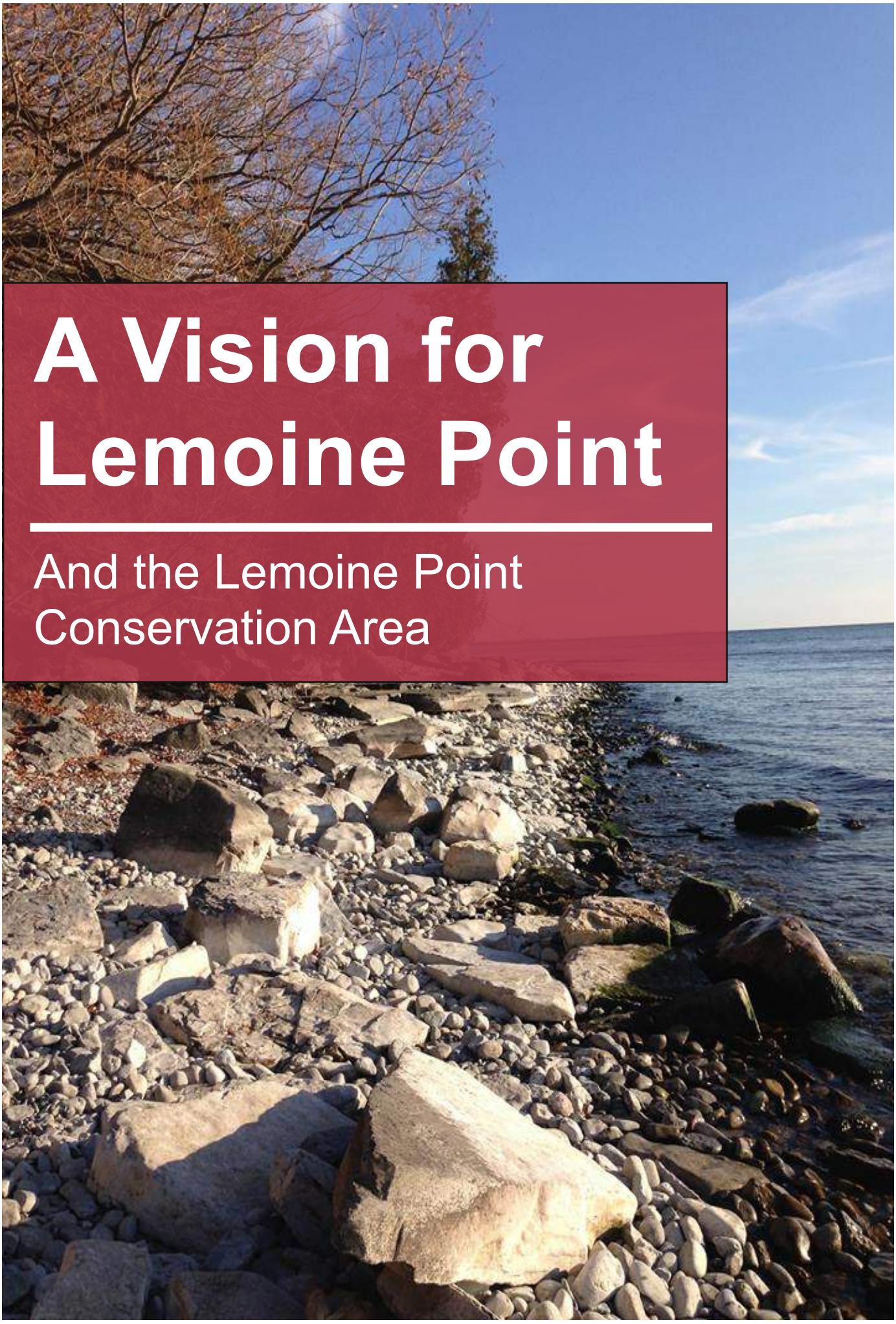


A Vision for Lemoine Point

And the Lemoine Point Conservation Area

A Vision for Lemoine Point

And the Lemoine Point Conservation Area

Project Team Members:

Michael Franzolini • Enam-ul Hoque • M. Elizabeth Meiklejohn • Matt Murray
Stefani Normand • Malcolm Norwood • Adam Robb • Madushi Seneviratne

Queen's University
School of Urban and Regional Planning
Department of Geography and Planning

December 2016

Prepared for the Cataraqui Region Conservation Authority

For more information contact:
Rob McRae
Cataraqui Region Conservation Authority
rmcrae@crca.ca

CATARAQUI REGION CONSERVATION AUTHORITY

QUEEN'S UNIVERSITY SCHOOL OF URBAN AND REGIONAL PLANNING

Standard Limitations

This report was prepared by students at Queen's University in the School of Urban and Regional Planning enrolled in SURP 825: Environmental Services Project Course for the account of the Cataraqui Region Conservation Authority. The disclosure of any information in this report is the sole responsibility of the Cataraqui Region Conservation Authority. The material in this report reflects the researchers' best judgments in light of the information available at the time of preparation. The findings and recommendations herein are the opinions of the researchers and have not been reviewed or endorsed by the Cataraqui Region Conservation Authority.

Acknowledgements

The project team would like to thank:

The Cataraqui Region Conservation Authority, for working alongside our team and giving us the opportunity to explore the environmental and land use impacts around the Lemoine Point Conservation Area.

Rob McRae, for your mentorship, expertise, and constant encouragement throughout the duration of the project.

Dr. Graham Whitelaw, for your guidance and support over the course of the project.

Dr. David Gordon, our Director, for your valuable expertise and leadership throughout our entire time at the School of Urban and Regional Planning.

Stakeholders, who attended our consultation event and provided meaningful feedback and advice for the project.

Thank you.

The Queen's University School of Urban and Regional Planning Project Course

Our team is composed of eight second-year Master's of Urban Planning Students from Queen's University. As part of the final year in the graduate program, students are required to complete a project course, which involves working alongside real clients with real budgets to prepare a final report and presentation on a particular planning-related issue. As the Environmental Services Project course (SURP 825), our team was tasked by the Cataraqui Region Conservation Authority to develop a coherent vision for the future of the Lemoine Point area in Kingston, Ontario.

With a range of professional and academic backgrounds that include environmental science, economics, political science, history, construction management, and forestry, our group came together and used our unique skills and perspectives to formulate key recommendations for the Lemoine Point area going forward.

SURP 825 Environmental Services Project Team

From Left to Right:
Michael Franzolini, Adam Robb, Madushi Seneviratne, M. Elizabeth Meiklejohn, Stefani Normand, Malcolm Norwood, Matt Murray, Enam- ul Hoque

Absent in photo:
Project Supervisor: Dr. Graham Whitelaw
Project Coach: Rob McRae, Cataraqui Region Conservation Authority

Executive Summary

Overview

The Lemoine Point area, located in the Southwest end of the City of Kingston, currently lacks an overarching framework for its growth and development. Despite its desirable location abutting Lake Ontario, the presence of notable private and public stakeholders, and its significant natural heritage features, the identity of the Lemoine Point area remains ambiguous within Kingston. While the Lemoine Point Conservation Area functions as the primary contributor to the area's identity, the Lemoine Point area encompasses a number of other land uses with considerable potential to contribute to its future progress. In September, 2016 of the Fall academic term at Queen's University, the Cataraqui Region Conservation Authority requested a project team from the School of Urban and Regional Planning to conduct research and develop a cohesive vision for the Lemoine Point area. The team was tasked with answer the following research question:

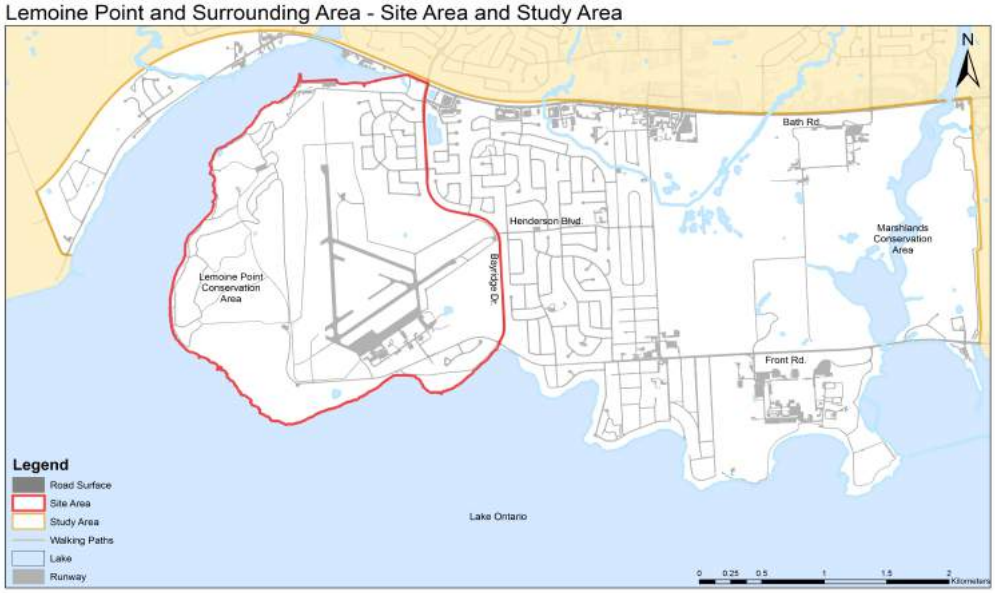
What is a coherent vision for the future of Lemoine Point?

As a result of a perceived incompatibility between the area's land uses, and the continued presence of disconnected operations between the various stakeholders, the Lemoine Point area has not yet reached its full potential of a complete community within the City of Kingston. After conducting significant background research, undertaking several analyses, and hosting a stakeholder workshop, the project team has identified the strengths, weaknesses, opportunities, and challenges of the Lemoine Point area to create a cohesive plan for its future.

Lemoine Point

For the purpose of the report, the Lemoine Point site area has been identified as the Southwest end of the City of Kingston, bordered by Lake Ontario to the West and South, Bayridge Drive to the East, and Bath Road to the North. The Lemoine Point area consists of the Lemoine Point Conservation Area, the Lemoine Point Farm, Norman Rogers Airport, the Landings Golf Course, Collins Bay Marina, four City parks and parkettes, and low-density residential neighbourhoods. A broader study area was identified to supplement site-specific research. A map of the site area (red) and study area (white) is located below.

Lemoine Point and Surrounding Area - Site Area and Study Area



Methodology

The project was completed in five major stages:

- Background Research/Primary Document Review
- Case Study Analysis
- Stakeholder Workshop
- Needs Assessment
- Development of comprehensive vision through thematic recommendations

Initial background research, and primary document review was conducted to ascertain the existing conditions of the Lemoine Point area and analyze the past research that had focused on the area. Analyses of local, national and international case studies were then completed to compile innovative land use initiatives relevant to the context of the Lemoine Point. Some examples include:

Vegetated waterfront path, Alleghany Riverfront, Pittsburgh, PA

South Huron Trail Mobile Program, South Huron, ON

Bee apiary on airport grounds, Chicago, IL

Natural heritage signage, Perth, ON

Multi-modal trail, Cape Breton Island, NS

Inspiration Lakeview Master Plan, Mississauga, ON

Building on the primary research and case study analyses, a stakeholder workshop was held to generate discussion on the existing conditions of the Lemoine Point area and determine how they envision the area evolving in the future. From this research, six guiding principles were identified to illustrate the major needs that the vision for Lemoine Point area must focus on resolving (shown below). These guiding principles were used to set up the framework for the recommendations and their objectives.

From left to right: Identity, Conservation, Climate Change, Partnerships, Access and Accessibility, and Connectivity

Recommendations

Feasible recommendations for the Lemoine Point area were developed to effectively meet the needs identified during the initial stages of the visioning process. These recommendations were grouped into three pillars to better reflect the objectives for the Lemoine Point area. The three pillars are: Conservation, Waterfront Access and Sustainable Development. The recommendations are intended to show the stakeholders how modifications in existing land use planning policies, along with stakeholder operations and mandates, can effectively translate into a comprehensive vision for the site area. Notable (12 out of 21) recommendations include:

Conservation
6.1 Protect the Natural Assets at the Lemoine Point Farm
6.5 Develop an Educational Community Gardening Program
6.6 Incorporate Non-Conflicting Habitats on Usable Airport Lands
6.10 Establish Conservation Partnerships to Create Sustainable Land Use Areas

Waterfront Access
7.2 Implement Shoreline Protection
7.3 Transition the Weatherall Property
7.4 Encourage a Passive Water Recreation Network
7.5 Create Natural Rest Stops Along North Shore

Sustainable Development
8.1 Increase Active Transportation Linkages
8.4 Improve Norman Rogers Airport Sustainability
8.5 Increase Transit Coverage within the Lemoine Point Area
8.6 Limit Future Residential Development

Through successful implementation of the 21 recommendations, the Lemoine Point Area will become a distinct region with the City of Kingston. It will operate on the values of conservation, waterfront access, and sustainability through co-operative stakeholder partnerships and land use compatibility.

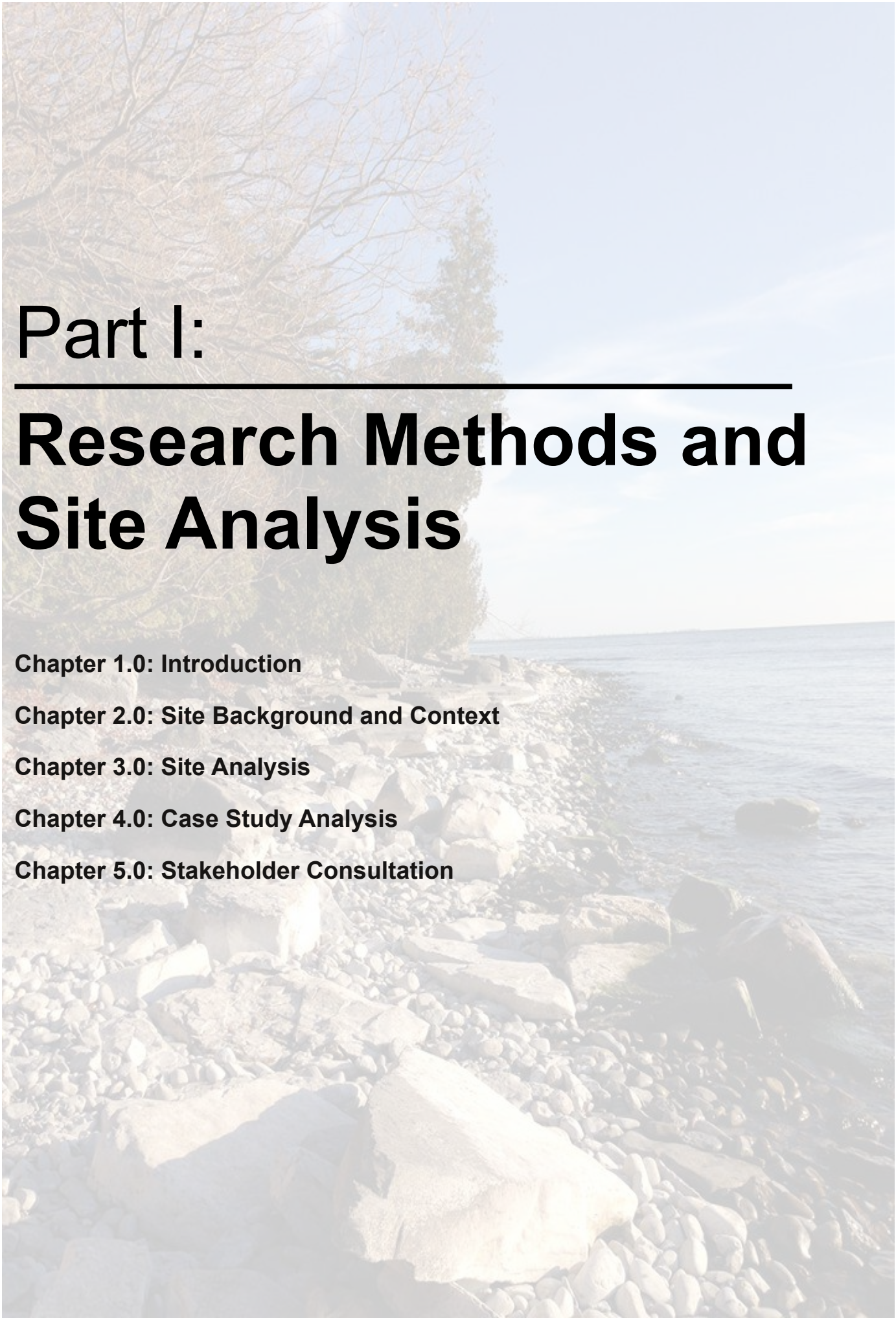
Table of Contents

Part I: Research Methods and Site Analysis

Part II: Vision, Goals, and Recommendations

List of Figures

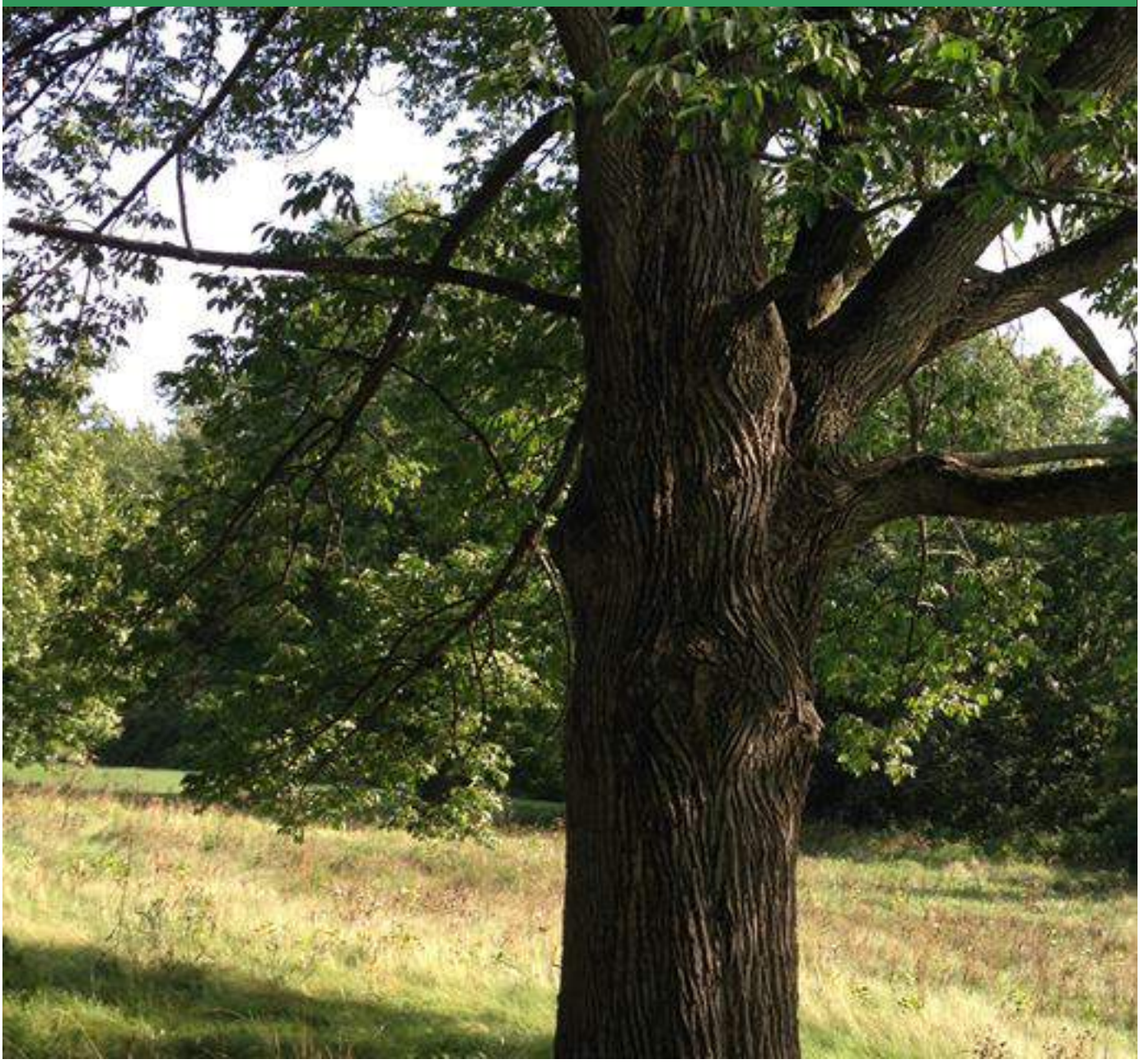
List of Tables



Part I:

Research Methods and Site Analysis

Chapter 1.0
Introduction



1.0 Introduction

1.1 Introduction to the Lemoine Point Area

The Lemoine Point area is located in Western Kingston and is inclusive of the Lemoine Point Conservation Area,the Norman Rogers Airport, Collins Bay Marina, the Landings Golf Course, Lemoine Point Farm, City of Kingston Parks, and surrounding neighbourhoods. The area is home to many native species of fauna and flora, is comprised of an extensive shoreline, and is currently facing growth pressures due to the airport and surrounding residential communities. The variety of land uses in the area highlight the need for a coherent vision to be implemented to guide future development, programming and decision-making., As a result, the "site area" of this project has been extended to include more than just the Lemoine Point Conservation Area. With the objective of creating an efficient and viable future for the area, all parties and land uses need to be considered (see Appendix B, Figure B4).

Figure 1.1: Entrance sign for the Lemoine Point Conservation Area

1.2 Study Purpose and Vision Statement

The primary goal of this report is to answer the question "What is a coherent vision for the future of Lemoine Point?" In evaluating the Lemoine Point area, a vision statement was developed to address the above research question and serve as a guiding principle to influence decision-making within the area. The vision statement is:

> *"The Lemoine Point area is a distinct region of Kingston that should operate on the values of **conservation, waterfront access, and sustainability** and attempt to promote those same values in terms of stakeholder partnership and land use compatibility, helping to create a unique identity for the Lemoine Point area in the future."*

This vision statement has guided the approach taken in developing this report, supported by the three guiding pillars of promoting conservation, sustainability, and waterfront access within the Lemoine Point area. These pillars articulate the vision statement in a manner that has structured the recommendations being put forward.

1.3 Research Approach and Methodology

This report was based on substantive research findings and feedback submitted at the stakeholder workshop held in October, 2016. The stakeholder workshop helped to identify six "Guiding Principles" that now inform the goals of the recommendations of this report. The six guiding principles are Identity, Environment, Climate Change, Connectivity, Access and Accessibility, and Partnerships. Viewing these principles as the key features in establishing a coherent vision for the Lemoine Point area, research proceeded to create three "pillars" to fundamentally define the best strategies to be pursued for the future ofthe Lemoine Point area. The pillars are that of Conservation, Waterfront Access, and Sustainable Development. Each recommendation strives to advance at least one of the values of Conservation, Waterfront Access, or Sustainable Development, while simultaneously being informed by the six guiding principles that were established for the Lemoine Point area.

The Vision:
A coherent vision for the future of Lemoine Point, based off the Pillars and Principles below

The 3 Pillars:
Conservation, Waterfront Access, and Sustainable Development

The 6 Guiding Principles: Identity, Environment, Climate Change, Partnerships, Access and Accessibility, and Connectivity (left to right)

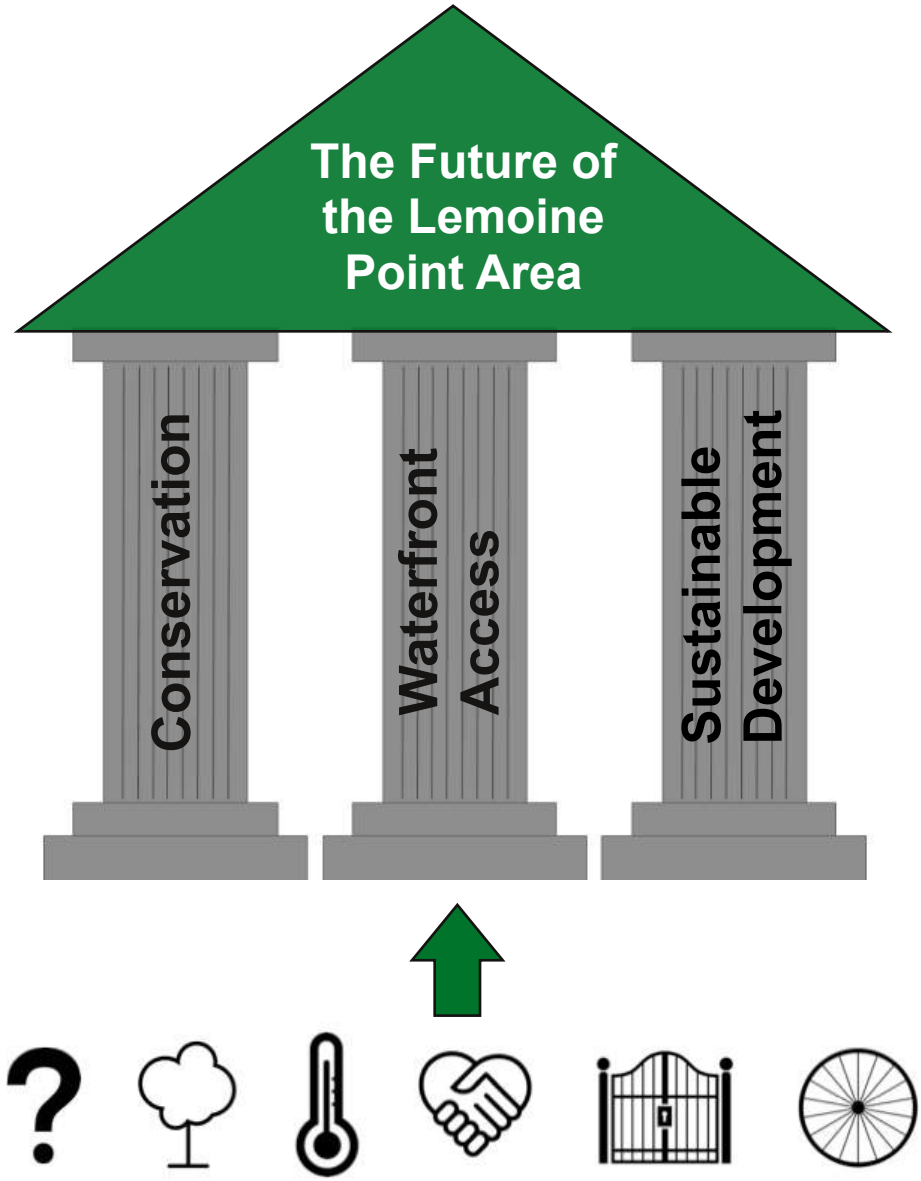


Figure 1.2: Visualization of the 3 Pillars and 6 Guiding Principles, which defined our vision

1.4 Process

This report represents the culmination of several phases of research and consultation. The comprehensive methodology used in creating this report is highlighted by the figure below. The process started with preliminary observations and evaluations into the Lemoine Point area in Phase 1, followed by the development of effective and tangible recommendations and solutions in Phase 2. The final steps involve presenting the findings in Phase 3, which includes a final presentation that was held on December 12, 2016 and this report.

.

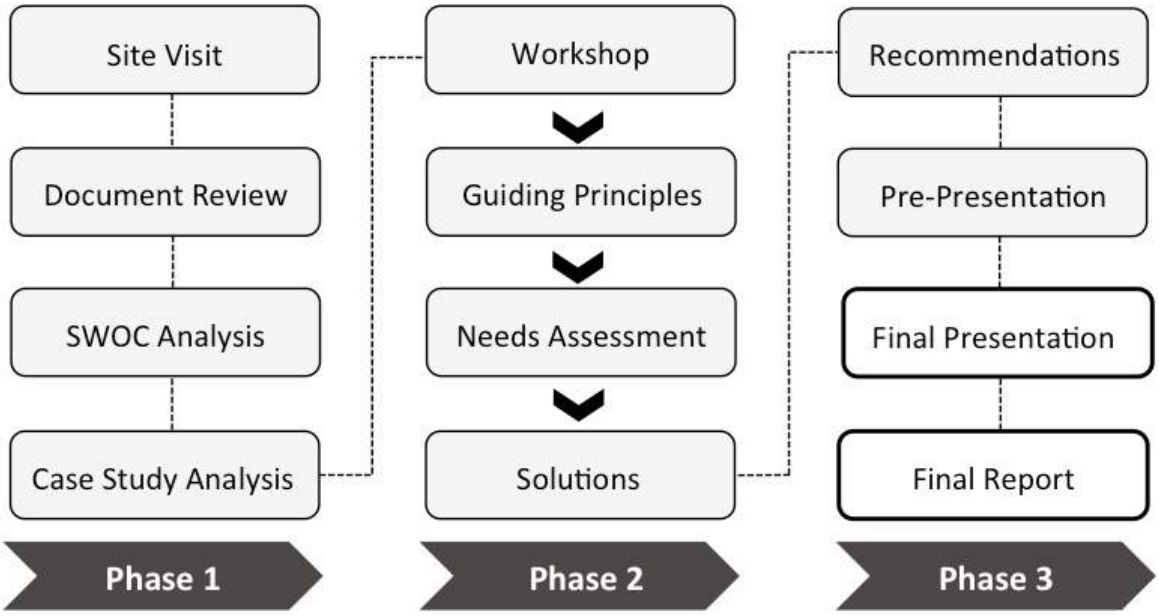


Figure 1.3: Flow chart illustrating our team's methodology and process

Chapter 2.0
Site Background and Context

2.0 Site Background and Context

2.1 Guiding Provincial Policies and Legislation

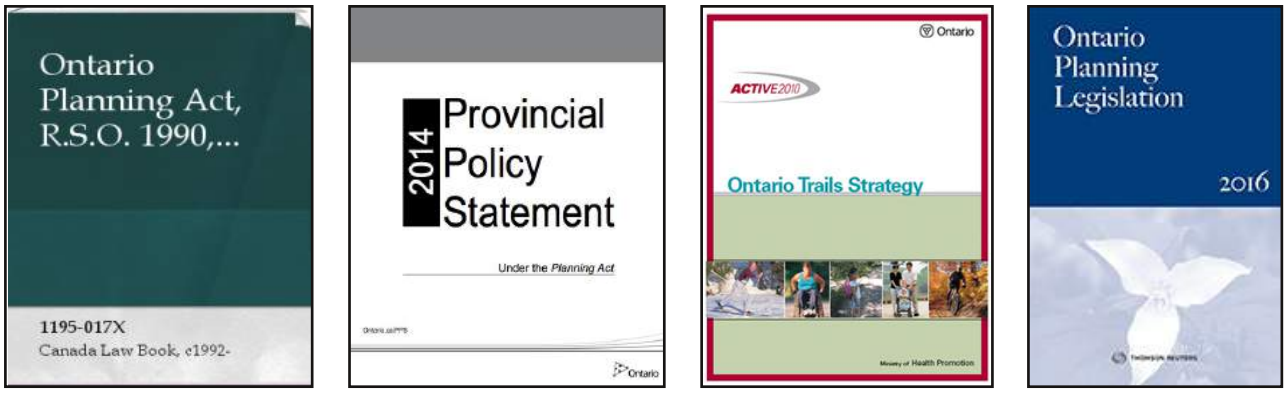


Figure 2.1: Sample of Provincial Policies and documents that were reviewed

The Planning Act

The *Planning Act* (the "Act") is Ontario's primary legislation through which land use planning policies receive legislative authority. Under Section 3, the Act requires that "the exercise of any authority that affects a planning matter, (a) shall be consistent with the policy statements issued under Subsection 1, and (b) shall conform with the provincial plans that are in effect on that date" (*Planning Act*, s. 3 (3)).

Provincial Policy Statement, 2014

With respect to the Provincial Policy Statement (PPS), this section will explore "matters of provincial interest related to land use planning and development" (PPS, 2014), with reference to "provincial plans [and] locally-generated policies" (PPS, 2014) that concern the Lemoine Point area. Properties in the Lemoine Point area are held under both public and private ownership, involving major facilities and sensitive land uses. Current trends in urban growth present a unique opportunity to examine the existing land uses for their long-term compatibility and to foster resilience throughout the evolution of the site. The Provincial Policy Statement (2014) advises that:

s. 1.2.6.1 Major facilities and sensitive land uses should be planned to ensure they are appropriately designed, buffered and/or separated from each other to prevent or mitigate adverse effects from odour, noise, and other contaminants, minimize risk to public health and safety, and to ensure the long-term viability of major facilities.

This sentiment is echoed in Section 1.6.9, regarding "planning for land uses in the vicinity of airports, rail facilities and marine facilities" (PPS, 2014), whereby it is stated planning "shall be undertaken so that: a) their long-term operation and economic role is protected" (PPS, 2014).

Together, these statements speak to the management of change as fundamental to building “strong healthy communities” as described in Section 1.0 of the Provincial Policy Statement (2014). Such communities are, in part, sustained by “promoting development and land use patterns that conserve biodiversity and consider the impacts of a changing climate” (PPS, 2014, s. 1.1.1(h)). This is relevant to the Lemoine Point area as its land uses involve major facilities such as the Collins Bay Marina and the Kingston Norman Rogers Airport. The site is also home to a number of sensitive land uses including the Lemoine Point Conservation Area, Rotary Park, The Landings Golf Course, and two residential neighbourhoods that are adjacent to the Lake Ontario waterfront. By considering Section 1.1.1(h), communities acknowledge the preservation of ecologically diverse environments as a contribution towards the long-term environmental sustainability and economic prosperity of an area.

Additional statements that support Section 1.1.1(h) include Sections 1.7 Long-Term Economic Prosperity; Section 1.8 Energy Conservation, Air Quality and Climate Change; and Section 2.0 Wise Use and Management of Resources and more specifically, Section 2.1, Natural Features and Section 2.2 Water. These sections advocate for energy conservation through renewable and alternative energy systems, active and public transportation, and “diversity and connectivity of natural features” (PPS, 2014, s. 2.1.2). They also focus on planning at the watershed scale in order to “protect, improve or restore the quality and quantity of water” (PPS, 2014, s. 2.2.1).

Conservation Authorities Act - Ontario Regulation 148/06

Through the Ministry of Natural Resources (the “Ministry”), the *Conservation Authorities Act* (the “Act”) legislates a conservation authority to conserve, restore, develop and manage the natural resources within its jurisdiction, “other than gas, oil, coal and minerals” (*Conservation Authorities Act*, 1990, s. 20(1)). Additionally, Conservation Authorities are able to regulate an area under its jurisdiction in regards to "development, interference, and alteration" that is consistent with Ontario Regulation 97/04 (Cataraqui Region Conservation Authority, 2012). Specifically, an authority may regulate:

s. 28(1) b. prohibiting, regulating or requiring the permission of the authority for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek stream or watercourse, or for changing or interfering in any way with a wetland;

s. 28(1) c. prohibiting, regulating or requiring the permission of the authority for if, in the opinion of the authority, the control of flooding, erosion, dynamic beaches or pollution or the conservation of land may be affected by the development;

The City of Kingston is guided by *Ontario Regulation 148/06: Cataraqui Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*. This document outlines the conditions of permitted and prohibited development, with corresponding guidelines regarding river and stream valleys, in terms of shoreline processes and functions; hazardous lands, in terms of unstable soil and unstable bedrock; watercourses, in terms of function; and wetlands and other areas, in terms of hydraulic functions.

Bill 100, Supporting Ontario's Trails Act, 2016 The Ontario Trails Strategy (OTS) Trails Action Plan 2016/2016 to 2017/2018

On June 9, 2016, *Bill 100, Supporting Ontario's Trails Act* (the "Act"), 2016 received Royal Assent. Through the Ministry of Tourism, Culture and Sport (the "Minister"), the purposes of the *Ontario Trails Act* (2016) under Section 1 of Schedule 1 are:

1) To increase awareness about and encourage the use of trails.
2) To enhance trails and trail experience.
3) To protect trails for today's generation and future generations.
4) To recognize the contribution that trails make to quality of life in Ontario.

Furthermore, under Section 8(1) of Schedule 1, the Act mandates that the Minister "maintain an Ontario trails strategy that:

a. Sets out strategic directions for the establishment, management, promotion and use of trails in Ontario and;
b. Is guided by the vision of a province that has a world-class system of diversified trails, that are planned and used in an environmentally responsible manner, and that enhance the health and prosperity of all Ontarians.

In December of 2015, Ontario released The Ontario Trails Strategy (OTS) Trails Action Plan 2015/2016 to 2017/2018. The Strategy outlines Ontario's core values, priority issues and opportunities, as well as three action pillars. With the Lemoine Point area in mind, key core values include "respecting private and public lands" and "protecting, conserving and appreciating the environment, including cultural and natural heritage" (Ontario Trails, 2015). Priority issues include, "Securing Land for Trails"; "Protection of Private and Public Property"; "User Conflict Management"; and, "Supportive Land and Transportation Planning," while priority opportunities include, "Enhancing Trails Tourism"; "Strengthening the Role of Trails in Active Transportation"; and, "Maximizing Water Trail Opportunities" (Ontario Trails, 2015). The three action pillars, "Sustainability and Planning"; "Access and Awareness"; and, "Tourism and Economic Development" (Ontario Trails, 2015), are based on five strategic directions that aim to improve stakeholder collaboration, enhance sustainability and user experience, educate Ontarians, and promote healthy living and economic prosperity.

Great Lakes Protection Act, 2015

Ontario's *Great Lakes Strategy 2016 Progress Report - The Great Lakes Protection Act* (the "Act") became law in November of 2015. It "recognizes the diverse issues facing the Great Lakes, from invasive species to pollution to climate change" (Ministry of Environment and Climate Change, 2016). Through the Ministry of Environment and Climate Change (the "Ministry"), its purposes, under Section 1(1), are:

a. To protect and restore the ecological health of the Great Lakes-St. Lawrence River Basin.
b. To create opportunities for individuals and communities to become involved in the protection and restoration of the ecological health of the Great Lakes-St. Lawrence River Basin.

In response to these diverse issues and the negative impacts they have caused, Section 5(1) of the Act mandates that the Ministry "maintain Ontario's Great Lakes Strategy" (2015), guided by the ecosystem approach, the precautionary approach and an adaptive management approach, the Strategy (2012) works towards six goals – (1) "Engaging and empowering communities"; (2) "Protecting water for human ecological health"; (3) "Improving wetlands, beaches and coastal areas"; (4) "Protecting Habitats and species"; (5) "Enhancing understanding and adaptation"; and, (6) "Ensuring environmentally sustainable economic opportunities and innovation" (Ministry of Environment and Climate Change, 2016). Notably, these goals reference the *Endangered Species Act*, 2007; the *Climate Change Mitigation and Low-carbon Economy Act*, 2016; *Ontario's Climate Change Strategy*, 2015; and, *Bill 100, Supporting Ontario's Trails Act*, 2015. All these documents play an important role in the Lemoine Point area, supplemented by other key legislation including:

Climate Change Mitigation and Low-carbon Economy Act, S.O 2016
Lakes and Rivers Improvement Act, R.S.O 1990
Environmental Assessment Act, R.S.O 1990
Environmental Protection Act, R.S.O 1990
Ontario Water Resources Act, R.S.O 1990
Invasive Species Act, S.O 2015
Public Lands Act, R.S.O 1992

2.2 City of Kingston Municipal Plans and Policies

Kingston's Strategic Plan 2015-2018

Kingston's Strategic Plan 2015-2018 is the City's second four-year strategy. The *Plan* calls for creating a smart, livable city, while moving towards the goal of becoming Canada's most sustainable city. The Strategic Plan builds upon the four pillars of sustainability (environmental responsibility, social equity, economic health and cultural vitality) to reach the City's ever-changing goals that evolve with the introduction of new technologies and knowledge. It lays out six Council priorities, outlined below:

1) Create a smart economy – The City of Kingston will aim to build entrepreneurial hubs, develop business opportunities and attract investment. Through strategies such as the tourism strategy, youth employment strategy, and workforce strategy, the City hopes to develop and retain a skilled workforce to contribute to the economy, while attracting tourism through innovative marketing strategies. Infrastructure projects, such as the creation of a post-secondary institution in the downtown core and the inclusion of a Kingston stop on the Windsor to Quebec City high-speed rail line, would further contribute to the City's economic growth.

2) Invest in infrastructure – Infrastructure projects range from housing projects to road improvements plans. The City has an action plan to create a third crossing across the water, expanding John Counter Boulevard to four lanes, and continuing to address aging infrastructure through the dedicated one percent annual tax-rate increase for capital. The City will also continue to implement the 10-Year Housing and Homeless Plan to provide a mix of housing types and tenure. Lastly, a capital plan will be initiated to rehabilitate and expand the airport. To support these significant infrastructure projects, active and integrated transportation solutions such as investments in transit, cycling and pathway infrastructure will continue to be a priority.

3) Plan a liveable city – In order to become the liveable city that Council is striving for, plans such as the *Sustainable Kingston Plan* and *Kingston Culture Plan* as well as initiatives focusing on responsible community planning, public transit improvements, and revitalization will be undertaken. To handle the annual population increase within Kingston's boundaries, intensification within the downtown core will be implemented in an appropriate manner. Despite the growth, heritage buildings and neighbourhoods will be protected throughout the city.

4) Green the city – The City's desire to 'green the city' involves a wide variety of plans, ranging from those focused on enhancing the City's trail system to diverting waste. The connection of trails, pathways and green spaces is a priority, with the completion of the K&P Trail as a perfect example of this. Furthermore, the City will enhance tree canopy within the urban boundary and aim to beautify neighbourhoods through strict property standards and parking-enforcement methods.

5) Advance a vibrant waterfront – The advancement of Kingston's waterfront is accomplished through waterfront-specific goals and goals achieved under the other five Council priorities. The creation of a *Waterfront Master Plan* and a redevelopment plan for the Inner Harbour through remediation are two specific goals the City has been pursuing to improve and grow the waterfront. Other plans include the redevelopment of the Kingston Penitentiary and enhancing Waterfront tourism through concepts such as deep-water docking facilities. These goals will help promote tourism and public access to the waterfront.

6) Foster open government – Through excellent customer-service, transparency and citizen engagement, the City will strive to continuously empower the public to engage and communicate within the municipal processes.

While Council's six priorities are intended to provide growth for the entire municipality of Kingston, the priorities also possess significant implications for the Lemoine Point area. Its diverse collection of land uses and infrastructure, including the Lemoine Point Conservation Area, Kingston Airport, low-density residential neighbourhoods, and environmentally-protected areas demonstrate the necessity of guided sustainable development through those priorites. Through the accomplishment of the sub-goals within each of Council's six priorities, such as enhancing tree canopy within the city's urban boundary and the continued promotion of brownfield redevelopment, the success of the Strategic Plan in laying down the framework for the City's successful growth is apparent.

Figure 2.2: City of Kingston's Strategic Plan 2015-2018 logo

City of Kingston Waterfront Master Plan

The purpose of the City of Kingston *Waterfront Master Plan* (WFMP) is three-fold. The *Plan* aims to:

1) Guide decisions on waterfront improvements and provide a long-term vision for the waterfront.
2) Improve access to the water and enhance opportunities for all types of recreation.
3) Organize and prioritize the renewal of public waterfront spaces and identify improvements for access and connectivity along the waterfront.

The *Waterfront Master Plan* also sets out three key mandates for the planning process to follow:

1) Connections: Capitalize on opportunities for existing and new linkages to improve the overall connection of waterfront spaces for all people.
2) Access: Manifest the spirit of engagement with water and increase access to elements such as water, nature, and recreation for all people.
3) Enhancements: Enhance and protect both the terrestrial and aquatic environments.

