SOUTHERN ONTARIO SEED STRATEGY

HEALING THE LAND TOGETHER IN PARTNERSHIP WITH NATIVE PLANTS

2024

Carolinian Canada

Acknowledgements

By Amy Hall, Jennifer Nantais, Siobhan Mullally and Sarah Winterton

This report was prepared by Carolinian Canada Coalition in partnership with the Southern Ontario Seed Strategy collective. The native plant sector in southern Ontario hosts extensive knowledge and decades of experience stewarding, growing, and caring for native plants. This strategy would not be possible without the knowledge of all participants and their willingness to share and work together. Thank you to the knowledge holders, growers, producers, seed collectors, restoration ecologists, botanists, business owners, communities, and many more. In particular to Stefan Weber, Tracey Etwell, Carolyn Callaghan, Carole Smith, Kerdo Deer, Dan Werner, Melissa Spearing, Paul LaPorte, Rob Messervey, Kristen Sandvall, Ryan Godfrey, Colleen Cirillo, Andrea D'Silva, Val Deziel, Sam Whiteye, Michelle Kanter, and Pernell Kegadonse. Special thanks to the partners who helped develop the strategy through co-creation, in-kind participation, and support throughout the process.

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Southern Ontario Seed Strategy: Healing the Land Together in Partnership with Native Plants.
A. Hall, J. Nantais, S. Mullally, S. Winterton. 2024. Carolinian Canada Coalition.

Cover photo: Cup Plant, Siobhan Mullally

Dedications

The Southern Ontario Seed Strategy is dedicated to the memories of Terrylynn Brant and Melissa Spearing. We remember the gifts of these two incredible leaders whose dedication to future generations through seed stewardship continues to inspire us.

Terrylynn Brant

Terrylynn Brant was a traditional Mohawk seed keeper from Six Nations of the Grand River. She was deeply committed to revitalizing traditional Mohawk agricultural practices and sharing the wisdom of seed sovereignty. Through her storytelling, teachings, and community engagement, she fostered a profound respect for the land and seeds, emphasizing the importance of reciprocity with the land and each other. Her legacy lives on in the cultural continuity she helped preserve, the people she worked with, and the seeds she planted. We give gratitude to the invaluable knowledge and gifts she shared with all who had the privilege of learning from her.

Melissa Spearing

Melissa Spearing was at the heart of the seed and forestry space in Canada. As a seed biologist for the National Tree Seed Centre, she shared her valuable knowledge and passion for seed and made positive impacts far and wide. We worked with Melissa over the years and are especially grateful for the time we connected with her through the development of the Economy of Hope report and Southern Ontario Seed Strategy. Her contributions to the seed sector, coupled with her outgoing personality and deep love for seeds and plants will be remembered and honoured. She is missed as a valued colleague and friend.

Butterfly Weed. Photo: Michelle Kanter

Executive Summary

The Southern Ontario Seed Strategy (SOSS) is responding directly to recommendations outlined in *The Economy of Hope*[1], the *Ontario Biodiversity Strategy 2023-2030*[2], and the *Near Urban Nature Network: A Solution to Climate Change and Biodiversity Loss*[3], all of which call for a native seed strategy in the region.

The lack of diversity and quantity of native seed is a factor limiting the ecosystem restoration activities of governments, businesses, organizations, communities and individuals across southern Ontario. This means that efforts to mitigate climate impacts and reverse biodiversity loss are less effective and even failing. Native plants are the foundation of a healthy ecosystem and are essential elements of a long-term solution to these issues.

Native plants are valued in the cultural practices of Indigenous Peoples. Indigenous cultures respect native plants as equal beings within creation and honour them as kin. Conversely, colonialism has contributed to extinction events, the climate crisis, and the conversion of the landscape through industry, agriculture, urban development, and other activities. It has systematically denuded the land of many species of native plants, destroyed natural habitat, and added countless exotic plants. To honour the reconciliation process between Peoples means honouring the return of native plants and healing the land.

Over a two-year period, a collective of diverse representatives convened regularly to foster a comprehensive understanding of regional issues, shared goals, opportunities, and needs related to native seed in southern Ontario. The co-created result is the Southern Ontario Seed Strategy (SOSS), which addresses the unique challenges and opportunities to scale a regional native seed supply in the spirit and practice of reconciliation.

The SOSS will help prioritize actions to grow more native plants, grow them better, and support the goals of reconciliation and restoration. It focuses on a coordinated approach to the stewardship and conservation of native plant materials and provides a framework to build an ethical restoration economy through recommendations that address barriers, gaps, and inequities in the sector. Indigenous leadership, knowledge, and community engagement is a priority in this strategy.

The SOSS recommendations aim to increase restoration capacity in southern Ontario and support local, regional, provincial, and national goals for biodiversity and climate resilience.

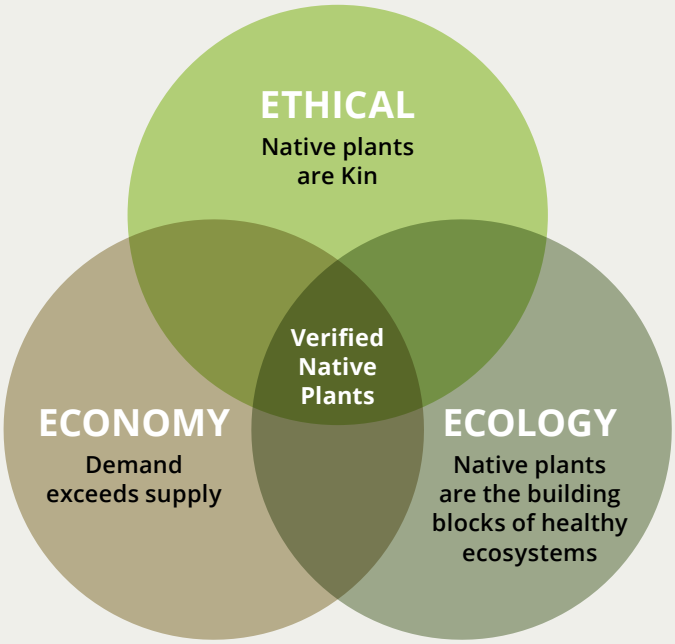
Native plants are the foundation of resilient, sustainable landscapes, offering beauty, stability, and connection to both nature and culture. They evolve in harmony with local ecosystems, playing critical roles in climate, water, soil, and biodiversity. With deep cultural significance, native species link us to traditional food, stories, and ceremonies, while fostering a healthy environment where all beings can thrive. Non-native species, by contrast, often disrupt these natural relationships and undermine biodiversity.

1. Winterton, S., James, V., Mullally, S., Hall, A., Weber, S., and Kanter, M. Carolinian Canada Coalition. (2024). *The Economy of Hope: Growing Healthy Landscapes in the Greater Golden Horseshoe in Partnership with Native Plants*. 2. Ontario Biodiversity Council. (2023). *Ontario's Biodiversity Strategy, 2023-2030*. 3.Southern Ontario Nature Coalition (SONC). (2021). *Near-Urban Nature Network: A Solution to Climate Change and Biodiversity Loss*.

At the intersection of ethics, economy, and the environment, native plants embody cultural heritage, Indigenous Knowledge, and the intrinsic value of local ecosystems. Their preservation supports biodiversity and fosters an ethical restoration economy, ensuring a future where ecosystems and communities can flourish together.

FIGURE 1

Native plants at the intersection of ethics, economy, and ecology



The SOSS aims to scale up the availability of genetically appropriate native seed and connect and support participants in the native plant supply chain, from growing to planting, to accelerate coordinated, respectful action for local, source-identified, climate-adapted, and native seed. Seed conservation and the protection of wild seed sources are a top priority. We must engage in coordinated action, share risks and responsibilities, ensure equitable access, and encourage inclusive participation.

The SOSS is a regional solution to address the crises of biodiversity loss and climate change in southern Ontario. It can be replicated in regions across Canada to support a national native seed strategy and address all five systems in Canada's *National Adaptation Strategy*[4], i.e., building resilient landscapes, supporting human health and well-being, enhancing and protecting biodiversity, providing green infrastructure, and building green economies and jobs. The SOSS is also responding to the global call to action laid out in the United Nations Decade on Ecosystem Restoration[5] and supports the implementation of the Global Biodiversity Framework[6], of which Canada is a signatory.

4. Environment and Climate Change Canada. (2023). *Canada's National Adaptation Strategy: Building Resilient Communities and a Strong Economy*. 5. United Nations Environment Programme. *United Nations Decade on Ecosystem Restoration*. 6. Convention on Biological Diversity. (2022, December 19). *Kunming-Montreal Global Biodiversity Framework*.

AN ETHICAL APPROACH

The SOSS makes recommendations to scale seed supply within an ethical framework by incorporating Indigenous leadership and using a Two-Eyed Seeing lens. Timely action is needed to address the current demand for seed, ensuring that the transition to a native seed supply chain values diversity and is founded on sustainable principles.

Integrating ethical criteria will help identify ways to close gaps in the supply chain to address illegal collection and overharvesting of wild populations, avoid over-reliance on a limited number of source populations to preserve genetic diversity, and ensure equitable benefits for local communities involved in seed collection or production.

After more than two years of setting intentions, building relationships, sharing knowledge, and collaborating, the SOSS established five goals to be implemented by 2030. The objectives and recommendations attached to these goals should be reviewed and updated periodically. By declaring intentions and developing a framework, together we can grow healthy landscapes, a green economy, and thriving, resilient communities now and for future generations. By prioritizing locally grown and sourced seed, we can work toward rebuilding ecological connections and relationships between all living things.

Goal 1: Expand ethical and safe space within the native plant sector.

Goal 2: Increase supply and support demand for reliably available genetically appropriate native seed.

Goal 3: Develop tools that allow coordinated, timely, informed action for seed conservation and stewardship in southern Ontario.

Goal 4: Develop strategies for widespread use and adoption of native plants within consumer, industry, and policy sectors.

Goal 5: Identify Two-Eyed Seeing knowledge needs to inform and support a native seed supply chain for restoration.

FIGURE 2

SOSS key terms compiled by collective, 2021

BLOODROOT
Sanguinaria canadensis

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Bush Clover seed. Photo: Amy Hall

SOSS Roots

Joe Pye Weed. Photo: Siobhan Mullally

Native plants gift our world with resilience, integrity, stability, beauty, connection, love, wonder, and hope. With ancient ingenuity, native plants show us the way to regenerate healthy, sustainable landscapes. They connect us to traditional food sources, stories, ceremonies, and cultural identity, and possess the potential to connect hearts, minds, bodies, knowledge, habitat, and opportunities for all beings to thrive.

Native plants are the foundation of the natural world, evolving through dynamic relationships with the climate, water, air, soil, and all local biota. Locally adapted species play critical roles in ecosystem functions and services. Non-native species may not provide the same benefits and can have severe negative impacts on biodiversity.

A ***native plant*** is one that is indigenous to an area and "has evolved in the presence of native soils and climate, and in tandem with other native plant species, animals, fungi and bacteria."[7] In North America, native plants are commonly defined as the species that existed on the land prior to European colonization.

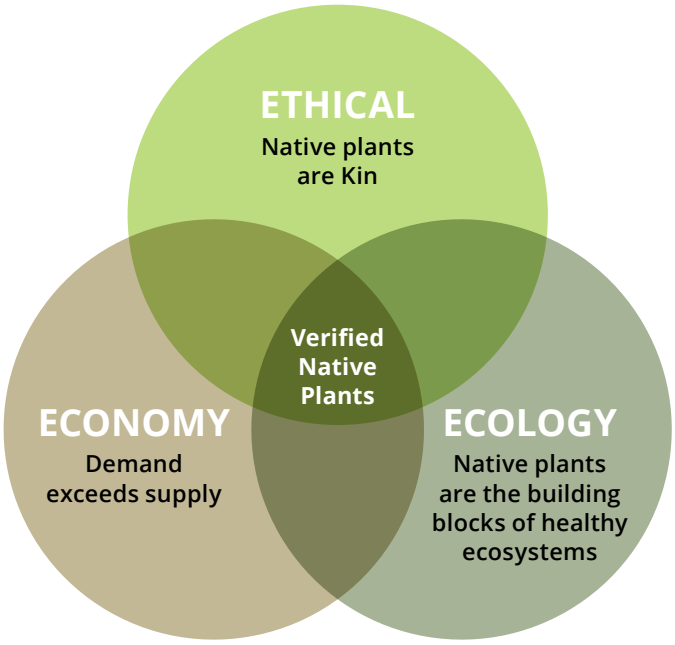
Native plants can be found at the intersection of ethics, economy, and the environment. While colonial land-use practices have caused the extensive habitat and biodiversity loss that we see today, the cultivation and preservation of native plants uphold practices of cultural heritage and Indigenous Knowledge, reflect the intrinsic value of local ecosystems and biodiversity by respecting Indigenous leadership and knowledge, and bolster the growth of an ethical restoration economy.

Native plants contribute to sustainable industries, such as medicine, landscaping, agriculture, green infrastructure, and eco-tourism, and, as a sector, provide green livelihoods. They mitigate the cost of managing invasive species and provide valuable ecosystem services worth millions of dollars, for example, by supporting wild pollinators for the agriculture sector and urban cooling through shade trees. Approaching native plants from a holistic perspective reveals immense potential for sustainable growth and fostering a green economy.

7. Ontario Native Plant Council. (2022). Beautiful Non-Invasive Plants for Your Garden: A Guide for Southern Ontario.

FIGURE 3

Native plants at the intersection of ethics, economy, and ecology



The 2021 United Nations (UN) Decade on Ecosystem Restoration calls for governments around the world to commit to restoring 30% of lands and waters by 2030 to halt and reverse ecosystem degradation.[8] This key target addresses the urgent need to combat biodiversity loss and mitigate climate change and other environmental challenges.

The current restoration goals cannot be met without a reliable supply of the broad diversity of native seed. Investment in the native plant sector is critical to meet restoration and biodiversity targets.

The Natural Heritage Information Centre's 2018 climate report identifies native plant opportunities, including reforestation, afforestation, habitat restoration, and sustainable land management practices.[9] Native plants sequester carbon dioxide from the atmosphere, provide habitat, conserve biodiversity, purify freshwater, mitigate flooding, and improve community well-being. Investment in native plants through green infrastructure will improve community safety, health and resilience.

8. Convention on Biological Diversity. (2022, December 19). *Kunming-Montreal Global Biodiversity Framework*. 9. Brinker, S. R., Garvey, M, and Jones, C. D. (2018). *Climate change vulnerability assessment of species in the Ontario Great Lakes Basin*. Ontario Ministry of Natural Resources and Forestry, Science and Research Branch, Peterborough, ON. Climate Change Research Report CCRR-48. 85 p. + append.

RECONCILING THE LANDSCAPE

Indigenous Peoples play a crucial role in stewarding significant areas of biodiversity, including in southern Ontario, where less than 11% of the landscape is protected.[10] Western conservation approaches have often failed to meaningfully include Indigenous leadership or significantly increase habitat cover and reverse biodiversity loss. By braiding Western and Indigenous Knowledge systems, we can harness their combined strengths to create high-impact solutions that heal both the land and relationships.

Indigenous Peoples have held deep connections with the land since time immemorial. Indigenous worldviews see all beings as kin, equal, and autonomous, and value the interconnectedness of all of creation. Colonial practices have fractured many of these connections and changed how all beings relate to one another on the land. These approaches often follow top-down hierarchies viewing humans as "owners" of the land and natural features as resources primarily for human use. Returning native plants to the landscape is essential to respecting the autonomy of native plants, upholding Indigenous worldviews, and reconciling with the land and each other.

"If human beings resolve problems between themselves but continue to destroy the natural world, then reconciliation remains incomplete. This is a perspective that we as Commissioners have repeatedly heard: that reconciliation will never occur unless we are also reconciled with the earth."

TRUTH AND RECONCILIATION COMMISSION OF CANADA[11]

Healing relationships with and on the land requires an integrated approach that addresses inequities and prioritizes Two-Eyed Seeing. By working together in mutual respect and reciprocity, we can bridge Indigenous worldviews and Western science approaches to grow a sustainable restoration economy.

As we work through the UN Decade on Ecosystem Restoration, the SOSS is positioned as a critical reconciliation initiative. By honouring the intricate connections between plants, place, and people, it addresses ecological imperatives, promotes economic growth, and upholds the principles of reconciliation.

10. Bonnyman, K. (March 13, 2024). *Protected Areas in Southern Ontario Contribute to National Biodiversity Target*. Ontario Nature Blog.
11. Truth and Reconciliation Commission of Canada. (2015). *Truth and Reconciliation Commission of Canada: Calls to Action*. p 230.

SEED NEEDS

For decades, survey data has revealed chronic gaps in seed supply to support restoration activities in Canada.[12] In southern Ontario, a lack of infrastructure, policy and regulation, financial support, knowledge, and coordination have created barriers to scaling the supply of source-identified, local native seed. These challenges often contribute to the use of non-desirable genetics and species on the landscape, resulting in suboptimal restoration outcomes.

Building a sustainable native seed supply chain for restoration requires cross-sector participation and coordination to:

- Support habitat and species recovery
- Build resilient agricultural landscapes
- Sequester carbon
- Support urban communities in climate adaptation and human health
- Enable emergency response to natural disasters
- Protect natural resources
- Provide green infrastructure
- Provide opportunities for cultural connections
- Build green economies[13]

Currently, the greatest challenges faced by the native plant industry in Ontario include:

- Inconsistent and uncertain demand and supply
- Lack of coordinated production
- Insufficient forecasting and lead time
- Discrepancies between ecological and fiscal timelines
- Contracting restrictions
- Cheaper non-native, non-local alternatives
- Lack of coordination around focal species
- Capacity building barriers and regional gaps[14]

Currently, the supply of ethically collected, source-identified native seed in southern Ontario does not meet the demand for restoration.

12. Spearing, M., McPhee, D., and Loo, J. Natural Resources Canada, Canadian Forest Service, Atlantic Forestry Centre. (2023). *Sizing Canada's National Seed Supply Chain: Preliminary Assessment focused on Trees and Shrubs*. Interim Report. 35p. 13. Ibid
14. Winterton, S., James, V., Mullally, S., Hall, A., Weber, S., and Kanter, M. Carolinian Canada Coalition. (2024). *The Economy of Hope: Growing Healthy Landscapes in the Greater Golden Horseshoe in Partnership with Native Plants*.

To achieve high quality restoration outcomes, a greater diversity and quantity of native species with locally adapted genetics are needed. The current lack of coordination and forecasting within the native seed supply chain increases uncertainty and risk for growers to invest in growing different species or scale up production, thereby limiting the availability of diverse native seed.[15]

As a result, the current capacity to produce native seed and plants is insufficient to support the growing needs for native plant materials for ecological restoration. All stages of the native seed supply chain need more capacity, which will mean more green jobs for planning and coordination at every stage of the seeds' journey from collection to restoration. Currently, 75% of native plant growers and producers surveyed indicated they had additional unused capacity for growing, storage, and testing native seed.[16] Additional and better use of existing infrastructure requires investment to support restoration. Growers and producers experience barriers to increasing or maximizing production due to market instability, limited capacity, lack of financial support, and insufficient seed sources.[17] Addressing these limitations in production and long-term storage is critical to increase seed supply.

A ***native plant grower*** cultivates native plants for purposes such as conservation, landscaping, or restoration projects with a focus on growing plants from seed or cuttings in a controlled environment to ensure they thrive when replanted in their natural habitat.

A ***native plant producer*** includes native plant growers and those involved in seed collection, propagation, marketing, distribution, and selling native plants to nurseries, landscapers, or customers.

THE LAND

Southern Ontario is known for its unique ecology and hosts some of the greatest biodiversity in Canada with over 2,000 species of native plants.[18] It is situated in the Mixedwood Plains Ecozone, the smallest of Ontario's ecozones[19] (Figure 4). The climate, soil conditions, and moderating effect of the Great Lakes support a mix of northern and southern species on the land, which was dominated by a rich diversity of habitat types, including forests, wetlands, prairies, and savannas before being dramatically altered through colonization. As a result, many plant and animal species are rare or at risk.

