ADVANCING ADAPTATION

Implementation Through Collaboration

CALEDON

The Advancing Adaptation Project led by ICLEI Canada
401 Richmond St W #204
Toronto, ON M5V 3A8
icleicanada.org
The Advancing Adaptation Project, led by ICLEI Canada, aimed to increase climate change resilience in Ontario municipalities by supporting adaptation planning, building local adaptation capacity, and supporting the implementation of adaptation initiatives in the Great Lakes watershed. As part of this project, 11 Ontario municipalities designed and delivered community-engaged climate change adaptation actions within their communities between June 2021 and December 2022. 11 case studies were developed to showcase the process, experience, and learnings from each implementation action. Visit ICLEI Canada’s Advancing Adaptation Webpage for more information on the project, to explore all case studies, and to learn more about other resources that were developed through the Advancing Adaptation Project.

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Introduction

By partnering with the Toronto and Region Conservation Authority (TRCA) and West Bolton Sustainable Neighbourhood Action Plan (SNAP), the Town of Caledon planned and facilitated community-engaged tree and shrub planting events along Jaffary’s Creek stormwater pond. Habitat boxes were also installed and signs were posted to educate the public of the actions taken, the role of the stormwater pond, and its connection to climate change resilience. These actions helped to minimise the risk of flooding by enhancing run-off absorption and infiltration into the substrate and surrounding vegetation, while enhancing the habitat for native wildlife species.

Municipal Profile

Population: 76,581
(2021 Census of population by Statistics Canada)

Municipal Budget: $239.7M

Economic sectors: Advanced Manufacturing, Agriculture and Food, Construction, Professional Scientific and Technical Services, Tourism, and Transportation and Logistics

Top climate risks: Increased frequency and intensity of extreme weather events, including extreme temperatures and precipitation events

Project Overview

Given the increase in precipitation events that Caledon is facing due to climate change, the Town took the opportunity to implement a community-engaged adaptation project to mitigate the risks of extreme precipitation and flooding as part of ICLEI’s Advancing Adaptation program. The project entailed the naturalisation of a major stormwater management pond in the Bolton neighbourhood through the planting of native trees and shrubs along the pond border to improve the absorption of rainwater and slow the accumulation of water within the pond to reduce the risk of flooding. Tree and shrub plantings also increase the habitat quality for native species while reducing greenhouse gas emissions by sequestering carbon dioxide from the atmosphere.

In urban areas such as Bolton, a large proportion of land-surface cover is impermeable. Stormwater ponds play an important role as they allow precipitation to run-off of these impermeable surfaces accumulate, and be absorbed in a designated location. In particular, urban run-off contains many pollutants and stormwater ponds help to filter these pollutants from the water as it moves through the water cycle. The stormwater pond naturalisation consisted of vegetation plantings by the community as well as native bird and bat habitat boxes constructed by the TRCA Girls Can Too program.

The Approach

Understanding and Assessing the Impacts

The Town of Caledon developed a climate change adaptation strategy called Resilient Caledon which assessed the risks and vulnerabilities of climate change pertinent to the Town (April 2021). The plan identified 57 climate change impacts. Of these, the highest priority impacts were the increased frequency and intensity of extreme weather events, including extreme temperatures and precipitation events.

As climate change continues to impact Caledon, the Town will continue to experience more frequent precipitation events. Currently, the Town sees an annual baseline of 867 millimetres of precipitation per year, and this is expected to increase to 976 millimetres per year by 2100. In addition, the maximum expected amount of precipitation in one day is currently 37 millimetres, which is expected to increase to 44 millimetres by the end of the century.

It is projected that climate change impacts from this increase in precipitation will impose substantial risks to the Town’s infrastructure, socioeconomic systems, and surrounding agriculture and natural systems. Extreme rainfall and increased snow melts will increase pressures on existing stormwater infrastructure.