The *Waterfront Master Plan* aims to promote and enhance Kingston's waterfront as a vibrant and publicly accessible space. The Lemoine Point area falls under the Lake Ontario West Focus Area, where it is recognized that there is the potential for greater water access through better waterfront connections, more lookout points, seating infrastructure, and other upgrades for the area. The "WFMP Focus Area 3" chart (See Appendix A, Table A2) of this report further breaks down the specific projects currently underway within the site and study areas, while outlining their respective priorities for improvement.

The City of Kingston *Waterfront Master Plan* is used as a basis for recognizing the City's goal of improving its waterfront, and therefore is a key influence in some of the recommendations for the Lemoine Point area. It is essential to promote public access to open spaces along Kingston's shores, while at the same time being sensitive to the protection of the natural environment of the area.

Figure 2.3: City of Kingston *Waterfront Master Plan* cover (left) and a conceptual rendering for Lemoine Point from the *Waterfront Master Plan* (right)

Rotary Park Design Guidelines

The Rotary Park Design Guidelines used public consultation to improve the user experience at Rotary Park, specifically with a survey. Some key features from the guidelines include increased bike storage and facilitation of usage, increased width of walking paths, landscaping suggestions (i.e. lilac pruning and trimming), accessible parking, sodded lawns, and the planting of new trees.

2007 Norman Rogers Airport Master Plan

The purpose of the 2007 *Norman Rogers Airport Master Plan* was to provide an overall vision for the airport and development of airport infrastructure and service. The *Plan* proposed the expansion of the terminal commercial area and evaluated the feasibility of adding new air routes in and out of Kingston. Demographic and socio-economic analyses of Kingston and the surrounding area showed that the City was expected to grow and as such, airport services should accompany this growth by upgrading facilities and servicing new routes. Although the focus of the *Airport Master Plan* was airport performance and service, it also recommended implementing a recreational and open space buffer around the airport. The *Plan* also shows that the Norman Rogers Airport is growing, highlighting the need to balance this growth with appropriate environmental protections. Norman Rogers Airport is currently the subject of two exercises where one is focused on runway and terminal expansion, and the second exercise identifies appropriate land uses for other airport lands.

Figure 2.4: Norman Rogers Airport Entrance

2.3 Lemoine Point Conservation Authority Plans

The Foundation – An Inventory of Natural and Cultural Assets, Phase I of the Lake Ontario – St. Lawrence River Waterfront Strategy for the Kingston Bioregion

"The Foundation" is a document that inventories natural and cultural assets in the Kingston bioregion. This is a pioneering document that helps set the framework for future cohesive waterfront strategies in Kingston. This report stresses the need for future waterfront initiatives that integrate environmental, recreational, and economic development objectives through various forms of partnerships.

Key recommendations have been extracted from the report that are relevant for the Lemoine Point area. One of main recommendations is to develop a Waterfront Working Group which could complete a comprehensive waterfront vision and strategy so that upcoming waterfront projects can be planned and implemented within the context of a long-term waterfront strategy.

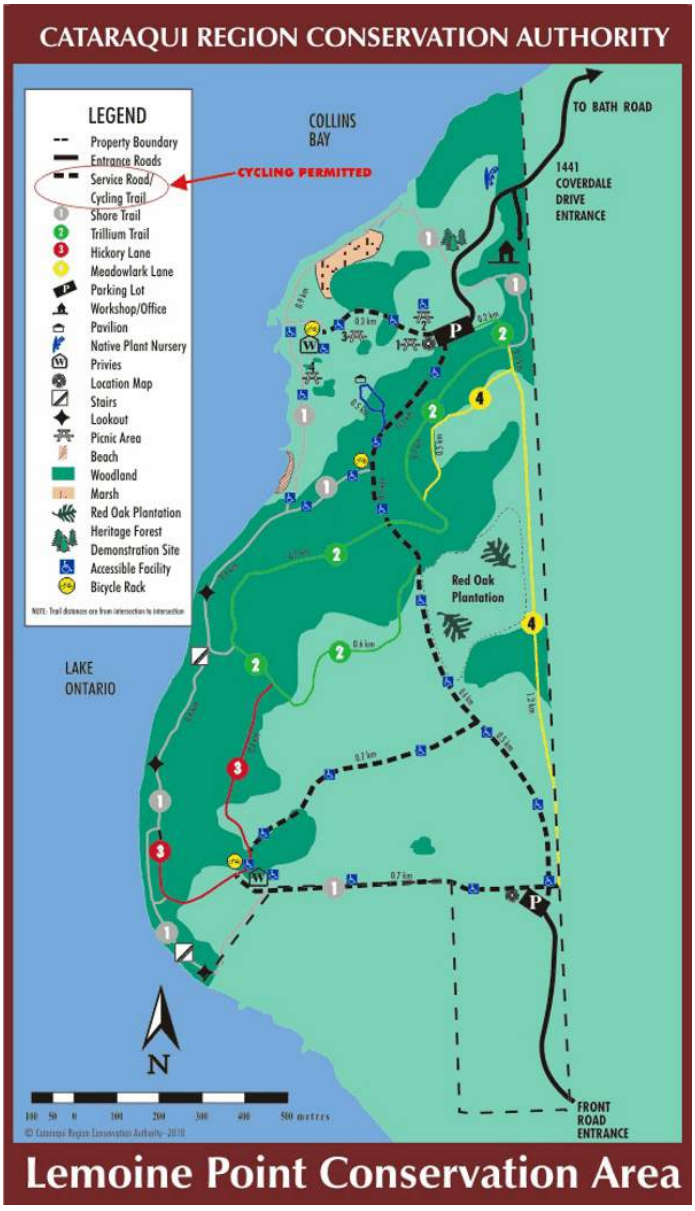


Figure 2.5: Current trail map at the Lemoine Point Conservation Area

Within the context of this strategy, tourism, economic development, and recreational objectives should be emphasized. Kingston should be a part of a larger waterfront trail that stretches from Adolphustown to Gananoque with the implementation of supporting strategies, such as design standards for waterfront trail signage, to promote the trail.

In terms of environmental stewardship and conservation, the Waterfront Strategy should promote education programs and integrate erosion control measures to protect the shoreline while enhancing public access. North to South greenways would be created to serve as a transportation corridor to the waterfront. Other recommendations include the acquisition of the Lemoine Point Farm to expand the Lemoine Point Conservation Area, and the remediation of the inner harbour near Block D to remove the toxic sediment and create public pathways along the waterfront. Lastly, the report states that the Cataraqui Region Conservation Authority should not interfere with private property rights in the development of a waterfront trail system, and that an inclusive stakeholder consultation process should occur whenever sections of a waterfront trail are developed or moved. Partnerships with members of the public and major industries that control waterfront properties should be pursued in achieving waterfront connectivity.

Despite the aforementioned point, the report does make site-specific recommendations for the Lemoine Point area, including the acquisition of private lands (i.e. the Lemoine Point Farm) in order to establish a connected waterfront trail system in prime waterfront areas of Kingston. The key waterfront areas to connect within the City would be Lemoine Point, the Dupont waterfront, Lake Ontario Park, Providence Care, Portsmouth Harbour, and Fort Henry.

Exploring Opportunities for Environmental Investment in Coastal Areas of the CRCA – SURP 825 Project Course Summary

The SURP 825 Project Course group (2013) conducted research on the Lake Ontario and St. Lawrence River coastline between Brockville and Greater Napanee. This was done to focus on the potential economic opportunities along the Cataraqui Region coastline and how they relate to environmental conservation, and vice versa. The Lemoine Point area boasts extensive natural resources, which provide both social and economic benefits. However, the site does face environmental threats, such as invasive species and blue-green algae. In addition, the waterfront amenities of the site are fragmented but do present opportunities for linkages and greater public access of the shoreline. Based on the above information gathered through a vast amount of research, the project group has developed several recommendations to address the issues and future growth of the Lemoine Point area.

The recommendations range from land acquisition and natural heritage mapping to planning for healthy communities. The group's first recommendation is to create a toolkit for natural and cultural assets in order to map the natural heritage system of fish and wildlife habitats and identify priority locations for conservation. Furthermore, cultural assets are to be prioritized for public investment and promotion. The second recommendation is to ensure there is inter-municipal coordination for shoreline development policies and restrictions. This would ensure that there is a consistent environmental protection mandate for development. The third recommendation is to improve physical linkages in the study area through cycle lanes and paths along the coastline, implementation of signage and tourism promotion, and enhancing waterborne connections. The fourth recommendation is to improve tourism marketing and draw people into the site area through themed packages, special group marketing initiatives, and studies. The fifth recommendation is to pursue opportunities for enhancing protection and accessibility of coastal lands. This can be done through land acquisition, analyzing the network of public and non-profit lands along the coastline, and maintaining and/or improving boat access. The sixth recommendation from the group is to promote the research and development of water technologies and green infrastructure. Innovative measures focusing on water conservation and stormwater management would help prepare the involved municipalities with mitigating the effects of climate change. The seventh, and final, recommendation focuses on improving accessibility to the waterfront by creating a safe, enjoyable setting for people of different ages and abilities.

The research and recommendations of the 2013 Project Course report serve as a foundation for the recommendations made in Part II of this report by the 2016 SURP 825 Project Group.

Figure 2.6: The bobolink (left) and meadowlark (right) are two vulnerable species within the Lemoine Point area.

Conceptual Plan for Lemoine Point Conservation Area: Phase II Lemoine Point Conservation Area Master Plan, November 1999

To create a vision for the future of the Lemoine Point area, the 1999 *Conceptual Plan for Lemoine Point Conservation Area* focused on guiding the protection, improvement, and use of the Conservation Area for future generations. The document emphasized that the site was an opportunity for the Cataraqui Region Conservation Authority and the City of Kingston to create a "magnificent inner-urban natural and cultural heritage complex", with the Cataraqui Region Conservation Authority taking a leadership role in fulfilling the area's long-term visions. It identified the need for a Conservation Plan that would build upon the principles of ecosystem management.

The future prosperity of Lemoine Point was to be achieved by promoting conservation land expansion, sustainable visitorship, land re-organization, the consolidation of high-impact activities, and more intensive management of Lemoine Point's forests, meadows and wetlands. The major prescribed changes from the 1999 *Plan* were that conservation lands be expanded into some of the airport lands through annexation; conservation corridors would reach into the City as linear naturalized parks; the Lemoine Point Farm would become an interpretive centre for learning; and two Lake Ontario Waterfront Trail routes - one along the Conservation Area shoreline and the other along Bayridge Drive - would be developed. The expansion of Conservation Area lands would moderate the impact of human activity by distributing it over a larger area and reducing wear and habitat fragmentation through changes to circulation and activity patterns within the site. Expansion would also promote the establishment of more plant and wildlife habitats and almost double the length of a publicly accessible shoreline. Unfortunately, few of these strategies have come to fruition.

The *Plan* provides further key insights into the overall goals of the Lemoine Point Conservation Area. The Conservation Area is primarily a place of nature, designated for public education and extensive protection measures to preserve the site's vast natural and cultural heritage features. However, the Conservation Area will continue to face a number of challenges due to development pressures of the area, inlcluding Kingston's rising population, and increased human activity at the site resulting in habitat disturbances and fragmentation. These pressures are addressed in the Plan in terms of habitat loss, ecological degradation and fragmentation, invasive species, over-harvesting, and pollution. It is the mandate of the Conceptual Plan that that human intervention in the area must be managed to preserve the Conservation Area and surrounding environmental resources.

Figure 2.7: The Lemoine Point Conservation Area is defined in the 1999 Master Plan as a place for nature, contemplation, learning and respite from developed environments

2009 Lemoine Point Conservation Plan

The 2009 *Lemoine Point Conservation Plan* was intended to provide a review of the ecosystem stressors affecting the area and provide policies and options to address them. By examining options to prevent habitat loss, and ecological degradation and fragmentation, the *Plan* proposed a range of initiatives to consider.

The 2009 *Plan* observed that the conditions of terrestrial habitat change, human activity, environmental stewardship, and the introduction of invasive species has been increasing and requires consistent monitoring. To combat these issues and mitigate their effects, active management plans were recommended for possible implementation.

The *Plan* states that invasive species represent the largest threat to the Lemoine Point Conservation Area due to the creation of a monoculture. The document further evaluated the status and effects of trails, human intrusion, over-harvesting, shoreline erosion, global warming and other impacts on the Lemoine Point Conservation Area while providing understanding into the ecological conditions of the area. The 2009 *Lemoine Point Conservation Plan* can serve as a basis for understanding the available ecosystem management options and developing an implementation plan for the future.

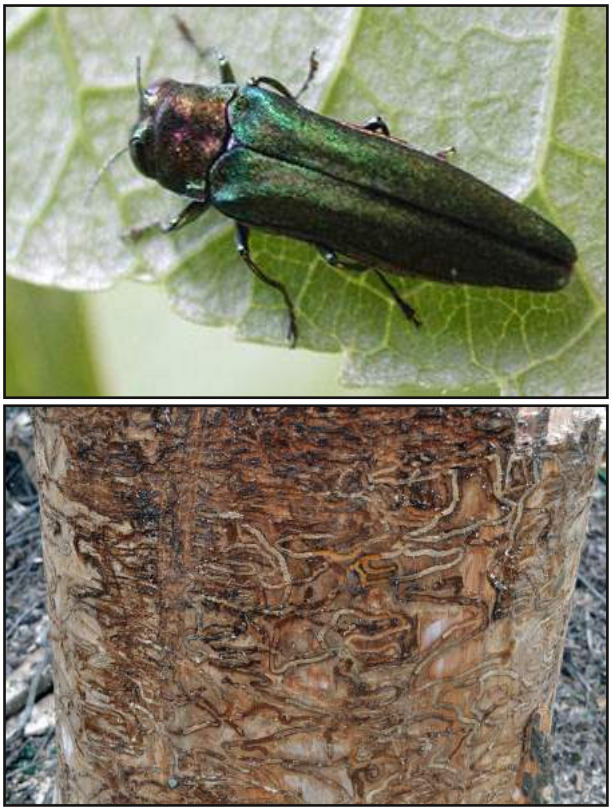


Figure 2.8: The Emerald Ash Borer (top) is an invasive species that could threaten the Lemoine Point area and needs monitoring. It has devastating effects on the health and lifespan of trees (below).

Chapter 2.0 References

Bill 100. Supporting Ontario's Trails Act. (2016). Royal Assent June 9, 2016. 41st Legislature, 1st Session. Retrieved from Ontario e-Laws: http://www.ontla.on.ca/bills/bills-files/41_Parliament/Session1/b100ra.pdf

Cataraqui Region Conservation Authority. (2012). Guidelines for Implementing Ontario Regulation 148/06: Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. Retrieved from: http://crca.ca/wp-content/uploads/PDFs/Regs%20Guidelines_final_June%202012.pdf

Conservation Authorities Act, (R.S.O. 1990, c. C.27). Retrieved from Ontario e-Laws: https://www.ontario.ca/laws/statute/90c27

Great Lakes Protection Act, 2015 (S.O. 2015, c. 24). Retrieved from Ontario e-Laws: https://www.ontario.ca/laws/statute/15g24

Ministry of Environment and Climate Change. (2016). Ontario's Great Lakes Strategy 2016 Progress Report. Government of Ontario. Retrieved from: https://www.ontario.ca/page/ontarios-great-lakes-strategy-2016-progress-report

Ministry of Health Promotion. (2010). Ontario Trails Strategy. Queen's Printer for Ontario. Retrieved from: http://www.mtc.gov.on.ca/en/sport/recreation/A2010_TrailStrategy.pdf

Ministry of Municipal Affairs and Housing. (2014). Provincial Policy Statement, 2014. Government of Ontario. Retrieved from: http://www.mah.gov.on.ca/AssetFactory.aspx?did=10463

Ontario Trails. (2015). The Ontario Trails Strategy (OTS) Trails Action Plan 2015/2016 to 2017/2018. Retrieved from: http://lin.ca/sites/default/files/attachments/trails-action-plan-final-Dec-2015.pdf

O. Reg. 148/06: Cataraqui Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. Retrieved from Ontario e-Laws: https://www.ontario.ca/laws/regulation/060148

Planning Act, (R.S.O 1990, c. P.13). Retrieved from Ontario e-Laws: https://www.ontario.ca/laws/statute/90p13

Chapter 3.0
Site Analysis

3.0 Site Analysis

3.1 Zoning Analysis

The City of Kingston's *Official Plan* and Zoning bylaws, in particular Bylaw 76-26, play a vital role in the sustainable and responsible operation of the Lemoine Point area. These bylaws and policies regulate and guide the development of the area's residential, environmental and industrial land uses. The existing policies, land use designations, and zoning provide information that helps identify permitted and prohibited uses, land use objectives, and the overarching City of Kingston goals for the area. Through an analysis of the *Official Plan* and Bylaw 76-26, the objective is to understand the existing policy framework shaping the Lemoine Point area, build upon existing legislation, and identify areas of improvement.

The Lemoine Point site area falls under Zoning Bylaw No. 76-26, last updated in April 2016. The intent of zoning is to effectively implement the City of Kingston's *Official Plan* land use designation by outlining specific and complementary uses and controlling the built form of the individual properties to ensure streetscapes and neighbourhoods possess similar physical traits.

Open Space (OS) – The Lemoine Point Conservation Area, a small patch of land South of the airport, and a segment of land North of Lake Ontario are zoned OS. Examples of the permitted uses include, but are not limited to, an accessory dwelling house (Residential), a park, a golf course, and a boat launching facility (Non-Residential). In addition to OS Zones, OS3 Zones are utilized in the area to zone specifically for public parks. West Park, located in the Northeast quadrant of the site area, is an example of a property zoned OS3.

Environmental Protection Area (EPA) – The EPA Zones are located along the Lake Ontario waterfront, within the site area. Permitted uses within this zone are limited to agricultural, conservation and forestry, and parks. The EPA zone also permits certain commercial activities, such as marine facilities and golf courses.

Residential (R1 and R2) – There are two Residential areas located within the site. The R1 Zones encompass the majority of the Residential in the area. The zone permits converted and single-family dwelling homes. The R2 Zones are dispersed and only present in the Northeast Residential site in the peripheral areas. The R2 Zone permits single-family dwellings, duplex, triplex, and semi-detached homes.

Development (D) – The Development zones are located along the Lake Ontario waterfront to the South, with a strict list of permitted uses including a cemetery, church, a farm, a fraternal lodge, or community center. Only existing single-family dwelling homes and accessory dwelling houses are permitted under Residential uses.

Airport (AP) – The Airport zone permits only an airport due to safety and compatibility issues. It is important to note that Special AP Zone, AP-1, is used for the Landings Golf Course and attached driving range, which operates in accordance with the provisions given in the Zoning bylaw.

Business Park (BP) – The Business Park Zone is located directly South of the Airport Zone. BP zoning permits no Residential uses. However, BP zoning allows for an assortment of Non-Residential uses including business offices, a hotel, a financial institution, and research and development facilities carried out within enclosed buildings.

Marine Commercial (C4) – Non-Residential permitted uses are commercial and service uses that compliment the property's waterfront location. These include a boat sales and/or service establishment, a marina, a motel or hotel and a restaurant. Permitted Residential uses include an accessory dwelling and/or an apartment dwelling house.

3.2 Official Plan Analysis

The Lemoine Point site area possesses a significant variety of land uses vital to the success of the City of Kingston's Strategic Policy Direction in Section 2 of the City's *Official Plan*. This section highlights four of the City of Kingston's major goals, which are: attaining sustainable development; protecting the City's resources; protecting stable residential areas; and preserving land use compatibility within the area. These have key implications for the Lemoine Point area.

The first goal relevant to the Lemoine Point area is found in Section 2.1 of the City of Kingston *Official Plan.* It outlines the City's strategies to "attain the sustainability of development" and pursue the goal of becoming one of North America's most sustainable cities. This ambitious objective can be achieved through the implementation of innovative energy systems, green building practices, and mixed-use development to encourage intensification. To complement these initiatives and ensure a sustainable design of streets, buildings, and neighbourhoods, development reviews and Secondary Plans can be employed. In regards to the Lemoine Point area, the Norman Rogers Airport expansion and infrastructure improvements are two key projects in the area that can benefit from incorporating this goal into development in order to practice the principles of sustainability.

The second major goal is focused on the protection of the City of Kingston's natural heritage lands and features and cultural heritage resources. This goal is met through the creation of a natural heritage system, maintaining a minimum forest coverage, while protecting the City's waterfront sites and prime agricultural lands. The Lemoine Point area contains significant environmental and cultural features, all of which possess significant ecological and social values that necessitate implementation of protection initiiatives in order to meet the City's goal.

The third and fourth goals outline the need for creating a pattern of cohesive neighbourhoods and districts, while minimizing conflict with existing and new developments. The protection of stable residential neighbourhoods is important to the City of Kingston, as expressed in Section 2.6 of the *Official Plan*. In the context of Lemoine Point and the City at large, it is important that various land uses, buildings, and sites co-exist from both a functional and visual perspective. As an area comprised of residential, industrial, commercial, and environmental land uses, the relationships between them within the Lemoine Point area must be developed or maintained to ensure co-operation and compatibility and reduce an adverse effects from conflicting land uses. With an understanding of the four goals that the City of Kingston aims to achieve, additional analysis of the *Official Plan* Land Use Designations and zoning can be utilized to further illuminate the relevance of those goals within the Lemoine Point area.

Official Plan Land Uses

There are six distinct Land Use Designations within the Lemoine Point site area and an additional four Land Use Designations within the broader Lemoine Point study area. The six Land Use Designations within the Lemoine Point site area are as follows:

Airport - This designation is used to identify Kingston's Norman Rogers Airport, a municipally owned and operated regional airport that is certified by Transport Canada. According to the City of Kingston *Official Plan*, the airport plays strategic role for the City.

Open Space - The Open Space designation includes city parks, private open spaces (i.e. Lemoine Point Farm), natural reserves, and lands adjacent to Environmental Protection Area designations. The intent of the Open Space designation is to provide recreational opportunities, trail connections, and linkages and corridors valuable for wildlife movement. It also provides visual relief within the urban landscape. The designation holds value as it offers protection for many significant cultural heritage resources, and natural heritage features and areas from development.

Environmental Protection Areas - This designation applies to waterfront and flood prone locations along the shore of Lake Ontario, to the West and South of the Lemoine Point area. It serves to protect lands with an inherent environmental sensitivity, that coincide with flood prone locations with an environment that is hazardous for development, based on the probability of a 100-year storm event and wave uprush conditions.

Harbour Area - Along the Lake Ontario and St. Lawrence River shorelines, specific areas have the potential to be expanded for a range of water-related uses. The Harbour designation is applied to the Collins Bay Marina, located along the shore of Lake Ontario in the Northwest quadrant of the site area.

Residential - The Residential designation applies to two distinct residential neighbourhoods in the area that comprises primarily of housing in the forms of detached and semi-detached dwellings at a relatively low density. The low-density neighbourhoods located in the Southeast and Northeast quadrants of the site area are recognized as "stable" residential areas within the City of Kingston's *Official Plan*.

Business Park Industrial - This designation applies to the Southern section of Norman Rogers Airport. The Business Park Industrial designation is intended to provide suitable locations for both industrial uses and industry support purposes that are visible as well as physically accessible within the City. The actual uses within the designation include a car rental service, gas station, and the office/club house for The Landings Golf Course.

Figure 3.1: City of Kingston *Official Plan* Land Use Designations

The six Land Use Designations that currently apply to different sections of the Lemoine Point site area illustrate the importance of ensuring compatibility between the conflicting actual land uses implemented within the area. Environmental Protection Areas, stable residential neighbourhoods, city parks, open space and an airport all possess separate City of Kingston intentions and goals, but must co-exist without conflict.

The four additional Land Use Designations within the study area are:

District Commercial - The planned function of the District Commercial designation is to provide a range of the most frequently needed commercial goods and services, such as grocery shopping, in convenient and balanced locations throughout the City to serve the needs of the immediate surrounding neighbourhoods. In line with the intent of the designation, a No Frill's Supermarket is located in the District Commercial designation.

Arterial Commercial - The Arterial Commercial designation is a special purpose designation for a limited and specialized range of goods and services. The designations range from hospitality uses, automotive uses, restaurants to serve the traveling public, to the functions that require large sites on a major road to display specialized goods in an outdoor setting.

Institutional - Kingston is home to many major institutions, such as post-secondary educational facilities, hospitals, military establishments, and corrections facilities. Most of these properties are owned and operated by higher levels of government, and serve not only the City, but extend to a regional, national or international population. The designation is applied in this area for the Collins Bay Penitentiary.

General Industrial - The General Industrial designation is an employment-based area intended to provide convenient locations for manufacturing, wholesale trade, construction, transportation, storage, communications, utilities, and other uses of a similar nature. These uses will be grouped into distinct employment areas to foster economic synergy and avoid or mitigate adverse effects on residential or other sensitive uses. Public/private parks and renewable energy sources are permitted as complementary uses. The manufacturer, Invista, has a plant located along the shore of Lake Ontario operating within the General Industrial designation.

3.3 Transportation, Circulation, Access and Parking Analysis

Overview

The Lemoine Point site area is automobile-dependent due to surrounding low density development and dedicated right-of-ways catering strictly to autombiles. Pedestrian access is limited, despite the heavy pedestrian usage of the area through public amenities such as Rotary Park and the Lemoine Point Conservation Area. There is an excellent opportunity for bicycle access and usage throughout the Lemoine Point site area, but significant gaps in the street cycling network along portions of Bath Road and Front Road have inhibited the full potential of cycling activity in the area. Public transit options are also limited as bus stops are only provided along Bayridge Drive. It is evident that the supply of active and public transportation infrastructure in the Lemoine Point site area does not currently meet the demands of the City.

Pedestrian Traffic

The Lemoine Point area's pedestrian traffic is highly dependent on the day of the week, time of day, and even the season. Due to the area's popular outdoor amenities offered by the Conservation Area, Collins Bay Marina, and waterfront, factors such as weather and time have a direct effect on the amount of pedestrian traffic. Qualitative analysis of pedestrian traffic can help develop important considerations regarding pedestrian activity in the Lemoine Point area were determined.

The Lemoine Point area is pedestrian-heavy, but requires other means of transportation to access it. For example, the Lemoine Point Conservation Area has a large amount of pedestrians that utilize the trails on the property. They frequent the Conservation Area in large numbers on specific days, primarily on weekends and days with pleasant weather conditions. However, these users must cycle or drive to access the trails at the Conservation Area due the limited transportation options to the area. As a result, the Lemoine Point area is a paradox with abundant edestrian activity but low pedestrian access.

The other uses in the Lemoine Point area are also not pedestrian-friendly. The airport and golf course have no pedestrian access points, and the marina has one sidewalk that is very seldom used. The main source of pedestrian traffic comes from users who access the area through other means of transportation such as bicycle, public transportation, or automobile. There are a few adjacent neighbourhoods that could provide sources of pedestrian traffic, however, these neighbourhoods are characterized predominately by low density, detached homes. These neighbourhoods' streetscapes minimize the viability of sidewalks and pedestrian activity, which in turn results in the promotion of automobile usage.

Public Transportation

Significant gaps in the Kingston public transit system limit access to the Lemoine Point area. The main bus routes that provide service for the Lemoine Point area are #15, #501, and #502. There is no service to Norman Rodgers Airport or the Lemoine Point Conservation Area. The #15 is a local collector bus with stops in the Auden Park, Henderson Place, and Lakeland Acres neighbourhoods located along connector neighbourhood streets along Bayridge Drive. It transports passengers to and from the Cataraqui Centre Transfer Point, with the use of a smaller access bus that does not participate in the Rack and Roll Program. The Rack and Roll program is designed to provide cyclists a means to transport their bicycles through the use of public transit, thus encouraging active transportation in Kingston. The stops along Acadia Drive account for the majority of transit stops in the Lemoine Point area, with stops along Roosevelt Drive and Glen Castle Road serving site area. The closest stop the Lemoine Point Conservation Area sits on Walden Gate and requires a 1.4km walk to reach the Conservation Area.

The #501 and #502 bus routes are primary commuter routes that connect the main commercial nodes (Cataraqui Centre and the Kingston Centre) to the Downtown Transfer Point and Kingston General Hospital. These buses also serve the St. Lawrence College by looping back along Bath Road and Bayridge Drive and heading back to the Cataraqui Centre. This can be viewed as the most reliable way of using public transportation to access the Lemoine Point area. The frequency of these buses and their participation in the Rack and Roll program make them viable options to to accessing the Lemoine Point area.

Automobile Traffic

Table 3.1 (below) depicts automobile and public transit proximity to a variety of destinations. This table demonstrates how dependent the Lemoine Point area is on automobile traffic. The route to virtually every commercial, institutional, or major transportation node is over ten minutes driving distance from Lemoine Point, and this distance negates any viability of walking to the area.

Automobiles access the Lemoine Point area via two main entryways: To the North through Coverdale Drive and Bath Road, and to the South via Front Road. Bath Road is a 4-lane separated commuter street that facilitates a high volume of traffic to and from Kingston's suburban West-end. Front Road to the South is significantly less busy as a 2-lane country road, and experiences less traffic overall and services both the Lemoine Point Conservation Area and Norman Rodgers Airport.

Figure 3.2: The private automobile is the primary means of getting to Lemoine Point and the surrounding area

Table 3.1: Automobile Traffic and Proximities to Destinations

Destination	Distance from closest CA entrance (km)	Travel Time to Destination (car)	Fastest Public Transit Travel Time to Destination
Commercial			
Kingston Centre	8.2	14 minutes	~39 minutes
Cataraqui Centre	5.9	11 minutes	~36 minutes
RioCan Centre	5	9 minutes	~26 minutes
Institutional			
Queen's University	9.2	12 minutes	~50 minutes
Royal Military College	12.8	19 minutes	~49 minutes
St. Lawrence College	6.9	8 minutes	~44 minutes
Hotel Dieu	11.5	18 minutes	~50 minutes
Kingston General Hospital	9.9	14 minutes	~47 minutes
Collins Bay Institution	7.9	12 minutes	~40 minutes
Transportation Nodes			
Highway 401	11.2	14 minutes	~60 minutes
Via Rail Station	8.5	14 minutes	~52 minutes
Bus Station	10.6	16 minutes	~58 minutes

Parking Analysis

On-street parking spots can be found in neighbourhoods in the site area. However, this is not offered along the primary access roads of Coverdale Drive, Bayridge Drive, Bath Road, and Front Road. Each of the main land uses within the Lemoine Point area have dedicated parking lots, including the Lemoine Point Conservation Area, Collins Bay Marina, Norman Rogers Airport, and Landings Golf Course. Parking is an important feature of the Lemoine Point area due to the fact that the predominant form of accessing the area is through private automobiles.

Table 3.2: Parking Analysis of Locations with the Lemoine Point area

Location	# of Parking Spots	# of Accessible Parking Spots	Other Features (Lighting, paved, signage)
Lemoine Point CA	North Lot: ~115 South Lot: ~60	North Lot: ~4 South Lot: ~4	-No lighting (closed at Dusk) -Packed Gravel -Signage for accessible spots, other signage available for trail entry
Rotary Park	~40	1	-Garbage receptacles located in parking lot -Paved with parking curbs that are in need of maintenance -No lighting
Norman Rogers Airport	~130		-Paved with distinct lines for each spot
Collins Bay Marina	~75	N/A	-Private parking lot -packed gravel -Minimal lighting -Informal parking along main east-west strip of marina
The Landings Golf Course	~50		-Packed gravel informal parking (no parking lines) -Private lot -no lighting (not open at night)
Surrounding Neighbourhoods	On Street Parking	N/A	-Paved neighbourhood streets for parking -On-street parking parameters are set by By-Law 2010-128

Bicycling

Bicycling to and around Lemoine Point has become easier over time, due to the implementation of various bicycle lanes along Front Road, Bayridge Drive, and Bath Road. Despite these improvements, there are still significant challenges to bicycling in Lemoine Point area. The first challenge is posed by the lack of bicycling right-of-way along Front Road, West of Bayridge (for bicycle access to the airport) and the Conservation Area. Furthermore, the Bath Road bicycle lane ends at Coverdale Road, approximately 4.5km away from the Northern access to Lemoine Point. These inconsistencies within the infrastructure of bicycle lanes hinder the access of cyclists to the Lemoine Point area. Bicycle lanes have had more success North of Bath Road, with various lanes that have been installed on North Bayridge Drive, Collins Bay Road, Woodbine Drive, as well as a new proposed lane that is intended to connect Collins Bay Road to Coverdale Drive along Bath Road. This is a positive step to connect neighbourhoods West of Collins Bay, and also from the North-West end of Kingston. However, despite these advances, the lack of bicycle infrastructure along the Bayridge overpass is still a major challenge in connecting the North end of Kingston to the Lemoine Point area.

The Conservation Area also has unpaved bike trails running through the West side of the lands. This is an asset, as it facilitates bicycle use in the Lemoine Point area, and provides a circular connection to the northern and southern ends of the area. Bicycling on these trails is considered seasonal, with most of the bicycle usage occurring in the Spring/Summer/ Fall seasons.

Access Roads to the Lemoine Point CA

Currently, the North and South access roads into Lemoine Point Conservation Area are the only two public entrances, which are packed gravel roads ending with a Conservation Area parking lot. Due to their packed gravel composition, these access roads are more susceptible to potholes and other seasonal damage. This necessitates a “rough road” sign that marks each access road. Furthermore, the lack of significant shoulders or side markers on the road make it difficult for automobiles to pull over on the side of the road, which can cause bottlenecking at certain high traffic points, such as the Rotary Park Dog Park, or the Lemoine Point native plant nursery.

Figure 3.3: Sign showing rough road access into the Conservation Area

3.4 Population Analysis

According to Statistics Canada, in 2006 and 2011 the Kingston Census Metropolitan Area (CMA) had a total population of 152,358 and 159,561 respectively. The Kingston CMA population is concentrated mostly within the City of Kingston, which had a population of 123,355 in 2011. Using census data, such as yearly births and fertility rates, have shown a population projection of 166,486 in 2016, and 171,163 in 2021, as shown in Table 3.3 below. This illustrates a moderate growth rate of approximately 5% every five years. Population pyramids in Figures 3.4 and 3.5 provides a better preview of the population by age groups, and this data can be highly significant in terms of long-term planning.

Table 3.3: Kingston City Population data for 2011 (observed) with projections for 2016 and 2021

Age of Cohort	Cohort Number (n)	Observed Population 2011			Projected Population 2016			Projected Population 2021		
		Male Population (PM_n^{2011})	Female Population (FM_n^{2011})	Total Population (P_n^{2011})	Male Population (PM_n^{2016})	Female Population (FM_n^{2016})	Total Population (P_n^{2016})	Male Population (PM_n^{2021})	Female Population (FM_n^{2021})	Total Population (P_n^{2021})
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0 to 4 years	1	3,955	3,915	7,870	3,956	3,929	7,886	3,956	3,929	7,886
5 to 9 years	2	4,025	3,710	7,735	4,214	4,143	8,358	4,216	4,158	8,373
10 to 14 years	3	4,265	4,015	8,280	4,284	3,881	8,165	4,474	4,314	8,787
15 to 19 years	4	5,340	5,170	10,510	4,803	4,628	9,431	4,822	4,494	9,316
20 to 24 years	5	6,625	6,090	12,715	6,907	6,325	13,232	6,373	5,784	12,157
25 to 29 years	6	5,480	5,370	10,850	6,587	5,788	12,375	6,867	6,023	12,889
30 to 34 years	7	4,915	4,815	9,730	5,553	5,260	10,813	6,649	5,677	12,325
35 to 39 years	8	4,685	4,570	9,255	5,119	4,995	10,115	5,749	5,438	11,187
40 to 44 years	9	5,185	5,195	10,380	4,907	4,750	9,657	5,334	5,173	10,507
45 to 49 years	10	6,235	6,460	12,695	5,334	5,454	10,788	5,062	5,014	10,076
50 to 54 years	11	5,785	6,430	12,215	6,193	6,586	12,780	5,320	5,596	10,916
55 to 59 years	12	5,310	5,745	11,055	5,680	6,407	12,087	6,069	6,560	12,629
60 to 64 years	13	4,915	5,390	10,305	5,174	5,688	10,862	5,518	6,327	11,845
65 to 69 years	14	3,720	4,085	7,805	4,590	5,201	9,791	4,825	5,484	10,308
70 to 74 years	15	2,870	3,120	5,990	3,366	3,889	7,255	4,119	4,920	9,039
75 to 79 years	16	2,225	2,780	5,005	2,457	2,801	5,258	2,856	3,478	6,334
80 to 84 years	17	1,560	2,145	3,705	1,658	2,242	3,901	1,823	2,259	4,082
85 years and over	18	1,120	2,355	3,475	1,292	2,443	3,735	969	1,538	2,507
TOTAL		78,215	81,360	**159,575**	82,075	84,411	**166,486**	84,999	86,164	**171,163**

Source: Statistics Canada. 2012. Kingston, Ontario. Census Profile. 2011/2006 Census. Statistics Canada Catalogue no. 98-316-XWE. Ottawa
Assumptions: Births and Survival Rates for 2011-2016 and 2016-2021 are the same as those of 2006-2011.

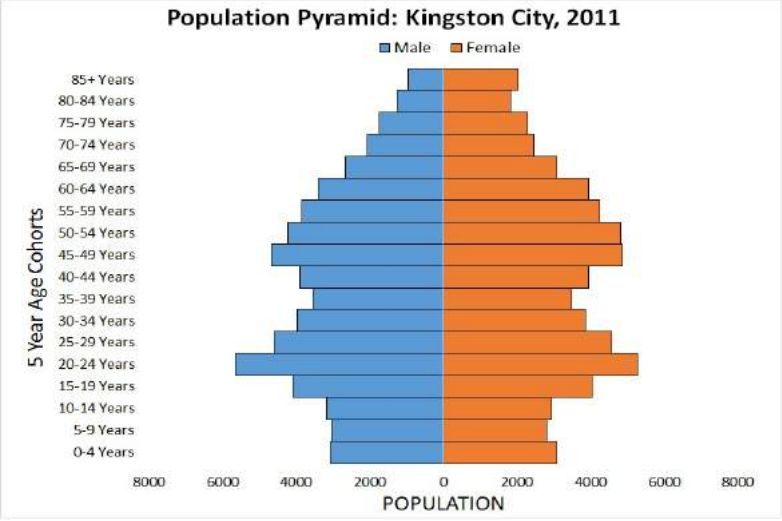


Figure 3.4: City of Kingston's Population Pyramid for 2011

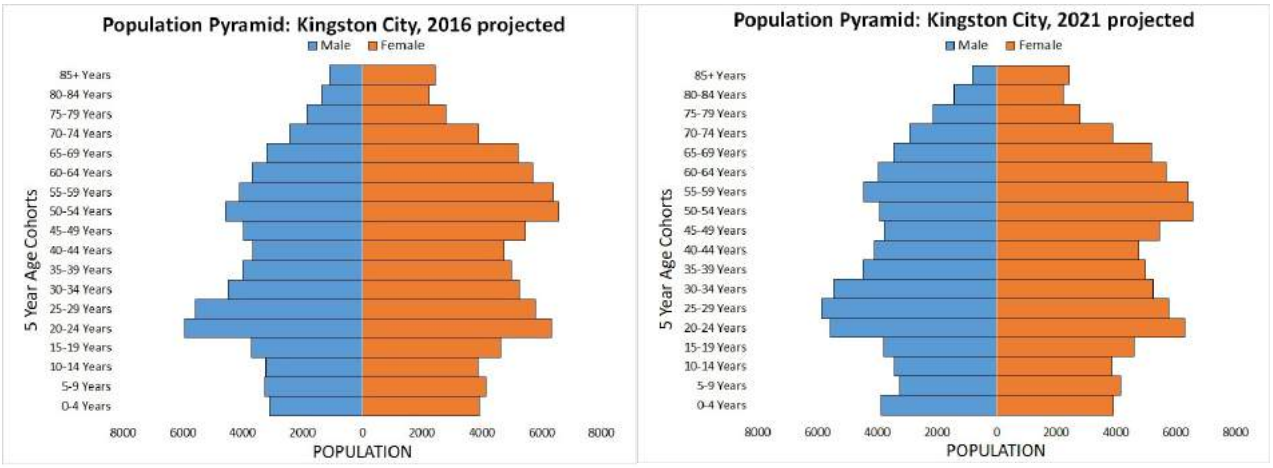


Figure 3.5: City of Kingston's Population Pyramid Projections for 2016 and 2021

Population in the immediate vicinity of the Lemoine Point Conservation Area has also been analyzed, with a census dissemination area delineated by Bath Road in the North, Days Road and Sunny Acres Road in the East, and Lake Ontario in the West and South. Figure 3.6 illustrates a population pyramid that includes residential neighbourhoods within walking distance from the Conservation Area with a data from the 2011 Census showing a population of 10,765. This is indicative of the idea that the Lemoine Point Conservation Area can become a place for people to gather and enjoy nature in its pristine setting, within the city boundaries.

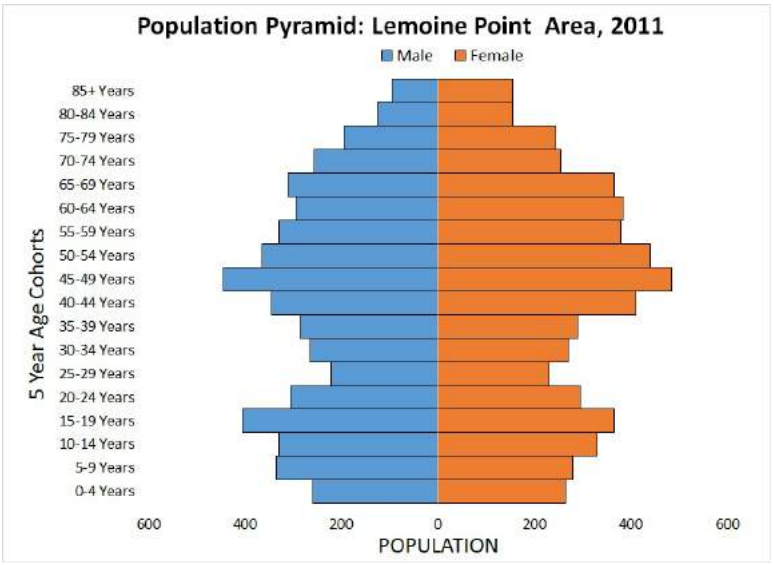


Figure 3.6: Population Pyramid for Lemoine Point Area, 2011

The analysis above is based on a standard population projection method using observed population data of a base year, combined with with external data (i.e. births per year, fertility rates of women of childbearing age, and migration history). Changes in net migration due to factors such as commercial and industrial growth and a higher student intake by the universities can affect this growth forecast. Figure 3.7 depicts a projection of the population up to 2041 based on a Linear Extrapolation Curve that demonstrates the growth pattern in the future, based on past population between 1991 and 2006 in Kingston CMA.

However, this is not reflected in the study performed by the City of Kingston, which predicts a gradual population decline after 2031. The forecasting model of the City projects a population increase from the 2011 base of 159,600 to 193,500 in 2033, followed by a gradual decrease to 185,530 by 2041. This comparison is shown in Table 3.4. The City's model justifies the gradual decline on reaching an economic saturation point by 2031, resulting in lower rates of incoming migration, coupled with the steady reduction of baby boomers through death.