Southern Ontario supports diverse activities that drive Ontario's economy, producing more than 25% of Canada's Gross Domestic Product and accounting for over one quarter of total farms in Canada as the second largest contributor to farm operating revenues.[20] As a result, the landscape has been severely degraded with less than 30% of wetlands remaining and less than 30% natural terrestrial cover.[21]

15. Ibid 16. Ibid 17. Ibid 18. Oldham, M. J. (2017, March). *List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E)*. Carolinian Canada and Ontario Ministry of Natural Resources and Forestry. Peterborough, ON. 132 pp. 19. Ontario Biodiversity Council. *State of Ontario's Biodiversity: Ontario's Ecozones*. 20. Ibid 21. Ibid

To support these natural habitats, the native plant sector must cultivate and support a wide diversity of species crucial for ecological restoration. This effort is essential not only for preserving biodiversity but also for ensuring the success of reclamation sectors, such as those involved in restoring wetlands, forests, and urban green spaces. These sectors rely heavily on the availability of native plants adapted to local conditions, which reinforces the need for regional coordination. By scaling up the production of focal species, these efforts can better align with local conservation and stewardship priorities to produce more resilient and self-sustaining ecosystems.

"Protecting the diversity of life on Earth — of which we humans are an integral part — requires broad societal consensus and participation. It is a challenge not for some of us, but for all of us."

ONTARIO'S BIODIVERSITY STRATEGY, 2023-2030[22]

Ecoregions 6E: Lake Simcoe-Rideau and 7E: Lake Erie-Lake Ontario fall within the Mixedwood Plains Ecozone. They contain unique physiographic and climatic characteristics that support patterns of species and habitat associations. These two ecoregions will be the focus of this strategy.

Lake Simcoe-Rideau Ecoregion

Ecoregion 6E extends from Lake Huron to the Ottawa River and contains distinct geological features, such as the Niagara Escarpment and the Oak Ridges Moraine, the latter of which is home to the Rice Lake Plains. This ecoregion hosts nationally rare habitat types, such as alvars, tallgrass prairie, and oak savanna.

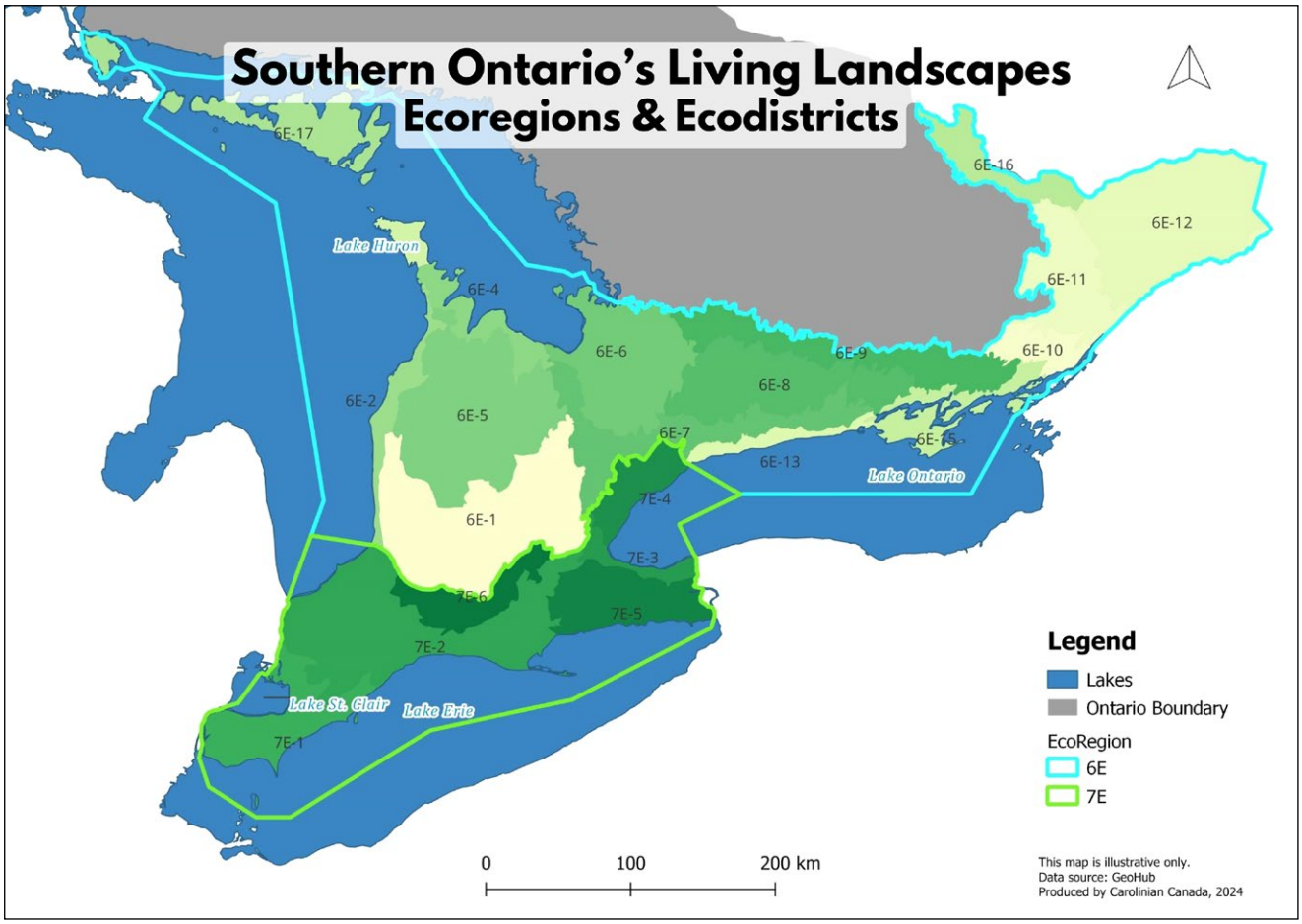
Lake Erie-Ontario Ecoregion

Ecoregion 7E aligns with the Carolinian Zone, which supports the greatest diversity of species in southern Ontario, including nearly 400 species of birds and over 2,000 species of plants. This region hosts Carolinian forest and oak savanna and is home to the largest remnants of tallgrass prairie habitats. Human activities, such as industry, agriculture, urban development, and road networks, have destroyed or degraded most natural habitats. Approximately 54% of native species in this ecoregion are considered rare and around 6% have likely already been extirpated from the region.[23] This ecoregion supports an estimated 25% of Canada's species at risk.

22. Ontario Biodiversity Council. (2023). *Ontario's Biodiversity Strategy, 2023-2030*. 23. Oldham, M. J. (2017, March). *List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E)*. Carolinian Canada and Ontario Ministry of Natural Resources and Forestry. Peterborough, ON. 132 pp.

FIGURE 4

Ecoregions and ecodistricts of southern Ontario



THE PEOPLE

Southern Ontario is home to over 14 million people, which is more than 36% of the national population and approximately 92% of Ontario's population.[24] This high population density presents unique challenges to scaling seed supply, including habitat fragmentation and land use competition from urbanization and agricultural demands, biodiversity pressures resulting from pollution and invasive species, and economic constraints from the demands of commercial and residential development over investment in native seed production infrastructure.

This region is historically and presently home to many Indigenous Nations (Figure 5). These Nations actively contribute to environmental stewardship, sustainable practices, and cultural revitalization efforts across the region.

As rightsholders, Indigenous Nations whose territories cover this region have constitutionally recognized rights to the land. There are several treaties recognized on the landscape and settler governments, organizations, and communities have obligations to understand and uphold treaties with Indigenous Nations.[25]

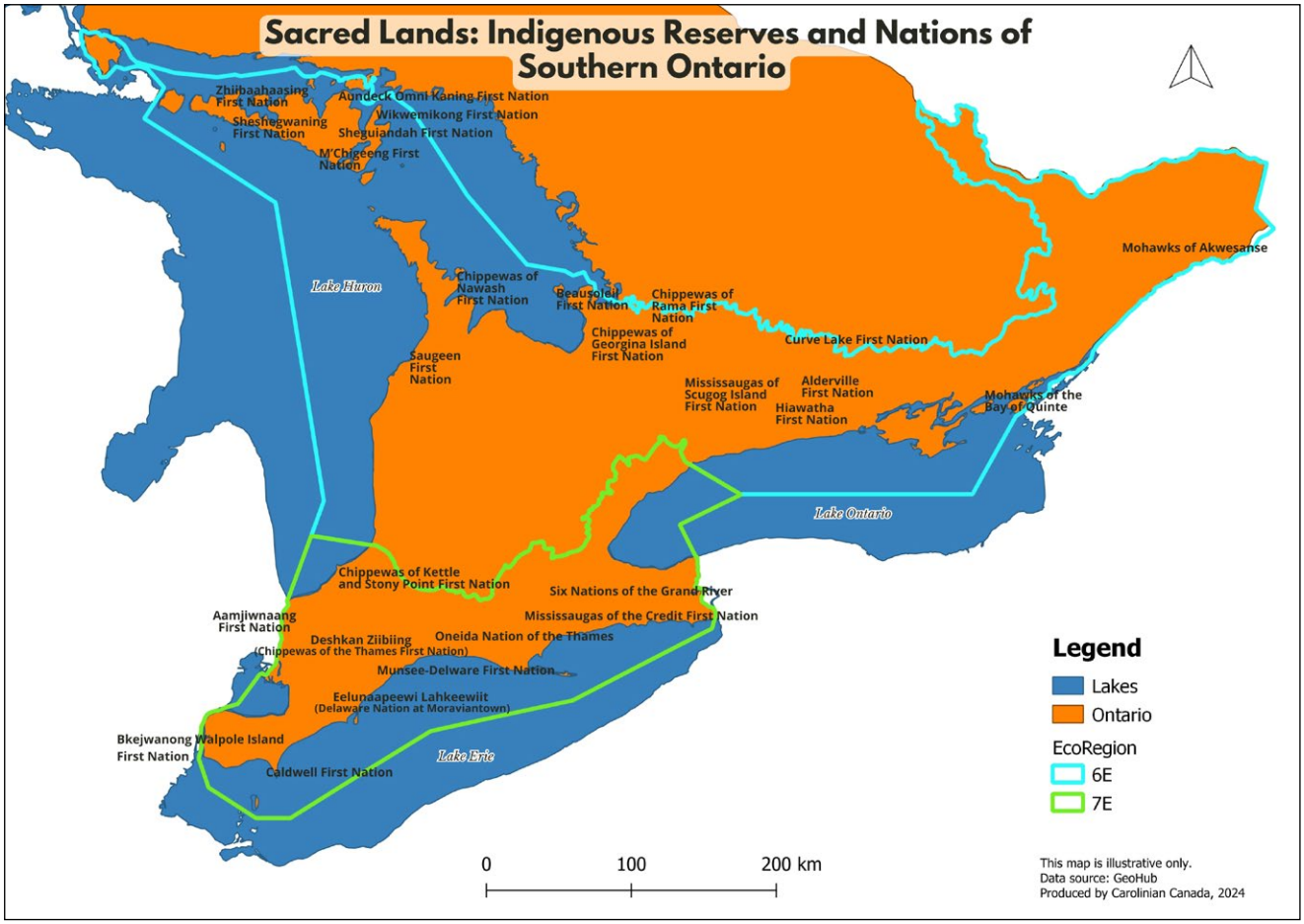
The SOSS recognizes the importance of inclusivity and collaboration across diverse groups. An essential part of this process is acknowledging and addressing the barriers to participation that Indigenous communities face – for example, colonial policies around land management – and working towards systemic change for equitable participation and Indigenous leadership.

Indigenous communities hold ways of knowing the land and native species that guide sustainable practices and honour the natural balance and biodiversity of the region. The SOSS aims to gather the collective wisdom of Indigenous communities, ecologists, native plant growers, backyard gardeners, and land stewards, ensuring that the experiences and insights of all stakeholders and rightsholders contribute to strengthening the native seed supply chain and enhancing biodiversity throughout the region.

24. Ontario Biodiversity Council. *State of Ontario's Biodiversity: Ontario's Ecozones*. 25. See map of treaties in Appendix B.

FIGURE 5

Sacred Lands: Indigenous Reserves and Nations of Southern Ontario



Black-bellied Plovers. Photo: Jennifer Nantais

Approaches to working together

ESTABLISHING THE SOSS COLLECTIVE

Carolinian Canada distributed invitations to form the SOSS collective in spring 2021. The focus was to establish a collective of diverse representatives to foster a comprehensive understanding of regional issues, shared goals, opportunities, and needs. The most important priority was to ensure that the strategy would be inclusive and speak for all communities impacted by the loss of native plants who want to be a part of the restoration story, including non-humans and the land itself.

At the outset, the SOSS process prioritized Indigenous leadership in strategy development, with a focus on building and strengthening reciprocal relationships with Indigenous partners and communities. In 2022, a series of virtual Indigenous-only round table meetings were held to determine how Indigenous partners wished to participate and establish clear guidelines on consent. Many Indigenous partners chose to participate anonymously, while others contributed publicly or joined as partners.

As the facilitating organization, Carolinian Canada convened monthly virtual meetings with the SOSS collective around key topics that featured guest speakers.[26]

The SOSS collective was guided by diverse perspectives and shared interests in:

- Respecting the autonomy of native plants and the essential work they do.
- Cultivating native plants to heal relationships with and on the land.
- Learning and sharing together.
- Saving species and ecological connections.
- Investing in life through an ethical restoration economy.

SOSS participation grew steadily throughout the duration of the project, eventually including more than 100 groups and individuals.[27] The meetings averaged roughly 30 attendees from Indigenous and settler backgrounds.

Partners

The Terms of Reference outlining the SOSS participation framework was shared with the collective, creating space for all to engage by signing on as a partner or observer. As part of this agreement, participants who identified as partners committed to help advance a coordinated collaborative approach through attending monthly meetings or participating via email to co-develop the strategy.

Observers

Collective members who participated in the SOSS development but did not choose to formally sign on as partners were considered observers. Observers were free to participate and contribute to all SOSS processes without obligation, provided they committed to abide by the established SOSS values, principles, and safe space guidelines.

26. The list of topics and speakers is available in Appendix D. 27. A list of participating organizations can be found in Appendix E.

FIGURE 6

SOSS collective interests, 2021

A LEARNING JOURNEY: BRAIDING KNOWLEDGE

Historically, the conservation sector has not always created spaces where reciprocal and sustainable relationships are developed. The inclusion of established and emerging ideas and concepts from Western and Indigenous Knowledge systems in the SOSS offers a holistic approach to understanding the natural world. Many of these concepts have been learned and reinforced through the SOSS collective journey. By bringing together these perspectives through an approach known as Two-Eyed Seeing, we can foster a deeper respect for the environment and recognize the interconnectedness of all living beings. Two-Eyed Seeing concepts that may be new to some readers serve to challenge traditional scientific paradigms, enrich our understanding of ecology and each other, and promote a more inclusive and sustainable relationship with the earth.

Convening Meetings in Ethical Space

The collective engaged in connection exercises to explore how we think about and connect to native plants within Western and Indigenous worldviews. These exercises opened discussion on a range of topics, beginning with training for working in ethical space. Carolinian Canada also produced resources for working in ethical space that were shared regularly with all participants. Key learnings and practices included:

- Establishing ethical space is an essential step to achieving Two-Eyed Seeing
- Opening discussion space in a good way through openness, positivity, and respect
- Challenging Western ways of thinking by presenting alternative views
- Engaging in connection exercises to move beyond scientific thinking
- Moving past resistance and asking uncomfortable questions
- Acknowledging failure and committing to improving the process
- Meeting people where they are at on the relationship building journey
- Adequate time is needed to build relationships
- A strong foundation in ethical space is needed to create a safe environment for all[28]

Safe Space

Safe space is an environment in which individuals can feel confident that they will not be exposed to discrimination, criticism, harassment, or any other emotional or physical harm. Safe spaces are often designed to provide support and comfort, particularly for marginalized or vulnerable groups, and to encourage open and respectful dialogue.

Ethical Space

Ethical spaces are places of inclusivity, respect, and trust where community comes together, and different knowledge systems can interact and thrive. To create ethical space, we must collaborate by listening, learning, and engaging in dialogue with one another to identify shared best practices and goals for stewardship and conservation.

28. A summary of the resources for working in ethical space is included in Appendix A, including examples of Two-Eyed Seeing connection exercises.

Ethical space can be described in different ways, such as:

- A framework for dialogue and interchange of knowledge and discussion between two cultures.
- A place where words are examined as the means to bridge cultural language differences in the design of mutually satisfying agreements.
- A safe place to position and address contentious issues and admit to the unknown. It is a safe environment in which cultural confrontation is encouraged and cultural divides are subsequently examined.

FIGURE 7

Different ways to describe ethical space

> *"The "ethical space" is formed when two societies, with disparate worldviews, are poised to engage each other. Ethical standards and the emergence of new rules of engagement through recent Supreme Court rulings call for a new approach to Indigenous-Western dealings. The new partnership model of the ethical space, in a cooperative spirit between Indigenous peoples and Western institutions, will create new currents of thought that flow in different directions of legal discourse and overrun the archaic ways of interaction."*
>
> **WILLIE ERMINE, M.ED., ETHICIST, RESEARCHER WITH THE INDIGENOUS PEOPLES HEALTH RESEARCH CENTRE, ASSISTANT PROFESSOR WITH THE FIRST NATIONS UNIVERSITY OF CANADA, STURGEON LAKE CREE NATION[29]**

Two-Eyed Seeing

Two-Eyed Seeing, or Etuaptmumk in the Mi'kmaq language, developed by Elder Albert Marshall, is a guiding framework that emphasizes the coexistence and complementary use of Indigenous and Western knowledge systems. This approach refers to learning to see from one eye with the strengths of Indigenous ways of knowing and from the other eye with the strengths of Western ways of knowing and to using both eyes together.[30] It is crucial for addressing complex environmental challenges and promoting sustainable and inclusive conservation efforts.

> *"Traditional Knowledge is always treated as a poor cousin of Western science. But that must change. The greatest biodiversity in the province is found on First Nations land. This is no coincidence. First Nations have been very careful."*
>
> **RICK BEAVER, OJIBWAY BIOLOGIST AND ARTIST, ALDERVILLE FIRST NATION[31]**

The Two-Eyed Seeing approach enhances our ability to respect, honour, and utilize the strengths of diverse knowledge systems. It enriches our collective understanding and fosters a more inclusive and holistic approach to addressing regional native seed challenges.

29. Ermine, W. (2007). The Ethical Space of Engagement. *Indigenous Law Journal, 6*(1). pp. 193-194. 30. Bartlett, C., Marshall, M., and Marshall, A. (2012, November 1). Two-Eyed Seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing. Journal of Environmental Studies and Sciences, 2. p. 335.
31. McDermott, L. and Bell, A. (2017, February). *Indigenous Perspectives on Conservation Offsetting: Five Case Studies from Ontario, Canada*. Ontario Nature, Plenty Canada, and the Indigenous Environmental Studies and Sciences Program at Trent University. p. 11.

> *"Indigenous knowledge systems, Indigenous legal traditions, laws, protocols, practices, songs, methodologies of validation, ratification, of actioning our lifeways, those are as valid as any other system in the world."*
>
> **DANIKA LITTLECHILD, INDIGENOUS RIGHTS ADVOCATE, LEGAL EXPERT, ERMINESKIN CREE NATION[33]**

Seed Sovereignty

According to many Indigenous worldviews, seeds that share the landscape with people are seen as ancestors. Indigenous seed sovereignty attempts to decolonize practices around seed stewardship and ownership by discussing and asserting the autonomy of plant relatives to exist and flourish on the landscape and of Indigenous peoples to steward the land and revitalize their food systems.

Decolonizing the Landscape

A decolonizing approach refers to recognizing and addressing the historical and ongoing impacts that colonization has had on ecosystems and Indigenous communities by emphasizing the inclusion of Indigenous knowledge, practices, and perspectives in restoration efforts to promote biodiversity and cultural resilience. Some key aspects include acknowledging Indigenous understandings of local ecosystems developed over millennia; restoring native species with a focus on culturally significant plant and animal species; ensuring that Indigenous communities have rights and access to traditional lands and resources necessary for cultural practices and sustainable management; developing collaborative management frameworks where Indigenous and non-Indigenous partners work together; integrating scientific and Traditional Knowledge for more effective restoration outcomes; and supporting the revitalization of Indigenous cultures through restoration activities that include the use of traditional practices and the recovery of culturally significant landscapes.

Plant Autonomy

Native plants act in their own interest and are experts of their own survival. As species in their own right, they should be free of threats to what they need to survive and thrive. As stewards of this land, humans have a responsibility to restore native plant populations to support healthy habitats that can propagate freely and restore themselves.

