-being, and economy. By outcompeting native vegetation, they degrade habitats, disrupt ecological balance, and impose substantial costs on management and restoration efforts. Recognizing the urgent need for a comprehensive response, Seguin Township's IPMP lays out a strategic framework to address these challenges and protect the region's unique ecosystems over the next decade and beyond.

Objectives of the Plan

1. **Protect Natural Heritage Systems:** Safeguard Seguin's diverse ecosystems by preventing the establishment and spread of invasive plant species.
2. **Promote Public Health and Safety:** Mitigate risks posed by invasive species to residents, including hazards in public spaces and recreational areas.
3. **Support Social, Cultural, and Recreational Values:** Preserve the natural spaces that residents and visitors enjoy while fostering a shared sense of stewardship.
4. **Minimize Economic Costs:** Reduce long-term financial burdens associated with invasive species management through prevention, early detection and reporting, education, and targeted action.

Plan Components

1. **Identification and Prioritization:** Identify invasive plant species threatening Seguin Township and prioritize management efforts based on ecological, economic, and cultural impacts.
2. **Control and Management Techniques:** Implement mechanical, chemical, and/or biological methods, coupled with safe disposal practices, to effectively manage invasive plants.
3. **Restoration and Monitoring:** Rehabilitate impacted areas with native species and establish ongoing monitoring to track progress and adapt management strategies.
4. **Education and Outreach:** Raise public awareness through workshops, educational materials, and signage, empowering residents to identify, report, and prevent the spread of invasive species.

5. **Prevention and Policy Integration:** Strengthen planning processes and policies, including clean equipment protocols, development guidelines, and by-laws, to prevent new infestations and manage existing ones.
6. **Collaborative Efforts:** Build partnerships with conservation organizations, First Nations, local groups, and other stakeholders to coordinate efforts and share resources.
7. **Staff and Community Training:** Equip municipal staff and residents with the knowledge and tools needed for effective invasive plant management.

In summary, Seguin Township's IPMP takes a proactive and comprehensive approach to managing invasive plants. By raising public awareness, enhancing reporting mechanisms, and implementing effective control measures, this plan aims to protect Seguin's natural environment, minimize economic impacts, and improve quality of life for current and future generations.

INTRODUCTION

The IPMP addresses the widespread presence and spread of invasive plants within Seguin Township. An invasive species is any plant, animal, or microorganism introduced outside its natural geographic range by human actions that pose threats to the environment, economy, or society. Lacking natural predators or diseases to curb their populations, invasive species can reproduce and spread rapidly, often overtaking sensitive ecosystems[1]. These species can spread through a variety of pathways, outlined in Figure 1 below.

Figure 1. Pathways of spread for invasive plant species.

[1] Canadian Council on Invasive Species. (2022, July 4). *Invasive species.* Canadian Council on Invasive Species. https://canadainvasives.ca/invasive-species/

Without timely control, these rapid invaders will continue to spread, leading to more significant issues and costs. The IPMP strengthens measures to protect Seguin's natural heritage, reduce future economic impacts, and enhance social and recreational opportunities for both permanent and seasonal residents. This plan provides guidance and support for effective, efficient, and environmentally-responsible control methods.

GEOGRAPHICAL OVERVIEW

Located in central Ontario's picturesque cottage country, Seguin Township is situated just two hours north of Toronto within the GBB region. It is bordered by the District of Muskoka to the south and east, and the Town of Parry Sound and the Township of McKellar to the north (Figure 2). Seguin Township is easily accessible via Highways 141 and 400, connecting residents and visitors to urban centers like Barrie within an hour's drive. This accessibility makes Seguin Township a popular destination for both year-round residents and seasonal visitors, surging from 5,280 permanent residents to over 15,000 during the summer months.

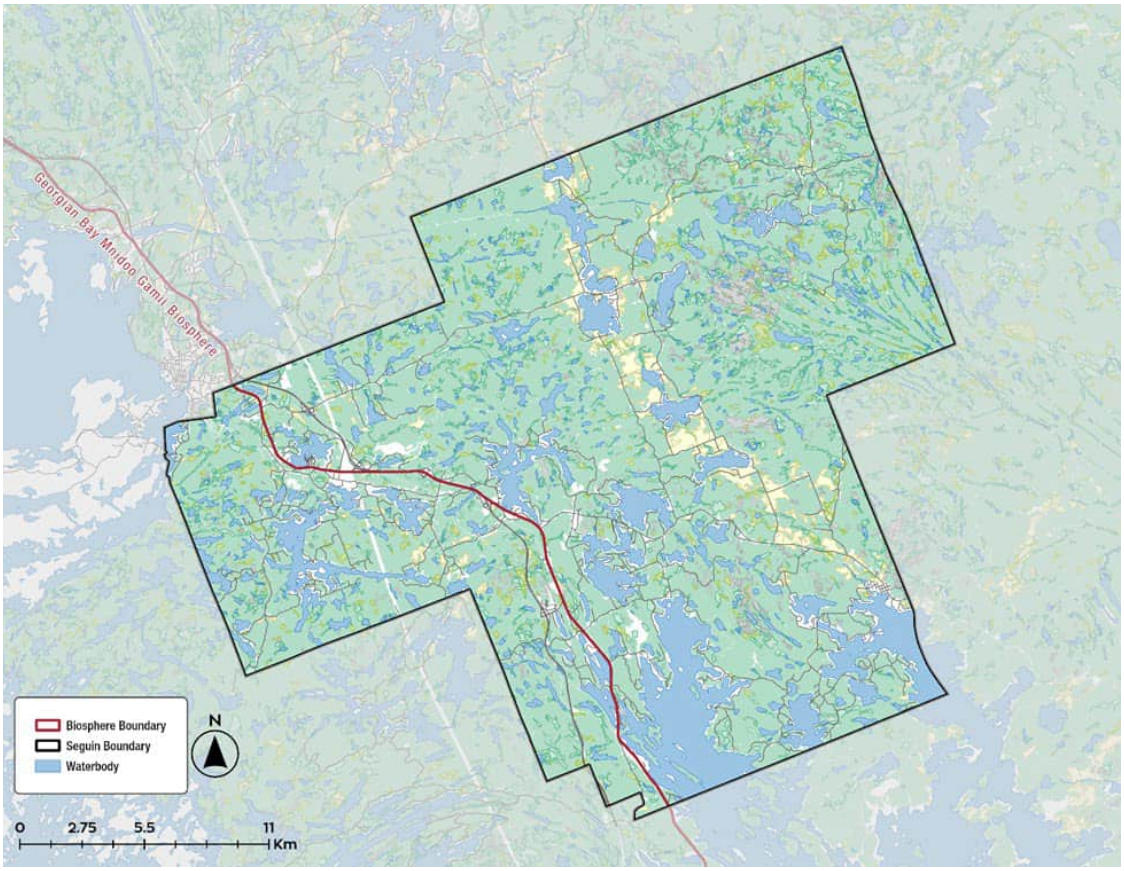

Figure 2. Map of Seguin Township.

Seguin Township is situated within Eco-Districts 5E-7 (Parry Sound) and 5E-8 (Huntsville), showcasing diverse elevation ranging from 172 meters to 587 meters above sea level. The landscape is primarily shaped by Precambrian bedrock, characteristic of the southern Precambrian Shield, interspersed with a discontinuous layer of shallow to moderate morainal material. Several east-west fault lines create narrow valleys, integral to the region's rivers and streams, including narrow inlets that extend many kilometers inland from Georgian Bay.

Known as "The Natural Place to Be", Seguin Township is celebrated for its rich natural heritage and diverse ecosystems. The area features various land cover types, including forests, wetlands, lakes, and rivers, which collectively support a vibrant array of wildlife and plant species. Primarily covered by deciduous and mixed forests, common tree species include sugar maple, red oak, and white pine. The Township is located within the Muskoka, Boyne, and Seguin watersheds which contain numerous wetlands, lakes, and rivers. Waterbodies, such as Lake Rosseau, Lake Joseph, and the Seguin River, are essential for aquatic biodiversity, supporting fish populations such as bass and pike while providing recreational opportunities for residents and visitors. Additionally, the landscape includes agricultural fields and rocky barren areas, complemented by sparse tree coverage scattered throughout the region.

INVASIVE PLANT SPECIES IN SEGUIN TOWNSHIP

Citizen science platforms like iNaturalist and EDDMapS have significantly enhanced invasive species detection efforts in Seguin Township. These tools empower community naturalists to report sightings, raise environmental awareness, and support effective monitoring and management of invasive species. Thanks to this community collaboration, the invasive plant species listed in Table 1 and displayed in Figure 3 have been identified within Seguin Township.

Table 1. Invasive plant species detected in Seguin Township using citizen science data collected from iNaturalist and EDDMapS.

Invasive Terrestrial Plant Species	**Invasive Aquatic & Semi-Aquatic Plant Species**
• Common Buckthorn (*Rhamnus cathartica*) • Dog-strangling Vine (*Cynanchum rossicum*) • Garlic Mustard (*Alliaria petiolata*) • Giant Hogweed (*Heracleum mantegazzianum*) • Invasive Goutweed (*Aegopodium podagraria*) • Japanese Knotweed (*Reynoutria japonica*) • White Sweet Clover (*Melilotus albus*)	• Invasive Phragmites/European Common Reed (*Phragmites australis subsp. australis*) • Purple Loosestrife (*Lythrum salicaria*) • Reed Canary Grass (*Phalaris arundinacea subsp. arundinacea*)

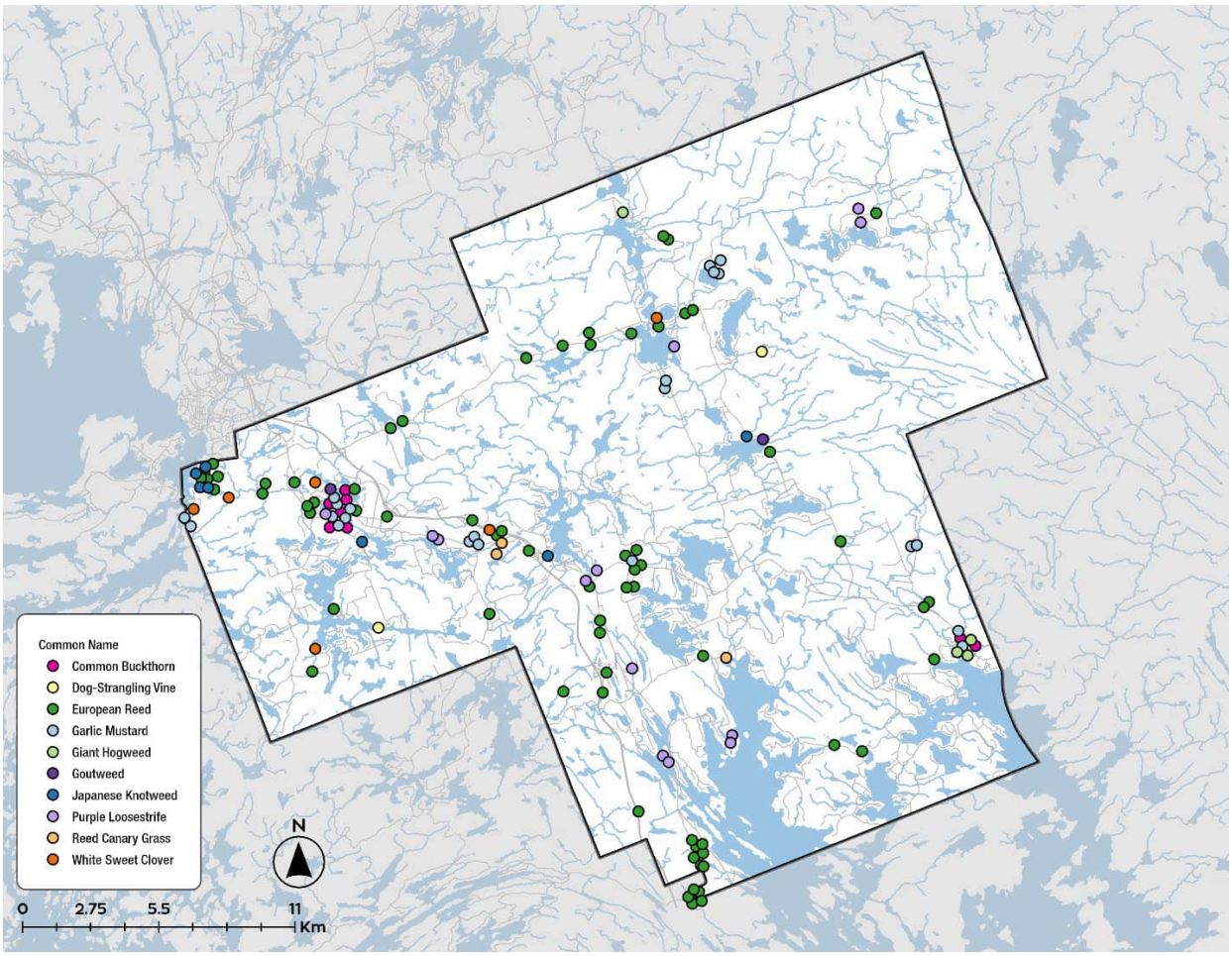

Figure 3. Map of invasive plant species detected in Seguin Township based on citizen science data collected from iNaturalist and EDDMapS.

In Seguin Township, most invasive plant observations are concentrated along major road networks. This pattern likely reflects transportation as a major pathway for the spread of invasive plant species. However, it is also important to consider the limitations of the data presented in Figure 3. The records are based on citizen science contributions, which are inherently influenced by observer bias. This means that detections are more frequent in high-traffic areas or locations where human activity is prevalent, potentially underrepresenting the presence of invasive species in less accessible or less visited parts of the Township. Consequently, it is plausible that invasive plants are more widespread than indicated above, and that additional species may be present in undetected areas.

INVASIVE PLANTS WITH POTENTIAL TO INVADE SEGUIN TOWNSHIP

There are various pathways (refer to Figure 1) through which invasive species can spread, emphasizing the need for vigilance in Seguin Township. Early detection is key to implementing effective and cost-efficient management strategies. When invasive species are identified, they should be reported to the Township and/or via applications like EDDMapS and/or iNaturalist. Table 2 below lists invasive plant species currently present in surrounding areas, highlighting the importance of proactive monitoring and response efforts to prevent their establishment within the Township.

Table 2. Invasive plants with potential to invade Seguin Township.