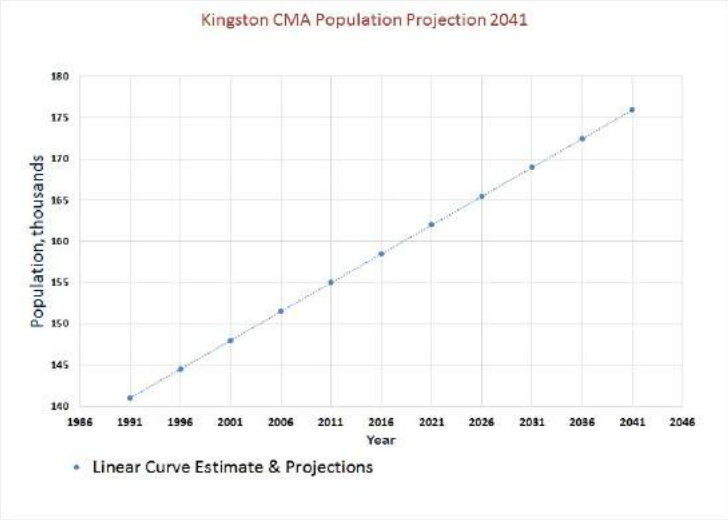


Figure 3.7: Population Projection of Kingston CMA 2041

Table 3.4: Kingston CMA Population Comparison Between Linear Projection and City's Study

	Population, thousands	
Year	Linear Curve Estimate & Projections	Base Case Population, City of Kingston Report
1991	141.00	
1996	144.50	
2001	148.00	148.27
2006	151.50	152.40
2011	155.00	159.60
2016	158.50	168.69
2021	162.00	176.29
2026	165.50	184.29
2031	169.00	192.17
2036	172.50	192.30
2041	176.00	185.53

On both population projection models, the City of Kingston's population is expected to grow at a healthy rate over the next 10-15 years. The medium-term population trends of the City, combined with the Lemoine Point area's central location within the Kingston boundaries, suggest that usage of the area will increase over the next 10-15 years. Thus, strategic planning for an increased amount of usage of the Lemoine Point area is a prudent direction to take.

3.5 Environmental Analysis

The Lemoine Point area in the City of Kingston is located within a distinct, environmentally sensitive site that presents several constraints for growth and development;, thus reinforcing the need for the conservation of the large number natural heritage assets. The first environmental constraint is the floodplain. It typically follows the shoreline, with the exception of the Northwest segment of the Lemoine Point area in which the floodplain intersects with significant wetlands and progresses further inland. These wetlands are a significant feature within the Lemoine Point area but more so along the Northwest shoreline. Additional wetland regions have been identified on Norman Rogers Airport lands as well as the Marshlands Conservation Area, which is host to the most sizable portion of wetlands in the Eastern-most section of the designated study area.

The significant woodlands in the Lemoine Point area constitute a dominant natural feature along the shoreline. This section of wooded shoreline is the longest publicly-accessible wooded shoreline on Lake Ontario in the Cataraqui Region watershed. Some portions of the woodlands have wetlands embedded within them that help create unique, natural sites that must be preserved. The woodland composition is primarily white pine, red oak, white oak, hard maple and white ash. Environmental concerns for the woodland area include the Emerald Ash Borer. While this hazard has been found within the Marshlands Conservation Area, it has not yet affected the ash trees at the Lemoine Point Conservation Area. However, it is predicted that the Emerald Ash Borer will eventually make its way to the Lemoine Point Conservation Area. Another environmental concern is the increasing severity of storms, which have had detrimental effects to the woodland areas due to such occurrences as ice storms in the winter. These ecological disturbances highlight the need for greater protections and woodland stewardship through reforestation efforts.

Wildlife within the Lemoine Point area include squirrel and chipmunk populations that have been unnaturally bolstered by human interference (i.e. relocating, feeding). There are also bird species, such as the Eastern Meadowlark and Bobolink species, that are currently identified as endangered. The grasslands feature declining bird populations as well in the form of Loggerhead Shrikes and Henslow's Sparrows.

Much of the Southern portion of the Lemoine Point area is not serviced by municipal water, but wastewater services cover the Southern section. It is noted that due to the environmental risks of expanding municipal servicing to the Lemoine Point area, future residential development should be restricted. For further information, refer to the Environmental Constraints Map in Appendix B.

3.6 City of Kingston Official Plan and Zoning Bylaw Updates

At the time of this report, the City of Kingston is undergoing an *Official Plan* update and subsequent Zoning Bylaws update. Proposed changes to the municipal documents have direct and indirect implications for the Lemoine Point area. While the recommendations in this report refer to the current *Official Plan* and site-relevant Zoning Bylaws, references to the recent updates may also be made throughout the document.

Changes inherent in the *Official Plan* update involving the Lemoine Point area are mainly associated with refinements in the policies of the Open Space and Environmental Protection Area designations and minor schedule changes. A significant change within the Open Space designation involves a key addition to the Open Space Program policies in which the City intends to actively acquire and gain access to waterfront lands through various strategies. This policy is identical to the City's intent in the *Waterfront Master Plan*. In terms of Environmental Protection Areas and the relevant policy changes, the *Official Plan* reduces the list of Defined Areas for Environmental Protection Area through the removal of defined natural areas, including endangered species habitats and land within the regulatory floodplain. These policy changes have implications for recommendations made in Part II of the report. The proposed *Official Plan* update also contains one change to the Lemoine Point area specifically in the Land Use Schedule of the document. The *Plan* updates the Collins Bay Marina's land use designation from "Open Space" to "Marina." The Marina designation is an additional subcategory to the Harbour Areas designation, which permits harbour uses that align with the Collins Bay Marina's operations.

The proposed Zoning Bylaws update contains two significant changes to the Lemoine Point area. The first change is the expanded Environmental Protection Area zoning within the site, which is applied to three wetlands identified within the Lemoine Point Conservation Area. This change increases the municipal protection of the wetlands. The second change is the rezoning of property on the Norman Rogers Airport lands from "Residential" to "Airport." As a result of this new zoning, the potential for this property to be developed for residential use has been removed. Other minor changes in the zoning update involve expanding or reducing permitted uses in zone categories. These changes are discussed in Part II of the report.

Overall, the *Official Plan* and Zoning Bylaws updates do not present significant ramifications for the future vision of the Lemoine Point area. However, these changes are referred to throughout the report as they highlight the effect of City policy within the area and how the report's own recommendations parallel or diverge from the City of Kingston's proposed changes.

Chapter 3.0 References

City of Kingston. (2013). City of Kingston and Kingston CMA: Population, Housing and Employment Projections. Kingston.

City of Kingston. (2016). Zoning Bylaw Update. Retrieved from https://www.cityofkingston.ca/city-hall/strategies-studies-plans/zoning-bylaw-update/phases

City of Kingston. (2016). Official Plan Update. Retrieved from https://www.cityofkingston.ca/business/planning-and-development/official-plan/update

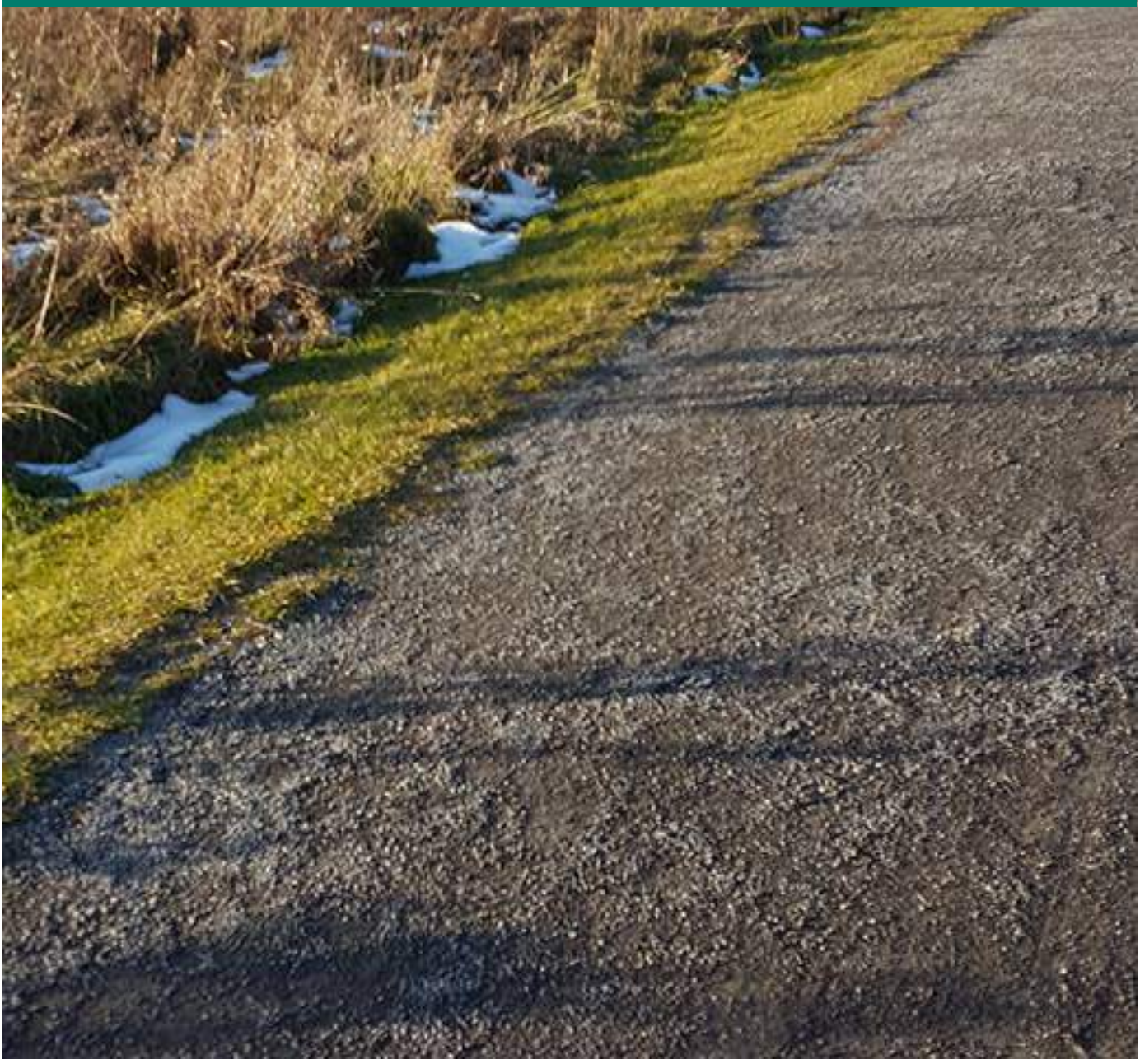
Grumbine, R. E. (1994). What is ecosystem management?. Conservation biology, 8(1), 27-38.

Snetsinger, S. D.(2009). Recreation and trail impacts on wildlife species of interest in Mount Spokane State Park. Pacific Biodiversity Institute, Winthrop, Washington.

Statistics Canada. (2012). Kingston, Ontario (Code 521) and Ontario (Code 35) (table). Census Profile. Retrieved from 2011 Census. Statistics Canada Catalogue no. 98-316-XWE. Ottawa. Released October 24, 2012.: http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E

Statistics Canada. (2013). Kingston, CY, Ontario (Code 3510010) (table). National Household Survey (NHS) Profile. Retrieved from 2011 Census. Statistics Canada Catalogue no. 99-004-XWE. Ottawa. Released June 26, 2013.: http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/index.cfm?Lang=E

Chapter 4.0
Case Study Analysis



4.0 Case Study Analysis

4.1 Waterfront Master Plans

Inspiration Lakeview Master Plan

- New, publicly accessible shoreline with connections to existing waterfront
- Naturalization and restoration of degraded shoreline
- Extensive public consultation with over a thousand stakeholders from neighbourhoods and local businesses

Table 4.1: City of Mississauga *Inspiration Lakeview Master Plan*.

City	Mississauga, Ontario
Population (Lakeview)	22,750
Project Name	Inspiration Lakeview
Agencies/ Partners Involved	Province of Ontario Ontario Power Generation (OPG) City of Mississauga Credit Valley Conservation Authority
Project Scope	245 acres
Project Cost	$3 billion
Land Use	Utility Business Employment Permitted Mixed Use

The *Inspiration Lakeview Master Plan* site stands on the traditional lands of the Iroquoian-speaking peoples of the Petun and Hurons as well as the Mississaugas. The Lakeview site has undergone numerous shifts, ranging from rural land use to industrial to a primarily suburban site with light industrial and a prime waterfront. For decades the Lakeview waterfront was inaccessible to the public, a tradition continued by the construction of the Lakeview Generating Station in 1962 by Ontario Power Generation (OPG). It was demolished in 2006 and the Inspiration Lakeview concept was born.

The modern-day Inspiration Lakeview site is a 245-acre property situated in Southeast Mississauga. The area is bordered by the Canadian National Railway in the North, the Etobicoke boundary in the East, Lake Ontario in the South, and the Cooksville Creek in the West.

In June 2014, the *Inspirational Lakeview Master Plan* was presented to the Planning and Development Committee after 4 years of public consultations, workshops, and visioning exercises. The *Plan* is an effective model in creating a sustainable waterfront within a car-centric urban centre.

The *Inspiration Lakeview Master Plan* offers a unique opportunity for engaging the local community to create a holistic and representative vision of Mississauga's waterfront that also incorporates exemplary sustainable development policies. The *Plan* has placed a great deal of emphasis on connecting the people of Mississauga to its waterfront, with the new waterfront connecting to the existing Waterfront Trail and continuing into Lake Ontario through the Western Pier.

Figure 4.1: Current conditions of the Inspiration Lakeview site.

Figure 4.2: *Inspiration Lakeview Master Plan,* featuring the waterfront trail and Western Pier.

In conjunction with the new waterfront connection, the *Plan* will see the implementation of a substantial green network comprising over 36% of the site. Fashioned into an East-West and North-South grid, green open spaces will function as realms for ecological preservation while enriching the cultural and social environment. A complementary series of stormwater management spines will be diffused throughout the site as well.

The OPG, City of Mississauga, and the Province of Ontario have also ensured that the *Inspiration Lakeview* Plan is centered around the key principle of ecological preservation and enhancement with a focus on land remediation, creating and maintaining biodiversity corridors, establishing more protected land and aquatic habitats, and increasing the urban tree canopy.

The City and its partners are committed to ensuring that current and future businesses and industrial activities adhere to the environmental principles and priorities set out for the site. The inclusive process of developing the *Master Plan* itself has fostered a sense of ownership for residents as their ideas and visions were incorporated into the *Plan*. This demonstrates a crucial practice in securing a plan for the long-term preservation of the site.

The *Inspiration Lakeview Master Plan* provides a model for brownfield restoration while the revitalization of the Lakeview lands showcases the potential for sustainable waterfronts as vibrant, ecologically-smart communities.

Lessons learned from the Inspiration Lakeview Project:

1) An inclusive development process creates opportunities for residents to actively maintain and protect the site including its new developments and environmental features.
2) A site dedicated to art and social expression inspires an economically vibrant waterfront while creating greater social bonds within a community
3) An environmental focus within a master plan illustrates the development of an ideal set of policies focused on aquatic habitat restoration, enhancement of remaining and future habitats, shoreline restoration, and the continued economic and social vitality of the site.
4) A connected, continuous Lakeview shoreline increases accessibility for all users and encourages sustainable and active modes of transportation.

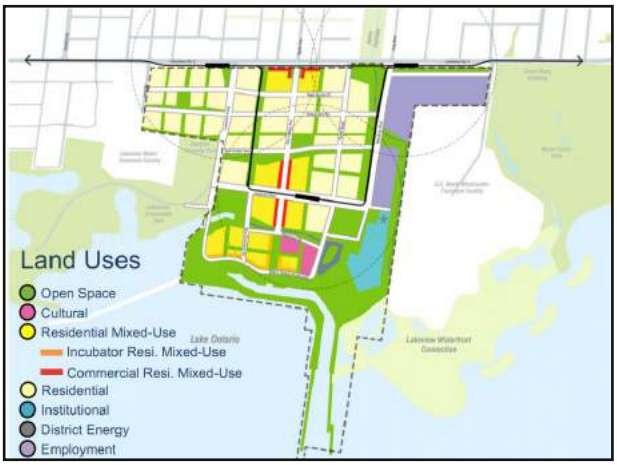


Figure 4.3: I*nspiration Lakeview Master Plan* Land Use map.

City of Brantford Waterfront Master Plan

- Waterfront initiatives framed around the protection, improvement, and repair of natural heritage systems surrounding the Grand River
- The sustainability goals are rooted in responsible watershed management approaches in order to support continuing environmental protection efforts in other sites and cities that share the watershed

Table 4.2: City of Brantford *Waterfront Master Plan* Fact Table.

City	Brantford, Ontario
Population	135, 501
Project Name	Waterfront Master Plan
Agencies/ Partners Involved	City of Brantford The Planning Partnership Grand River Conservation Authority Ontario Ministry of Natural Resources and Forestry Six Nations
Project Scope	70km of trails 6800km^2 of lands adjacent to the Grand River
Land Use	Residential Industrial

The City of Brantford is built on the traditional lands of the Six Nations who ceded their lands to the British Crown in the Haldimand Treaty in 1784. The City is bordered by lands and natural features adjoining the Grand River and Mohawk Lake, an area that is further defined by its abundant cultural heritage based on 11,000 years of settlement by First Nations and European settlers.

The Grand River is the largest, uninterrupted publicly accessible open space situated through the City's centre. It is also part of the largest watershed in Southern Ontario, spanning 300km and 6800km^2. As a result of its position as a shared natural resource with substantial natural heritage features that border industrial, residential, and commercial areas, the City of Brantford designed the *Waterfront Master Plan* in 2010 to create a set of guiding principles for the careful, sustainable re-development of the waterfront. The *Plan* is the result of extensive consultation with and input from community residents, First Nations, and numerous public and private stakeholders. Their visions were expanded to form the six layers of the *Waterfront Master Plan*:

1) Environment
2) Parks
3) Access
4) Heritage and Culture
5) Destinations
6) Neighbourhoods and Districts

The *Plan* won the 2011 National Merit Award by the Canadian Society of Landscape Architects.

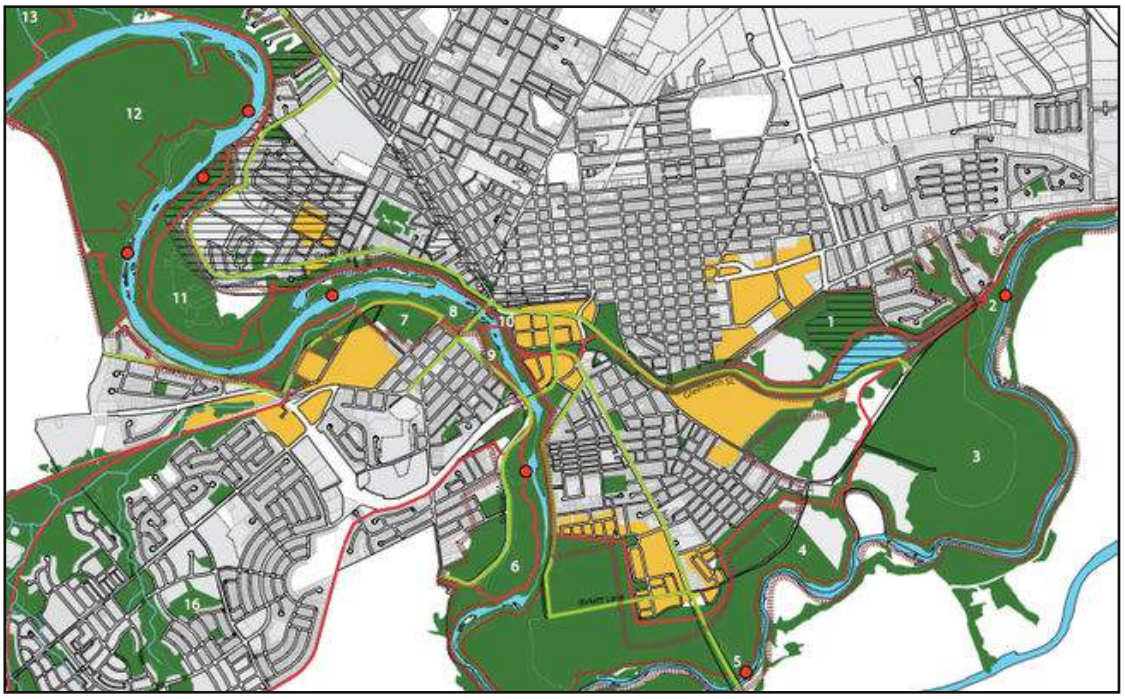


Figure 4.4: City of Brantford map showing its waterfront access along the Grand River.

Similar to other waterfront master plans, the City of Brantford has emphasized the need for increased accessibility to the waterfront. However, its distinct focus on maintaining the ecological integrity of the sites surrounding the Grand River presents a guiding set of principles for greener waterfront enhancements.

In its ingoing efforts to exemplify the city's goals for maintaining the diverse natural and cultural heritage of the Grand River waterfront lands, the *Plan* focuses on such policies as the naturalization of public spaces with native plant species. This naturalization effort extends to the restoration of riparian buffers in order improve water quality, enhance land and aquatic habitats, and combat invasive species. A 30m buffer is to be installed from all areas designated as:

- Environmentally Sensitive
- Provincially Significant Wetlands
- Sites of Natural and Scientific Interest
- Endangered plant habitats
- Wetlands
- Watercourses

The phasing strategy designed to employ these initiatives ensures that there will be minimal disruption to existing habitats.

The City emphasizes the importance of access to the waterfront and connectivity between the waterfront and adjacent neighbourhoods. This policy is complemented by measures outlined in the *Plan* to implement a continuous linear greenway along the Grand River, with improvements made to existing trails through better interpretive and directional signs, rest areas, and trailheads. A distinguishing feature of the *Brantford Waterfront Master Plan* in enhancing these new public spaces and trails is the initiative to introduce Crime Prevention Through Environmental Design (CPTED).

Certain areas of the City illustrate poor urban interfaces with the waterfront due to back-lotting, creating unsafe and even inaccessible trails for the public. As a result, the city recommends replacing wood or plastic fences with hedges and the removal of vegetation along paths to ensure clear sightlines. This natural access control and surveillance allows for the safe movement of residents through public spaces while enhancing the natural features surrounding the Grand River.

Lessons learned from the City of Brantford *Waterfront Master Plan*:

1) Clear distinctions between areas of environmental and cultural protections and sites for acceptable development are necessary to ensure long-term sustainability practices along the waterfront.
2) Incremental process of implementation lowers the risk of habitat disturbance and allows for an adjustment period for existing and future developments to the areas.
3) First Nations consultation in sustainable development, waterfront or otherwise, ensures an inclusive process and can better inform planning practices surrounding sensitive natural heritage systems.

Figure 4.5: Current City of Brantford Grand River waterfront, where houses back onto the water and there is a need for better urban interfaces to provide waterfront access.

Hamilton Waterfront Secondary Plan

- Illustrates the opportunities available to employ underused and empty parcels of prime waterfront land to establish a unified, mixed-use quarter that is accessible to the entire public
- The secondary plan focuses on a Land Use Schedule that identifies zoning and the appropriate land uses, coupled with urban design guidelines, in the West Harbour
- Plan was developed around the core tenet of the City of Hamilton that continuing sustainability practices and lasting economic vibrancy relies on stable, diverse, and attractive downtown and waterfront cores.

Table 4.3: City of Hamilton *Waterfront Secondary Plan* Fact Table.

City	Hamilton, Ontario
Population	519, 950
Project Name	West Harbour Secondary Plan
Agencies/ Partners Involved	City of Hamilton
Project Scope	25 acres
Project Cost	$500 million
Land Use	Marine recreational Open space Local commercial Medium density residential Prime retail

Hamilton's West Harbour site stands on the traditional lands of the Iroquois who occupied the land for thousands of years prior to the arrival of European settlers in the early 17th century. It is bordered by Hamilton Harbour in the North, Wellington Street in the East, Cannon Street in the South, and York Boulevard in the West. The city has gone through numerous transformations for over two centuries, resulting in stable suburban neighbourhoods, brownfield sites and unused lands left behind from vacated industries, and an rough-hewn waterfront.

For 30 years, the West Harbour has received investments and initiatives that have renovated the waterfront. Such initiatives include the launch of a former industrial site as Bayfront Park in 1993 and the establishment of the West Hamilton Trail in 2000. Both these projects opened Hamilton's waterfront for public access with better connectivity for the first time in decades. Through this momentum of creating a more vibrant and accessible waterfront, the City of Hamilton introduced the *Secondary Plan for West Harbour* in 2005. The city currently owns all of Hamilton's waterfront lands, including the 25 acres in the West Harbour.

One key feature found in Hamilton's *Secondary Plan for West Harbour* is its commitment to strengthening existing neighbourhoods. The *Plan* proposes to accomplish this by encouraging development that is harmonious with the current character of the neighbourhoods and by enhancing existing parks with more publicly accessible green spaces. These efforts are complemented by another key principle to create a continuous, publicly accessible route to a vibrant waterfront destination with improved linkages to the harbour from surrounding neighbourhoods and the downtown core.

Figure 4.6: City of Hamilton Waterfront Secondary Plan Map.

In order to improve accessibility to the waterfront, the City has pledged to extend the existing street grid to the waterfront in conjunction with a system of open spaces that would run along the waterfront through neighbourhoods and the downtown area. The trail connections would create a loop around the Eastern end of the West Harbour, running from Bayfront Park to Eastwood Park and along Strachan Street. This would also extend the current waterfront trail and complement the proposed network of pedestrian and cycling routes leading to the harbour. The City's commitment to an entirely accessible waterfront is reflected in the policy that new development along the waterfront will not "prevent or inhibit public access to the water's edge."

The City has also designated shoreline protection policies that will balance the development initiatives for the harbour. Such initiatives include restoring the shoreline to a more natural state, with the assistance of landowners, by protecting existing vegetation and installing native plant species along Bayfront Park, Pier 4, and the Waterfront Trail. Shoreline naturalization protects aquatic habitats while enhancing the aesthetic value of the waterfront. These efforts for shoreline protection are supplemented by wildlife management policies, including the City's mandate to mitigate the negative effects of Canada Geese, gulls, and other nuisance wildlife on park use and the water quality of beaches. The *Secondary Plan* has struck a clear balance between enhancing Hamilton's West Harbour through development and protecting the waterfront for long-term ecological vitality.

Lessons learned from the City of Hamilton *Waterfront Secondary Plan*:

1) Encouraging better public access and linkages from surrounding areas to the harbour improves land-use transitions.
2) Connected open spaces and networks of pedestrian and cycling paths promote a multimodal transport that reduces car dependence while preserving views to the waterfront.
3) A focus on maintaining the character of existing harbourfront neighbourhoods not only preserves the area's history but creates a foundation for better partnerships between the City, developers, and the community.

Figure 4.7: City of Hamilton Waterfront Trail.

4.2 Waterfront Pathways and Trails

Cape Breton Island Coastal Trail

- Construction of a continuous trail system through multiple localities while mitigating the effects of coastal erosion.
- Part of the longest recreational trail in the world.

Table 4.4 Cape Breton Island Coastal Trail Fact Table.

City	Port Hastings to the Town of Inverness, Cape Breton Island
Project Name	Celtic Shores Coastal Trail
Agencies/ Partners Involved	Province of Nova Scotia Cape Breton Island Pathways Association STE-MAC Engineering Trans Canada Trail Local Communities
Project Scope	92km

The Celtic Shores Coastal Trail is a 92km mixed-use trail on the Western coast of Cape Breton Island that extends from Port Hastings to the Town of Inverness. The trail itself is an amalgamation of the Ceilidh Coastal Trail, the Judique Flyer Trail and the Inverness County Trail and is a small section of the Trans Canada Trail that spans 24,000km across the country.

The trail is built along the abandoned Inverness and Richmond Railway line, which was built in 1874 and decommissioned in 1986. Community members, agencies, and all levels of government developed the rail line into a connected system of pathways and trails and in 2008, the Ceilidh, Judique Flyer, Chestico, Mabou Rivers, and Inverness Shean trails were opened to

the public. These trails comprise the Celtic Shores Coastal Trail, which is designated for hiking, cycling, snowmobiling, horseback riding, and cross-country skiing. The trail is bounded by wetlands, waterways, and a shoreline and connected to numerous communities that celebrate the natural and cultural heritage of Cape Breton.

Collaboration between community volunteers and public and private agencies was a fundamental aspect of creating and merging the trails into a connected network of public open spaces. Various groups of trail users were invited to provide their input for the design of the trail, leading to the incorporation of considerations from motorized, pedestrian, cycling, and equestrian trail users.

Figure 4.8: Signage and multi-modal usage along the Cape Breton Island Coastal Trail.

The momentum from this collaborative effort resulted in the participation of the Cape Breton Island Pathways Association. This regional partner supplied manpower for financial management, proposal planning, and assisted in the supervision of contractors throughout the trail development. The high level of engagement and representation revealed more options for federal funding.

The design of the trail illustrates an overarching resolution toward effective trail management. With much of the walkways and cycling paths so closely intertwined with the shoreline, coastal erosion was chief concern for the long-term maintenance of the trail. As a result, mitigating coastal erosion was incorporated into the construction of the trails.

However, this commitment to trail maintenance and erosion control did not end in 2008. In 2015, the Ceilidh Coastal Trail Association employed the services of STE-MAC Engineering to install armour stone along the shoreline at the beginning of the Coastal Trail.

The trail also places a great deal of emphasis on wayfinding and signage. Information signs are dispersed throughout all sections of the trails at community kiosks, describing the local history of the trail community and complemented with detailed maps. Directional signage is also provided at trailheads and intersections with information regarding the nearby community including accommodations, historic sites, and restaurants.

Lessons learned from the Cape Breton Island Coastal Trail:

1) Community engagement through volunteers for trail developments is an effective way to reduce costs and create a complete network of trails that can be utilized by a wide-range of trail users.

2) Erosion control is an on-going effort that is necessary for successful trail management, despite the time and cost investments involved.

Allegheny Riverfront Park

- All park trails are fully accessible to pedestrians, cyclists, and wheelchair users.
- The linear park has reconnected Pittsburgh's residents to the waterfront and is an extension to the Three Rivers Heritage Trail
- The lower level promenade of the park presents a shoreline with native plant species that naturally re-vegetate the site after flooding

Table 4.5: Allegheny Riverfront Park Fact Table.

City	Pittsburgh, Pennsylvania
Population	305,841
Project Name	Allegheny Riverfront Park
Agencies/ Partners Involved	City of Pittsburgh Pittsburgh Cultural Trust Michael Van Valkenburgh Associates ARUP Accessibility Development Associates
Project Scope	1.2km in length 9-15m width of promenades
Project Cost	$11 million
Land Use	Urban Industrial General Industrial Residential

In 1911, the Olmsted Brothers designed a network of parks that would border the Allegheny River. However, the plan was buried and a chain of expressways were planned and built in its place. The lower level leading to the Allegheny River became an remote parking lot while the upper level consisted of a tapered footpath adjacent to a main expressway. For decades the riverfront was deemed a generic space that was inaccessible to the public. However, the early 1990s saw the Pittsburgh Cultural Trust commission the design and implementation of a park and pathway along the Allegheny River waterfront. The park opened in 2001 and is now a functional waterfront path with green spaces interjected into a formerly austere site.

The Allegheny Riverfront Park was designed around the core tenets of accessibility, ecology, circulation, and a vibrant, stable downtown core and waterfront. In order to create a site that reflected the urban structure of Pittsburgh while still adhering to those core principles, Michael

Van Valkenburgh and his associates created a park with two unique levels that are connected to one another and the river through pathways and ramps. The lower level of the park is a pathway that runs along the waterfront, with a raw, holistic feel to it as it follows the natural curve of the Allegheny River. It also projects 16ft out into the water from the shoreline, creating a stronger link to the natural resource and enhancing the experiences of users.

Figure 4.8: Naturally vegetated paths within an urban core at Alleghany Riverfront Park.

Along with the aesthetics of the park and the walkways, the architects focused on rebuilding a riparian buffer that would help protect the lower tier from spring floods and re-establish habitats along the riverfront. River birch and silver and red maple trees were installed for their resiliency and ability to re-grow after flood damage. The designers mimicked a floodplain and supplemented the lower tier walkway with randomized and intensified tree and vegetation placements. A distinctive feature of the site is the addition of boulders along the pathway to combat erosion, stabilize the vegetation, and act as initial barriers to the floodwaters. The designers addressed key ecological issues while maintaining both an urban and naturalized character throughout the walkways.

The upper level runs adjacent to a major roadway and reflects a more urban character with bluestone overlay and expansive views of the river. The London Plane trees that are dispersed throughout the walkway in a narrow configuration were chosen due to their resiliency to air pollution and ability to withstand attacks from various pests and ailments. The ramps that connect the upper and lower levels act as noise barriers to the expressways that run adjacent to the park.

The park itself is a link between surrounding neighbourhoods and the downtown core to the waterfront. It embodies the principles of connectivity and accessibility as it is fully compliant with the Americans with Disabilities Act of 1990. These principles also serve to create a social setting, with ample seating and spaces for interaction and day-to-day recreation, including running and dog-walking. The park's design as a multi-use pathway in the middle of a major metropolis

creates a greater sense of community and social cohesion.

Lessons learned from the Alleghany Riverfront Park:

1) Ecological considerations for a site can be incorporated into successful urban design to uncover overlooked natural features and instill a sense of place in users.

2) Soft engineering is an effective method for erosion and flood control without impeding environmental processes.

3) Routine uses of public spaces, increases user awareness for the natural resources surrounding them and result in long-term sustainability practices from the community.

4) Accessibility considerations are a necessary feature in urban developments for ensuring the inclusive use of all public spaces.

Figure 4.10: Bicycle friendly infrastructure, accessibility considerations and an awareness for surrounding natural resources at Alleghany Riverfront Park.

4.3 Conservation Areas

Perth Wildlife Reserve- Rideau Valley Conservation

- Since 2008 the Rideau Valley Conservation Authority (RCVA) has invested in several new projects to demonstrate its commitment to wildlife rehabilitation
- Various educational features make visitors experiences memorable

Table 4.6: Perth Wildlife Reserve Fact Table.

City	Perth, Ontario
Population	5,840
Project Name	Perth Wildlife Reserve – Mississippi Valley Field Naturalists
Agencies/Partners Involved	Rideau Valley Conservation Authority – Ontario Ministry of Natural Resources
Project Scope	2.5km trail, 257-hectares of reserve
Land Use	Natural Resources/Environment

Located just outside of Perth, Ontario, this wildlife reserve fosters a variety of diverse plant and animal species. It is a conservation area that's geared specifically towards wildlife management. Since 2008 the RCVA, the Ontario Ministry of Natural Resources and the Rideau Valley Field Naturalists have invested in several new wildlife and visitor service improvements to better protect the environment and educate visitors on plant and animal conservation, especially for at-risk species.

One of the most exemplary manifestations of these improvements has been the colorful and interpretive signage that has been strategically positioned throughout the area. This signage not only seeks to educate visitors about the various plant and animal species found on site but also demonstrates how visitors can practice their own conservation techniques at home. This is a great example of how conservation areas can keep visitors engaged and encourage conservation beyond their properties.

Figure 4.11: Examples of the interpretative signage at the Perth Wildlife Reserve.

Another educational feature that the Perth Wildlife Preserve offers is a trail guide and brochure for guests to pick up at the entrance of the conservation area. This interpretive trail guide outlines specific habitat improvements on the trail map provided and explains the regions significance.

A man-made observation tower that overlooks Tay Marsh is another new feature at the wildlife reserve that also encourages guests to participate in the conservation effort. There is a form at the tower that visitors can fill out and share what species at-risk they may have viewed, with identification made easier by the interpretive signage throughout the area. Ultimately this supplies the RVCA with important wildlife monitoring information.

Figure 4.12: The man-made observation tower at the Perth Wildlife Reserve.

Additionally, the reserve has also created their own turtle-viewing pond by installing log basking platforms in and above the water. Several phases of a butterfly garden have also been implemented, which involves the planting of specific perennial flowers that attract butterflies to the area. Signage at this Monarch Butterfly Waystation also encourages visitors to build their own butterfly gardens at home. These viewing habitats scattered throughout the park are an integral component to the educational aspects of a conservation area.

Lessons learned from the Perth Wildlife Reserve:

1) Educational features such as signage and brochures at conservation areas can motivate visitors to become more involved in the conservation process, which ultimately improves community wide plant and wildlife conservation

Grassland Bird Recovery Program- Credit Valley Conservation Authority

- A leader in wildlife conservation techniques.
- As an at-risk species, protecting grassland birds is essential for Ontario's conservation authorities.
- Highlights programs that can be implemented locally.

Table 4.7: Grassland Bird Recovery Program Fact Table

City	Watershed area in Mississauga, Ontario
Population	750,000
Project Name	Grassland Bird Recovery Program
Agencies/Partners Involved	Credit Valley Conservation Authority – Ministry of Natural Resources
Project Scope	Program covers the extent of the watershed – Includes the cities of Brampton, Milton, Mississauga, Orangeville
Land Use	Various

The Province of Ontario now considers certain grassland bird species such as the Eastern Meadowlark and Bobolink at-risk. In fact, due to urbanization and reforestation efforts, declining populations in grassland birds has become a global phenomenon. This is mostly due to increased habitat loss, as these birds require undisturbed large open spaces with tall vegetation, as well as hayfields and pastures for successful reproduction.

As a result, the Credit Valley Conservation Authority, with financial assistance from the Ministry of Natural Resources Species at Risk Stewardship Fund, has launched a three-year Grassland Bird Recovery Program.

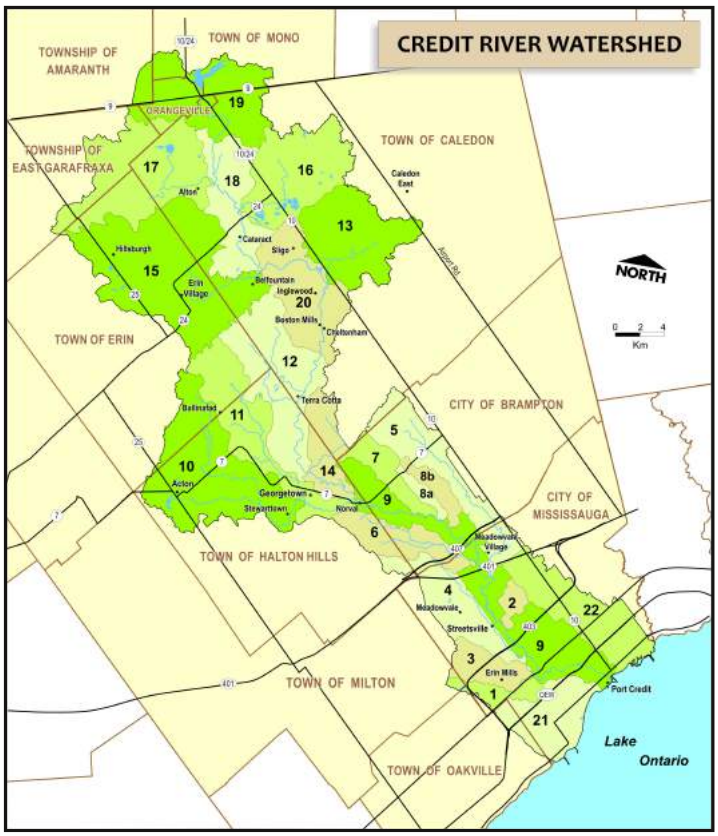


Figure 4.13: Map of the Credit River Watershed area, within Halton Region, Ontario.

This program is composed of four subset programs that aim to address population declines. They include:

- Grassland bird survey
- Bird friendly certified hay program
- Grassland restoration at Upper Credit Conservation Area
- Grassland restoration on private lands

The first step of this program was data collection. Members of the public volunteered to participate in a monitoring blitz to identify grassland birds by sight and sound in meadowlands located within the Credit River watershed.

The program also implemented a bird friendly hay marketplace where hay growers, purchasers and landowners could come together to negotiate the sale of hay and land rental agreements. In 2015 9 hay producers grew 193 acres of bird friendly certified hay on 10 different farms.

Field naturalization of both private and conservation lands is an essential component of this recovery program. It ultimately creates habitats for these species to thrive in and since the Upper Credit Valley Conservation Area's field was naturalized, 21 pairs of Bobolink and Eastern Meadowlark have been observed breeding on this site.

Field naturalization at the Upper Credit Valley Conservation Area involved the removal of non-native and invasive plant species in favor of native plants and tall grasses.

Lessons learned from the Grassland Bird Recovery Program:

1) Capitalizing off of public interest and using local volunteers to collect data and monitor bird sightings can increase the success of the program and ultimately reduce costs.

2) Launching a comprehensive recovery program sets out specific targets to meet and allows for easier analysis of results

3) Naturalizing fields is no small project but it is the most effective way to ensure grassland bird populations have the appropriate habitat needed to repopulate

Figure 4.14: The bobolink (note that this is a female and looks different from the one previously shown in this report) is a species that relies on grassland habitats.

South Huron Trail Mobile- Ausable Bayfield Conservation Authority

- This program is a leader in conservation area accessibility
- A local example of accessibility initiatives and the only program of its kind in Ontario
- Low cost, easy to implement and maintain
- Highlights the potential for partnership between conservation authorities and volunteer groups

Table 4.8: South Huron Trail Mobile Fact Table.

City	Ausable River Valley, South Huron, Ontario
Population	9,945
Project Name	South Huron Trail Mobile
Agencies/Partners Involved	Ausable Bayfield Conservation Authority – Friends of the South Huron Trail
Project Scope	8-mile all-season trail
Land Use	Open space

The South Huron Trail is an 8-mile all season trail that runs through the Ausable River Valley in South Huron, Ontario. It connects to the MacNaughton Park in Exeter, Ontario as well as the Morrison Dam Conservation Area. This dam was constructed n 1959 and has since created a lake ecosystem that offers many recreational activities to its users including canoeing, fishing, hiking and bird watching.

This trail is being showcased as a leader in trail accessibility for conservation areas. In partnership with the Ausable Bayfield Conservation Authority, the Friends of the South Huron Trail run a program called Trail Mobile. The program uses a small, six-seated motorized vehicle driven by volunteers to shuttle individuals with mobility challenges throughout the trail.

In operation for over eight years, it is not unusual for several hundred people to use the service each summer. To book a shuttle appointment, community members would call the Ausable Bayfield Conservation Authority, who would then set up a time with their volunteers from 8:30 – 4pm Monday to Friday.

The program was made possible by a generous donation from the family of the late Gordon Strang and is able to continue its operations today through community donations. This type of program requires a strong commitment from the volunteers that operate it, but according to them, it is worth all of the time and energy put into it and they genuinely enjoy helping more people access the trail.

This is truly an exceptional example of a community's commitment to accessibility, allowing those who would not normally be able to access the trail to experience the immense benefits of nature and the outdoors.

Another accessible feature is the South Huron trail itself. It is a trail that was specifically designed with the entire community in mind, with features for all ages and mobility levels. The main granular paved surface allows easy access for hikers, runners, strollers, bicycles and wheelchairs.

Figure 4.15: The South Huron Trail Mobile (top) and accessible trail design (bottom).

Lessons learned from the South Huron Trail Mobile Program:

1) The relevancy of accessibility for all members of a community continues to grow, and this program is a great example of how small initiatives can make very large differences in the lives of individuals with impaired mobility.

4.4 Greenports

Chicago's O'Hare International Airport

- Committed to maintaining its position as a global leader in airport sustainability
- Numerous industry-leading initiatives that enhance conservation and reduce waste, energy and emissions

Table 4.9: O'Hare International Airport Fact Table

City	Chicago, Illinois, USA
Population	2.719 million
Project Name	O'Hare International
Agencies/Partners Involved	Chicago Department of Aviation
Project Scope	7,200 acres of land, 8 terminals, 189 gates, serves 2,400 aircrafts daily
Land Use	Airport

O'Hare International began as a four runway airport in 1945 and has since turned into one of the worlds largest and busiest airports. Today it operates on 7,200 acres of land, has 8 runways and serves over 2,400 aircrafts every day.