33. Ibid

Reciprocal Relationship with Nature

This concept emphasizes the importance of viewing humans as part of nature rather than separate from it and advocates for a relationship with the natural world based on mutual respect, responsibility, and reciprocity. While many Indigenous cultures have long upheld this approach, Western culture has often failed to reciprocate, exploiting nature and altering the landscape for centuries. Reciprocity was recently popularized by author Robin Wall Kimmerer whose book *Braiding Sweetgrass*[34] focused on reciprocity and respect for nature through guidelines for harvesting plants, which include taking only what is needed and giving thanks for the gift.

Gratitude

Gratitude is a fundamental aspect of Indigenous cultures, perceiving nature as a gift for which humans should express thanks and give back, fostering a sense of connection and responsibility toward the environment.

Plants as Kin

This concept is rooted in the belief that all living beings, including plants, are interconnected parts of a larger family, rather than mere objects or resources. The relationship between humans and plants is often honoured through stories, ceremonies, and practices that emphasize respect, reciprocity, and recognition of the role of plants in the ecosystem. This view encourages sustainable and ethical interactions with the natural world, fostering a sense of responsibility and stewardship.

Seeds hold traditional knowledge of the land. In Australia, for example, certain species may be abundant because Indigenous Peoples used to travel across the landscape to gather, process, and store seeds. This cultural connection underscores the value of seeds not just for biodiversity but also for preserving Traditional Ecological Knowledge and practices.[35]

Seed keepers are vital stewards of biodiversity and cultural heritage, preserving native plant seeds and the traditional knowledge tied to them. They play a key role in maintaining genetic diversity, protecting local ecosystems, and supporting food sovereignty.

34. Kimmerer, R. W. (2015). *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*. Milkweed Editions.
35. Bliege Bird, R., Bird, D. W., Martine, C. T., McGuire, C., Greenwood, L., Taylor, D., Williams, T. M., and Veth, P. M. (2024). Seed dispersal by Martu peoples promotes the distribution of native plants in arid Australia. *Nature Communications, 15*(6019).

OUTREACH AND ENGAGEMENT

Online Tools

SOSS participants had open access to meeting notes through a link to the "SOSS Live" document that cumulatively recorded all activities and progress. This document was set up as a shared file in which participants could add their ideas and responses directly and functioned as a living record of the overall SOSS process.

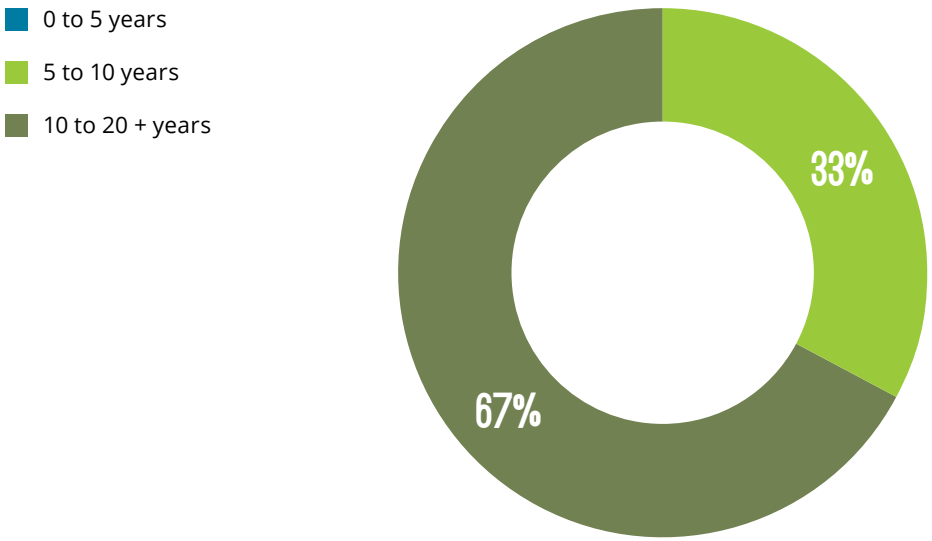
The SOSS website was developed to promote the project externally, share resources, and build connections. Resources included a Seed Saver Training video series, seed stories from participants, and the Seed Saver Tool.[36]

Collective Feedback

Midway through the project, Carolinian Canada surveyed participants for their feedback and recommendations for improvement.[37] The survey revealed a wealth of collective knowledge, with 67% of respondents reporting a minimum of 10+ years' experience learning, growing, working with, or stewarding native seed and plants.

FIGURE 8

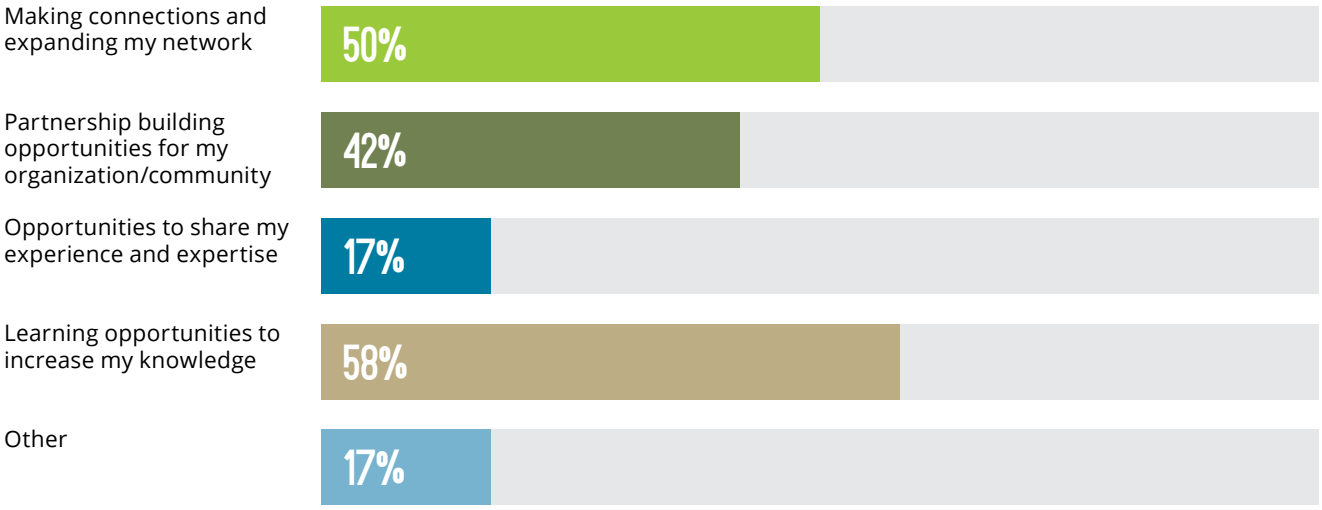
SOSS participants' experience (2023)



36. The resources can be found on the SOSS website: carolinian canada.ca/seed. 37. See full list of questions in Appendix G.

FIGURE 9

Survey responses on opportunities the SOSS has provided (2023).



Reciprocity has always been central to the SOSS work. Survey respondents identified teaching, learning, partnership building, and networking as opportunities they valued in the collective process. (Figure 9) The survey provided a check-in to ensure the process was effective and allowed for realignment and adaptation as needed to support the collective work. This approach not only supported the strategy but also gave back to the collective.

Finally, to inform the writing of the strategy and wrap up the meetings, the SOSS collective participated in an interactive virtual session to review strategic priorities, seek input, refine goals, and integrate feedback.

Working Groups

Three working groups explored specific subject areas to inform the strategy in more depth:

The **Ethical & Safe Space Working Group** convened 6 members over 3 meetings in 2023. They discussed various themes such as native plant autonomy, reconciliation, and Two-Eyed Seeing. The group emphasized the need to reflect Indigenous voices in the strategy and considered how to make the group inclusive to Indigenous communities. Challenges were acknowledged, such as the colonial nature of other existing conservation strategies and the need to ensure inclusivity and comfort in the discussion. Additionally, the group noted the importance of incorporating different cultural practices, reaffirming the commitment to ethical collaboration, and recognizing the potential for using mistakes as learning opportunities. The sessions concluded with action items focusing on community engagement and educational materials to foster Indigenous participation and feedback.

The **Native Plant Economy Working Group** convened 11 members over 6 meetings to discuss voluntary guidelines, protocols, and certification opportunities as well as programs that incentivize growers without imposing burdens, potentially through policies like subsidizing local seed purchases. Other topics included navigating permissions for seed collection, enhancing market certainty, and developing a transparent certification system to support a sustainable native plant supply. The group also discussed strategies to engage Conservation Authorities, streamline collection permissions, and foster a network for seed collectors that could address barriers and promote collaboration.

The **Focal Species Working Group** convened 12 members over 5 meetings on a wide range of topics related to conservation, restoration, and coordination efforts around focal species in southern Ontario. Key themes included the importance of native species, genetic diversity, and climate change adaptation. The group emphasized the selection and prioritization of focal species based on various factors, such as ecological significance, ease of propagation, and habitat restoration needs. Discussions also covered the development of guidelines, collaboration, integration of Indigenous Knowledge, strategies for scaling up seed production, addressing barriers, and ensuring genetic integrity.

Focal species are those chosen to represent the needs of larger sets of species within an ecosystem, helping to streamline conservation efforts and resource allocation.

Expanding Connections

Carolinian Canada facilitated three special webinars, with guest speakers, that targeted participation from key audiences, i.e. municipal government, provincial government and land managers respectively.[38]

In addition, Carolinian Canada staff participated in the development of the National Native Seed Strategy (NNSS) framework, led by Canadian Wildlife Federation. The SOSS team attended monthly NNSS meetings and presented to the national collective early in 2023 to share the SOSS framework, developments, progress, and lessons learned.

Dr. Cristina Eisenberg, Sam Whiteye, Jennifer Nantais, Amy Hall, and Kerdo Deer (pictured from left to right) connecting at the U.S. National Native Seed Conference in 2023. Photo: Jennifer Nantais

Defining Next Steps

Carolinian Canada consulted SOSS partners on their priorities for implementation of the strategy and to map out next steps for the upcoming year and to 2030.

The top priorities that emerged from these discussions included:

- Maintaining the momentum by continuing to build on the successful SOSS process and ensure capacity to drive implementation priorities.
- Telling the story of the value of native plants through the development of an evaluation tool that will showcase their importance in relation to soil health, carbon sequestration, pollinators, cultural and social impacts, and more.
- Quantifying the contribution of native plants to the green economy, government greening initiatives, and ecosystem services, such as pollination.
- Adopting innovative approaches to enhance leadership within the sector on capacity building strategies, selecting criteria for standards, and connecting with investment strategies such as the Conservation Impact Bond.
- Establishing a native seed hub to focus on supply chain gaps and opportunities, such as seed need forecasting, sector marketing capacity, education, and training.
- Helping new growers through networking support and market development.

38. See full list of special webinars in Appendix F.

SOSS Vision, Mission, and Goals

Grey-headed Coneflower. Photo: Siobhan Mullally

VISION

A full diversity of native plants, cultural practices, and thriving ecosystems flourishing across a healthy southern Ontario landscape.

MISSION

Ensure availability of source-identified native seed for cultural needs and ecological restoration to heal relationships with the land and people.

SOSS GOALS (2025-2030)

Goal 1: Expand ethical and safe space within the native plant sector.

Goal 2: Increase supply and support demand for reliably available genetically appropriate native seed.

Goal 3: Develop tools that allow coordinated, timely, informed action for seed conservation and stewardship in southern Ontario.

Goal 4: Develop strategies for widespread use and adoption of native plants within consumer, industry, and policy sectors.

Goal 5: Identify Two-Eyed Seeing knowledge needs to inform and support a native seed supply chain for restoration.

Working together to achieve these five goals will create a framework that ensures equitable, inclusive, and respectful practices that integrate Indigenous leadership and foster collaboration among diverse stakeholders and rightsholders. During this timeframe, implementation of the SOSS will promote the sustainable use of native plants; enhance community involvement and support; strengthen the native seed supply chain; and ensure a consistent and adequate availability of high-quality seed tailored to local ecosystems to support large-scale restoration projects and biodiversity conservation efforts.

This strategy is for all native plants, including woody and non-woody species. In Ontario, some systems and programs support the production, tracking, certification, testing, and storage of tree seed; however, more support is needed to implement similar systems for non-woody species. Therefore, in this strategy, greater emphasis may be placed on scaling herbaceous species for seed-based restoration.

By 2030, new or enhanced tools and platforms will help coordinate efforts among conservationists, enabling effective and efficient seed collection, storage, and distribution. This will improve the resilience of native plant populations and facilitate adaptive management strategies. The integration of native plants in various sectors will be promoted through targeted education, incentives, and policy changes, leading to broader acceptance and use of native plants, contributing to ecosystem health and resilience.

Critical research areas will be identified and prioritized to advance understanding and support the native seed supply chain, driving innovation and wise restoration ecology practices in an uncertain climate future. This research will ensure that restoration efforts are scientifically sound and effective in achieving long-term ecological sustainability to heal the land and support diverse ecosystems for generations to come.

SOSS Priority Levels

In the following section, each goal will be broken down into objectives, which inform recommendations that have been developed and prioritized by the SOSS collective.

Beneficial: Lowest priority. Action identified to support the ethical scaling of native seed.

Necessary: Medium priority. Action required to support the ethical scaling of native seed.

Urgent: Highest priority. Action critical to support the ethical scaling of native seed.

Wild Bergamot. Photo: Michelle Kanter

GOAL 1

EXPAND ETHICAL AND SAFE SPACE WITHIN THE NATIVE PLANT SECTOR.

As leaders in the stewardship of southern Ontario's biodiversity, Indigenous communities should be meaningfully engaged in strategic planning to scale the native plant sector in collaboration with all stakeholders and rightsholders. Expanding safe and ethical space within the native plant sector supports Truth and Reconciliation Commission goals related to promoting cultural revitalization, respecting Indigenous Knowledge, and fostering economic development.

Creating a seed strategy that values and prioritizes Indigenous leadership and includes recommendations to support capacity building and Indigenous priorities is a step towards decolonizing the landscape. In this way, the work of the native plant sector will reflect the contributions of Indigenous communities, aid in the preservation and revival of cultural practices tied to native plants and ensure the reciprocal exchange of economic empowerment and benefits for Indigenous expertise and resources. Collective action and systemic change will be required to achieve these objectives.

Understanding seed needs is critical for coordinated scaling of seed supply. The priorities of Indigenous communities (i.e., cultural preservation, food security, jobs, youth programs) must be understood to ensure the native plant materials sector is supporting the goals of everyone on the landscape.

OBJECTIVE 1.1: Establish a sector wide Two-Eyed Seeing approach to seed-based restoration by supporting Indigenous-led initiatives to heal the land.

Participants in the native plant sector must commit to meaningful reconciliation through the acknowledgement of past and present harm to Indigenous Peoples and the land; the creation of ethical spaces where relationships can be restored, built, and sustained; and the establishment of a Two-Eyed Seeing approach.

Through creating relationships that are based on the principles of ethical and safe space, a Two-Eyed Seeing approach can be better integrated within the conservation and restoration sectors. This task requires strong commitments from settler participants to challenge their perspectives and ensure ethical representation of Indigenous Knowledge in all spaces within the sector. Many cross-cultural relationships have been established and fostered over decades to share knowledge and work together to grow more native plants. These relationships are a foundation on which the sector can continue to grow and learn.

The integration of formal engagement mechanisms will increase opportunities for Indigenous-led knowledge sharing, capacity building, and participation in the growth of the native plant sector for many First Nations. The establishment of an Indigenous-led native plant council, similar to the United States Intertribal Nursery Council, could assist in achieving various objectives outlined in this strategy. It must be created by Indigenous people for Indigenous people.

Recommendations set out for each goal have been developed to assist the sector in achieving the stated objectives.

Recommendation 1.1.1

Increase sector-wide understanding of safe and ethical spaces to foster meaningful collaboration, ensure Indigenous autonomy in relationships and decision making, and build cross-cultural relationships based on respect for Indigenous Knowledge.

PRIORITY: URGENT

Recommendation 1.1.2

Support an Indigenous-led native seed-needs assessment and priority setting for seed-based restoration and identify opportunities to connect with the National Native Seed Strategy efforts.

PRIORITY: URGENT

Recommendation 1.1.3

Support the establishment of an Indigenous-led native seed council to improve coordination, share knowledge, establish goals and priorities, and identify gaps and opportunities to connect with the broader native plant sector and National Native Seed Strategy.

PRIORITY: NECESSARY

United States Intertribal Nursery Council

The United States Intertribal Nursery Council was developed through targeted discussions held by the United States Department of Agriculture to advance the voices of Indigenous Peoples regarding native plant production for restoration. The council meets annually, hosted by tribes across the country on a rotational basis. Some key objectives of this council are to share and preserve knowledge, provide additional education and training, and to perform restoration on the land.[39]

OBJECTIVE 1.2: Improve equity in the native seed economy by increasing the capacity for Indigenous Nations to participate and ensuring equitable access to resources, training, and economic growth.

Land management and ownership restrictions often limit Indigenous rights and self-determination by permitting occupation and use of land while prohibiting ownership. This model means that while settler-owned land may have significant monetary value, reserve lands held by the Crown for the use and benefit of specific First Nations do not since they are limited by prohibitions on consent, taxation, and approval, and may be expropriated for public purposes if deemed necessary.

39. United States Department of Agriculture. *Intertribal Nursery Council*.

Inequitable access to land and resources and barriers to land securement and leasing can prohibit Indigenous people from participating in the native plant sector. A lack of assets then prevents Indigenous participants from qualifying for loans and other traditional avenues of securing capital funds.

Other traditional funding sources, such as government and private foundations, are often not equally accessible to Indigenous communities because the funding criteria do not meet their needs, such as capacity building, relationship building, and project continuity. Similarly, the application and reporting requirements can be onerous.

Inequities that exist in our society must be acknowledged and considered when making recommendations for the native seed and plant sector. Indigenous people must be able to participate equitably if we are to build an ethical and sustainable restoration economy.

Without financial resources and capacity building support, participation in the native plant sector may not be feasible for all Indigenous Nations. Increasing and diversifying available funds to support the unique needs of Indigenous communities and businesses is essential.

Government, philanthropy, and corporate giving should consider the unique needs of diverse communities and remove barriers to participation in funding streams by creating inclusive processes and supporting diverse goals.

Recommendation 1.2.1

Investigate and activate diverse investment models to increase Indigenous business development opportunities in the native plant materials sector.

PRIORITY: NECESSARY

Diverse, Inclusive, Innovative Investment through the Conservation Impact Bond

There is an urgent need to scale investment in green economies. The estimated global annual biodiversity conservation funding gap is CAD $741-1,021 billion, and Canada's estimated annual conservation funding gap is CAD $18.6-24.8 billion through to 2030.[40] Currently, the Canadian economy is dominated by extractive practices that damage the natural environment. Investment has historically been supported by public agencies and funder priorities, but diversification of funds is needed to close the funding gap and support the urgent need for landscape restoration. Carolinian Canada's Conservation Impact Bond (CIB) is committed to supporting the growth of the native seed supply chain through a Two-Eyed Seeing approach by prioritizing support for Indigenous-led projects. It works with diverse investors and accelerators to provide up-front flexible funds for healthy landscape activities. The CIB requires reasonable application and reporting processes that do not create barriers for participation.[41]

40. Kosciolek, K., Kwan, N., Longaphy, C., Wilson, R., Gautier, K., and Sharir, A. (2020). *Financing conservation: How conservation financing could be used to protect Canada's ecosystems*. Nature Conservancy of Canada and Rally Assets. 41. Carolinian Canada Coalition. *Conservation Impact Bond (CIB)*.

GOAL 2

Sharp Loped Hepatica. Photo: Amy Hall

INCREASE SUPPLY AND SUPPORT DEMAND FOR RELIABLY AVAILABLE GENETICALLY APPROPRIATE NATIVE SEED.

There is a pressing need to increase the native seed supply due to chronic shortages in both the quantity and diversity of seed required for restoration projects and retail markets. These shortages hinder efforts to restore and maintain healthy ecosystems as the availability of genetically appropriate native seed is essential for successful restoration. Without an adequate supply of diverse native seed, it is challenging to support biodiversity, enhance ecosystem resilience, and meet the growing demand from retail markets looking to incorporate native plants into landscapes. Addressing these shortages will ensure that restoration projects can proceed effectively and that retail markets can promote sustainable and ecologically beneficial practices.