Invasive Terrestrial Plant Species	**Invasive Aquatic & Semi-Aquatic Plant Species**
• Flowering Rush (*Butomus umbellatus*) • Spotted Knapweed (*Centaurea stoebe*) • Himalayan Balsam (*Impatien glandulifera*)	• Eurasian Watermilfoil (*Myriophyllum spicatum*) • Curly-leaved pondweed (*Potamogeton crispus*)

IMPACTS OF INVASIVE PLANTS

Invasive plants have wide-ranging effects on human health and safety, the economy, ecosystems, and cultural practices. They can impact public health, disrupt economic activities, harm biodiversity, and alter natural landscapes. The following sections examine the impacts of invasive plants in four key areas: human health and safety, socio-economic factors, ecological consequences, and cultural implications.

DANGER TO HUMAN HEALTH AND SAFETY

Invasive plants present considerable risks to human health and safety due to their rapid, extensive growth. Along roadways, fast-growing invasive species, such as Phragmites or Japanese knotweed, can significantly reduce visibility for drivers and pedestrians, increasing the likelihood of vehicle accidents, injuries, and/or fatalities. Dense stands of invasive plants can also block access to critical infrastructure, such as fire hydrants, hydro corridors, and stormwater management systems.

Invasive plants also contribute to both wildfire and flooding risks. For instance, the dead, dry stalks of Phragmites are highly flammable, burning at temperatures up to 2000℃, producing strong winds, spreading rapidly and creating serious hazards for nearby properties and communities[2]. Similarly, Japanese knotweed exacerbates flooding by outcompeting ground cover plants, reducing water infiltration, and accelerating surface water runoff during spring melts and storms[3]. This can lead to overflow in rivers, streams, and/or roads, increasing the risk of flooding.

Some invasive species, like giant hogweed and wild parsnip, also pose direct health threats. Their sap can cause severe skin reactions (dermatitis) upon exposure to sunlight, resulting in painful blistering, swelling, and itching that may persist for months. If sap enters the eyes, it can cause temporary or permanent blindness. Individuals exposed to giant hogweed sap may experience increased UV sensitivity and long-term changes in skin pigmentation. Managing invasive plants effectively is essential for safeguarding human health and safety, though it remains a complex challenge.

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[2] Great Lakes Phragmites Collaborative. (n.d.). *Dense stands of phragmites pose wild-fire risk*. Great Lakes Phragmites Collaborative. https://www.greatlakesphragmites.net/uncategorized/httpgreatlakesphragmites-netp2863/#:~:text=The%20fire%20chief%20reported%20that,from%20the%20blazes%20could%20melt

[3] Adler-Colvin, J. (2020, August 19). *Invasive Japanese knotweed exacerbates flood risk*. Cary Institute of Ecosystem Studies. https://www.caryinstitute.org/news-insights/blog-reu/invasive-japanese-knotweed-exacerbates-flood-risk

SOCIO-ECONOMIC IMPACTS

Invasive species have far-reaching socio-economic impacts, affecting everyone from private property owners to federal institutions. In 2004, Environment Canada estimated that just sixteen invasive species collectively costed Canada between $13 to $35 billion annually in lost revenue[4]. Canadian industries face substantial challenges due to these species. In agriculture, invasive plants reduce available crop space and production, while also acting as hosts for new and/or existing pests and pathogens. This leads to increased use of pesticides and/or herbicides, increasing operational costs, and lowering crop values. Combined, the forestry and agriculture sectors experience annual revenue losses estimated at $7.5 billion[4].

The Ontario government allocated over $5 million in 2023-2024 to support invasive species research, monitoring, and management across the province. Local governments, including municipalities and townships, are significantly impacted by invasive species, incurring increased maintenance costs for parks, sports complexes, roads, boat launches, and other public spaces. In 2019, the Invasive Species Centre estimated the annual expenditures of Ontario's municipalities and conservation authorities on 16 individual invasive species, four of which are plants (see Figure 4). Collectively, these entities were estimated to have spent $4.7 million on the management of just four invasive plant species among the 29 identified in Ontario[5].

[4] Environment Canada. (2004, September). *Canada's invasive alien species strategy*. Government of Canada. https://www.gov.nl.ca/ffa/files/wildlife-biodiversity-invasive-alien-species-ias-strategy.pdf

[5] Vyn, R. J. (2019, January). *Estimated expenditures on invasive species in Ontario: 2019.* Invasive Species Centre. https://www.invasivespeciescentre.ca/wp-content/uploads/2020/02/Final-Report-2019-Survey-Results-No-Appendix-A.pdf

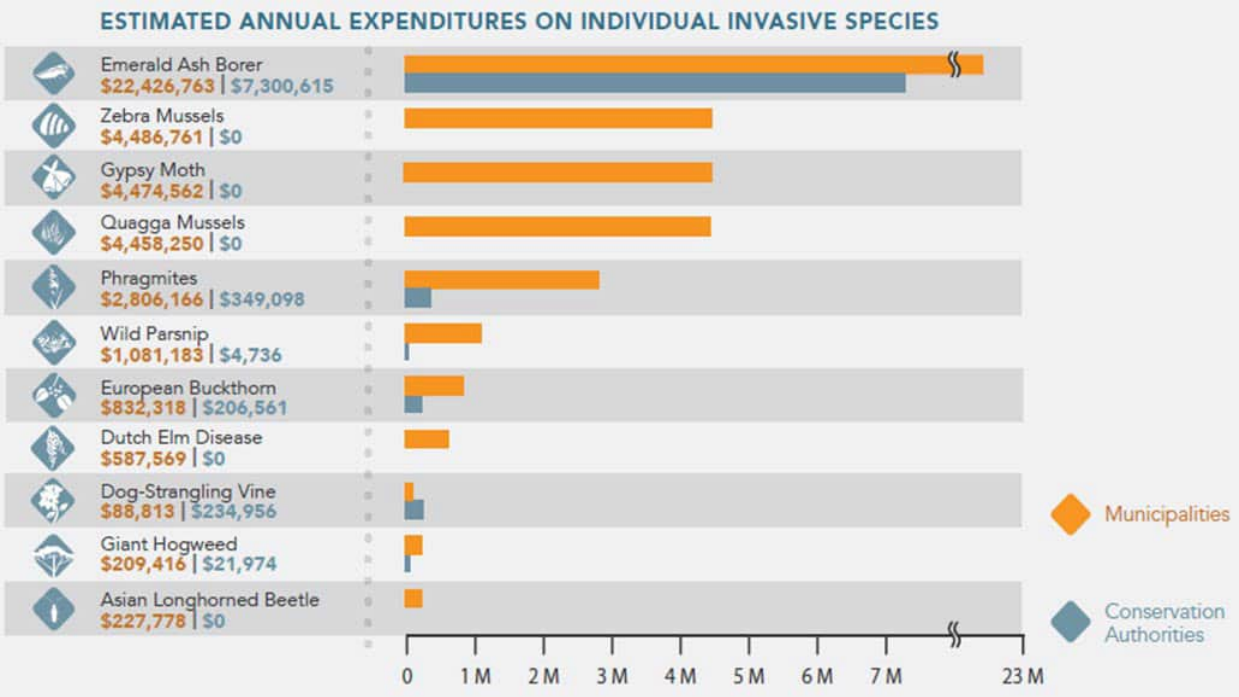

Figure 4. Estimated annual expenditures on invasive species in Ontario[5].

Private property owners are affected both economically and recreationally. Properties with invasive species on or near them often experience a decrease in property values. Additionally, invasive species can significantly diminish recreational opportunities. Eurasian watermilfoil, for instance, disrupts swimming, boating, and fishing by forming dense mats that make water activities unpleasant and even hazardous. These mats also create stagnant water which encourages mosquito breeding and reduces oxygen levels, leading to fish die-offs and reduced recreational fishing opportunities.

Invasive species not only impose significant economic burdens across multiple sectors but also reduce the quality of life for Canadians. This underscores the urgent need for continued investment in management and prevention efforts. Prevention is the most effective and cost-efficient strategy for addressing invasive species (see Figure 5). Once a species is introduced, however, management costs increase exponentially over time, whilst the likelihood of eradication diminishes[6].

[6] Invasive Species Centre. (2021, October 1). *Investing in prevention: Invasion curve*. Invasive Species Centre. https://www.invasivespeciescentre.ca/learn/invasion-curve/

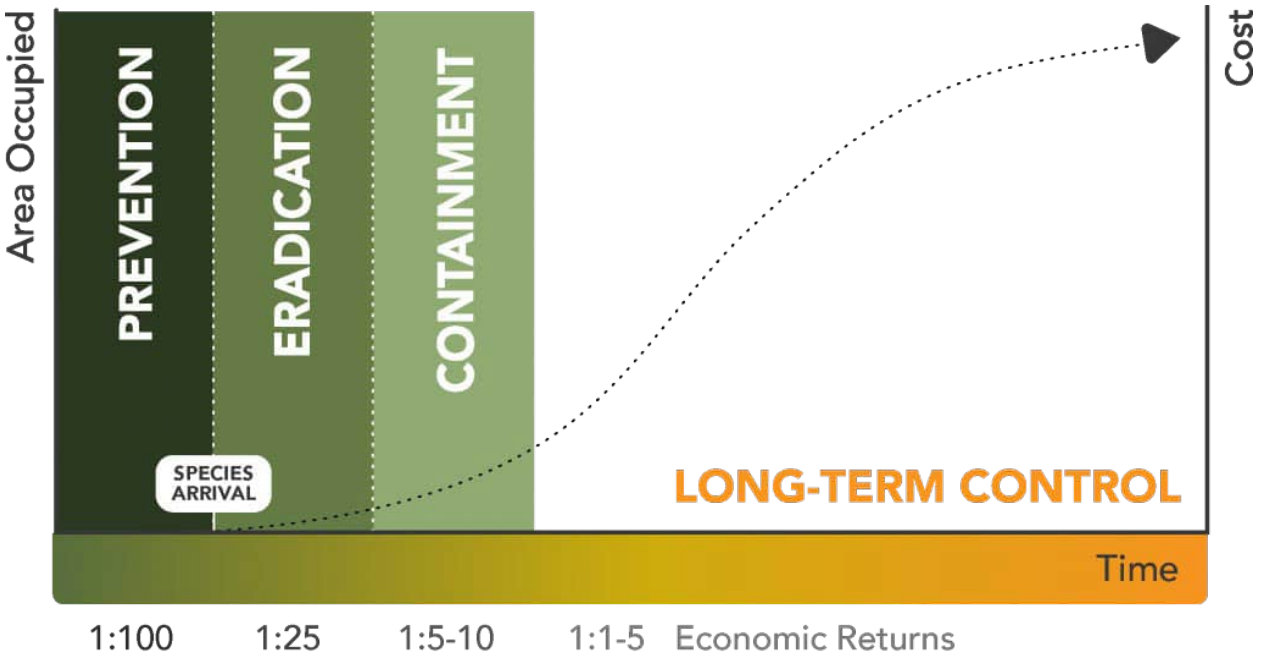

Figure 5. The invasion curve[6].

DEGRADATION OF NATURAL HERITAGE SYSTEMS

Invasive species threaten the integrity of natural heritage systems by disrupting ecosystem balance and reducing biodiversity. Invasive plants rapidly outcompete native vegetation, forming monocultures that eliminate biodiversity and alter essential habitats for native species. In Ontario, invasive species directly impact approximately 20% of species at risk, underscoring their extensive influence on local biodiversity[7]. Recent research on the effects of Phragmites highlight its negative impact on Blanding's turtles, a threatened species in Ontario. The study found that dense stands of Phragmites restricted movement of this turtle species and reduced access to essential basking and nesting sites. While Blanding's turtles may occupy areas with Phragmites, they tend to avoid dense patches, which limits their ability to forage and reproduce effectively, potentially threatening the species' long-term survival[8]. Additionally, large dense stands of Phragmites contribute to water level drawdown in wetlands since this invasive plant transpires water at a faster rate than native vegetation. Such disturbances weaken ecological resilience and degrade

[7] Ontario Biodiversity Council. (2010). *State of Ontario's biodiversity 2010—Highlights report*. State of Ontario's biodiversity. https://sobr.ca/__biosite/wp-content/uploads/SOBR-2010__Highlights-Report__E.pdf

[8] Markle, C. E., & Chow-Fraser, P. (2018). Effects of european common reed on blanding's turtle spatial ecology. *The journal of wildlife management*, *82*(4), 857–864. https://doi.org/10.1002/jwmg.21435

essential ecosystem services on which communities depend, including water filtration, stormwater retention, pollination, and habitat availability.

Climate change amplifies these impacts, creating more favorable conditions for invasive species, which often spread more rapidly in disturbed areas following extreme weather events. Additionally, elevated atmospheric CO^2 levels can accelerate the growth of these species and increase their resistance to herbicides, making restoration of natural ecosystems increasingly challenging. Addressing these combined pressures is essential to protect and preserve natural heritage systems.

CULTURAL IMPACTS

Invasive species can have a profound impact on Indigenous lands and communities by displacing culturally significant plants and animals. For instance, in southern Ontario, garlic mustard is encroaching on the habitat of American ginseng, a crucial plant for traditional medicine. These invasive species can also disrupt access to essential resources for food, medicine, and ceremonies, undermining the traditions that are foundational to Indigenous identity. Furthermore, management programs aimed at controlling invasive species can cause harm to Indigenous communities, particularly through the use of herbicides without proper consultation and engagement. The rapid ecological changes induced by invasive species may outpace communities' capacity for adaptation and mitigation, threatening their health and well-being by restricting access to vital cultural resources and livelihoods.

MANAGING INVASIVE PLANTS

Deciding whether to eradicate, contain, or control an invasive species involves several key factors, including the species' current spread, its human health and safety, ecological and economic impacts, and the feasibility of management actions.

These considerations are outlined below:

1. **Stage of Invasion**: Assess whether the species is newly introduced or widespread, guiding the choice between eradication or containment and control strategies.

2. **Human Health and Safety Impact**: Evaluate the potential harm the species may cause, such as severe dermatitis, visibility hazards on roadways, or fire risks.
3. **Economic Impact**: Analyze the potential damage to key economic sectors, including agriculture, forestry, and recreation, as well as the financial burden on federal, provincial, and municipal governments.
4. **Ecological Impact**: Assess the species' effect on local ecosystems, including native plants, wildlife, habitats, and ecosystem services.
5. **Feasibility of Management**: Consider the practicality of managing the species, based on available control methods, resources (i.e., funding, expertise, local support), the species' biology (e.g., reproduction rate), and environmental conditions.

