SEEDS OF CHANGE:

Cultivating Mini Forests Across Canada

Green Communities CANADA

LIVING CITIES Canada

THE UNIVERSITY OF BRITISH COLUMBIA

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Acknowledgements:

We are grateful to all 15 mini forests that participated in the Green Communities Canada's (GCC) 2023 National Mini Forest Pilot program for their insights and openness to share their experiences and ideas for future development of mini forests across Canada. This report was developed with the generous support of All One Fund, Definity Financial Corporation, and Mitacs. The projects highlighted in this report were supported through Green Communities Canada's Living Cities Canada Fund and the National Mini Forest Pilot in 2023. These initiatives were made possible thanks to funding from the Definity Insurance Foundation, All One Fund, Greenbelt Foundation, Balsam Foundation, and Natural Resources Canada's 2 Billion Trees program. This report also greatly benefited from feedback provided by five external reviewers who generously provided their time and suggestions to improve this work.

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This report was released in 2025

LIVING CITIES Canada

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Executive Summary

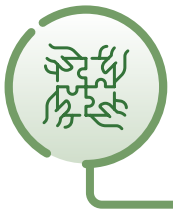
This report provides an overview of the emerging **mini forest movement in Canada,** rooted in the **Miyawaki method** – a dense, multi-layered, native tree planting technique. Miyawaki forests, and adaptations called 'mini forests', 'tiny forests', and 'micro forests' are a relatively new small-scale afforestation approach that many communities worldwide are using to plant trees in and around cities. The **rapid proliferation of mini forests** is mainly explained by the multiple benefits this novel approach promises. Mini forests are postulated to be self-sustaining and an approach that can restore degraded land, support climate resilience, and enhance biodiversity. However, to date very few studies are assessing the growth and functionality of mini forests.

With mini forests expanding in Canada, and worldwide, there is an **increasing need to better understand the benefits and risks** of this urban greening approach, and the different **mechanisms that could support their successful implementation and scaling.** This report provides an initial baseline to address this need. **The purpose of the report is twofold:** first, to provide an overview of best practices for the creation of mini forests based on evidence collected from different case studies across Canada, and second, to promote the mini forest movement while accounting for challenges, lessons learned, and novel ways to experiment and improve this practice.

Since the first Canadian mini forest was established in Stratford, Ontario in 2016, interest in this method has grown substantially. Green Communities Canada (GCC), supported by Natural Resources Canada's 2 Billion Trees Program, launched the 2023 National Mini Forest Pilot program, resulting in 15 pilot sites across five provinces. This report provides an account of lessons learned and recommendations stemming from these pilot projects. Municipalities and practitioners can use the findings in this report to diversify their tree planting strategies, and engage the public in meaningful ways to transform spaces to better support biodiversity and build community. Decision-makers can use this report to inform current and new tree planting programs that aim to increase equitable canopy cover and build climate resilience.

Summary of key findings:

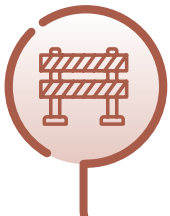
Motivations
Motivations for mini forest projects were primarily ecological (biodiversity, canopy cover), followed by social (community building), exploratory (method testing), and educational goals.



Design processes
Design processes often included strong community involvement and collaboration with experts, highlighting the need for both technical knowledge and participatory planning.

Ecological benefits
Ecological benefits observed include high tree survival rates (~89%), accelerated growth, improved soil quality, and increased biodiversity (e.g., pollinators and native flora).

Social benefits
Social benefits include enhanced community engagement, environmental education, empowerment, and sense of place—especially among youth and underserved groups.



Challenges relate to **funding constraints and governance hurdles** for post-planting care and monitoring, **operational issues** such as site access, watering, and public perception of the forest's "wild" look, and **volunteer reliance** for long-term stewardship which is critical yet difficult to sustain without dedicated resources.

Success factors and best practices for thriving mini forests involve **relying on expertise** for species selection, soil preparation, and volunteer engagement, **building strong partnerships** with municipalities and local organizations, and **investing in stewardship capacity,** including training and long-term community involvement.

Despite their growing popularity, mini forests are not yet widely embedded in Canadian policy frameworks. However, they align well with existing national and municipal goals related to climate risk management, biodiversity conservation, urban canopy expansion, and equity in green space access. This creates an opportunity to mainstream mini forests as a viable, multifunctional approach.

Municipalities are uniquely positioned to embed mini forests into local planning and greening strategies.

Many municipalities already have climate adaptation plans, urban forest strategies, or tree canopy targets that mini forests can directly support. Relevant municipal policy levers include:

- **Climate Risk Management:** Mini forests can help create cooler microclimates, reduce flood risk, and support climate adaptation frameworks.
- **Urban Greening and Tree Canopy Targets:** As traditional planting faces space limitations in dense urban areas, mini forests offer a space-efficient, high-impact alternative for increasing canopy cover and biodiversity.
- **Green Equity and Inclusion:** Mini forests can be targeted to underserved or racialized communities where greenspace and canopy cover are disproportionately low.
- **Natural Asset Management:** Municipalities using asset management frameworks can assign value to mini forests based on ecosystem services such as stormwater management, habitat provision, and climate regulation.

To scale the mini forest movement, the report identifies four key strategies:

1. **Sharing Resources and Building Capacity:** Foster a national community of practice to promote peer learning and collaboration with development and local adaptation of toolkits, training modules, and monitoring protocols.
2. **Leading by Example:** Demonstrate mini forest viability through pilot projects that can generate evidence and inspire replication, which can be celebrated and highlighted through media, academic publications, and community events to raise awareness.
3. **Shifting Hearts and Minds:** Engage residents in co-design and stewardship to foster local ownership and long-term support, and influence decision-makers by showcasing ecological, social, and economic benefits.
4. **Securing Long-Term Funding for Stewardship:** Advocate for funding models that prioritize not only planting but also post-planting care and monitoring through multi-year stewardship commitments, training, and community engagement. Encourage municipalities to incorporate mini forest maintenance into public works or parks budgets.

Mini forests are a **flexible, evolving, and community-powered approach** to urban greening. Continued **experimentation, adaptation,** and **knowledge sharing** are essential for realizing their full ecological and social potential. The report provides recommendations and ideas for further research and practice that can inform development of future municipal greening strategies. For example, practitioners are suggest adjusting the Miyawaki method to suit **local conditions,** and are considering modifying **tree spacing** or **simplifying soil preparation** to make projects more scalable and cost-effective. Some organizations are integrating mini forest principles into **larger-scale naturalization efforts** where mini forests are seen as potential **"seed banks"** and **biodiversity nodes** that can help restore degraded or connect fragmented ecosystems. Some practitioners propose reimagining mini forests as **"teaching forests",** particularly in urban cores where nature access is limited.

Overall, there is a strong interest in **longitudinal studies** and **systematic monitoring** to better understand both **ecological** and **social impacts** over time. Mini forests present a **promising, community-driven solution** to support **biodiversity, climate resilience,** and **public engagement in urban Canada,** but success hinges on **planning, expertise, relationships, and stewardship.** Continued experimentation, adaptation, and data collection will be key to realizing their full potential.

Purpose of this Report

This report has been prepared for municipalities and practitioners interested in learning more about mini forests in Canada, and decision-makers investing in alternative tree planting initiatives to create greener and healthier cities. The purpose of the report is twofold: first, to provide an overview of best practices for the creation of mini forests based on evidence collected from different case studies across Canada, and second, to promote the mini forest movement while accounting for challenges, lessons learned, and novel ways to experiment and improve this practice.

Using insights provided by this report, municipalities and practitioners can incorporate new ideas to diversify their tree planting strategies, whilst at the same time engaging the public in meaningful ways to transform spaces to better support biodiversity and build community. Decision-makers can use this report to inform current and new tree planting programs that aim to increase equitable canopy cover and to build climate resilience. Recommendations and ideas for further research included in this report can inform development of future municipal greening strategies.

This report has been organized into six core sections:

Section one provides an overview of mini forests in Canada, their implementation process, and some of the current driving factors behind their adoption;

Section two introduces our methodology and provides insights into motivations and characteristics of case studies across the country;

Section three summarizes observed impacts and challenges distilled from the case studies, accounting for both social and ecological aspects;

Section four points to best practices and success factors identified from case studies that can be used as reference in the development of new mini forests;

Section five introduces leverage points and strategies that can inform the scaling of mini forests and mainstreaming of this emerging practice across municipalities nationwide; and

Section six looks at future considerations and provides ideas for experimentation, growth, and further research.

! The scope of this report is not to offer a comprehensive literature review of mini forests or summarize research and case studies implemented outside of Canada. This report is based on evidence collected locally, building on the perspective and experience of community partners involved in the implementation of mini forests in different Canadian cities. It is therefore an initial baseline and can be complemented with additional empirical studies.

Overview of Mini Forests

1. Overview of Mini Forests

What Do We Know about Mini Forests?

In the past decade, a new approach to small-scale afforestation based on the Miyawaki method has gained global attention in cities. 'Miyawaki forests', and adaptations also called 'mini forests', 'tiny forests', and 'micro forests' are a strategy that many communities worldwide are currently using to plant trees both in the urban core and peri-urban areas (Heuch & Thurman, 2024). This new approach to urban greening is derived from a method of ecological engineering for forest reconstruction and restoration of degraded areas developed in the 1970s by Japanese botanist and plant ecologist Dr. Akira Miyawaki (Miyawaki & Golley, 1994). The method involves planting dense, multi-layered forests, mimicking the species composition of local mature forests (Lewis, 2022). The dense planting method encourages vegetation to grow upward instead of outward, resulting in taller plants in a shorter time. A diverse mixture of native species that can best survive the local environment are planted at densities of 3 to 5 trees per square metre. In the early 21stcentury, the method was simplified by Shubhendu Sharma, who mainwed the method internationally through a TED talk in 2014. This method and various adaptations have since surged in popularity with thousands of 'mini forests' planted around the world.

The rapid proliferation of mini forests is mainly explained by the multiple benefits this novel technique promises. Mini forests are postulated to be a self-sustaining and a nature-based solution that can restore degraded land, support climate resilience, and enhance biodiversity (Lewis, 2022). Concerns about this approach have also risen, with concerns of the high-density planting causing tree mortality and vulnerability in the long-term, comparatively high costs, and the intensive work required in terms of soil preparation (Heuch & Thurman, 2024).

To date, very few studies are assessing the growth and ecological function of mini forests, or the social impacts of this approach. Existing studies usually focus on a singular aspect. For example, assessing canopy structure development (Roy & Chatterjee, 2023), carbon stock or carbon sequestration potential (Yilma & Derero, 2020), or impact on soil quality (Guo, 2018; Oldfield et al., 2014). Overall, there is minimal research on the mini forests' capacity to benefit their local environments, such as through stormwater runoff reduction, micro-climate cooling, and biodiversity enhancement. In addition, while mini forests provide greenspaces for people to enjoy and connect with nature, there is very little research testing their role in supporting human well-being and place-making. With mini forests proliferating in Canada, and worldwide, there is an increasing need to better understand the benefits and risks of this approach, and the different mechanisms that could support successful mini forest implementation and scaling.

The Mini Forest Movement in Canada

The earliest known mini forest planted in Canada was established in Stratford, Ontario in 2016. Six years later, in 2022, Green Communities Canada launched the National Mini Forest Pilot program with capacity-building funding from Natural Resource Canada's 2 Billion Trees program. This two-year initiative, which saw the development of a suite of training resources, project management supports, a national community of practice, and the planting of 15 new mini forests, has raised the profile of the Miyawaki method across Canada. Since the pilot's completion, Green Communities Canada has supported the creation of an additional 17 mini forests with funding and training resources. The community of practice has grown to over 90 participants, involving practitioners from a wide range of community-based environmental nonprofits, urban forestry professions, and municipal departments to discuss their projects, processes, and challenges.

By 2025, many other mini forests have been planted outside of those that have been funded by Green Communities Canada, with over 45 planting locations of planting across Canada. In 2024, the City of Montreal announced their intention to plant an additional 15 'micro forests' following the Miyawaki approach in five boroughs over the next few years– it was a winning project in the city's first participatory budget. In general, there is broad public interest in hyperlocal planting approach and municipalities are taking notice.