This will cause greater risks of localised flooding, leading to potential damage to public and private infrastructure such as roads, buildings, homes, and the costs needed to restore these. Increased intensity of precipitation events will also prove to be detrimental to natural environments and agriculture by eroding soils and causing crop management challenges and stress. Caledon’s socioeconomic systems will also be negatively impacted by extreme precipitation which can cause property damage, disruptions in business operations, and reduced local food production, resulting in increased personal, business and municipal servicing costs.
CALEDON

Implementation

The Town of Caledon engaged with the community to facilitate the naturalisation of Jaffary's Creek stormwater pond, and increased climate change resilience to impacts like flooding, water quality issues, and threatened habitat quality for native species. The project undertook the transformation of the stormwater pond site into a space that also provides a beautiful and accessible natural space for the community at large to enjoy.

Prior to the planting event, a climate change Emergency Preparedness webinar was hosted by the West Bolton SNAP. Invitations were sent to local residents to attend this event which served to educate the public on the ongoing risks of flooding due to climate change and the procedures that could be used to prepare and minimise the risk of home flooding. The event detailed the importance of green infrastructure in urban communities to assist in rainfall collection and absorption, and assisted in promoting the Town's planting event to interested members of the community. It was also recorded and distributed by West Bolton SNAP to be posted on websites for the Town of Caledon and the TRCA.

In collaboration with the TRCA and the Region of Peel, the Town of Caledon finalised a fall planting date and composed a site plan detailing the locations for native tree plantings, educational signage, and habitat boxes for birds and bats. The TRCA was largely responsible for designing the tree and shrub species list and the landscape design by picking native and drought resistant species to ensure the long-term survival of the plantings. They chose species that were less favourable to beavers and deer living in the surrounding area. Beaver guards were also installed around certain plantings to prevent damage.

A site visit was performed in April with all partners to better ensure planting sites were clear of obstructions. Due to the presence of a utility line in one area of the site, the planting sites were moved closer to the edge of the pond. The TRCA committed to providing resources to support a large planting event, as there was a large amount of land available.

Additionally, the site was heavily infested with phragmites, a non-native plant species also known as the European Common Reed. This species is known for colonising near water bodies, crowding out native vegetation, and reducing the habitat quality for native wildlife species. Therefore, the Town of Caledon involved invasive species removal (through mechanical methods) as part of their naturalisation project to improve biodiversity by enhancing the growth of native plant species.

The tree planting event was held for three hours and boasted a high turnout, with 50 community members participating. As the planting and watering portion of the event came to a conclusion, a pizza lunch was held for all participants. With the remaining trees still left to be planted, the Town of Caledon held another planting event in October dedicated to naturalising the other side of Jaffary's Creek pond. The TRCA engaged a school group and the Town's Engineering department to facilitate the planting of another 250 trees.

Through the stormwater pond project, the Town collaborated with the TRCA’s Girls Can Too program to further improve habitat quality by constructing and installing habitat boxes on the site for native bird and bat species, including for wood ducks, black-capped chickadee, eastern screech owls, and various other songbirds and bats.

A planting plan draft was completed in May which detailed the proposed number of plants and plant species. As the day of the planting event approached, the Town of Caledon finalised their plan and turned their attention to promoting the event through the production and distribution of event posters and collaboration with event partners. Local schools were also contacted to encourage students to participate.

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Signage was also created and installed at the entrance of the park to educate the public on stormwater management and the role of Jaffary's Creek pond naturalisation project, as well as the importance of creating habitat for native species and not releasing pets into the pond. The completion of the signs had unexpected delays due to slow return of quotes, finalising graphic work, and editing.
Funding

Funding of $15,000 was provided through the Canada Ontario Agreement and coordinated by ICLEI Canada through the Advancing Adaptation project. The Town of Caledon matched this amount by contributing another $15,000. The combined funds were used to purchase plant materials for the tree planting events and educational signage, plan and implement the emergency preparedness webinar, create marketing materials, and support the design and implementation of the project by Town staff.