Native plants currently represent a small percentage of crops in the agriculture and horticulture sectors, and broader relationships and programs are needed to support scaling within these sectors. These objectives aim to improve the understanding of seed needs in southern Ontario and increase the capacity of the sector to act in a timely manner.[42]

The many barriers to scaling supply include the undervaluing of resources like certified seed collectors, the disproportionate placement of risk on growers due to a lack of communication and coordination of demand, and a lack of available data regarding the native species currently being propagated and the seed needed, in terms of quantity and diversity, over the next 5 to 10 years.

Coordinated action for seed is critical to the growth of the native plant sector in southern Ontario. Strong leadership and diverse participation through programs and partnerships that provide regional coordination for seed to support conservation and stewardship targets are needed. Strong government support is also necessary to build a robust and sustainable native seed supply chain. Unified efforts can improve access to wild seed populations and identify land to expand wild and managed seed sources. This effort includes participation and investment in scaling the native plant sector by large bulk seed users (industry, hydro, etc.) through long-term partnerships, contracts, and capacity-building support.

42. Winterton, S., James, V., Mullally, S., Hall, A., Weber, S., and Kanter, M. Carolinian Canada Coalition. (2024). *The Economy of Hope: Growing Healthy Landscapes in the Greater Golden Horseshoe in Partnership with Native Plants*.

"Meeting the growing demand for native seed and plant materials is too big of a job for any one sector or entity to tackle independently. Most organizations lack the scope or capacity to carry out the critical intertwined actions to build networks – including identifying social actors who are engaged across the supply chain, and locating pathways to improve interconnections, build trust, and promote novel synergies… By taking a network approach we can prevent an uncoordinated patchwork of duplicative efforts, reduce resource competition, and promote trust. Most importantly, collectively we can make inroads in better matching supply with demand to advance a wide range of critical activities to heal our ecosystems now and in the future."

ECOLOGICAL HEALTH NETWORK[43]

Seed collection, cleaning, treatment, storage, testing, growing, and selling are all essential steps in the native plant supply chain and require extensive time, money, and expertise. Currently, there is a lack of support for growers and producers of native plant materials in southern Ontario. Many of these essential services are undervalued and rely on volunteer time.

Native seed is vital for a healthy and resilient society and should be valued and treated as an essential natural resource. The native plant sector merits support through government policies and subsidies. This goal aims to increase the supply of native seed by strengthening government policies, expanding investment, aligning current efforts, and implementing capacity building opportunities throughout the supply chain.

OBJECTIVE 2.1: Coordinate southern Ontario long-range seed forecasting to connect supply and demand with a full diversity of species on an ecoregional basis.

Scaling seed in southern Ontario can be achieved through a coordinated network of people and infrastructure to collect, process, store, and grow seeds, and utilize them to their full potential. Knowledge holders, seed collectors, growers, farmers, businesses, nurseries, botanists, and ecologists are needed to work in coordination to scale seed rapidly. Currently, many large land managers face barriers to multi-year contracting due to prohibitive policies and funding barriers preventing multi-year planning and procurement. Addressing these barriers is critical to enable long-term and group buying contracts. Innovative solutions and financial investment are needed to improve coordination and contracting mechanisms in southern Ontario.

Long-term planning and coordination are needed to understand the seed needs for future development and restoration projects. This information must be shared with growers and producers to ensure the right seed is available at the right time.

43. Ecological Health Network. (2024). EHN's Seed & Plant Supply Chain Program.

Understanding the demand of large bulk seed users is critical to scaling seed supply. Better coordination of seed needs will create opportunities for long-term planning and scaling. The unique barriers to coordination and long-term planning must be understood for each sector.

Efforts should be made to forecast seed needs on a long-term basis to provide advanced notice and assurance of demand for growers and producers. For example, highway improvements, mining, and development projects typically involve years of planning and scoping in advance of implementation, and with improved collaboration, cross-sector seed needs could be better understood and seed production timelines met.

The production and sale of specific native seed and plants are not distinguished through the Annual Greenhouse, Sod and Nursery (GSNA) survey conducted by Statistics Canada. Consequently, there is a lack of available data to track the production capacity of the native plant industry in southern Ontario. Commercial native plant growers lack specific information about how the market for locally sourced native plants is performing, making it difficult for them to assess trends that would help in forecasting what type of plants they should be growing.[44]

As the demand for native plants increases, widespread and ongoing participation is needed from stakeholders and rightsholders to ensure an ethical and sustainable market transition and capacity building within the sector. Active leadership is needed to ensure that implementation of these recommended actions is done ethically and in the interest of those who have invested in the native plant sector for restoration.

Recommendation 2.1.1

Conduct a comprehensive native plant materials needs assessment for all levels of government, non-government, industry, and other large users of seed for restoration of ecosystems in collaboration with National Native Seed Strategy efforts and with an Indigenous-led parallel process.

PRIORITY: URGENT

Recommendation 2.1.2

Establish a tracking process for sales of native plant materials inclusive of both bulk and retail markets to inform reporting and statistics at a national level.

PRIORITY: NECESSARY

Recommendation 2.1.3

Engage all stakeholders and rightsholders in the development of the native plant supply chain through strategic planning to meet immediate demand for native seed.

PRIORITY: NECESSARY

44. Winterton, S., James, V., Mullally, S., Hall, A., Weber, S., and Kanter, M. Carolinian Canada Coalition. (2024). *The Economy of Hope: Growing Healthy Landscapes in the Greater Golden Horseshoe in Partnership with Native Plants*.

OBJECTIVE 2.2: Through coordinated effort, increase availability of cultural, ecological, and restoration focal species with locally adapted genetics for regional use.

This strategy aims to scale native seed supply for cultural and ecological restoration of a wide diversity of species and habitats. There is a strong need for coordination around focal species to establish seed needs in the near- and long-term. Key considerations for focal species include:

- species for Indigenous land stewardship and cultural restoration,
- key species to support local conservation programs,
- restoration workhorse species that perform well in early successional habitats and can be used broadly across the landscape, and
- species that support biodiversity and serve various ecological functions.

Restoration workhorse species are often common species that perform well in early successional habitats and can be utilized broadly across the landscape; however, to be inclusive of all species and habitats, a wide variety of species, including rare and species at risk, may be prioritized on an ecoregional basis.

Great care and consideration must be taken when working with species at risk, including adherence to the *Species at Risk Act* (SARA). Permits and authorizations can be required to collect, grow, and distribute these species in Ontario. Production of native plant materials for species at risk conservation should be done in accordance with recovery strategy actions or with Indigenous knowledge holders. All species at risk can be best supported through the prevention of further habitat loss and by improving habitat quality and connectivity through restoration of the landscape.

Native seed partnerships build local supply chains around coordinated actions for conservation and stewardship of species. Establishing regional communication pathways and partnerships will improve market coordination and enable long-term forecasting if all large users and producers of seed are actively participating. Connecting supply and demand helps to ensure the right species and genetics are available when needed. Collecting, growing, and planting seed locally can produce better restoration outcomes than non-local sources.

The identification of focal species is a useful tool to coordinate action for seed production in southern Ontario. This should include species conducive to ecological restoration and representative of regional habitat types that support wildlife, such as pollinators and birds, and culturally significant plants and medicines.

Indigenous communities may have unique interests and priorities for native seed stewardship on the landscape. These priorities must be reflected in the greater goals of the sector to support reconciliation through healing the landscape and supporting Indigenous food systems and ways of life.

"The birds, when they sing, they bring their songs from the south. When we hear those songs in the morning, it's medicine. It heals our minds and bodies."

KERDO DEER, ECOLOGICAL TEAM LEAD, KAYANASE

Recommendation 2.2.1

Identify focal species by region (ecoregion, ecodistrict, traditional territory) for scaling to meet restoration, cultural, stewardship, and green infrastructure goals.

PRIORITY: URGENT

Seed Mix Calculator for Restoration

Canadian Wildlife Federation has created a meadow restoration seed mix calculator to aid practitioners in formulating the appropriate seed mix for restoration by ecodistrict and site conditions. This resource includes reliability rankings for seed establishment and sourcing, two substitutions per species, a Monarch rank to assess a species potential at supporting pollinators and other insects, and seeding rates, weights, and rough costs.[45]

Recommendation 2.2.2

Utilize Native Seed Partnership frameworks to coordinate regional actions for focal species.

PRIORITY: NECESSARY

Native Plant and Seed Partnerships

The Institute of Applied Ecology coordinates three native plant and seed partnerships in the western United States. Stakeholders and rightsholders are brought together with the shared mission of building a reliable and affordable seed supply that can address landscape level goals. Each partnership has a regional focus and identifies target species to scale for restoration of local native habitats. Contracting mechanisms and planning tools are used to reduce risk and uncertainty in the region by establishing short- and long-term goals. Through these partnerships, local, sustainable seed supply chains are built that assist participants in building capacity and achieving desired restoration outcomes.[46]

45. Canadian Wildlife Federation. (2023, February 1). *Native Seed Calculator and Companion Guide*.
46. Institute for Applied Ecology. *Native Seed Partnerships*.

OBJECTIVE 2.3: Implement strategic cross-sector capacity building support for growers and producers.

This objective aims to scale local seed supply by establishing seed sources to support conservation and restoration goals. Seed orchards and seed production areas can provide a continuous supply of seed with known provenance.

Cross-sector collaboration and innovation are needed to scale native plant materials production capacity. An important step to increase participation in the native plant sector is to bridge gaps between agriculture, horticulture, and ecological restoration industries by incentivizing participation in native plant materials production.

The Ontario Native Plant Growers Association (ONPGA) was established to serve as a collective voice for native plant growers in Ontario. Capacity-building support is needed to help this group expand and participate as a leader in this sector.[47] Growers hold rich knowledge and expertise in growing native plants and are critical to developing an ethical and inclusive approach to scaling native seed.

Diverse and flexible investment is needed to support capacity building across the sector and must remove barriers for Indigenous people to participate. Traditional funding timelines often don't align with growing seasons and ecological timelines. Growing native plant materials and conducting ecological restoration require planning, sometimes up to several years in advance to account for production time. Multi-year planning, bulk native plant materials production, and long-term storage can alleviate supply constraints. Funding is needed to support these activities on appropriate timelines. Additionally, onerous application and reporting requirements reduce accessibility to all participants. Incentives would help to increase participation in the native plant materials sector and transition agriculture and horticulture sectors to support large-scale ethical native plant materials production.

To understand the magnitude of investment, further research is needed.

Recommendation 2.3.1

Establish cross-sector partnerships and supports to expand opportunities to grow native plants in the agriculture, horticulture, and ecological restoration sectors.

PRIORITY: URGENT

Ontario Agriculture Connections

Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) hosts *Specialty Cropportunities*, a program that assists growers who are interested in transitioning to production of new specialty or non-traditional crops. Programs that support innovation in agriculture can bridge the gap between conventional farming and opportunities to scale native seed supply.[48]

47. Winterton, S., James, V., Mullally, S., Hall, A., Weber, S., and Kanter, M. Carolinian Canada Coalition. (2024). *The Economy of Hope: Growing Healthy Landscapes in the Greater Golden Horseshoe in Partnership with Native Plants*. 48. Ontario Ministry of Agriculture, Food & Rural Affairs. *Specialty Cropportunities: A Resource for Specialty Crop Growers*.

Recommendation 2.3.2

Support the establishment of incentive programs to increase participation in the native plant materials sector and help transition agriculture and horticulture sectors to support large-scale ethical native plant materials production.

PRIORITY: NECESSARY

Native Plant Materials Development Program

By establishing and managing native seed orchards, the U.S. Bureau of Land Management's Native Plant Materials Development Program (NPMDP) is designed to ensure a sustainable supply of genetically diverse seed for restoration across the United States. The NPMDP collaborates with federal and state agencies, nonprofits, research institutions, and private sector partners, leveraging resources and funding to develop these orchards. Funding and investment opportunities are available through federal grants, partnerships with the U.S. Department of Agriculture's Natural Resources Conservation Service, and private sector contributions, providing critical support for the program's expansion and success in preserving biodiversity and restoring ecosystems.[49]

Recommendation 2.3.3

Support the expansion of the Ontario Native Plant Growers Association to enable active leadership for native plant and seed growers.

PRIORITY: NECESSARY

Ontario Native Plant Growers Association

The Ontario Native Plant Growers Association (ONPGA) is a network of nurseries and growers dedicated to the propagation and sale of native plant species in Ontario. The association plays a key role in supporting biodiversity and ecological restoration by connecting native plant growers with restoration projects, conservation initiatives, and landscapers across the province. ONPGA members prioritize sustainable growing practices and offer high-quality, source-identified native plants that are crucial for maintaining local ecosystems. Through education and shared expertise on species-specific needs and site considerations, the ONPGA helps enhance habitat restoration, strengthen climate resilience, and protect Ontario's natural heritage.

49. Bureau of Land Management. *Native Plant Materials Development Process*.

Recommendation 2.3.4

Identify funding and investment opportunities to support the development or expansion of native seed orchards and seed production areas.

PRIORITY: URGENT

Environmental Farm Plan

The Environmental Farm Plan (EFP) initiative, administered by the Ontario Soil and Crop Improvement Association (OSCIA), helps farmers enhance their environmental stewardship through tailored action plans and financial support for implementing ecological projects to improve soil health, water quality, and habitat restoration across Ontario farms. Expanding the program to specifically support the development of native seed orchards would leverage its established framework to address the growing need for native plant materials in restoration efforts. By providing additional funding and technical assistance for establishing and managing seed orchards, the EFP could further enhance biodiversity conservation, promote sustainable agriculture, and ensure a reliable supply of native seed for large-scale ecosystem restoration projects.[50]

Recommendation 2.3.5

Develop a business case for policy makers and industry users to support increased investment in the native plant sector.

PRIORITY: NECESSARY

Economy of Hope Report

The Economy of Hope: Growing Healthy Landscapes in the Greater Golden Horseshoe in Partnership with Native Plants[51] shows that in southern Ontario, where habitat loss is especially high, the native plant sector offers serious opportunity for investment and support to build a robust and ethical supply chain to meet healthy landscape restoration targets.

The report emphasizes the importance of grounding the growth of the sector in Indigenous leadership, as Indigenous Peoples have been stewards of the land since time immemorial, with the goal of reconciling peoples and ecosystems. The report concludes with 15 recommendations for actions to support the native plant economy and increase biodiversity protection and climate resilience.

50. Ontario Soil and Crop Improvement Association. *Environmental Farm Plan*. 51. Winterton, S., James, V., Mullally, S., Hall, A., Weber, S., and Kanter, M. Carolinian Canada Coalition. (2024). *The Economy of Hope: Growing Healthy Landscapes in the Greater Golden Horseshoe in Partnership with Native Plants*.

Common Milkweed. Photo: Amy Hall

Native flowers. Photo: Siobhan Mullally

GOAL 3

DEVELOP TOOLS THAT ALLOW COORDINATED, TIMELY, INFORMED ACTION FOR SEED CONSERVATION AND STEWARDSHIP IN SOUTHERN ONTARIO.

Tools are needed to assist all participants in the native plant sector to reduce risk and uncertainty, share information, and make informed decisions. Many tools currently exist across North America, such as seed tracking databases, decision support tools, and online marketplaces for connecting growers and buyers; however, few have been widely adopted for use in southern Ontario. Currently, there is a strong need for coordination and centralization of information to connect supply and demand, track native seed origins, and share knowledge and resources across the sector. Administrative tools like long-term contracts and agreements remove the risk that growers will be left holding stock they cannot sell. For example, many buyers seek species which require long lead times for production. In order to make these species available for restoration and retail sale, the grower is forced to shoulder the risk of investing in these species with no guarantee that the stock will be sold. Through the objectives and recommendations associated with this goal, we intend to identify existing tools for adoption or new tools to fill gaps.

OBJECTIVE 3.1: Develop a comprehensive regional training and certification program for practitioners in the sector.

Training is essential to ensure ethical standards throughout all stages of the native plant supply chain, which includes collectors, processors, growers, producers, and restoration practitioners. These standards protect ecosystems from exploitation and support practitioners by validating their knowledge and practices. Training and certification should enhance the good work already being done without creating barriers to participation.

Investment is needed to establish a comprehensive training program and support ongoing delivery. Current training and certification programs, primarily offered by NGOs, need sustained financial support to expand beyond their current focus on native trees and shrubs. Seed collectors, crucial to the native seed supply chain, have been historically undervalued in Ontario compared to other Canadian provinces. Their demanding work often pays unsustainable wages, and increasing financial support would enhance resource utilization and better track wild seed populations, protecting them from over-collection.[52]

Additionally, improving access to training and mentoring for all participants, particularly Indigenous people, is vital. Indigenous-led programs and the integration of Two-Eyed Seeing into existing programs can ensure equitable access and support.

52. Spearing, M., McPhee, D., and Loo, J. Natural Resources Canada, Canadian Forest Service, Atlantic Forestry Centre. (2023). *Sizing Canada's National Seed Supply Chain: Preliminary Assessment focused on Trees and Shrubs*. Interim Report. 35p.

Recommendation 3.1.1

Develop and sustain a multidisciplinary Two-Eyed Seeing training program led by industry experts, Indigenous knowledge holders, academic institutions, and others to certify sites and practitioners in alignment with ethical standards.

PRIORITY: URGENT

Recommendation 3.1.2

Establish a recognized seed collector program or adapt existing programs to include all native plant species and increase capacity for seed collection in southern Ontario.

PRIORITY: NECESSARY

Recommendation 3.1.3

Improve equitable access to training and mentorship programs, knowledge sharing, youth engagement opportunities, and job creation.

PRIORITY: URGENT

Ontario's Natural Selections Program

This voluntary certification program is managed by the Forest Gene Conservation Association (FGCA). It certifies plants and seed that are genetically diverse and locally adapted, ensuring their suitability for specific planting projects. The program recognizes and endorses practices and projects that contribute to the conservation and sustainable management of natural resources. Organizations, landowners, and businesses can achieve certification by demonstrating adherence to environmental standards related to biodiversity protection and habitat restoration. The certification acts as a mark of environmental stewardship and supports the promotion of sustainable practices by helping consumers select high-quality, locally adapted plant materials.

Certified Seed Collector Course

This course, offered by the Forest Gene Conservation Association (FGCA), trains participants in the collection, processing, and certification of seed from native tree species, focusing on preserving genetic diversity and supporting ecological restoration. Participants are certified to ensure adherence to high standards in seed handling, contributing to healthier and more resilient forests. This course has enabled local communities and conservationists, including Indigenous groups, to actively participate in sustainable forestry and biodiversity conservation efforts.

OBJECTIVE 3.2: Establish a certification and labelling system to certify products produced in compliance with ethical standards for collection, sale, and distribution.

Certification is needed for native plant materials to ensure seed sources can be tracked through the supply chain. Certifying native plant materials ensures ethical standards are utilized through the collection, handling, and distribution process of native plant materials. Labelling of certified products allows end users to make informed decisions about the native plant materials they are sourcing.

Currently, there is an identified need for the adaptation of, or increased access to, existing programs or the establishment of new programs to support training for:

- **Site certification**, which could include seed orchards and production areas established with source-identified seed. This provides assurance of seed origin and orchard management practices.
- **Practitioner certification**, which could include seed collectors (Forest Gene Conservation Association, National Tree Seed Centre), growers, producers (Canadian Seed Growers' Association), and restoration practitioners (Society for Ecological Restoration).

Coordination with seed and plant certification is essential to create a comprehensive system of accountability. Site certification ensures that restoration or conservation projects meet ecological standards, while practitioner certification verifies that individuals or organizations handling native plant materials follow wise practices. By aligning these certifications with seed and plant labelling, the entire process, from collection to planting, maintains transparency and ensures ethical and ecological integrity across the supply chain.

In The Zone Tag Program

Carolinian Canada, in partnership with WWF-Canada, developed the In the Zone (ITZ) native plant gardening program to promote biodiversity and restore habitat in southern Ontario. A key feature of the program is its native plant tag, created through a licensing agreement that includes six criteria covering native species, source-identification, ethical seed collection, genetic variation, pesticide restrictions, and rare species precautions. By linking these voluntary guidelines to a recognizable tag, the ITZ program helps consumers make informed choices while encouraging nurseries to adopt sustainable practices. This initiative supports the growth of the native plant economy while fostering resilient ecosystems in the Carolinian Zone. The program has created a tag to be used by native plant growers.

FIGURE 10

ITZ native plant tag.

Certification must not create barriers to participation that would further deepen inequity in the sector. There must be equitable access to training opportunities that are reflective of diverse perspectives, including Indigenous worldviews. Through analysis of existing certification programs, recommendations should be made to improve ethical space by increasing equity and access for Indigenous participants.