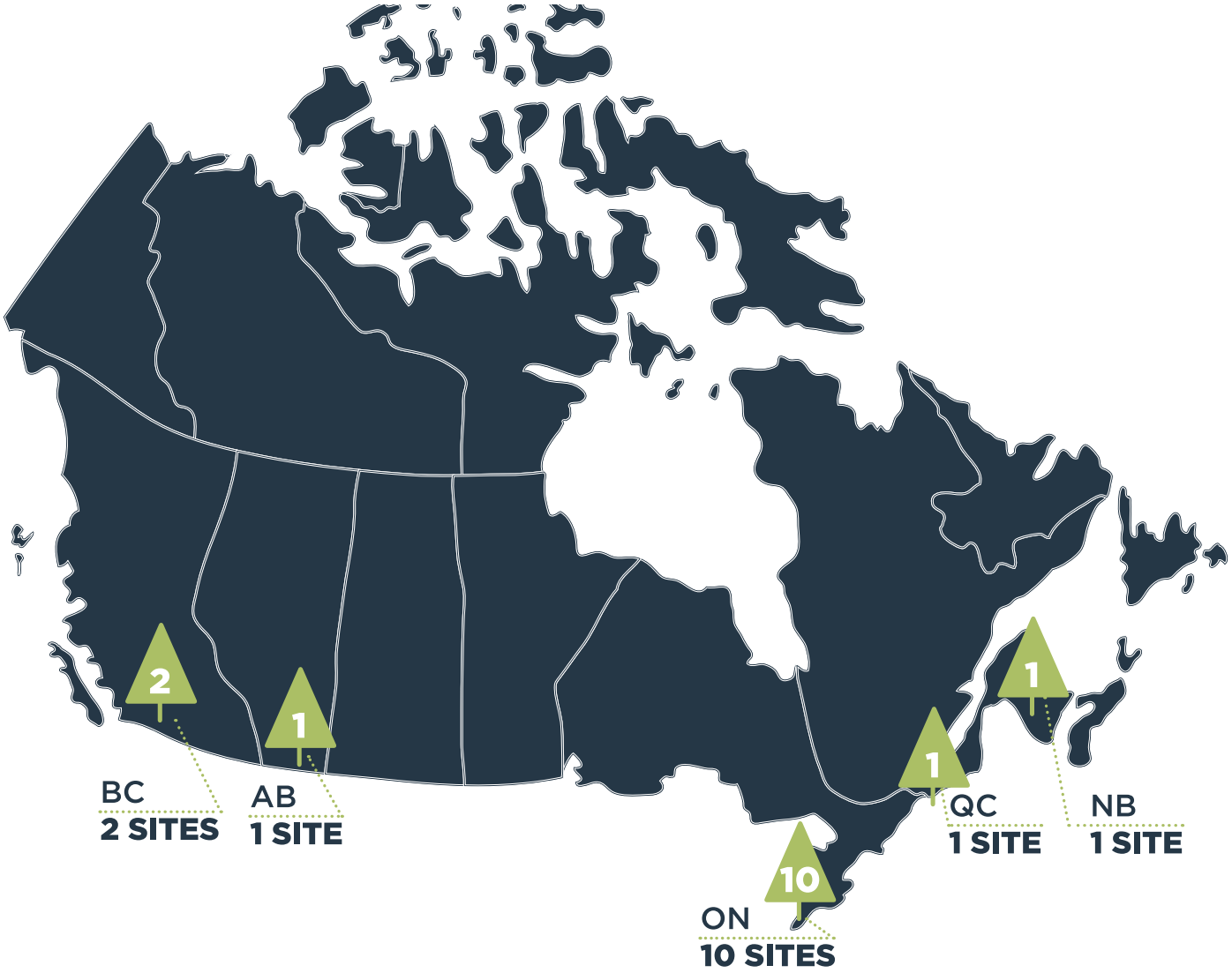
In 2024 the Federal Government transferred the urban planting stream of the 2 Billion Trees program to the Federation of Canadian Municipalities, which launched the "Growing Canada's Community Canopies" program, as an initiative under the Green Municipal Fund. This shift in fund administration has signaled a desire for municipalities to lead the way in expanding the urban canopy – and Miyawaki forests are one of the opportunities to do so if the method shows positive impacts. Now is a critical time to develop the necessary tools to support novel urban tree planting projects that can provide multiple benefits.

Mini Forests Case Studies

2. Mini Forest Case Studies

Study Approach

This study employed mixed methods to examine the experiences of practitioners currently implementing mini forests, and to explore future opportunities for mini forests in Canada. We applied a staged approach starting with a review of existing policy levers, then an online survey to all 15 mini forest projects under the Green Communities Canada's (GCC) 2023 National Mini Forest Pilot program, and finally semi-structured interviews with a selected sample of the 15 mini forests. Methods were implemented from September to December 2024. The mini forest cases from across Canada represent a diversity of site types and sizes, mini forest designs and layouts, organizational backgrounds (i.e., both municipal government and non-profit organizations), and geographic contexts (i.e., from Coast-to-Coast, see Figure 1).



[1] Figure 1. Geographic distribution of the 15 mini forests included in GCC's 2023 National Mini Forest Pilot program. The sites are located across five provinces: British Columbia (2 sites), Alberta (1 site), Ontario (10 sites), Quebec (1 site), and New Brunswick (1 site).

Online Surveys

An online survey was shared with practitioners involved in the implementation of the 15 mini forests included in GCC's 2023 National Mini Forest Pilot program. The survey was structured into five sections: (1) Characteristics and Design, (2) Approach, (3) Social Impacts, (4) Ecological Impacts, and (5) Opportunities and Lessons Learned. The full list of survey questions can be found in Annex 1. Of the 15 mini forest sites contacted (Table 1), two sites were excluded from the sample due to incomplete submissions or being unable to respond, resulting in a sample size of 13 mini forests for the survey portion.

Code of mini forest site	Province	Organization type	Context	Land Ownership	Previous Land Use	Site size (m^2)	Total # of plants	Tree planting density. m2)	# of species planted	Total # of volunteers
S01	ON	Municipality	Urban	Public	Park / Forested Area	100	300	3.0	13	25
S02	AB	NGO	Urban	Private	Under-utilized urban space	200	870	2.2	32	72
S03*	QC	NGO	Suburban	Public	Parking lot	100	690	1.1	N/A	127
S04	BC	NGO	Suburban	Public	Arboretum	100	260	0.8	26	55
S05	ON	NGO	Urban	Public	Park / Forested Area	300	488	0.1	43	35
S06	ON	Municipality	Suburban	Public	Arboretum	300	903	2.4	38	28
S07	ON	NGO	Urban	Public	Senior Centre	560	1571	2.2	85	375
S08*	ON	Municipality	Suburban	Private	Park / Forested Area	100	300	3.0	13	20
S09	ON	NGO	Suburban	Public	School/ College	100	300	2.1	30	70
S10	NB	NGO	Urban	Public	Former landfill	200	707	3.1	12	12
S11	ON	NGO	Urban	Private	Church / Monastery	100	300	2.4	14	15
S12	ON	Conservation Authority	Suburban	Private	Church / Monastery	100	396	2.0	32	50
S13	BC	Municipality	Suburban	Public	Park / Forested Area	130	740	0.8	36	100
S14	ON	Conservation Authority	Urban	Public	Under-utilized urban space	100	300	1.8	18	60
S15	ON	Municipality	Urban	Public	Park / Forested Space	500	1292	1.3	55	237

Table 1. Summary of key information on the 15 mini forest projects in GCC's 2023 National Mini Forest Pilot program. (*Did not respond to the survey)

Semi-Structured Interviews

Semi-structured interviews were conducted with representatives from municipalities and non-profit organizations involved in the 2023 National Mini Forest Pilot program. Of the 13 mini forest pilot projects that responded the online survey, 7 were selected by GCC to participate in the research interviews due to having at least one year of operation post-planting and met at least two of the following criteria: (1) having a project lead with planting experience beyond one mini forest project, (2) located in an urban setting, and/or (3) having continued leadership in mini forest's stewardship.

The interview questions involve a mix of predefined questions drew upon the practitioners' responses to the completed online survey and impromptu questions asked during the 2-hours long online interviews. The interviews were organized into five (5) main sections (see Annex 2): (1) forest creation (i.e., motivations, enabling factors, site selection, design, governance, and participation); (2) forest function (i.e., observed social or ecological functionality); (3) forest impact (i.e., observed social or ecological impacts); (4) best practices (i.e., success factors, challenges, lessons learned, etc.); and (5) the future (i.e., responses, recommendations, improvements, and adaptations, perceived value between mini forests and other urban greening projects, etc.).

Policy Analysis

Policy analysis involved a systematic approach to identify, evaluate and contextualize policies relevant to mini forests across several governance levels in Canada, i.e. local, municipal, and federal levels. The selection of policies for review was guided by the Pathways to Living Cities framework1, which outlines policy entry points with the greatest potential to influence green infrastructure implementation across Canadian municipalities. This review was useful to determine the policy levers currently in place that benefit urban greening, urban forestry practices, and climate action. Once policies were identified, specific tools with potential to influence mini forests implementation were examined, including strategies, programs, regulations, incentives, and targets. A matrix was created, further classifying selected policies and tools based on key themes.

[1] https://greencommunitiescanada.org/programs/living-cities-canada/living-cities-framework/

Characteristics of the Case Studies

Motivations for Mini Forest Projects

The motivations driving the creation of the 15 participating sites in GCC's 2023 national pilot program can be broadly categorised into 4 motivational factors, ranked from most to least mentioned among the practitioners: (1) ecological, (2) social, (3) explorational, and (4) educational. These motivations reflect a shared desire to generate a variety of co-benefits by utilizing the Miyawaki method, with most projects mentioning multiple objectives simultaneously.

Ecological motivations emerged as the most frequently cited across all mini forest projects, with 28 total references across the surveys and interviews. The most common ecological goals were to increase urban canopy cover, enhance biodiversity, create wildlife habitat, and increase the presence of native species. Aside from these shared motivations, individual projects expressed the desire to use their mini forest for growing food, establishing a seed source, and reducing the proliferation of invasive species.

Social motivations were the second most common, with 22 total references. Many sites emphasized goals of creating community spaces and boosting public engagement. Across surveys, the word "community" was mentioned 16 times in relation to project motivations. Along with the emphasis on community, social justice and equity-related motivations were also dominant. For example, one project considered tree equity as a core motivation because "low-income neighbourhoods with high BIPOC populations have low tree canopy cover" (S02).

Benefits to individual well-being of community members and fostering a "connection to nature" was a shared motivation across 3 projects, one of which was planted in a space used by "the local Indigenous community for teachings and gatherings [, as well as] ceremonies" (S05). Beyond the aforementioned themes, this site also emphasized cultural practices and land stewardship.

"[One] of the objectives, as I mentioned from our natural heritage action plan, was to engage the community more and empower the community more. This was an opportunity to do that." (MCP02)

Ecological and social motivations were often mentioned simultaneously. Quotes from practitioners suggest that many viewed mini forests as multifunctional and capable of generating multiple benefits:

"This mini forest will help increase the amount of tree cover on [the] waterfront, help decrease erosion, and give people an excellent area to connect with nature." (S10)

"Our motivation for creating a mini food forest was to provide a space where the local Indigenous community can feel connected to the land within the urban environment. Additionally, we aimed to increase the presence of native flora, creating a habitat that supports local wildlife and enhances biodiversity in the area." (S05)

"*And so co-developing these action plans with the community, we really work with them to identify different categories of interest that we can help advance.... So one of them in the [area] is green space revitalization and open space revitalization. So [the mini forest] definitely falls within that category, but it also bridges the gap to another category, which is, I forget the exact terminology, but community connection or community cohesion. And so this ticks off two buckets...It has that multi-objective focus.*" (MCP04)

Many projects viewed the 2023 pilot program as an opportunity to test the mini forest method, and this explorational approach emerged as the third most common motivation with 8 references. Six practitioners noted an interest to compare the Miyawaki method with other more traditional afforestation, and the possibility to integrate it into their existing programs and naturalization techniques. One project explicitly noted funding availability as a factor for experimenting with the mini forest method.

"*We were interested in the method, how it differs from methods/techniques used in our broader naturalization planting program and how we might incorporate what we learn from the mini forest method into our broader program. Our broader program sees over 20,000 native trees and shrubs planted at about 50 sites across the city each year by our own crews and volunteers.*" (S15)

Lastly, educational motivations were referenced 4 times. Two projects expressed long-term intentions to provide environmental and biodiversity-related education to the public by welcoming community groups and school classes to their mini forest. Meanwhile, a third project referenced educational themes in 2 distinct ways: (1) the "educational demonstration planting" process of creating the mini forest as a public-facing educational opportunity, and (2) the utilization of their mini forest as an example to educate or inform partners and colleagues.

"*The future vision for the site is to become a biodiverse park with a focus on education about Miyawaki Forests, biodiversity, keystone species and insect wildlife.*" (S07)

Design Approaches and Features of Mini Forest Projects

The 15 mini forests in the GCC's 2023 National Mini Forest Pilot program are nearly evenly distributed between urban (53%) and suburban (47%) contexts, with the former further categorized into urban residential areas (40%) and dense urban cores (13%). The majority of sites are on public land (73%), while the remaining are located on private land, often the property of a community organization or their partners. Many of these mini forests are located near trail networks, single-family housing and schools (Figure 2).