Eradication is generally the goal for newly introduced invasive species or those in limited populations. It is most effective when adequate resources and techniques can support complete removal, particularly when the species poses a serious ecological or economic threat.

When complete removal is not feasible, containment or control strategies are implemented. Containment focuses on preventing the further spread of an invasive species beyond its current range. Efforts such as physical barriers, public awareness campaigns, and monitoring are often employed when the species is too widespread for eradication but can still be restricted to certain areas, thus minimizing its impact on new ecosystems. Control aims to reduce the population of an invasive species within its established range to manageable levels, thereby lessening its effects. Control measures may include regular mechanical removal, biological controls, and/or selective herbicide application. This approach is particularly practical for species that are well-established and cannot feasibly be eradicated or contained.

In cases where an invasive species is both widespread and harmful, a combined containment and control approach can effectively manage its spread and impact on the environment, balancing ecological integrity with available management resources.

Table 3 on the next page serves as a decision-making tool for invasive plant management, providing qualitative assessments of social, ecological and economic impacts as well as the feasibility of management actions for various invasive species in Seguin Township.

Table 3. Invasive plant management prioritization tool.

Green = Low management priority
Yellow = Medium management priority
Red = High management priority

Species	1. Stage of Invasion*	2. Human Health & Safety Impact	3. Economic Impact	4. Ecological Impact	5. Feasibility of Management
Common buckthorn	Newly introduced	Low	Low	Moderate	Moderate
Dog-strangling vine	Newly introduced	Low	Low	Moderate	Moderate
Garlic mustard	Newly introduced	Low	Low	Moderate	Easy
Giant hogweed	Newly introduced	High	Moderate	Low	Moderate
Goutweed	Newly introduced	Moderate	Low	Moderate	Easy
Japanese knotweed	Widely spread	Moderate	High	High	Difficult
Phragmites	Widely spread	High	High	High	Difficult
Purple loosestrife	Widely spread	Low	Low	Moderate	Moderate
Reed canary grass	Newly introduced	Low	Moderate	Moderate	Moderate
White sweet clover	Widely spread	Moderate	Moderate	Moderate	Moderate

***Note: The ability to determine if a species is newly introduced or widely spread depends on the quality and availability of species occurrence data. Inaccurate or incomplete data regarding the extent of the infestation may lead to an incorrect assessment of the management level that can realistically be achieved.

How to Use the Invasive Plant Management Prioritization Tool

Table 3 takes a value-based approach to assessing and ranking invasive plant species. In general, management efforts should prioritize invasive plants that have multiple high management priorities (indicated in red). However, in specific

situations, a practitioner may wish to focus on certain factors (i.e., human health and safety). For example, if an invasive species grant prioritizes human health and safety impacts, one would use the tool to evaluate which species have the highest impact. In this scenario, giant hogweed and Phragmites are identified as equal priorities (both are red). If only one species can be chosen as the target, one could use an additional factor, such as "Feasibility of Management" to help further narrow the choice. In this scenario, assuming the invasive species grant is under $10,000, one must select a species that is relatively easy and effective to manage with minimal effort. By referencing the "Feasibility of Management" column, one would identify giant hogweed as higher management priority over Phragmites (giant hogweed scores "moderate", whereas Phragmites scores as "difficult"). Additionally, in this example, giant hogweed is also less wide spread (refer to "Stage of Invasion"), making it more effective to manage than Phragmites.

MANAGEMENT METHODS

A range of control methods—including chemical, mechanical, and biological approaches—provide a complementary strategy for reducing invasive plant prevalence. Together these strategies form a comprehensive approach to mitigating the impacts of invasive plants and promoting the recovery of native habitats. See Table 4 below for a summary of the benefits associated with effective management methods.

Table 4. Benefits of effective management.

Benefit	**Description**
Ecosystem Health	Effective management preserves and restores native ecosystems, promoting biodiversity essential for ecological stability.
Cost-Effectiveness	Data-informed, proactive management saves costs long-term by addressing invasions before they become entrenched, reducing the need for extensive removal.
Collaboration and Education	Monitoring initiatives foster community engagement and education, creating a sense of stewardship that enhances management efforts and promotes collective responsibility.

Adaptive Management	Data collected through monitoring informs adaptive strategies, allowing practitioners to adjust their approaches based on field effectiveness, which is vital amid changing environmental conditions.

MECHANICAL

Mechanical controls are an effective method for managing invasive plant species by physically removing or reducing their infestation through various tools and techniques. These controls can include mowing, cutting, digging, tilling, or using specialized equipment or machinery to uproot invasive plants. Mechanical methods are often preferred in areas where chemical treatments may be too harmful to the environment, or where ecological sensitivity is a concern. While they can be labour-intensive and may require repeated efforts, mechanical controls can provide immediate results that are highly targeted, minimizing damage to non-target species. When integrated into a broader management plan, mechanical controls can significantly reduce the spread of invasive plants and help restore ecosystems.

CHEMICAL

Chemical controls involve the use of herbicides or other chemical agents to manage and reduce populations of invasive plants. These treatments are often employed when mechanical methods are impractical or ineffective, particularly for large-scale and/or dense infestations. Chemical controls offer the advantage of being efficient and relatively easy to apply, especially when dealing with long-established or difficult-to-manage species. However, many herbicides pose a risk to the environment and they require careful planning and management to avoid harming non-target species. When used correctly and in conjunction with other control methods, chemical treatments can be an important tool in the fight against invasive plants.

BIOLOGICAL

Biological controls involve the use of natural predators, parasites, pathogens or competitors to manage invasive plants. This method seeks to restore ecological balance by introducing or enhancing the presence of organisms that naturally regulate invasive plant populations. For example, specific insects, fungi or bacteria may be introduced to target invasive plants, effectively reducing their numbers

without harming native vegetation. Biological control can offer sustainable, long-term solutions, as they can continue to work over time with minimal human intervention after introduction. However, careful consideration is required to ensure that the introduced species does not become an invasive species and disrupt the local ecosystems themselves. For answers to frequently asked questions regarding biological control of Phragmites, please refer to **APPENDIX A**. When properly researched, monitored and managed, biological controls can be a highly effective and environmentally friendly tool in invasive plant management.

DISPOSAL

Proper disposal of invasive plants is a critical component of effective management strategies. Invasive plants can produce large quantities of seeds or vegetative parts that, if not properly disposed of, may establish new infestations. Therefore, it is essential to implement appropriate disposal methods to ensure plant material is handled and transported safely, rather than inadvertently contributing to the problem. Common disposal techniques include burning, bagging, burying, and more. Refer to Table 5 below for a summary of disposal techniques and their advantages, disadvantages, and best practices. The type of technique used is dependent on the invasive plant species, local municipal landfill setup, bylaws, and site conditions.

Table 5. Summary of disposal techniques for invasive plant species.

Disposal Technique	**Bagging**	**Burying**	**Burning**	**On-site Disposal**
Description	Sealing invasive plant material in bags for disposal (usually in landfills).	Digging to bury invasive plant biomass.	Controlled combustion to destroy seeds, roots, and plant material.	Cutting invasive plants and leaving the material on site to decompose naturally.
Advantages	Contains seeds and roots; prevents spread.	Prevents regrowth; natural decay.	Efficient, fast, and prevents regrowth.	Low cost; returns nutrients to the soil.
Disadvantages	Requires transport to landfill; takes up space.	Risk of disturbance; requires proper depth.	Air pollution, fire hazards, regulatory restrictions.	Requires site-specific conditions and monitoring; may spread seeds if

				not done properly.
Best Practices	Use durable bags, seal tightly, and dispose in designated facilities.	Bury deep, ensure no disturbance, and monitor for regrowth.	Burn in controlled sites, ensure high temperatures, and comply with regulations.	Monitor decomposition; ensure conditions are suitable; avoid spreading seeds.

Seguin Township facilitates proper disposal of invasive plants at the Christie Waste Transfer and Landfill Site by accepting invasive biomass. By designating a specific area for invasives disposal, Seguin is able to help prevent the spread of these species into new areas. Proper disposal not only minimizes environmental risks but also supports the overall success of invasive plant control efforts.

POST-TREATMENT MONITORING

Monitoring is essential for effectively managing invasive plants as it provides a systematic approach to understanding and mitigating their impacts on native ecosystems. Citizen scientists play a significant role in continuous monitoring, allowing land managers to collect and track critical data, laying the foundation for targeted management strategies. With ongoing surveillance, practitioners can track the spread and growth of invasive plants, ensuring prompt intervention and more efficient use of resources. See Table 6 below for specific benefits of monitoring for invasive plants.

Table 6. Importance of monitoring invasive plant species.

Benefit	**Description**
Data-Driven Insight	Monitoring invasive plant species provides critical data on their abundance, distribution, and habitats, enabling land managers to understand the extent of the issue and impact on local biodiversity. This insight is essential for developing targeted management strategies.
Early Detection and Rapid Response	Early detection of an invasive plant allows for prompt action to prevent further spread, which is more effective and resource-efficient than addressing established populations.

Prioritization of Sites	By documenting the severity and spread of invasives, managers can prioritize areas needing immediate attention, ensuring efficient resource allocation to maximize impact.
Evaluation of Management Effectiveness	Ongoing data collection tracks the success of management actions over time, allowing practitioners to evaluate the effectiveness of control measures and make necessary adjustments.
Post-Eradication Monitoring	Even after eradication, ongoing monitoring is crucial to prevent reinvasion. It helps identify leftover seeds or residual biomass that could lead to a resurgence of invasive populations.

Effective management of invasive plants goes beyond eradication; it includes understanding their ecological impacts and implementing strategic interventions. The benefits of comprehensive monitoring extend beyond immediate control efforts, promoting sustainable practices that support both ecological integrity and community engagement.

RESTORATION

Revegetating and restoring areas impacted by invasive plants with competitive native vegetation can increase ecosystem resilience and help prevent future invasions. Research has shown that planting native grasses, forbes and woody plants can effectively suppress the growth and seed germination of invasive species (Nichols, 2024). Incorporating native plants into restoration efforts not only helps prevent reinvasion, but also begins to reverse the ecological damage caused by invasive plants. Sites should be evaluated on a case by case basis to determine if revegetation is needed; depending on the severity of invasion, revegetation should be considered. For example, a large, dense monoculture of Phragmites that was clear cut is a good candidate for revegetation efforts; however, a stand of Phragmites that was selectively cut and still has native vegetation interspersed should revegetate naturally. If this does not occur, as determined by post-treatment monitoring, planting should be tailored to the specific needs of the site and the species selected for planting, to ensure successful establishment and long-term ecosystem recovery.

Refer to **APPENDIX B** to learn more about Seguin's Strategic Process for Phragmites Management, and **APPENDIX C** for a summary of Phragmites Management efforts undertaken in 2024.

BEYOND MANAGEMENT: PREVENTING THE SPREAD

Effective prevention of invasive plants requires more than just proper management, disposal, monitoring and restoration efforts; it also relies on implementing clean equipment protocols, incorporating invasive plant management into Township planning processes, providing education and training for both staff and the public, and fostering partnerships. Together, these efforts ensure long-term success in managing and preventing the spread of invasive species.

CLEAN EQUIPMENT PROTOCOL

Preventing the introduction and spread of invasive species is vital for safeguarding ecosystems, communities, and local economies. Seguin Township has implemented clean equipment protocols in their day-to-day activities and in their Request for Proposal (RFP) process for contractors. However, everyone plays a role in this effort, including private landowners, organizations, and businesses, who can help by thoroughly inspecting and cleaning machinery, vehicles, and equipment to minimize the risk of spreading harmful species into new areas.

Vehicles, off-road vehicles, machinery, boats and equipment should all be inspected and cleaned before transporting or working in a new area. When visiting multiple sites with the same equipment, begin work in the least disturbed areas, free of known invasive species, to reduce the risk of spreading invasive plants. Inspections and cleaning should follow the guidelines outlined in Figure 6. For further details, refer to the Clean Equipment Protocol for Industry[9].

[9] Halloran, J., Anderson, H., & Tassie, D. (2016, May). *Clean Equipment Protocol for Industry*. Ontario Invasive Plant Council. https://www.ontarioinvasiveplants.ca/wp-content/uploads/2016/07/Clean-Equipment-Protocol_June2016_D3_WEB-1.pdf

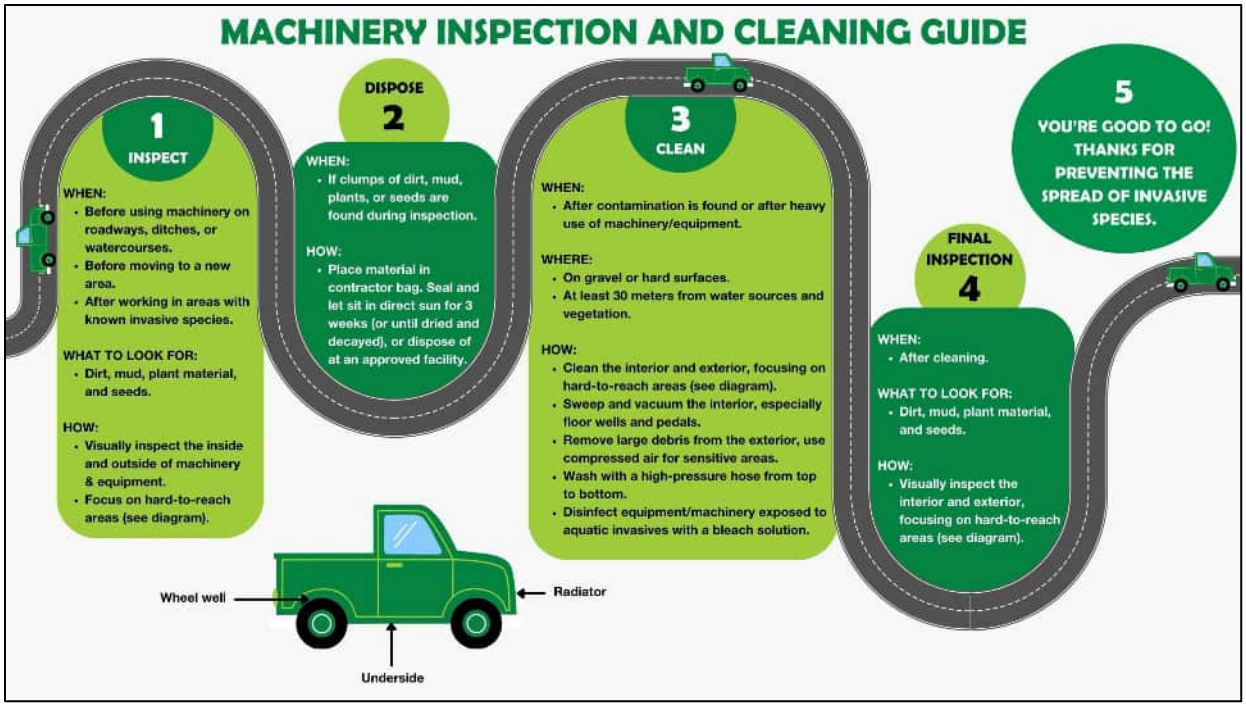

Figure 6. Machinery inspection and cleaning guide.