Incentivizing ethical sourcing practices could support native seed growers, encourage sustainable harvesting methods, increase Indigenous participation in the economy, and ensure biodiversity conservation. This approach not only promotes environmental stewardship but also aligns with broader goals of community engagement and equitable economic development within the native seed sector.

"Did you know that 8 of 10 consumers expect companies to ensure that their wood or paper products do not contribute to deforestation or damage wildlife habitats. And 76% of those consumers believe strongly in the importance of independent certification."

FOREST STEWARDSHIP COUNCIL (FSC)[53]

A certification system informed by ethical standards would allow buyers and users of seed to make informed decisions for ecological restoration. Existing standards should be expanded or reformed to ensure inclusion of diverse knowledge systems.

Ethical Standards include considerations for ecological impacts, genetic contributions, land access permissions, and sustainable harvest quantities to protect wild seed populations.

Existing standards for collectors, growers, and buyers in southern Ontario that can be adopted immediately include:

Herbaceous Plants

- Native Plant Grower Guidelines, Society of Ecological Restoration Ontario Chapter[54]
- Native Plant Buyers Guidelines, Society of Ecological Restoration Ontario Chapter[55]
- Guidelines for Commercial Native Plant Growers, North American Native Plant Society[56]
- Seeds of Success Technical Protocol, Bureau of Land Management[57]

Woody Plants

- Woody Plant Seed Collection Guidelines for a Changing Climate, Forest Gene Conservation Association[58]
- Ontario's Natural Selections Guidelines for Native Woody Species, Forest Gene Conservation Association[59]

It is recommended that all native plant materials sold and distributed in Ontario include clear labeling and information about seed origin to ensure transparency and ecological appropriateness. In southern Ontario, the adoption of existing minimum voluntary standards for native plant materials is encouraged, even without a formal certification program. Labels should be used now on a voluntary basis to provide important information for consumers and practitioners, acting as an interim solution until a certification system is fully established.

Existing standards that can be adopted immediately by collectors, growers, and buyers include ethical seed collection, proper documentation of provenance, maintenance of genetic diversity, and sustainable growing practices. These voluntary standards help ensure ecological integrity across the sector while certification programs are being developed.

53. Forest Stewardship Council (FSC). *FSC Certification*. 54. Society for Ecological Restoration - Ontario Chapter. (2010). *Native Plant Growers Guidelines*. 55. Society for Ecological Restoration - Ontario Chapter. (2010). *Native Plant Buyers Guidelines*. 56. North American Native Plant Society. *Guidelines for Commercial Native Plant Growers*. 57. Bureau of Land Management. (2015). *Technical Protocol for the Collection, Study, and Conservation of Seeds from Native Plant Species for Seeds of Success*. 58. Forest Gene Conservation Association. *Ontario's Natural Selections: Woody Plant Seed Collection Guidelines for a Changing Climate*. 59. Forest Gene Conservation Association. (2002). *Ontario's Natural Selections: Seed Source Certification Manual*.

Recommendation 3.2.1

Work in collaboration with the Canadian National Native Seed Strategy to implement an independent certification program to award certification and labelling for native plant materials.

PRIORITY: NECESSARY

Seeds of Success

The mission of the U.S. Bureau of Land Management's Seeds of Success (SOS) national native seed collection program is to collect wild seed for research, development, conservation, and restoration as part of the Native Plant Materials Development Program (NPMDP) to increase the quality and availability of native plant materials for restoration. Seed collections have been contributed from state, county, and municipal lands primarily across the western U.S. but spanning the entire country. SOS coordinates widescale seed collection through identifying priority habitats and target species to scale for restoration. Seed collectors work with local federal land managers and national coordinators to determine target species and coordinate seed collection efforts. The SOS program has established protocols and priorities to guide the program and deliver comprehensive training. Collections have been used for restoration, long-term storage, and biodiversity protection, which can allow for adaptive action to natural disasters.[60]

Recommendation 3.2.2

Investigate opportunities for subsidies on ethically sourced and produced products.

PRIORITY: BENEFICIAL

Recommendation 3.2.3

Work collaboratively to develop standards for the certification of source-identified native plant materials that prioritize ecological and genetic integrity without creating barriers for participation.

PRIORITY: URGENT

Recommendation 3.2.4

Create or adopt a voluntary source-identification label for use on all native plant materials.

PRIORITY: URGENT

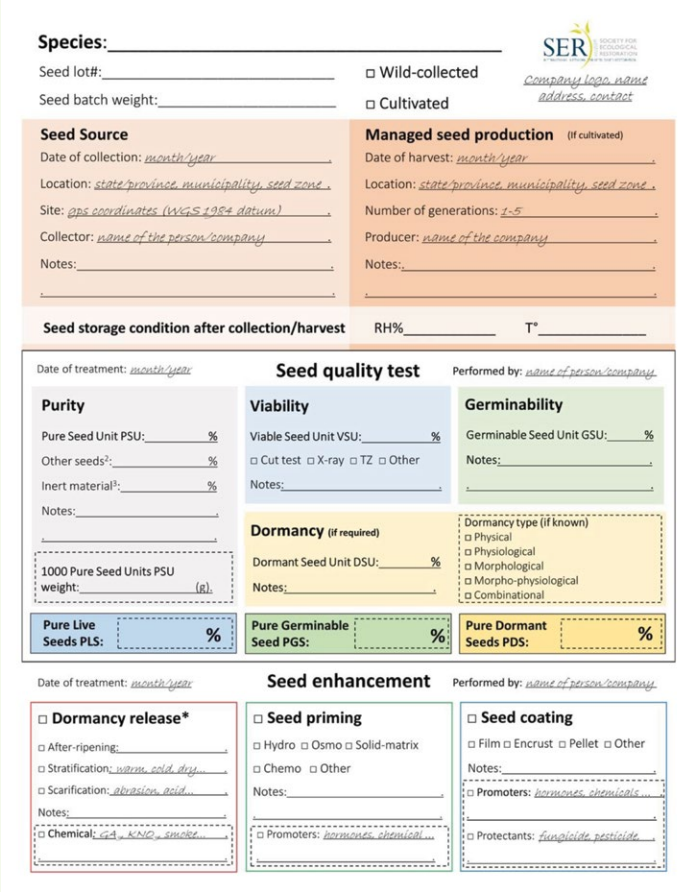
60. Barga, S. C., Olwell, P., Edwards, F., Prescott, L., and Leger, E. A. (2020, May 7). Seeds of Success: A conservation and restoration investment in the future of U.S. lands. *Conservation Science and Practice, 2*(7).

Society for Ecological Restoration Product Label

Adoption of all or part of the pro-forma label created by the Society for Ecological Restoration (SER) was recommended by the SOSS collective. This standardized tool is designed to provide essential information about ecological products, such as seed and plants. It includes details on the genetic diversity, local adaptation, and environmental benefits of the product, ensuring that consumers can make informed choices based on ecological integrity and sustainability.

FIGURE 11

SER pro-forma label template divided in three sections based on the seed supply chain key steps: Seed sourcing/provenance, seed quality testing, and seed enhancement.[61]



61. Pedrini, S. and Dixon, K.W. (2020). International principles and standards for native seeds in ecological restoration. *Restoration Ecology, 28: S286-S303.*

Certified Ecological Restoration Practitioner Program

The SOSS collective support the adoption of the Society for Ecological Restoration (SER) Certified Ecological Restoration Practitioner (CERP) label.[62]

The certification is designed to verify a practitioner's knowledge, skills, and experience in planning, implementing, and monitoring ecological restoration projects. The program includes various levels of certification based on experience and education and aims to establish high professional standards, promote ethical practices, and advance the field of ecological restoration. Certified practitioners are expected to adhere to SER's code of ethics and maintain their certification through continuing education.

OBJECTIVE 3.3: Establish a Native Plant Hub to coordinate guidelines, regionalize support for the growth of the native plant sector, and identify long-term needs and opportunities.

Tracking tools that are utilized broadly can provide information about genetic contributions at restored sites and track the outcomes of restoration efforts. Restoration wise practices can assist in planning for effective and diverse restoration outcomes.

A multi-sector collaborative hub is needed to centralize communications and support for the native plant sector. This hub should include information and resources for all participants in the native plant sector, including Indigenous communities, growers and producers, restoration practitioners, land stewards, industry sectors, nonprofits, economists, marketers, and others. This hub must utilize the expertise of many sectors to centralize resources and build the necessary tools to conduct long-term forecasting, regional coordination for seed-based restoration, and provide current wise practices. It is imperative to build this hub with Indigenous leaders to ensure that it is reflective of a Two-Eyed Seeing approach without exclusion, exploitation, or misuse of information.

Developing and sharing wise practices regarding seed storage, treatment, and viability and quality testing will allow for consistent practices and outcomes across the sector. Broad communication and coordination are needed to streamline processes for seed collection and restoration of sites and to protect wild seed sources.

Recommendation 3.3.1

Adopt or develop shared online tools to track restoration efforts and share wise practices for site- and species-specific considerations.

PRIORITY: NECESSARY

62. Society for Ecological Restoration. *Certified Ecological Restoration Practitioner (CERP) Program*.

In The Zone: Gardens that Help Wildlife Thrive

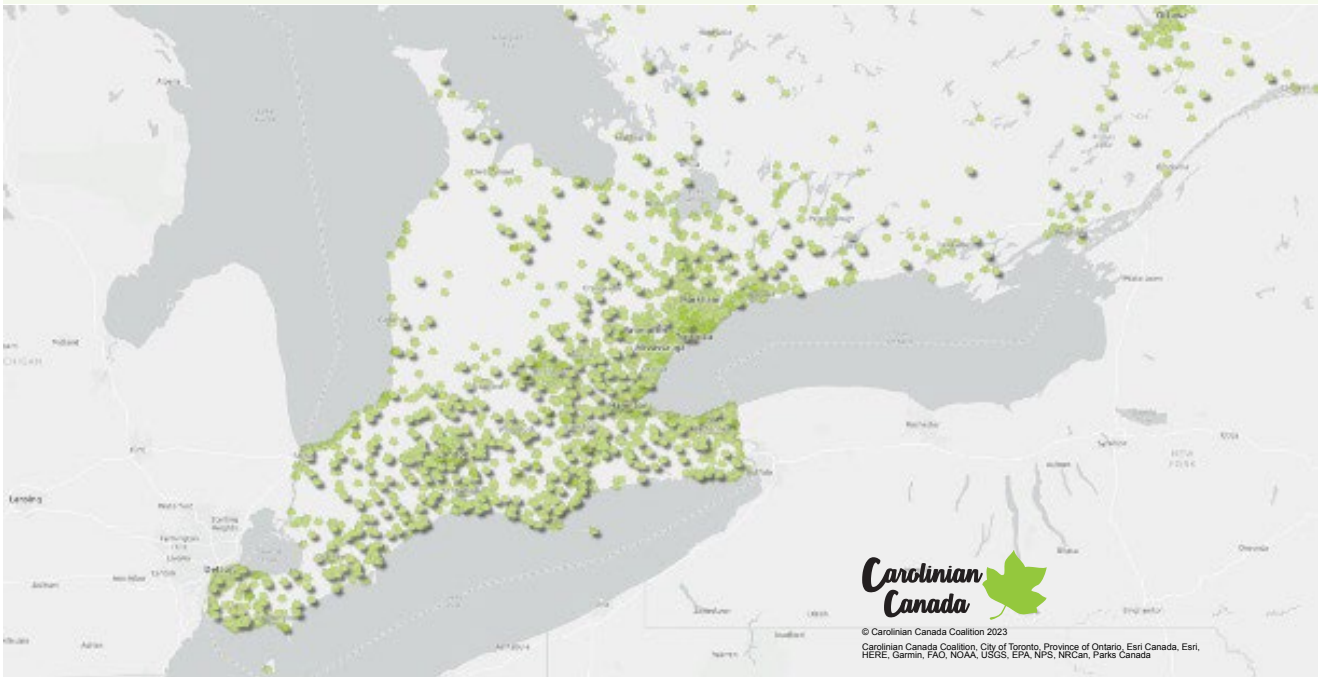
The In the Zone (ITZ) program was launched by Carolinian Canada and WWF-Canada in 2017. It has since registered over 7,000 properties across southern Ontario. This program could be further adapted to track restoration efforts by monitoring the progress of registered properties and collecting valuable data on habitat creation and species diversity. By sharing wise practices tailored to site- and species-specific considerations, the program serves as a vital resource for land stewards and restoration practitioners, offering guidance on how to maximize ecological impact while supporting biodiversity. The platform could also facilitate collaboration between participants, creating a network to exchange knowledge and strategies for successful restoration projects.

Key metrics from the ITZ participant survey include:

- The top three motivators for joining ITZ are providing habitat for wildlife, climate resilience, and the aesthetic appeal of the plants.
- A total of over 375,000 native plants have been added to properties.
- An average of 63 native plants have been added per property.
- 95% of participants intend to grow more native plants.
- On average, 44% of their annual garden budget is spent on native plants.
- 51% of plants in gardens are native species.
- On average, 33 different native species are planted per property.
- 35% of the property area is habitat with native plants.

FIGURE 12

In the Zone participant garden sites.



Restoration Database and Project Map

The Society for Ecological Restoration (SER) provides a searchable database of restoration projects from around the world intended to serve as a resource for practitioners, researchers, educators, students, and the public. Projects freely contributed by users are searchable on a comprehensive mapping tool. Currently, there has been limited use of the tool in southern Ontario, but this tool holds potential for piloting a program where certified restoration projects could be mapped to provide a record of restoration projects, wise practices, and seed origin.[63]

FIGURE 13

Restoration projects tracked in the SER database.[64]

Recommendation 3.3.2

Identify an online platform to host a Native Plant Hub that provides tools and resources for all producers and users throughout the native seed supply chain as well as opportunities for cross-cultural resource exchange.

PRIORITY: NECESSARY

63. Society for Ecological Restoration. *Restoration Database*. 64. Society for Ecological restoration. *Project Map*.

Information Hubs

Network for Nature hosts a comprehensive online library of native plant information for public use. This platform includes resources with varying levels of understanding to make informed decisions about regional species selection, information about local native plant suppliers, and site-specific consideration for all native species.[65]

The Society of Ecological Restoration hosts a membership platform that provides tools, information, and networking opportunities for restoration professionals and others interested in learning more. Paid membership provides access to restoration resources and emerging science and workshops and courses to further education and gain accreditations.[66]

Recommendation 3.3.3

Develop a comprehensive resource library to support the native plant materials sector in growing, collecting, treating, and storing a diversity of native seed.

PRIORITY: NECESSARY

Seed Mixes

The University of Northern Iowa hosts a tallgrass prairie seed mix tool that formulates seed mixes based on a variety of site and project conditions. This tool also contains useful information for restoration professionals to order and purchase seed.[67]

Optimizing Native Plant Selections for Pollinator Habitats

The Ecoregional Revegetation Application (ERA) Tool is a pollinator-friendly search-and-print nationwide revegetation mapping and plant database developed for designers as a starting point for developing appropriate plant palettes and seed mixes specific to a project site. The user-friendly online tool supports custom searches to identify and generate lists of the optimal native plant species for revegetation and pollinator habitats for individual ecoregions.[68]

65. Network of Nature. *Network of Nature*. 66. Society for Ecological Restoration. *Membership*. 67. University of Northern Iowa. *Tallgrass prairie seed calculator*. 68. U.S. Department of Transportation, Federal Highway Administration. *Ecoregional Revegetation Application*.

Recommendation 3.3.4

Develop or adopt mapping tools to connect seed practitioners with wild seed populations, streamline permissions and permits, and track seed collections to prevent over collection.

PRIORITY: NECESSARY

Ecotype Project

This project promotes collecting and propagating native seed within their ecoregion, ensuring ecological integrity and better survival rates for restoration efforts. It involves community education and collaboration with Indigenous groups to integrate Traditional Ecological Knowledge, fostering stewardship, sustainability, and strengthened community ties and providing a sustainable model for ecological restoration.[69]

Seed collection. Photo: Jennifer Nantais

69. Ecotype Project. *Northeast Seed Network Map*.

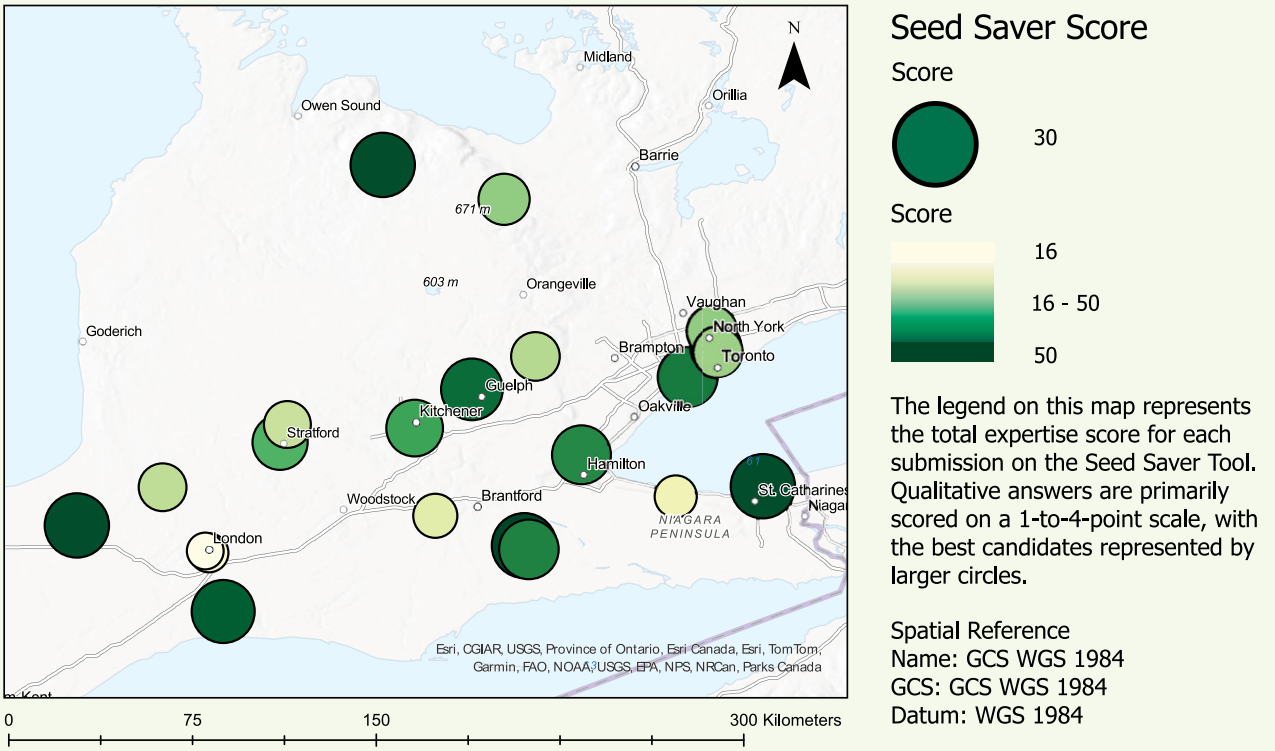
Southern Ontario Seed Saver Tool

The Southern Ontario Seed Saver Tool is a module designed by Carolinian Canada to help participants engage in native seed-saving activities by providing resources and supporting community building. After completing a survey, users receive a Seed Saver package with guidance on stewarding seed orchards or collection areas. Participants and potential stewards ranging from beginners to experts, are invited to join a network to share knowledge, explore wise practices, and develop partnerships. In 2024, the tool has supported 26 participants who are fostering interest in expanding seed orchards, scaling up native seed supply, and contributing to local markets.

The Seed Saver Tool map (Figure 14) indicates opportunities identified where the size of each circle corresponds to the participant's score in the tool. Higher scores reflect opportunities that are more developed and take less resources to start; however, all scores reflect valid opportunities to connect people with seed saving at different scales.

FIGURE 14

Opportunities identified through the Seed Saver Tool.[70]



70. Data property of Carolinian Canada Coalition, Powered by Esri. Base layer provided by Province of Ontario, Esri Canada, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, NRCan, Parks Canada.

OBJECTIVE 3.4: Increase capacity for seed storage and distribution in southern Ontario.

Southern Ontario lacks sufficient public infrastructure to support the native seed supply chain, with varying capacities across regions. There are no provincial seed warehouses or facilities for native seed storage, hindering scalability. To address this, identifying or developing such facilities is crucial.