Common Surrounding Infrastructure (<100m)

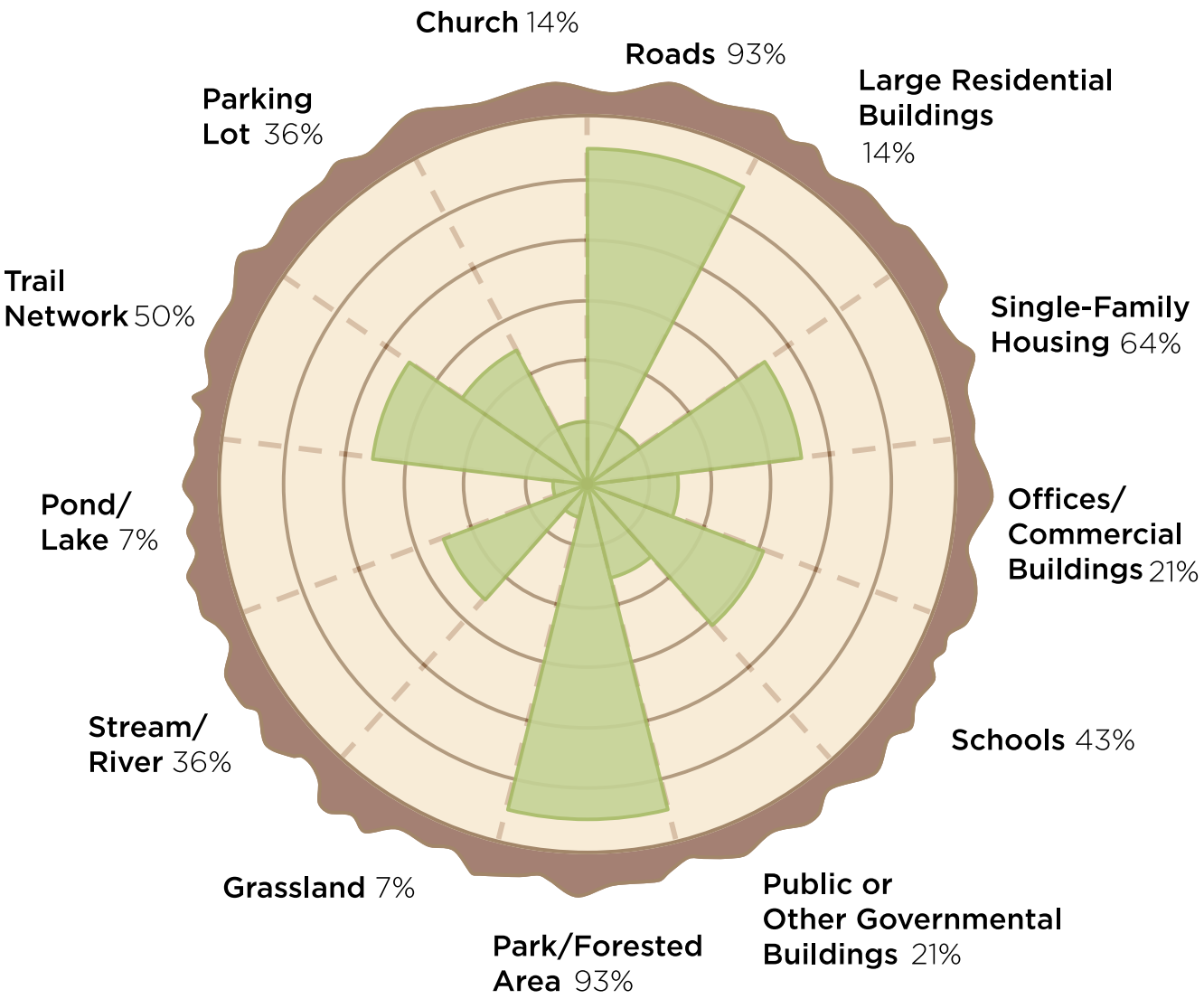


Figure 2. Most common types of infrastructure within the immediate surroundings (<100 m) of suburban and urban mini forests.

Given the diverse motivations, contexts, and stakeholders behind each of the 15 mini forest projects, their design processes and approaches were also varied, demonstrating different forms of leadership and collaboration. A key theme across most projects was the emphasis on community consultation, which was referenced 25 times across the surveys by 13 sites. In most cases, community engagement was an integral part of the planning and design processes, influencing decisions in site layout, species selection, planting day activities, and long-term visioning.

The communities consulted include neighbourhood residents, Indigenous youth, students, senior centre members, religious communities or church congregations, and environmental groups. Twelve of the 13 projects that answered the surveys, initiated outreach to these groups through direct contact or marketing, and one project consulted local residents on an occasional basis during site visits. Some approached community consultation through a series of workshops or planning sessions, which guided the scope and vision of the mini forest, while other projects approached community members for feedback once the initial design was completed.

Particular sites demonstrated strong bottom-up community leadership, as demonstrated by a project where the mini forest idea was first proposed by local residents during a neighbourhood action plan meeting. Some projects leveraged public engagement through community leaders. For instance, one project organized a particularly successful planting day by collaborating with the minister of the local spiritual community to schedule their event after Sunday service. By working closely with the community leader, this project was able to engage with its community members more deeply, including through the contents of the service itself. Notably, the only 2 sites that did not reference community consultation were municipality-led projects, indicating a potential difference in design approaches between municipal and community-driven initiatives.

"*In delivering the community engagement education piece for this project, we developed a template for community engagement that involved presenting information about Miyawaki Forests, native tree species and the value of biodiversity. We involved community members in visioning and co-planning exercises that determined the scope and the design of the project. We used the same template in engaging a community housing project slated for planting next fall, and will use the same process this winter to engage residents in two other community housing projects where little forests are planned for next year.*" (S07)

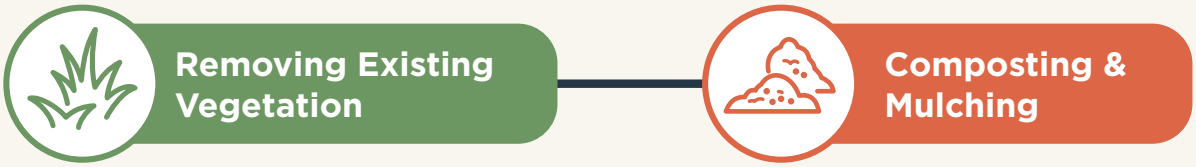
"*We consulted with [the local religious community's] Reverend [name redacted]. Her suggestion to plant on a Sunday following their Sunday service really contributed to the event's success because she framed that service around the importance of connecting with nature and how trees and forests play important roles in our lives.*" (S02)

In addition to public engagement, internal staff within the leading organizations played a significant role in shaping project design, with 11 references across 9 sites. Municipal involvement was also a recurring theme, referenced in 7 instances across 6 sites. One municipality-led project highlighted the challenges of navigating city approval processes but emphasized that these efforts led to policy adoption, paving the way for future urban mini forest projects:

"This is the first little forest on city lands, and the approval process was somewhat messy, but it was worth it in the long run because the city has now adopted a policy, based partly on our community engagement model, process and timeline, which will allow for the planting and partial funding of future little forests and native, naturalized gardens in city parks." (S07)

Three projects incorporated expert consultation. These projects drew on the knowledge of forestry professionals, ecologists, and university researchers in fields such as soil science and plant biology. Additionally, landscape architects, either internal or externally contracted, contributed to design decisions in 4 projects. The involvement of these experts and professionals showcases the intersection of technical knowledge, professional practice, and community-driven ideas in the development of mini forests.

Overall, the design processes across the sites reflect a blend of participatory engagement, institutional collaboration, and professional expertise - highlighting the need to recognize both the ecological and social dimensions of mini forests.



- Remove weeds and invasive species
- Mow remaining vegetation
- Cover ground with cardboard

- Applied on top of cardboard layer
- Cover site with soil amendments like compost manure, and/or mulch

Used for different benefits:

- Aeration: Shredded leaves, chopped straw
- Moisture retention, Biochar, coco coir

- Excavation is recommended if the soil is compact
- Till soil to the depth of the compaction, but no

- Recommended by the Miyawaki Method
- Expensive and energy intensive, advised for heavily degraded soils

Site Prep

Site preparation techniques varied by location, organizational capacity, and prior conditions.

Common approaches include mowing, removing weeds, and invasive species, mulching, applying soil enhancements, installing fending and tilling.

Planning

Site Selection

For community-led projects

- Located near or on the lands of a community organization/hub.

For Municipality-led projects, key factors are

- Public accessibility and visibility
- Ecological determinants
- Maintenance accessibility

Design Process

- Hosting design & visioning workshops with community members
- Communicating with community leaders
- Consulting experts
- Working with landscape architects
- Organizing a volunteer team
- Planning planting day logistics

Monitoring & Maintenance

2 Approaches: Conducted by staff or volunteer stewards.

Monitoring

Quantitative:

- Tree height
- Diameter at breast height
- Survival rate

Qualitative:

- Visual assessments
- Social observations

Maintenance

- Watering (at some sites, only for the first two years)
- Removing weeds and invasive species
- Trimming
- Common frequency: 1 or 2x per season

Planting

Planting day logistics

Common approaches:

- Demonstrating at the start of the event
- Information booth and activity table
- Providing volunteers with assistance throughout the event
- Small groups working in sections
- Dividing tasks amongst the group
- Inviting media to cover the event

Impacts and Challenges of Mini Forests

3. Impacts and Challenges of Mini Forests

Drawing from both survey results and interview responses, this section details the benefits and challenges shared by practitioners in the 2023 National Mini Forest Pilot program. In all interviews, ecological benefits were discussed with 42 total mentions and social benefits with 38 total mentions. Overall, mini forests were seen as a novel, dynamic and multifunctional approach.

"*What we found is all of the Miyawaki forests are conservation, education and public engagement rolled into one*." (MCP03)

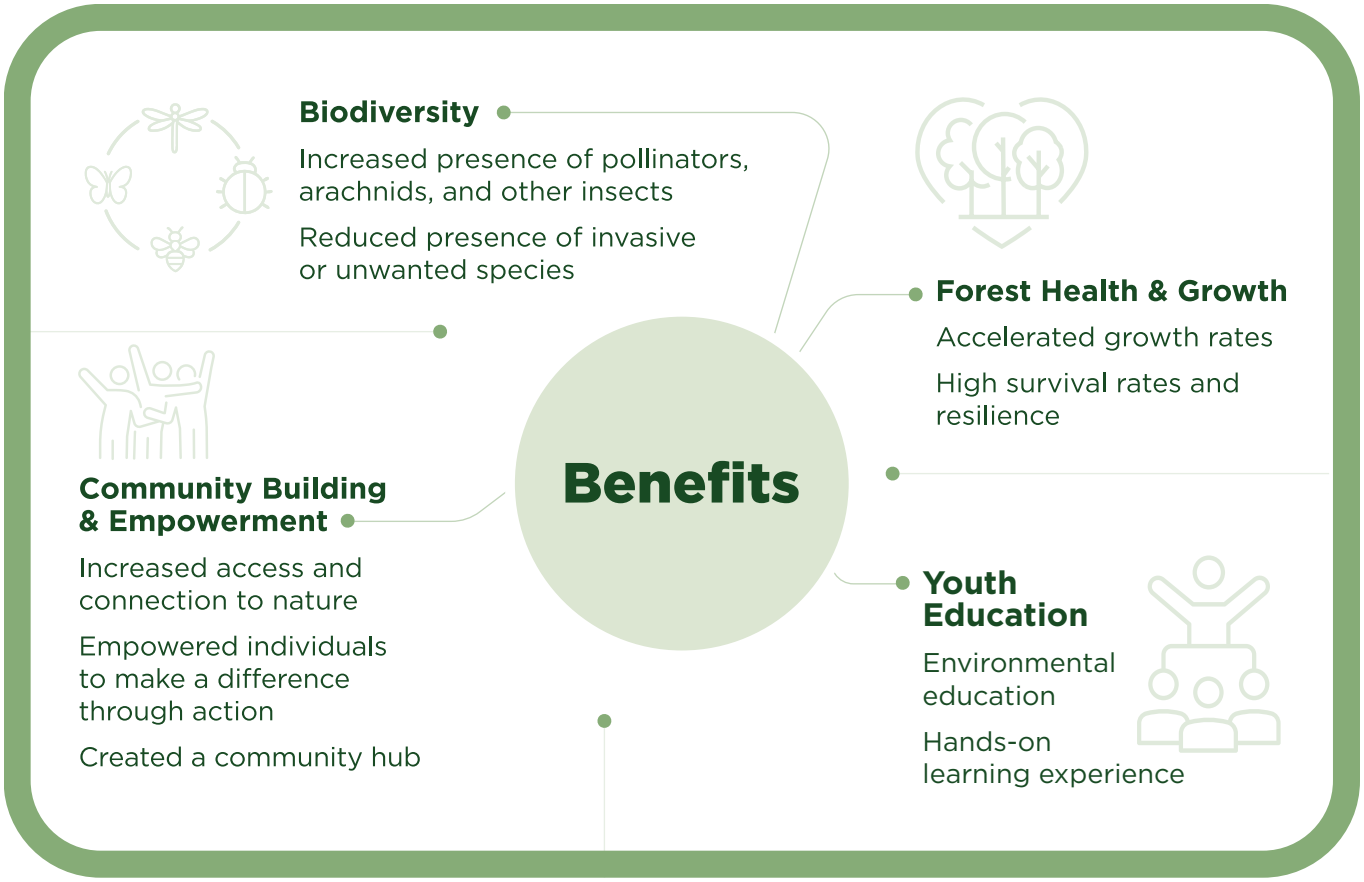
Ecological benefits

Except for the reported survival rates, the information and patterns noted as ecological benefits are mostly anecdotal and based on visual observation by the stewards or persons caring for the mini forests. There are currently no generalizable conclusions for Canada as mini forest sites are scattered across different provinces and all sites are in their early stages with little monitoring data. Despite 80% of surveyed mini forest sites report conducting some monitoring of their mini forest, this biodiversity monitoring has been informal and not through a formalized methodology. The main ecological benefits of mini forests reported in this section relate to increased growth rate and overall forest health, and enhanced biodiversity. Other ecosystem benefits mentioned in the interviews include: carbon sequestration, erosion control on hill slope, habitat creation for birds and mammals, and improved soil health.