Consequentially the scope of operations at this site places a significant strain on the environment. As a result, in 2012 the Chicago Department of Aviation (CDA) released a sustainability report that highlights the green accomplishments and defines future sustainability goals for both O'Hare and Midway airports.

One manifestation of O'Hare's commitment to sustainability is its Sustainable Airport Manual. O'Hare is the first airport in the nation to develop sustainable guidelines for design and construction, and contractually requires every project on airport property to incorporate these standards.

The CDA has also taken big steps towards environmental conservation by implementing:

- Almost 340,000 square feet of vegetated roofs to reduce the urban heat island effect, conserve energy and reduce stormwater runoff.
- Indoor aeroponic gardens that directly supply fresh vegetables to the airport restaurants.
- The world's largest airport apiary, home to over 1 million bees, that helps replenish bee populations.
- A grazing herd pilot program that uses goats, sheep, llamas and burros to clear scrub vegetation on airport property.
- Waste reduction techniques including water efficient landscaping, filtered water bottle refill stations, rainwater collection, composting, single-stream recycling, and construction material recycling

Both O'Hare and Midway International have also implemented several approaches to increasing energy efficiency and reducing emissions. These include:

- On site wind turbines and solar panels used as sources of renewable energy
- On site electric vehicle charging stations
- A Green Taxi Pilot program that offers preferential access to compressed natural gas taxis
- A fleet of hybrid vehicles for all airport operations
- LEED certification for many of its buildings including the North air traffic control tower and FedEx World Services Centre

Lessons learned from Chicago O'Hare International Airport:

1) A contract ensuring new projects implement eco-friendly features into their design can ensure long lasting sustainability for an airport
2) Defining sustainability goals within a documented framework can ensure a commitment to long term implementation
3) A variety and abundance of smaller initiatives can help to contribute to the larger sustainability goal

Figure 4.16: Examples of sustainable initiatives at Chicago's O'Hare International Airport, which include gardens and a bee apiary.

Chapter 4.0 References

Allegheny Riverfront Park. (n.d.). Retrieved from http://www.michaelmercil.com/allegheny-riverfront-park/

Amidon, J. (2005). Michael Van Valkenburgh Associates: Allegheny Riverfront Park. New York: Princeton Architectural Press.

Ausable Bayfield Conservation Authority. (2016). South Huron Trail Mobile. Retrieved from http://www.abca.on.ca/page.php?page=trail-mobile

Celtic Shores Coastal Trail. (n.d.). Retrieved from https://www.cbisland.com/things-to-do/celtic-shores-coastal-trail/

Celtic Shores Coastal Trail. (n.d.). Retrieved from http://ste-macengineering.ca/recent-projects/wetlands/celtic-shores/

Chicago Department of Aviation. (2016). Sustainability Report and Plan. Retrieved from http://www.flychicago.com/OHare/EN/AboutUs/Sustainability/2012-Annual-Sustainability-Report.aspx

City of Brantford. (2010). City of Brantford Waterfront Master Plan. Retrieved from http://www.brantford.ca/govt/projects/waterfrontmasterplan/Pages/default.aspx.

City of Hamilton. (2012). Setting Sail Secondary Plan for the West Harbour. Retrieved from https://d3fpllf1m7bbt3.cloudfront.net/sites/default/files/media/browser/2015-04-20/west-harbour-setting_sail-secondary-plan.pdf.

City of Mississauga. (2014). Inspiration Lakeview Master Plan. Retrieved from

http://www.mississauga.ca/portal/residents/inspirationlakeview.

Conservation Ontario. (2015). Best Educational Features at Ontario's Conservation Areas. Retrieved from http://ontarioconservationareas.ca/stories-to-tell/116-educational-features

Credit Valley Conservation. (2009). Demographic Profile of the Credit River Watershed. Retrieved from http://www.creditvalleyca.ca/wp-content/uploads/2014/04/Demographic-Profile-of-the-CRW-Final-Report.pdf

Credit Valley Conservation. (2016). Habitat Loss Places Grassland Birds At Risk. Retrieved from http://www.creditvalleyca.ca/news/story/habitat-loss-places-grassland-birds-at-risk/

Credit Valley Conservation. (2016). Grassland Bird Recovery Program. Retrieved from http://www.creditvalleyca.ca/your-land-water/grassland-bird-recovery-program/

Discover the Celtic Side of the Trans – Canada Trail. (n.d.). Retrieved from http://www.celticshores.ca/

Moffat, D. (2002). Allegheny Riverfront Park, Pittsburgh, Pennsylvania [EDRA / Places Awards,

2001-2002 -- Design]. Places, 15(1).

Nova Scotia Tourism Agency. (2015). Assessing Trail Connections: Port Hood to Inverness (pp. 1-38, Rep.). Nova Scotia Tourism Agency.

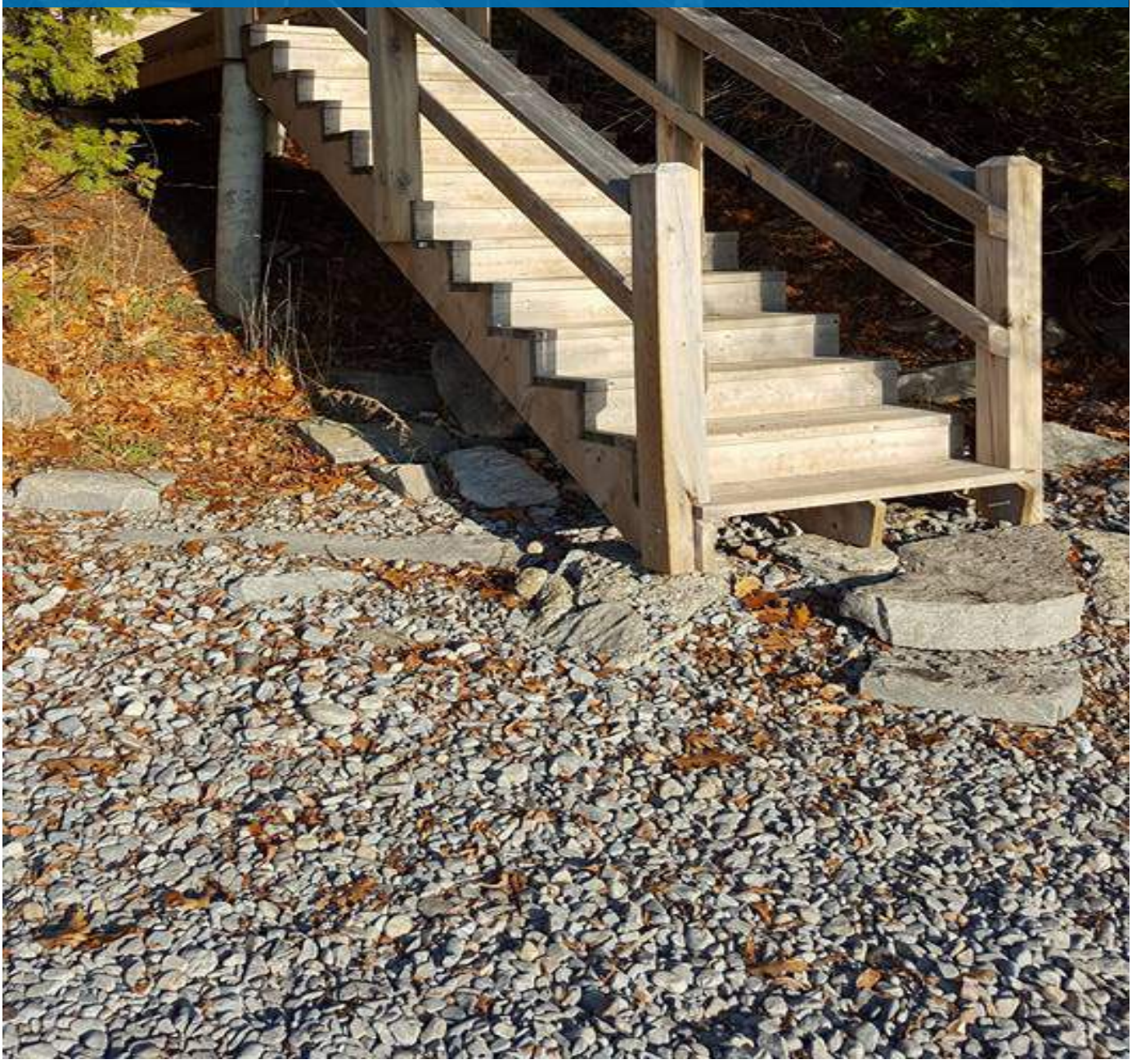
Pigg, S. (2014, August 18). Hamilton looks to its waterfront as next great frontier. The Toronto Star. Retrieved from https://www.thestar.com/business/2014/08/18/hamilton_looks_to_its_waterfront_as_next_great_frontier.html

Rideau Valley Conservation Authority. (2016). Perth Wildlife Reserve Conservation Area. Retrieved from http://www.rvca.ca/careas/perth/

Rogers, Melissa. (2015). If you Build It, They Will Come. Conservation Ontario. Retrieved from https://ontarioconservationareas.ca/stories-to-tell/139-if-you-build-it-they-will-come

Trails for all Ontarians Collaborative. (2006). Ontario's Best Trails - Guidelines and Best Practices for the Design, Construction and Maintenance of Sustainable Trails for All Ontarians. Retrieved from http://atfiles.org/files/pdf/ontario-design-construction-maintenance-sustainable-trails.pdf

Chapter 5.0
Stakeholder Consultation



5.0 Stakeholder Consultation

5.1 Summary

The SURP 825 Project Team was directed by the Cataraqui Region Conservation Authority to conduct a stakeholder workshop for the purpose of gaining insight into the future of the Lemoine Point site area from individuals with intimate knowledge of the area. This research initiative was approved by the Queen's University Ethics Commission and was consented to by each of the participating stakeholders. The stakeholder workshop represented the beginning of Phase 2 of this project. The event was invitation-only to a group of select stakeholders, chosen by Cataraqui Region Conservation Authority, with an active interest in the Lemoine Point area. Additional invitees were identified by the project team and required permission from the Cataraqui Region Conservation Authority to invite.

Further consultation with the public and surrounding First Nations is recommended to produce a more robust and inclusive management plan going forward.

The overarching research question for the SURP 825 project is, "What is a coherent vision for the Lemoine Point area?" This question provides an explicit visioning mandate for a desired outcome and has guided the direction of the stakeholder workshop as well as the manner in which the project team approached the stakeholders.

Community visioning is a relatively new form of public engagement that underscores the "communicative turn" in planning. Many localities in the United States have adopted different visioning programs out of the communicative turn in the planning profession. As a result, the visioning exercise was established after consulting various precedents. The stakeholder workshop for the purposes of this project was based off of the "Oregon Model," which is a four-step process of community visioning as outlined below:

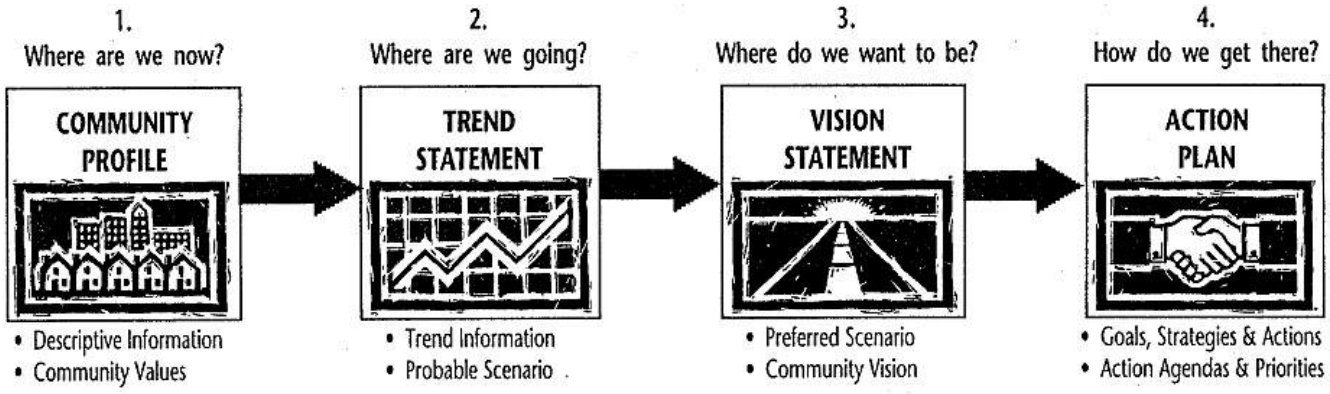


Figure 5.1: The Oregon Model of Community Visioning.

The steps within The Oregon Model can vary given that visioning is often understood as a combination of unique circumstances that require the process to adapt and change. The four-step process outlined in Figure 5.1 is reflected in the organization of the stakeholder workshop for SURP 825 Project Course.

The first two steps of the workshop were characterized by contextual information and an overview of the project course. Step 1 of the workshop began with an introduction of the project team and the project research question, along with a summary of the completed background research. Step 2 consisted of a brief presentation of two maps of the Lemoine Point site area: one map to illustrate the conditions of the area in 1957 and a second, present-day map to demonstrate how the site has developed in the last 60 years. The purpose of this was to provide workshop participants with a narrative of Lemoine Point's past that would inform their current understanding of the area and its potential for the future.

In the next segment of Step 2, stakeholders were given the task of assessing the current state of the Lemoine Point area through a modified SWOC analysis. A map of the Lemoine Point site area was shown to the participants, along with complementary pictures that highlighted the different physical spaces in the area. Stakeholders were asked to identify strengths, weaknesses, questions, and observations of the site area using colored Post-It notes. The goal of this activity was to get a stakeholder analysis of the existing conditions within the Lemoine Point site area to help guide the project team's own evaluation of the site.

Figure 5.2: Stakeholders participating in Activity 1- The Modified SWOC Analysis.

Following the modified SWOC analysis, the workshop shifted into Steps 3 and 4 to review the current trends within the site area and the possible schemes that could be implemented to enhance the area for the future while working within the parameters of the site's prevailing conditions. This was expressed through the presentation of case studies from around the world to demonstrate how communities similar to Kingston have incorporated successful planning strategies to address the same challenges and weaknesses identified for the Lemoine Point site area during the modified SWOC analysis.

Stakeholders then proceeded to work with project team facilitators to identify their own visions for the Lemoine Point area and strategies to make it a better place for all of types of users. Reference maps were provided to each table of participants and facilitators engaged them in discussions regarding future initiatives to mitigate issues such as overuse, accessibility, and development pressures within the site area. Issues were identified on printed maps, with comments on such problems as inadequate environmental servicing to the Southern portion of the Lemoine Point area and problematic road connections.

Additionally, important points that were throughout the activity were written down on a large piece of notepaper to provide both visual and textual references to the ideas that were brought to the tables. At the end of the visioning session, each group presented three main takeaways from the identified solutions and vision for the future of Lemoine Point. For a review of the research from this activity, please refer to the workshop summary documents listed in Appendix A, Table A4 of this report.

Figure 5.3: Stakeholders participating in Activity 2 - Working with facilitators to identify their own vision for the Lemoine Point Area.

Outcomes

The workshop produced several outcomes for the project team, with the intended outcome being one that would allow the team to develop different themes from the feedback provided during the workshop. The activities were designed to be the primary channels for gathering feedback. From the two activities and the feedback they generated, several themes emerged based on the most common stakeholders comments. From these themes, guiding principles were created to guide the vision of the project. The guiding principles are as follows: Identity, Environment, Climate Change, Connectivity, Access and Accessibility, and Partnerships. Each vision or recommendation for the future of the area refer back to these guiding principles and are presented under the banners of the three pillars of Conservation, Waterfront Access, and Sustainability.

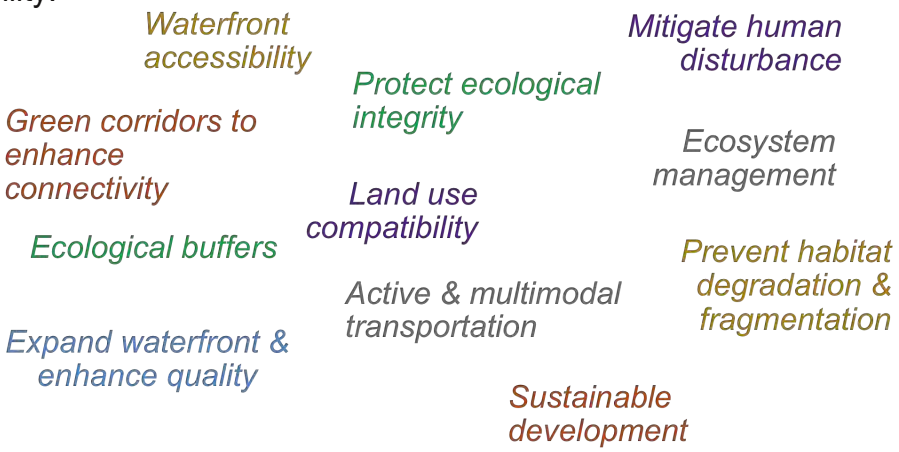


Figure 5.4: Key themes that were developed from our Stakeholder

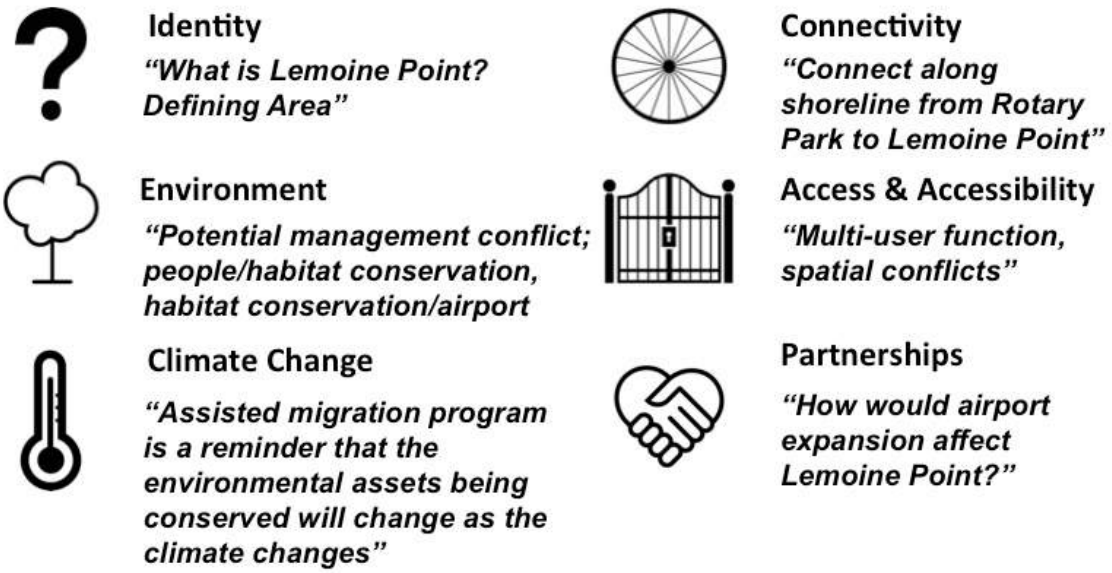


Figure 5.5: The 6 Guiding Principles that were formulated from stakeholder workshop

5.2 Strenghts, Weaknesses, Issues and Opportunities (SWOC)

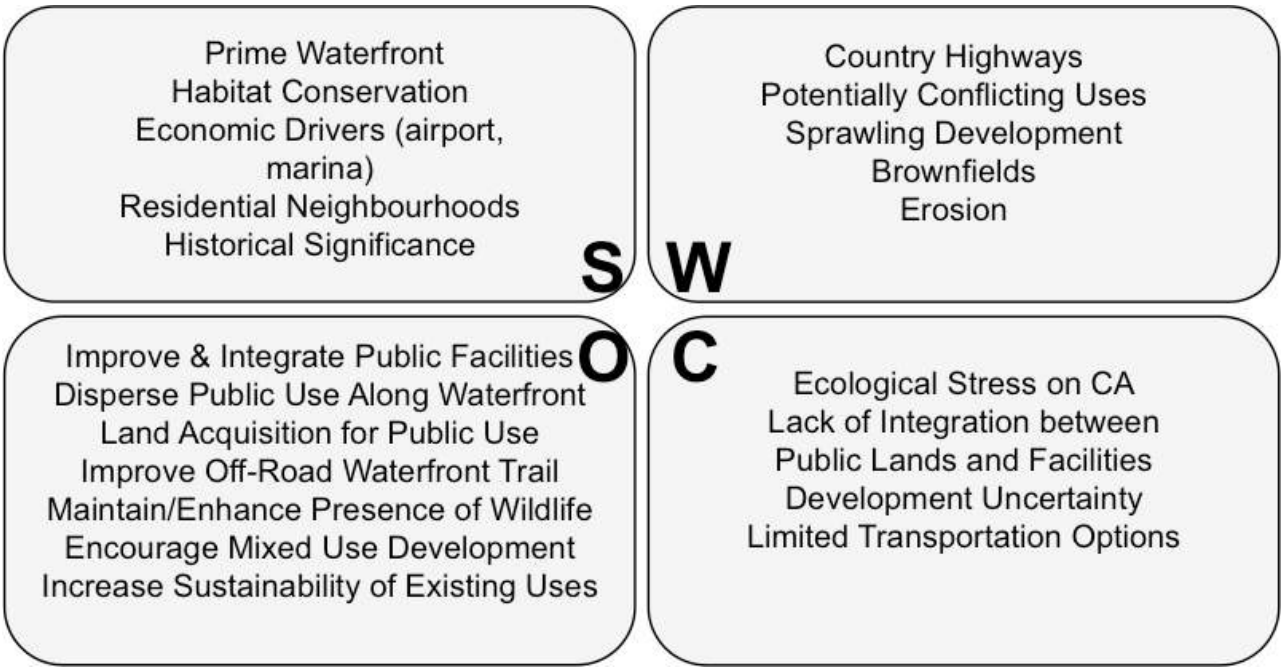
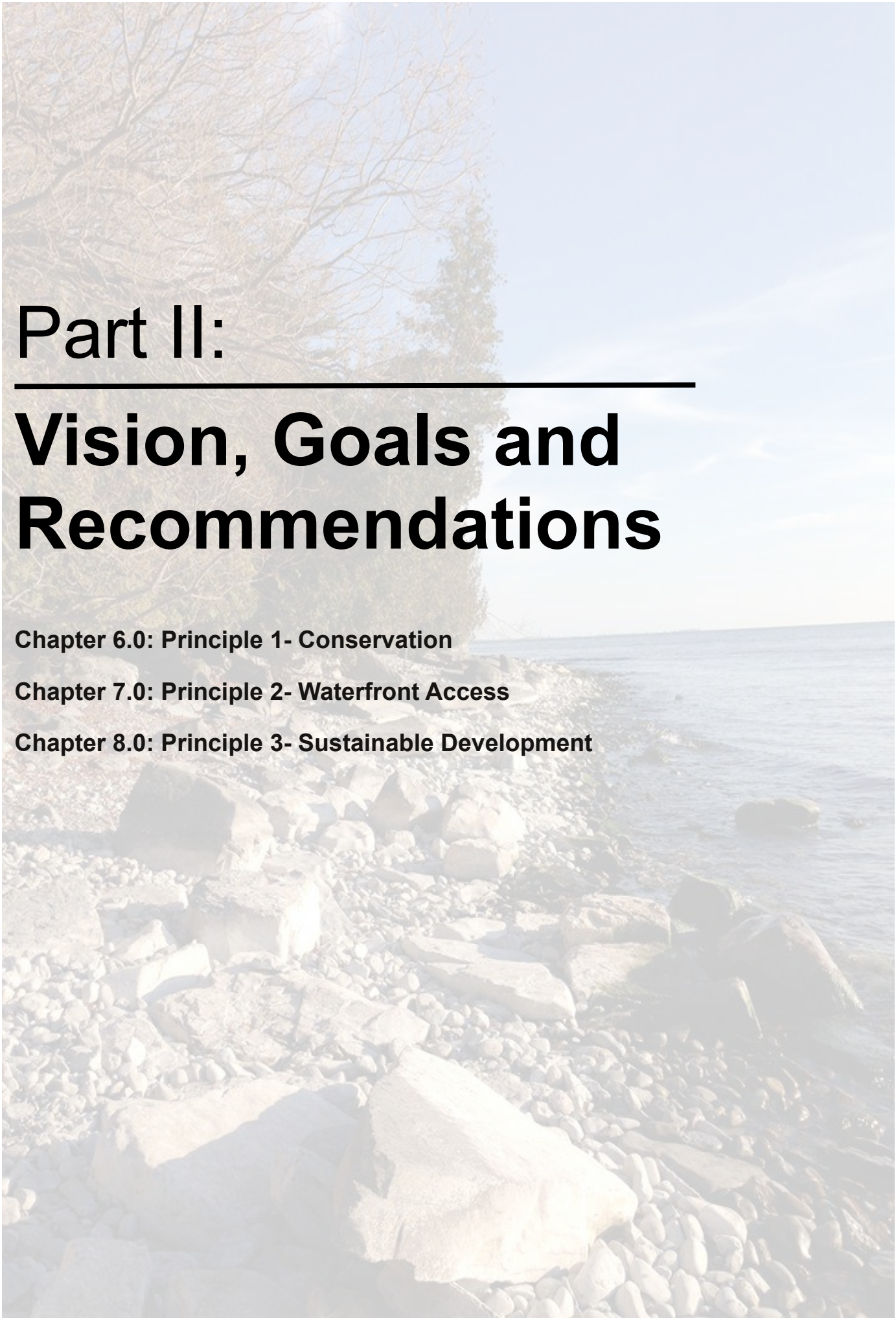


Figure 5.6: SWOC Analysis



Part II:

Vision, Goals and Recommendations

Chapter 6.0: Principle 1- Conservation

Chapter 7.0: Principle 2- Waterfront Access

Chapter 8.0: Principle 3- Sustainable Development

Chapter 6.0
Pillar 1: Conservation

6.0 Conservation

6.1 Protect the Natural Assets at the Lemoine Point Farm

Affected Stakeholders: Lemoine Point Farm, Lemoine Point Conservation Area

Implementation Timeframe: 5-15 years or 15+ years

Resource Allocation: Medium - High

Description of Problem:

The Lemoine Point Farm is a privately-owned hobby farm on a 32 hectare parcel of land located just South of the Lemoine Point Conservation Area. There are cultural and natural assets on the Farm that are important to conserve and yet, they are currently unmonitored for environmental health. These features are also potentially at risk of human interference and damage. This property's natural assets consist of 2.5 miles of shoreline, 10 hectares of naturally significant woodlands that connect to the significant woodlands on the Lemoine Point Conservation Area, some wetlands, and several large grassland fields. There are a number of buildings on the Lemoine Point Farm property, two of which have been listed as significant cultural assets and are candidates for heritage designation under the *Ontario Heritage Act*.

The Farm also faces a connectivity issue as its location on the Southern tip of the Lemoine Point site area creates a disconnect in the waterfront trail around the area. A key element in the City of Kingston *Waterfront Master Plan* is "Protecting the waterfront ribbon," which it describes as a "continuous ribbon of greenspace, connected to blue space." If this vision is to be realized, then the Farm's waterfront assets must be protected for future generations to ensure a continuous waterfront ribbon of green space in the Lemoine Point area.

Description of Recommendation:

Protection of the natural and cultural assets at the Lemoine Point Farm is an important goal that has several different options to help achieve the same conservation mandate. A significant layer of protection can be applied through a heritage designation of the natural and cultural assets under the *Ontario Heritage Act*. A heritage designation could be made under Part IV of the Act as a cultural landscape designation that would identify individual assets on the property that should be protected. Under a Part V regarding district designation, the individual assets would still be protected with the added layer of protecting each asset's relationship to one another and the general character of the property. The steps for designation under the *Ontario Heritage Act* are as follows:

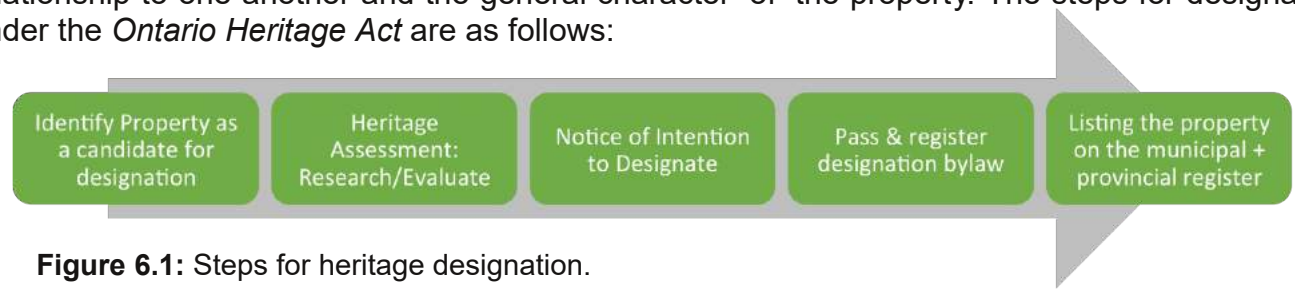


Figure 6.1: Steps for heritage designation.

The first step was already completed by the former Kingston Township in recognizing that two stone buildings on the property should be "listed" within the municipality as candidates for heritage designation. The next step would require a working partnership with the owners of the property to gain access to it and develop a Heritage Assessment of the different significant elements and segments of the property. A heritage designation is attached to physical property and as such, natural features that contribute to the character of the land would also warrant protection. The natural features on the Farm include the tree-lined driveway with gateway entrance; the large tract of continuous shoreline forest that connects to the Lemoine Point Conservation Area; and several open fields and grasslands that are linked to the Lemoine Point Conservation Area.

Figure 6.2: Historic features of the Farm - the gated entrance (top), tree-lined entry (right) and Dutch colonial barn (bottom).

Figure 6.2 presents some of the heritage features of the farm, including the tree-lined entryway with the remnants of the gate (top and right). This entryway is a unique element of the property and exhibits a specific sense of place, enhanced by the Dutch-colonial barn that emerges as the roadway veers to the right. For example, the gambrel roof of the barn is indicative of a very common style in Eastern Ontario.

Other historic farmhouses have been designated in Kingston, including the McMichael Farmhouse located at 1373 Princess Street (Figure 6.3). This is a 19th century stone farmhouse that was recently restored and designated under Part IV of the *Ontario Heritage Act.*

Figure 6.3: The McMichael Farmhouse.

A heritage designation on the Lemoine Point Farm would formally acknowledge the historical significance of the property, while adding a layer of regulation towards protection of its various historical assets. Other added benefits are that the owner would be able to apply for the City of Kingston's Heritage Property Tax Refund Program or the Heritage Property Grants Program.

Another option is to use a conservation easement or a stewardship agreement with the Cataraqui Region Conservation Authority to protect the natural and cultural assets of the property. A conservation easement would be granted under the Conservation Authorities Act or the new Trails Act developed in 2016. The easement would require a legal agreement that confers various rights of the property to the Cataraqui Region Conservation Authority or another conservation body, such as the Ontario Heritage Trust or the Ontario Farmland Trust. Conservation easements can be structured in different ways, with the first option being a full title gift or donation that is usually processed through the Ecological Gifts Program. An alternate approach is a split receipt gift or donation, whereby a portion of the property's rights are conferred and the owner receives compensation and/or tax breaks on the donated portion. A third option is a full remainder, where rights to the property are conferred but the owner, or someone of the owner's choosing, can live on the property for the duration of their lives.

In regards to other means of transferring rights, an option such as purchasing the property outright presents countless challenges. Primarily, the property is not for sale and the price to purchase such a parcel of land would be high. For reference, the City of Kingston purchased the abutting 7.2 hectare parcel of land known as the Weatherall Property for $1.55 million in September 2016. That averages the value of similar lands at $215,278 per hectare, if rounded up. Thus, the 32 hectare farm would be worth at least $6.88 million at this comparable land value rate. As this is an estimate of land value based on the recent comparable Weatherall Property sale, it does not include incremental pricing for the various buildings and infrastructure on the farm property. Nevertheless, a purchase of the farm would present a very high capital cost. Therefore, strategies that utilize partnerships with the owner, such as a heritage designation or easements, are preferable and viable. Partnerships are also desirable as such a recommendation works in synergy with Recommendation 6.5 to preserve the historic use of the farm.

Proposed Implementation Strategy:

A working partnership with the owner of the Farm is the first step in implementing this recommendation. Heritage designations and conservation easements are municipal tools that are best applied with working partnerships. A heritage designation would require access to the property to research the two stone buildings and the cultural landscape features including the tree-lined entryway, the shoreline forest, and the grassland habitat. Once this research is completed, the City of Kingston would issue a "Notice of Intent to Designate" with a chance for objection. Once the objection period has passed, the designation bylaw would need to be passed by City Council and then registered in the municipal registry. This option is less intensive as an easement and thus, it is considered to be a short to medium term approach.

A partnership is just as necessary for a conservation easement. A core premise of an easement is philanthropy, which manifests in an owner's willingness to donate the rights to their land or portions of their land to a conservation body. If the owner of the Farm desires to protect the natural assets through an easement, then a legal agreement must be negotiated that specifies the exact land rights that are being transferred. This process is lengthy and takes a significant amount of resources and thus, it is considered to be a medium to long term approach.

If neither a heritage designation or an easement are suitable to the owner, the option of a stewardship agreement could also be reached between the Cataraqui Region Conservation Authority and the owner of the farm. This would be a “hand-shake” agreement that would not be enforceable, but would begin a framework for the two parties to work together on environmental stewardship projects together. This is an established practice through other conservation authorities, such as the Nottawasaga Valley Conservation Authority. A stewardship agreement could be the first collaborative step between the owners of the Farm and the Cataraqui Region Conservation Authority towards implementing this recommendation.

6.2 Enhance Communication and Transparency

Affected Stakeholders: Cataraqui Region Conservation Authority

Implementation Timeframe: 5-15 years

Resource Allocation: High

Description of Problem

The Lemoine Point Conservation Area is a place of nature. However, its web page does not reflect this. A Conservation Area should provide online resources on area's natural heritage systems, ecosystem stressors, priority habitats and species, and the role of conservation in the larger urban framework. The Lemoine Point Conservation Area web page, found through the Cataraqui Region Conservation Authority’s website, presents the site as a recreation hub that supports hiking, cross country skiing, picnicking, cycling, and swimming. The web page does provide links to the ongoing climate change research conducted by the Cataraqui Region Conservation Authority and the Friends of Lemoine Point page, which provides summary information regarding current conservation projects and programs.

However, this information is brief and, in some cases, out of date. For example, the new trail map is lacking from the page along with information regarding the new interpretive signage along the Conservation Area trails. These updates ensure that the public comprehends how to effectively use the Conservation Area specifically as a place of nature and not recreation.

Description of Recommendation

To effectively present the Lemoine Point Conservation Area as a place of nature, this recommendation proposes that the Cataraqui Region Conservation Authority enhance its website in ways that enhance communication and transparency with the public. By doing so, the Cataraqui Region Conservation Authority may engage users to play a more active role in the preservation and enhancement of the Lemoine Point Conservation Area, transforming passive users into active stewards of the environment. Points of activation shall include (1) updating the information on the webpage; (2) providing information in real-time and enabling users to do so; and, (3) creating an interactive map gallery, similar to the City of Kingston's KMaps feature. With more and better access to information, the Cataraqui Region Conservation Authority may encourage learning; garner support for controversial conservation initiatives, such as trail re-routing; and, ultimately, confirm the identity of the Lemoine Point Conservation Area as a place of nature first and foremost.

1) Update information on the web page

The identity of the Lemoine Point Conservation Area is clearly defined in the vision statement of Phase II of the Lemoine Point Master Plan, the 1999 Conceptual Plan for Lemoine Point Conservation Area, as, "a place of nature – and a place for contemplation, for respite from developed environments and for research and learning about our natural and cultural heritage." However, the web page describes the Lemoine Point Conservation Area as having, "Many opportunities for recreation and nature appreciation…" and that it is "of great importance both as a recreational and a natural area." In both instances, the Lemoine Point Conservation Area is presented first as a place to recreate and second as a place of nature. What is more, as the web page continues the Cataraqui Region Conservation Authority emphasizes the trail system, featuring such activities as hiking, cross country skiing and swimming, before at last mentioning wildlife viewing and nature appreciation. Therefore, it is strongly recommended that the Cataraqui Region Conservation Authority undertake an informational update in order to better support the Lemoine Point Conservation Area as a place of nature in its online presence. By doing so, the Cataraqui Region Conservation Authority will more sustainably manage the use of the Lemoine Point Conservation Area, differentiating it from a park by emphasizing its use as an area designated for conservation practices. Such updates shall include clarifying the identity and defining the purpose of the Lemoine Point Conservation Area. This may be fulfilled by:

- Featuring the vision statement offered in the 1 999 *Conceptual Plan for Lemoine Point Conservation Area*;
- Identifying the role of the Lemoine Point Conservation Area in such contexts as the Lemoine Point area, the City of Kingston and the Cataraqui Region Conservation Authority;
- Emphasizing passive recreational activities that complement contemplation, respite, research, and learning;

- Offering information on the natural heritage system; and,
- Explaining the role users play in maintaining the Lemoine Point Conservation Area as a place of nature, as well as how they can harm it.

2) Provide information in real-time and enable users to do so

Building off of the last point of activation, it is important that the Cataraqui Region Conservation Authority maintain up to date information on its website; however, it is recommended that the Cataraqui Region Conservation Authority go one step further by providing information in real-time. This could be accomplished by embedding a Lemoine Point Conservation Area Twitter feed, as well as a blog or a News tab that could feature announcements; programming and events; volunteer recruitment; partnerships; and, ongoing projects and milestones. Take, for example, the trail revision – the Twitter feed could announce the revision, direct users to view the revised trail map on the Lemoine Point Conservation Area webpage and invite users to read about why the revision took place and what it hopes to achieve on the Lemoine Point Conservation Area blog or News tab.

The second half to this point of activation is enabling users to provide information in real-time. Twitter is a great platform for this because users can retweet; however, it can also be used to encourage placemaking, foster user responsibility and develop active stewards of the environment. One way this can be achieved is by hosting a photo contest for users to share "their" Lemoine Point Conservation Area. Photos can later be uploaded to the webpage for continued placemaking, as well as for educational and marketing purposes.

It is also recommended that the Cataraqui Region Conservation Authority consider providing a comment box on the Lemoine Point Conservation Area webpage. The goal of this addition is to encourage ongoing feedback regarding conservation initiatives, and to inform the Cataraqui Region Conservation Authority about the public's vision for the future of the Lemoine Point Conservation Area. With regard to these comments, it is recommended that the Cataraqui Region Conservation Authority discuss the degree of transparency to which they wish to share these comments in "real-time." The intention behind this recommendation is not to provide an outlet for public debate, but to encourage environmental stewardship and gain a better understanding about the public's preferred use of the area.

3) Create an interactive map gallery

Motivation for an interactive map gallery came in response to the lack of public information available regarding the ecological health of the Lemoine Point Conservation Area. By providing a few different kinds of maps or developing one map with a series of layers, the Cataraqui Region Conservation Authority can engage users and encourage research and learning about the natural and cultural heritage in the Lemoine Point Conservation Area. Such maps or map layers might include:

- Natural Heritage System (woodlands, wetlands, grasslands).
- Biodiversity Action Plan (BAP) priority ecosystems, habitats, species and landscapes.
- Ongoing project areas (Heritage Forest Program, Native Plant Nursery, assisted migration, reforestation).
- Future project areas (reforestation, shoreline restoration, trail maintenance/ closures reroutes, areas in need of restoration or in succession).
- Invasive species and target areas.

- Threatened species and habitats.
- Trail system and points of interest (parking, washrooms, lookouts, bike racks, etc.).

Proposed Implementation Strategy

At present, the Cataraqui Region Conservation Authority maintains a web page for each of its conservation areas; however, this has led to static and out of date information on the Lemoine Point Conservation Area web page. The Cataraqui Region Conservation Authority may wish to allocate additional resources to its current web developer to enhance its online public engagement for each conservation area. For example, developing a Public Engagement Plan and/or a specific social media strategy that aims to enhance user interaction with the Conservation Authority online could be pursued. These coordinated policies could establish a framework for governing the day-to-day online presence of the Conservation Authority, and help support the operation and maintenance of the Lemoine Point Conservation Area web page to be able to provide relevant and up to date information. An additional Part-Time Equivalent or greater may be required to facilitate a redevelopment of the webpage and an update of the procedures for timely informational updates.

Resource allocation for this recommendation is estimated as high due to the potential hiring of additional staff and the costs associated with maintaining an active web page for each of the Cataraqui Region Conservation Authority's conservation areas. The requirement for additional staff could potentially be offset if conjoined with other staff requirements contained in the recommendations of this report, such as Recommendations 6.5 and 6.8. The timeframe is estimated between 5-15 years due to funding requirements. While the costs associated to realize this recommendation for the Lemoine Point Conservation Area may reduce the timeframe to within 0-5 years, the Cataraqui Region Conservation Authority operates as one body and so any update to its website must include each conservation area's web page. Therefore, macro policies and plans that coordinate the timely delivery of updates for each conservation area should be considered when implementing updates to the online presence for the Lemoine Point Conservation Area.

6.3 Establish Conservation Corridors

Affected Stakeholders: Airport, City Roads

Implementation Timeframe: 5-15, 15+ years

Resource Allocation: Medium-High

Description of Problem:

The two access points to the Lemoine Point Conservation Area are through Coverdale Drive in the North and through Front Road in the South. Both roads are made up of two lanes, with Coverdale Drive operating as a neighbourhood road that services Collins Bay Marina and parts of Auden Park Neighbourhood. Front Road is an arterial road that services the Norman Rogers Airport. There is an opportunity to utilize these access roads to extend fringe habitat areas beyond the Conservation Area, connect significant natural heritage woodlands, and to act as a buffer between seemingly incompatible uses.

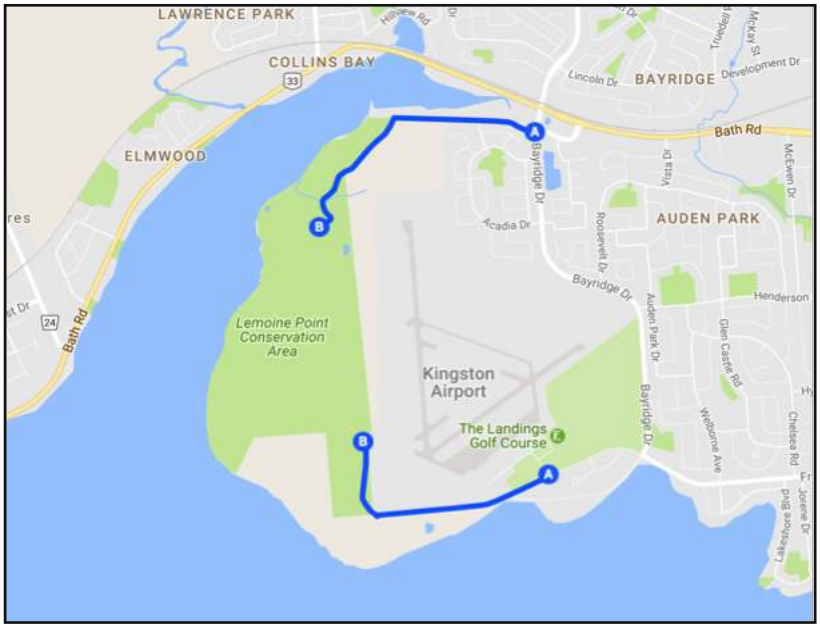


Figure 6.4: Sections of Road for Conservation Corridors.