Ecodistricts, currently used for tree seed transfer zones, should be adopted consistently for herbaceous species in southern Ontario to ensure coordination. Further research is needed to shape seed transfer policies that proactively address climate change and assisted migration. A comprehensive analysis would allow for coordinated long-term action for native seed in southern Ontario.

Recommendation 3.4.1

Assess the current capacity for seed production, cleaning, treatment, and storage in southern Ontario.

PRIORITY: URGENT

Recommendation 3.4.2

Identify opportunities to expand public seed storage capacity in southern Ontario.

PRIORITY: NECESSARY

Recommendation 3.4.3

Adopt Ontario ecodistricts as seed transfer zones for use with herbaceous species.

PRIORITY: NECESSARY

Plant sale. Photo: Michelle Kanter

GOAL 4

Red Trillium. Photo: Michelle Kanter

DEVELOP STRATEGIES FOR WIDESPREAD USE AND ADOPTION OF NATIVE PLANTS WITHIN CONSUMER, INDUSTRY, AND POLICY SECTORS.

Successful implementation of the SOSS requires the broad cooperation of governments, funders, industry, and the public. Scaling a native seed supply chain requires cross-sector cooperation and coordination, government support and funding, and public interest. Strong education and marketing strategies can bridge gaps in understanding and help position native plants as a solution to environmental, economic, and ethical problems.

The private sector plays an important role in an industry shift to native plants. Energy, development, and extraction sectors require large quantities of native plant materials for restoration of impacted sites. Additionally, many of these projects, including restoration, may be planned several years in advance allowing appropriate lead time for native plant producers to fulfill contracts. Mining and mineral reclamation and rights-of-way are key examples of industry and private sector projects that create demand for native plant materials.

"Without plants there is no life. We need to rewrite the plant narratives to bring plants front and center. For this, we need to craft new approaches to attract the next generation to the plant sciences."

SARADA KRISHNAN, DIRECTOR OF HORTICULTURE AND CENTER FOR GLOBAL INITIATIVES, DENVER BOTANIC GARDENS[71]

OBJECTIVE 4.1: Establish source-identification practices for ethically collected native seed as the industry standard.

This objective aims to increase broad understanding of ethical, ecological, and genetic considerations for native plant materials used in restoration. Source-identification is critical for users across sectors to make informed decisions about seed sources and their appropriate uses. Source-identification and ethical collection practices should be a minimum standard for native plant materials for ecological restoration in southern Ontario. Also, consumers in retail markets should have access to product information, enabling them to make responsible, well-informed choices.

Certifying products based on ethical criteria will create an industry standard and promote wise practices for producers. Promotion of certified products informs consumers of wise practices and standards and allows the end user to make informed decisions.

71. The University of British Columbia Botanical Garden. *To Save Biodiversity and Feed the Future, First Cure "Plant Blindness."*

Recommendation 4.1.1

Increase visibility of the native plant sector within government, industry, and the public to improve understanding of ethically sourced and produced native plant materials and how to access them.

PRIORITY: NECESSARY

OBJECTIVE 4.2: Develop communication tools to increase public and cross-sector awareness and perception of native plants.

Native plants play a critical role in every sector and on every scale. They hold rich opportunities for green economic growth, job creation, and cross-sector collaboration and innovation. Widescale outreach is needed to bridge gaps between sectors and to increase understanding of native plants and the solutions they hold.

"Unfortunately, we're losing species faster than we can study and account for them… plant extinction should not be an option, and public education is key."

TARA MOREAU, ASSOCIATE DIRECTOR, UNIVERSITY OF BRITISH COLUMBIA BOTANICAL GARDEN[72]

Local targeted outreach programs can connect communities with the natural world around them and increase the visibility of native plants that support local wildlife and ecosystem services. Plant blindness has resulted in a critical undervaluation and misunderstanding of plants in our society. Plant blindness refers to the tendency to overlook plants in the environment, underestimating their importance and diversity. This term highlights the general lack of awareness and appreciation of distinct species and for the critical role plants play in ecosystems by providing oxygen, food, and habitat that sustains all life. Consequently, society has failed to adequately recognize the need for plant conservation, restoration, education, and research.

The *Economy of Hope* report identified three main native plant markets in southern Ontario: restoration, retail, and specialty. These markets represent an enormous long-term opportunity that justifies investment in the growth of the native plant sector.[73] The establishment of regional native plant partnerships could provide a useful tool for local outreach.

72. Ibid. 73. Winterton, S., James, V., Mullally, S., Hall, A., Weber, S., and Kanter, M. Carolinian Canada Coalition. (2024). *The Economy of Hope: Growing Healthy Landscapes in the Greater Golden Horseshoe in Partnership with Native Plants*.

Recommendation 4.2.1

Develop and implement targeted outreach strategies to engage diverse audiences, including public and industry groups, to raise the profile of native plants and communicate their role in achieving regional, national, and global targets.

PRIORITY: URGENT

Recommendation 4.2.2

Conduct outreach to the horticulture sector to prevent sale of invasive plants and promote native plants.

PRIORITY: NECESSARY

Action Against Harmful Plants

There has been a growing movement among plant nurseries and garden centres to voluntarily refuse to sell plants that are known to invade and out compete native species as well as any varieties listed on the Ontario Invasive Species List.[74] These commitments have been driven by customer feedback and effective outreach, leading to increased demand for Ontario native plants. To build on this momentum, continued and expanded outreach efforts are crucial. Some commonly sold invasive garden plants being targeted include:

- Lily of the Valley (*Convallaria majalis*)
- Periwinkle (*Vinca minor or Vinca major*)
- Orange Daylily (*Hemerocallis fulva*)
- Yellow Archangel (*Lamiastrum galeobdolon*)
- Bugleweed (*Ajuga reptans*)

OBJECTIVE 4.3: Strengthen and/or create policies that support the use of native plant materials across the landscape.

While there are currently no federal or provincial policies mandating the use of local and ethically collected source-identified native seed in ecological restoration and green infrastructure projects, some municipal standards, such as the Toronto Green Standard, require the use of native plants from identified ecodistricts. The absence of comprehensive guidelines and the limited availability of native seed often result in the use of non-native and non-local plant materials in restoration efforts. These alternatives lack the appropriate genetic characteristics for the local environment, leading to less effective restoration and biodiversity outcomes. Implementing policies that require the use of genetically appropriate native seed can help stabilize the supply chain, identify gaps in seed availability, and establish ecological and ethical standards for seed-based restoration in southern Ontario.

74. Ontario Invasive Plant Council. *Species*.

Policies that are prohibitive to long-term contracting and purchasing of native plant materials should be amended to include multi-year contracts and group buying opportunities to increase coordination and assurance for growers. Long-term contracts allow growers to plan accordingly to deliver the desired species and quantities of seed. They also allow for end users to be assured of delivery year-over-year to fulfill their planting or restoration targets. Currently, there are few examples of long-term contracts being used for bulk seed or other native plant materials in southern Ontario.

A detailed policy analysis is needed to understand inclusive and effective approaches to integrating native plants into government policies at all levels. These policies must align with an ethical framework for native plants and consider the current capacity of the native plant materials supply chain.

Government adoption of supportive native seed policies could stabilize the sector by establishing standards for native plant materials production and providing assurance of demand. As large users of seed, both directly and indirectly, governments should invest in the sustainable scaling of the native seed supply chain in southern Ontario to ensure seed availability for restoration and green infrastructure projects.

Remaining wild seed sources are critical to support the scaling of source-identified native seed. The best way to protect native seed and habitat is to halt further habitat loss and safeguard local genetics. It is essential to preserve local genetic characteristics of plant and seed populations. Access to wild seed populations is a barrier for seed collectors and for the scaling of local native genotypes.

A common practice among seed collectors is to conduct plant rescues if they see a wild plant population doomed by a new development project. Government policies should also require developers to create an inventory of native plants at risk due to development and provide advanced notification to seed collectors and growers to allow for adequate collection before the plants are impacted.

"As demand for locally grown plants, shrubs, and trees across the GGH increases to address the crises of biodiversity loss and climate change, the need for a consistent, plentiful, and diverse supply of locally sourced and ethically collected seed ranks as an urgent priority. A lack of seed is affecting the ability to scale activity effectively and to produce the spectrum of native plants that would historically occur on a healthy landscape."

CAROLINIAN CANADA, ECONOMY OF HOPE

Recommendation 4.3.1

Conduct a multi-level government policy analysis to identify effective policies that support the native plant materials sector and address gaps in policies that create barriers to growth.

PRIORITY: BENEFICIAL

Recommendation 4.3.2

Engage all levels of government to adopt policies that support the use of genetically appropriate native plant materials, e.g., for new and existing projects, such as transportation corridors, urban development, utility corridors, and mining reclamation projects.

PRIORITY: URGENT

Toronto Green Development Standards

The City of Toronto introduced Green Development Standards that require development projects to "plant the at-grade landscaped site area using a minimum of 50% native plants (including trees, shrubs and herbaceous plants) comprising at least two native flowering species that provide continuous bloom throughout all periods over the growing season."[75] The City of Toronto has taken an important step implementing these standards and leading the way for municipalities in southern Ontario; however, challenges have arisen at the local seed supply.

Recommendation 4.3.3

Develop policies that protect remaining wild seed populations from development in ecologically sensitive locations.

PRIORITY: NECESSARY

Recommendation 4.3.4

Develop policies that promote soil and seed bank salvaging from development projects that impact remnant native plant populations and genetics.

PRIORITY: NECESSARY

75. City of Toronto. (2022). *Toronto Green Standard: Version 4*.

Sundial Lupine. Photo: Amy Hall

GOAL 5

IDENTIFY TWO-EYED SEEING KNOWLEDGE NEEDS TO INFORM AND SUPPORT A NATIVE SEED SUPPLY CHAIN FOR RESTORATION.

Seed grown for ecological restoration must be appropriate for the landscape that they are restoring. Policies and guidelines that uphold ecological and genetic integrity must be informed by research that seeks to better understand the genetic composition of the landscape. Regional guidelines exist to inform seed action; however, some identified gaps remain. Ongoing research must include Indigenous Knowledge to ensure comprehensive understanding and application.

Increasing the quantity and diversity of genetically appropriate and ethically sourced native seed for restoration and other markets will benefit from a comprehensive understanding of complex systems and sectors. Native seed supply chains have been successfully established in regions throughout the world, but each region holds a unique collection of social, economic, political, and ecological characteristics. To scale seed responsibly and effectively, a greater understanding of these characteristics is needed.

The impact of climate change on species distributions, genetic diversity, and ecosystem functionality has already been observed, and future impacts are difficult to predict. Research gaps include understanding how climate change affects the phenology (seasonal behaviours), physiology, and adaptive capacities of different species. This is crucial for developing climate-resilient restoration practices and selecting species and seed sources that can withstand changing environmental conditions. Studies should investigate the migration patterns, genetic variation, and resilience of species under varying climate change scenarios.

Research on ecological restoration often disproportionately focuses on tree species due to their perceived importance in ecosystem services and carbon sequestration; however, non-tree species, such as shrubs, grasses, forbs, and other understorey plants, are equally critical for biodiversity, soil health, and ecosystem stability. Filling these research gaps will lead to more holistic and effective restoration strategies that integrate the contributions of both tree and non-tree species to ecosystem health and resilience.

OBJECTIVE 5.1: Identify key research topics and gaps for further investigation including Indigenous and Western science priorities.

Research and knowledge sharing are critical to our understanding of the natural world. Although much is known about native plants in this region, further exploration is needed to ensure the best ethical and ecological approaches to seed stewardship in southern Ontario. Some key topics identified included Indigenous-led research priorities, climate change impacts, and others with a focus on plant propagation, land restoration, and market strategies including:

- Seed sovereignty
- Language of plants
- Propagation challenges
- Climate-adapted seed sources
- Genetic variability
- Collection timing
- Growing requirements
- Harvesting and cleaning
- Quality and viability
- Predictive models
- Site preparation and seeding practices
- Invasive species control
- Soil health and restoration
- Market dynamics
- Assisted migration for all species

Historically, Indigenous knowledge and perspectives have largely been excluded from Western science approaches to seed conservation. Prioritizing Indigenous goals and values is necessary to bridging this gap and improving ethical space in the sector. It is critical to support the priorities of Indigenous communities to share and document Traditional Knowledge within Indigenous spaces. It is also important to support opportunities for cross-cultural sharing and learning together. This process should be led by Indigenous people and communities with support from all sector participants.

The effects of climate change are already playing out in southern Ontario and the full impact on native plants is not completely understood. Assisted migration has been more heavily studied for tree species, but gaps exist for herbaceous species in eastern North America. Further investigation into seed transfer zones and assisted migration practices is needed to guide approaches in southern Ontario.

Proper protocols and procedures for the collection and handling of native seed can have significant implications on viability. Scaling seed for a diversity of species requires specific species information. For some hard to propagate species, appropriate guidelines can reduce seed waste. The development of protocols should be inclusive of both Indigenous and Western knowledge.

Recommendation 5.1.1

Identify opportunities to integrate Indigenous Knowledge into existing resources or to develop new and additional Two-Eyed Seeing resources in ethical space.

PRIORITY: NECESSARY

Recommendation 5.1.2

Collaborate to support genetic variability research to delineate seed transfer policies and develop wise practices regarding assisted migration for herbaceous plant materials.

PRIORITY: NECESSARY

Recommendation 5.1.3

Support development of resources to fill information gaps regarding the collection, propagation, and storage of all focal species, including hard to propagate species.

PRIORITY: BENEFICIAL

OBJECTIVE 5.2: Research the establishment and strategic use of climate-adapted seed sources to support biodiversity and ecosystem resilience in response to climate change.

Developing climate-adapted tree seed sources from areas identified through research and established partnerships may prove crucial as climate change threatens to disrupt local ecosystems. Local species and populations that once thrived under specific conditions may no longer be best suited to changing environments, necessitating the investigation of seed sources from regions more closely suited to projected future climates. Reliable access to high quality, genetically diverse seed from zones in Canada and the United States is currently not available. While assisted migration has emerged as a potential strategy to address these challenges, it remains a controversial topic due to ecological, ethical, and management considerations. Therefore, focusing on researching and identifying potential seed sources and species selections can guide wise practices and decision making toward a proactive approach to enhancing biodiversity and ecological resilience.

Assisted Migration is the intentional human-aided movement of plants to more suitable habitats in response to climate change. This approach helps species adapt to rapid environmental shifts that outpace natural dispersal. It involves modifying seed transfer guidelines to source seed or plant material from known regions, typically warmer, and planting them in areas projected to have similar climates in the future, based on climate predictions.[76]

76. Natural Resources Canada. *Assisted migration*.

Scaling up seed supply is essential to meet the increasing demand for climate-adapted tree species. Once suitable seeds are identified, expanding infrastructure for propagation and cultivation becomes crucial to ensure a sufficient supply. This includes establishing seed production areas, increasing nursery capacity and storage, and fostering partnerships with Indigenous communities, local land stewards, and growers. By building capacity for seed production, we can support large-scale restoration efforts that enhance ecosystem resilience in an uncertain climate future.

Researching source regions, building partnerships, and focusing on herbaceous species are essential for supporting pollinators, diverse habitats, and resilient ecosystems. Identifying climate-adapted herbaceous populations and species and assessing their potential across different ecodistricts are critical to preserving and enhancing biodiversity. Collaborating with academic institutions, Indigenous seed keepers, and conservation organizations will enable joint research and seed production efforts, ensuring both trees and herbaceous species can thrive in future climates, thereby contributing to ecosystem stability.

Recommendation 5.2.1

Investigate potential sources from adjacent ecodistricts and seed zones aligned with future climate projections to ensure access to climate-resilient species.

PRIORITY: URGENT

Recommendation 5.2.2

Invest in seed collection, storage, and distribution infrastructure to address shortages and ensure a reliable supply of native climate-adapted tree seed.

PRIORITY: NECESSARY

Recommendation 5.2.3

Conduct collaborative research to assess existing Indigenous and Western knowledge and practices of assisted migration for all native plant species and identify gaps for additional research.

PRIORITY: URGENT

OBJECTIVE 5.3: Report on Southern Ontario Seed Strategy progress, identify achievements, opportunities, and gaps, and revise the strategy.

A Southern Ontario Seed Strategy steering committee should be established and include Indigenous and Western perspectives to further the goals and recommendations determined by the SOSS collective. Strong leadership will be critical to facilitate the successful implementation of this strategy.

The SOSS is meant to be an evolving strategy that learns and improves through experience. Adaptive management is necessary to reflect progress, identify opportunities, and address gaps and barriers. Revisions may happen on a rolling basis or at minimum in five-year intervals.

Recommendation 5.3.1

Establish a SOSS implementation steering committee to assess progress, identify priorities, and share outcomes broadly.

PRIORITY: URGENT

Recommendation 5.3.2

Review and revise the strategy regularly or as needed.

PRIORITY: NECESSARY

Dutchman's Breeches. Photo: Amy Hall

Citations

Jack-in-the-pulpit. Photo: Amy Hall

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Bloodroot. Photo: Amy Hall

Glossary

Assisted migration is the intentional human-aided movement of plants to more suitable habitats in response to climate change. This approach helps species adapt to rapid environmental shifts that outpace natural dispersal. It involves modifying seed transfer guidelines to source seed or plant material from known regions, typically warmer, and planting them in areas projected to have similar climates in the future, based on climate predictions.

Chain of custody ensures transparency and integrity of seed through meticulous documentation of collection, processing, storage, certification, and tracking, adhering to ethical guidelines and legal compliance to maintain seed viability and authenticity.

Co-creation is a collaborative process where multiple stakeholders, rightsholders, communities, organizations, or individuals work together to design and implement a project, product, or solution, integrating diverse perspectives and shared decision-making to achieve mutually beneficial outcomes.

Ecodistricts are ecosystem boundaries distinguished by physiographic differences (e.g., geology, geomorphology, patterns of relief, substrate parent material) and microclimate and by the successional trends exhibited by the predominant vegetation type on those physiographic features. In contrast, ecoregions are larger than ecodistricts and are characterized by climate patterns only.[77]

Ecosystem services refer to the benefits provided by natural systems to support human life and well-being, including services such as clean air and water, pollination, climate regulation, and recreational opportunities.

Ethically collected seed refers to seed obtained, produced, or distributed in a manner that prioritizes environmental sustainability, genetic diversity, and biodiversity preservation. This includes a critical focus on quantity, with no more than 10% of seed being harvested from any wild population to ensure the long-term viability of the wild population.[78] Additionally, it emphasizes respect for Indigenous seed systems, local communities, and cultures, along with fair treatment of workers, support for small-scale growers, and transparency throughout the supply chain.

Ethical space is a conceptual framework where different worldviews, values, and knowledge systems, such as Indigenous and Western perspectives, can engage in dialogue and collaboration on equal terms, respecting each other's integrity and differences.

Focal species are those chosen to represent the needs of larger sets of species within an ecosystem, helping to streamline conservation efforts and resource allocation.[79]

Genetic diversity is "the genetic variation present in a population or species."[80]

Habitats are areas that provide organisms, including plants and animals, with the necessities of life, and identify ways in which a local habitat provides these necessities.

77. Crins, W. J., Gray, P. A., Uhlig, P. W. C., and Wester, M. C. (2009). The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions. Ontario Ministry of Natural Resources, Peterborough Ontario, Inventory, Monitoring and Assessment, SIB TER IMA TR- 01, 71pp. 78. North American Native Plant Society. *Seed Collecting and Saving*. 79. Noss, R. F. (1990). Indicators for monitoring biodiversity: A hierarchical approach. *Conservation Biology*, 4(4), 355-364. 80. Canadian Forest Service. *Forestry Glossary*.

Healthy landscapes refer to ecosystems that are diverse, resilient, and able to sustainably support both wildlife and human communities. These areas integrate native plants and habitats to promote biodiversity and ecological functions in harmony with existing land uses, local community needs, regional climate strategies, and environmental, economic, and cultural benefits.

Indigenous-led means initiatives, projects, or decision-making processes that are guided and directed by Indigenous individuals or communities, ensuring their knowledge, priorities, and leadership are central to the planning and implementation.

Invasive species are plants, animals, and micro-organisms that are found outside of their natural range, and whose presence poses a threat to environmental health, the economy, or society.[81]

Local adaptation is the process by which plant populations develop specific traits that enhance their survival and reproduction in their unique environmental conditions, driven by natural selection and genetic variation.