Forest Health and Growth

Of the 15 mini forest projects, 13 of them provided tree and shrub health assessments in the survey (87%), whereas wildflowers and grass were less monitored (40% and 13%, respectively). Across all sites, plant conditions were reported as either "mostly alive and thriving" or "thriving but around a quarter are dead."

"I would say just in terms of the health and the vigor of the plants, it's noticeably different. In some areas we have almost complete coverage of the ground layer. You literally can't see the ground layer when standing above it in some portions of the site. The plants themselves, like the leaves look great, really dark green color and larger, and the stems [look] like they've really done well." (MCP02)



Survey responses indicate that the average survival rate for trees was 89%, but one-third of all sites implemented replanting efforts to compensate for losses.
At one site, a practitioner reported a survival rate between 90–100%, compared to an average of 80% in traditional plantings (MCP02). In the interviews, survivability and resilience were highlighted as key characteristics of mini forests.
One practitioner noted that mini forests offer greater resilience against herbivory and mechanical damage, as high-density plantings can withstand localized losses without significant impacts on overall success (MCP05).

"*You can withstand more damage within the forest because there's still a lot more diversity happening. And so the success rate is higher.*" (MCP05)

Increased growth rate was the most frequently mentioned ecological outcome in the interviews. Practitioners reported significantly accelerated tree growth compared to traditional plantings. One interviewee estimated that the first season of growth in their mini forest "is probably equivalent to about 3 seasons of a traditional approach" (MCP02). More specifically, the height increases at this site ranged from 20-30% in one year, exceeding the interviewee's observations across traditional tree planting sites, which typically saw growth rates of 10–15%. This practitioner also noted that "a stem the size of [their] thumb when [it was planted] have doubled in diameter" and "multi-stemmed shrubs [which looked] a little thin and underwhelming in their first year" have grown into plants with "multiple stems [and] a lot of good, strong lateral branching." (MCP02). Another interviewee noted that silver maples at their site exhibited exceptional growth, gaining 1 metre over the summer of 2024 (MCP01).

"*Generally all species are performing better in the mini forest than our other naturalization sites. Higher survival, more growth, more vigorous in appearance.*" (S11)

Biodiversity Enhancement

Biodiversity improvements were the second most frequently mentioned ecological outcome in interviewees. One practitioner noted an increase in pollinators such as bees, butterflies, and moths, as well as arachnids and other insects (MCP06). Furthermore, the presence of new wildflowers has also been observed at this site, probably as a result of decreased mowing:

"*Original land was grass and meadow areas, and now it has many different tree species and weeds amongst the trees. This attracted pollinators, butterflies, bees, moths, spiders, wasps, etc. When I had previously been there, there was nothing of this level of biodiversity from before. Could be interesting to set up a camera for monitoring.*" (MCP06)

Two sites also mentioned a reduced presence of invasive or unwanted plant species within their mini forests. One practitioner attributed this to the inclusion of herbaceous species in the ground cover layer, which seem to have covered the mulched area and prevented the spread of common invasive species in the area such as buckthorn, garlic mustard, and bindweed (MCP02).

Social Benefits

Mini forest practitioners have observed a range of social benefits since planting their mini forests, particularly community building, youth engagement, educational opportunities, increasing sense of place and ownership, and stronger connection to nature. Very few Canadian mini forest sites are being monitored for social impacts, with only 2 sites conducting monitoring of visitors. However, casual observations indicate a multifunctional potential of mini forests and warrant further research on the social dimensions.

Community Engagement

Above all other social benefits, most interviewees mentioned benefits to community either during the mini forest planting event or in the year(s) following implementation. Mini forest planting events offer significant opportunities for community engagement compared with other urban greening techniques. Mini forest practitioners noted that planting and maintaining a mini forest was more approachable for older adults and young children, as the planting area is small, with the is soil prepared in advance, making it easier to plant:

"*We have done a few events with just like our traditional plantings, but this was definitely a lot more approachable for people with kids and older folks and stuff, just because it's a small area. It's perfect. Like it's flat and prepared.*" (MCP01)

The accessibility of mini forest plantings, both in the time and level of effort required, allows those of diverse ages and abilities to participate, get outside, connect with nature, and share while planting a tree. Mini forest practitioners described a number of other benefits, including learning new skills, supporting mental health, and increased sense of joy or excitement.

"*People have such a good feeling when they're actually planting the forest, like there's a sense of joyousness as people plant and as they leave the planting experience.*" (MCP03)

Beyond the mini forest planting event, mini forest practitioners observed a few other benefits to the community in the year(s) following the planting, including creating a community hub and increasing access and connection to nature. Stewarding the site fosters social connections between members, and provides a gathering space for the community (MCP04).

Another example involved a practitioner working with employees of a local company to plant a mini forest on their company property. The practitioner relayed the difference the mini forest makes in the employees' work environment by offering a space to retreat and connect with nature through the workday (MCP07).

Youth Education

Mini forests offer an opportunity to learn about native species, ecosystems, ecology, biodiversity, and planting. Mini forests facilitate learning through hands-on engagement. For these reasons, mini forest planting and stewardship events are a natural fit for schools and educators interested in increasing experiential, environmental education. Many practitioners had experience planting mini forests on school grounds, or inviting and involving local school children and teachers to nearby planting events. In one example, young elementary students (grades 3-8) participated in two planting events with the same mini forest practitioner. The practitioner noted that the attendance to the Fall planting tripled in size compared to the Spring planting with the same school group, demonstrating the increased children's engagement and appetite for the hands-on planting and learning experience (MCP06). In another example, pre-school age children become "stewards" of their local mini forest, monitoring and learning from it as the forest grows.

Ownership, Sense of Place & Empowerment

After planting a mini forest, practitioners described the sense of accomplishment and empowerment among participants. Some practitioners described volunteers returning to the mini forest site in the months following planting to observe the growth of "their" tree, reflecting their pride and sense of attachment to the place. Other practitioners explained that planting a forest, albeit a mini forest, can be an "antidote to all of the bad news, lots of bad climate news" (MCP03). Running a volunteer-based mini forest planting event can offer an opportunity for individuals to take hands-on action, empowering them to make a difference. This can carry forward for mini forest stewards, who participate in the maintenance and ongoing success of the mini forest.

"*But when you actually take action, there's a sense of empowerment and that you're doing something. It's better to do something than to do nothing. And sure... These are small little patches that we're putting in, but it signifies something much greater...*" (MCP03)

Perceived Challenges

Mini forest practitioners who participated in the study described a number of challenges they experienced in planning, planting, and stewarding their mini forests. From the survey, challenges mentioned by a large part of the practitioners are: herbivores affecting the forest growth (46% of responses), weeds and overgrown plants that make the mini forest difficult to access (46%), difficulties watering the mini forest (38%), and a lack of volunteers for maintenance (23%). Challenges mentioned in the interviews were unique to practitioners in specific contexts. However, some challenges shared across contexts included governance issues, funding and limited capacity, the ability to source the right quantity of native species, and variable community acceptance due to mini forests 'unkept' aesthetics. Natural disturbances such as heat waves, drought, or flooding were not perceived as challenges affecting the mini forests at the time of the study. However, practitioners in the interviews highlighted that all of these potential climate-related risks were considered during the planning and development phase to design mini forests that would withstand these disturbances with native species.

Governance and Funding Issues for Stewardship

In general, the main challenges of mini forests relate to governance and funding requirements. Mini forests are expensive, with tight budgets that can constrain creativity in terms of landscape design and additional features:

"*... mini forests are pretty expensive. We're spending anywhere between, I would say $5-6,000 just on supplies and then, add in staff time, all this stuff. We usually don't have any money left over for benches or hardscaping.*" (MCP05)

Funding structures influence and create other challenges, including a lack of capacity for post-planting activities like maintenance, and limited access to funds to support long-term research or monitoring activities to study the full impacts of mini forests. To meet these high expectations for monitoring data and other information that can be reported to partners requires significant staff time and capacity, limiting practitioners' ability to undertake new projects or resulting in monitoring efforts falling "to the wayside when other things are going on" (MCP06). This is a significant challenge for mini forest practitioners when it comes to post-planting activities:

"Everyone wants to give us money for trees. Everyone wants to take a picture planting a tree. Everyone loves paying for flowers. We've actually had projects where we had too much funding for supplies. And we didn't need it. We're like, we don't need more soil, we don't need more trees. We need staff time. Monitoring is all staff time." (MCP05)

Operational and Safety Issues

Following governance and funding-related challenges, the next category of challenges are operational and context-specific. Six mini forest practitioners described challenges around site logistics, including difficulty accessing the site with large equipment or for deliveries leading to delays. Community concerns around safety and visibility, given the density of a mini forest, also posed a challenge for practitioners in terms of both community acceptance and site selection. For some groups, safety and visibility concerns affected the design of the mini forest, opting against a trail or pathway through the mini forest for fear of creating an opportunity for offenders to hide amidst the density. These considerations also affect site selection, limiting the potential for mini forests to be planted in small, urban spaces or parks in the city-centre.

Thriving Mini Forests:

Best Practices & Success Factors

4. Thriving Mini Forests: Best Practices & Success Factors

The following section highlights best practices for thriving mini forests in Canada. In sharing their experiences with us, mini forest practitioners emphasized several factors influencing the success of their mini forest.

For some practitioners, success stemmed from aspects of the planting method itself, particularly the multi-layered density, and the soil preparation and added amendments. One practitioner emphasized that, even without the 1-metre excavation typical of the original Miyawaki method, their mini forest has been flourishing thanks to the soil amendment and mix of species and despite being planted in a historically contaminated, and degraded site, that would be otherwise difficult to plant in. For other practitioners, a high-level of planning and organization, both prior to and on the planting day, influenced their mini forest's success. Organizing their volunteers into groups where each member had a dedicated task (i.e., one person digging the hole, one person planting the tree or shrub, one person adding fertilizer and mycorrhizal amendments, and one person watering) ensured a well-planted mini forest and a successful, enjoyable, and memorable planting day for the volunteers.

However, there were 3 key success factors that were mentioned by nearly every mini forest practitioner. These key success factors are: (1) expertise, (2) relationships, and (3) stewardship. These success factors and related best practices are elaborated hereafter.

Relying on Expertise for Species Selection, Soil Preparation, and Volunteer Engagement

Despite the fact that the Miyawaki method has been made readily available with simply-to-follow instructions, mini forests require a certain level of expertise and often site-specific adaptation to be successfully planned. Because of the density, mini forest practitioners emphasized the importance of understanding the soil's composition and selecting species that thrive in those specific conditions. Working with staff, volunteers, or consultants with expertise in the fields of horticulture, botany, arboriculture, urban forestry, and/or urban ecology is an asset, not only for the mini forest's long-term success, but for a faster implementation process. Connecting with organizations that are known to be involved in the mini forest movement can help find experts that can provide support, for example individuals can reach out to Green Communities Canada, the Network of Nature, and Dougan Ecology for guidance on making these connections.

Working with experts embedded in the municipal government was considered a success factor because this expedited the process and integrated the mini forest method into existing systems and practices at the organizational/ institutional level. Expertise can play a role not only in terms of species selection and mini forest design, but also when it comes to organizing a successful planting day and protecting the forest from development over the long term.

"*I think our leadership is really valuable... Because we can tap into knowledge that maybe other organizations don't have... And then as a whole, vwe've] been running volunteer planting events for decades now, we've been in [city] for 30 years. And so, I think we have a really well-established system for any kind of planting.*" (MCP05).

BEST PRACTICE:

Rely on the expert.
Engage researchers, consultants, Municipal agencies or community organizations to fill gaps in knowledge and expertise, especially relating to species selection, soil preparation, and volunteer engagement.

Building Good Working Relationships Based on Common Goals

Mini forest practitioners stressed the importance of good working relationships for the successful planning and implementation of a mini forest. One of the most discussed relationships to foster was that with the local municipality. Strong relationships with local government staff were credited with expediting aspects of the planning process (e.g., obtaining approvals or information) and for some groups, led to the establishment of maintenance agreements where a mini forest was included in the city's watering route.

Good working relationships with the local municipality, landowner, or other collaborating partners is not only an important time- or cost-saver, they can also engender support for replicating this new mini forest method. Having partners, including the local government, onboard, buying-in and advocating for mini forests can enable their success by making the effort collaborative, cross-departmental, or inter-organizational. In the interviews, strong relationships were very diverse and included collaborations between municipalities, climate hubs, conservation societies, spiritual hubs, schools, colleges, and private companies.