Partnerships

- Toronto and Region Conservation Authority (TRCA)
- West Bolton Sustainable Neighbourhood Action Plan (SNAP)
- Girls Can Too

Engagement

The Town of Caledon engaged with the TRCA, which is an organisation with ample experience planning and coordinating land restoration and naturalisation projects along wetlands and water bodies throughout the Greater Toronto Area. In this project, they were largely responsible for planning and designing the site plan. They were also heavily involved in facilitating the planting events, helping to recruit volunteers, and establish the plants through watering and mulching. The TRCA Girls Can Too program engaged young women in the community to assist in the construction and installation of habitat boxes for native wildlife like bird and bat species. The West Bolton SNAP program assisted in educating the public by holding the emergency preparedness webinar on flooding risks and protection. They also participated in the tree planting event and signage production.

Challenges

- Challenges related to property jurisdiction/ownership, as well as land use designation (as the stormwater pond is not a park) inhibited the installation of a public gathering space, that included a bench, at the stormwater pond.
- There was little success in engaging a large number of residents in the emergency preparedness webinar likely due to general webinar fatigue and a lack of a clear purpose for the event.
- There was minimal interest in the maintenance of community green infrastructure (such as rain gardens, food gardens and trees). This could lead new green infrastructure projects to appear un-kept and possibly die. There is a need to build a commitment to maintenance at the start of projects.
- The liability with working with volunteers on Town property and on Town projects is always an additional formality to work through.

Positive Successes

- Although the public gathering space with a bench was denied, decisions were made quickly to redirect funds to facilitate the construction and installation of habitat boxes for native wildlife species.
- The tree planting event had an unexpectedly high turnout of community volunteers.
- All leftover trees and shrubs were planted on a separate planting days by members of various school and engineering groups.
- The implementation of habitat boxes and native species plantations improved biodiversity and habitat quality in the surrounding area.
**Co-Benefits**

The project implemented by the Town of Caledon contributed to the enhancement of community resilience to local climate change impacts such as extreme precipitation events. These actions also led to a multitude of additional benefits such as:

- Improved stormwater management
- Improved air quality
- Increase in green cover
- Enhanced habitat quality for native species
- Reduced strain on stormwater sewers
- Improved greenhouse gas emission sequestration
- Reduced level of pollutants in stormwater
- Improved water quality in local water bodies
- Reduced the risk of localised flooding and damage to infrastructure
- Removal of invasive species on-site

**Indicators**

- 12 individuals attended the webinar on emergency preparedness related to climate change events
- 50 community members volunteered for tree and shrub planting during the first tree planting event
- 52 students and 13 Town staff members planted trees and shrubs at the second planting event
- 500 trees and shrubs purchased and planted
- 13 habitat boxes were constructed and installed

**Next Steps**

- The Town of Caledon is now requiring the completion of a Risk and Vulnerability Assessments for all new site development plans.
- Caledon experiences a large amount of greenfield development, so the Town is implementing improved green development standards for all new developments. These improved standards will assist in reducing greenhouse gas emissions sourced from buildings and will include the implementation of features to better adapt to climate change impacts.
- Peel Region has directed lower tier municipalities, including Caledon, to conduct energy/emissions and adaptation studies as part of all new secondary plans to ensure new homes are resilient to climate impacts. The lessons from this pilot project will help inform those policies in Caledon.

**Key Learnings**

- Signs take a lot of time and effort. They are sometimes left until the end of a project and should be prioritised early on in the project timeline.
- Plants chosen must be small enough for volunteers to manage, move around and plant.
- Creating a single community event, in partnership with aligned community organisations, that encompasses education and hands-on action, and that is bolstered by the provision of food, will likely result in good community turnout.

**COPY THIS!**

This project has many elements that could be replicated in other communities but here are just some easily replicable actions:

- **Planting Plan**
- **Event Advertisement**
- **Permanent Signage**