Local seed is seed collected from the vicinity of a planting site. In this document, local seed refers to seed collected from the seed zone or ecodistrict in which the future planting site is located; non-local seed is that collected from another seed zone or ecodistrict.[82]

Native plants are indigenous terrestrial and aquatic species that have evolved and occur naturally in a particular region, ecosystem, or habitat. Species native to North America are generally recognized as those occurring on the continent prior to European settlement. Native plant species represent a number of different life forms, including conifer trees, hardwood trees and shrubs, grasses, forbs, and others.[83]

Native plant communities are recurring assemblages of native plant species associated with local substrates and natural dynamic processes. Their composition varies in space and time in response to changes in climate and species dispersal.[84]

Native plant growers cultivate native plants for purposes such as conservation, landscaping, or restoration projects with a focus on growing plants from seed or cuttings in a controlled environment to ensure they thrive when replanted in their natural habitat.

Native plant materials refer to seed, cuttings, and plants that can be used and produced to support ecological restoration efforts.

Native plant producers include native plant growers and those involved in seed collection, propagation, marketing, distribution, and selling native plants to nurseries, landscapers, or customers.

Nature-smart climate solutions are strategies that leverage natural systems and biodiversity to address climate change, such as restoring ecosystems, protecting wildlife habitats, and using native species for carbon sequestration. These solutions enhance resilience while benefiting both the environment and human communities.

81. Ontario Invasive Plant Council. *Species*. 82. Ontario Ministry of Natural Resources. (2020). *Ontario Tree Seed Transfer Policy*. 83. Plant Conservation Alliance. (2015). *National Seed Strategy for Rehabilitation and Restoration, 2015-2020*. Washington, DC: U.S. Department of the Interior, Bureau of Land Management. 84. Ibid

Plant autonomy recognizes plants as beings with agency within ecosystems that can regulate and independently perform biological processes such as growth, development, reproduction, adaptation to surroundings, and maintain essential life functions without external control, guidance or intervention from humans or other organisms.

Plant blindness is the tendency of people to overlook the importance and diversity of plants in their environment, leading to a lack of awareness about their critical ecological roles, conservation needs, and contributions to human well-being.

Protocols are standardized methods containing detailed steps.[85]

Provenance "refers to the geographical location of natural forest within the natural range of a species where seed is collected."[86]

Reconciliation is the process of building respectful relationships between Indigenous and non-Indigenous communities by addressing historical injustices and promoting mutual understanding. It involves acknowledging Indigenous rights and knowledge while fostering collaboration toward equitable futures.

Restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.[87]

Rightsholders are individuals or groups entitled to specific rights regarding resources, knowledge, or cultural heritage, particularly emphasizing the rights of Indigenous Peoples to their land and cultural practices. This term highlights the importance of their involvement in decision-making processes that affect their rights and resources.

Safe space is an environment where individuals feel respected, supported, and free from discrimination, judgment, or harassment, allowing them to express themselves without fear of harm or intimidation.

Seed banks are place[s] where seeds are stored to preserve genetic diversity for the future.[88]

Seed collection areas are sites where seed may be collected.[89]

Seed keepers are vital stewards of biodiversity and cultural heritage, preserving native plant seeds and the traditional knowledge tied to them. They play a key role in maintaining genetic diversity, protecting local ecosystems, and supporting food sovereignty.

Seed orchards are managed areas used for growing, harvesting, and tracking native plant seeds.

Seed production area are areas where native plants of known seed source are grown to produce seed. This can be done using a horticultural type method or as part of a mixed biodiversity planting.[90]

85. Ibid 86. White, T.L., W.T. Adams and D.B. Neale. 2007. Forest Genetics. CABI Publishing, Wallingford, UK. 682 p.
87. Plant Conservation Alliance. (2015). *National Seed Strategy for Rehabilitation and Restoration, 2015-2020*. Washington, DC: U.S. Department of the Interior, Bureau of Land Management. 88. Gosling, R. (December 2, 2020). *What is a seed bank, how does it work, and why is it important?* Woodland Trust. https://www.woodlandtrust.org.uk/blog/2020/12/what-is-a-seed-bank/ 89. Ibid
90. Greening Australia Capital Region. *Introducing Seed Production Areas: An Answer to Native Seed Shortages*.

Seed source is "the geographic location where seed is collected. Seed source may or may not be the same as provenance, depending on whether the seed collection location is the natural origin or secondary plantations."[91]

Seed transfer area is a location where seed or planting stock can be deployed as defined by an Ontario ecodistrict[92] or a zone from the former seed zones of Ontario.[93]

Seed zone refers to "areas of similar climatic and elevation conditions, used to specify where tree seed was collected and where trees from such seed are most likely to be successfully grown."[94]

Seventh Generation Principle prioritizes the well-being of future generations over immediate gains. This holistic approach fosters sustainability and long-term thinking by emphasizing that decisions made today should consider the impact on the next seven generations. This philosophy, rooted in the Great Law of the Haudenosaunee Confederacy, underscores the importance of ensuring that our actions today benefit future generations in terms of environmental stewardship, resource management, and relationship building.

Source-identified seeds are traceable back to their specific origin or source. This designation ensures transparency and allows for the tracking of genetic lineage, cultivation practices, and potential environmental exposures, providing valuable information about seed characteristics, provenance, and considerations for their successful growth and use.

Species refers to "a group of closely related organisms that are very similar to each other and are usually capable of interbreeding and producing fertile offspring. The species is the fundamental category of taxonomic classification, ranking below a genus or subgenus."[95]

Stakeholders are individuals, organizations, and intergovernmental partners who are involved in or contribute valuable knowledge and support for implementing the actions outlined in this Strategy or who may be directly or indirectly impacted by the actions of the Strategy. Those who have an interest in the Strategy's outcome.[96] ***Indigenous Peoples are not stakeholders*** (see "Rightsholders").

Stewardship is the responsible management and care of land, water or ecosystems, ensuring their sustainability and well-being for future generations through conservation, protection, and thoughtful use.

Traditional territories describe the ancestral and contemporary connections of Indigenous Peoples to a geographical area. Territories may be defined by kinship ties, occupation, seasonal travel routes, trade networks, management of resources, and cultural and linguistic connections to place.[97]

91. Zobel, B. and J. Talbert. Applied Forest Tree Improvement. 1984. The Blackburn Press. Caldwell, NJ, USA. 505 p. 92. Crins, W. J., Gray, P. A., Uhlig, P. W. C., and Wester, M. C. (2009). The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions. Ontario Ministry of Natural Resources, Peterborough Ontario, Inventory, Monitoring and Assessment, SIB TER IMA TR- 01, 71pp. 93. Ontario Ministry of Natural Resources. (2010). Seed Zones of Ontario. Ontario Ministry of Natural Resources, Forest Management Directives and Procedures, Forest Health and Silviculture Directive For 06 02 01. 94. Ontario Ministry of Natural Resources. (2000). A Silvicultural Guide to Managing Southern Ontario Forests. Ontario Ministry of Natural Resources, Toronto, ON. 661 p. 95. Editors of the American Heritage Dictionaries. (2016). American Heritage Dictionary of the English Language, Fifth Edition. Houghton Mifflin Harcourt Publishing Company. 2112 pp. 96. Plant Conservation Alliance. (2015). *National Seed Strategy for Rehabilitation and Restoration, 2015-2020*. Washington, DC: U.S. Department of the Interior, Bureau of Land Management. 97. Malone, M. and Chisholm, L. (July 5, 2016). Indigenous Territory. The Canadian Encyclopedia.

Wise practices are informed, context-sensitive approaches to prioritize sustainability, ecological integrity, and ethical considerations, and involve using local knowledge and scientific research to make decisions that support biodiversity, soil health, and ecosystem resilience.

Workhorse species are species that are locally adapted native plants that are abundant across a wide range of ecological settings, establish quickly, and produce high ground cover on disturbed sites.[98]

Switchgrass. Photo: Siobhan Mullally

98. Plant Conservation Alliance. (2015). *National Seed Strategy for Rehabilitation and Restoration, 2015-2020*. Washington, DC: U.S. Department of the Interior, Bureau of Land Management.

Appendices

Monarch Butterfly. Photo: Jennifer Nantais

A. Approaches to Working Together

Monthly Collective Meetings

Monthly SOSS meetings, which took place from 2021-2023, were critical to the SOSS development process. These meetings assembled stakeholders and rightsholders to share knowledge, develop goals and recommendations, and create a Two-Eyed Seeing strategy for the region that all could stand behind. These meetings helped build new relationships, strengthen old ones, and ensure that all voices are heard, including all living beings and the land itself.

Working in Ethical Space

The formation of the SOSS collective involved setting intentions and guidelines to support the strategy development process. All SOSS Collective activities and participants agreed to abide by Safe Space Guidelines[99/100].

- Address the issue not the person
- Lean into discomfort
- Be respectful of others - on their terms
- Expect and accept non-closure
- Acknowledge we are all on a journey and part of the journey is growth
- Show up with humility and empathy even if opinions differ
- Be patient and accountable to one another to ultimately build trust with one another
- Confidentiality: What's said here stays here, what's learned here leaves here.

Braiding Knowledge Connection Exercises

In 2023, the collective participated in a series of exercises to tap into our connection with native plants by stepping out of the Western science framework and integrating a holistic approach to our restoration goals and relationships across the sector.

1. How We Connect to Native Plants

In April of 2023 the collective shared thoughts through word association exercises on the themes of food, celebrations, art, songs, relationships and memories. Members also worked together to answer the following questions:

- How can we as a collective ensure that stakeholders and rightsholders see themselves reflected in the resulting strategy?
- How can the SOSS inform a system that returns native plants, medicines and cultural connections to the land and allows them to flourish?
- What do you hope to gain personally or professionally from your participation in the SOSS collective?

99. Carolinian Canada Coalition. *Carolinian Canada's Commitment to Creating Ethical and Safe Spaces*.
100. Pillar Nonprofit Network. (2024). *Brave Space Guidelines*.

2. Knowledge Sharing

In May of 2023, participants reviewed images representing different types of knowledge sharing and recorded their collective thoughts and impressions as a group. The group also conducted a Moment Analysis to identify:

- Key Allies/Key Obstacles
- Steps That Can Be Taken Now/Steps That Can Be Taken In The Future
- Available Resources/Resources Still Needed

3. Plant Relatives: Genetics and Assisted Migration in a Changing Climate

In June 2023 the collective set aside time to reflect on the following topics:

- Connections: Origins
  Ecosystem boundaries have shifted over long timescales impacting from human and non-human influences. How would you describe the relationship between plants and place? What impact do humans have on this relationship and what should be our responsibilities toward respecting this connection?
- Connections: Relationships
  Western science advances in DNA are exploring genetic connections between species across time. Name some non-human species that you feel a kinship toward. Feel free to elaborate on these connections including origins, memories, and the nature of these relationships.
- Connections: Emotions
  We are all connected. What does this mean to you? How do you witness connection in the world around you?
- Connections: Change
  Shifting baseline: Reference point for change must acknowledge change that preceded it. From where do we derive our historical references? Textbooks? Families? Stories? What informs how we view change over time?

4. Plant Blindness

In July 2023, the collective explored the concept of “plant blindness” using the following questions:

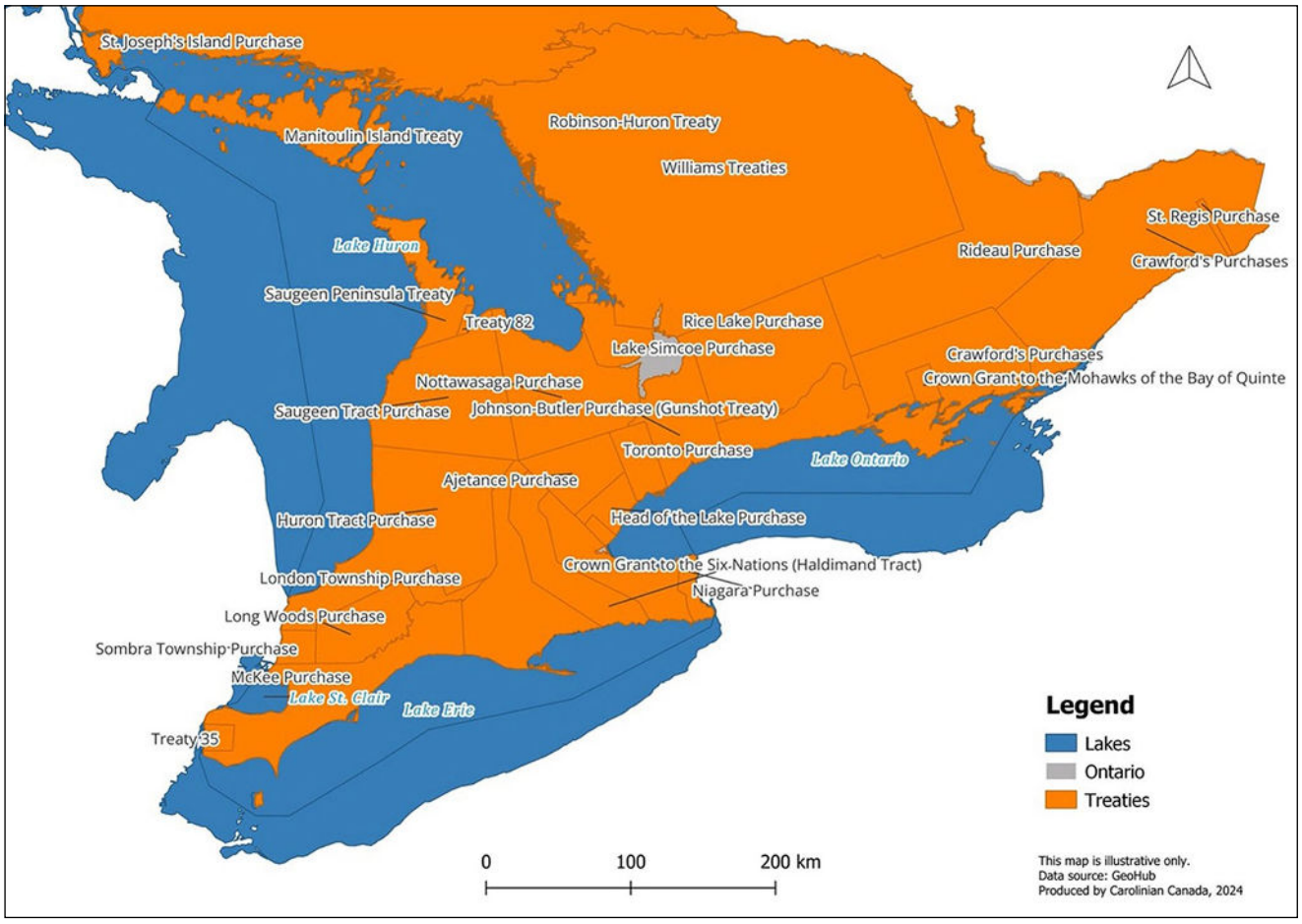
- Are you familiar with the concept of plant blindness? How would you define it?
- Can you identify any cultural relationships or practices that place plants at the centre?
- What can we do to diminish plant blindness?
- Can you think of any examples of plant blindness affecting plans and policies?

B. Treaty Lands Map

Treaty Lands: Mapping Southern Ontario's Agreements

FIGURE 15

This map outlines historical treaty boundaries and areas covered by agreements between Indigenous nations and non-Indigenous governments. While some fostered mutual benefits, others have left a lasting legacy of harm.



C. Resource Library

Guidelines

- Ministry of Natural Resources, Ontario Tree Seed Transfer Policy
- Parks Canada, Principles and Guidelines for Ecological Restoration in Canada's Protected Natural Areas
- Society for Ecological Restoration – Ontario Chapter, Native Plant Resource Guide Ontario, 6th Edition
- Society for Ecological Restoration – Ontario Chapter, Native Plant Growers Guidelines
- North American Native Plant Society, Guidelines for Commercial Native Plant Growers
- Society for Ecological Restoration, Standards for Native Seeds in Ecological Restoration
- Canadian Wildlife Federation, A Guide to Establishing Prairie and Meadow Communities in Southern Ontario
- Society for Ecological Restoration, International Principles and Standards for Native Seeds in Ecological Restoration

Seed Supply

- National Academies of Sciences, Engineering, and Medicine. (2023). An Assessment of Native Seed Needs and the Capacity for Their Supply.

Propagation and Germination

- North American Native Plant Society, 2016 Seed Exchange Germination Requirements
- Reforestation, Nurseries, and Genetic Resources, Propagation Protocol Database
- Forest Gene Conservation Association and Forests Ontario, Tomorrow's Forests: Tree Seed Management in Ontario
- Forest Gene Conservation Association, Ontario Natural Selections

Groups and Associations

- Canadian Seed Growers Association
- Ontario Native Plant Growers Association
- North American Native Plant Society

Seed Strategies

- Canada National Native Seed Strategy
- United States National Native Seed Strategy
- Australia Native Seed Strategy

Seed Selection Resources

- United States Ecoregional Revegetation Application
- Toronto and Region Conservation Authority Seed Mix Guidelines
- Wildflower Farm Seed Selector Tool
- St. Williams Nursery and Ecology Centre's Guide to Establishing Native Plants from Seed
- Canadian Wildlife Federation Native Seed Calculator and Companion Guide
- University of Northern Iowa Tallgrass Prairie Seed Calculator

Pollinators and Gardens

- David Suzuki Foundation, Butterflyway Project
- Pollination Guelph, Native Plants for Pollinators
- Seeds of Diversity, Resources for Pollinator Friendly Farmers and Gardeners
- Canadian Wildlife Federation, Managing Rights-of-Way for Pollinators: A Practical Guide for Managers
- World Wildlife Fund-Canada and Carolinian Canada Coalition, In the Zone Garden Guide
- In Our Nature, Resource Library
- Wild Species, General Status of Species in Canada
- Ontario Biodiversity Council, Ontario Biodiversity Strategy
- Carolinian Canada Coalition and Ontario Ministry of Natural Resources and Forestry, List of Vascular Plants of Ontario's Carolinian Zone

Videos

- Carolinian Canada Coalition, Seed Saver Training Videos
- International Network for Seed-based Restoration Videos

Training and Education

UG – Undergraduate G – Graduate PD– Professional Development (Continuing Education)

University

- Trent University/Fleming College – Joint Ecological Restoration Diploma/Degree (UG)
- University of Victoria – Ecological Restoration Programs – Diploma, Certificate, or Professional Specialization Certificate (UG, G, PD)
- British Columbia Institute of Technology (BCIT) – Ecological Restoration Master's (G)
- University of Guelph – Horticulture and Landscape Design diplomas and certificates (G/PD)
- University of Waterloo – Diploma in Ecological Restoration and Rehabilitation (UG)

College

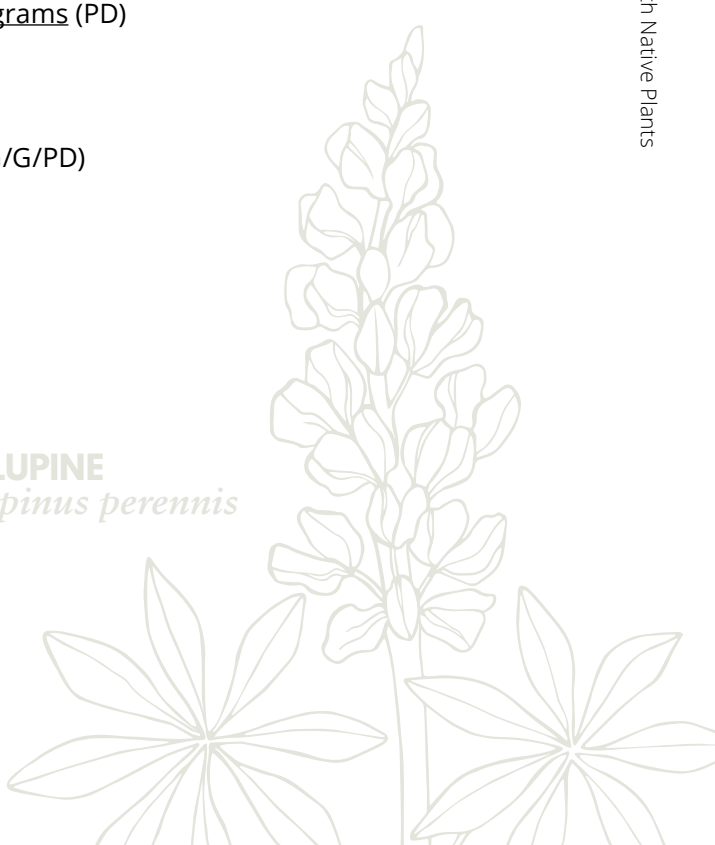
- Niagara College – Ecosystem Restoration Graduate Certificate (G)
- Humber College Programs and Workshops
  - Sustainable Urban Beekeeping (PD)
  - Master Gardener's Workshops (PD)
  - Landscape Technician, Arborist, or Horticulture Programs (G, PD)
- Lakeland College – Land Stewardship and Conservation Diploma (UG)
- Lethbridge College – Environmental Assessment and Restoration Diploma (UG)
- Medicine Hat College - Environmental Biology and Reclamation Technology Diploma (UG/G/PD)
- Niagara College – Greenhouse Technician (UG/G)
- Fanshawe College – Oneida – Language Immersion, Culture, and Teaching (UG/G)