Key to building relationships and fostering collaboration is to have open lines of communication where conflicting ideas can be discussed to find common ground, and move forward. Mini forest practitioners stressed that relationship-building is not only important to engender support of the near-term project, but to build advocacy for future mini forests in the long-term.

"We're stronger if we work together. That's how we see it. And that's how we see working with the city... We've got some really great people in the city, in the parks, that have really taken to this idea. But if it didn't have community engagement, I don't think it would have worked." (MCP03)

BEST PRACTICE:

Build relationships by finding common goals.
Position mini forests as helping to achieve synergistic goals for the partner organization, landowner, or municipality (i.e., conservation of riparian areas, increasing local community engagement, etc.)

Building Capacity and Motivation for Stewardship

Mentioned in all interviews, stewardship is perhaps the most important factor in a mini forest's success. There seems to be two key aspects to successfully caring for a young mini forest: (1) volunteer or staff capacity, and (2) stewards' vested interest in ensuring the mini forest's success.

Capacity for stewardship can be achieved through staff time (often the case for municipal mini forests), part-time or student positions, or community volunteers (including school children when planted on school grounds). Community volunteers are cost-effective and can help make a project viable for municipalities who require maintenance agreements to commit to a project. There are added benefits for volunteers such as skill development, improved sense of place and belonging within their community, and increased environmental leadership or empowerment, as well as overall increased community buy-in of the mini forest and method.

When stewards have a vested interest and are dedicated to the forest's success, they are proactive with maintenance. Participating in the stewardship of the mini forest helps to build the local stewards' leadership and empowers them to take initiative in ensuring the mini forest's health and longevity. Taking initiative is a positive sign for any steward, not just community volunteers. In municipal mini forest projects, staff's commitment to the success of the mini forest was cited as a reason for high survival and growth rates.

"The community is really invested in this project... They're actually taking the time to message us and say: Hey, we noticed this thing... It just speaks to the community's interest in the project." (MCP04)

BEST PRACTICES:

1) Build stewardship capacity:
Engaging community volunteer stewards in the maintenance of the mini forest can stimulate greater community acceptance. Relying on community stewards with a vested interest (e.g., local environmentalist group, neighbourhood beautification committee) can improve long-term success for the mini forest. Providing community stewards with training, tools, contacts, and other resources builds their capacity and empowers them to take initiative.

2) Strength in diversity:
Environmental stewardship can increase a sense of place and belonging; engaging a diverse group of stewards can help achieve equity goals. Diversifying the group of stewards can also help to ensure the mini forest's long-term protection, by increasing the number of key stewards and their complementary age, ability, knowledge, etc.

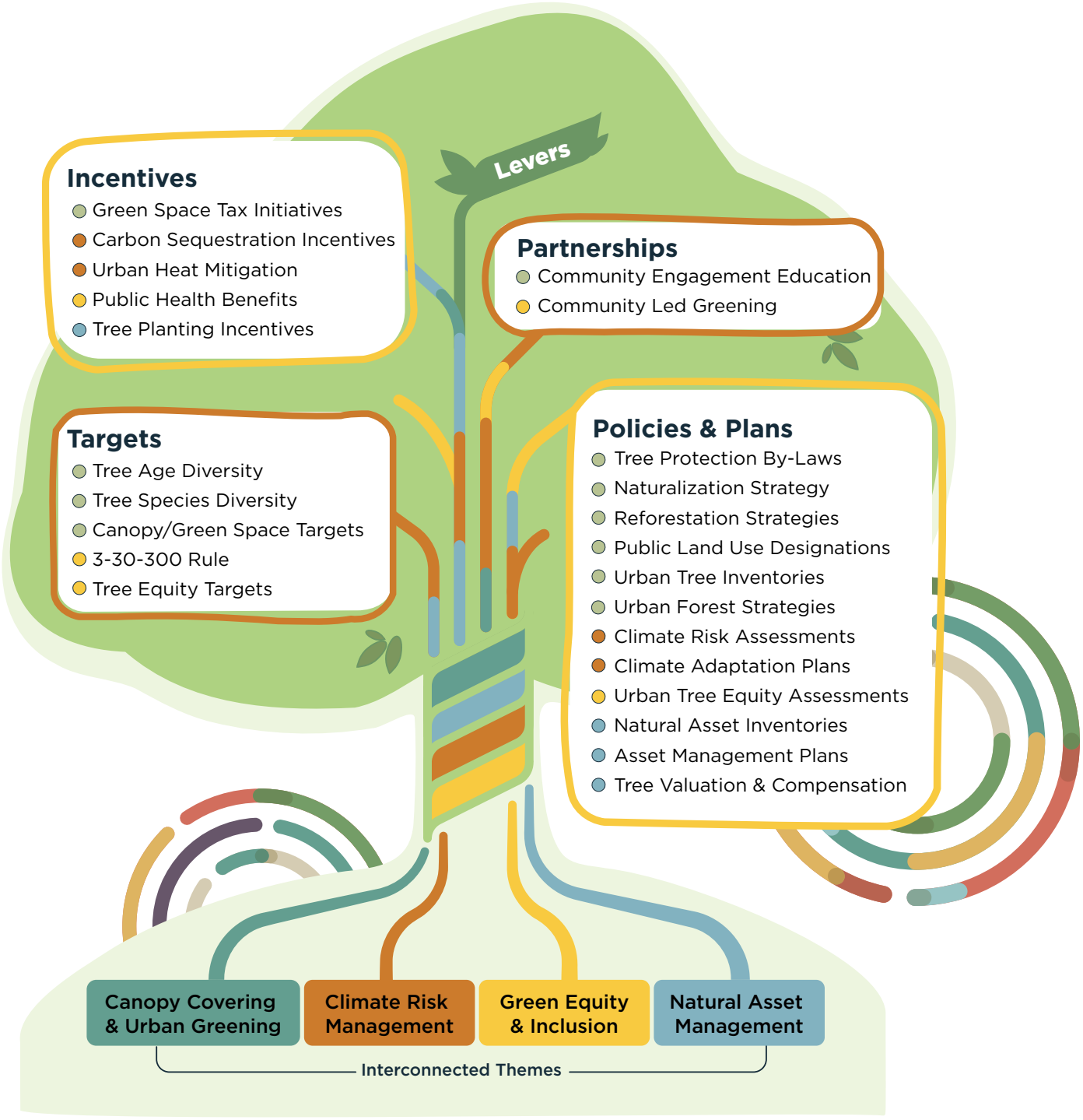

RICHMOND
Welcome to the first Mini Forest in Western Canada located in a public park!
What is a Mini Forest?
A Mini Forest - also known as a Miyawaki forest, micro forest, tiny forest, pocket forest, or little forest - is a community of native trees and understory plants planted very close together. The dense planting encourages the plants to grow tall quickly (up to four times faster than conventional planting) instead of outwards, in search of sunlight and other resources. Mini Forests are typically planted in urban or suburban areas where space is limited, and can be planted in an area as small as 100 square meters. Mini Forests mimic the complexity of a native, mature forest through introduction of a diverse range of trees and plants. When the trees and plants are established, they form a layered plant community comprised of a tree canopy layer, shrub layer, and groundcovers / perennials.
For more information on Mini Forests, scan the QR code
Canada

Growing Mini Forests in Canada:

Policy Levers & Mainstreaming Strategies

5. Growing Mini Forests in Canada: Policy Levers and Mainstreaming Strategies

The diagram below maps out the wide range of policy levers and strategies that can support mini forest implementation. These levers are grouped into four categories — Incentives, Policies/Plans, Targets, and Partnerships — and are shown as interconnected, rather than sequential. Together, they support four strategic themes for urban forest expansion in Canada: Canopy & Urban Greening, Green Equity & Inclusion, Climate Risk Management, and Natural Asset Management.



Policy Levers for Multifunctional Mini Forests

Despite their global spread, mini forests are a new concept within Canada, with the earliest known mini forest being established less than 10 years ago. While not yet endorsed by policy, mini forests have the potential to play a multifunctional role and provide benefits across environmental and social dimensions, which makes them an attractive solution to multiple challenges and an opportunity to meet a variety of needs or goals within a community. Notwithstanding mini forest multifunctionality, there is still much work to be done to increase uptake throughout Canadian municipalities. In general, green infrastructure such as mini forests are often considered an "add-on" to already existing policy and not considered during early in strategic planning phases. Although mainstreaming green infrastructure is difficult, this section highlights a range of levers – including policies, incentives, targets, and partnerships – and strategies that can position mini forests as viable solutions to multiple societal challenges.

National Policy Levers to Support Mini Forests

At a national level, Canada has established a number of ambitious commitments to address climate change and biodiversity loss. A key element of Canada's larger climate strategy is its approach to nature-based solutions, which focuses on managing natural ecosystems to address societal challenges such as climate change and biodiversity loss. Canada has pledged to achieve net-zero greenhouse gas emissions by 2050 using nature-based solutions to combat climate change, and protect 30% of its land and 30% of its oceans by 2030 (Government of Canada, 2020). This commitment is anchored by the Natural Climate Solutions Fund, a $4 billion investment that supports Environment and Climate Change Canada's (ECCC) Nature Smart Climate Solutions Fund, Agriculture and Agri-Food Canada's (AAFC) Agricultural Climate Solutions Program, and the Natural Resources Canada's (NRCan) 2 Billion Trees program (Environment and Climate Change Canada, 2021). The latter was launched in 2021 and sets forth a goal to plant two billion trees across Canada by 2031, harnessing partnerships with provinces, territories, non-profit organizations, businesses, and Indigenous governments and organizations (Environment and Climate Change Canada, 2021).

Supported by the 2 Billion Trees Program, the Growing Canada's Community Canopies (GCCC) initiative is led by the Federation of Canadian Municipalities' (FCM) Green Municipal Fund. In addition to planting at least 1.2 million trees in municipalities nationwide, this program intends to address some of the common obstacles that communities and local governments encounter when attempting tree canopy expansion projects, such as lack of staff capacity, knowledge gaps, and funding shortages (Green Municipal Fund, 2024).
To implement this program, FCM has partnered with Tree Canada, leveraging their urban forestry knowledge and networks to provide coaching in the form of customized support, coaching communities on planting aspects such as tree species and site selection, best practices, and preserving diverse canopies (Tree Canada, 2024).

Although Canada currently lacks a federal urban forest strategy, commitments to address climate change, conserve biodiversity, and support canopy growth offer a foundation that can support mini forest implementation nationwide through collaboration, knowledge-sharing and funding. Programs like the 2 Billion Trees and GCCC offer financial and technical resources, while the focus on nature-based solutions and biodiversity throughout Canada's climate strategies aligns with the mini forest intention of greening urban environments with community engagement.

Municipal Policy Levers Aligned with Mini Forests

Municipal jurisdictions offer opportunities to align existing climate change action plans, urban forestry strategies, and tree canopy targets with the mini forest movement (Table 2). Based on their purpose, municipal levers were categorized into four key themes: climate risk management, urban greening, equity and access, and natural asset management.

These inter-connected themes were identified as significant driving factors for nature-based solutions at municipal level, with the capacity to support mini forest implementation.

Note: "Y" stands for yes, "N" stands for no, "UD" stands for under development.

Municipality	Province	Population (2021)	Land Area (km2)	Climate Change Policy	Urban Forest Strategy	Tree Canopy Goal
Calgary	AB	1,306,784	820.62	Y	Y	Y
Guelph	ON	143,740	87.43	Y	Y	Y
Hamilton	ON	569,353	1,118.31	Y	Y	Y
Kingston	ON	132,485	451.58	UD	Y	Y
Langley	ON	132,603	307.22	Y	Y	Y
London	ON	422,324	420.50	Y	Y	Y
Markham	ON	338,503	210.93	Y	UD	Y
Moncton	NB	79,470	140.67	Y	N	N
Richmond	BC	209,937	128.87	Y	Y	Y
Sherbrooke	QC	172,950	353.40	Y	Y	Y
Toronto	ON	2,794,356	631.10	Y	Y	Y

Table 2. Summary of existing policy levers across municipalities that took part in the GCC's 2023 National Mini Forest Pilot program.

Canopy Cover and Urban Greening

Maintaining and increasing tree canopy is a common goal across Canadian municipalities, recognizing the many benefits that urban forests directly or indirectly provide to urbanites. Increasing urban tree canopy, however, is not as easy as planting more street trees - the lack of space in urbanized environments offer limited options for traditional street tree planting, and novel approaches to urban greening are necessary.