INCORPORATE THE IPMP INTO SEGUIN TOWNSHIP PLANNING PROCESSES

Incorporating Seguin Township's IPMP into various planning processes is essential for safeguarding and restoring the health of local ecosystems long-term. By integrating the IPMP into broader Township planning efforts, such as transportation, trails, and development strategies, the Township can address the issue from several perspectives, ensuring active prevention and reducing key vectors of spread. This proactive approach not only protects natural resources but also enhances the quality of life for residents and visitors, ensuring that Seguin remains a vibrant, resilient community for generations to come.

SEGUIN TOWNSHIP'S STRATEGIC PLAN: TO 2026 AND BEYOND

Seguin Township's IPMP aligns well with its Strategic Plan for 2026 and Beyond. The Strategic Plan, developed with community input, is built on five foundations that guide decision-making. Two of these foundations—(i) Prioritize the environment and (ii) Engage our community—are directly supported by the objectives of this Plan. The primary goals of the IPMP are to protect and preserve Seguin's natural environments

while fostering community involvement. By organizing volunteer events for invasive species removal and encouraging residents to report invasives, the Township promotes active engagement. Workshops and educational initiatives further raise awareness about invasive plants, fostering deeper connections among residents. Through these efforts, Seguin Township addresses environmental challenges while strengthening community engagement and stewardship.

SEGUIN TOWNSHIP'S WASTE MANAGEMENT STRATEGY

Incorporating invasive plant management practices into Seguin Township's Waste Management Strategy, specifically for the disposal of invasive biomass, offers numerous benefits. Safe handling, proper transportation and appropriate disposal helps prevent the spread of invasive species, safeguarding Seguin's natural heritage systems. To ensure compliance, establishing dedicated disposal areas for invasive plants, notifying the public, and amending bylaws to include penalties for improper handling can integrate invasive species management with existing legal dumping enforcement practices. By providing a clear and accessible disposal service, and educating residents on invasive species management, the Township can foster environmental stewardship, and build public support for waste initiatives.

Additionally, promoting innovative programs—such as reusing boat shrink wrap for invasive biomass containment—supports a key goal of the Waste Management Strategy, which is to recover and reuse what can be recycled. With clear guidelines and dedicated disposal areas, the Township can reduce barriers residents often face when it comes to managing invasive plants on their properties, while ensuring the proper disposal methods of invasive plants. Ultimately, these measures balance environmental responsibility, economic viability, and community engagement, positioning Seguin as an environmental leader among rural municipalities, and fulfilling another key goal of the Waste Management Strategy.

SEGUIN TOWNSHIP'S OPERATIONAL PLAN

The IPMP can be integrated into Seguin Township's Operational Plan through various guidelines, policies, practices, and directives. Table 7 on the next page summarizes how the IPMP can be incorporated.

Table 7. Incorporation of IPMP into Seguin Township's Operational Plan.

Title	Description
Develop a strategy to address the adverse impact of invasive species	• Seguin Township retained GenE to develop an IPMP as a framework and foundation for long-term invasive species management.
Increase collaboration with clubs, committees and other organizations	• Collaboration enhances invasive species management by leveraging diverse expertise, resources, and perspectives. • Engaging stakeholders such as government agencies, non-profits, researchers, and local communities and clubs fosters knowledge-sharing and a unified response.
Complete a Park and Recreation and Culture Master Plan	• Incorporate the IPMP by placing educational signage in public spaces like parks and community centers to raise awareness about reporting and preventing invasive species. • Strengthen prevention efforts through partnerships with local organizations and prioritize invasive species management in parks and high-traffic areas to encourage community involvement.
Active Transportation and Trails Master Plan	• Add guidelines for trail and road maintenance that include measures to prevent and mitigate the spread of invasive plants. • Educate trail users, require cleaning of equipment in areas with known invasive species, and install signage to direct public compliance.
Update policies that relate to water quality	• Incorporate IPMP principles into water quality policy statements to protect aquatic ecosystems and prevent invasive aquatic plant spread (e.g., "The Township is committed to preventing and managing invasive aquatic plants to protect water quality and maintain healthy aquatic ecosystems."). • Develop recreational activity guidelines, such as "clean, drain, and dry" practices for boats and equipment, with designated cleaning stations.
Review and update the Township's Official Plan and Zoning By-law	• Update the Township's Official Plan to reflect a commitment to invasive species prevention, control, and management to preserve natural heritage. • Include policy statements, land-use guidelines, or restoration directives. For example, a policy

	statement that outlines the Townships intentions and sets a direction for action could be: "The Township recognizes the ecological, economic, social, and cultural impacts of invasive plants and commits to their prevention, control, and management to preserve the natural heritage systems." Another example pertaining to development could be ""Development adjacent to natural heritage systems or features should include an invasive plant management plan detailing prevention and mitigation measures during and after construction." • Emphasize restoration efforts with native plant reintroduction in areas impacted by invasive species. For example, "Areas undergoing rehabilitation due to invasive species impacts shall prioritize the reintroduction of native plant species."

STAFF TRAINING AND EDUCATION

To effectively address the challenges posed by invasive plants, Seguin Township should continue to prioritize staff education and training as an essential part of its long-term management strategy. For example, in the summer of 2024, GenE, in partnership with Georgian Bay Forever (GBF), successfully facilitated a staff and community member training workshop. Building on this foundation, Seguin Township can now expand its efforts by offering regular, comprehensive training sessions that equip staff with the knowledge and skills necessary to communicate the ecological impacts of invasive species, how to identify and report invasive species, and various Best Management Practices (BMP's) to prevent the spread and manage invasions.

Future training should focus on hands-on learning, with an emphasis on effective removal techniques, ensuring that staff can implement safe, environmentally responsible practices that prevent invasive species from establishing or spreading further. BMP training workshops delivered by professionals should also be integrated into these sessions to deepen staff understanding of the plant's ecological dynamics, and the timing and techniques needed for successful control.

Regular workshops and refresher courses should be scheduled with key staff, such as Parks and Public Works staff, keeping teams prepared to respond to emerging

challenges with the most effective, evidence-based practices. Through this continuous training program, Seguin Township will empower its staff to engage the community, implement proper removal techniques, and follow best practices, ensuring both immediate and long-term stewardship of the Township's wetlands.

PUBLIC EDUCATION AND OUTREACH

Public education and outreach should be an ongoing priority throughout the year to raise awareness about invasive species and promote early detection and rapid response. Invasive species can spread year-round through various means, including recreation and travel. By informing the public about simple actions they can take to prevent the spread of these species and how to report sightings, Seguin Township can enhance its management efforts and foster greater community participation. Figure 7 outlines best practices for the public to help reduce the spread of invasive species. For further details pertaining to individual invasive species, visit the Ontario Invasive Species Action Plans[10].

[10] Government of Ontario. (2021, October 14). *Invasive species action plans*. Government of Ontario. https://www.ontario.ca/page/invasive-species-action-plans

STOP THE SPREAD

HERE'S HOW YOU CAN STOP THE SPREAD OF INVASIVE SPECIES

Fishers & Anglers

- Know the rules and regulations
- Know the area you are fishing in
- Never dump your bait into the water or on the ice
- Rinse out your livewell before traveling to a new body of water
- Report invasive species sightings

Boaters & Paddlers

- Follow the clean, drain and dry method to clean your boat and gear
- Avoid boating/paddling through aquatic vegetation
- Know the rules and regulations
- Report invasive species sightings

Cottagers and Campers

- Use local firewood
- Clean your gear before heading to or from the cottage
- Groom your pets before heading to or from the cottage
- Never release pets
- Report invasive species sightings

Gardeners

- Garden responsibly, sourcing plants and materials locally
- Know how to identify invasive species to prevent planting them
- Dispose of invasive plants carefully and appropriately
- Do not compost invasive species
- Report invasive species sightings

Hikers

- Stay on the path
- Clean your gear at the end of your hike, especially hiking boots
- Groom your pets before leaving the area
- Report invasive species sightings

To learn more: https://www.ontario.ca/page/invasive-species-action-plans

Figure 7. Best practices for the public to aid in the prevention of spreading invasive species.

Engaging the public through workshops and community invasive species removal events is crucial for fostering awareness and action. Workshops educate participants on how to identify invasive species, report sightings, and implement proper removal and disposal techniques. These events also offer guidance on who to contact for further assistance. Community events provide hands-on experience, allowing volunteers to actively contribute to controlling invasive species. Refer to **APPENDIX D** for an example of a community event that was held in 2024 to manage Phragmites. The more people involved, the greater the collective impact on management efforts. Through these experiences, participants gain a deeper understanding of the importance of prevention and early detection, promoting a sense of community responsibility in the fight against invasive species.

Social media, newsletters, and signage are also essential tools for spreading information and increasing awareness. Social media platforms allow for the sharing of engaging content, including species identification tips, removal strategies, and local event highlights. Community newsletters can feature expert articles, offer actionable advice, and foster a sense of shared responsibility. Signage in parks, trails, and/or public areas provides clear, visually engaging information for identifying invasive species. These resources empower community members to recognize, prevent, and manage invasive species effectively.

To enhance public awareness, accessible resources should be provided on the Township website, linking to additional informative platforms. Key tools include species identification guides and reporting resources, which enable the public to recognize invasive species on both private and public lands, and know how to report them. Refer to **APPENDIX E** for an example of an invasive species Identification and Reporting Poster. Accurate distribution maps, created through public reporting, are critical for effective management and early detection. Early detection is especially important, as it allows for timely and cost-effective control measures before infestations become widespread and difficult to manage. To facilitate reporting, the Township website and communication products should include links or QR codes to reporting platforms like EDDMapS and iNaturalist, which are easily publicly accessible via mobile apps or desktop browsers. Additional resources, such as current BMP's and invasive species management plans, should be made available to the public.

PARTNERSHIPS AND COLLABORATION

Partnerships and collaboration are essential for the effective management of invasive species, as they bring together diverse expertise, resources, and perspectives to strengthen strategic decision-making and impact. Involving a range of stakeholders—including government agencies, non-profit organizations, researchers, and local communities—facilitates the sharing of knowledge and best practices. Existing regional partnerships in Seguin Township, such as the Integrated Community Energy and Climate Action Plans (ICECAP), may be leveraged to bring together members of leadership and experts to collaborate on invasive species management. This collaborative approach fosters a comprehensive understanding of invasive species dynamics and management techniques, enabling a more informed, effective, and unified response.

As noted above, current ongoing partnerships between GenE and GBF have already proven valuable. For example, GenE offers consultation on BMP's, grant writing, and ecological concerns. GBF has significant experience managing invasive Phragmites, and provides important in-kind support through expertise. These collaborations allow for the pooling of resources, leading to more efficient and sustainable monitoring, control, and restoration efforts. For more information regarding future funding opportunities that support this collaborative approach to invasive plant management, refer to **APPENDIX F**.

Private landowners are also essential partners in Seguin Township's invasive species management efforts, with private property permissions often being a crucial component of invasive plant management. For example, private lands represented nearly half of the area managed by the Phragmites project in 2024 and the success of the initiative depends on the continued support and engagement of landowners. Moving forward, it is crucial to continue nurturing these relationships to ensure ongoing collaboration. To sustain these partnerships, it is important to maintain clear communication, receive written consent to access properties, and respect landowners' preferences regarding access and notice. Transparency in communication fosters mutual understanding and builds trust, ensuring the continued success of invasive species management and the protection of the local environment.

It is essential to engage with local First Nations, such as Wasauksing First Nation and Shawanaga First Nation, at the start of an invasive species management project to gather feedback and braid Indigenous Knowledges and western science

perspectives. Collaborating with Indigenous communities enriches the collective understanding of local ecosystems and First Nation historical relationships with the land. This partnership also helps preserve culturally significant species and practices, ensuring a holistic approach to invasive species management.

Looking ahead, fostering partnerships with ratepayer associations will be crucial for large-scale invasive species management. Involving ratepayer associations will help expand the inventory of invasive species, as community members can report sightings and manage invasive species on their properties using accessible resources. This involvement not only raises awareness but also empowers residents to act in preventing the spread of invasive species.

Lastly, collaboration with neighboring municipalities will enable a coordinated effort to manage invasive species across broader geographic areas. By working together, these partnerships will strengthen resilience against future invasions from nearby areas, promote biodiversity conservation, and ensure that management strategies are culturally relevant and widely supported. By working together, the collective capacity to protect and restore Seguin Township's ecosystems will be strengthened, benefiting both the environment and the community.

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APPENDIX A

DUCKS UNLIMITED CANADA (2024) FREQUENTLY ASKED QUESTIONS: PHRAGMITES BIOLOGICAL CONTROL PILOT-PROGRAM IN ONTARIO

1. Will the biological control agents feed on non-target plants?

No, these biological control agents will not feed on non-target plants. They have undergone extensive testing to evaluate their host specificity, being exposed to a wide variety of similar plants and those of significant economic or cultural importance. This rigorous testing has confirmed that they will only develop on invasive Phragmites. In fact, research into biological control agents for invasive Phragmites has been ongoing for over a decade, ensuring their safety and effectiveness.

2. Will the biological control agents evolve to feed on other plants or will their population grow to out of control levels?

No, the biological control agents are evolved to feed only on invasive Phragmites, as demonstrated by rigorous host specificity testing. There is no scientific evidence to suggest that these agents, or any other species, could quickly adapt to target other plants, whether invasive, non-native, or native. Additionally, their populations are naturally regulated by the same factors that affect all native species, including food supply, competition, climate constraints, and predation. This ensures that their populations remain in check and do not grow to unsustainable levels.

3. Will these biological control agents threaten or damage native phragmites?

No. the host specificity testing results indicated that these biological control agents have a strong preference for laying their eggs on invasive Phragmites rather than the native species. Any eggs that were laid on native phragmites had very low survival rates as the native Phragmites stems are too thin to support their life cycle. As well the native Phragmites generally sheds its leaves during the winter exposing and killing the eggs laid there.