Other

- Society for Ecological Restoration – E-Learning Course (PD)
- British Columbia Institute of Technology – Ecological Restoration Bsc (UG)
- Rewilding Academy – Ecological Restoration free online courses (PD)
- Gaia College – online courses and programs on horticulture, ecological gardening, growing food, native plants, ecological landscaping, etc. (PD)
- Royal Botanical Gardens – Courses & Workshops (PD)
- Forest Gene Conservation Association – Certified Seed Collector Course (PD)
- National Tree Seed Centre – Indigenous Seed Collection Program (PD)
- Pollinator Partnership – Seed Collection Training (PD)
- Pollinator Partnership – Pollinator Stewardship Certification (PD)
- Pollinator Partnership – Various trainings (PD)
- Forests Ontario – Tree Planting and Forest Stewardship Programs (PD)

Compiled lists from other organizations:

- Ontario Colleges – Ecosystem Courses (UG/G/PD)
- Society for Ecological Restoration – Education Programs (UG/G/PD)



D. Collective Meetings

Year	Meeting Topic	Presentations & Speakers
2022	Ethical Space, Updates, Meeting Schedule	
	SOSS Vision & Autonomy of Native Plants	
	Committees & Components	
	Equity within the Native Plant Economy	• Carole Smith, Kayanase • Jonas Spring, Ecoman
	Focal Species	• Stefan Weber, Canadian Wildlife Foundation
2023	Grass & Forb Guidelines, Seed Collection Areas	• Grass & Forb Guidelines, Orchards & Seed Production Areas: Stefan Weber, Canadian Wildlife Federation • Native Seed Collecting, Cleaning, Storing and Growing: Mary Gartshore • Growing to Conserve Ontario's Natural Biodiversity: Cristy Thiessen, Emily Haggith Arthur, St. Williams Nursery & Ecology Centre • A Network of Seed Orchards in Southern Ontario: Ryan Godfrey, WWF-Canada
	Carolinian Canada Native Plant Economy Survey and Seed Tracking and Forecasting	• Chain of Custody, Seed Tracking and Forecasting: Mark McDermid, Forests Ontario • Carolinian Canada Native Plant Economy Survey: Sarah Winterton, Carolinian Canada
	Biodiversity as a Foundation for Two-Eyed Seeing	• Biodiversity is Relationships: Sam Whiteye, Carolinian Canada • First Nations Growers Panel Discussion: Carole Smith, Kayanase; Verlin James, AlterEden; Dylan Henry, Maajiigin Gumig, Aamjiwnaang First Nation
	National Strategy Connections & SOSS Progress Report	• National Native Seed Strategy Update: Stefan Weber, Canadian Wildlife Federation • Southern Ontario Seed Strategy Progress: Amy Hall, Carolinian Canada
	Knowledge Sharing	• Certified Seed Collector Training Courses: Kristen Sandvall, Forest Gene Conservation Association • Paul LaPorte, Ephemeral Ark Nursery, ONPGA

Year	Meeting Topic	Presentations & Speakers
2023	Plant Relatives: Genetics and Assisted Migration in a Changing Climate	• Conservation of Plant Biodiversity: The Role of In Vitro Technologies: Dr. Praveen Saxena and Dr. Mukund Shukla, Gosling Research Institute for Plant Preservation (GRIPP), Department of Plant Agriculture, University of Guelph • Basic Genetic & Assisted Migration Concepts for Resilient Forests: Kristen Sandvall, Forest Gene Conservation Association
	Ecological and Cultural Restoration	• Ecological and Cultural Relationships in the Grand River: Kerdo Deer, Ecological Team Lead, Kayanase • Reforestation, Nurseries and Genetics Resources (RGNR) & Tribal Nurseries: Jeremy Pinto, Research Plant Physiologist/Tribal Nursery Specialist, U.S. Forest Service • Ecological Restoration & the MTO: Jessica Smeekens, Vegetation Services Coordinator, Ontario Ministry of Transportation
	Restoration and Reciprocity: Ex/Inter-situ and SAR	• Regional Species Selection for Bulk Seed Mixes: Stefan Weber, Plant Ecologist and National, Canadian Wildlife Federation Seed Strategy Coordinator • Every Species Can Be Saved (And We Know How): Melissa Spearing, Seed Biologist, National Tree Seed Centre • Deerberry Conservation in Thousand Islands National Park: Josh Van Wieren, Ecologist Team Lead and Mary Beth Lynch, Resource Management Officer, Thousand Islands National Park of Canada • Testing Translocation as a Recovery Tool for Plant Species at Risk in Southern Ontario: Jenny McCune, Assistant Professor, Department of Biological Sciences and Emma Neigel, PhD Candidate, Department of Biological Sciences, University of Lethbridge • Southern Ontario Seed Strategy Development: Amy Hall, Manager of Ecosystem Recovery, Carolinian Canada Coalition

E. Partners and Observers

Partners

- Canadian Wildlife Federation
- Carolinian Canada Coalition
- David Suzuki Foundation
- Environment and Climate Change Canada
- Forest Gene Conservation Area
- Kayanase
- Ontario Native Plant Growers Association
- Ontario Plant Restoration Alliance
- Swallowtail Native Plants
- World Wildlife Fund Canada

Observers

- Indigenous Groups (anonymous)
- Agriculture and Agri-Food Canada
- Alternative Land Use Services (ALUS) Middlesex
- Alternative Land Use Services (ALUS) Norfolk
- Bee Sweet Nature Co.
- Blooming Boulevards
- Bruce Trail Conservancy
- Canadensis Wild Seeds
- City of Guelph
- City of Kitchener
- City of Pickering
- City of Toronto
- County of Huron
- Credit Valley Conservation Area
- Dougan and Associates/Network of Nature
- Ecoman
- Ephemeral Ark Native Plant Nursery
- Forests Ontario/Grasslands Ontario
- GEI Consultants
- Grand River Conservation Authority
- Greenbelt Foundation
- Grey Bruce Master Gardeners
- Hamilton Conservation Authority
- Hamilton Naturalists
- Hidden Habitat Ecological Landscapes
- Huron University
- Lacewing Plants
- Lake Simcoe Region Conservation Area
- Landcare Niagara
- Long Point Basin Land Trust
- McMaster University
- Ministry of Environment, Conservation and Parks
- North American Native Plant Society
- National Tree Seed Centre
- Native Plants in Claremont
- Natural Resource Solutions Inc.
- Nature Conservancy Canada
- Niagara Parks Commission
- Niagara Parks School of Horticulture
- Niagara Peninsula Conservation Authority
- North-South Environmental
- Ontario Farmland Trust
- Ontario Flora
- Ontario Ministry of Transportation
- Ontario Parks
- Parks Canada
- Pollinator Partnership
- Reforest London
- Regenerate Grey Bruce
- Royal Botanical Gardens
- Sierra Club
- Somerville Nurseries Inc.
- South Nation Conservation Authority
- Squiirrel/Wilder Climate Solutions
- St. Clair Region Conservation Authority
- St. Williams Conservation Reserve
- St. Williams Nursery & Ecology Centre
- Thames Talbot Land Trust
- United States Forest Service
- University of Guelph
- University of Lethbridge
- Vinelands Research Centre
- Wildlife Preservation Canada
- Willow Farm Grasses
- Artists, authors, and other individual volunteers

F. Webinars

Date	Webinar	Attendees
September 6, 2023	SOSS Municipal Engagement Session	96
December 6, 2023	SOSS Provincial Engagement Session	50
May 16, 2024	Municipal Land Manager Webinar	30

G. SOSS Survey Questions

1. When did you join the SOSS collective?
2. Are you participating in the SOSS as an observer or a partner?
3. Do you attend monthly meetings?
4. Do you engage with SOSS virtually (email, SOSS Live)?
5. Which SOSS platforms do you think add value and utility to the collective?
6. Prior to joining the SOSS Collective, did you have experience engaging in or creating Safe and Ethical space in your organization?
7. In your opinion, would you benefit from more in-depth meetings on Safe and Ethical space?
8. Has your organization taken steps to create and maintain safe and ethical spaces?
9. How would you best describe your role within the native plant community?
10. How many years have you been learning, growing, working with or stewarding native seeds and plants?
11. Do you find the monthly meetings to be useful and informative?
12. What opportunities do you feel SOSS has provided you with?
13. What expertise and experiences do you feel that you could share in future sessions?
14. What additional training opportunities would you benefit from?
15. Do you believe the SOSS collective is reflective of all stakeholders, rightsholders, and parties interested in native seed in southern Ontario?
16. Who else would you like to see join the collective? (Organizations, communities, individuals, etc. as participants, speakers, workshop hosts, etc.)
17. Are meeting topics and discussions useful to inform the draft SOSS?
18. Which sessions have you found engaging thus far?
19. What other topics would add value to this process?
20. Does the discussion period bring value to SOSS meetings?
21. Which future topics are you looking forward to attending?
22. How would you like to contribute to the development of the draft strategy?
23. Have you experienced any barriers to participation in the SOSS?
24. If you answered yes to question 23, please feel free to share your experience.
25. Please provide any additional feedback.

H. Summary of Goals, Objectives, and Recommendations

GOAL 1: EXPAND ETHICAL AND SAFE SPACE WITHIN THE NATIVE PLANT SECTOR.

OBJECTIVE 1.1: Establish a sector wide Two-Eyed Seeing approach to seed-based restoration by supporting Indigenous-led initiatives to heal the land.

Recommendation 1.1.1

Increase sector-wide understanding of safe and ethical spaces to foster meaningful collaboration, ensure Indigenous autonomy in relationships and decision making, and build cross-cultural relationships based on respect for Indigenous Knowledge.

PRIORITY: URGENT

Recommendation 1.1.2

Support an Indigenous-led native seed-needs assessment and priority setting for seed-based restoration and identify opportunities to connect with the National Native Seed Strategy efforts.

PRIORITY: URGENT

Recommendation 1.1.3

Support the establishment of an Indigenous-led native seed council to improve coordination, share knowledge, establish goals and priorities, and identify gaps and opportunities to connect with the broader native plant sector and National Native Seed Strategy.

PRIORITY: NECESSARY

OBJECTIVE 1.2: Improve equity in the native seed economy by increasing the capacity for Indigenous Nations to participate and ensuring equitable access to resources, training, and economic growth.

Recommendation 1.2.1

Investigate and activate diverse investment models to increase Indigenous business development opportunities in the native plant materials sector.

PRIORITY: NECESSARY

GOAL 2: INCREASE SUPPLY AND SUPPORT DEMAND FOR RELIABLY AVAILABLE GENETICALLY APPROPRIATE NATIVE SEED.

OBJECTIVE 2.1: Coordinate southern Ontario long-range seed forecasting to connect supply and demand with a full diversity of species on an ecoregional basis.

Recommendation 2.1.1

Conduct a comprehensive native plant materials needs assessment for all levels of government, non-government, industry, and other large users of seed for restoration of ecosystems in collaboration with National Native Seed Strategy efforts and with an Indigenous-led parallel process.

PRIORITY: URGENT

Recommendation 2.1.2

Establish a tracking process for sales of native plant materials inclusive of both bulk and retail markets to inform reporting and statistics at a national level.

PRIORITY: NECESSARY

Recommendation 2.1.3

Engage all stakeholders and rightsholders in the development of the native plant supply chain through strategic planning to meet immediate demand for native seed.

PRIORITY: NECESSARY

OBJECTIVE 2.2: Through coordinated effort, increase availability of cultural, ecological, and restoration focal species with locally adapted genetics for regional use.

Recommendation 2.2.1

Identify focal species by region (ecoregion, ecodistrict, traditional territory) for scaling to meet restoration, cultural, stewardship, and green infrastructure goals.

PRIORITY: URGENT

Recommendation 2.2.2

Utilize Native Seed Partnership frameworks to coordinate regional actions for focal species.

PRIORITY: NECESSARY

OBJECTIVE 2.3: Implement strategic cross-sector capacity building support for growers and producers.

Recommendation 2.3.1

Establish cross-sector partnerships and supports to expand opportunities to grow native plants in the agriculture, horticulture, and ecological restoration sectors.

PRIORITY: URGENT

Recommendation 2.3.2

Support the establishment of incentive programs to increase participation in the native plant materials sector and help transition agriculture and horticulture sectors to support large-scale ethical native plant materials production.

PRIORITY: NECESSARY

Recommendation 2.3.3

Support the expansion of the Ontario Native Plant Growers Association to enable active leadership for native plant and seed growers.

PRIORITY: NECESSARY

Recommendation 2.3.4

Identify funding and investment opportunities to support the development or expansion of native seed orchards and seed production areas.

PRIORITY: URGENT

Recommendation 2.3.5

Develop a business case for policy makers and industry users to support increased investment in the native plant sector.

PRIORITY: NECESSARY

GOAL 3: DEVELOP TOOLS THAT ALLOW COORDINATED, TIMELY, INFORMED ACTION FOR SEED CONSERVATION AND STEWARDSHIP IN SOUTHERN ONTARIO.

OBJECTIVE 3.1: Develop a comprehensive regional training and certification program for practitioners in the sector.

Recommendation 3.1.1

Develop and sustain a multidisciplinary Two-Eyed Seeing training program led by industry experts, Indigenous knowledge holders, academic institutions, and others to certify sites and practitioners in alignment with ethical standards.

PRIORITY: URGENT

Recommendation 3.1.2

Establish a recognized seed collector program or adapt existing programs to include all native plant species and increase capacity for seed collection in southern Ontario.

PRIORITY: NECESSARY

Recommendation 3.1.3

Improve equitable access to training and mentorship programs, knowledge sharing, youth engagement opportunities, and job creation.

PRIORITY: URGENT

OBJECTIVE 3.2: Establish a certification and labelling system to certify products produced in compliance with ethical standards for collection, sale, and distribution.

Recommendation 3.2.1

Work in collaboration with the Canadian National Native Seed Strategy to implement an independent certification program to award certification and labelling for native plant materials.

PRIORITY: NECESSARY

Recommendation 3.2.2

Investigate opportunities for subsidies on ethically sourced and produced products.

PRIORITY: BENEFICIAL

Recommendation 3.2.3

Work collaboratively to develop standards for the certification of source-identified native plant materials that prioritize ecological and genetic integrity without creating barriers for participation.

PRIORITY: URGENT

Recommendation 3.2.4

Create or adopt a voluntary source-identification label for use on all native plant materials.

PRIORITY: URGENT

OBJECTIVE 3.3: Establish a Native Plant Hub to coordinate guidelines, regionalize support for the growth of the native plant sector, and identify long-term needs and opportunities.

Recommendation 3.3.1

Adopt or develop shared online tools to track restoration efforts and share wise practices for site- and species-specific considerations.

PRIORITY: NECESSARY

Recommendation 3.3.2

Identify an online platform to host a Native Plant Hub that provides tools and resources for all producers and users throughout the native seed supply chain as well as opportunities for cross-cultural resource exchange.

PRIORITY: NECESSARY

Recommendation 3.3.3

Develop a comprehensive resource library to support the native plant materials sector in growing, collecting, treating, and storing a diversity of native seed.

PRIORITY: NECESSARY

Recommendation 3.3.4

Develop or adopt mapping tools to connect seed practitioners with wild seed populations, streamline permissions and permits, and track seed collections to prevent over collection.

PRIORITY: NECESSARY

OBJECTIVE 3.4: Increase capacity for seed storage and distribution in southern Ontario.

Recommendation 3.4.1

Assess the current capacity for seed production, cleaning, treatment, and storage in southern Ontario.

PRIORITY: URGENT

Recommendation 3.4.2

Identify opportunities to expand public seed storage capacity in southern Ontario.

PRIORITY: NECESSARY

Recommendation 3.4.3

Adopt Ontario ecodistricts as seed transfer zones for use with herbaceous species.

PRIORITY: NECESSARY

Bluehearts. Photo: Amy Hall

GOAL 4: DEVELOP STRATEGIES FOR WIDESPREAD USE AND ADOPTION OF NATIVE PLANTS WITHIN CONSUMER, INDUSTRY, AND POLICY SECTORS.

OBJECTIVE 4.1: Establish source-identification practices for ethically collected native seed as the industry standard.

Recommendation 4.1.1

Increase visibility of the native plant sector within government, industry, and the public to improve understanding of ethically sourced and produced native plant materials and how to access them.

PRIORITY: NECESSARY

OBJECTIVE 4.2: Develop communication tools to increase public and cross-sector awareness and perception of native plants.

Recommendation 4.2.1

Develop and implement targeted outreach strategies to engage diverse audiences, including public and industry groups, to raise the profile of native plants and communicate their role in achieving regional, national, and global targets.

PRIORITY: URGENT

Recommendation 4.2.2

Conduct outreach to the horticulture sector to prevent sale of invasive plants and promote native plants.

PRIORITY: NECESSARY

OBJECTIVE 4.3: Strengthen and/or create policies that support the use of native plant materials across the landscape.

Recommendation 4.3.1

Conduct a multi-level government policy analysis to identify effective policies that support the native plant materials sector and address gaps in policies that create barriers to growth.

PRIORITY: BENEFICIAL

Recommendation 4.3.2

Engage all levels of government to adopt policies that support the use of genetically appropriate native plant materials, e.g., for new and existing projects, such as transportation corridors, urban development, utility corridors, and mining reclamation projects.

PRIORITY: URGENT

Recommendation 4.3.3

Develop policies that protect remaining wild seed populations from development in ecologically sensitive locations.

PRIORITY: NECESSARY

Recommendation 4.3.4

Develop policies that promote soil and seed bank salvaging from development projects that impact remnant native plant populations and genetics.

PRIORITY: NECESSARY

WHITE TRILLIUM
Trillium grandiflorum

GOAL 5: IDENTIFY TWO-EYED SEEING KNOWLEDGE NEEDS TO INFORM AND SUPPORT A NATIVE SEED SUPPLY CHAIN FOR RESTORATION.

OBJECTIVE 5.1: Identify key research topics and gaps for further investigation including Indigenous and Western science priorities.

Recommendation 5.1.1

Identify opportunities to integrate Indigenous Knowledge into existing resources or to develop new and additional Two-Eyed Seeing resources in ethical space.

PRIORITY: NECESSARY

Recommendation 5.1.2

Collaborate to support genetic variability research to delineate seed transfer policies and develop wise practices regarding assisted migration for herbaceous plant materials.

PRIORITY: NECESSARY

Recommendation 5.1.3

Support development of resources to fill information gaps regarding the collection, propagation, and storage of all focal species, including hard to propagate species.

PRIORITY: BENEFICIAL

OBJECTIVE 5.2: Research the establishment and strategic use of climate-adapted seed sources to support biodiversity and ecosystem resilience in response to climate change.

Recommendation 5.2.1

Investigate potential sources from adjacent ecodistricts and seed zones aligned with future climate projections to ensure access to climate-resilient species.

PRIORITY: URGENT

Recommendation 5.2.2

Invest in seed collection, storage, and distribution infrastructure to address shortages and ensure a reliable supply of native climate-adapted tree seed.

PRIORITY: NECESSARY

Recommendation 5.2.3

Conduct collaborative research to assess existing Indigenous and Western knowledge and practices of assisted migration for all native plant species and identify gaps for additional research.

PRIORITY: URGENT

OBJECTIVE 5.3: Report on Southern Ontario Seed Strategy progress, identify achievements, opportunities, and gaps, and revise the strategy.

Recommendation 5.3.1

Establish a SOSS implementation steering committee to assess progress, identify priorities, and share outcomes broadly.

PRIORITY: URGENT

Recommendation 5.3.2

Review and revise the strategy regularly or as needed.

PRIORITY: NECESSARY

Carolinian Canada