Urban forest strategies exist across Canadian municipalities, ranging from overarching visions to detailed management plans. It is common for municipalities, especially large cities, to have at least one of these strategies in place (e.g. Table 2). At the heart of these urban forest strategies is a general understanding of current urban forest conditions and an identified need to grow canopy, often using indicators to track progress towards future goals. Targets for tree canopy cover, greenspace availability, and tree species diversity are commonly included in these strategies. It will require strategic planning and innovative techniques by municipalities to meet these targets. All the municipalities that took part in GCC's National Mini Forest Pilot program have urban forest strategies already in place, or are in the process of developing one. The City of Hamilton has incorporated mini forests into their urban forest strategy, and Councillors have taken an invested interest in seeing mini forests spread

across the city. The City of Guelph's One Canopy Tree Planting Strategy includes several recommendations that indicate the need to identify best practices in urban design and zoning to "maximize quality growing space on public and private land" (City of Guelph, 2023). **Municipalities can employ unconventional planting strategies such as mini forests to increase tree cover and enhance participatory urban greening.**

Green Equity and Inclusion

More Canadians are settling in urban areas than ever before, with almost three-quarters of Canadians (73.7%) living within one of Canada's large urban centres (population of 100,000 or more) in 2021 (Statistics Canada, 2022). This urban population growth is driven by factors such as employment, education, and social opportunities. This trend increases the need for infrastructure, housing, and other services. For many municipalities, maintaining access to these services often takes priority over preserving or creating greenspaces, especially within dense urban environments. However, urban nature is crucial for many reasons. Greenspaces like parks and community gardens offer opportunities for social interaction, recreation, and physical activity. Studies have shown that the presence and access to greenspaces have positive impacts on mental and physical health and general well-being (Kabisch & van den Bosch, 2017).

Unfortunately, availability and access to nature is not equitably distributed. Tree canopy tends to be lower in racialized and low-income areas and this trend is visible nationwide (Nature Canada, 2022). As discussed above, most municipalities have identified goals for increasing tree canopy cover, however these city-wide goals do not always address the inequity of access for different neighbourhoods or communities present. Simply increasing the quantity and distribution of trees is not enough; quality and process matter too. When introducing green infrastructure like a park or mini forests into a community, it is important to ensure that those who live in the community are actively engaged in the implementation processes, and/or are actively benefiting from it. **Municipalities can utilize mini forest plantings to improve equitable access to urban nature and to catalyze participatory action of underserved and racialized communities in urban greening.**

Climate Risk Management

Canadian cities are increasingly vulnerable to climate risks such as droughts, floods, heat waves, and other extreme weather events. To manage this, many municipalities have developed climate change adaptation and mitigation policies. These policies often contain an evaluation of potential climate hazards for the region and include actions or implementation plans to help manage these risks. They are often interconnected with other policies or strategic priorities, and implementation typically requires support from multiple stakeholders. Most of these policies recognize urban trees and greenspaces as examples of green infrastructure that can address climate-related challenges through their capacity to support stormwater management, mitigate urban heat island effect, improve air quality, and sequester carbon. **In this context, municipalities can leverage mini forests as a hyperlocal solution to support climate adaptation plans or related strategies.**

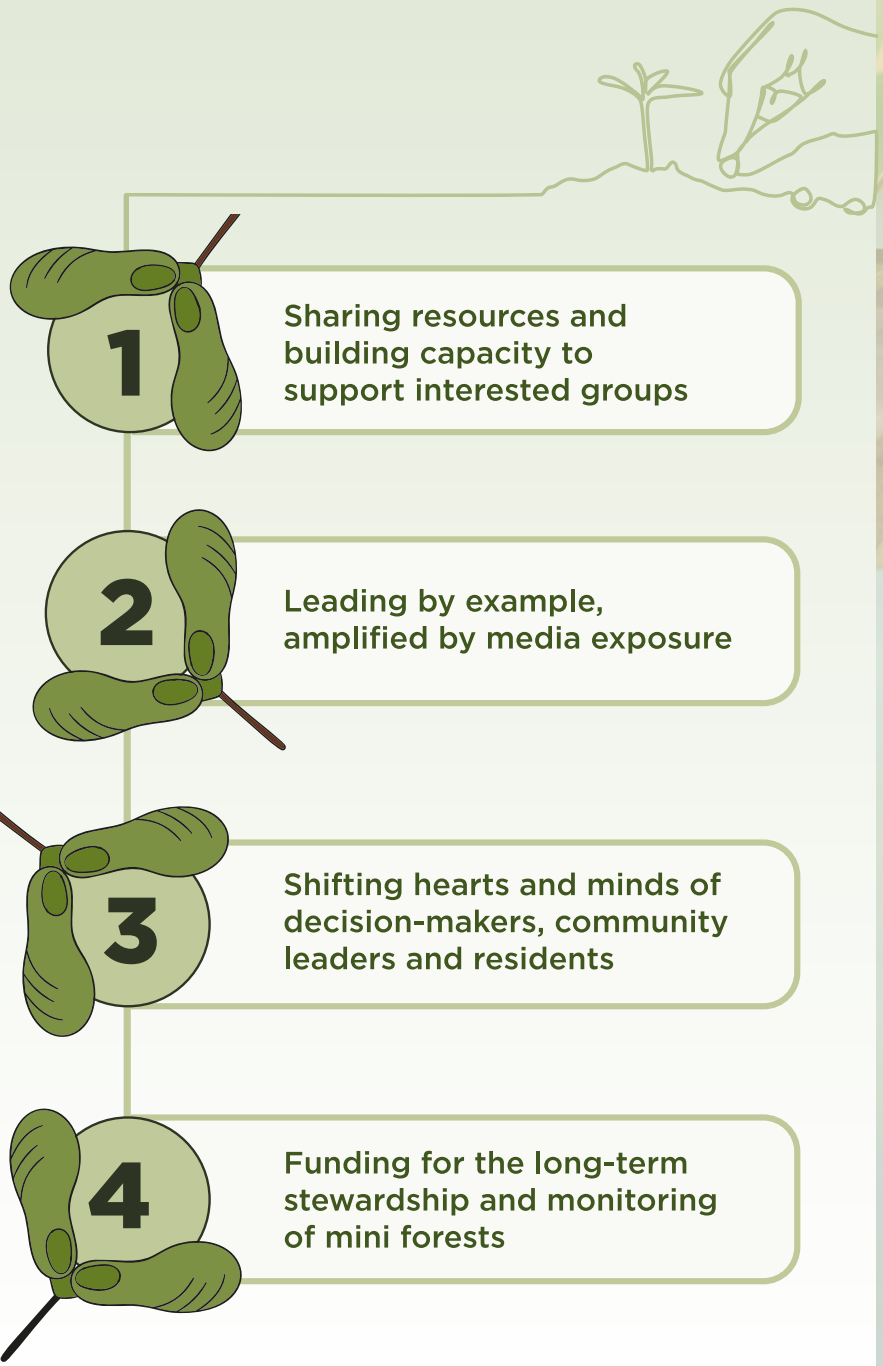
Natural Asset Management

Natural asset management (NAM) is a way to make the business case for green infrastructure by providing economic comparison between service areas and asset types. The first step is to take an inventory of green and grey infrastructure that is owned and managed by the municipality. This should include their economic value, current condition, and lifespan. This approach allows incorporating green infrastructure into decision-making, even though it is difficult to capture many socio-cultural values in financial terms. By adopting a natural asset management approach, municipalities have revealed green asset multifunctionality, which can be comparatively cost-effective to grey infrastructure alternatives.

Replacement cost method is commonly used for NAM, which identifies the cost to replace a given asset with a new similarly functioning. Using this method, the City of London determined that the current value of the city-owned urban forest is approximately $402 million (City of London, 2019). This method serves to provide the economic value of a given asset, yet it fails to evaluate possible additional benefits and services provided by the asset. The value transfer method, on the other hand, considers both the services produced by the asset and the multiple benefits derived by beneficiaries of those services. Using this method, the City of Hamilton estimated that their urban forest provides $8.2 million in ecosystem services annually, through services such as pollution removal, oxygen production, stormwater management, climate change mitigation, and energy savings (City of Hamilton, 2021). **Municipalities could use a NAM approach to identify the economic value that mini forests could provide through ecosystem services and multiple benefits and compare it to grey assets or to conventional tree planting over time.**

Strategies to Mainstream Inspiring Mini Forests

Movements grow incrementally through a process of mainstreaming, whereby change is inspired by positive feedback, and social acceptability achieved through evidence building and knowledge sharing. There are 4 primary strategies through which mini forest practitioners in Canada have been – actively or passively – mainstreaming mini forest planting:



Strategy 1: Sharing Resources and Building Capacity

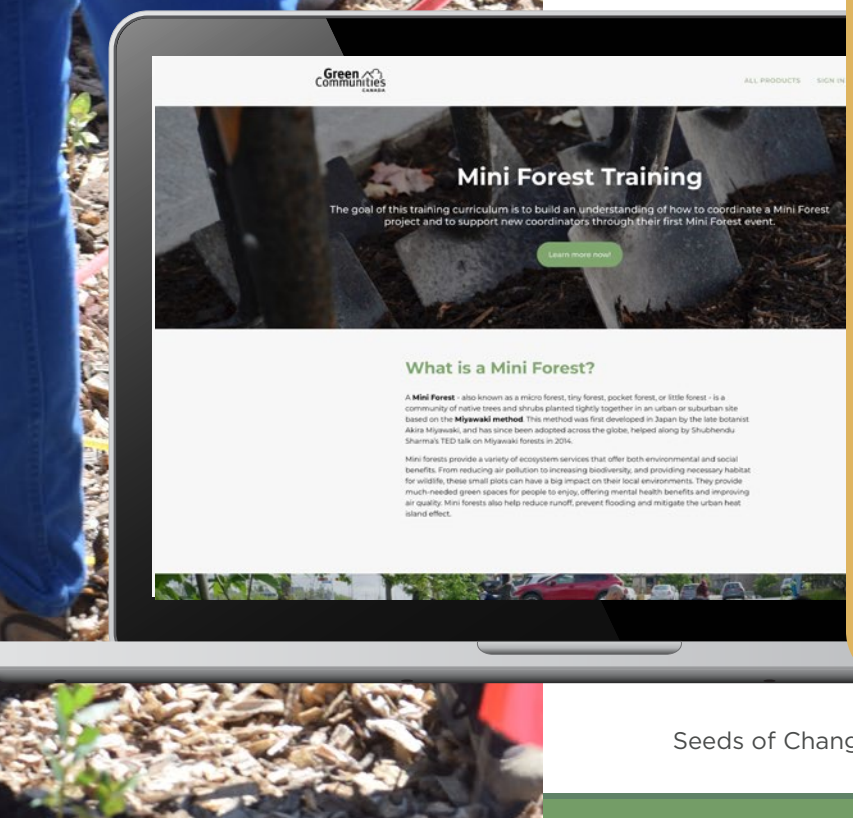
Increased mini forest interest has triggered a need for resources that support this planting method. National organizations, such as Green Communities Canada in collaboration with the Network of Nature, have created and shared resources to build capacity, compiling a curriculum, or multi-section training, that details each phase of a mini forest project. Smaller non-profit organizations and municipalities engaged in the mini forest movement are likewise producing resources to share with interested parties, informed by on-the-ground experience, lessons learned from monitoring their mini forests, and institutional knowledge.

Resources for capacity building include public-facing materials, such as online YouTube videos detailing approaches to soil preparation, and protocols developed to support systematic monitoring of tree growth by volunteers once mini forests have been planted. One mini forest practitioner described sharing a 'toolkit of templates with step-by-step instructions' for each phase of a mini forest project with a group from a nearby community. This toolkit was developed with the intention to replicate success when launching new mini forest projects, but needs to be adjusted to new site needs. The purpose of the toolkit is to provide a solid starting point for others interested in adopting this approach. Through informal networks of learning and an open sharing approach, the mini forest movement in Canada is growing with practitioners eager to share their experience-based knowledge, evidence collected on the ground, and resources with other community groups and individuals.

National Mini Forest Practice

Green Communities Canada's National Mini Forest Community of Practice brings together leading ENGO and Municipal partner organizations to share best practices, advance collective projects, and support evaluation and evolution of local approaches to advancing mini forest plantings that are equitable, abundant, and thriving. This community of practice provides the following resources and opportunities for connection:

- Monthly 1-hour Meetings with practitioners from across the country
- Mentorship Networks of support
- Periodic Webinars to share research and project examples
- Collaborative Funding Opportunities
- A Free **6-Part Training Curriculum** Hosted Online (asynchronously)



Mini Forest Training Course

Developed in 2023 through the **National Mini Forest Pilot** in partnership with the **Network of Nature**, Green Communities Canada's free **Mini Forest Training Course** offers a variety of free supports to new urban forestry practitioners and environmental organizations alike as they embark on their first mini forest projects. Expertise from **Dougan Ecology** features prominently in the course, including resources on soil preparation, plant species selection, and monitoring and maintenance.

The course covers the following topics:

- Introduction to mini forests;
- Budgeting and fundraising;
- Site preparation and plant selection;
- Event day materials, and health and safety guidelines;
- Monitoring and maintenance guidelines; and
- Communicating the impact of your mini forest, including on social media, through press releases, and on the Canada-wide **Network of Nature database**.

Strategy 2: Leading by Example

Successful examples of mini forest plantings are inspiring adoption across Canada by raising awareness and through positive stories: many mini forest practitioners described reinforcing feedbacks wherein the positive evidence generated with their first mini forest planting spurred the creation of more mini forests. Some practitioners have adjusted their approach to urban greening entirely, adopting the mini forest method as their primary urban greening method following the continued and replicated success (MCP05, MCP06). Similarly, a mini forest practitioner reported their partner organization is now actively looking for open, available, and underused land for future planting.