APPENDIX B

SEGUIN TOWNSHIP'S STRATEGIC PROCESS FOR PHRAGMITES MANAGEMENT

2024 Enhancing Wetlands in Seguin Township

In 2024, funded by the Ministry of the Environment, Conservation and Parks (MECP) through the Wetland Conservation Partner Program (WCPP), Generations Effect (GenE), the social enterprise division of GBB, was retained by Seguin Township to undertake a comprehensive Phragmites Management Project. This project involved the identification, mapping, and manual removal of invasive Phragmites and purple loosestrife within local wetlands.

Key project highlights:

- **Phragmites Identification and Tracking:** Over 35 Phragmites patches were identified and mapped, with nearly half located within wetlands. Documentation, treatment, and monitoring were conducted using the EDDMapS reporting and tracking system.
- **Management Techniques:** The project employed best practices, including the cut-to-drown technique using cane cutters, shovels, and hedge trimmers.
- **Disposal Methods:** Biomass was disposed of on-site where possible; otherwise, biomass was bagged and disposed of at the landfill.
- **Results:** A total of 3,550 kg of invasive plants were removed across 13 sites, 10 of which were completely cut (the remaining 3 were partially cut and require follow-up cuts in 2025). This effort involved collaboration between Seguin Township, GenE, and GBB staff. Of the completed 10 sites, post-cut monitoring revealed minor to moderate regrowth at 7 of the sites, while the 8th site showed no regrowth. The remaining 2 completed sites were managed by Seguin Township; post-treatment monitoring results are forthcoming.

Given that complete eradication requires consistent cutting for 5-7 years, this project highlights the value of ongoing, dedicated management. For a detailed summary of the project process and outcomes, please see the 2024 End of Season Report in **APPENDIX B**.

PHRAGMITES MANAGEMENT RATIONALE

Enhancing Wetlands in Seguin Township was a year-long project that launched the Township's Invasive Plant Management Plan, focusing on the conservation, restoration, and improvement of local wetlands. In partnership with GenE, Seguin successfully applied for a grant from the Wetlands Conservation Partnership Program (WCPP) under the Ministry of Environment, Conservation and Parks (MECP). This initiative was vital as wetlands offer significant ecological goods and services, providing critical environmental, economic, and social benefits. These benefits include enhancing water quality, mitigating stormwater impacts, increasing resilience to climate change, reducing flood risks, and preserving habitats for endangered species. Moreover, healthy wetlands enhance recreational and tourism opportunities, benefiting the well-being of Ontarians, while also holding cultural significance for Indigenous communities through sources of food and medicine.

Phragmites is a major threat to regional wetlands because it out-competes native vegetation such as cattails, bulrushes and many other organisms. Its proliferation not only reduces habitats for wildlife, including species at risk like the Massasauga rattlesnake and Blanding's turtle, but also alters ecosystem hydrology by depleting water levels faster than native plants. Recognizing the detrimental effects of Phragmites, Seguin took proactive measures to manage this invasive species to meet their wetland enhancement goals.

With funding secured, Seguin and partners established a clear timeline and researched best management practices. The team conducted a comprehensive inventory and mapping of Phragmites in the Township, developed a prioritization tool, and finalized a management plan. Implementation involved acquiring necessary equipment, scouting impacted wetlands, raising awareness through training workshops for Township staff and the public, and conducting management activities. Practical management activities included cutting Phragmites and monitoring the wetlands to assess the effectiveness of their management efforts.

This project laid the foundation for Seguin Township's Invasive Plant Management Plan.

MANAGEMENT

Effective Phragmites management relies on selecting appropriate control methods based on environmental conditions, management objectives, and available

resources. Due to Phragmites' extensive rhizome system, using multiple control methods in combination often yields the best results.

MECHANICAL

Selective cutting or spading is the most effective control method where chemical treatments are not advisable[11]. This approach minimizes disruption to surrounding habitats and reduces Phragmites' ability to regenerate. The technique for mechanical removal varies slightly in terrestrial and aquatic environments, as detailed below in Table 1.

Table 1. Mechanical controls for Phragmites in terrestrial and aquatic environments.

Terrestrial Environments	• **Tools:** Manually cut Phragmites stalks with a serrated spade or sharpened shovel. • **Technique:** Stems should be cut at a 45-degree angle just below the soil surface, at the stem-rhizome junction. Avoid pulling up the rhizomes. If seed heads are present, they will need to be cut off and placed into a garbage bag first (before the stalk is cut) so as to prevent further spread. All cut biomass must be removed from the site to prevent further spread. • **Timing:** Optimal between July and September, when plants are at peak height. Repeating cuts throughout the season and over multiple years may be required for sustained control. • **Site Suitability:** Best for small, less dense sites mixed with native vegetation; avoids excessive disruption. Effective only in soils that allow shovel penetration (not rocky or very hard). • **Impact:** This method depletes the plant's energy by reducing its ability to photosynthesize.
Aquatic Environments	• **Tools:** For small infestations, use handheld tools like raspberry cane cutters, shovels, or hedge trimmers (only in Phragmites monocultures to avoid harming native plants). Larger infestations may require amphibious cutting vehicles and boats for efficient removal.

[11] Nichols, G. (2024, September). *Invasive Phragmites (Phragmites australis) Best Management Practices in Ontario: Improving species at risk habitat through the management of Invasive Phragmites*. Ontario Invasive Plant Council. https://www.ontarioinvasiveplants.ca/wp-content/uploads/2024/02/OIPC_BMP_Phragmites_Feb212024_D13_WEB.pdf

	• **Technique:** Cut Phragmites stalks as far below the waterline as possible to drown the plant, cutting off its oxygen supply. In water depths over 30 cm, cutting low enough helps block new shoots from reaching the surface. All cut biomass must be removed from the water to prevent further spread. Note - if seed heads are present, they will need to be cut off and placed into a garbage bag first (before the stalk is cut) so as to prevent further spread. • **Timing:** Ideal between mid-July and mid-August, before flowering. Repeating cuts throughout the season and over multiple years may be required for sustained control. • **Site Suitability**: Suitable for both small and large infestations. Works best in areas where water depth consistently exceeds 30 cm, aiding the drowning effect. • **Impact:** This method inhibits regrowth by preventing the plant from accessing oxygen, effectively reducing its spread.

Warning: Cut stalks can pose a hazard due to their sharp edges. Please wear appropriate footwear and exercise caution when navigating through areas that have been cut.

While handheld tools are accessible and cost-effective, they can be labor-intensive and less practical for large, dense stands. In contrast, amphibious vehicles provide greater efficiency for managing larger infestations, though they come at a higher cost and require experienced operators. For example, the Invasive Phragmites Control Centre purchased an amphibious vehicle, Truxor DM5000, that has been used for Phragmites management across Ontario[12]. This machine is equipped with specialized tools to cut, remove, and manage dense stands of invasive Phragmites, allowing for effective vegetation control in areas that are otherwise difficult to access.

Consideration must be given to native vegetation, fish, and wildlife during management activities in both terrestrial and aquatic environments. All work should comply with relevant legislation, such as the *Migratory Birds Convention Act, 1994*, the *Fisheries Act*, and the *Species At Risk Act*, to minimize disruption in sensitive habitats. Furthermore, it is essential to monitor and assess potential changes in

[12] Great Lakes Commission. (2017, September 6). Amphibious vehicle cutting phragmites below the waterline in Ontario. Great Lakes Phragmites Collaborative. https://www.greatlakesphragmites.net/blog/amphibious-vehicle-cutting-phragmites-below-the-waterline-in-ontario/

water flow and wave action following the removal of large stands to mitigate impacts such as shoreline erosion.

CHEMICAL

Herbicide application may not always be the most suitable control method for managing Phragmites, as it can pose risks to the environment and wildlife. However, in certain situations, it can help mitigate the broader environmental impacts caused by Phragmites. Combining herbicide applications with other management practices, such as mechanical control, is recommended to reduce dead standing stems, promote native vegetation regeneration, and enhance overall management effectiveness.

It is essential to obtain all necessary permits and adhere to regulations when using herbicides. In Ontario, herbicide sale, storage, use, and transport are regulated under the *Pesticides Act and Regulation 63/09* (1990), as well as the federal *Pest Control Products Ac*t. To ensure you have the most current label, and that the product is registered, consult the PMRA's pesticide label search tool, which can be found by searching "PMRA label search" in any major search engine. Always read the entirety of, and adhere to the label and directions as per federal legislation, and verify that Phragmites is listed on the product label before use.

Timing and application methods are also crucial for maximizing effectiveness while minimizing risks to non-target species. Applications should occur in late summer to fall, coinciding with reduced wildlife activity and dormancy of native vegetation. Herbicides should only be applied when air temperatures are between 4°C and 25°C to ensure optimal plant metabolism and herbicide uptake. Spraying is the only approved chemical application method for managing Phragmites, as glyphosate and imazapyr are not approved for hand wicking, wiping, or daubing on the pesticide label. It is vital to monitor wind and weather conditions to protect non-target and native species during application, as well as yourself and others. Avoid breaking stems during treatment, as this disrupts the herbicide's movement from the leaves to the roots.

For smaller stands of phragmites, backpack sprayers work well for application. For larger stands, high-pressure sprayers are recommended. These can be mounted on all-terrain vehicles or equipped with booms, allowing application from above ensuring complete coverage of the entire patch. Herbicides should be applied to the leaves of the plant. The plants should be approximately 1.5 meters in height and have

sufficient leaf surface area for the herbicide application to be effective. Do not break stems during or immediately after treatment, as this would prevent the herbicide from reaching the rhizomes.

See Table 2 below for more details on chemical controls for Phragmites in both terrestrial and aquatic environments.

Table 2. Chemical controls for Phragmites in terrestrial and aquatic environments.

Terrestrial Environments	• **Active Ingredients:** Glyphosate and imazapyr are the two registered active ingredients in Canada for Phragmites management. • **Effectiveness:** Imazapyr is more effective than glyphosate but is less cost-effective. Alternating between these can mitigate resistance risk. • **Timing for Cutting:** Allow a minimum of three weeks after herbicide application before cutting or burning treated plants. Follow-up applications may be necessary after one year. • **Application Restrictions:** Glyphosate is prohibited over open water and should only be used in non-aquatic areas without surface water. Only one imazapyr-based product, Habitat Aqua (PCPA Registration No. 32374), is allowed near water. See Herbicide Application in Aquatic Environments below for more details.
Aquatic Environments	• **Active Ingredients:** Habitat Aqua (PCPA Registration No. 32374) is the only registered imazapyr-based product for aquatic environments (since 2021). Glyphosate remains prohibited over open water. • **Timing for Cutting:** Allow a minimum of three weeks after herbicide application before cutting or burning treated plants. Follow-up applications may be necessary after one year. • **Application Restrictions:** Habitat Aqua should not be applied directly to water surfaces or in fast-moving water, as this may transport the herbicide beyond the intended treatment area. Applications should target emergent plants in slow-moving bodies of water while traveling upstream. Always consult the product label for recommended buffer zones, concentrations, application directions, and equipment.

BIOLOGICAL

Invasive species often reach problematic population levels due to a lack of natural predators in their introduced environments, and biological control methods can help address this issue. Research has identified two stem-boring noctuid moths, *Archanara neurica* and *Lenisa geminipuncta* (formerly *A. geminipuncta*), as potential biological controls for *Phragmites australis*[13]. In 2019, the Canadian Food Inspection Agency (CFIA) approved the release of these moths. Subsequently, Agriculture and Agri-Food Canada (AAFC), the University of Toronto, and Ducks Unlimited Canada, in collaboration with the Centre for Agriculture and Bioscience International in Switzerland, launched a pilot-scale biological control program targeting invasive Phragmites in Southern Ontario.

The moths were introduced to Phragmites stands in 2019 using plastic cups with mesh bottoms. This setup allowed hatched larvae to escape while protecting the eggs from predators[14]. Since then, around 30,000 larvae have been released across sites from Essex County to North Bay and Ottawa[13].

Monitoring by the University of Toronto and AAFC has documented stem damage caused by larval feeding, observed as boreholes that lead to chlorosis and necrosis above the feeding sites. Observations indicate that the released larvae have reproduced in these stands, with subsequent generations causing further feeding damage, demonstrating the release method's effectiveness. Additionally, the moths have shown an ability to overwinter in Canadian climates and disperse locally within release sites[14]. Although this biological control does not eradicate Phragmites, it effectively contains the stands and prevents further spread.

The next phase of the pilot program will establish “nurse sites” to support sustainable moth populations. This approach will enable the collection of larvae for distribution to additional Phragmites stands throughout Ontario, transitioning the project from a pilot phase to a broader landscape-level initiative[13].
Ongoing research and monitoring of this biological control program demonstrate promising results in managing invasive Phragmites across Southern Ontario. There

[13] Ducks Unlimited Canada. (2024, April 26). *Biological control - Frequently asked questions*. https://www.ducks.ca/places/ontario/biocontrol-in-ontario/phragmites-biocontrol-progress/

[14] McTavish, M. J., Jones, I. M., Häfliger, P., Smith, S. M., & Bourchier., R. S. (2023). Field tests of egg and larval release methods of biological control agents (Archanara neurica, Lenisa geminipuncta) for introduced phragmites australis australis (cav.) trin. Ex Steud. *Biological control*, *188*, 105414. https://doi.org/10.1016/j.biocontrol.2023.105414

are currently no release sites within Seguin Township; however, the pilot-project has plans to close this gap in the future, with the nearest release site planned for 2025 in Sundridge, ON. Given the observed success in reproduction and increased feeding damage to Phragmites, implementing biological control methods in Seguin Township could be beneficial. Prior to introducing release sites in Seguin and/or the region, consultation with community members, local First Nations, and other stakeholders is strongly recommended. For answers to frequently asked questions regarding this biological control, please refer to **APPENDIX C**.

DISPOSAL

The proper disposal of Phragmites is key to effective prevention, control and management. Before handling and disposing of this invasive plant, consider the following:

- **Herbicide Residue:** Phragmites can retain herbicide in its leaves for up to 27 days after application. Dispose of treated plants carefully to protect people, wildlife, and surrounding areas. Ensure animals do not consume treated plants, prevent chemicals from entering water bodies, and use appropriate personal protective equipment (PPE).
- **Transport Precautions:** When transporting Phragmites, secure and cover the load to prevent fragments, particularly seed heads, from dispersing during transit.
- **Landfill Acceptance:** Seguin Township allows for disposal of invasive plants at the Christie Waste Transfer and Landfill Site. The disposal area is monitored by landfill staff to prevent regrowth.
- **Legal Compliance:** Review federal, provincial, and local regulations on the disposal, transportation, or handling of invasive species to ensure compliance.