Description of Recommendation:

A "conservation corridor" recommendation appears in several existing plans in the Lemoine Point area. The *Conceptual Plan for Lemoine Point Conservation Area* recommends conservation corridors along Front Road, Coverdale Drive, and Bayridge Drive. It describes them as "linear zones of publicly accessible natural waterfront" (Cataraqui Region Conservation Authority, 1999).

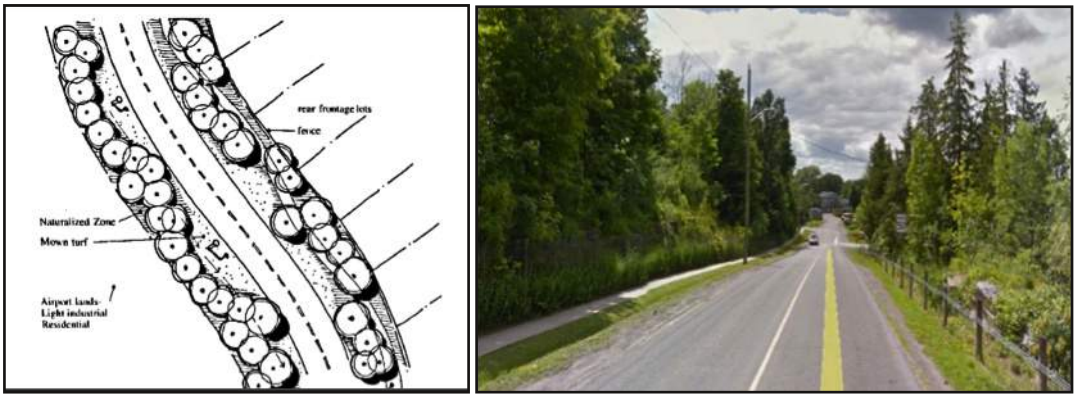


Figure 6.5: Conservation Corridor rendering from the 1999 Conceptual Plan for Lemoine Point (left), and section of Coverdale Drive with tree-lined right-of-way that exemplifies conservation corridor concept (right).

Other plans that reference conservation corridors are the City of Kingston *Airport Master Plan*, which recognizes the need for expanding the right-of-way on the North side of Front Road to 15m during airport expansion to accommodate a conservation corridor. A conservation corridor is a concept that seeks to turn the main access roads leading to the Lemoine Point Conservation Area into parkways that are lined with trees and have delineated paved bike lanes to increase active transportation connectivity.

Roadways lined with trees help with extended portions of fringe woodland habitat that spread local wildlife, such as squirrels and chipmunks, across greater areas. The trees also add to a user's sense of place by reinforcing the area's identity as a place of conservation by acting as gateways to the Conservation Area. Lastly, the tree-lined roadways help create a buffer between potentially incompatible uses by blocking unwanted views of development and mitigating some of the negative noise pollution from the airport.

Figure 6.6: Picture of Front Road as it exists today (left) and the same picture with conservation corridor features added, mainly low-lying trees and demarcated bicycle lanes (right). Note the additional privacy for residences backing onto Front Road and increased buffer between the road and airport lands.

Establishing a conservation corridors produces synergies with other recommendations such as Recommendation 8.1 to Increase Active Transportation, Recommendation 6.4 to Grow and Preserve Natural Heritage Assets at the Lemoine Point Area, and Recommendation 8.3 to Implement Green Infrastructure on Airport Lands.

Proposed Implementation Strategy:

The main catalyst for implementing conservation corridors is to use the Norman Rogers Airport expansion plans as an opportunity to expand the Front Road right-of-way by 15 m to accommodate a conservation corridor along the North edge of Front Road. This would allow for landscaped areas lined with trees, as well as the inclusion of a bike lane. The development of a Front Road conservation corridor would have to be coordinated between the City of Kingston's Airport management, as well as with City of Kingston Engineering and Public Works Departments. The Cataraqui Region Conservation Authority's role would be to utilize native plants grown at the nursery to facilitate the tree-lined right-of-way and to monitor the ecological connections between the corridor and the Conservation Area.

Conservation Corridors could also be implemented in conjunction with active transportation upgrades, such as adding bicycle lanes to Coverdale Drive access point. The 2015 Update to the City of Kingston *Transportation Master Plan* indicates a conceptual active transportation network that includes bike lanes on Coverdale Drive, and Front Road, West of Bayridge (See Appendix B, Figure B5). The right-of-way upgrades required to implement this infrastructure could be paired with additional landscaping that extends native flora and fauna along the roadside to fulfill the purpose of a conservation corridor.

6.4 Review Open Space Designation and Zoning

Affected Stakeholders: City of Kingston and Cataraqui Region Conservation Authority

Implementation Timeframe: 0-5 years

Resource Allocation: Low

Description of Problem:

The City of Kingston's *Official Plan* designation and the zoning of the Lemoine Point Conservation Area recognizes the property as Open Space. The shoreline and three existing wetlands within the Conservation Area are the only segments of land designated as Environmental Protection Areas. As a result, at the policy and zoning level, the majority of the Conservation Area is subject to the same policy controls and zoning as the abutting Rotary Park and other city parks. While the Cataraqui Region Conservation Authority ultimately controls the 'development' of the land and mandates the preservation of its biodiversity, the current designation and zoning of the land has made it vulnerable.

According to the City's *Official Plan*, the goal of the Open Space designation is to respond to the recreational and leisure needs of the City's residents while sustaining natural heritage systems and contributing to cultural and heritage landscapes as well as the quality of life and a sense of place. Permitted uses include active and passive passive recreation and conservation areas. However, a conservation use and mandate is not permitted under the Open Space designation.

Figure 6.7: Lemoine Point Conservation Area's current zoning from the City of Kingston Map Gallery.

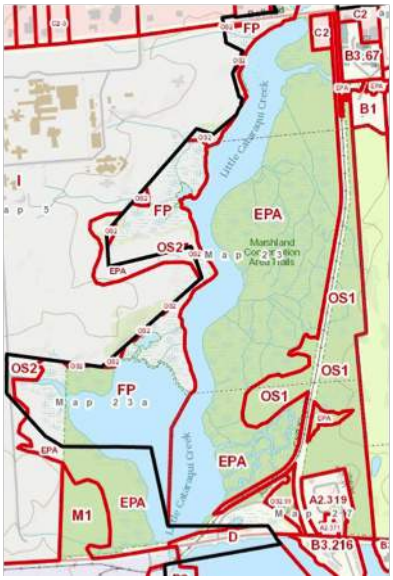


Figure 6.8: Marshland Conservation Area's current zoning from the City of Kingston Map Gallery.

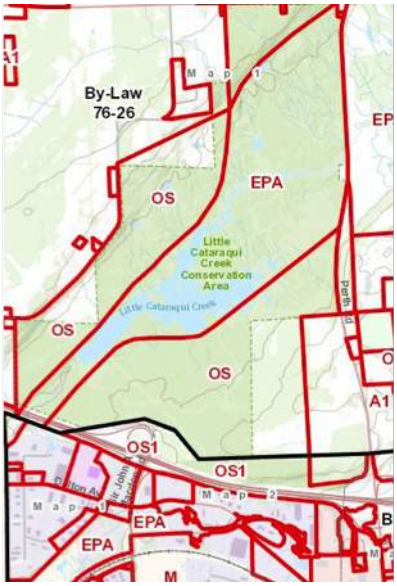


Figure 6.9: Little Cataraqui Creek Conservation Area's current zoning from the City of Kingston Map Gallery.

In contrast to the diverse objectives of an Open Space zone, the goal of the Environmental Protection Area designation is to preserve the ecological integrity of a site. Defined areas under this designation include significant wildlife habitat areas, significant wetlands, and habitats of threatened species. Unlike the Open Space zoning, an Environmental Protection Area designation explicitly permits conservation use.

As illustrated by Figures 6.8-6.10, both the Marshlands Conservation Area and Little Cataraqui Creek Conservation Area in Kingston have significant portions of their lands designated as Environmental Protection Areas. This is due to the presence of regulatory flood plains and significant wetlands on the lands, two specific land types the Official Plan lists as Environmental Protection Areas. The absence of an Environmental Protection Area designation for a greater area within Lemoine Point Conservation Area demonstratess the inconsistent application of the Official Plan's policies on Environmental Protection Area designations and zoning when viewed in the context of the the criteria required for it.

Description of Recommendation:

The Lemoine Point Conservation Area has significant woodlands, wildlife habitats, and wetlands on the property. According to the City's *Official Plan,* significant wildlife habitats are defined as, "areas where plants, animals and other organisms live and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle, and areas that are important to migratory or non-migratory species" (City of Kingston, 2014). Figure 6.10 highlights highlights the grassland habitat, a significant wildlife habitat in the Conservation Area which is demarcated by the red circle. The grasslands are one of the most endangered ecosystems in the world. This section of the Conservation Area serves as the primary habitat for the Bobolinks and Eastern Meadowlarks bird species, both of which are threatened species in Ontario. As such, the Environmental Protection Area designation is an imperative planning tool that must be applied to prevent further fragmentation and habitat endangerment.

It is important to note that the Open Space designation and zoning is appropriate for certain areas of the Conservation Area, such as the North end, where park activities, and washroom facilities are located.

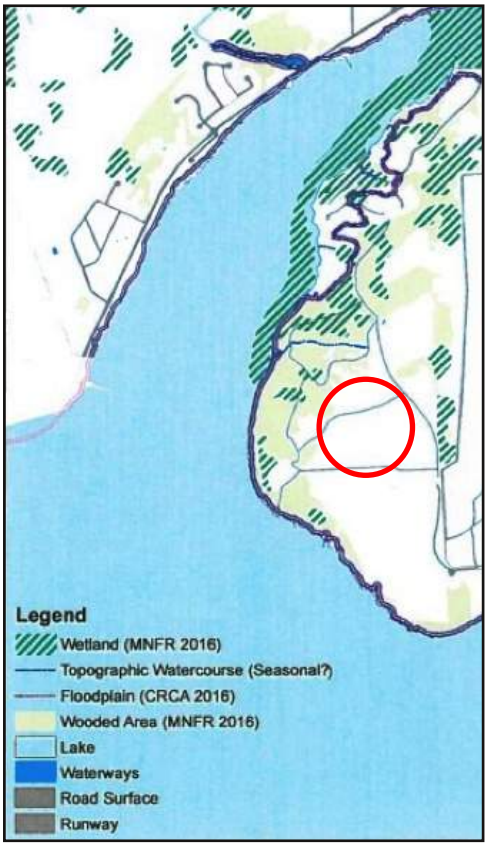


Figure 6.10: Lemoine Point Conservation Area's natural heritage features.

Furthermore, the Cataraqui Region Conservation Authority operates according to a property management plan that allows them to protect natural features without the requirement of municipal planning documents. While it is understood that the Environmental Protection Area designation is too restrictive in certain sections of the Conservation Area that require frequent upkeep, it is still recommended that the sensitive grasslands should be protected through this same restrictive zoning. This recommendation is designed to build on Recommendation 6.9 Revise Trail System by removing the pedestrian trail within the grasslands habitat.

Proposed Implementation Strategy:

The implementation of the recommendation is highly viable due to the short time frame and minimal resource allocation required. In terms of financial cost, the fee for an *Official Plan* Amendment and a Zoning Bylaw Amendment submitted concurrently, totals to approximately $10,000.00. According to the City of Kingston's website, an *Official Plan* Amendment can take up to four to six months until a recommendation can be made to City Council. The implementation of the recommendation has low financial and administrative barriers.

6.5 Develop an Educational Community Gardening Program

Affected Land Uses: Lemoine Point Conservation Area, Lemoine Point Farm, Norman Rogers Airport, Weatherall Property

Implementation Timeframe: 0-5 years, large-scale community garden 5-15 years

Resource Allocation: Low - Medium

Description of Problem:

There are a limited number of formal educational programs at the Lemoine Point Conservation Area. Educational programming is key feature within a conservation area because it provides an opportunity to educate the public on historic and current, appropriate land uses, while fostering a greater understanding and appreciation of the natural flora and fauna of the conservation area. Ultimately, public education on matters of environmental stewardship on sensitive lands will help bolster support for the long-term protection of the natural assets on the Lemoine Point Conservation Area lands. The Lemoine Point nursery is a strategic asset on the Conservation Area lands that has considerable potential for educational programming. However, it is currently underused and understaffed by volunteers.

Description of Recommendation:

The development of a community gardening program at the Lemoine Point Conservation Area is a unique idea that has a spectrum of approaches. The base goal is to install an educational program at the Lemoine Point Conservation Area that utilizes the area's existing resources. Future partnerships with the Norman Rogers Airport or the Lemoine Point Farm can be formed to enhance and expand the community gardening initiative. The main idea for a community garden is to utilize the current operations of the Lemoine Point native plant nursery and incorporate educational programming around the management of the nursery.

This would provide an opportunity of education in the following areas:

- Mechanics of tree planting and tree growth maintenance.
- Soil formation and health.
- Knowledge of the natural flora and fauna of the Conservation Area.
- Responsible environmental stewardship of sensitive lands.

The existing infrastructure at the nursery provides an opportunity to incorporate more community involvement in its operations and education is a way to assist in the operation of the nursery while transferring environmental stewardship values that the nursery represents in the community. The staff of the Cataraqui Region Conservation Authority that would oversee the proposed educational programming would also act as main points of contact for the Friends of Lemoine Point, allowing for greater communication and access to each organization's resources.

Figure 6.11: Native Plant Nursery at the Lemoine Point Conservation Area.

This educational programming centered around the native plant nursery is not a typical manifestation of a community garden as it would not incorporate crop harvesting. However, this recommendation's scope can increase exponentially with access to adjacent farmlands outside of the Lemoine Point Conservation Area, such as airport lands or the Lemoine Point Farm. Expanding the community gardening program has the potential to develop educational opportunities in the following areas:

- Sustainable food practices
- Nutrition and growth cycles
- Knowledge of the local area's history

Using lands outside of the Conservation Area for this initiative would require strong partnerships with the owner of the Lemoine Point Farm and the Norman Rogers Airport. The lands on the farm would be ideal as its existing farming operations would be able to transition into a larger scale community gardening initiative. However, expansion of such a program would require a greater volume of resources, including additional infrastructure to facilitate a larger community garden operation. Infrastructure at the Lemoine Point Farm is well-suited to adapt to the needs of a community garden, but significant challenges exist in creating a viable partnership that could support a cooperative framework that is mutually beneficial.

There is significant policy support for educational programming regarding the operations at the nursery with the Cataraqui Region Conservation Authority and City of Kingston's community gardening policies. Educational programming at Lemoine Point fits in with "Goal E" of the CRCA's *Cataraqui to 2020 Plan* which aims to "to provide opportunities for the public to learn from the public open spaces within the jurisdiction, and to respect the local natural environment." The base community gardening educational initiative at the Lemoine Point nursery would help the management of that resource as well. Supporting the nursery would also advance "Goal D" in *Cataraqui to 2020 Plan* which aims "to facilitate protection of natural resources in order to conserve, restore, develop or manage them." This is because support of the nursery directly enhances the replanting efforts that occur throughout the year at the Lemoine Point Conservation Area, thereby restoring and developing the natural vegetation and woodlands that have been negatively impacted by human disturbance.

The City of Kingston's policy considers community gardens as "a means of providing active and social opportunities to enhance health and well-being, connecting people to nature, providing protection and use of public open spaces, environmental education and reducing food insecurity" (City of Kingston, 2016). Community gardens are also supported in the Sustainable Development and Urban Agriculture general policies of the City of Kingston *Official Plan* (s. 2.1.2(d), s 3.2.8). They are permitted uses in Open Space zoning, which the Conservation Area and the farm are already zoned as (see Recommendation 7.3 Transition the Weatherall Property for more information on that parcel).

Proposed Implementation Strategy:

- Start educational programming at nursery
- Incorporate this with other educational programming at Lemoine Point
- Medium-Long Term strategy is to capitalize on partnerships with surrounding land uses, particularly with the Norman Rogers Airport, Lemoine Point Farm, or the Weatherall Property.

The implementation of the base educational programming surrounding the Lemoine Point nursery would require at least one part-time staff member to oversee the operations of the program and the nursery itself. They would be responsible for developing educational programming unique to the Lemoine Point Conservation Area. This would be accomplished by adapting existing educational programming that takes place at Little Cataraqui Creek Conservation Area and integrating it with the four base learning outcomes that are identified above from educational programming at the nursery. A potential existing educational program within the Cataraqui Region Conservation Authority that can be adapted for the community gardening of native plants at the nursery is the "Leaves Roots and Beyond,' which is offered to Grade 3 classes at Little Cataraqui Creek. Educational programming for the nursery could also be adapted from other sources, such as Forests Ontario. It is a non-profit charity that has already developed educational programs for tree identification, tree planting, forest stewardship, and sustainable farming.

Educational programming at the Lemoine Point Conservation Area does not have to be limited to the operations of the nursery, but could be one part of larger educational programming relating to natural heritage (See Recommendation 6.4 Grow and Preserve Natural Heritage Assets), biodiversity of wetlands, and climate change initiatives (i.e. Assisted Migration Program).

Existing education in wetlands are presented at Little Cataraqui Creek Conservation Area in the form of “Marsh Mysteries” (Grade K-2), “Water Cycle Journey” (Grade 2), “Ecosystem Interactions” (Grade 7), and “Wetland Conservation” (Grade 9). Climate change educational programming could be adapted to the Lemoine Point Conservation Area from existing programming, such as “My Ecological Footprint” (Grade 9).

Setting up educational programming surrounding the nursery, wetlands, natural heritage, and climate change sets the groundwork for developing similar initiatives with the City of Kingston regarding such matters as the use of Norman Rogers Airport lands and Weatherall Property development.

Figure 6.12: Rendering of larger scale community gardening project in Massachusetts.

Any expansion to this type of community gardening program would require a minimum of one Full-Time Equivalent to manage the expansion of the educational programming and operating a larger community garden. This preparation would take at a minimum of 8-12 months and there would be a medium-long term timeframe to establish a working legal framework for the type of partnership that is required to run educational programming on a separately owned parcel of land, such as the farm or airport. A larger scale operation would also require infrastructure, such as an administrative work-space and additional storage capacity, to adequately support the operations of the educational programming.

Other partnerships that could help with overall maintenance and administration could be extended to existing community gardens in the area, such as Lakeside Community Garden, that is located at 100 Days Road. Mutual benefits of this partnership could include the sharing of tools, human resources, storage areas, and community networks. There are many existing precedents within the United States that demonstrate the effectiveness of educational programming incorporated in a community garden framework, and many of them incorporate a historic farm property (See Town of Cumberland, *Master Plan for Metcalf-Franklin Farm*, Denver Public School Urban Garden Curriculum, 2016). These could be used as case studies to help guide some of the day-to-day operations of combining running an effective community garden project and incorporating an educational component.

6.6 Incorporate Non-conflicting Habitats on Usable Airport Lands

Affected Stakeholders: Norman Rogers Airport, Cataraqui Region Conservation Authority

Implementation Timeframe: 0-5 years

Resource Allocation: Low

Description of Problem:

As many as one-third of North American bee populations are currently in decline. The Rusty-patch bumblebee species has become officially designated as endangered in Ontario, and six others are determined to be critically at-risk in Canada. One of the main reasons for this population decline is Colony Collapse Disorder (CCD). It is a phenomenon that occurs when the worker bees in a colony disappear and abandon the queen, leaving the few immature bees left to try and care for the queen and their hive. Other reasons include a deadly class of insecticides, urbanization, invasive parasites and climate change that causes habitat loss.

The decline of bee populations is a serious problem that goes much further than the affordability of honey. One-third of all the food we eat is actually pollinated by bees. As pollinators, they are responsible for ensuring most vegetable and fruit crops mature into edible food. As a result, the decline of their numbers has severe implications for the agricultural industry, and ultimately for us.

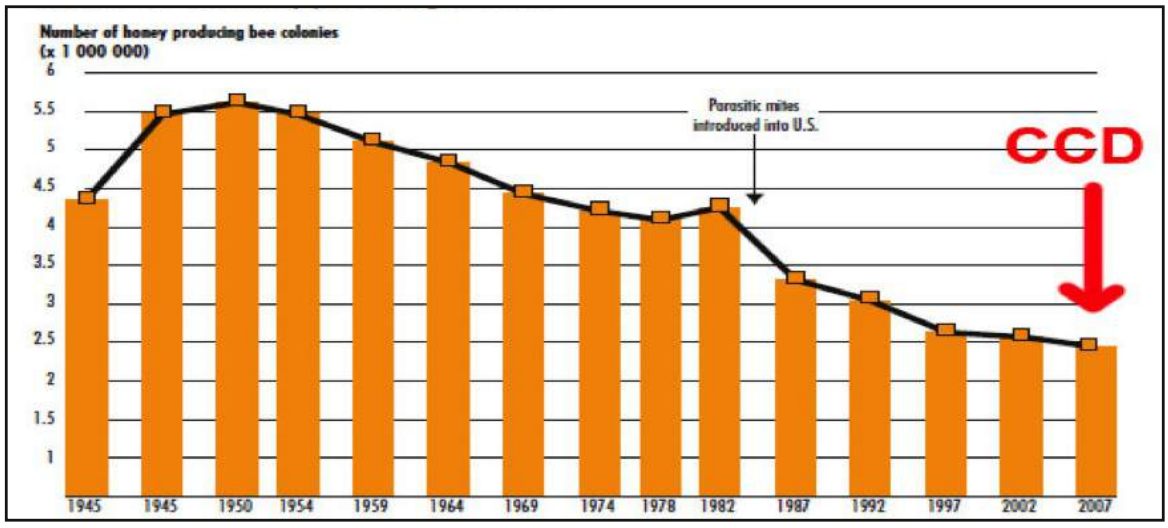


Figure 6.13: Graph from the United States Department of Agriculture highlighting colony collapse disorder and its effect on bee populations in the United States.

Description of Recommendation:

Airports can actually play a significant role in helping to alleviate this problem. By creating bee apiaries on their undevelopable land, airports can assist in the repopulating of bee numbers and ultimately the preservation of an at-risk species. This type of endeavor would also be supporting an urban agriculture initiative, which gives a use to urban lands that would otherwise be left

vacant. The idea of an airport apiary first began as a pilot project in Hamburg, Germany over a decade ago has since seen great success and has been recreated at airports around the world. Chicago O'Hare International Airport for example is home to the largest airport bee apiary in the world with over one million bees and 75 hives.

What makes this project successful is that bees are one of the only wildlife species whose habitat is non-intrusive and actually compatible with airport land use. This gives airports the opportunity to foster and enhance wildlife habitats when normally their management plan would focus on preventing or removing them.

Figure 6.14: Beehives at the Seattle-Tacoma Airport.

Figure 6.15: Beehives at the Chicago O'Hare International Airport.

Proposed Implementation Strategy:

At the Norman Rogers Airport, a small bee farm project could be built in the vegetated buffer zone on the outskirts of the airport property on parcel 5.

Figure 6.16: Norman Rogers Airport Parcel Map with Parcel 5 to the North (top left).

This type of initiative does not require a lot of space, for example Chicago O'Hare's apiary, which is the largest in the world, is only one-half acre in size. Starting off with six hives would produce approximately 500,000 bees, and start up costs would be less than $5,000:

- 6 Hives and starter kits approx. $1600 - $2000
- 6 Nucs: (contains 4 deep frames of bees with a queen) approx. $1000 - $1200

One way to create a supportive environment on normally barren airport lands would be to plant specific flowers attractive to bees to provide the nectar and pollen sustenance they require. For example, bees feast on various aster plant species, which are also one of the plant varieties that are ideal for vegetated roofing at Norman Rogers Airport. Other ground cover flowers such as daisies and zinnias will also attract a large variety of bees.

Even the honey produced on site could be sold in the airport terminal building (the expansion outlines a retail space) as a small social enterprise business with profits reinvested into maintaining the apiary. As showcased at the Chicago O'Hare International Airport, there is even an opportunity to partner with Kingston's non-profit organizations such as the John Howard Society or the KEYS Job Centre to offer skills training and education on bee farm operations. This could supply a maintenance team for the project that maintains the hives, collects and packages the honey. If selling the honey on-site proves successful, there is potential to expand into various candle, soap, and skincare products and market this merchandise to Kingston retailers.

Beehives are also used as biological sensors in Europe. The pollen and honey are actually analyzed and used as indicators of pollution. With these samples biologists can measure the levels of heavy metals, volatile organic hydrocarbons and polyaromatic hydrocarbons to determine how well the airport is operating on an environmental level.

6.7 Grow and Preserve Natural Heritage Assets

Affected Stakeholders: Cataraqui Region Conservation Authority, Lemoine Point Farm, Weatherall Property

Implementation Timeframe: 15+ years

Resource Allocation: Medium

Description of Problem:

The Cataraqui Region Conservation Authority completed the *Central Cataraqui Region Natural Heritage Study* in 2006. However, much of the natural heritage resources that were identified at the Lemoine Point area needs additional recognition, support, and growth. Moreover, there is an educational programming gap at the Lemoine Point Conservation Area that natural heritage education could be incorporated as a component of larger educational programming at the site.

Description of Recommendation:

A primary objective under "Goal C" in the *Cataraqui to 2020 Plan* is "stewardship of our natural heritage" (Cataraqui Region Conservation Authority, 2001). This strategic goal recognizes the need to protect a broader spectrum of natural heritage assets beyond just Areas of Natural and Scientific Interest and wetlands. Furthermore, The City of Kingston *Official Plan* also contains many policies to support natural heritage stewardship. The most prominent within the Official Plan is s. 6.1: Natural Heritage System, whereby the goal is to "manage growth and land use in a manner that maintains, restores and enhances the natural heritage system within Kingston…." (City of Kingston, 2015). With these robust supporting natural heritage policies from the City of Kingston and the Cataraqui Region Conservation Authority, more effort and resources should be directed towards growing and preserving natural heritage at Lemoine Point.

The 2006 *Natural Heritage Study* found that the natural heritage assets of the Lemoine Point area include the significant shoreline woodlands, recent and historical sensitive species of flora and fauna, and significant grassland habitats of endangered Bobolink and Eastern Meadowlark bird species. Some key recommendations contained in this plan are to:

- Promote stewardship of the natural heritage system through education and awareness activities
- Encourage landowners to donate and/or convey ecologically sensitive lands to land trusts or other public bodies
- Encourage preparation of forest management plans for significant woodlands, and the uptake of reforestation assistance programs for areas of restorable habitat.

There are several opportunities to promote these initiatives at the Lemoine Point Conservation Area. The Cataraqui Region Conservation Authority should grow the existing natural heritage assets at the Conservation Area by continuing reforesting parts of the land, seeking easements to encourage integration of all shoreline woodland including the Lemoine Point Farm (See Recommendation 6.1 Protect the Natural Assets at the Lemoine Point Farm) and implementing conservation corridors at the North and South entry points (See Recommendation 6.3 Establish Conservation Corridors).

Figure 6.17: This map shows the section of forested lands currently on the Lemoine Point Farm property that is separated from the Lemoine Point Conservation Area's lands.

Reforestation is ongoing at Lemoine Point in turning some of the open areas that are unsuitable agricultural land. Climate change initiatives like the assisted migration program are also adding additional woodlands to the area. The Friends of Lemoine Point also organizes a Spring and Fall community tree planting event, which helps to regenerate portions of the forest on the North and South ends of the Conservation Area. These initiatives should be continued to help grow the natural heritage woodlands on the Conservation Area.

Easements should also be pursued so that significant woodland assets can be maintained under the stewardship of the Cataraqui Region Conservation Authority. The most valuable of these would be connecting approximately 1.1km of deciduous shoreline forest on the Lemoine Point Farm property. This would allow for the entire riparian woodland system at Lemoine point to be under the stewardship of the Conservation Authority, and could also eventually hold a publicly accessible trail that would traverse the entirety of the shoreline forest, from the North end of the Conservation Area to the Weatherall Property.

Conservation Corridors would be used to connect regional natural heritage assets. The shoreline woodlands at Lemoine Point are just one part of a larger natural heritage system within the Cataraqui Region Watershed. By extending fringe habitat corridors along widened rights-of-way, natural connections can be established between regional natural heritage woodlands. Figure 6.19 (below) demonstrates how the natural heritage woodlands at Lemoine Point are a part of a larger regional woodland system (each highlighted in a yellow box, and a conservation corridor that stretches around Collins Bay along Coverdale Drive and Bath Road could help connect and ultimately grow these natural heritage assets).

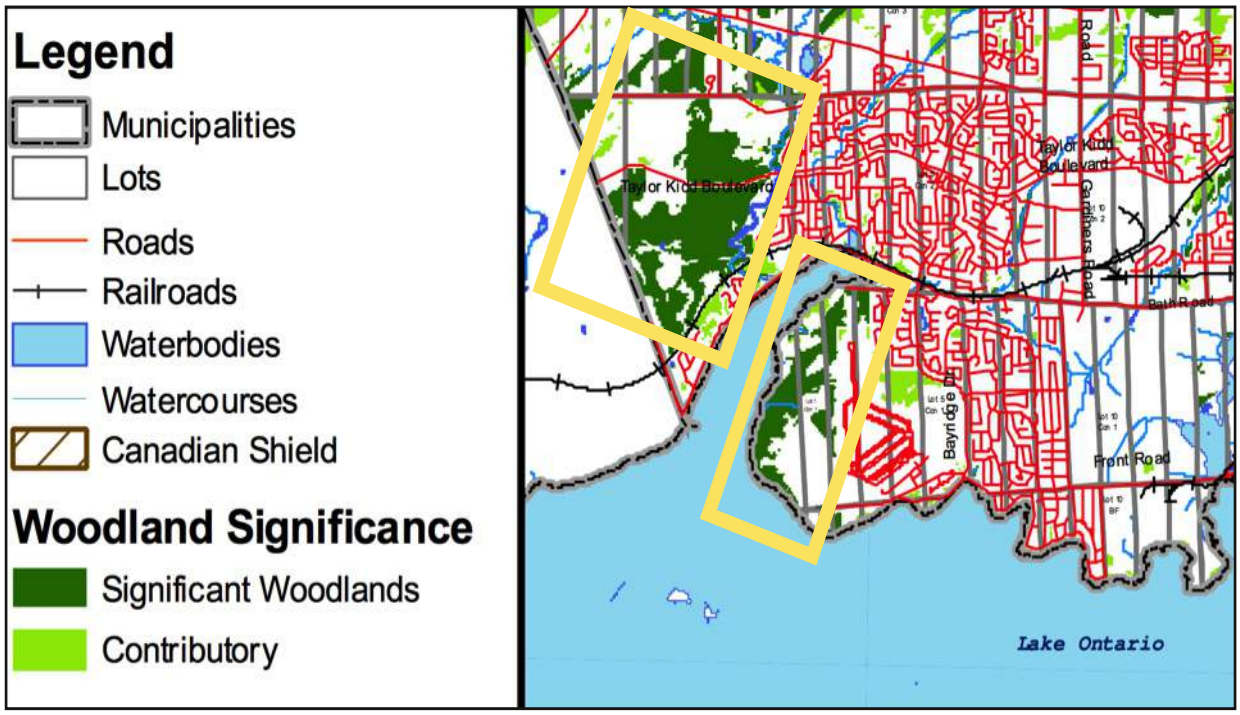


Figure 6.18: Significant Woodlands Map from the Central Cataraqui Natural Heritage Study.

Growing the physical natural heritage system through reforestation, easements, and conservation corridors is just one aspect of this recommendation. Further strategies should be implemented in also increasing the awareness and understanding of these natural heritage assets. Heightened awareness can achieved by incorporating natural heritage education into a larger educational program at Lemoine Point. This is congruous with the overall philosophy of natural heritage that is prescribed in the Central Cataraqui Natural Heritage Study, as it quotes the Ministry of Natural Resources natural heritage philosophy that states, "Natural Heritage is a concept that expresses collective and individual responsibilities in a relationship to biodiversity" (Cataraqui Region Conservation Authority, 2006). Educational programming is the conduit that expresses those individual and collective responsibilities, and it can assist in creating greater sense of the larger natural heritage network that Lemoine Point area is a part of.

Another method to improve the awareness and understanding of the natural heritage of the Lemoine Point area is to increase the amount of interpretive boards at the Conservation Area. Newly installed interpretive boards have been implemented as recently as the Fall of 2016. They add a layer of natural heritage education at the site that was missing. More interpretive signage could be installed as the environmental assets grow, but currently the new signage is a promising start to developing a more natural heritage awareness.

Figure 6.19 New natural heritage signage at the Lemoine Point Conservation Area.

Proposed Implementation Strategy:

This recommendation necessitates a long-term approach since the natural heritage assets at the Lemoine Point area include mature woodlands, unevaluated wetlands, and grasslands that have had centuries to grow. Growing and preserving the natural assets through reforestation of woodlands should be a strategy outlined in the *Forest Management Plan*, while protection and growth of wetland and grassland habitats would fall under a *Biodiversity Action Plan* or *Habitat Conservation Plan* (See Recommendation 6.10 Establish Conservation Partnerships to Create Sustainable Land Use Areas). Connecting the shoreline woodlands of the Lemoine Point Farm through easements would be implemented with the strategy identified in Recommendation 6.1 Protect the Natural Assets at the Lemoine Point Farm, and could potentially expand with Recommendation 7.3 Transition the Weatherall Property to create the southern "book-end" of the natural heritage woodlands at the Lemoine Point area.

Adopting an educational programming strategy at the Lemoine Point Conservation Area would likely be incorporated with Recommendation 6.3 Develop an Educational Community Garden Program at Lemoine Point. A part-time equivalent or a full-time equivalent would be required to implement educational programming at the Lemoine Point Conservation Area. Existing educational resources at the Little Cataraqui Creek Conservation Area should be utilized to improve cost-efficiency of this initiative as well as to ensure consistency among educational programming within the Cataraqui Region Conservation Authority. and to make consistent educational programming within the conservation authority. Ontario Nature's Best Practices Guide to Natural Heritage Systems highlights how educational programming is a key part of a formal natural heritage system strategy.

6.8 Parking User Fee at the Lemoine Point Conservation Area

Affected Stakeholders: Lemoine Point Conservation Area, Users of Lemoine Point Conservation Area

Implementation Timeframe: 0-5 years

Resource Allocation: Low

Description of Problem:

The Lemoine Point Conservation Area is one of the busiest conservation areas within the Cataraqui Region watershed. The Conservation Area does not currently charge any parking or entrance fee, despite implementing an entrance fee at Little Cataraqui Creek Conservation Authority. Estimates have annual entries to the Lemoine Point Conservation Area at 300,000+ per year and the primary mode of accessing the Conservation Area is by private automobile. This abundant and increasing usership causes parking constraints on peak visiting days (i.e. holidays, weekends, etc…) diminished visitor experience, road traffic, trail use conflict, habitat degradation, and trail surface wear.

There is also a general need for additional funding resources to help manage the Lemoine Point Conservation Area. Management and operations of the Conservation Area are subsidized with "special levy" funds from the City of Kingston. The City of Kingston has a Lemoine Point Advisory Committee that makes recommendations on improvements and projects for the future of the area in using the special levy. However, additional funding streams are required to increase trail maintenance, support environmental initiatives, monitor eco-systems, and develop more community programming. The main on-site staff member at the Lemoine Point Conservation Area is the Forest Technician for the Cataraqui Region Conservation Authority who splits time at the Conservation Area with other duties related to being the watershed's Forest Technician. More on-site staffing should be allocated to better help manage the Lemoine Point Conservation Area.

Description of Recommendation:

A parking fee should be implemented at both the North and South parking lots of the Lemoine Point Conservation Area. This parking fee will help generate revenue for necessary upgrades in management and infrastructure that will help to offset the increasing usership. The parking fee will also work symbiotically with Recommendation 8.1 (Active Transportation and Recommendation 8.4 (Increase Public Transit, since these improvements will help increase accessibility to the area by means other than a private automobile. Implementing a parking fee should be prioritized over increasing parking lot capacity, since the ladder requires undesirable infrastructure expansion that conflicts with the Cataraqui Conservation Authority's conservation mandate. Implementing parking metres or other parking infrastructure is also undesirable, since the costs of purchasing and maintaining electronic parking metres combined with the cost of enforcement might outweigh the potential parking revenue.

A new strategy that other conservation authorities have implemented, such as the Rideau Valley Conservation Authority, is a pay-by-phone parking smartphone application.

This application that the Rideau Valley Conservation Authority uses is administered by Verrus Corporation, a Vancouver-based software and wireless solutions company. The system works by having a user first register for an account on the Pay-By-Phone website with their name, credit card number, and license plate number. The user will be given an account number that matches the digits of the phone number. Once an account is created, you can pay for parking by calling assigned Pay-By-Phone number or by logging into the application, and specify what parking lot you are intending to park at and for how long (usually done by an associated parking lot code).

The advantages to this system are that it is a low cost to maintain, since Verrus Corporation takes a portion of the parking fee that is charged. It is also easy to enforce since the conservation authority would be able to view the license plates who have paid for parking at a specific location and contrast it to the license plates that are on cars in that location's parking lot. The disadvantage of this system is that it requires access to the internet and to a credit card to be able to purchase parking. This will likely restrict some users from being able to pay for parking with the Pay-By-Phone application, but there are some ways that this problem could be mitigated. If users are also looking for a cost-effective, offline, and potentially pay-by-cash way for paying for parking at the Lemoine Point Conservation Area, then yearly unlimited parking passes could be coupled with the Cataraqui Region Conservation Authority Annual Pass ($80) or a membership to the Friends of Lemoine Point ($20). This in turn still supports the conservation authority or the Friends of Lemoine Point and maintains the principle of paying for parking.

Proposed Implementation Strategy:

The Cataraqui Region Conservation Authority must have a well-thought out marketing and implementation strategy to grandfather a Pay-By-Phone initiative in, since this proposal is likely to be unpopular. Some strategy recommendations based off the Rideau Valley Conservation Authority's experience are to:

- Have a "transition period" where the public is given ample time to understand how the new parking initiative works and why it is being implemented
- Do not issue "tickets" during the roll-out phase of the parking initiative, but rather create an educational pamphlet to explain usage of the app, necessity of parking fee, and where the funds will be allocated. Use this pamphlet in conjunction with trail maps.
- Be consistent with customer service and community liaising during transition process as there will a number of concerns and questions from the public regarding new parking fees.
- Have signage with location codes on site and information on how to use the application.
- Consult with Friends of Lemoine Point for coordinating free parking for its members.
- Transition Cataraqui Region Conservation Authority Annual Pass to an online account with associated license plates (not a physical card) as this will facilitate a general converstion an online registration system.

The Conservation Authority must have a staff member to oversee the "back-end" of the parking application. This individual would be responsible for coordinating operations with Verrus, inputting "Annual Pass" license plates into an online database, and providing location codes for each of the parking areas where you want to implement Pay-By-Phone parking. Similarly, on-site enforcement will also have to be implemented, which would likely require at

least one part-time equivalent. The revenue for parking should offset most of the cost of an additional staff member, however, this staff member could have expanded duties beyond parking enforcement at the Lemoine Point Conservation Area that are currently understaffed, such as: trail maintenance, washroom maintenance, invasive/noxious species identification, customer service/community liaising, and depending on this staff members' qualifications, potentially deliver educational programming.

6.9 Review the Trail System at the Lemoine Point Conservation Area

Affected Stakeholders: Cataraqui Region Conservation Authority

Implementation Timeframe: 0-5 years

Resource Allocation: Medium

Description of Problem:

Inspiration for this recommendation came as a response to the 2009 *Draft Lemoine Point Conservation Plan*, which identifies human-induced ecosystem stressors that threaten the long-term ecological integrity of the Lemoine Point Conservation Area. More specifically, the *Draft Plan* highlights both trail and human intrusions, and shares how "increased use has created stresses that could evolve the property to be an urban park" (Cataraqui Region Conservation Authority, 2009). This concern speaks to an evolving debate about the future of the Lemoine Point Conservation Area, which could not be more relevant today. Fielding upwards of 300,000 plus entries a year, the Lemoine Point Conservation Area rivals the number of visitors to municipally-owned public parks within the City of Kingston in its intensity of use. What is more, the Lemoine Point Conservation Area is located adjacent to Rotary Park, one of Kingston's premier public waterfront destinations, which has and continues to cause confusion over the identity and ownership of the Lemoine Point Conservation Area. This confusion was reinforced at the Lemoine Point Visioning Workshop in October, 2016, and was again brought to debate at the final presentation in December, 2016. To address this concern, the following questions may be asked:

- Is the identity of the Lemoine Point Conservation Area a conservation area or a park?
- Is the current intensity of use at the Lemoine Point Conservation Area sustainable?
- What is a sustainable annual visitor count for a conservation area, in general, and the Lemoine Point Conservation Area, specifically?

Description of Recommendation:

Through comprehensive research and analyses, the SURP 825 Project Course Team believes that the Lemoine Point Conservation Area should, in the long-term, continue to be managed as a conservation area, rather than a park. To remedy further confusion over identity, this recommendation suggests a review of the Lemoine Point Conservation Area trail system to restore bisected habitats and enhance permeability into the core. By doing so, this recommendation addresses the impacts of human use and increased user activity on habitat loss, degradation and fragmentation, and more clearly defines the Lemoine Point Conservation Area as a place of nature. It must be noted, however, that the intention behind this

recommendation is not to reduce usership. Instead, it is meant to reduce the negative impacts of human use and protect the property in the long-term. This can be achieved by encouraging the development of a trail system that better supports the ecosystems, habitats, species and landscapes that have so attracted users in the first place.

To review the Lemoine Point Conservation Area trail system, an approach that draws from both local and landscape-scale conservation actions is recommended. Such actions highlight the importance of creating bigger, better, more and more connected habitats in order to enhance

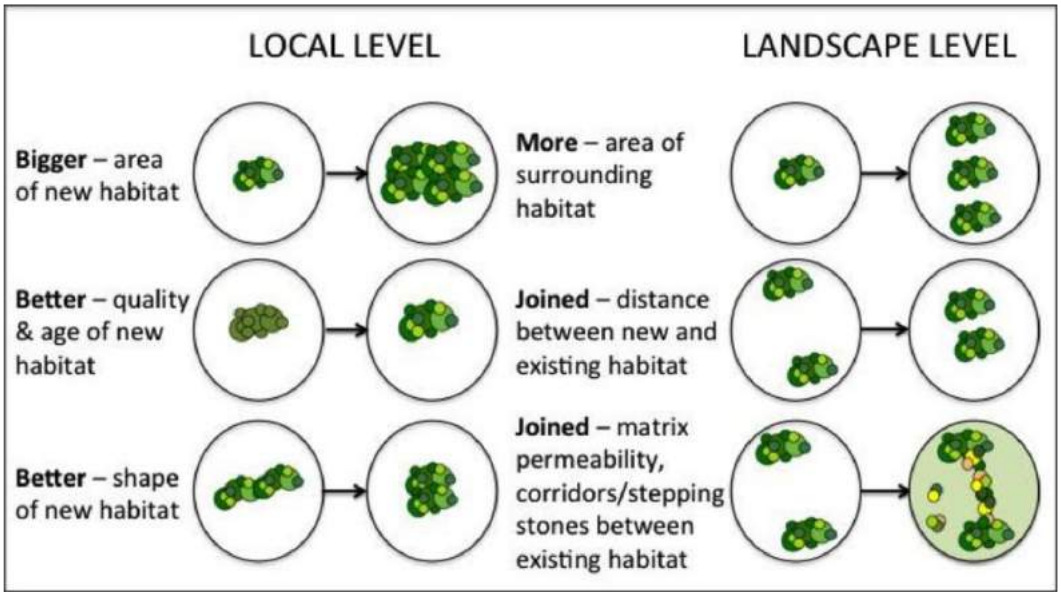


Figure 6.20: Local versus landscape-level diagram.