"When you see something that is actually working and it's tangible...You can clearly see it. And there's data that supports it. It's not an abstract ideology." (MCP05)

Media is a key factor raising awareness about mini forests. To date, mini forest practitioners have shared their stories through interviews, blog posts, news stories, and academic research, that have raised the public's interest in the method. One mini forest practitioner remarked the attention and buzz around mini forest projects, receiving many calls for interviews during and after planting. Another practitioner noticed that their city-wide mini forest initiative "lit a fire" of community residents desiring to plant a mini forest in their neighbourhood or park, with some even bringing it to their local city council. The more the mini forest movement is featured in media, the more people are exposed to examples from across the country and want to take action.

"If this is what makes people want to make environmental change in their neighborhood, then great. That's fantastic. The more, the better" (MCP04).

Strategy 3: Shifting Hearts and Minds

To mainstream mini forests in Canada, practitioners emphasized the importance of 'shifting hearts and minds' of local residents, the general public, and especially, decision-makers and government officials. Shifting hearts and minds involves changing societal norms and adjusting systems to remove mental and bureaucratic roadblocks. Interviewees suggested education as one method through which these hearts and minds can be shifted. One mini forest practitioner reflected on the increasing disconnect between human society and the natural world, and how this disconnect is leading to disregard for nature and biodiversity. Educating local residents and the public on the ecological benefits of mini forests, has been noted as a way for community to re-engage with and care for nature, and see themselves as part of nature.

Mini forests are characterized by a natural, almost 'wild' aesthetic. This aesthetic stands in stark contrast to the tidy and manicured landscapes typical of parks and street boulevards in North America. Education in the form of community events or even simply informational signage on-site, is helping communities accept this wilder, 'unusual' landscape by understanding the long-term intentions and benefits. The wild aesthetic of mini forests can likewise help normalize more natural and wild landscapes, especially in urban areas, shifting hearts and minds generally on what a landscape "should" look like within the city.

Practitioners also pointed to community engagement opportunities, specifically volunteer or other public participation opportunities, as integral to shifting hearts

and minds. These individual participation experiences can manifest in private plantings and tree caring decisions, future engagement with other urban greening projects, stewardship on-site, or voting behaviour, engendering much larger, rippling positive environmental changes within the community.

"Maybe the community cannot plant as well as a professional tree planter, but that experience for the community brings long term benefits and social awareness for stewardship" (MCP06).

Whether through participation, education, or other relationship-building approaches, shifting the hearts and minds of residents and decision-makers is important for long-term, systemic change. Many of the mini forest practitioners emphasized that, while change can be instigated by one individual, it is better sustained by a network of individuals with a shared vision. Developing this network of people through a project not only mainstreams mini forests within the practices, policies, and plans of the collaborating organizations, but also influences others exposed to do the same, shifting hearts and minds of the wider public on the importance and benefits of mini forests, and urban nature more broadly.

Strategy 4: Funding for Stewardship

Practitioners pointed to the importance of planning ahead for the post-planting phase with budgetary allocation several years (ideally 5 or more) beyond the creation of a mini forest. In some cases, practitioners learned that maintenance was the "sticking point, from the City's perspective" and suggested that:

"You should be thinking about that long term maintenance piece and how you're going to address that, whether it's through volunteers or whether it's through an agreement with the City to maintain it" (MCP04).

Leaning on local volunteers and drawing on the community for maintenance lend great support in the long term, but it requires resources and training. Without a group of committed and engaged stewards, practitioners suggested hosting maintenance events through at least the first 3 years post-planting. A committed group of mini forest stewards requires financial support and open communication from the project outset. The maintenance needs require consideration for climatic conditions and disturbance impacts:

"Also identify the maintenance and watering needs so that you can communicate it to the group, so that [they can] mentally prepare themselves for it. Because…it's not necessarily a reflex for everyone to think we will have to water a [mini forest] several times a week when there is a heat wave. You know, not everyone has that reflex. So really communicating that as soon as possible so that it's already in people's heads, it's important too." (MCP07)

Lastly, maintenance and monitoring can be made simpler and more efficient for volunteers or staff with appropriate budget for preparation. For example, funding resources can be used for tagging the trees with labels, which can indicate the tree code or species, can expedite monitoring tree growth and health. Having a budget, a protocol, a schedule, and training facilities can help volunteers systematically maintain activities and data collection for subsequent analysis.

Ideas for Future Mini Forests

6. Ideas for Future Mini Forests

Inspiring Novel Adaptations

The Miyawaki method has been piloted and adapted to the local context in all of the mini forests implemented under the GCC's 2023 National Mini Forest Pilot program. Adaptations were defined by the different needs of project partners and the characteristics of the specific plantation sites, including soil condition, previous ground cover, and microclimate. Moving forward, further adaptations to the method are expected. One practitioner suggested increasing the spacing between trees by 30-50 cm to facilitate maintenance. Two practitioners mentioned the possibility of planting larger urban forests using the density and diversity of trees and shrubs inspired by the initial mini forest pilots. One project site further adapted the mini forest approach and integrated it into broader naturalization programs: "60% of our community planting has now been an adjusted approach of the Miyawaki method. We have tightened up our planting space and increased the number of trees. We've also added site preparation techniques that we've never done before. It has shifted our practices as a whole". (MCP06) While deep soil excavation was highlighted as an expensive practice when scaling the mini forest approach, adaptations such as tilling and amendment with cardboard and woodchips were considered beneficial and feasible at larger scales.

"The majority of our methods in naturalization programs are extensions of woodlots, so using a mini method is a no-brainer because we want to simulate conditions of a natural forest as much as possible." (MCP06)

Connecting High-Value Mini Forests across the Landscape

Mini forests can be strategically located within the landscape to manage and increase biodiversity. Ideas are emerging about how to use mini forests as 'seed banks' within broader landscapes, particularly in sites that have been heavily disturbed and could benefit from an alternative approach that includes diverse planting and soil amendment. In a similar way, practitioners proposed using mini forests as 'nodes' of a connected network of corridors. In this network, mini forests would act as high-value spots to develop and spread seeds and help improve the soil. Such an approach could be built over time, and locations for the establishment of mini forests along the green corridors could be strategically selected for this purpose. The idea of mini forests as sources of seeds could be supported by higher-level urban greening strategies, for instance by targeting designated restoration corridors identified as potential wildlife quarters where mini forests would help accelerate restoration:

'I think they [mini forests] really offer a big opportunity there to jumpstart a site or a network of sites because they do seem to grow very quickly and the survival rate at this point is really high, and the plants are really robust' (MCP02).

Learning from Mini Forests over Time

Many mini forest practitioners expressed a desire to experiment with mini forest accessibility to encourage better visitor access, improved community engagement, and increased connection with nature. Adjusting the mini forest's design, shape, and/or layout may encourage visitors to engage and experience the mini forest in diverse ways. Practitioners also noted a desire to understand how user experience might affect long-term community stewardship. One interviewee mentioned a unique experiment to conceive of the mini forest as a 'teaching forest'. Their suggestion was to achieve this by incorporating pathways, gathering spaces, or changing the layout to improve approachability and accessibility (including for wheelchairs).

Given the density and diversity of native species, there is an opportunity for mini forests to 'teach' visitors about native ecology through signage and contemplation. The idea of forests as teachers was suggested for urban areas, including the downtown cores where residents have less access to nature. Practitioners see this as an opportunity to increase tree canopy in a concrete environment, learn best practices for further method adaptation, and improve urban residents' connection to nature.

Learning from mini forests and how their adaptations unfold also calls for more systematic monitoring and longitudinal research. Canada-wide research projects, in partnership with local institutions, could mobilize resources to monitor and evaluate the ecological and social benefits of mini forests through time, including considering different geographic conditions.

Calling for Mini Forest Creators and Caretakers

Lastly, mini forest practitioners mentioned a desire to experiment with growing the extent of community engagement in the planning and pre-planting phase. Practitioners were particularly interested in engaging the community earlier in the process, so that residents can participate in the design of the mini forests. Practitioners also called for more diverse groups to be engaged in the mini forest planning process. Youth and environmental groups were already active participants, but there is a desire to engage more local Indigenous groups in the co-design process of future projects. Expanding the mini forest approach to private land is also an opportunity with large potential, particularly given that in many Canadian cities half of the urban forest is located on private land where the planting and maintenance shifts to individuals who would take on the role of mini forest creators and caretakers.

Conclusions

Learning from the case studies provides valuable insight into the multifunctionality of mini forests. This emerging approach to tree planting offers significant potential to enhance urban canopy cover, biodiversity, and a range of ecosystem services. Beyond ecological benefits, mini forests also support community building, place-making, environmental education, and foster a strong sense of purpose and empowerment among individuals and communities involved in long-term stewardship.

As an alternative urban greening strategy, mini forests create space for innovation and experimentation. They encourage new methods for planting trees and understory vegetation at high densities, with greater emphasis on soil health. They also enable novel ways to incorporate 'high-value ecological spots' within urban green corridors and offer inclusive, inspiring opportunities for communities to connect with nature and take part in greening their surroundings—promoting a sense of belonging and agency.

The policy landscape in Canada is increasingly favorable for scaling this approach. Existing frameworks aimed at climate risk management, increasing municipal tree canopy, green equity and inclusion, and natural asset management serve as important levers for mainstreaming mini forests. These efforts can be strengthened by a growing learning network committed to resource-sharing, capacity-building, and generating evidence of social and ecological outcomes through systematic monitoring and evaluation. More efforts could also be targeted towards creating mini forests in underserved and racialized communities where greenspace and canopy cover are disproportionately low, or in urban cores where nature access is limited.

The challenge ahead lies in bridging the gap between the current early stages of implementation—where most mini forests in Canada now stand—and the full realization of their potential. Much remains to be studied to fully understand the breadth of benefits and risks. However, several success factors are already clear: the importance of expertise in species selection and soil preparation, collaborative planning, and ensuring sufficient resources for long-term maintenance and monitoring.

Ultimately, mini forests offer a more intimate, human-centered approach to urban greening. They connect municipalities with residents—from children to elders—by creating places where people can care for nature, learn together, and find joy and meaning as the forest matures. This rare form of urban greening is gaining attention across the country, inspiring new projects and adaptations. As communities continue to tailor the approach to local contexts, the diversity and impact of mini forests will grow—ensuring they are planted in the right place, in the right way, and for the right reasons.


Natural
Infrastructure
at Work

List of Key Terms

Access to Nature: The opportunity for individuals and communities to experience and interact with natural green spaces, which has been shown to improve mental and physical health, foster social connections, and enhance overall well-being

Biodiversity: The variety of life forms within an ecosystem, including plants, animals, fungi, and microorganisms. Biodiversity is critical for ecosystem health, resilience, and the provision of services such as pollination, pest control, and carbon storage.

Carbon Sequestration: The process by which trees, plants, and fungi, absorb carbon dioxide from the atmosphere and store it in their biomass and soil.

Climate Resilience: The capacity of ecosystems and communities to withstand, adapt to, and recover from climate change impacts, such as extreme weather, flooding, and heatwaves.

Community Engagement: The active involvement of local residents, schools, and organizations in the planning, planting, and care of a local project. Engagement fosters a sense of ownership, promotes environmental awareness, and ensures the long-term success of these projects.

Ecosystem Services: The benefits that natural ecosystems provide to humans, such as air and water purification, climate regulation, pollination, and recreational opportunities.

Equity: The process of ensuring that processes, programs, and social conditions are fair, and provide equal possible outcomes for every individual, regardless of personal positionality in relation to societal power and privilege. Equity particularly focuses on righting historic and ongoing injustices by providing additional focus, resources, and support to equity-deserving groups.

Equity-Deserving Groups: Communities that experience barriers to equal access, opportunities, and resources due to disadvantage and discrimination and actively seek social justice and reparation. This marginalization could be created by attitudinal, historic, social, and environmental barriers based on characteristics that are not limited to sex, age, ethnicity, disability, economic status, gender, gender expression, nationality, race, sexual orientation, and creed.

Green Infrastructure (GI): The natural vegetative systems and green technologies that collectively provide society with a multitude of economic, environmental, health, and social benefits. GI includes natural assets (e.g. woodlots, street trees, wetlands, grasslands), enhanced assets (e.g. rain gardens, green roofs and walls, bioswales) and engineered assets (e.g. permeable pavements, infiltration trenches). GI is or uses nature, natural materials and processes to deliver community services.

Grey Infrastructure: An approach to water management that uses conventional engineered infrastructure such as pipelines, reservoirs, and water and wastewater treatment plants, dams, seawalls, and roads.

Mini Forest: A small, densely planted forest created in urban or suburban areas using the Miyawaki method.

Miyawaki Method: A reforestation approach developed by Japanese botanist Dr. Akira Miyawaki. It emphasizes planting densely packed native species in layers to create a forest that grows rapidly, supports high biodiversity, and becomes self-sustaining within a few years.

Native Species: Plants that naturally occur in a particular region and have adapted to local environmental conditions.

Soil Preparation: The process of enriching and amending soil with organic matter, nutrients, and microorganisms to create ideal conditions for forest growth.