Disposal methods vary based on location, conditions, resources, and local regulations. Refer to Table 3 below for specific options.

Table 3. Methods of disposal for Phragmites biomass in Seguin Township.

On-site Disposal	• Effective under specific conditions to prevent spread/regrowth:
	  ○ Place biomass in a dry, elevated location, away from water sources, ensuring full sunlight exposure for drying.
	  ○ Avoid placing biomass in areas with soil or native vegetation to prevent Phragmites spread.

	○ Conduct periodic checks on the biomass to ensure it is not re-growing. • Only use when seed heads are absent; if present, cut off and place in sealed garbage bags, following the below protocol for bagging biomass.
Bagging	• Suitable for smaller quantities of biomass: ○ Use thick, industrial-grade bags or tarps to wrap stems, sealing tightly to prevent spread. ○ Any seed heads should be placed in a sealed black garbage bag. ○ Leave bags/tarps in sunlight until biomass decays fully, which typically takes around 3 weeks, depending on environmental conditions. See Figure 1 below for the appearance of decayed Phragmites biomass. ○ Once decomposed, dispose by burning or at a landfill approved for invasive species.
Burning	• Effective but requires adherence to local regulations and safety measures: ○ Only burn stalks when green, in a controlled space (e.g., fire pit or burning barrel). ○ Keep fire away from native plants and flammable materials. ○ Seed heads should be cut and bagged for decay, after which they can be burned or taken to an approved landfill. ○ Always check with local authorities on burning rules and landfill disposal capabilities.

Figure 1. Dried, decayed biomass that was wrapped in boat shrink-wrap and left to sit in the sun for 3 weeks.

POST-CUT MONITORING

To effectively manage Phragmites over the long term, it is essential to conduct periodic monitoring to assess stand density, regrowth rates, and distribution across impacted areas. Monitoring should focus on key metrics such as plant height, stand size, and stand density. It is crucial to document environmental conditions, such as water levels as these can influence Phragmites growth. The data collected should guide management techniques and track the ultimate impact of these actions on the ecosystem over time.

RESTORATION

Revegetating and restoring sites with competitive native plants can increase resilience against future invasions by Phragmites and other invasive species. Research into the use of native grasses, forbes, and woody plants shows promising results in suppressing Phragmites spread and seed germination.

Restoration efforts not only help prevent Phragmites from re-establishing, but also protect the soil from additional invasives, and begin to reverse ecological impacts. Studies by the Ontario Ministry of Transportation (MTO), McMaster University, and practitioners in Ontario and the U.S. have identified several native species effective in inhibiting Phragmites[11], including:

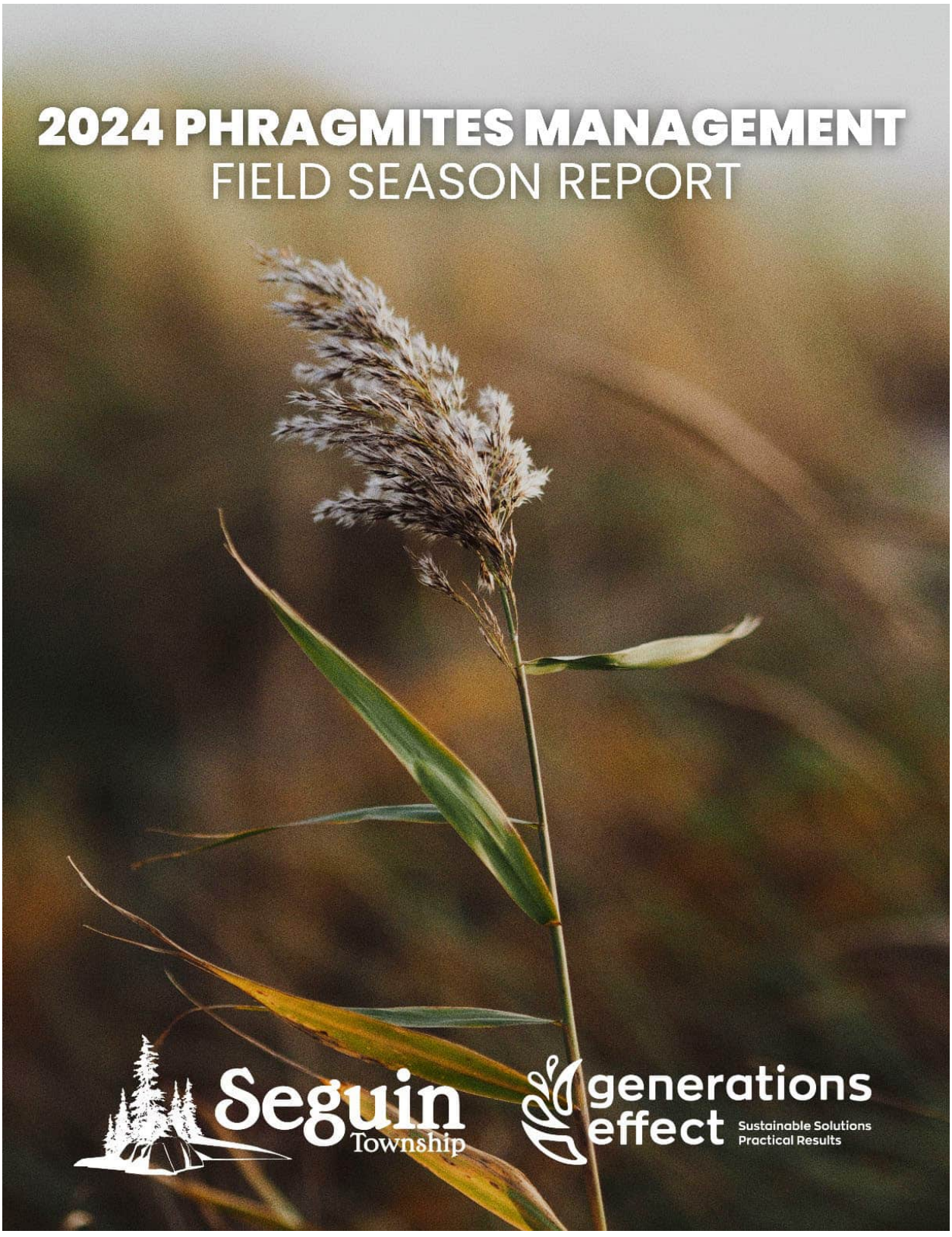
- Big bluestem (*Andropogon gerardii*);
- Yellow indiangrass (*Sorghastrum nutans*);
- Switchgrass (*Panicum virgatum*);
- Prairie cordgrass (*Sporobolus michauxianus*);
- Fox sedge (*Carex vulpinoidea*);
- Other various sedges and flowering forbes.

For successful restoration, it is crucial to first remove all Phragmites biomass. In sites located near established native plant communities, reseeding and/or planting may be unnecessary or minimal, as these areas may naturally revegetate. However, in more disturbed areas, particularly those dominated by dense Phragmites monocultures, extensive restoration efforts will likely be needed to promote the establishment of native plants. Plants should be carefully selected and tailored to the specific environmental conditions of the site.

APPENDIX C

2024 PHRAGMITES MANAGEMENT FIELD SEASON REPORT

(Report starts on the following page)


2024 PHRAGMITES MANAGEMENT
FIELD SEASON REPORT
Seguin Township
generations effect
Sustainable Solutions
Practical Results

ABOUT US

GenE staff removing Phragmites with long-reach hedge trimmers.

GenE and Seguin staff removing Phragmites from a wetland.

Seguin Township and GBB have a history of collaborating on climate action, species at risk, habitat stewardship, and water quality projects. Building on this relationship, Seguin Township retained GenE to lead a pilot Phragmites management project focused on restoring wetland habitats.

Generations Effect (GenE) is a social enterprise rooted in the Georgian Bay Mnidoo Gamii Biosphere (GBB). We provide consulting and technical services that advance ecological, social and economic well-being, ensuring that we work to maximize benefits to society and ecosystems and giving back to community. We reinvest our profits into initiatives and projects in the Georgian Bay Mnidoo Gamii Biosphere Region.

Our approach is to bring people and ideas together. Through collaboration we bring ingenuity to complex challenges and develop clear strategies to achieve goals with positive, long term outcomes. We look at each project in the context of achieving sustainable development goals as defined by the United Nations. We know that the decisions we make today will have an effect on future generations, so we strive to solve immediate problems with a view to long-term resilience.

Seguin staff transporting cut Phragmites biomass out of a wetland with a canoe.

generationseffect.com info@generationseffect.com

PROJECT OVERVIEW

A wetland being selectively cut to manage invasive Phragmites.

GenE staff demonstrating how to manually remove Phragmites with cane cutters and serrated-spade shovels in the field.

The *Enhancing Wetlands in Seguin Township* project launched in spring 2024 as a year-long pilot initiative to develop Seguin Township's Invasive Plant Management Plan. The project prioritized the identification, mapping, and manual removal of invasive Phragmites and purple loosestrife from wetland habitats, with an overarching goal of restoring ecosystem function and improving ecosystem services.

GenE and Seguin staff stockpiling and bagging Phragmites biomass.

Funded by the Ministry of the Environment, Conservation and Parks (MECP) through the Wetland Conservation Partner Program (WCPP), this initiative demonstrated how GenE serves the region by addressing environmental challenges with local partners, while upholding the values of the UNESCO-designated Biosphere.

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PROJECT RATIONALE

Wetlands, often referred to as the "kidneys of the landscape," provide essential environmental, economic, and social benefits, including:

- Improving water quality;
- Reducing stormwater impacts and flood risks;
- Enhancing resilience to climate change;
- Supporting recreational and tourism opportunities;
- Providing critical habitats for fish spawning, breeding, and endangered species; and
- Offering ecological and culturally significant goods and services, particularly for Indigenous communities.

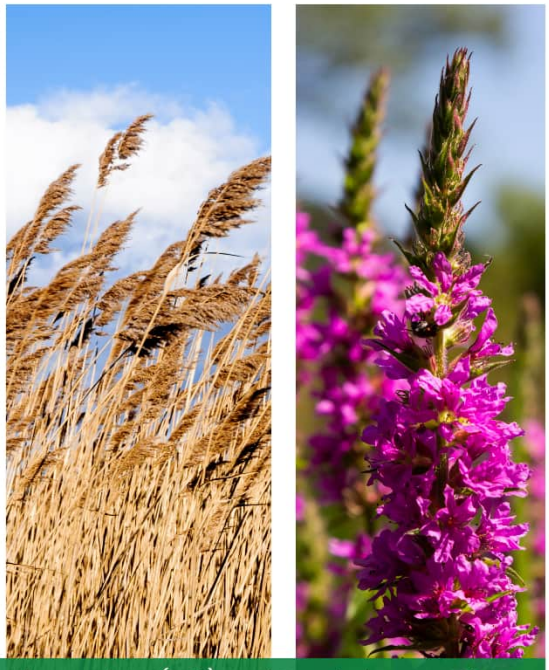
A major threat to wetlands in Seguin Township is the invasive species Phragmites (*Phragmites australis* subsp. *australis*). This aggressive plant displaces native vegetation, such as cattails and bulrushes, which are essential to wetland health. The spread of Phragmites diminishes wildlife habitats—especially for species at risk like the Blanding's Turtle and Massasauga Rattlesnake—alters hydrology by accelerating water depletion, and degrades water quality by disrupting nutrient cycles and the physical structure of wetlands. Additionally, Phragmites negatively impacts recreational activities and poses safety risks for drivers by obstructing sightlines along roads.

Recognizing these threats, Seguin Township initiated measures to control Phragmites and protect its wetlands, focusing on restoring natural heritage systems and supporting biodiversity.

Stand of Phragmites starting to grow in a wetland and displace native vegetation.

METHODS & IMPLEMENTATION

The project focused on controlling invasive Phragmites and purple loosestrife, while simultaneously building local capacity for long-term management through training and collaboration. Following a structured timeline (Table 1), Best Management Practices (BMPs) for Phragmites control were implemented targeting local wetlands. Figure 1 provides a summary of the scouting efforts conducted in May and June of 2024, with a more thorough list of roads and trails scouted provided in Table 2.



Phragmites (left) and Purple loosestrife (right).

Table 1. *Enhancing Wetlands in Seguin Township 2024 project timeline.*

Timing	Project Activity
May - June	Conducted Phragmites scouting surveys. Updated the Phragmites distribution map. Engaged with local First Nations. Hosted a Phragmites Identification and Removal Training workshop with staff and community. Purchased equipment.
June - September	Updated reporting and verified priority sites for removal. Started drafting the Invasive Plant Management Plan. Managed, controlled, and disposed of Phragmites and purple loosestrife.
October	Re-visited and monitored treated sites.
October - December	Conducted project reporting. Finalized the Invasive Plant Management Plan.