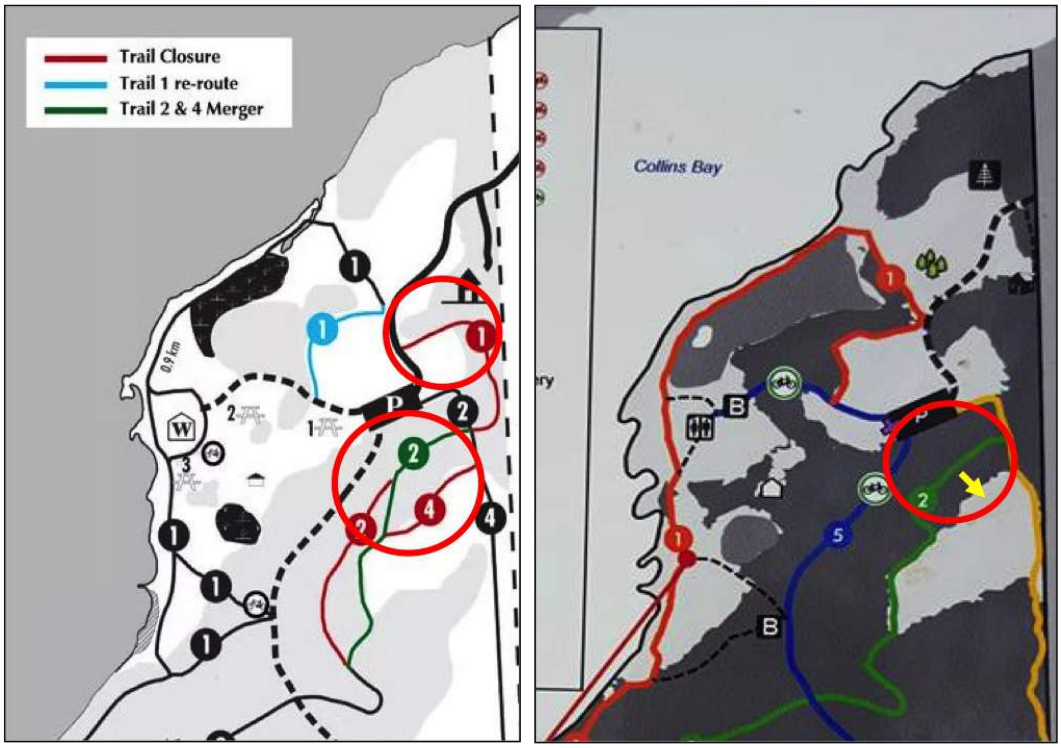


Figure 6.21: Small scale trail re-organization to alleviate bisected habitats (left) and a proposal to keep Trail 4 along the edge of the woodland habitat and close the merged section of Trail 2 that continues to bisect the woodland.

biodiversity, restore ecosystem functioning and ensure the long-term ecological resilience and provision of ecosystem services. With reference to the 2009 Draft Plan, habitats within the Lemoine Point Conservation Area are described as “degraded in quality…[but] sufficient in quantity to continue to maintain a tolerant ecological community” (Cataraqui Region Conservation Authority, 2009, p. 9. Using this as a starting point, it is recommended that an assessment of the trail system look for opportunities to create new and expand or restore existing habitat patches. Excitingly enough, this is exactly what the Cataraqui Region Conservation Authority set out to do with the closure, re-routing and merger of three trail routes near the North entrance to the Lemoine Point Conservation Area.

This is an example of a small-scale trail reorganization meant to reduce trail clutter and alleviate bisected habitats. However, this reorganization could be taken one step further by keeping Trail 4 along the edge of the woodland habitat and closing the merged section of Trail 2 that continues to bisect the woodland, leaving a small habitat patch.

The Cataraqui Region Conservation Authority may also wish to explore a large-scale trail reorganization. For example, near the South entrance to the Lemoine Point Conservation Area there is a unique grassland habitat, vulnerable to development pressures and invasive species. This habitat is also home to the Eastern Meadowlark and Bobolink, two bird species that are listed as threatened in Ontario and are therefore protected under the Endangered Species Act. While these and other priority species are often what attract users to the Lemoine Point Conservation Area, trail development that brings visitors closer to these species and their habitats can also serve as a harmful intrusion. Such is the case with this unique grassland habitat that is bisected nearly in half by an arm of Trail 5, which extends nearly three kilometers in length by about eight meters in width. To make the interior core habitat of this grassland bigger, the Cataraqui Region Conservation Authority could propose the closure and restoration of this middle section of Trail 5, or re-routing of it along the outside of the habitat.

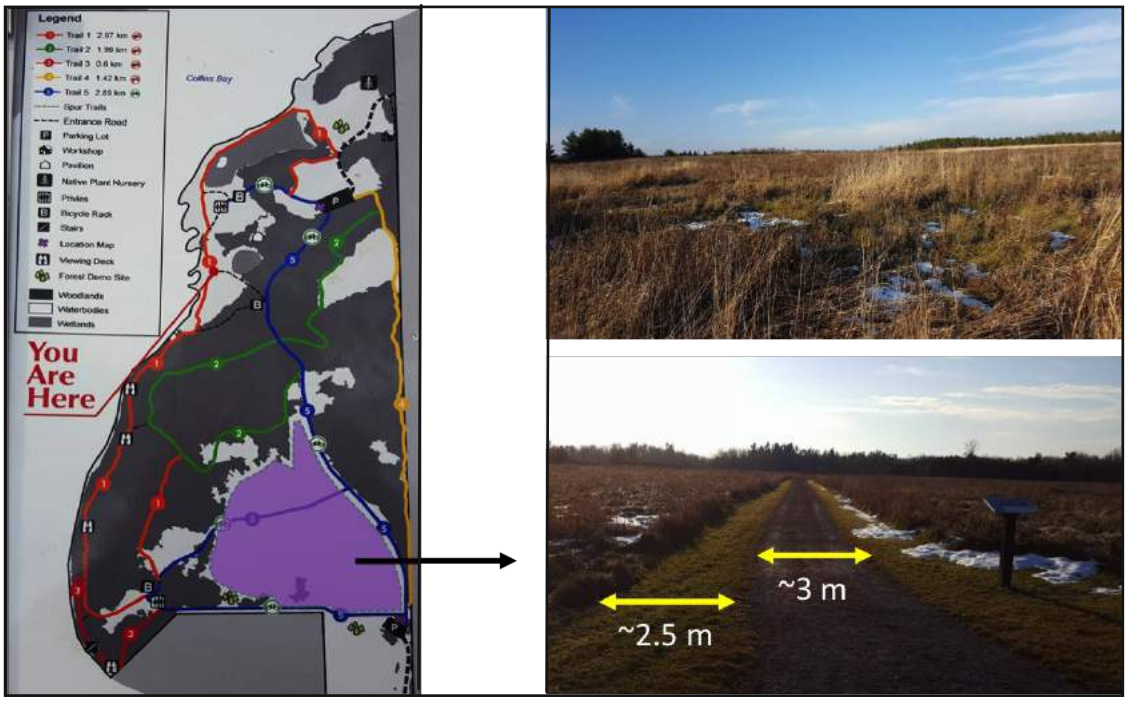


Figure 6.22: Trail map of the Lemoine Point Conservation Area (left), grassland habitat of the highlighted purple area (top right), and trail section and widths (bottom right).

Proposed Implementation Strategy:

The implementation for this recommendation, and specifically the suggested large-scale reorganization of Trail 5, may be carried out by preparing a Lemoine Point Conservation Area *Habitat Conservation Plan*. In preparation, it is advised that the Cataraqui Region Conservation Authority conduct or facilitate an Ecological Impact Assessment (EIA), with the key deliverable being a Trail System Assessment Map. With this analysis, the Cataraqui Region Conservation Authority may then prepare a *Biodiversity Action Plan* (BAP), identifying all priority ecosystems, habitats, species and landscapes on a BAP Priority Map. Such priorities may include threatened or endangered habitats and species, as well as landscape features of natural and cultural heritage significance. Once complete, the Cataraqui Region Conservation Authority may use this information to prepare a *Habitat Conservation Plan*, which will include an Ecological Network Map and identify revisions to the existing trail system. The next step will be to propose a revised Lemoine Point Conservation Area Trail Map. While gathering outside feedback may not be mandatory before carrying out the revision, it is recommended that the Cataraqui Region Conservation Authority involve key stakeholders and the public throughout the entire process from first assessment to final revision. This inclusion, coupled with an Environmental Outreach Strategy aimed at building awareness about the difference between a conservation area and a park, may help foster support for the proposed revision.

Resource allocation for this recommendation is estimated as medium due to the potential of the Cataraqui Region Conservation Authority conducting these analyses with minimal outside consulting help; however, if outside help is necessary, the cost to complete such analyses may move the resource allocation to high. This will also depend on the current availability of staff resources and the possibility of needing to hire additional staff. The timeframe to complete the initial analyses and prepare a Lemoine Point Conservation Area *Habitat Conservation Plan* is estimated between 0-5 years. While a revision may be proposed in this timeframe, effort to involve key stakeholders and the public may prolong a final revision. While cost may also contribute to time delays, the actual trail revision and decommissioning/restoration of existing trails will require a phasing strategy and financial plan.

6.10 Establish Conservation Partnerships to Create Sustainable Land Use Areas

Affected Stakeholders: Cataraqui Region Conservation Authority, Norman Rogers Airport

Implementation Timeframe: 0-5

Resource Allocation: High

Description of Problem:

The idea to engage in partnerships with surrounding land uses to create sustainable use areas draws from the “concept of ecological networks, and their focus on landscape-scale conservation” (University of Stirling, 2010).

By definition, an ecological network is “a suite of core areas connected by buffer zones, corridors and smaller stepping stone patches that allow species…to move between them” (University of Stirling, 2010). By applying this concept on a macro-scale to surrounding land uses, the Lemoine Point Conservation Area can facilitate the creation of sustainable use areas – areas that commit to the sustainable use of natural resources, engage in mutually beneficial activities and maintain ecosystem services – that will help strengthen land use compatibility, mitigate the effects of climate change and ultimately improve the ecological integrity of the Lemoine Point area as a whole.

Description of Recommendation:

To expand on the mutually beneficial activities aspect of sustainable use areas, this recommendation proposes a partnership between the Cataraqui Region Conservation Authority and Norman Rogers Airport. One component of this partnership will focus particularly on habitat protection and recovery activities, such as habitat displacement and relocation. This is especially relevant at present as the Barn Swallow, a threatened species in Ontario, is at risk of losing its habitat in an airport hangar under renovation. Effort to relocate this habitat is a topic of discussion among the Cataraqui Region Conservation Authority and the Friends of Lemoine Point; however, the initiative may benefit from an official process, defined in the form of a joint Habitat Conservation Plan between the Cataraqui Region Conservation Authority and the Airport. This Plan would focus on protecting habitats and species, and work complimentary to the airport’s existing Wildlife Management Plan that focuses on minimizing safety risk.

Figure 6.23: The Barn Swallow is a native species within the Lemoine Point area.

Other recommendations that further exemplify and support the sustainable use areas aspect of the Ecological Network concept include Recommendation 6.6 to Incorporate Non-conflicting Habitats on Usable Airport Lands, categorized under the Conservation pillar.

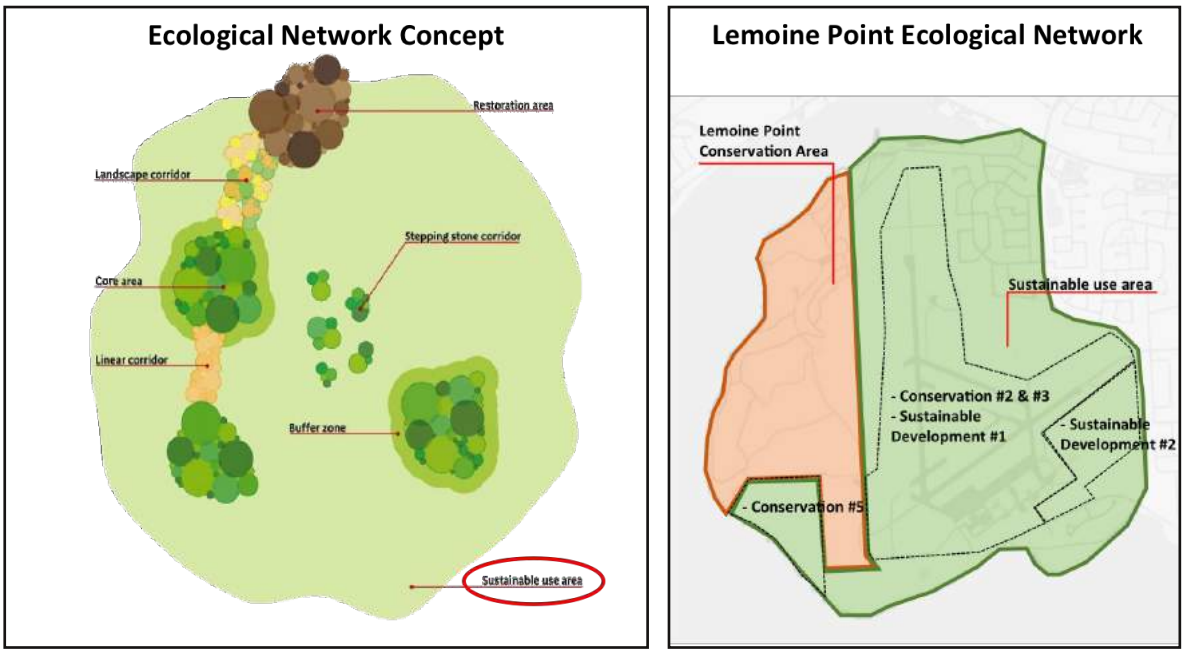


Figure 6.24: Ecological Network Concept (right) and Lemoine Point area Ecological Network (right) with the Conservation Area in orange and sustainable use areas in green.

Proposed Implementation Strategy:

This recommendation may be implemented in conjunction with the creation of a Lemoine Point Conservation Area Habitat Conservation Plan as outlined in recommendation 6.9. This *Habitat Conservation Plan* will contain a section on Sustainable Use Area Partnerships that will set the framework for establishing sustainable use areas. Each partnership will include its own collaborative conservation framework that will address specific conservation goals, and each goal will include an accompanying process or strategy-building framework for success. For example, the partnership proposed between the Cataraqui Region Conservation Authority and Norman Rogers Airport will complement the Airport's existing Wildlife Management Plan by addressing habitat displacement and loss with habitat protection and recovery initiatives. Such initiatives may also include habitat relocation, such as in the case of the Barn Swallows.

Resource allocation for this recommendation is estimated as high due the possibility of new hires to,

- build and manage each partnership;
- prepare the Sustainable Use Area Partnerships section of the *Habitat Conservation Plan* with each partner; and,
- carry out the objectives in each goal.

Each goal will require its own timeframe, phasing strategy and financial plan. However, to get this recommendation off the ground it is estimated that the Sustainable Use Area Partnerships section of the Habitat Conservation Plan will take 0-5 years to complete.

Chapter 6.0 References

Airport World Magazine. (2016). Airport Beehives – Sea-Tac Installs Apiary. Retrieved from http://www.airport-world.com/news/general-news/2746-airport-bee-hives-sea-tac-installs-its-own-apiary.html

Bill Hutchins. Sep. 15 2016. “City buys prime West end waterfront land for future park space.” Kingston Region. http://www.kingstonregion.com/news-story/6860675-city-buys-prime-west-end-waterfront-land-for-future-park-space/

British Columbia. (1998). Biodiversity and Interior Habitats: The Need to Minimize Edge Effects Part 6 of 7. Ministry of Forests Research Program. Available at https://www.for.gov.bc.ca/hfd/pubs/docs/en/en21.pdf

Busy Bee Beeswax & Supplies. (2016). Beekeeping Supplies. Retrieved from http://busybeebeekeepingsupplies.com/nucs1.html

Cataraqui Region Conservation Authority. (2001) Cataraqui to 2020.

Cataraqui Region Conservation Authority. (2006). Central Cataraqui Region Natural Heritage Study.

Cataraqui Region Conservation Authority CRCA. Lemoine Point Conservation Area. Available at http://crca.ca/conservation-lands/conservation-areas/lemoine-point-conservation-area/

Cataraqui Region Conservation Authority (CRCA). (2009). 2009 Draft Lemoine Point Conservation Plan.

Chicago Department of Aviation. (2016). Apiary (Beehives). Retrieved from http://www.flychicago.com/OHare/EN/AboutUs/Sustainability/Apiary.aspx

City of Kingston. (2016). Highest and Best Land Use Study Kingston Airport presentation.

City of Kingston. (2003). Cycling and Pathways Study. Retrieved from: https://www.cityofkingston.ca/documents/10180/27835/Cycling+%26+Pathways+Study/11a460ec-bcea-4b4c-b97a-e31eb2b745a9

City of Kingston. (2016) “Community Gardens Development and Operations Policy.” Approval Date: May 17, 2016. Effective Date: June 1, 2016. Retrieved from: https://www.cityofkingston.ca/residents/recreation/facilities/community/community-gardens

City of Kingston. (2015). Update to the Kingston Transportation Master Plan. Kingston: Aecom.

City of Kingston. (2007). Norman Rogers Airport Master Plan Study

City of Kingston. (2015). City of Kingston Official Plan. Retrieved from https://www.cityofkingston.ca/business/planning-and-development/official-plan.

City of Kingston. (2016). Restricted Area Zoning By-Law 76-26. Retrieved from https://www.cityofkingston.ca/business/planning-and-development/zoning/kingston-township

City of Kingston. (2016). Map Gallery. Retrieved from https://cityofkingston.maps.arcgis.com/apps/MapSeries/index.html?appid=343a968a042a4a3ba

Cataraqui Region Conservation Authority. (1999). Conceptual Plan for Lemoine Point.

Department of Conservation and Recreation. (2010). Trails Guidelines and Best Practices Manual. Available at http://atfiles.org/files/pdf/MAtrailguidelines.pdf

Denver Public School Urban Garden Curriculum. Retrieved from: https://dug.org/school-garden-curriculum/

Earthling Communications, & Brad Johnson + Associates Limited. (1999). Conceptual Plan for Lemoine Point Conservation Area.

Environmental Protection Agency. (2016). Colony Collapse Disorder. Retrieved from https://www.epa.gov/pollinator-protection/colony-collapse-disorder

Forman, Richard T. T. (1995), “Land Mosaics: The ecology of landscapes and regions.” New York: Cambridge University Press.

Humphrey, J., Watts, K., Fuentes-Montemayor, E., Macgregor, N., & Park, K. (2013). The evidence base for ecological networks: lessons from studies of woodland fragmentation and creation. Report from the WrEN Project, Forest Research, Farnham, Surrey. Available at http://www.stir.ac.uk/media/schools/naturalscience/bes/images/WrEN_FR_report_2013.pdf

Government of Ontario. (2006). Ontario Heritage Toolkit. Toronto: Queen’s Printer for Ontario. Retrieved from: http://www.mtc.gov.on.ca/en/heritage/heritage_toolkit.shtml.

Goyette, J. (2015). A new home for honeybees, just off the tarmac. Public Radio International. Retrieved from http://www.pri.org/stories/2015-03-08/airports-welcome-bees-way-make-good-use-their-required-undeveloped-space

Kingston Whig-Standard. (2016). Lemoine Point reroutes sections of trails. Available at http://www.thewhig.com/2016/09/14/lemoine-point-reroutes-sections-of-trails

Lawton, J. H., Brotherton, P. N. M., Brown, V. K., Elphick, C., Fitter, A. H., Forshaw, J.,…Wynne, G. R. (2010). Making Space for Nature: a review of England’s wildlife and ecological network. Report to Defra. Available at http://webarchive.nationalarchives.gov.uk/20130402151656/http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf

Lew, J. (2016). Airports welcome bees to the flightplan. Mother Nature Network. Retrieved from http://www.mnn.com/your-home/organic-farming-gardening/stories/airports-welcome-bees-to-the-flight-plan

Mecnarowski, M. Barn Swallow, Photo. Ohio Department of Natural Resources, Division of Wildlife. Available at http://wildlife.ohiodnr.gov/species-and-habitats/species-guide-index/birds/barn-swallow

Nottawasaga Valley Conservation Authority. (2007). Land Securement Strategy. Retrieved from: http://www.nvca.on.ca/Shared%20Documents/Land%20Securement%20Strategy.pdf.

Ontario Beekeepers Association. (2016). FAQS for New Beekeepers. Retrieved from http://www.ontariobee.com/research/getting-started/faqs-for-new-beekeepers

Ontario Nature. (2014). Best Practices Guide to Natural Heritage Systems Planning. Retrieved from: https://www.ontarionature.org/discover/resources/PDFs/reports/nhs-guide-web.pdf

Perlman, D. L., & Milder, J. (2005). Practical Ecology: for planners, developers, and citizens. Washington: Island Press.

Port of Seattle. (n.d). Seattle-Tacoma International Airport Pollinator Conservation Program Fact Sheet. Retrieved from https://www.portseattle.org/Environmental/Water-Wetlands-Wildlife/Documents/Sea-Tac%20Airport%20Bee%20Fact%20Sheet%20060214.pdf

Puiu, T. (2015). Airports all over the world are turning into giant beehives. ZME Science. Retrieved from http://www.zmescience.com/science/airport-apiaries-0432423/

Saura, S., Bodin, O., & Fortin, M-J. (2014). Stepping stones are crucial for species' long-distance dispersal and range expansion through habitat networks. Applied Ecology. 51, 171-182. DOI: 10.1111/1365-2664.12179. Available at http://onlinelibrary.wiley.com/doi/10.1111/1365-2664.12179/epdf

Sygo, J. (2014). For the Bees: What is Colony Collapse Disorder, and why does it impact what we eat? National Post. Retrieved from http://news.nationalpost.com/appetizer/for-the-bees-what-is-colony-collapse-disorder-and-why-does-it-impact-what-we-eat

Thompson, J. Ahluwalia, M. (2013). What's Killing Canadian Honeybees? CBC News. Retrieved from http://www.cbc.ca/news/canada/what-s-killing-canadian-honeybees-1.1312511

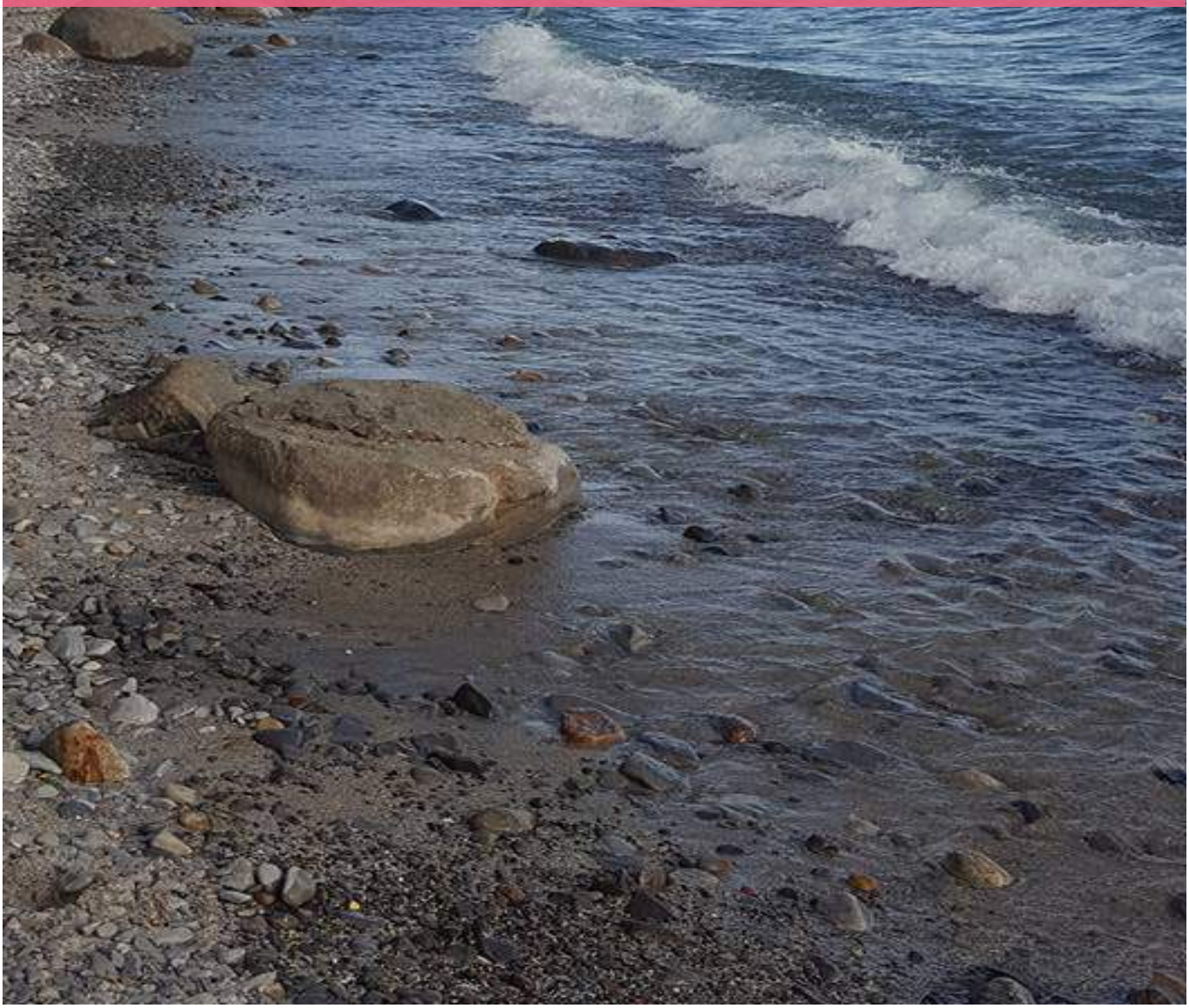
Trust for Public Land. (2016). Fowler Clark Epstein Urban Farm. Retrieved form: https://www.tpl.org/our-work/working-lands/fowler-clark-epstein-urban-farm

Town of Cumberland. (2015). Master Plan for Metcalf-Franklin Farm. http://www.cumberlandri.org/sites/cumberlandri/files/uploads/franklin_farm_rehabilitation_master_plan_2015.pdf

University of Stirling. (2010). Woodland Creation & Ecological Networks. Available at http://www.stir.ac.uk/natural-sciences/research/groups/bes/ecologyevolutionandconservation/wren/#lawton2010

Wild, A. (2011). Honey Bee Collapse Disorder, in Context. Retrieved from: http://www.myrmecos.net

Chapter 7.0
Pillar 2: Waterfront Access



7.0 Waterfront Access

7.1 Enhance Rotary Park's Waterfront

Affected Stakeholders: City of Kingston, Cataraqui Region Conservation Authority

Implementation Timeframe: 0 – 5 years

Resource Allocation: Medium

Description of Problem:

Rotary Park serves as Lemoine Point's primary City of Kingston waterfront park. Park amenities available on-site, and listed on the City of Kingston's Parks, Trails & Sportsfield's web page include an off-leash dog park, basketball court, baseball diamond, play structures, barbecues and a picnic shelter with picnic tables. The list does not include any reference to infrastructure related to the usage and enjoyment of Rotary Park's direct waterfront access. Furthermore, as identified from a site visit and evident from site photographs below, the infrastructure and opportunity for water-oriented activities are limited. Waterfront seating for socializing and water viewing is provided through two wooden benches. While the beach area provides direct access to the water, the shoreline is not currently accessible for other means of water recreation as well; such as a small launch/dock for pleasure crafts.

Figure 7.1: Rotary Park's trail and shoreline featuring minimal seating areas (left) and the Rotary Park beach (right).

According to the City of Kingston's *Waterfront Master Plan*, investment in Rotary Park's waterfront has a priority ranking of #41 out of 138 Kingston waterfront-related projects. Furthermore, the timeframe for the expected implementation of improvements to the Park is projected to occur within the next 11 to 20 years. While realistic expectation for City infrastructure investment is warranted, Rotary Park's function as the sole provider to Lemoine Point residents for waterfront access from a City park, should garner increased attention.

Residents in the Southwest end of Kingston utilize Rotary Park for sports, social events and the off-leash dog park. Rotary Park's currently under-invested waterfront is essentially preventing the park from becoming a complete park that is dedicated to providing users with a wide array of opportunities for land and water oriented leisure and recreation.

Description of Recommendation:

Infrastructure should be installed at Rotary Park that emphasizes the park's views and coveted water access. This notion is supported with the City of Kingston's W*aterfront Master Plan*. These infrastructure improvements can occur in the form of strategically placed seating, public art, and the installation of a small launch/dock for non-motorized pleasure crafts.

1) Public Art: The City's *Public Art Master Plan* aims at fostering creativity and innovation to animate the public realm for residents and visitors. By installing public art similar to the precedent on the left, Rotary Park's waterfront can be enriched while illustrating the rich natural heritage in the area, including threatened species such as the Meadowlark bird species. This form of public art will enhance the users' passive experience of the waterfront.

Figure 7.2: Public Art

2) Effective Seating: Two key goals of the City's *Waterfront Master Plan* are to increase social interaction on the water; and emphasize the provision of conveniently located seating. By implementing seating similar to the bench structure and placement on the right, park users will enjoy an increased supply in the park's waterfront seating, along with an emphasis on socializing and enjoying the view.

Figure 7.3: Waterfront Seating

3) Launch/Dock: A launch/dock allows for park users to gain direct access to the shore in a manner compatible with non-motorized pleasure crafts such as a kayak, canoe, or paddle board. Beach access presents problems for paddles due to potential damage and the chance of falling when entering and exiting the pleasure craft. The presence of a launch/dock emphasizes that active recreation on the water is encouraged.

Figure 7.4: Launch Dock

Proposed Implementation Strategy:

The implementation of the recommendation, in comparison to other waterfront-related projects in Kingston, is not a significant undertaking in terms of financial and physical feasibility. This notion is supported by the City's *Waterfront Master Plan*, which ranks the Rotary Park improvements as having "High Viability" potential.

A highly viable project possesses little to no barriers impeding the completion of the project. The financial cost of implementing the recommended improvements to Rotary Park in the City's *Waterfront Master Plan* totals to $340,000.00. It is assumed the recommendation will be within 10-15%of that price due to potential minor variations in recommendations, construction, and labour; therefore, approximately $290,000.00-$375,000.00.

Implementing the measures relies on the City's willingness to upgrade the park's waterfront, and permission from the Cataraqui Region Conservation Authority, due to the waterfront's designation as Environmental Protection Area. The City just completed Rotary Park improvements to the playground structure, so there may be apprehension to dedicate more funding to the park's waterfront. The development would also be subject to Ontario Regulation 148/06 and require an Environmental Impact Assessment to ensure no negative effects arise. Due to the low impact nature of a dock, naturalized benches, and public art, the approval process for development is not expected to be problematic. A 0-5 year timeframe for this recommendation is viable due to the relatively low cost and minimal policy barriers.

7.2 Implement Shoreline Protection

Affected Stakeholders: City of Kingston, Utilities Kingston, Cataraqui Region Conservation Authority

Implementation Timeframe: 0-5, 5-15 years (soft and hard engineering approach

Resource allocation: Low (Joint Planting) to High (Stepped Armour Stone)

Description of Problem:

As the effects of climate change continue to become more evident throughout the world, it is crucial to recognize the Lake Ontario's shorelines are exceedingly at risk of accelerated erosion and habitat disruption. The City of Kingston currently boasts 280km of Lake Ontario shoreline, with dynamic stone revetments currently utilized to protect it from erosion that may result from natural and human activity. Over the years, Kingston has demonstrated a commitment to shoreline stabilization, through efforts such as the 1997 Kingston *Waterfront Stabilization Study* and the City of Kingston *Official Plan* policy that establishes a 30m Ribbon of Life alongside the water in order to protect the shoreline ecology.

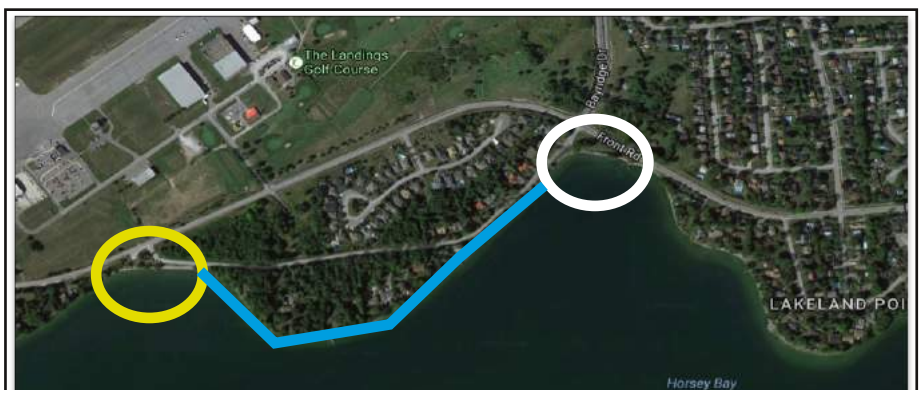


Figure 7.5: Aerial view of Smugglers Cove (yellow) and Horsey Bay Parkette (white), with shoreline outlined in blue.

This commitment to shoreline stabilization is also rooted in the desire to create a continuous, publicly accessible waterfront that supports recreational and environmental mandates.

While major sections of the Downtown Kingston waterfront illustrate adequate erosion control, the 1.11km shoreline between Horsey Bay Parkette and Smugglers Cove Parkette along Old Front Road present a different story. The methods for erosion control between the two parkettes are fragmented, with stone revetments interposed with rock beaches that provide insufficient erosion control and waterfront access. The City of Kingston *Waterfront Master Plan* has recently identified Smugglers Cove as a potential for green space development and waterfront access, with the existing issue of shoreline erosion. In addition, parcels within Horsey Bay Parkette demonstrate the negative effects of development along the shoreline whereby the absence of vegetation alongside the impermeable road surface has increased stormwater runoff and the rate of erosion.

While erosion is a natural process that can occur from consistent wave action, human activity and development can exacerbate it and as such, shoreline stabilization has become a necessary factor in protecting the land. In 2001, the City of Kingston commissioned a shoreline protection project along Old Front Road with the construction of a stone revetment. Between Horsey Bay and Smugglers Cove, the design and irregular placement of the rocks and concrete blocks along this shoreline provide very little habitat support for fish and other wildlife in the area. With a lack of vegetation, fish species are left without a natural food source or cover from predators. While the City approved the development of an off-site fish habitat by the Cataraqui Region Conservation Authority to offset the disruption of aquatic species, this hard engineering approach along the shoreline that stands in such close proximity to the Lemoine Point Conservation Area demonstrates a significant problem – the site requires greater incorporation of shoreline stabilization efforts with environmental measures, including habitat protection and enhancement.

Figure 7.6: Eroded section of land at Horsey Bay Parkette.

Figure 7.7: Disconnected erosion control at Horsey Bay Parkette with no vegetation and habitat support (top and bottom).

Both parkettes are lacking in safe, direct access to the waterfront. Instead, they display disturbed areas with exposed soil and rock that are susceptible to soil erosion. These informal paths are a direct result of foot traffic from park users. Soil compaction as a result of this foot traffic, as seen in the photograph on the right, reduces the infiltration capacity of the land and intensifies runoff which permits nutrients and soil deposits to enter the lake, subsequently resulting in greater levels of erosion.

Figure 7.8: Soil erosion due to informal pathway at Smugglers Cove (left) and informal pathway leading to waterfront at Horsey Bay Parkette (right).

Description of Recommendation:

Option 1: Soft Engineering Approach – Joint Planting

Within the recommendation of implementing better erosion control along the Smugglers Cove and Horsey Bay Parkette shoreline, there are two options: soft engineering and hard engineering. The soft engineering approach for shoreline stabilization requires the implementation of a joint planting process which involves driving live stakes of native vegetation into the openings between stones in shoreline revetments or riprap. This process creates a riparian habitat where hard erosion control structures have already been installed, softens the shoreline, and requires low maintenance once established. In addition, joint planting allows for supplementary erosion control as the live stakes form a root mat beneath the stone revetments to bind soil in place.

Figure 7.9: Existing conditions of revetments at Horsey Bay Parkette shoreline (left) and potential for vegetated riprap (right).

The advantages of soft engineering or bioengineering significantly outweigh the benefits of un-vegetated stone revetments in a number of ways. Sections of shoreline that have undergone bioengineering in the form of joint planting provide long-term erosion control and habitat protection. As the live stakes mature and roots take hold of the soil, they have the capacity to stabilize the shoreline beyond the lifetime of stone revetments or riprap, without the additional cost of replacing the structures. If installed correctly, bioengineered erosion controls will repair

themselves as a result of the resiliency of the native vegetation. The mature plants also provide an additional buffer from riprap or stone revetments to disperse energy created from wave uprush. This protects against erosion, increases shoreline stability, and ensures the durability of existing erosion controls.

Joint planting also presents a number of opportunities for ecological enhancement and biodiversity. The use of native vegetation assists in the suppression of invasive plant species while providing cover for aquatic species and habitats in areas where none would normally survive due to the bare stone revetments. Increased vegetation cover within the stone revetments provides a constant source of food for native fish species, maintains lower water temperatures, and reduces the potential of pollutants and sediment entering the lake. While this approach has great potential for enhancing the ecological and scenic value of the shoreline between Horsey Bay and Smugglers Cove Parkettes, it also presents a cost-effective method for implementing erosion control. Conventional hard engineering processes along the shoreline entail the use of large machinery that can cause irreversible damage to the delicate ecology of the shoreline and require extensive funds to complete. In contrast, joint planting decreases the use of heavy equipment and results in lowered costs and greater environmental benefits.

Option 2: Hard Engineering – Stepped Armour Stone

There is a little over 1km of shoreline between Horsey Bay and Smugglers Cove Parkettes that runs through both public and private lands. Both parkettes have been identified as key points for waterfront access under the City of Kingston *Waterfront Master Plan*. Putting aside the issue of developing behind private lands, the shoreline between the two parkettes presents a unique opportunity to enhance erosion control with robust engineering while still providing areas for wildlife and habitats to thrive. This vision can be achieved with a stepped armour stone shoreline, extending from one end of Smugglers Cove to Horsey Bay Parkette. The armour stone would incorporate gaps to allow for habitat ‘chambers’ within the water for the revitalization of native aquatic species in the area.

A similar project was successfully completed at Guthrie Park in St. Clair Township, Ontario in 2008 by the St. Clair Region Conservation Authority. The shoreline restoration scheme, which began in 2001, replaced 700m of deteriorating sheet pile wall with stepped armour stone and sloped rip rap. The stepped armour stone sections also incorporate native vegetation to provide habitat pods for fish, birds, and other wildlife. The shoreline now serves as a hub of wildlife activity and recreational access to the waterfront.

Figure 7.10: Complete Guthrie Park shoreline restoration.

Creating an armoured shoreline between Horsey Bay and Smugglers Cove fills in the gaps of eroded sections and establishes a more uniform method of erosion control to replace the disjointed revetments that currently exist. This approach to shoreline protection and restoration presents some unique challenges for the Kingston waterfront due to the private lands that abut the waterfront, with even greater benefits. Incorporating ecological principles with an armoured shoreline significantly reduces erosion, is a durable solution for shoreline restoration, and enhances aquatic wildlife. In addition, it provides safe and easy access to the water from Horsey Bay and Smugglers Cove parkettes exclusively.

Figure 7.11: Infiltration steps leading down to waterfront

Aside from the direct shoreline protection initiatives, both parkettes also present opportunities to for safe, direct access to the waterfront. In order to stabilize the informal paths that have been created by park users, infiltration steps can be installed. These steps are made up of crushed stones within a timber framework and can provide supplementary erosion control by restraining any lose sediment in place while also directing park users to one path to reduce the potential of foot traffic eroding the surrounding land. Infiltration steps are also ideal for shoreline slopes as they will accumulate and absorb any runoff to ensure it does not enter the lake. The access provided by these steps are exclusive to the publicly owned lands at Horsey Bay and Smugglers Cove Parkettes.

Proposed Implementation Strategy:

An implementation plan for the joint planting approach to shoreline protection and restoration begins with the creation of an inventory of natural heritage features and identifying sensitive areas with aquatic and terrestrial habitat potential along the 1.11km of shoreline between the two parkettes. The second step requires the design a site planting plan for areas identified for revegetation along the stone revetments. Joint planting within the existing revetment structure is ideal as it involves the use of very little machinery, with live stakes being hand-installed between the rocks. The live cuttings have to be soaked for 14 days prior to installation and must stand higher than any proximate plants to ensure that vegetative cover does not hinder their growth. These stakes require root to soil contact and as such, stems must be long enough to jut out of the stone while also reaching beneath the soil to reach water reservoirs in a dry climate. The plants are generally placed in a grid pattern, 2 feet apart from one another to ensure healthy growth and effective shoreline cover. Higher numbers of live cuttings are encouraged in the first year to compensate for the low resiliency of stakes in the first year. The cost of this method of supplementary erosion control can range from $6 to $15 per each live stake, including the cost of collecting, transporting, storage, and general process management.

Implementation of an armoured shoreline with habitat chambers is a more extensive project that employs a larger amount of resources and funds. Based on the St. Clair Township Guthrie Park Shoreline Restoration Project cost of $2.5 million for a 700m shoreline, it is estimated that the

1.1km of Kingston shoreline identified for the recommendation will require approximately $3 million. This form of erosion control typically consists of excavating the existing shoreline and replacing it with stone revetments that lead into the water. Low-impact machinery should be considering for this project to ensure a reduced capacity of soil compaction in the surrounding land. Following this, native vegetation must be planted to provide for habitat restoration and increase in biodiversity. A partnership with the Cataraqui Region Conservation Authority is recommended to conduct environmental impact assessments along the shoreline and assist in restoring disturbed aquatic habitats.

The infiltration steps can be installed with simple design guidelines and engineering procedures. Along with the installation of the steps, it is recommended that the City of Kinston partner with the Cataraqui Region Conservation Authority to vegetate the sides of the steps with native plants from the Lemoine Point native plant nursery to supplement erosion control and filter any runoff. As it requires some low-level machinery and human labour, the resource allocation for this project ranges from medium to high, including the cost of materials such as pea stone.