Succession: The natural process by which plant communities develop and change over time, starting with pioneer species and progressing to mature ecosystems.

Urban Canopy: The layer of tree foliage covering urban areas when viewed from above.

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ANNEX 1

Start of Block: Section 1. Site Characteristics and Design

Q1 What is the name of your mini forest?

Q2 Indicate the context of the mini forest within the city.

- ☐ Dense urban core (downtown area)
- ☐ Urban residential (within or in the core of a metropolitan area, high population and housing density)
- ☐ Suburban residential (on the outskirts of a city or metropolitan area, lower population and housing density)
- ☐ Town (community less than 50,000 inhabitants)
- ☐ Rural
- ☐ Other

Q3 What infrastructures are in the immediate surroundings (< 100 m) of the mini forest?

- ☐ Roads
- ☐ Large residential buildings
- ☐ Single-family housing
- ☐ Offices/ commercial buildings
- ☐ Schools
- ☐ Public or other governmental buildings
- ☐ Park
- ☐ Grassland
- ☐ Stream / River
- ☐ Pond / Lake
- ☐ Trail network
- ☐ Parking lot
- ☐ Other _

Q4 How can people access the mini forest?

- ☐ By road with public transport
- ☐ By road with private car
- ☐ By trail using bike
- ☐ Walking
- ☐ Using special infrastructure for mobility impairment (e.g. ramps)
- ☐ Other _____

Q5 What is the shape of the mini forest?

- ☐ Circular shape
- ☐ Rectangular / Square shape
- ☐ Corridor shape
- ☐ Irregular shape
- ☐ Other

Q6 What is the configuration of the planting in your mini forest?

- ☐ Radial configuration (trees densely planted at the core, surrounded by shrubs and other vegetation)
- ☐ Sparse trees configuration (all trees planted at same density with understory vegetation planted more randomly)
- ☐ Grid configuration (same number of trees and understory plants per m2)
- ☐ Random (trees and other vegetation planted randomly)
- ☐ Other _____

Q6.5 From the records your provided, we know the species of trees and shrubs you planted in your mini forest. Why did you select these specific species to plant?

Q7 What is the topography/surface of the land where the mini forest is located?

- ☐ Smooth / Flat
- ☐ Moderate mound
- ☐ Extreme mound
- ☐ Concave
- ☐ Uneven

Q8 What features are included in the mini forest? Please only select the features that are WITHIN or ADJACENT to the boundaries of the mini forest.

- ☐ Gate
- ☐ Trails
- ☐ Fencing
- ☐ Benches
- ☐ Tables
- ☐ Informational signs
- ☐ Outdoor classroom
- ☐ Gathering space (a designated gathering space with/without cover)
- ☐ Playground
- ☐ Grass area
- ☐ Stream / River
- ☐ Pond / Lake
- ☐ Irrigation system
- ☐ Lighting
- ☐ Garbage bins
- ☐ Toilet
- ☐ Other

Q9 If you have a design plan of your mini forest, could you share it with us?

End of Block: Section 1. Site Characteristics and Design

Start of Block: Section 2. Approach

Q10 Why did you decide to create a mini forest? What was your motivation?

Q11 Why did you decide to establish the mini forest in this specific location?

Q12 Who was involved in the design of the mini forest, and why?

Q13 What is the mini forest's governance structure (e.g., who is involved in the decisions related to the mini forest)?

Q14 Are you conducting monitoring and maintenance of the mini forest?

- ☐ Yes
- ☐ No

Q15 Who is involved in the maintenance and management of the mini forest?

Q15.2 What monitoring and maintenance practices are you using? What is the frequency/interval of implementation?

Q16 What obstacles are preventing you and your organization from being able to conduct monitoring and maintenance of the mini forest?

Q17 In your final report to GCC, you provided a lot of information about the planting day. Please provide information on the biophysical preparation of the site prior to planting (e.g., cleaning, removing weeds and invasive species, establishing irrigation system, etc.).

Q18 Please describe any soil preparation procedures done prior to the planting day, if applicable (i.e. what soil amendments, what depth, etc.)

Q19 Please provide information on the community preparation prior to planting (e.g., awareness raising campaigns, volunteer registration method, consultation for design, etc.).

End of Block: Section 2. Approach

Start of Block: Section 3. Social Impacts

Q20 Are you monitoring/observing how visitors use the mini forest?

- □ Yes
- □ No

Q21 What obstacles are preventing you and your organization from being able to monitor how visitors use the mini forest?

Q22 Based on your observations, who is using the mini forest? What populations and communities are being served by the mini forest?

Q23 When people visit the mini forest, are they usually:

- □ Solo
- □ In small groups (2-3 people, family)
- □ In groups (>3 people), not guided
- □ In groups (>3 people), guided
- □ Other

Q24 When is the forest used with most frequency?

	Weekdays	Weekends & Holidays
Morning		
Lunchtime (11am-1pm)		
Afternoon		
Evening (after 6pm)		

Q25 Based on your observations so far, how is the community using the mini forest?

- □ Walking through
- □ Sitting inside individually
- □ Socializing onsite
- □ Organized events
- □ Food harvesting
- □ Education
- □ Physical activity
- □ Wellness activities (e.g., meditation)
- □ Other _____

Q26 Have you continued to promote or raise awareness about your mini forest?

- □ Yes
- □ No

Q27 Please describe the mechanism(s) you are using to raise awareness about the mini forest (e.g., signs, feedback forms).

Q28 Have you received any feedback on the mini forest?

- □ Yes
- □ No

Q29 Who have you received feedback from?

Q30 What is the feedback you have received?

Q31 It has been some time since the creation of the mini forest, what positive social impacts have you noticed on the community associated to its creation?

End of Block: Section 3. Social Impacts

Start of Block: Section 4. Ecological Impacts

Q32 How is the health of your mini forest? Please rate the health conditions of each type of plants in your mini forest according to the descriptions.

	Mostly alive & thriving	Thriving but around a quarter are in bad condition or dead	Around half are in bad condition or dead	Mostly in bad condition or dead	N/A
Trees					
Shrubs					
Wild-flowers					
Grass					
Overall (all of the above)					

Q33 What is the estimated survival rate of the trees in the mini forest? Please enter a percentage.

Q33.2 Did you plant more trees (after the initial planting day) to compensate for losses?

- □ Yes
- □ No

Q34 Are there species of plants experiencing higher mortality rates or seem to be more vulnerable than others? If yes, please provide the names of those plant species and explain your observations.

Q34.2 Are there species of plants experiencing higher survival or growth rates and seem to be thriving more than others? If yes, please provide the names of those plant species and explain your observations.

Q35 Are you monitoring biodiversity impacts of the mini forest?

- □ Yes
- □ No

Q36 What obstacles are preventing you and your organization from being able to monitor biodiversity impacts?

Q37 In terms of the effects of your mini forest on biodiversity, please rate the state of each indicator according to the scale below.

	Barely improved or not at all	Slightly improved	Moderately Improved	Greatly Improved	I don't know / unmonitored
# of insects					
# of mammals					
# of birds					
# of pollinators					
Soil conditions					

Q38 What other impacts on biodiversity have you noticed since the creation of the mini forest?

Q39 To what extent have you seen the following natural disturbances affecting your mini forest?

	Barely / not at all	To a small extent	To a moderate extent	To a great extent	I don't know / unmonitored
Intense rainfall					
Flooding					
Drought					
Heat waves					
Strong wind					
Fire					
Pest & Disease					
Other					

End of Block: Section 5. Opportunities and Lessons Learned

Start of Block: Section 6. Personal Information

Q40 Your mini forest has been established for some time now, and you may be facing some challenges. To what extent do you agree or disagree to the following statements?

Q41 Are there any other challenges you are facing that were not mentioned above?

	Strongly Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Strongly Agree
There are difficulties in watering the mini forest					
Weeds and overgrown plants make the mini forest difficult to access					
Invasive species are overtaking the mini forest					
Herbivores are affecting the forest growth					
There is a lack of volunteers for maintenance					
Governance of the mini forest is unclear					
There is poor maintenance of the mini forest					
The forest condition is deteriorating					
There is garbage and litter in the mini forest					
Graffiti and vandalism are present in the mini forest					
There are issues with humans entering and disturbing the mini forest (e.g., trampling, compacting soil, uprooting of plants, overharvesting, logging).					
There is a lack of interest from residents (e.g., lack of use, lack of care/maintenance)					
There are safety concerns for visitors of the forest (e.g., poor lighting, low visibility)					

Q42 Could you suggest some recommendations to overcome these challenges?

Q43 What do you consider as factors contributing to the success of your mini forest?

Q44 Now that the mini forest is in place, what opportunities for growth or scaling do you see?

Q45 Your name

Q46 Your email address

Q47 What is your organization's name?

Q48 What is your role within your organization?

Q49 How many years have you been working at your organization?

Q50 What has been your role in relation to this mini forest? How long have you been working with this mini forest?

Q51 Do you have any prior knowledge or experience with Miyawaki forests?

Q52 What is your disciplinary background?

End of Block: Section 6. Personal Information

ANNEX 2

Interview Questions

Section 1. Forest Creation

1. In your survey response, you noted [INSERT RESPONSE] as the motivation or reason for creating a mini forest. Can you elaborate on that motivation?

a) Were there any other motivations or driving factors behind creating the mini forest?

2. What factors enabled the creation of the mini forest? (e.g. policy, funding, community, advocates)

a) What factors would you identify as the key to enabling your project?

3. What context or factors (e.g., demographics, policy, governance, inequities) influenced the decision to implement a mini forest on that specific site?

a) Were other sites considered for the mini forest?

4. In your survey response, you noted the following people/groups [INSERT RESPONSE] as being involved in the design of the mini forest. To what extent were these people involved?

a) Did their involvement continue past the design of the mini forest?

b) How much was the community involved in the mini forest's design?

5. What is the process for making decisions in relation to the mini forest?

6. In your survey response, you noted the following people/groups [INSERT RESPONSE] contribute to the governance (i.e. decision-making processes, delegation of responsibilities) of the mini forest. Can you describe each person/group's role in governance?

a) How much is the community involved in the mini forest's governance?

Section 2. Forest Function

7. Now that more time has passed since the creation of your mini forest, who has been visiting the mini forest?

a) When do you see most people visiting the mini forest?

b) How are people using the mini forest?

c) Are there any patterns you have noticed in terms of the community's use of the mini forest?

8. Was there a demographic or group you were targeting to use the mini forest?

9. Now that more time has passed since the creation of your mini forest, what environmental outcomes (both positive and negative) have you noticed?

a) Were there any environmental functions that you intended to achieve by planting the mini forest?

b) What benefits has the mini forest provided since its planting, that you have directly observed? (e.g., cooling, biodiversity, etc.)

10. How do you think the benefits or functions that you've noticed could be boosted in future mini forests?

Section 3. Forest Impact

11. What impacts have you noticed on the community? (e.g., well-being, health, climate adaptation/resilience)

a) Are there specific groups that are particularly affected by the mini forest?

12. What impacts have you noticed on biodiversity? (e.g., habitat creation, species richness, green network connectivity)

a) Are there specific species that are particularly affected by the mini forest?

13. Are there any other impacts you have noticed that have been particularly significant or notable, beyond those mentioned for the community or biodiversity?

Section 4. Best Practices

14. Your mini forest was selected because it is exemplary and successful. In your opinion, why has your mini forest been so successful?

a) What advice could you share that could assist other groups in replicating this success in another mini forest project?

15. In your final report to GCC, you mentioned [INSERT RESPONSES] as a factor in the project's success during implementation. Can you explain why you identified this factor and the role it played in your project's success?

16. In the survey response you noted [INSERT RESPONSE] as a factor in the project's success since planting. Can you explain why you identified this factor and the role it played in your success?

a) Were there any other factors that influenced your forest's success?

17. What factors would you identify as key to the success of your project?

18. In your final report to GCC, you mentioned [INSERT RESPONSES] as challenges you faced in the planning, pre-planting, or planting phase. How did you overcome these challenges?

19. In the survey responses you noted [INSERT RESPONSES] as challenges you have experienced since planting your mini forest. How are you overcoming these challenges?

20. Did you experience any other challenges, other than those mentioned?

21. In the survey response you noted that you have received feedback on the mini forest [INSERT FEEDBACK]. How have you incorporated this feedback into your operations or approach?

22. Thinking about your experience(s) with mini forests before, during, and following planting, what lessons have you learned?

a) How can these lessons be translated into best practices for future mini forest development?

Section 5. Future

23. In your final report to Green Communities Canada, you commented on things you would do differently if you were to deliver another mini forest project in the future [INSERT RESPONSE]. Now that more time has passed since the creation of your mini forest, are there any aspects you would change if you were to create a new mini forest?

a) How would you change your design?

b) What other features would you add?

c) Who or what groups would you involve or not involve?

d) How would your engagement strategy change?

24. If you were to start from scratch on this same site, would you still choose to plant a mini forest or would you take an alternative approach? Why or why not?

25. Comparing this to other urban greening projects you have experience with - what do you think the value of mini forests is?

a) What pros and cons do you see with mini forests?

b) Would you recommend mini forests, why or why not?

26. Is there anything else you would like to add?