METHODS & IMPLEMENTATION

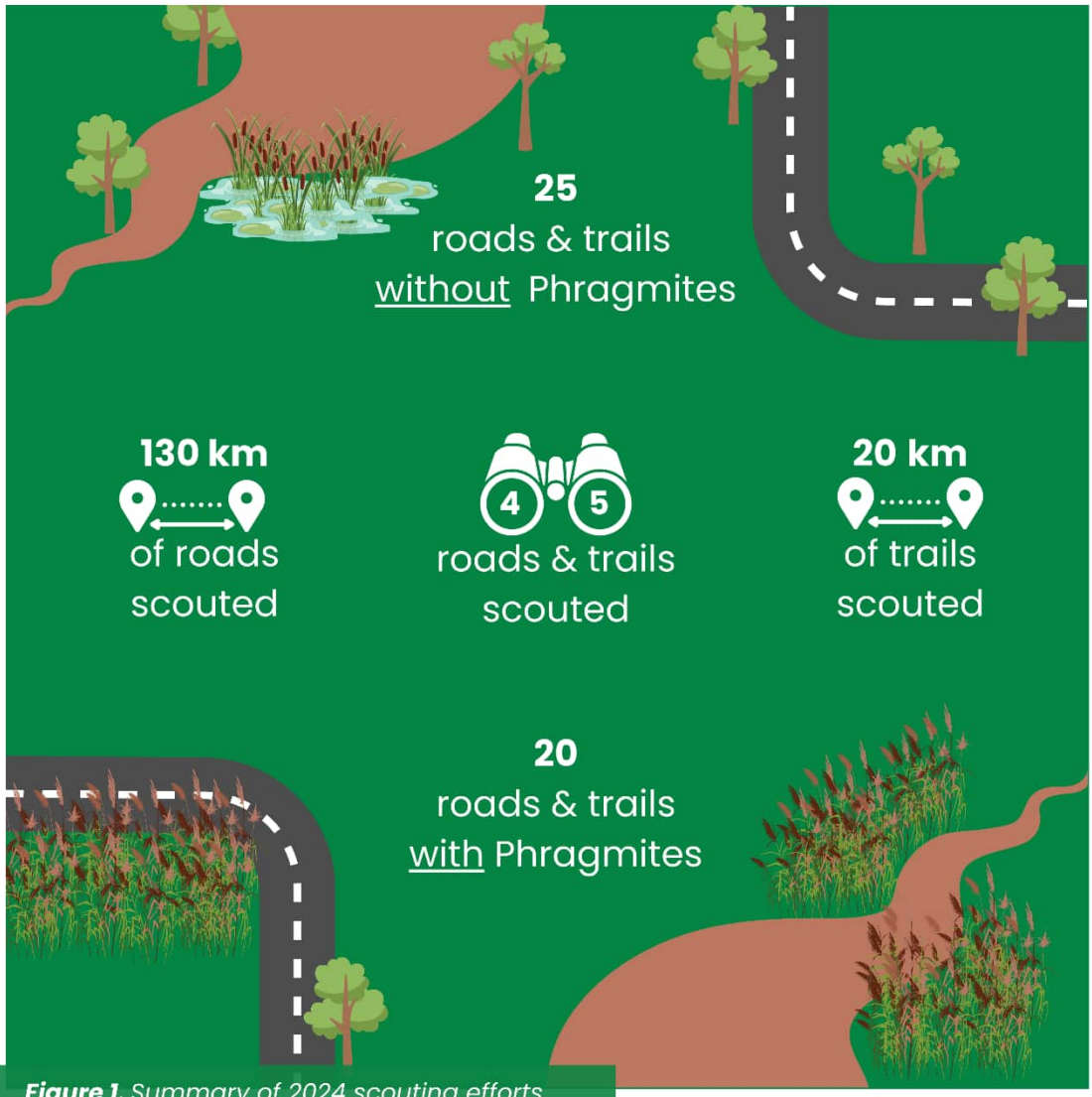


Figure 1. *Summary of 2024 scouting efforts.*

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METHODS & IMPLEMENTATION

Table 2. *Roads and trails scouted in 2024.*

Roads		Trails & Other
• Badger Road • Bartlett Drive • Beechwood Drive • Birdwalk Road • Blue Lake Road • Bradshaw Road • Brooks Road • Burgess Road • Clear Lake Road • Cochrane Lake Road • Deerwood Drive • Elliott House Road • Emily Street • Ferris Road • Garden Court • Goodard Crescent • Horseshoe Lae Road • Hunter Drive • HWY 141 • HWY 518 • HWY 612	• HWY 632 • James Bay Junction Road • Lake Joseph Road • Lawson Crescent • Little Otter Lane • McCauley Road • Otter Lake Road • Rankin Lake Road • Rose Point Road • Salmon Lake Road • Sandy Plains Road • Seguin Place Drive • Stanley House Road • Star Lake Road • Steeles Road • Stoneman Drive • Sugar Lake Road • Tall Timbers Road • Tally Ho Swords Road • Turtle Lake Road	• Horseshoe Lake Boat Launch • Humphrey Barn and Nature Trails • Park-To-Park Trail • Rose Point Trail

METHODS & IMPLEMENTATION

To prioritize sites for Phragmites management, we consulted experts from Georgian Bay Forever, whose extensive experience guided our decision-making process. The following priority ranking system was used to guide site selection:

- **Small, Sparse Sites:** Begin with small, sparse Phragmites sites. These are easier to eradicate when addressed early, preventing them from spreading into larger, more challenging areas.
- **Previously Treated Sites:** Follow up on previously treated sites in order of smallest to largest. Revisiting these areas ensures any remaining Phragmites is effectively controlled, maintaining progress.
- **High-Value Areas:** Prioritize sites supporting species-at-risk (SAR) populations and/or cultural values. These areas require immediate attention to protect ecological integrity and cultural/community access and use.
- **Large, Dense Sites:** Address larger, denser Phragmites sites last. These areas are more resource-intensive and may require additional support, such as volunteers, to manage effectively.

However, challenges in securing private property permissions for smaller, less dense sites required us to adapt our approach. In some cases, this meant adding a few large, dense sites where access was granted. This adaptive management style allows us to make measurable progress despite logistical constraints.

By applying this structured yet flexible approach, we ensured that our Phragmites management efforts remained strategic and impactful, maximizing ecological benefits within the constraints of land access and available resources.

Large, dense, aquatic stand of Phragmites.

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METHODS & IMPLEMENTATION

Key removal methods included mechanical controls, such as selective and clear cutting of invasive Phragmites in aquatic areas. Large, dense stands were clear-cut using long-reach hedge trimmers, while less dense areas were selectively cut to preserve native vegetation, using raspberry cane cutters in aquatic zones or serrated-spade shovels in drier locations. Canoes were employed to access Phragmites stands in high-water areas. Where feasible, plant material was disposed of on-site by leaving it wrapped in a tarp to dry in the sun; otherwise, off-site disposal using a bagging method was carried out by Seguin Public Works, utilizing recycled boat shrink wrap.

Equipment pictured in Figure 2, was utilized throughout the project to effectively manage and control Phragmites, ensuring successful removal and restoration of wetland habitats.

Figure 2. *Equipment used to manage Phragmites.*

METHODS & IMPLEMENTATION

The project utilized the EDDMapS Pro (Early Detection and Distribution Mapping System) app to track and monitor Phragmites stands, enabling an adaptive management approach. Data was recorded in the app at three key stages:

1. **Initial Observation (Spring):** Documented the size, location, and density of Phragmites stands.
2. **Post-Removal (Summer):** Recorded the treatment method and amount of biomass removed following manual removal.
3. **Post-Cut Assessment (Fall):** Evaluated the effectiveness of control efforts by assigning a qualitative regrowth score: no regrowth, minor regrowth, moderate regrowth, or major regrowth.

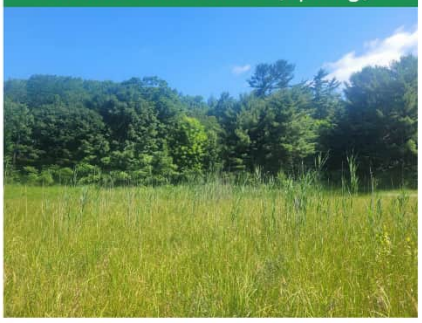
This system provided real-time updates on Phragmites distribution, supported the assessment of spread, and offered valuable insights into the success of control measures. These capabilities ensure informed, data-driven decision-making throughout the project.

EDDMapS Pro for IOS

EDDMapS Pro for Android

EDDMapS find • map • track

Initial Observation (Spring)



Post-Removal (Summer)

Post-Cut Assessment (Fall)

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RESULTS

A total of 13 sites were managed for Phragmites in the 2024 field season (see Figure 3):

- Complete removal of Phragmites from 8 aquatic sites and 1 terrestrial site.
- Complete chemical treatment of Phragmites at 1 terrestrial site (by a third-party contractor hired by Seguin Township).
- Partial removal of Phragmites from an additional 3 aquatic sites.
- Removal of over 3,550 kg of Phragmites biomass, preventing further spread and regrowth.
- Restoration of 29 hectares of wetland habitat, enhancing ecosystem services such as water filtration, flood mitigation, and wildlife support.

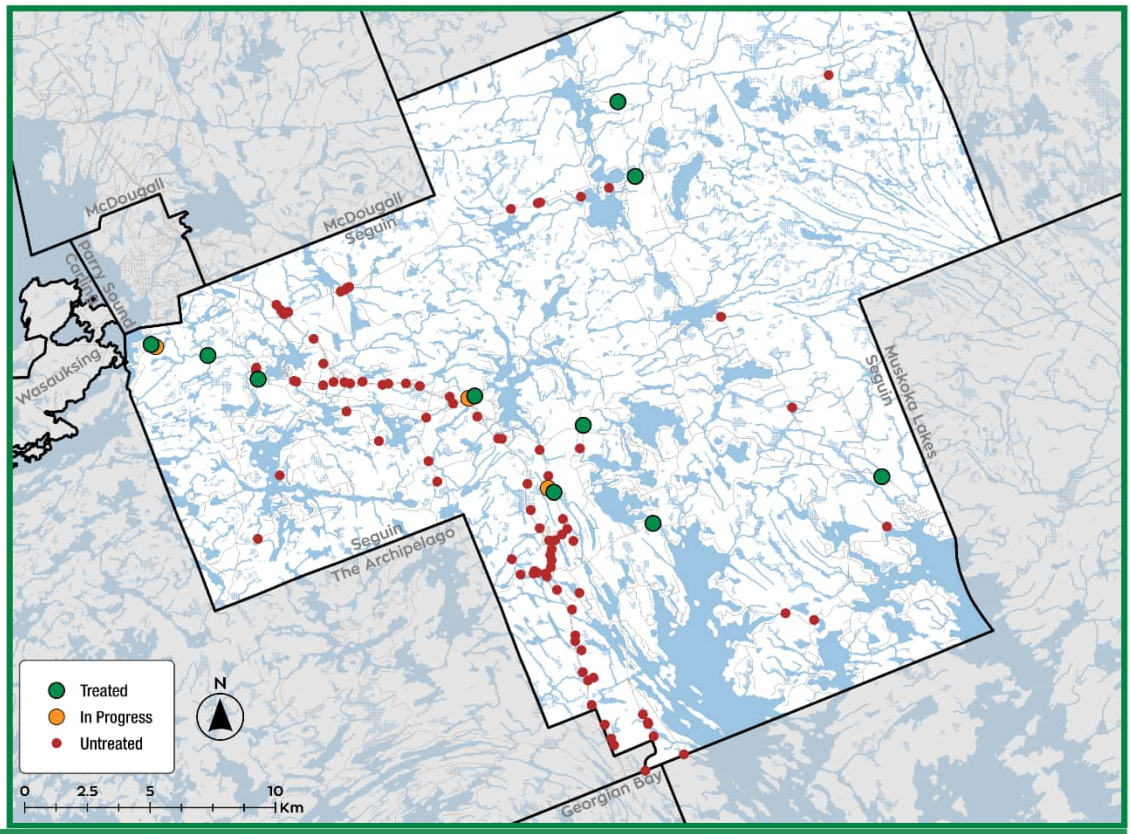

Figure 3. *Locations of complete site treatments (green), partial/in progress site treatments (orange), and untreated sites (red) in Seguin Township.*

RESULTS

Complete Site Treatments

Blackwater Road Site

45°24'24.4"N 79°47'32.7"W

Selective cutting (serrated-spade shovels)

0.013 ha of Phragmites removed

Effectiveness TBD (post-cut monitoring results pending)

Initial observation at Blackwater Road Site.

Clear Lake Road Wetland

45°15'18.7"N 79°46'39.6"W

Selective cutting (cane cutters and serrated-spade shovels)

0.3 ha of Phragmites removed

200 kg of Phragmites removed

Minor regrowth

Initial (left) and post-removal observation (right) at Clear Lake Rd Wetland.

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RESULTS

Horseshoe Lake Road East Wetland

45°18'06.5"N 79°52'01.9"W

Selective cutting (cane cutters and serrated-spade shovels)

0.14 ha of Phragmites removed

220 kg of Phragmites removed

No regrowth

Initial (left) and post-removal observation (right) at Horseshoe Lake Rd E Wetland.

Humphrey Barn and Nature Trails Wetland

45°17'24.9"N 79°48'46.3"W

Selective cutting (cane cutters and serrated-spade shovels)

0.3 ha of Phragmites removed

570 kg of Phragmites removed

Minor regrowth

Initial (left) and post-removal observation (right) at Humphrey Barn and Nature Trails Wetland.

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RESULTS

James Bay Junction Road Wetland

45°18'34.1"N 79°58'40.3"W

Selective cutting (cane cutters)

0.32 ha of Phragmites removed

40 kg of Phragmites removed

Minor regrowth

Initial (left) and post-removal observation (right) at James Bay Junction Road wetland.

Memories of Muskoka East Wetland

45°15'57.0"N 79°49'39.8"W

Selective cutting (cane cutters and serrated-spade shovels)

0.10 ha of Phragmites removed

110 kg of Phragmites removed

Minor regrowth

Initial (left) and post-removal observation (right) of Phragmites at Memories of Muskoka East Wetland.

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RESULTS

Nippissing Road Wetland

45°16'18.1"N 79°39'41.8"W

Selective cutting (serrated-spade shovels)

0.001 ha of Phragmites removed

5 kg of Phragmites removed

Minor regrowth

Initial (left) and post-removal observation (right) at Nippissing Road Wetland.

Orrville Community Centre Site

45°22'46.3"N 79°47'01.0"W

Herbicide spray (Glyphosate-based product)

0.019 ha of Phragmites removed

Effectiveness TBD (post-treatment monitoring results pending)

Initial observation at Orrville Community Centre Site.

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RESULTS

Park-To-Park Wetland

45°19'03.5"N 80°00'10.0"W

Selective cutting (cane cutters and serrated-spade shovels)

0.005 ha of Phragmites removed

10 kg of Phragmites removed

Moderate regrowth

Initial (left) and post-removal observation (right) at Park-To-Park Wetland.

Rose Point Road West Wetland

45°19'17.2"N 80°01'52.8"W

Selective cutting (cane cutters, hedge trimmers and serrated-spade shovels)

0.40 ha of Phragmites removed

700 kg of Phragmites removed

Moderate regrowth

Initial (left) and post-removal observation (right) at Rose Point Road West Wetland.

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RESULTS

Partial Site Treatments

Horseshoe Lake Road West Wetland

45°18'04.2"N 79°52'06.8"W

Selective cutting (cane cutters)

0.28 ha of Phragmites removed

100 kg of Phragmites removed

Moderate regrowth

Initial observation at Horseshoe Lake Road West Wetland.

Memories of Muskoka West Wetland

45°16'06.4"N 79°49'49.4"W

Selective cutting (cane cutters, hedge trimmers, and serrated-spade shovels)

0.10 ha of Phragmites removed

800 kg of Phragmites removed

Minor regrowth

During the removal of Phragmites at Memories of Muskoka West Wetland.