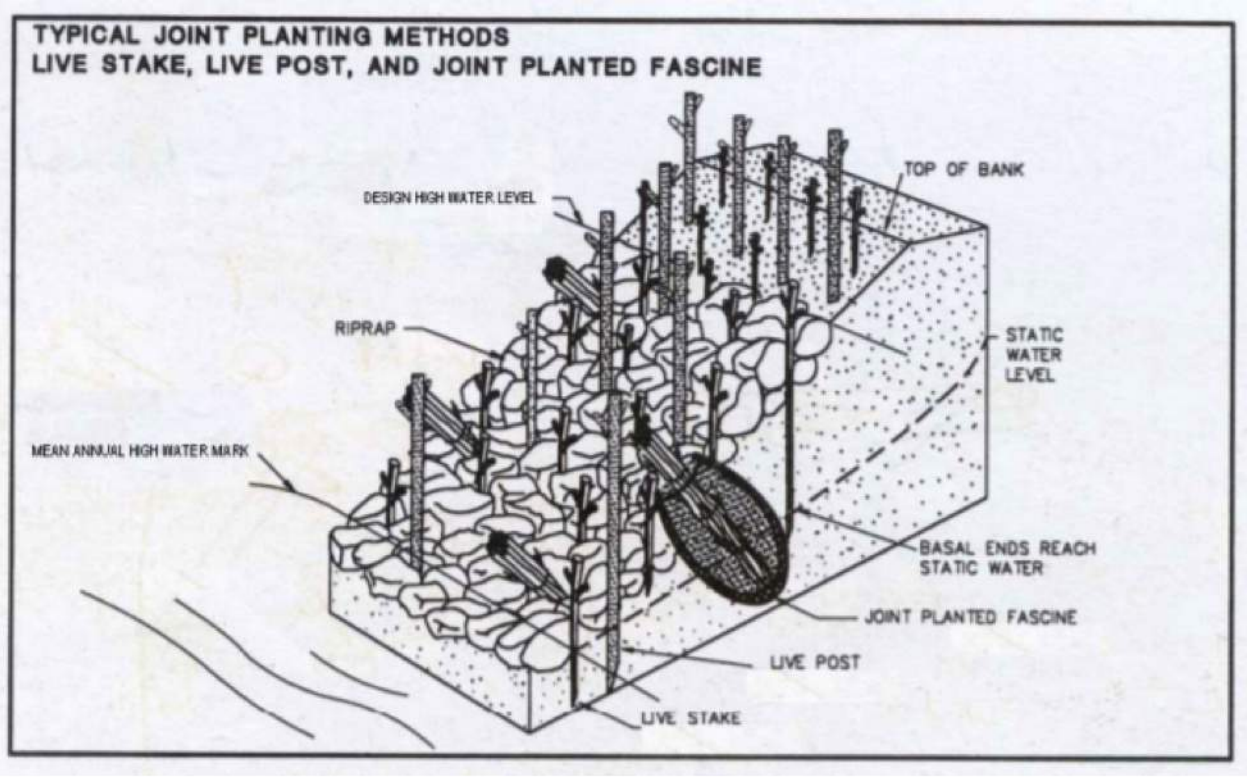


Figure 7.12: Illustration of a modified joint planting scheme within existing riprap.

7.3 Transition the Weatherall Property

Affected Stakeholders: Cataraqui Region Conservation Authority, and Norman Rogers Airport

Implementation Timeframe: 5 – 15 years

Resource Allocation: Medium to High

Description of Problem:

Public waterfront access within the Lemoine Point area is restricted to the Lemoine Point Conservation Area, Rotary Park, Horsey Bay Parkette, and Smuggler's Cove Parkette. Despite the numerous waterfront options available, each option presents significant limitations to the user's enjoyment of the waterfront experience. The Conservation Area, due to its strong environmental mandate, permits only passive forms of water recreation such as nature viewing. The two parkettes are small in size, and therefore unable to offer waterfront amenities other than view appreciation, and swimming. Lastly, Rotary Park's existing waterfront is underutilized, and similar to the other three public waterfront properties, places an emphasis solely on swimming and view appreciation.

The lack of existing waterfront opportunity, and the close proximity of the two primary public waterfront properties, Rotary Park and the Conservation Area in the North section of Lemoine Point, has lead to significant human and vehicle traffic concentrated in the northwest end of the area. While usage is encouraged, parking limitations and road conditions do not adequately meet the demand of usership. The recent purchase of the Weatherall property presents the City with the opportunity to spread, and connect waterfront usage within Lemoine Point to relieve the Northwest area of significant vehicle and human traffic.

Figure 7.13: Aerial views of the Weatherall property (left and right). The property is proposed to contribute to waterfront pathway connection from Lemoine Point to Front Road in the *Waterfront Master Plan*.

The Norman Rogers Airport has dedicated flight paths directly above the property, due to the airport occupying abutting land to the North. Due to warranted safety concerns with the flight paths, permitted uses at the Weatherall property must respect the air space above them. This means activities such as kite boarding, or activities that attract bird species should be discouraged. In regards to the site's topography, the property has four hectares of significant woodlands, and a rugged shoreline difficult for water entry. In order to create a publicly-accessible property that emphasizes waterfront experiences, and attracts users from the other waterfront properties in Lemoine Point, these problems must be resolved.

Description of Recommendation:

The Weatherall property was under private ownership during the creation of the City's *Waterfront Master Plan*. The property is included under Project #3.09 – Waterfront Pathway Connection – From Lemoine Point to Front Road in the *Plan*. The project entails connecting the waterfront trail from Front Road to the Lemoine Point Conservation Area. With the recent purchase of the Weatherall property, the trail connection from Front Road, and traversing through the property to the water can be constructed. In order to connect this portion of the trail to the Conservation Area, the Lemoine Point Farm will need to be involved in the process. The trail can be potentially implemented through the farm property with easements. Refer to Recommendation 6.1 which discusses a potential easement strategy.

The initial stage for the transition of the Weatherall property involves applying for an *Official Plan* Amendment and Zoning Bylaw Amendment to change the property's designation from Residential to Open Space, and the zoning from Development to Open Space. Following this, the Weatherall property will be enhanced through emphasizing and preserving the existing significant woodlands, increasing access to the water for all users, and absorbing park users from other Lemoine Point properties to relieve over usage.

Water Access: Similar to the recommendation for improvements to Rotary Park (See Recommendation 7.2 Rotary Park Improvement, the Weatherall property's waterfront should be enhanced to allow for a variety of recreational activities. The shoreline is currently unfriendly to users and pleasure crafts due to the rugged, rocky terrain. To allow for easy, convenient access, an access point similar to the precedent above, would facilitate safe entry and exit for swimmers, kayakers, and paddlers. This access point will also serve as a key rest spot or view point for paddlers moving along the shoreline on Lake Ontario.

Natural Heritage: The four hectares of significant woodlands existing on-site will be preserved for ecological value and passive recreation. The woodlands contribute to the greater natural heritage system prevalent in the Lemoine Point area, and within the City of Kingston, and add a unique dimension to the Weatherall property's landscape.

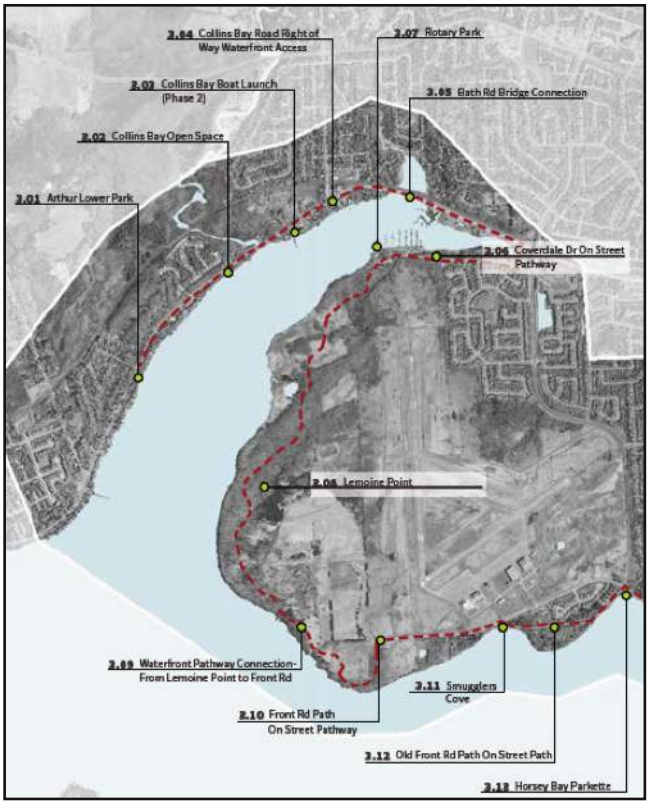


Figure 7.14: The recommendation for the Weatherall property seeks to implement the Waterfront Master Plan's goal for the property to extend the Waterfront trail.

Figure 7.15: An example of increased water access.

A viewing structure and additional low impact trails, will be constructed to allow park users to venture through, and enjoy the woodlands.

Recreational Opportunity: Recreation on the property will include the Waterfront trail, open space and water recreation. Garbage receptacles on the property will be enclosed to prevent attracting birds to the property which may interfere with the airport's flight paths. A link will be implemented connecting the Weatherall property to Rotary Park for park users to move from the South end of Lemoine Point to the North end. The link can be found in Recommendation 8.1 Increase Active Transportation Linkages. This connection is a key aspect of the Weatherall property and for the Lemoine Point area, as it allows users to engage in recreational activities at connected waterfront parks, while relieving human pressures on the Lemoine Point Conservation Area.

Figure 7.16: Examples of a viewing structure located within woodlands (left) and a rendering of a Lemoine Point waterfront trail through the Weatherall property (right).

Proposed Implementation Strategy:

The implementation of this recommendation, similar to the Rotary Park recommendations, relies on the City's budget and project prioritization, and the Cataraqui Region Conservation Authority's approval of the proposed site plan. According to the *Waterfront Master Plan*, the project involving the Weatherall property is ranked #30 out of 138 waterfront-related projects (City of Kingston, 2016). Despite the high priority of the project, the project is classified as "Low Viability" of occurring (City of Kingston, 2016). This is due to the assumed difficult task of acquiring the private properties, or receiving permission from the property owners to implement a traversing trail on each property. With the Weatherall property now under public ownership, the viability of the implementation of the recommendation is ranked as "High" due to the recommendation focusing strictly on the property. Policy barriers would potentially stem from the Cataraqui Region Conservation Authority. See Recommendation 7.2 Rotary Park for the required approval process.

The financial cost of implementing the *Plan's* project is $1,040,000.00 (City of Kingston, 2016). The *Plan's* cost, however, involves additional properties from the Weatherall property, such as the Lemoine Point Farm and private properties East along the shoreline. The *Plan's* cost also deals strictly with trail construction, and not the proposed park enhancements for the Weatherall property stated above. By utilizing the Waterfront Master Plan's estimate of $340,000.00 for Rotary Park's waterfront improvement project, and incorporating additional costs for land-oriented park infrastructure, the total cost of the Weatherall property's transition is estimated to range from $500,000.00-$750,000.00. The $1,500,000.00 purchase price for the land is not included in the total calculation. Due to the amount of funding and planning involved in the Weatherall property's enhancement, a timeframe of 5 – 15 years for completion is estimated.

7.4 Encourage a Passive Water Recreation Network

Affected Stakeholders: Collins Bay Marina, City of Kingston (Weatherall Property Purchase

Implementation Timeframe: 0-5 years, 5-15 years

Resource Allocation: Low to Medium

Description of Problem:

The City of Kingston *Waterfront Master Plan* is built upon the three mandates of Access, Connections, and Enhancement. The *Plan* has dedicated a great deal of its policies to focusing on waterfront connections, with the understanding that a continuous waterfront connection is not entirely possible due to certain lands held under private property ownership. The connectivity of green spaces is simply part of the issue regarding public waterfront and water access. The *Waterfront Master Plan* mandates that while connections can be made through new linkages, they are also based on seizing existing opportunities for waterfront access from public spaces. However, this has yet to be addressed within the Lemoine Point area as there is a significant oversight concerning its potential to become a premier site of both conservation and public water access.

The Collins Bay Marina actively supports access to the water through water based recreation activities. However, there is a gap in the possible connections from the Marina to the publicly owned spaces in the Lemoine Point area. This presents an opportunity to link Collins Bay Marina with other publicly accessible waterfront assets. A central issue that has contributed to this omission in water access and connectivity is the lack of investment in park infrastructure that would allow boats or kayaks to dock and very little support for public access to and from the waterfront through these public lands. They are even absent of the most basic piers that would create minimal habitat disturbance while still engaging the public with the water.

Figure 7.17: Pier and canoe dock.

Description of Recommendation:

To enhance waterfront connectivity and water access, it is recommended that a passive recreation water route be established around the Lemoine Point site. A network such as this offers various linkages around Lemoine Point, beginning in the Collins Bay Marina and connecting to other city-owned waterfront access sites including the Weatherall Property, Smugglers Cove Parkette, and Horsey Bay Parkette. The emergence of the Collins Bay Marina over the last three to four decades as an established entity in the North end of Collins Bay presents an opportunity to employ the existing infrastructure, such as storage facilities and docks, for passive water recreation crafts including canoeing, kayaking, and paddle-boarding. Ideally, the Marina would be able to collaborate with the City of Kingston to successfully develop this recommendation, with the added incentive of financial benefits for the marina with the increased use of their facilities and rentals.

The City's newest land acquisition in the form of the Weatherall Property just South of the Lemoine Point Conservation Area presents an additional opportunity to anchor a water access loop around the Conservation Area (See Recommendation 7.2). With the two "bookends" of waterfront access established around the Lemoine Point Conservation Area, it is the hope that usership of the Conservation Area would be dispersed to the surrounding sites to support the long-term preservation of the site's natural heritage features, while still allowing users to access the beauty of it. If the Lemoine Point site becomes known for passive water recreation, there is significant potential to link the network to the infrastructure located in downtown Kingston.

Proposed Implementation Strategy:

A potential passive water recreation network was developed for this report (See Appendix B, Figure B5), with mooring points located at the Collins Bay Marina, the Weatherall Property, Smugglers Cove Parkette, Horsey Bay Parkette, and Crerar Park. Implementation of this recreation network and linkages would requires the Collins Bay Marina to establish a partnership framework with the City of Kingston regarding a canoe/kayak/paddleboard rental program that is linked to the city-owned properties. While this initiative would require more resources than individuals utilizing their own water transportation devices, a rental scheme would encourage a larger number of users and increase revenue for the marina.

Another key factor in the successful implementation of a water access loop around Lemoine Point is the development of the Weatherall Property to better receive passive recreation users from the water. While the existing conditions of the shoreline at the property would suffice for this purpose, a formally established mooring location would be necessary in the long-run along with access to Front Road from the shoreline. This access would be informed and supplemented by the conservation corridor that is recommended for Front Road leading into the Lemoine Point Conservation Area (See Recommendation 6.3 Establish Conservation Corridors).

7.5 Create Natural Rest Stops Along North Shore

Affected Stakeholders: Cataraqui Region Conservation Authority

Implementation Timeframe: 0-5 years, 5-15 years

Resource Allocation: Medium

Description of Problem:

The current trail system within the Lemoine Point Conservation Area runs alongside the majority of the site's shoreline, with multiple benches provided along the way. Much of this shoreline trail is forested, with certain access point to the water through sparse gaps in the trees or steep slopes leading down into the water. One section of the Conservation Area that permits direct access to the water within a clear space is the Northwest shore. This segment of land is characterized as a fairly naturalized site with unevaluated wetlands and is currently linked from the North parking lot to the Service Road/cycling trail, presenting an accessible path to the Shore Trail.

Figure 7.18: Aerial view of Northwest shore at the Lemoine Point Conservation Area.

One issue with this unique area is the lack of natural seating that would otherwise allow all types of users, including those with mobility difficulties, to rest and enjoy the waterfront. There is also currently only one wooden bench to service this segment of the shoreline. The site is also absent of clear access points or demarcations to where the Service Road leads into the Northwest shoreline stop. It should also be noted that viewpoint of the Shore Trail into the Northwest shoreline is currently inaccessible to those with mobility devices or aides.

Figure 7.19: Current condition of Northwest shoreline.

Description of Recommendation:

The Northwest shoreline displays the greatest potential for an engaged waterfront experience, as the 1999 *Conceptual Plan for Lemoine Point Conservation Area* identified it as an ideal spot for a wading area as well as natural and unstructured seating areas due to the angle of the shore and the remarkable views into the water.

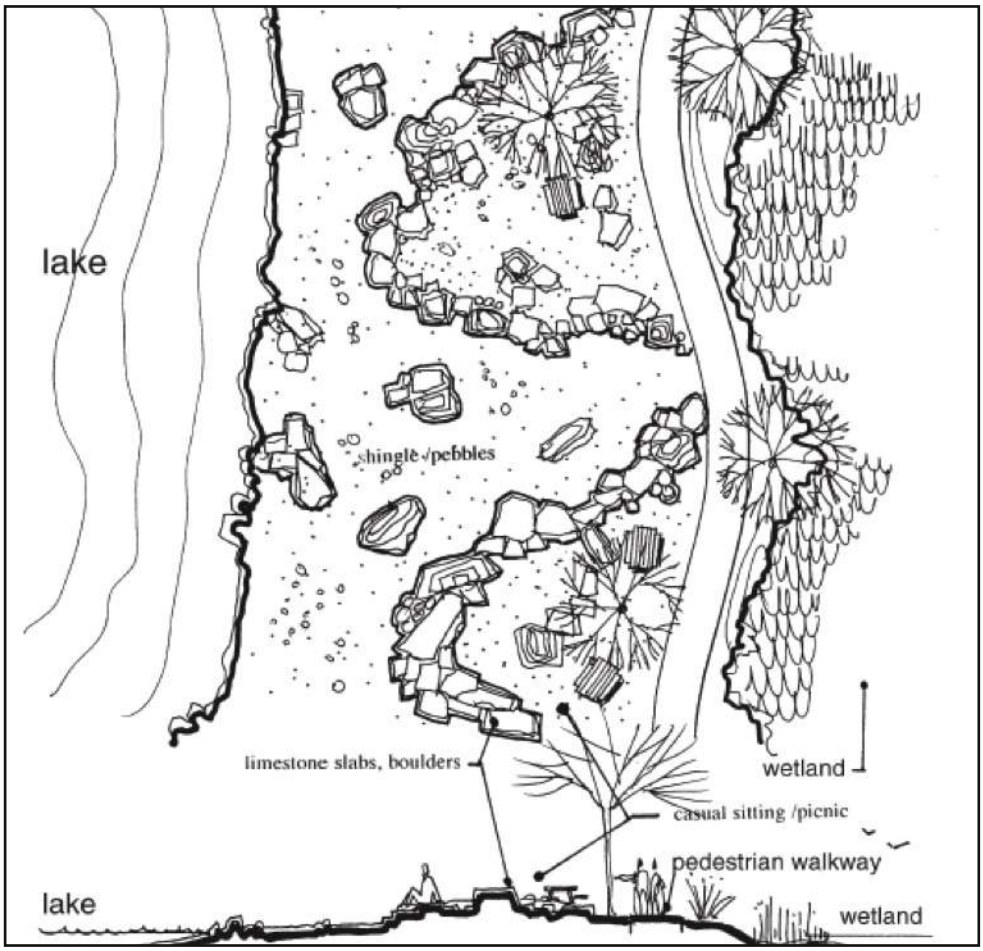


Figure 7.20: Illustration of enhanced shoreline with seating along the Northern wetlands according to the *Conceptual Plan for Lemoine Point Conservation Area* (1999).

Keeping with the initial objective of the *Conceptual Plan*, the first recommendation is for the Cataraqui Region Conservation Authority to install naturalized seating directly along the shoreline. The seating can be comprised of limestone or armour stone rock or even tree stumps, enhanced with native shoreline vegetation to provide shade for users and enhance shoreline stability. Naturalized seating is a requirement for this recommendation to augment the natural characteristics of the site sand ensure that park infrastructure is not a staple within a conservation area.

These rest stops are vital features in maintaining an effective trail network throughout the Conservation Area. They not only provide respite for trail users, but also increase 'access' to the waterfront in a manner that is different from the existing trails that simply require individuals to pass by the stunning natural features along the shoreline. Waterfront access has been consistently identified as a key mandate in in all types of planning policy in Kingston. Along with the City of Kingston *Waterfront Master Plan*, a report on Kingston's participation in the WALK Friendly Ontario pilot project in 2013 recommended providing greater pedestrian access to the water in parks and from trails to increase the pedestrian 'friendliness' of the city. This access would be supplemented by providing resting spots for the public.

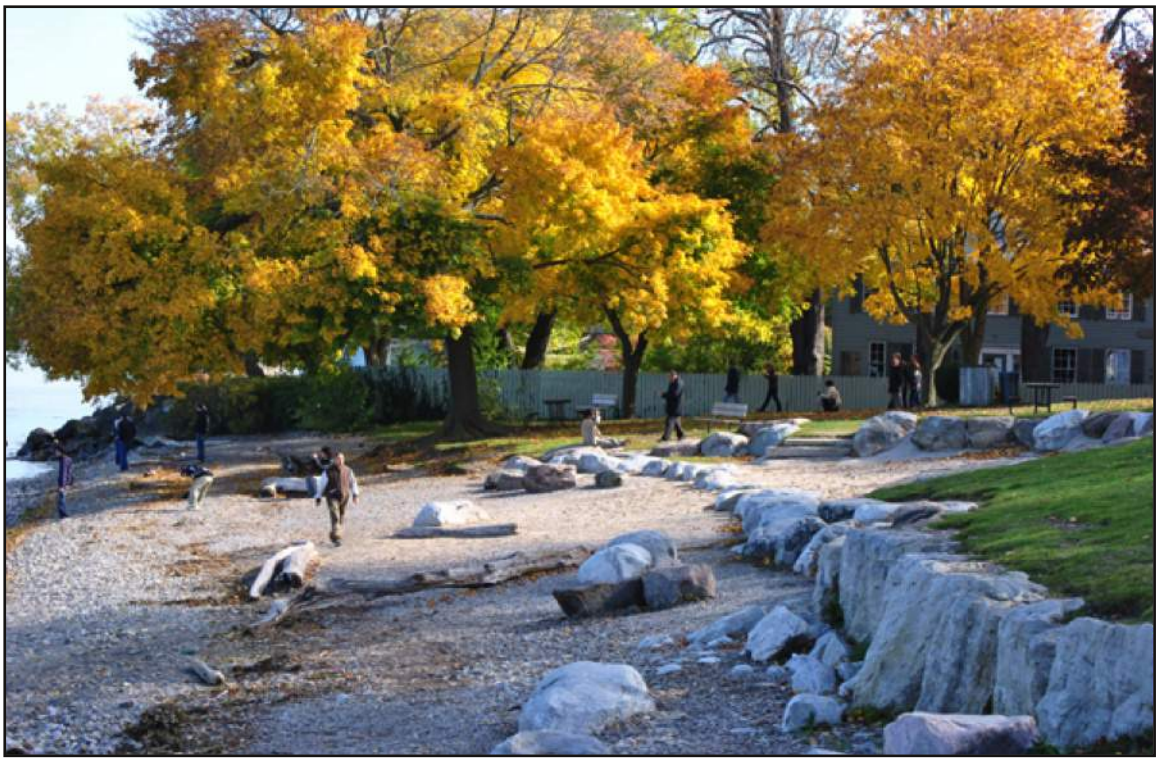


Figure 7.21: Log and boulder naturalized seating along shoreline.

Accompanying the recommendation for creating naturalized rest spots along the Northwest shoreline is the proposal to relocate the existing site bench closer to the accessible Service Road/cycling trail that runs almost perpendicular to the Northwest shoreline. The bench would have to be placed on a non-slip surface, such as cement, with a similar surface connection to the cycling trail. Pursuant to the Ontario Human Rights Code that protects the fundamental rights of every person to be included, respected, and maintain their dignity in all realms of the public sphere, it is important that accessible seating is provided for even this small section of the

Conservation Area. It also reflects one of the key mandates of the City of Kingston *Official Plan* to remove barriers to all citizens within the City with the promotion of universal design principles.

Proposed Implementation Strategy:

This particular recommendation presents a durable solution to providing passive waterfront access within a significant natural heritage feature of the Lemoine Point Conservation Area. As such, it necessitates an environmental impact assessment and view studies to determine the best sites for the naturalized seating. Implementing naturalized seating itself along the Northwest shoreline requires a medium level of resource allocation as a result of the cost of materials, transportation, and installation of seating. It is recommended that a volunteer program be established through the Cataraqui Region Conservation Authority, in partnership with groups such as the Friends of Lemoine Point, to encourage public participation in enhancing the environment of the Lemoine Point Conservation Area North-West shoreline. Not only does this reduce the need for human capital and funds, it provides the Conservation Area users with a greater sense of place and responsibility to help maintain the infrastructure. Relocation of the bench and subsequent accessible design implementation of the seating area should utilize low-impact machinery.

Chapter 7.0 References

Beach, C., & Bain, G. (2013). Walk Friendly Ontario – Pilot Project Outcomes(Rep. No. EITP-13-012). Kingston, ON: City of Kingston.

Brodie, I. (Ed.). (2004). Accessible Design for the Built Environment. Canadian Standards Association. Ottawa, ON.

Canada, Ministry of Environment, Okanagan Region. (2006). Best Management Practices for Lakeshore Stabilization. Penticton, BC.

City of Kingston. (2016). Waterfront Master Plan. Retrieved from https://www.cityofkingston.ca/city-hall/projects-construction/waterfront-master-plan

City of Kingston. (2015). Official Plan.

City of Kingston. (2014). Public Art Master Plan. Retrieved from https://www.cityofkingston.ca/explore/culture-history/arts/public-art

City of Kingston. (2016). Parks, Trails and Sportsfields. Retrieved from https://www.cityofkingston.ca/residents/recreation/parks-trails

Conservation Practices for Homeowners. (2006). Maine Department of Environmental Protection Fact Sheet Series.

Crown Landscaping. (n.d.). Retrieved from http://crownlandscaping.ca/portfolio.php

Dave Calver Consulting. (2008). Design Considerations For Accessible Parks & Trails. Campbell River, BC.

Dock Doctors. (2016). Dock Systems. Retrieved from http://thedockdoctors.com/dock-and-launch-systems.html

Federation of Vermont Lakes and Ponds. (2015). A Guide to Healthy Lakes Using Lakeshore Landscaping(Rep.). VT.

Flagler. (2015). Public Art Soars Increasingly Into View, Part of Gargiulo Foundation's Gifts to Palm Coast. Retrieved from https://flaglerlive.com/81079/gargiulo-foundations-public-art/

Moore Iacofano Goltsman Inc. (2006). Park and Trail Accessibility Design Guidelines(Rep.). Berkley, CA.

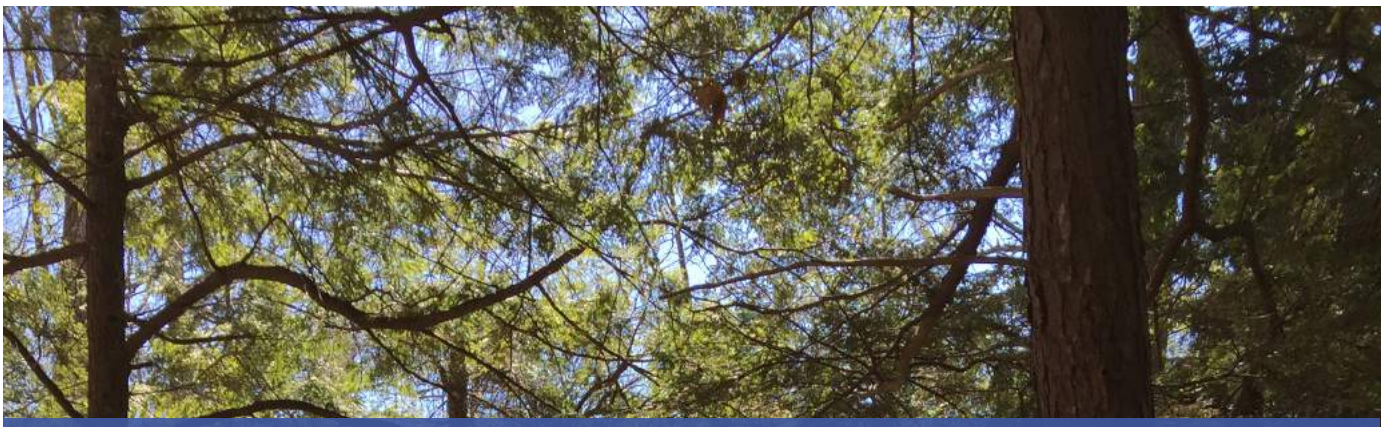
National Engineering Handbook. (2007). Streambank Soil Bioengineering, Technical Supplement 14I, Part 654. Retrieved from: https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17818.wba

S Golden & Associates. (2008). Accessible Parks and Trails Assessment Toolkit Appendices A-E. BC.

SRCA. (2016). Erosion Control Projects: St. Clair Region Conservation Authority. Retrieved from https://www.scrca.on.ca/flood-and-erosion/erosion-control-projects/

Sotir, R., & Fischenich, C. (2001). Stability thresholds for stream restoration materials. EMRRP Technical Notes Collection. ERDC TN-EMRRP-SR-35. Vicksburg, MS: U.S. Army Engineer Research and Development Center

Yelp. (2016). Hunters Point South Waterfront Park. Retrieved from https://www.yelp.com/biz/hunters-point-south-waterfront-park-long-island-city



Chapter 8.0
Pillar 3: Sustainable Development

8.0 Sustainable Development

8.1 Increase Active Transportation Linkages

Affected Stakeholders: Lemoine Point Conservation Area, Neighbourhood Residents, City of Kingston

Implementation Timeframe: 15+ years

Resource Allocation: High

Description of Problem:

Kingston's public waterfront trail is a key feature of the Lemoine Point area and connects to the larger 1600km Great Lakes Waterfront Trail of Southern Ontario. This trail, which was created to celebrate and reconnect people to the Great Lakes waterfront, is a widely used recreation attraction by both Canadians and tourists from around the world.

In our study area, there is a dedicated multi-purpose portion of the waterfront trail that runs through the Lemoine Point Conservation Area on a pathway called Meadowlark Lane. Alternatively, there are on-road routes along Bayridge Drive, Front Road and Coverdale Drive.

However, some problems with the safety, connectivity and overall user friendliness of the waterfront trail and other active transportation routes in this study area have been identified.

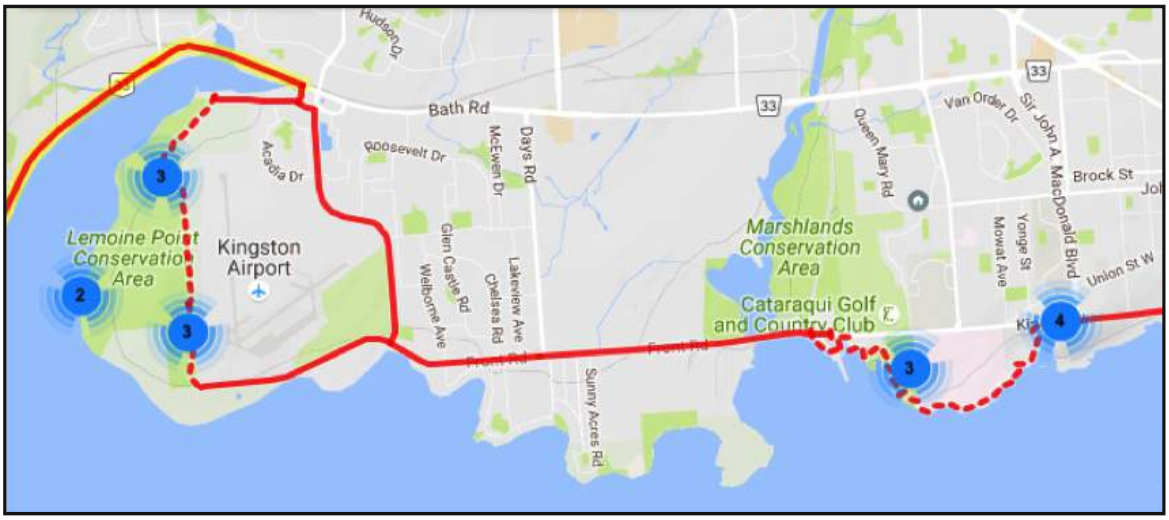


Figure 8.1: The waterfront trail runs along Meadowlark lane, Bayridge Drive, Front Road and King Street West. The continuous red line signifies the on-road portion of the trail, with sections that share the path with vehicles. The dotted red line signifies a dedicated multi-purpose trail.

For example, Bayridge Drive, Front Road, Bath Road and Days Road are all main arterial streets that experience a significant amount of fast moving vehicular traffic. With cycling lanes that share these streets with other traffic and are at best delineated by a white line, it can be hazardous and even intimidating for cyclists to navigate these routes.

Figure 8.2: Kingston's *Transportation Master Plan* map illustrating the existing cycling lanes (green) within the study area. Notice the lack of connectivity along Bath Road, Front Road and Coverdale Road.

Figure 8.3: The waterfront trail on Bayridge Drive. Lane is demarcated by a white line and painted cycling signage that offers no physical protection from vehicular traffic.

Figure 8.4: The waterfront trail on Front Road near Invista/Dupont. A white line demarcates the lane which offers no physical protection from vehicular traffic.

Similarly, along Coverdale Drive, which leads into the Lemoine Point Conservation Area from Bayridge Drive, no specified cycling lane exists whatsoever. While this is a residential street, it is still an on-road portion of the waterfront trail and one of two access roads for the Conservation Area users. Therefore, a safe and clearly demarcated bike lane is recommended here.

There are also portions of Bayridge Drive, Front Road, Bath Road and Days Road that do not have a sidewalk for pedestrian usage. For example, a sidewalk exists along Bayridge Drive but ends abruptly at Henderson Boulevard without continuing on.

The discontinuous pattern of sidewalks in the area also prevents pedestrians from walking safely along the entirety of this street and ultimately deters people who live in the surrounding neighbourhoods from considering walking as an appropriate form of transportation.

Figure 8.5: Google Earth image of Coverdale drive without a designated cycling lane.

Figure 8.6: Google earth image of the discontinuous sidewalk along Bayridge Drive that ends abruptly at Henderson Boulevard.

As it exists now, the waterfront trail along Front Road offers very little actual view of the waterfront. While this may be a necessary linkage for most of Front Road, there is opportunity to move a small portion of the waterfront trail onto an interior neighbourhood street to promote the connection of users to the actual waterfront and increase their scenic viewpoints.

Description of Recommendation:

There are several areas that have been identified for improvement along the waterfront trail, as well as at other key streets within the Lemoine Point area. These improvements seek to increase the safety, connectivity and accessibility of road linkages which will help encourage healthier modes of transportation, and provide better active transportation linkages between city assets, such as the Weatherall Property and Rotary Park.

One priority would be to connect the discontinuous sidewalks along Bayridge Drive, Front Road, Bath Road and Days Road to increase active transportation linkages and create a safe and connected route for pedestrians. This will encourage members of the Lemoine Point neighbourhoods and users of the waterfront trail to consider walking as an appropriate, secure and pleasant mode of transportation in this area.

Improving the existing road infrastructure on Bayridge Drive, Front Road, Bath Road, Days Road, Coverdale Road and the Service Road is another opportunity to create safer and user-friendlier cycling paths. Implementing infrastructure that separates cyclists from vehicles is necessary to mitigate the hazards that vehicular traffic poses to cyclists. This could involve many different options including:

- Widening roads that are too narrow for safe cycling paths such as Coverdale Road and the Service Road.
- Raising and separating bicycle lanes and sidewalks on busy arterial streets such as Bayridge Drive, Bath Road, Front Road and Days Road to separate pedestrians and cyclists from the street level.

- Separating cyclists from vehicles using a series of raised concrete parking curbs as a barrier.
- One benefit to using a series of simple parking curbs to separate cycling and driving lanes is the cost efficiency relative to the construction of entirely raised multi-use lanes.
- Paint the portions of the on-road waterfront trail to demarcate the pedestrian use of the road.
- The waterfront trail is an important active transportation and scenic linkage, and painting the on-road portions of the trail incites effective wayfinding for the appropriate waterfront route. This could be incrementally implemented in Kingston with the goal of creating a truly user-friendly, demarcated waterfront trail.

Another suggestion to improve the usability of the waterfront trail in the Lemoine Point area would be to move a small portion of the on-road connection on Front Road through to Old Front Road. This is an interior neighbourhood street that has views of the water and offers cyclists and pedestrians a temporary escape from the busier and less picturesque Front Road. A sidewalk and an attached painted bicycle lane could be implemented to delineate the pathway on the shoulder of the road nearest the water.

This suggestion will likely result in an increase pedestrian and cyclist traffic along Old Front Road, and this may not be seen as a benefit to some abutting landowners. This is a challenge for waterfront connectivity across Kingston. However, additional infrastructure investments in making roadways safer and more connected should been seen as a community investment that enhances the pleasantness of our shared waterfront spaces.

A final and more general recommendation would be to adopt the Kingston Transportation Master Plan's goal of 3% of trips made by bicycle. Since Vancouver is currently recognized as being a leader in cycling within Canada, and since they currently have a 5% share of their trips by bicycle, we feel that this goal of 3% is appropriate and justified.

Figure 8.7: Example of parking curbs being used to create a separated bicycle lane in Ottawa, Ontario.

Figure 8.8: Shoulder of road near Smugglers Cove Parkette on Old Front Road that could be converted into a multi-use bicycle and pedestrian laneway.

Proposed Implementation Strategy:

There are multiple different options along the various routes within this study area to increase the accessibility, connectivity and user friendliness of active transportation linkages so as to encourage healthier modes of transportation. The most cost effective measure to enhance transportation linkages would be to demarcate cycling lanes with line painting and utilize physical barriers like concrete curbs on the roads identified in Table 8.1. The approximate cost of installing separated and paved multi-use paths on all recommended road segments within the study area would be CAD$3,638,022.

Multi-use Path (Paved) Cost:

= US$ 261,000/mile
= CAD$ 219,158/km

Installation of these multiuse paths would effectively establish a safe, user-friendly and connected active transportation loop of Lemoine Point, which would link together the Lemoine Point Conservation Area and the Marshlands Conservation Area.Total cost of implementing this recommendation along identified roads below would be: 16.6km x $219,158 = $3,638,022

Table 8.1: Road segments that could benefit from a separated multi-use path.

Roadway:	Approximate Length (km)
Service Road	1.3
Coverdale Drive	1.2
Bath Road	4.3
Front Road	4.6
Old Front Road	0.9
Bayridge Drive	2.3
Days Road	2.0
Total:	**16.6**

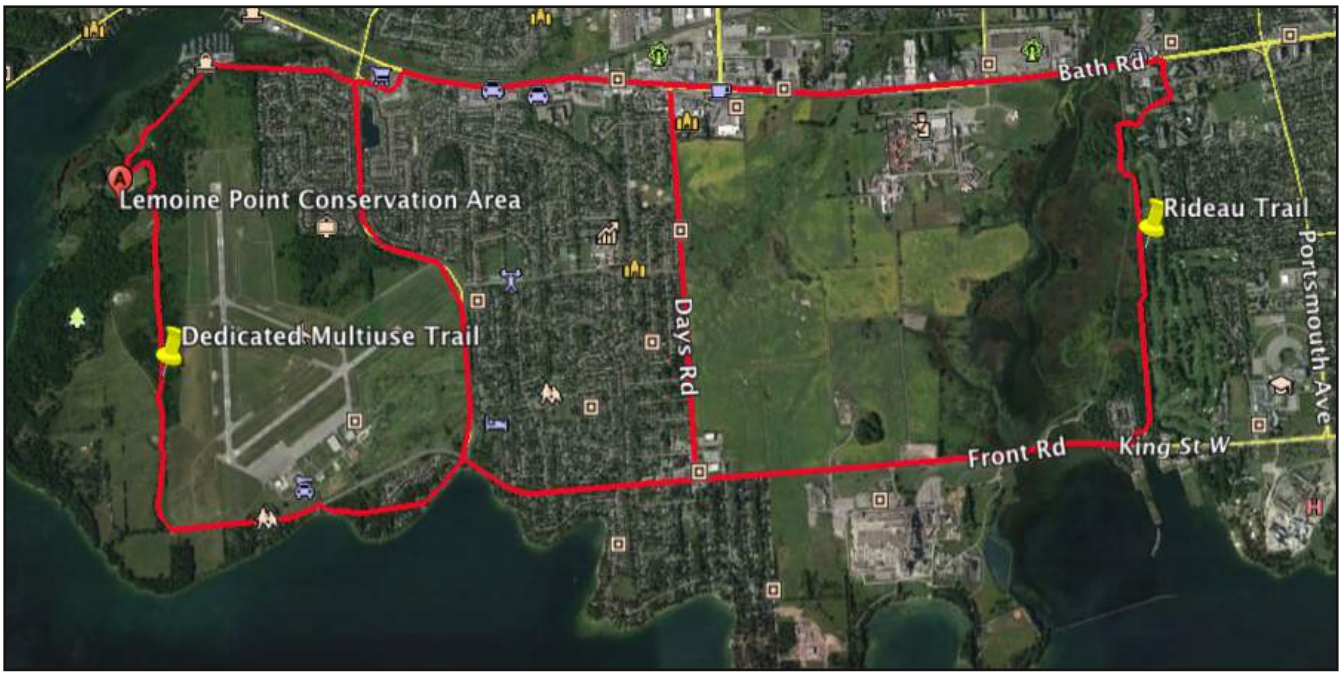


Figure 8.9: A conceptual image of the "Lemoine Point Loop" with recommended active transportation connections throughout the Lemoine Point study area.

8.2 Foster and Accessible Transportation Partnership with Landings Golf Course

Affected Stakeholders: Landings Golf Course, Cataraqui Region Conservation Authority, Friends of Lemoine Point

Implementation Timeframe: 0-5 years

Resource Allocation: Low

Description of Problem:

While the Lemoine Point Conservation Area experiences approximately 300,000 users annually, there is still a lack of universal accessibility to this site, particularly for individuals with physical mobility challenges. With the current trend of a growing aging population in Canada where older adults will become a more prominent demographic in our society, accessibility to the built and natural environment for all members of the community is an increasingly popular concept in recent years. Therefore increasing the opportunity for any individuals who face mobility challenges to better access the natural and cultural heritage of Lemoine Point Conservation Area should be emphasized. This will ultimately help to establish a more fair and equitable Lemoine Point area for Kingstonians.

Description of Recommendation:

There is precedent for this type of programming, as seen in the case of the Ausable Bayfield Conservation Area and the Friends of the South Huron Trail volunteer group. Thanks to generous community donations and donated time from volunteer members, they have developed an effective and beneficial program that shuttles individuals through the Conservation Area on a small-motorized vehicle. The program is called Trail Mobile (as mentioned previously in Cahpter 4.0: Case Studies), it works on an on-demand basis, and it is not unusual for the service to shuttle several hundreds of individuals throughout the trail per season.

This particular program could be recreated at Lemoine Point given its proximity to the Landings Golf Course, which has a fleet of well-maintained golf carts that could be used to shuttle individuals throughout the Conservation Area. A partnership framework between the golf course and the dedicated Friends of Lemoine Point volunteer group, potentially assisted by the Cataraqui Region Conservation Authority would need to be established to make this recommendation possible.

Proposed Implementation Strategy:

The implementation of this strategy will rely on the availability of volunteers from the Friends of Lemoine Point, the willingness of the Landings Golf Course to loan a golf cart, and the viability of a low-impact vehicle on Conservation Area lands. Establishing the parameters of these elements poses the greatest challenge to implementing this recommendation. The Cataraqui Region Conservation Authority will play a role in establishing these elements and framing a partnership between organizations to create innovative ways to increase accessibility to the Lemoine Point Conservation Area, such as a Trail Mobile program.

The pick up and drop off points could be at the Landings club house, and volunteer drivers could shuttle guests along Front Road and onto the service laneway that connects to the Conservation Area. The Cataraqui Region Conservation Authority could work with the Friends of Lemoine Point to ensure that the shuttle service would not negatively impact the environment and conservation lands.

Figure 8.10: Trail Mobile program (left) and Landings Golf Course fleet (right).

For example, the dedicated multi-use trail known as Wowlark Lane could be one potential route for the motorized vehicle to travel along.

This would be relatively low cost, as the golf cart vehicle fleet already exists. Only small associated costs would exist, such as gas for the motorized vehicle. Therefore a small fee for example of $5 per ride could be associated with the shuttle service to cover fuel costs. As the Friends of Lemoine Point is currently in need of volunteers, a call for volunteer drivers could be put out to the community to encourage greater involvement.

8.3 Enhance Water Management at Landings Golf Course

Affected Stakeholders: Cataraqui Region Conservation Authority, Landings Golf Course

Implementation Timeframe: 5-15 years

Resource allocation: Medium to High

Description of Problem:

Golf courses are notoriously ecologically unsustainable as a result of the vast quantities of water they require for maintenance and the threat they pose to native wildlife. The Landings Golf Course located just South of the Norman Rogers Airport does not depart from this reputation. It is a large parcel of land that presents several environmental issues including a lack of effective water management, loss of habitat diversity, and pesticide and nutrient pollution to maintain the greens. These issues are not unique to the Landings Golf Course but do present an opportunity to promote environmentally sound practices without diminishing the recreational opportunities of the golf course.

Figure 8.11: Satellite image of the Landings Golf Course within the Lemoine Point area.

Description of Recommendation:

Encouraging environmentally sound practices and sustainable development are fundamental goals within the Lemoine Point area. Golf courses present a challenge on how to comply with such goals and while still establishing an atmosphere of quality recreation. One option that is available for the Landings Golf Course to mitigate its negative environmental impacts and maintain the integrity of the sport is to become a member of the Audubon International Cooperative Sanctuary Program for Golf. Established in 1991, the Audubon International program supports golf courses in creating Natural Resource Management Plans to work toward the goals of reducing pesticide use, increasing water quality and resource management, and preserving wildlife and habitats. The program consists of educational component that utilizes the expertise of industry leaders, environmental groups, and golf course management to ensure the longevity of the golf course's best management practices. Along with the benefits of enhanced environmental conditions within the greens, Landings Golf Course would also be eligible to obtain the title of a Certified Audubon Cooperative Sanctuary. This is designed to improve the reputation of member golf courses through their implementation of Best Management Practices and provide an incentive for them to comply with the regulations set out under the program.

This type of partnership can be extended to include the Cataraqui Region Conservation Authority as the Landings Golf Course implements the strict criteria for environmental sustainability set out under Audubon International. As such, the recommendation for the golf course incorporates the educational program of Audubon International and the expertise of the Cataraqui Region Conservation Authority to make the following changes within the golf course:

1) A rainwater harvesting program should be installed to irrigate the golf course, with the use of cisterns or rain barrels to exercise better water management practices and reduce golf course's water demand from Lake Ontario.
2) Implement xeriscaping, a method of water efficient landscaping with the use of native, drought-resistant vegetation to reduce the amount of water required.
3) Develop a program, in partnership with the Cataraqui Region Conservation Authority, to reduce pesticide use by employing liquid compost comprised of good bacteria that diminish the land's susceptibility to disease.

Figure 8.12: Rainwater barrels for rainwater harvesting program (right) and xeriscaping (left).

Proposed Implementation Strategy:

Successful implementation of this recommendation begins with the golf course completing a detailed site assessment to determine water use, pesticide use, and habitat loss within the area. The golf course can utilize this information to determine the extent of work that is required for developing and maintaining a sustainable golf course. The next step in the implementation process simply requires the Landings Golf Course to purchase an annual membership with Audubon International. This is necessary to facilitate a long-term commitment to effectively reduce the negative environmental impacts of the golf course and subsequently, reduce maintenance costs over time. A 2011 survey conducted on members of the Audubon International Cooperative Sanctuary Program for Golf showed that 52% have reduced water costs, 70% have reduced pesticide costs, and 51% have reduced waste management costs.

In order to ensure a local presence in assisting the golf course to achieve its environmental mandate through Audubon International, a partnership with the Cataraqui Region Conservation Authority can be developed. The Conservation Authority can offer the necessary resources for such efforts as xeriscaping by providing native drought-resistant plants from the Lemoine Point Native Plant nursery. In addition, a partnership with a conservation authority lends Landings Golf Course greater credibility as a potential leader in sustainable practices. The implementation of this recommendation would require a medium to high resource allocation in terms of staff and capital assets required for retrofitting the golf course with new vegetation and installing rainwater harvesting barrels.

8.4 Improve Norman Rogers Airport Sustainability

This one recommendation is three-fold, and involves pursuing LEED certified construction and retrofits, installing green roofs, and equipping a photovoltaic power station. Each of these three sub recommendations will now be evaluated under the over-arching recommendation of improving the sustainability of the Norman Rogers Airport.

1. LEED Certified Construction and Retrofits

Affected Stakeholders: Norman Rogers Airport

Implementation Timeframe: 5-15 years

Resource allocation: Medium

Description of Problem:

By virtue of the fossil fuels consumed by airplanes, both airports and the aviation industry at large produce significant greenhouse gas emissions, which are the central contributor to climate change. With Norman Rogers Airport's planned expansion on the horizon, it would be advantageous from an environmental perspective to offset some of the environmental impacts by establishing LEED Standards for the buildings at the airport.

Description of Recommendation:

LEED construction means building to a higher standard, so that buildings have fewer negative impacts on human health and are more environmentally sustainable than conventional structures. The rating system works on a points system, where the more points that a building can claim, the higher the rating it will receive. These ratings include:

- LEED Certified: 40-49 points
- LEED Silver: 50-59 Points
- LEED Gold: 60-79 Points
- LEED Platinum: 80 points and above

Points are awarded for various improvements including water use reduction, water efficient landscaping, innovative wastewater technology, optimized energy performance, on-site renewable energy, storage and collection of recyclables, using sustainably certified wood in construction, increased ventilation, indoor chemical and pollutant source control and durable building. We recommend that the buildings at Norman Rogers Airport seek a LEED Platinum certification, though settling for LEED Gold or Silver would still represent very worthwhile improvements.

Recent surveys on LEED construction reveal that builders and developers perceive LEED construction as significantly more expensive. However, the increased cost is only 1% to 2% higher than conventional construction and cost less to operate than conventional buildings. Furthermore, Canadian buildings that have been retrofitted to LEED standard have generally recovered the cost of the retrofits within 7 years of renovation from savings in decreased operating costs alone. Once the cost of the retrofit is recovered, the reduced operating costs will continue to save the property owner money every year thereafter.

Proposed Implementation Strategy:

Within the LEED Certification system, there are a variety of approaches to certification based on the characteristics of a given site. The defining characteristics that make Norman Rogers Airport a prime candidate for LEED Campus Certification is that it is a shared site, under the control of a single entity.

The overarching goal is to see LEED retrofits implemented for 11 of the 13 buildings (See Appendix A, Table A3 for a full listing of buildings). The first of the two non-retrofit buildings is the Transport Canada Building. Since it has been unoccupied for years, is in a poor state of repair and of little value to current or future tenants, it is recommended that it be demolished without reconstruction. The second building is Hangar 3. It has been unoccupied for many years and a 2004 assessment found that it requires 1.1 to 1.5 millions dollars worth of repair. A fully reconstructed and LEED Certified building is recommended.

Within the overarching recommendation to implement green principles and technology at Norman Rogers Airport, LEED Certification is one of its main goals. Within the LEED system, points are given for both green roofs and renewable energy generation. Since these installations are two that stood out as especially valuable to Norman Rogers Airport, they have each been given a section within the recommendation below.

2. Norman Rogers Airport Green Roofs

Affected Stakeholders: Norman Rogers Airport

Implementation Timeframe: 5-15 years

Resource Allocation: Medium

Description of Problem:

Since its inception, the aviation industry has been negatively impacting the environment, most notably by releasing massive amounts of Greenhouse Gases into the atmosphere that ultimately contribute to global climate change. However, in the last few decades' airports from all over the world have begun to increase their commitment to environmental sustainability in an attempt to moderate aspects of their often-disastrous ecological footprint.

Even operations at small airports such as Kingston's Norman Rogers Airport can be destructive to the surrounding environment. Air, soil, water and noise pollution, as well as habitat loss and impacts to biodiversity are all environmental problems that occur on the lands surrounding Norman Rogers Aiport While some mitigation measures have been established in the *Airport Master Plan* to combat these issues, the airport should consider taking a much more serious approach to long-term sustainability. This is especially important in light of the future plans for airport expansion, which will undoubtedly increase the airport's environmental footprint.

Description of Recommendation:

One approach to sustainability that airports from all over the world are taking is the implementation of green roofs. Chicago O'Hare, for example, has installed 338, 171 square feet of vegetated roofs on 12 different facilities.

Figure 8.13: The Chicago Department of Aviation installed a 174, 442 square feet of vegetated roof at O'Hare's FedEx building in 2010.

The environmental benefits of green roofs are diverse. They increase storm water retention, filtration and evaporation on a property that is mostly impervious due to the length of runways. They also improve thermal insulation and counteract the urban heat island effect, which consequentially reduces the amount of energy used to heat and cool buildings. This simultaneously reduces energy consumption while saving costs. Another benefit of green roofs is their ability to filter dust, greenhouse gases and harmful airborne particles out of the air. The estimation is that one square metre of green roof can remove approximately four pounds of airborne particulate matter annually. Other advantages of green roofs include their ability to extend roof longevity through protection from exposure, even increasing the lifespan of a roof by 20-30 years.

The Norman Rogers Airport has the potential to implement green infrastructure in the form of vegetated roofs on a number of their current and future buildings. Not only would this mitigate a multitude of the negative environmental impacts and save the airport valuable costs, it would effectively demonstrate a newfound commitment to sustainable airport operations. It can also be seen as a great opportunity to bring Kingston closer to its goal of becoming Canada's most sustainable city.

Proposed Implementation Strategy:

One building where a vegetated roof would be appropriate is the main air terminal building. As part of the proposed airport expansion, the air terminal building will be renovated to include an extra 4036 square feet of area.

Norman Rogers could include the implementation of vegetated roofing on this site into the construction phase.

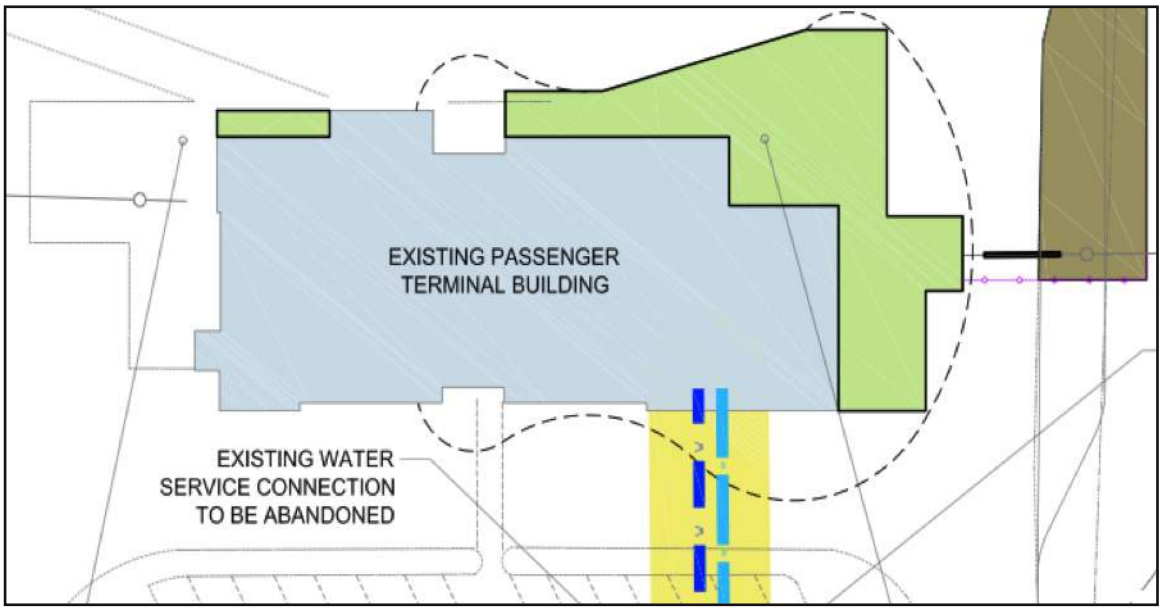


Figure 8.14: Proposed expansion for air terminal building with new roof areas shown in green.

Another building on site that would be ideal for vegetated roofing would be the airport maintenance building. According to the 2007 *Airport Master Plan,* this building is 5489 square feet of garage space used mostly for the safekeeping of snow removal vehicles. The building is described as being in good condition and is well maintained. Airport expansion may necessitate a relocation or expansion of the airport maintenance building. If either opportunity arises, then these plans should include the installation of green roofing into the building's new design.

Figure 8.15: Current airport maintenance building (top) and satellite image of current location of the airport maintenance building (bottom).

When determining the viability of vegetated roofs, one of the biggest considerations is cost. According to the United States Low Impact Development Centre, a typical green roof costs $15-20 per square foot. If green roofs were approved for vegetation on the airport terminal building and on the airport maintenance building, the cost assumption for implementation would be in the range of $140,000 – $190,000. These costs include all stages and aspects of green roof development.

Example:

Air terminal building = 4036 sq. feet

Air maintenance building = 5489 sq. feet Sum: 9525 sq. feet

9525 x 15 = $142,875
9525 x 20 = $190,500

The typical components of a green roof are illustrated in Figure 8.16. A waterproof membrane is the first layer on top of the roof structure to ensure that no interior leakages occur. A root barrier on top of the membrane is also required to prevent root penetration. The drainage panel layer acts as both a tool to expel surplus water from the roof during large rain events and to act as a reservoir during dry periods. The simplest and most cost effective form of this layer would be gravel. A moisture retention mat is laid on top of the drainage panel to provide water for the engineered soil known as growing media. On top of the growing media is the final living layer of vegetation. For an airport green roof, specific types of vegetation that do not attract wildlife are used. For cold climates with harsh winters, specific types of Aster and other plants are utilized. Green roofs should be inspected once per season for garbage and to cut back vegetation as needed.

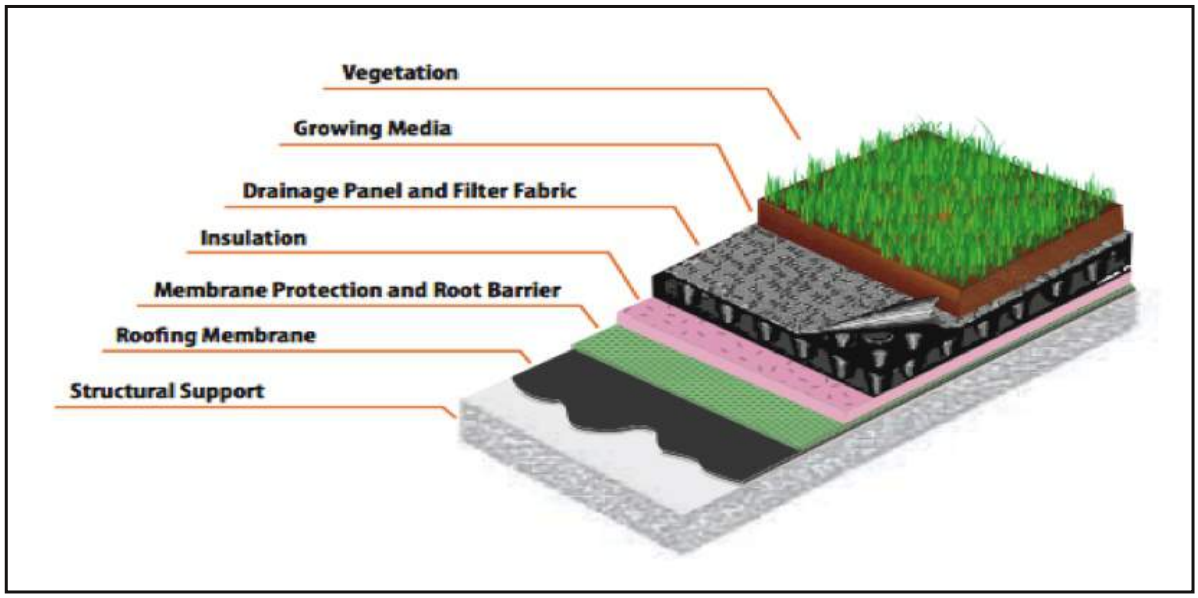


Figure 8.16: A detailed image of the layers required for green roof installation. Image from Toronto's Green Roof Construction Standard.

To determine the structural suitability of green roofs, the weight-bearing capacity of these buildings must be determined in accordance with the Ontario Building Code.

According to the Chicago Department of Aviation, buildings with vegetated roofs have energy savings of approximately $0.20 per square foot each year. For Norman Rogers Airport to measure the success of vegetated roofs implemented on their property, they could calculate their projected savings based off of this value and monitor their annual energy output to determine if it is declining by a similar amount.

3. Photovoltaic Power Station

Affected Stakeholders: Norman Rogers Airport

Implementation Timeframe: 5-15 years

Resource Allocation: High

Description of Problem:

Airports can be intensive land uses that require a significant amount of resources to operate. From utilities to manpower, airports are a resource intensive operation.

What airports have an excess of is unused land that is used as a buffer around its runways. Other airports are attempting different ways to use these lands that are compatible with airport operations, and an emerging strategy is to develop a photovoltaic power station on some of these unused lands.

The planned expansion for Norman Rogers Airport provides an opportunity for the City of Kingston to look for ways to minimize the increased environmental impact of the airport expansion by adopting a more serious approach to airport sustainability.

Figure 8.17: Aerial view of Kingston's Norman Rogers Airport.

Description of Recommendation:

Norman Rogers Airport can demonstrate its commitment to sustainability by creating a compatible land use in their undeveloped lands through the installation of a photovoltaic power station as a renewable energy source. The first airport to successfully rely its entire operations on solar power is the Cochin International Airport in the state of Kerala, Cochin, India, which has a 12 megawatt solar farm (over 46,000 solar panels) tapping the suns rays every day and converting it into usable energy.

Figure 8.18: Solar farm at the Cochin International Airport that supplies 100% of energy needed to operate the airport (top) and Thunder Bay Airport solar power station (bottom).

While net zero energy is the ultimate goal for airports with a strong sustainability commitment, a more applicable case study is the Thunder Bay Airport in Northern Ontario. It is similar in size to Kingston's Norman Rogers Airport and has also implemented a successful solar power station on its property. The Thunder Bay airport operates an 8.5-megawatt solar farm project with an annual output of approximately 7.5 million kilowatt hours. This is equivalent to:

- Supplying power to 2,300 homes per year
- Saving 5,000 metric tons of CO2 emissions
- Planting 405,000 trees
- Removing 2,000 cars from the road for a year
- 14,000 kilometers of air travel

Installation of a solar farm at Norman Rogers Airport is not a new idea. In fact, a 17-acre solar power station has already been proposed as a potential development on parcel 5 of Norman Rogers airport lands. This renewable energy development meets the Cataraqui Region Conservation Authority's environmental considerations for development adjacent to sensitive lands.

While this is a large-scale initiative with high associated costs and resource allocation, a solar farm at Norman Rogers will effectively reduce the airport's carbon footprint, help solidify its status as a greenport and ultimately increase energy cost saving considerably once a return on investment has been secured.

Proposed Implementation Strategy:

Previous airport studies have identified a 17-acre parcel of land (parcel 6) as fit for renewable energy development. While every system is unique, to produce 1 megawatt of solar farm energy approximately 4 acres of land is needed. Therefore, a 17-acre parcel at Norman Rogers could produce a 4.25-megawatt system. Furthermore, a cost analysis has determined that installing solar farm panels costs approximately $500,000 per acre. Thus, with 17-acres this project would cost about $8.5 million.

In terms of an implementation timeframe, recent land use studies of the airport have determined it to be a 1-10 year project timeframe. According to the Thunder Bay solar farm project, actual construction and implementation only took one year. A target implementation timeframe would be 5-15 years, considering the complexity of the project, high capital cost, and the airport expansion process. Some concerns surrounding solar farm projects on airport lnads include the effect of snowfall on energy yields, as well as the potential for glare from the solar panels to passing and landing aircraft. However these concerns have been addressed by multiple studies including one carried out in Kingston, Ontario. Overall findings of this study determine a mere 4.25% energy loss during winter precipitation episodes, which overall does not reduce the viability of the project substantially.

Samsung completed a glare analysis study in 2014 on the Windsor, Ontario airport solar project to determine value of negative glare effect from panels on airplane pilots. Overall the findings determine that there is a low to minimal potential for glare but that the project would not result in hazardous glare conditions for pilots, in comparison to the Federal Aviation Administration standards. Should Norman Rogers move forward with solar farm development, this study may be of assistance in determining solar panel orientation in conjunction to aircraft landing directions.

While there is currently precedent to establish roof-mounted solar panels given the existing solar array on the air terminal building that was introduced in 2011 at Norman Rogers Airport, ultimately the benefits of a ground-mounted solar array far outweigh the potential for an expansion of the roof solar array on this site. For example, the most significant benefit would be the substantial size of a ground-mounted solar farm at the Norman Rogers Airport, as 17-acres of the property has already been allocated for a renewable energy project. Maintenance of ground-mounted panels is also much more efficient and there is a greater capability to orient panels in the right direction. Finally, while the existing airport hangers on site have the largest building square footage for roof-mounted solar panels, significant repairs would be required to these older units before solar panel implementation would be possible. Once implemented, determining the annual output of kilowatt-hours that the solar power station has produced will be a good indicator of the projects effectiveness.

8.5 Increase Transit Coverage within the Lemoine Point Area

Affected Stakeholders: Norman Rogers Airport, Lemoine Point Conservation Area, neighbourhood residents

Implementation Timeframe: 5-15 years

Resource allocation: Medium

Description of Problem:

The results from the project group's stakeholder workshop indicated a greater need for public transportation to the Lemoine Point area. As can be seen by the Transit Map within the Appendix B, Figure B5, the current bus routes marked in red and yellow do not service either Lemoine Point Conservation Area nor Norman Rogers Airport. In fact, the nearest bus stop to the airport is 1.7km away (Roughly Front and Days Roads), the nearest stop to the Lemoine Point Conservation Area is 1.4km (Walden Gate and Coverdale Drive) away and the nearest stop to Rotary Park is 0.5km away (Walden Gate and Coverdale Drive).

Despite public interest, increased public transit coverage has not expanded to the Lemoine Point area. This is because the frequency of flights, aggregate number of passengers and the approximately 117 employees at the airport do not constitute sufficient demand to support public transit. Moreover, despite there being over 300,000 visitors to the Lemoine Point Conservation Area each year, a large number of these users bring dogs, which are restricted from Kingston Transit. For these reasons, increasing transit access to the Lemoine Point area has been difficult to implement for many years.

Both of the 2009 and 2015 *Transportation Master Plan* updates do not address the lack of transit coverage to the airport, despite the 2004 *Transportation Master Plan's* goal to, "[f]ully coordinate services with intercity bus terminal, train station, ferry and airport passenger services."

Description of Recommendation:

Clearly, there is not sufficient demand at present to warrant rerouting the # 501 and #502 buses off of Henderson Boulevard to allow for expanded coverage to the Lemoine Point area. The expansion plan of Norman Rogers Airport likely means that demand for transit access to the airport will increase, by both regular employees of the airport and by passengers. This is why we suggest that transit access to the Lemoine Point area be expanded to Norman Rogers Airport in the mid-term, after the expansion has been completed.

A variety of options exist to increase access to the Lemoine Point area with Kingston Transit in the mid-term. The first option would be to reroute the express buses #501 and #502 to service the airport, as can be seen in Appendix B, Figure B5. The current path of this route has three turns and continues through the Auden Park neighbourhood along Henderson Boulevard, it would be better to change the route so that it can move at a faster speed on arterial roads.
We recommend changing the route to go along Front Road to Norman Rogers Airport's parking lot and then head back East along Front Road, before turning North on Bayridge Drive.

This proposed change would see one bus stop relocated from the intersection of Glen Castle Road and Henderson Boulevard 500m to the West to the intersection of Bayridge Drive and Henderson Boulevard. The downside to implementing this plan is that it would reduce the connection opportunities that currently exist between the express buses and the local bus route #15.

Another option to potentially increase public transportation access to the airport would be to introduce a shuttle bus that connects the airport to the existing express #501 and #502 bus stop at Henderson Boulevard and Glen Castle Boulevard. This would be less of an overhaul of the public transportation network in the Lemoine Point Area, and can be coordinated to align with 'the airport's flight schedule. However, this would do little to accommodate persons interested in taking the bus in order to gain closer access to other uses in the Lemoine Point area.

Proposed Implementation:

The airport expansion may warrant the consideration of increased public transit coverage in the future, as it will likely increase the number of people who go to Norman Rogers Airport to work or to board flights. For this reason we recommend that the feasibility for public transit to both Norman Rogers Airport and Lemoine Point Conservation Area be reassessed after the airport expansion is complete, to ensure that transit coverage expansion is optimized.

8.6 Limit Future Residential Development

Affected Stakeholders: Neighbourhood residents, City of Kingston

Implementation Timeframe: 15+ years

Resource allocation: Low

Description of Problem:

The Lemoine Point area currently has the Auden Park neighbourhood and Smugglers Cove neighbourhood as its main residential nodes. While these existing residential areas are adequately serviced, any residential expansion would require additional capital investments in increasing environmental service capacity to the area. Residential is also one of the least compatible land use types to be located adjacent to an airport or conservation area. Furthermore, developing greenspace, either the Weatherall Property or the Lemoine Point Farm, would reduce the quality of a connected waterfront capable of supporting a connected waterfront trail system in the future. Finally, developing these properties would go against policies set out in the City of Kingston's *Waterfront Master Plan*.

Description of Recommendation:

"The main component of this recommendation is to restrict new residential development in the Lemoine Point area. This notion is in line with several policies set out by the City of Kingston, and the need to use environmentally sensitive land combined with the high cost that would be associated with increasing environmental servicing to the area makes new residential development unsustainable for the future of the Lemoine Point area."

Maintaining the character of a neighbourhood is often a key consideration when a new development is proposed in a stable and mature neighbourhood. This means that an expansion of residential use would most likely take the form single-detached housing which is already abundant in the area. Moreover, Kingston housing policies are attempting to reduce the share of single-detached housing in the future, and expansion of residential use in the Lemoine Point area would likely not contribute towards these housing policies.

This recommendation harmonizes with with Recommendation 7.3, which proposes to transition the Weatherall Property's residential designation and development zoning to open space.

Proposed Implementation:

City of Kingston policies and zoning designations should prohibit new residential development within the Lemoine Point area. This can be done through *Official Plan* and zoning bylaw amendments (See Recommendation 7.3), but can also be supported by other types of regulations as well, such as those proposed for the Lemoine Point Farm (See Recommendation 6.1). However, if the City of Kingston deems it necessary to incorporate the Lemoine Point area in its plan for accommodating new residential development, it is recommended that this growth should be facilitated by light intensification in the form of expanding the secondary suites provisions to the Lemoine Point area. This would still come at an added cost associated with expansion of environmental servicing, but this would also be the case if a new subdivision were developed. Figure 8.19 shows areas in yellow and green where secondary suites are allowed.

Figure 8.19: Secondary suite allowance within the City of Kingston.

Chapter 8.0 References

AECOM. (2015). Kingston Transportation Master Plan. Retrieved from https://www.cityofkingston.ca/city-hall/strategies-studies-plans

AECOM. (2009). Transportation model update: Model development & calibration report. Retrieved from https://www.cityofkingston.ca/documents/10180/86810/KTMP_2009ModelUpdate.pdf/74ffe84f-274e-40fd-a5ff-e09a87721176

AECOM. (2015). Kingston Transportation Master Plan. Retrieved from https://www.cityofkingston.ca/

Andrews, R. W., & Pearce, J. M. (2012). Prediction of energy effects on photovoltaic systems due to snowfall events. 2012 38th IEEE Photovoltaic Specialists Conference, (pp. 003386-003391). Austin, TX. Retrieved from: http://ieeexplore.ieee.org.proxy.queensu.ca/stamp/stamp.jsp?tp=&arnumber=6318297&isnumber=6317554

Audubon International - Audubon Cooperative Sanctuary Program for Golf. (n.d.). Retrieved from http://www.audubonintemational.org/acspgolf

Ausable Bayfield Conservation Authority. (2016). South Huron Trail Mobile. Retrieved from http://www.abca.on.ca/page.php?page=trail-mobile

Bushell, M. Poole, B. Zegeer, C. Rodriguez, D. (2013). Costs for pedestrian and bicyclist infrastructure improvements. Retrieved from http://www.pedbikeinfo.org/cms/downloads/Countermeasure%20Costs_Report_Nov2013.pdf

Canada Green Building Council. (2009). LEED Canada for new construction and major renovations 2009, LEED Canada for core and shell development 2009: Rating system. Retrieved from http://www.cagbc.org/cagbcdocs/LEED_Canada_NC_CS_2009_Rating_System-En-Jun2010.pdf

Canadian Solar. (2016). Thunder Bay Airport, Canada. Retrieved from http://www.canadiansolar.com/na/projects/thunder-bay-airport-canada.html

Chicago Department of Aviation. (2016). Vegetated Roofs. Retrieved from http://www.flychicago.com/OHare/EN/AboutUs/Sustainability/Vegetated-Roofs.aspx

City of Kingston. (2016). Bath Road Bikeway Open House. October 25, 2016. Retrieved from https://www.cityofkingston.ca/city-hall/projects-construction/bath-road-bikeway November 18, 2016.

City of Kingston. (2013). Airport Infrastructure Expansion Project Definition Document Summary. Retrieved from https://www.cityofkingston.ca/documents/10180/14295/Airport+Master+Plan/b9729bf8-b1f7-491d-8df2-c43c3396a671

City of Toronto. (n.d). Toronto Green Roofs Construction Standard. Retrieved from https://www1.toronto.ca/city_of_toronto/city_planning/zoning__environment/files/pdf/GreenRoof-supGuidelines.pdf

Dillon Consulting. (2014). Glare Analysis Report – Windsor Solar Project. Retrieved from http://www.samsungrenewableenergy.ca/sites/default/files/windsor_project/R3-4_WSP_Draft%20Design%20&%20Operations%20Report%20(Nov.2014)_Appx%20D.pdf

Dillon Consulting. (2004). 2004 Kingston Transportation Master Plan.

Explorer Solutions. (2016). Highest and Best Land Use Study – Kingston Airport. Retrieved from www.cityofkingston.ca

Green Building Canada (n.d.) Why Build Green? Retrieved November 20, 2016 from http://www.greenbuildingcanada.ca/green-building-guide/why-build-green/

Innovative Solar Farms. (2014). Solar Farm Cost Per Acre. Retrieved from http://innovativesolarfarms.com/solar-farm-cost-per-acre/

Kingston Transit. (2016). 5 Year business plan 2017-2021. Retrieved from https://www.cityofkingston.ca/documents/10180/19838/Transit+Redevelopment+Plan/54fd3026-8fc8-4015-abf3-764dbb802f2a

Low Impact Development Centre. (2007). Urban Design Tools for Green Roofs. Retrieved from http://www.lid-stormwater.net/greenroofs_cost.htm

Menon, S. (2015). How is the world's first solar powered airport faring? BBC News. Retrieved from http://www.bbc.com/news/world-asia-india-34421419

Meridian Planning. (2013) City of Kingston and Kingston CMA population, housing and employment projections. Retrieved from https://www.cityofkingston.ca/documents/10180/3062316/Projections+Study+Report/6973521d-2c53-4aaa-a206-ae6b1440a89b

MMM Group. (2007). Kingston Norman Rogers Airport Kingston, Ontario: 2007 Master Plan Study. Retrieved from https://www.cityofkingston.ca/documents/10180/14295/Airport+Master+Plan/b9729bf8-b1f7-491d-8df2-c43c3396a671

McGraw Hill Construction. (2014). Canada green building trends: Benefits driving the new and retrofit market. Retrieved from https://www.cagbc.org/cagbcdocs/resources/CaGBC%20McGraw%20Hill%20Cdn%20Market%20Study.pdf

Robison, M. (2015). UPDATE 2: Can Nevadans collect rain in barrels? No. Retrieved from http://www.rgj.com/story/news/2015/05/26/ask-rgj-can-nevadans-collect-rain-barrels/27983037/
Xeriscaping - Perfect for Dry Locations like Kelowna. Retrieved from https://4elementslandscape.com/projects/xeriscaping/

Salgot, M., & Tapias, J. C. (2006). Golf courses: Environmental impacts. Tourism and Hospitality Research,6(3), 218-226. doi:10.1057/palgrave.thr.6050016

Solar Power Authority. (2016). Ground-Mounted vs. Rooftop-Mounted Solar Panels. Retrieved from https://www.solarpowerauthority.com/ground-mounted-versus-rooftop-mounted-panels/

Suncyclopedia. (2016). Area Required for Solar PV Power Plants. Retrieved from http://www.suncyclopedia.com/en/area-required-for-solar-pv-power-plants/

U.S. Department of Transportation. (2015). Separated Bike Lane Planning and Design Guideline. Retrieved from https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/separated_bikelane_pdg/page19.cfm

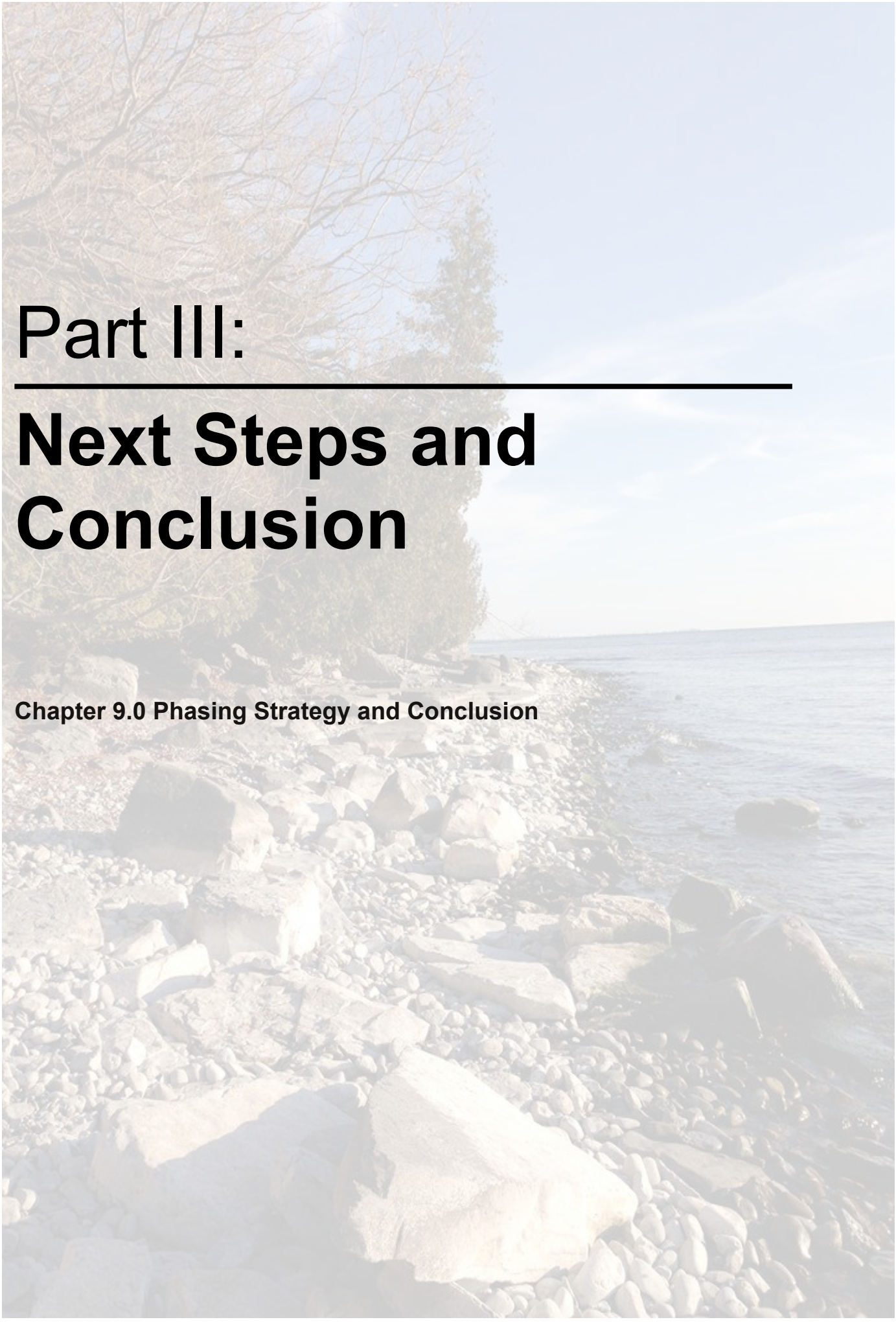
United States Golf Association. (2013). Audubon Cooperative Sanctuary Program for Golf Courses. Turfgrass and Environmental Research Online,12(1), 1-3. Retrieved from http://usgatero.msu.edu/v12/n1-1.pdf

U.S. Green Building Council. (2014). LEED Campus Guidance: For Projects on a Shared Site. Retrieved from http://www.usgbc.org/resources/leed-campus-guidance

Vinson, K. Zheng, Y. (2013). Recommendations for Green Roofs in Northern Climates. University of Guelph. Retrieved from http://www.ces.uoguelph.ca/greenroof/research/GREENROOFSURVEY-Jan2013.pdf

Vijayakumar and Burda. (2015). Cycle Cities, Supporting cycling in Canadian Cities. Pembina Institute. Retrieved from https://www.pembina.org/reports/cycle-cities-full-report.pdf

Waterfront Regeneration Trust. (2013). Waterfront Trail. Retrieved from http://www.waterfronttrail.org



Part III:

Next Steps and Conclusion

Chapter 9.0 Phasing Strategy and Conclusion

Chapter 9.0
Phasing Strategy and Conclusion

9.0 Phasing Strategy and Conclusion

9.1 Phasing Strategy

The chart below describes the implementation and phasing process for the 21 recommendations outlined in this report. Please note that these are rough timelines due to the availability of resources and viability of particular projects.

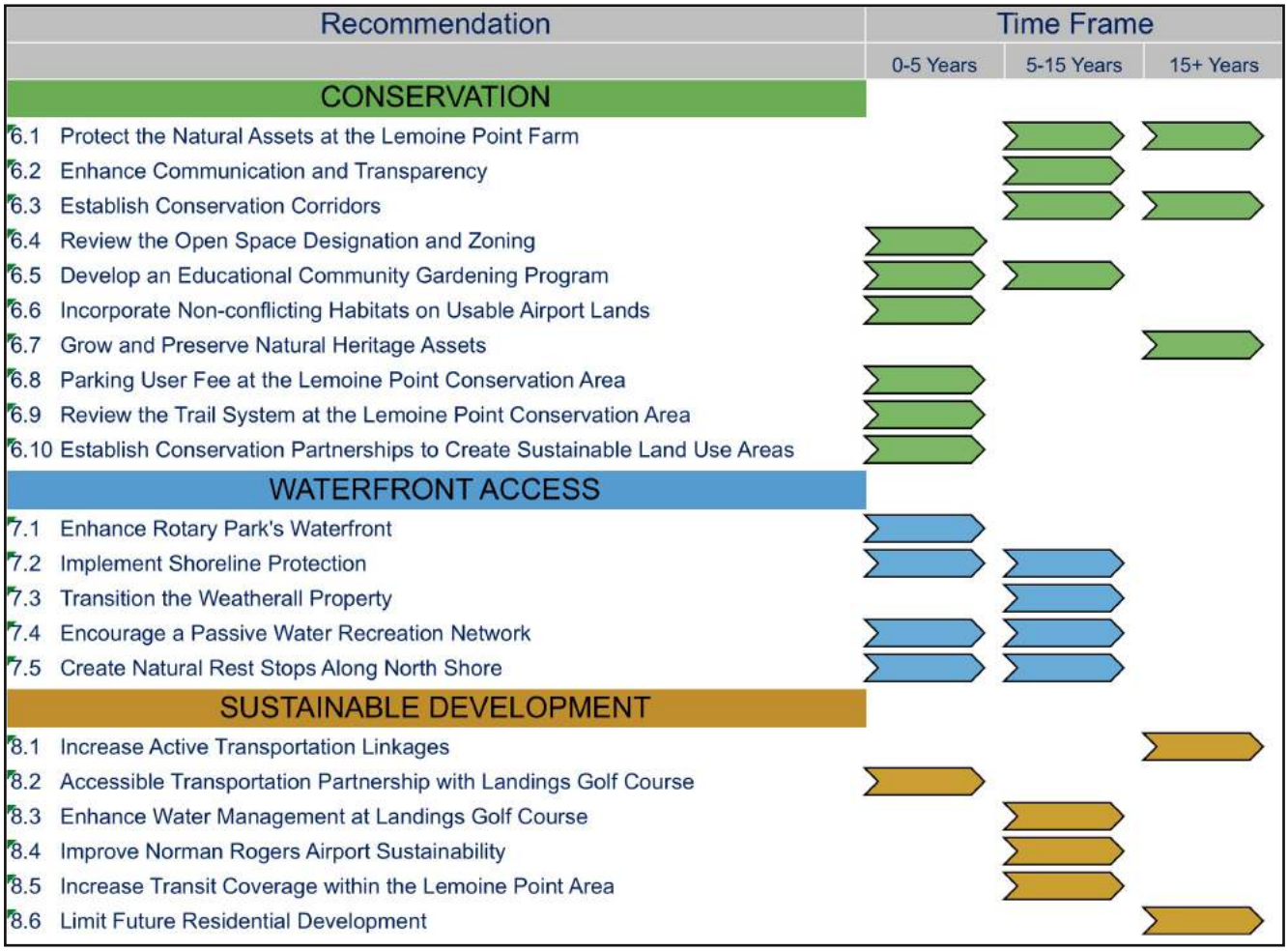


Figure 9.1: Phasing Implementation table for the 21 recommendations.

9.2 Summary and Conclusion

The vision statement for the future of the Lemoine Point area is:

The Lemoine Point area is a distinct region of Kingston that should operate on the values of conservation, waterfront access and sustainability and attempt to promote those same values in terms of stakeholder partnership and land use compatibility, helping to create a unique identity for the Lemoine Point area in the future.

The three main pillars of conservation, waterfront access, and sustainability help frame the recommendations in this report. The aggregate result of these recommendations will ultimately assist in creating a unique character for the Lemoine Point area.

In the development of this final report, the project team has conducted fieldwork, completed extensive background, primary document, and best practice research, consulted with stakeholders, conducted a needs assessment and ultimately developed solutions to address these needs in the form of 21 different recommendations.

Conservation

The recommendations outlined within the conservation pillar all seek to solidify the Lemoine Point area as a sanctuary for the preservation and enhancement of cultural, natural and biological features. Clearly differentiating the Conservation Area from a public park, protecting and enhancing the natural heritage features and establishing partnerships between conflicting land uses are all guiding principles that helped to formulate the basis of these recommendations.

Waterfront Access

Similarily, the recommendations that have been identified as central to the Lemoine Point waterfront work towards highlighting its full potential by creating and supporting a healthy environment of waterfront recreation and access. Protecting the shoreline environment, improving access and accessibility and enhancing the connectivity of waterfront sites were the foundational principles of these recommendations.

Sustainable Development

The recommendations for sustainable development seek to emphasize a newfound commitment to bringing Kingston closer to its goal of becoming Canada's most sustainable city. Mitigating the effects of climate change, improving access and better connecting the study area so as to encourage healthier modes of transportation are principles that guided the development of sustainability-focused recommendations.

Next Steps

The SURP 825 project team suggests a number of steps moving forward to better guide the future management decisions in the Lemoine Point area and ultimately help enrich its distinct and beloved character within the City of Kingston.

- Develop a steering committee at the Cataraqui Region Conservation Authority to determine the priority of recommendations within this report and decide on potential implementation techniques for the future.
- Consult the public to gather vital community feedback and to promote citizen engagement. The project team recognizes this as one limitation to the study that could not be completed.
- Conduct future studies on the nature, origin and frequency of usership in the Lemoine Point Conservation Area