Rose Point Road East Wetland

45°19'17.5"N 80°01'52.2"W

Selective cutting (cane cutters, hedge trimmers, and serrated-spade shovels)

0.40 ha of Phragmites removed

800 kg of Phragmites removed

Moderate regrowth

During the removal of Phragmites at Rose Point Road East Wetland.

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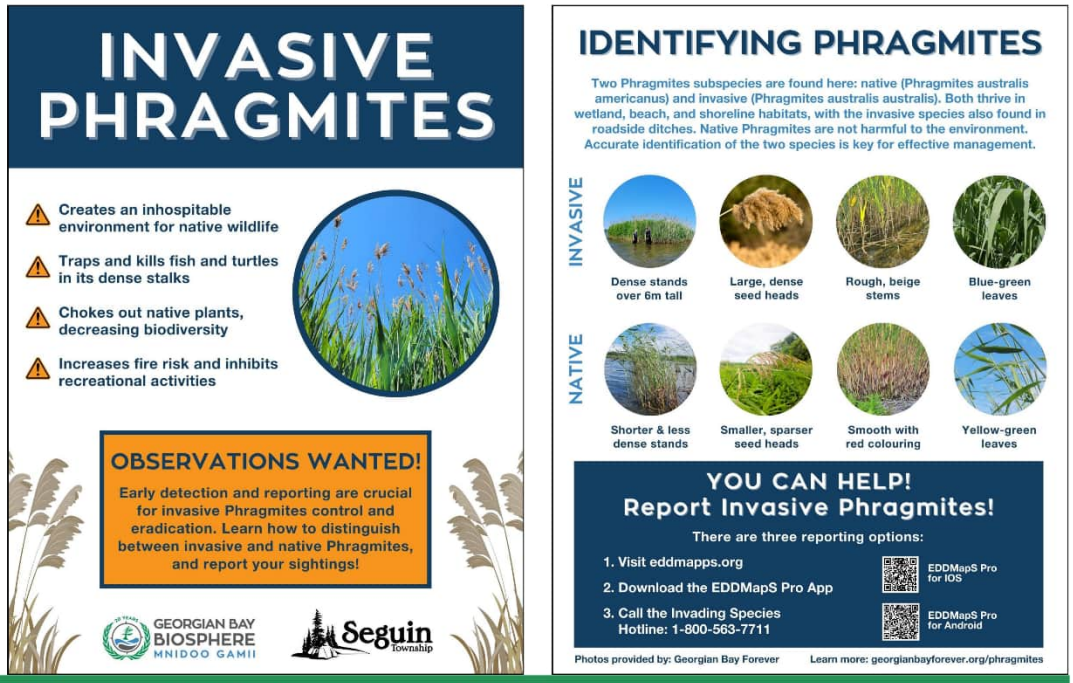
OUTCOMES

PROJECT OUTCOMES

1. Updated inventory of Phragmites stands through the use of reporting tools like iNaturalist and EDDMapS, creating an accessible dataset for future management.
2. Community engagement and education via:
   a. a Phragmites Identification and Reporting poster shared online and at major community hubs;
   b. multiple social media posts engaging the public to identify and report Phragmites; and,
   c. an Invasive Phragmites Identification and Management Workshop attended by over 30 participants.
3. Fostered community collaboration and support by co-hosting a Community Phragmites Cut event, engaging local volunteers in hands-on conservation efforts.
4. Strengthened local capacity for invasive species management, laying the groundwork for long-term stewardship of wetland ecosystems.



Phragmites Identification and Reporting Poster.

RECOMMENDATIONS

To address remaining data gaps in Phragmites observations, it is important to conduct an inventory of Phragmites locations in areas of Seguin Township that were not surveyed in 2024. For next year's field season, it is important to continue monitoring and management of the 10 sites treated during the 2024 field season. Sustained efforts at these sites will further enhance wetland health and ecosystem functionality. Specific recommendations for these sites are provided in Table 3 and 4.

Table 3. *Management recommendations for sites treated in 2024.*

Completed Sites in 2024	
Site	**Management Recommendation**
Blackwater Road Site	Enter site into EDDMapS (patch size, treatment details and post-treatment monitoring results). Continued monitoring and management through selective cutting.
Clear Lake Road Wetland	Continued monitoring and management through selective cutting.
Horseshoe Lake Road East Wetland	Continued monitoring. If monitoring finds regrowth occurring, manage through selective cutting.
Humphrey Barn and Nature Trails Wetland	Continued monitoring and management through selective cutting. AND/OR Explore the professional opinions of licensed herbicide applicators for management of this site with chemical controls.* *NOTE: This wetland has two distinct patches of Phragmites. Herbicide application is more suitable for the drier area along the trail.

RECOMMENDATIONS

James Bay Junction Road Wetland	Continued monitoring and management through selective cutting.
Memories of Muskoka East Wetland	Continued monitoring and management through selective cutting.
Nippissing Road Wetland	Continued monitoring and management through selective cutting.
Orrville Community Centre Site	Continued monitoring and management through chemical control.
Park-To-Park Trail Wetland	Continued monitoring and management through selective cutting.
Rose Point Road West Wetland	Continued monitoring and management through selective cutting.* *NOTE: Due to proximity to Wasauksing First Nation, herbicide application is not recommended.

GenE and GBB staff managing a large, dense patch of Phragmites in a wetland.

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RECOMMENDATIONS

Table 4. *Management recommendation for sites partially treated in 2024.*

Partially Managed Sites in 2024	
Site	**Management Recommendations**
Horseshoe Lake Road West Wetland	Continued monitoring and management through selective cutting.
Memories of Muskoka West Wetland	Continued monitoring. Explore the professional opinions of licensed herbicide applicators for management of this site with chemical controls (imazapyr-based). AND/OR Continued monitoring and management through selective cutting.* *NOTE: This wetland has two very large and dense stands of Phragmites, meaning mechanical control of this site will require a lot of time and human power.
Rose Point Road East Wetland	Continued monitoring and management through selective cutting.* *NOTE: Due to proximity to Wasauksing First Nation, herbicide application is not recommended.

Moving forward, a long-term, adaptive management strategy is recommended to ensure the continued effectiveness of control measures. This approach will allow for ongoing adjustments based on monitoring results and emerging research. By regularly assessing the success of management actions and responding to ecological changes, adaptive management ensures strategies remain relevant and effective. Similarly, an integrated approach to managing future invasive plant species is advised. This would involve collaboration, regular monitoring, and species-specific strategies tailored to the plant's impact.

RECOMMENDATIONS

Phragmites out-competing native vegetation in a wetland.

ADDITIONAL SITES FOR FUTURE MANAGEMENT

If resources allow, additional sites should be added to the priority list. These sites are listed in Table 5 and shown in purple in Figure 4, with an initial recommendation to begin management using the mechanical control method of selective cutting. Regular monitoring after implementing controls will be essential to assess progress and adjust management methods as needed.

Table 5. *Additional sites to prioritize for treatment in future years.*

Site	Location
Haines Lake North Wetland	45°20'27.2"N 79°56'07.9"W
Haines Lake South Wetland	45°20'26.5"N 79°55'58.9"W
Oastler Park Drive Wetland	45°19'13.4"N 79°59'12.0"W
Stanley House Road Wetland	45°13'10.8"N 79°41'48.3"W
Hunter Drive Wetland	45°20'12.4"N 79°58'27.8"W
Lawson Bay Road South Wetland	45°13'36.6"N 79°49'27.4"W

RECOMMENDATIONS

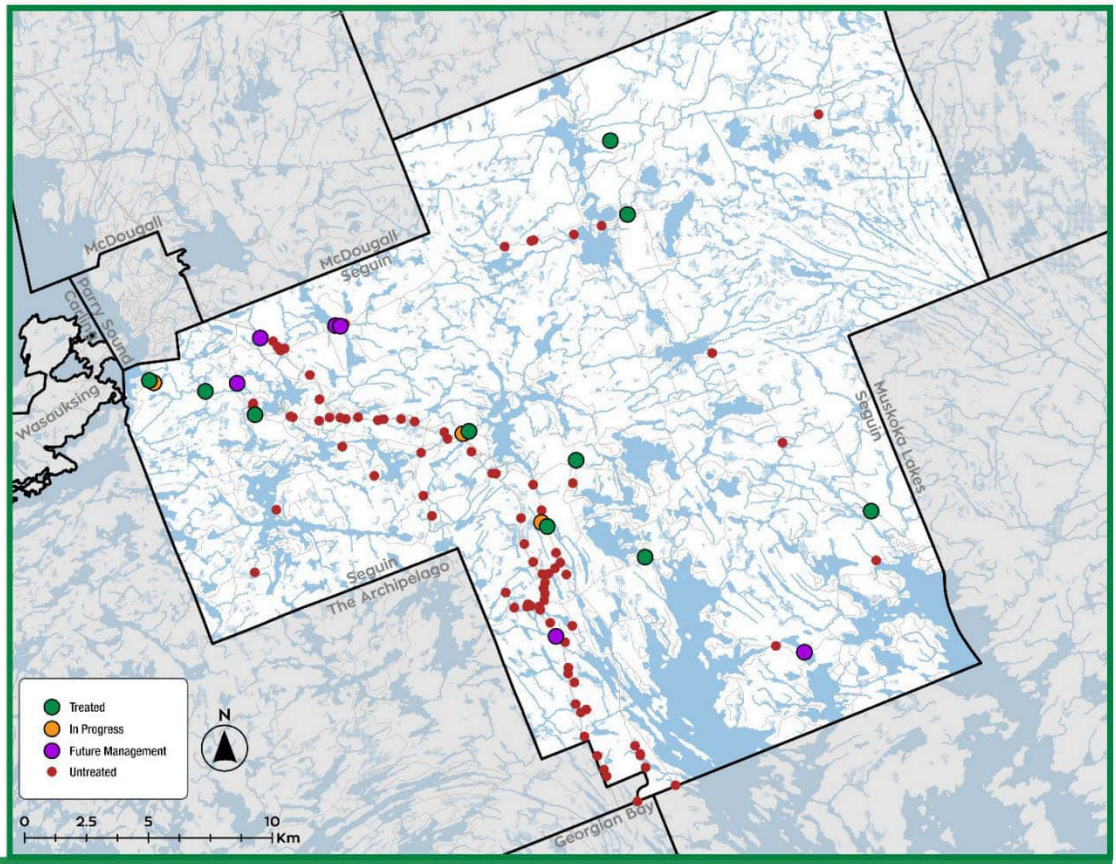

Figure 4. *Locations of complete site treatments (green), partial/in progress site treatments (orange), untreated sites (red), and future management sites (purple) in Seguin Township.*

RECOMMENDATIONS

LOGISTICS AND EQUIPMENT

Additionally, it is important for the Township to plan ahead for disposal options by evaluating the specific sites they intend to manage. This will help determine the amount of reused boat shrink wrap required, ensuring they are well-prepared. Planning also needs to account for the density of vegetation at each site, as areas with significant biomass—such as Phragmites monocultures—will require considerable human effort and time to manage. To improve efficiency and reduce the risk of injury from lifting heavy awkward bundles of biomass, having equipment like a backhoe on-site for loading trucks and trailers will save time and minimize physical strain. By proactively addressing these logistical needs, Seguin Township can ensure an effective, sustainable, and safe management process.

Seguin Public Works and GenE staff loading cut Phragmites biomass into trailer.

RECOMMENDATIONS

Phragmites growing in a wetland.

HEALTH AND SAFETY

Staff working in wetlands with elevated water levels or traversing bog mats must take specific precautions to mitigate health and safety risks. All staff should wear high-visibility clothing, including reflective vests or shirts in poor-visibility conditions such as dense Phragmites stands. Well-fitted, waterproof waders and slip-resistant footwear are essential for preventing falls and maintaining stability on uneven or submerged surfaces. Staff should move slowly, take their time, and remain vigilant for deep areas or sudden drops in the terrain. Staff should be trained in how to safely unfasten their waders in the event that they become trapped or pulled under water. Additionally, wearing personal flotation devices (PFD's) can help mitigate the risk of being pulled or falling below the water's surface. It is critical for staff to work in pairs, stay aware of their surroundings, and communicate regularly. Supervisors and/or Health and Safety Representatives should review their health and safety procedures to ensure they adequately address these types of fieldwork conditions, with a consideration for including a depth-of-water threshold beyond which staff should avoid working in water.

Working along roadways also presents significant health and safety risks, which can be mitigated through proper planning and procedures. All staff should receive thorough training on road safety, covering topics such as identifying danger zones, establishing clear work areas, and maintaining safe distances from traffic. Staff must wear appropriate personal protective equipment (PPE), including high-visibility clothing. Prior to beginning work, traffic control measures should be implemented, such as the use of flaggers, temporary lane closures, reduced speed limits, and barricades or traffic signals to clearly mark the work area. Additionally, effective communication with the public is essential—informing the public about planned work in advance enables them to adjust their routes, helping to reduce traffic volumes around the work site.

APPENDIX D

COMMUNITY PHRAGMITES CUT POSTER

APPENDIX E

PHRAGMITES IDENTIFICATION AND REPORTING POSTER

IDENTIFYING PHRAGMITES

Two Phragmites subspecies are found here: native (Phragmites australis americanus) and invasive (Phragmites australis australis). Both thrive in wetland, beach, and shoreline habitats, with the invasive species also found in roadside ditches. Native Phragmites are not harmful to the environment. Accurate identification of the two species is key for effective management.

INVASIVE

Dense stands over 6m tall

Large, dense seed heads

Rough, beige stems

Blue-green leaves

NATIVE

Shorter & less dense stands

Smaller, sparser seed heads

Smooth with red colouring

Yellow-green leaves

YOU CAN HELP!
Report Invasive Phragmites!

There are three reporting options:

1. Visit eddmapps.org
2. Download the EDDMapS Pro App
3. Call the Invading Species Hotline: 1-800-563-7711

EDDMapS Pro for IOS

EDDMapS Pro for Android

Photos provided by: Georgian Bay Forever

Learn more: georgianbayforever.org/phragmites

APPENDIX F

GRANT FUNDING OPPORTUNITIES

There are several grant opportunities available to support invasive species management efforts, including:

- Green Shovels - Invasive Phragmites Control Fund (20 - 50 projects, ranging from $2,500 to $25,000 with exceptional projects up to $50,000).
- Invasive Species Center - Invasive Species Action Fund (Microgrants up to $2,500, Accelerated Impact funding up to $10,000 and Transformative Action funding ranging from $25,00 to $50,000).
- Fisheries and Oceans Canada's - Aquatic Invasive Species Prevention Fund ($233,000 for projects in Ontario between 2022-2025).

Thank You
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