DRAFT

Lower Trent Conservation

Watershed Based Resource Management Strategy

PREFACE

This Watershed Based Resource Management Strategy has been prepared by Lower Trent Conservation to meet the provisions set out under Section 21.1 of the *Conservation Authorities Act* and Ontario Regulation 686/21 under this Act.

Contents

1 INTRODUCTION

1.1 Purpose

Lower Trent Conservation (LTC) has prepared this Watershed-based Resource Management Strategy to meet the provisions set out under Section 21.1 of the *Conservation Authorities Act* (CA Act) and Ontario Regulation 686/21 (Mandatory Programs and Services).

The Strategy sets out the guiding principles and objectives of LTC, its *Mandatory Programs and Services*, and its *Municipal* and *Other Programs and Services.* The Strategy will assist LTC with enhancing the delivery of its *Mandatory Programs and Services* and with assessing any issues and identifying risks that impact the effective delivery of its other programs and services. It also identifies desirable future programs, services and actions that will help LTC meet its objectives and long-term goals.

1.2 Regulatory Framework

Section 21.1 of the CA Act sets out the *Mandatory Programs and Services* which must be delivered by all conservation authorities; these are described in more detail under Ontario Regulation 686/21. Section 21.1.1 of the CA Act refers to the *Municipal Programs and Services* that conservation authorities are permitted to provide under agreement with its member municipalities. Section 21.1.2 sets out the *Other Programs and Services* that conservation authorities are permitted to deliver.

Subsection 12(1) paragraph 3 of the Regulation requires all conservation authorities to prepare a "watershed-based resource management strategy" in accordance with subsections 12(4) through (9).

Ontario Regulation 686/21

12 (4) The watershed-based resource management strategy referred to in paragraph 3 of subsection (1) shall include the following components:

1. Guiding principles and objectives that inform the design and delivery of the programs and services that the authority is required to provide under section 21.1 of the *Act*.
2. A summary of existing technical studies, monitoring programs and other information on the natural resources the authority relies on within its area of jurisdiction or in specific watersheds that directly informs and supports the delivery of programs and services under section 21.1 of the *Act*.
3. A review of the authority's programs and services provided under section 21.1 of the *Act* for the purposes of,
   i. determining if the programs and services comply with the Regulations made under clause 40 (1) (b) of the *Act*,
   ii. identifying and analyzing issues and risks that limit the effectiveness of the delivery of these programs and services, and
   iii. identifying actions to address the issues and mitigate the risks identified by the review, and providing a cost estimate for the implementation of those actions.
4. A process for the periodic review and updating of the watershed-based resource management strategy by the authority that includes procedures to ensure stakeholders and the public are consulted during the review and update process.

(5) Subject to subsections (6) and (7), a watershed-based resource management strategy may include programs and services provided by the authority under sections 21.1.1 and 21.1.2 of the *Act*.

(6) If, in respect of programs and services the authority provides under subsection 21.1.1 (1) of the Act, a memorandum of understanding or other agreement is required, a watershed-based resource management strategy may not include those programs and services unless the memorandum of understanding or other agreement includes provisions that those programs and services be included in the strategy.

(7) If, in respect of programs and services the authority provides under subsection 21.1.2 (1) of the *Act*, an agreement is required under subsection 21.1.2 (2), a watershed-based resource management strategy may not include those programs and services unless the agreement includes provisions that those programs and services be included in the strategy.

(8) The authority shall ensure stakeholders and the public are consulted during the preparation of the watershed-based resource management strategy in a manner that the authority considers advisable.

(9) The authority shall ensure that the watershed-based resource management strategy is made public on the authority's website, or by such other means as the authority considers advisable.

1.3 About Lower Trent Conservation (LTC)

The Lower Trent Region Conservation Authority (Lower Trent Conservation or LTC) was formed in 1968 under the CA Act. Located in southern Ontario, LTC's area of jurisdiction covers 2,070 km^2 and includes all, or portions of, seven municipalities:

- Township of Alnwick/Haldimand
- Municipality of Brighton
- Municipality of Centre Hastings
- Township of Cramahe
- City of Quinte West
- Township of Stirling-Rawdon
- Municipality of Trent Hills

The CA Act of Ontario provides the mechanism for establishing and administering a conservation authority. The CA Act reads:

> *The purpose of this Act is to provide for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario.*

The Board of Directors is comprised of 10 representatives from the seven member municipalities (Brighton, Quinte West, and Trent Hills each have two representatives). LTC's Board of Directors and staff work with a growing number of partners who share a concern for the future of the region's environment. These partners provide information, ideas, labour and funding.

A more comprehensive description of the organization can be found in the annual Business Plan and the history of its formation is described in the Conservation Report 2018.

2 *STRATEGIC DIRECTION*

2.1 LTC's Strategic Plan

LTC's Strategic Plan (2018 -2028) outlines its priorities, organizational commitments and environmental goals, which together, will help the organization thrive in this changing world.

LTC's vision for the future is:

Healthy watersheds for healthy communities

LTC's mission, its reason for being, is:

To protect land, water and living things by working with and inspiring others.

The Conservation Strategy also sets out its values – the beliefs and philosophy that guide LTC's decision-making and actions.

- Integrity, Accountability and Transparency
- Being Adaptive and Embracing Change
- Supporting Staff Excellence and Wellness
- Partnerships, Collaboration and Teamwork
- Continuous Improvement and Innovation
- Providing Quality Service

2.2 Guiding Principles

Guiding principles establish the fundamental approach that drives the decision-making of the Conservation Authority. These newly established guiding principles have been developed to meet the requirements of Ontario Regulation 686/21 and provide the context for the objectives outlined in this Strategy:

- The conservation, restoration, development, and management of natural resources is best implemented on a watershed basis.

- The health and safety of watershed residents is a primary consideration for all development.

- Water and other natural resources are vital natural assets; they buffer the impacts of climate change, mitigate natural hazards, filter contaminants, assimilate waste, sustain biodiversity, and provide green spaces for recreation, among other community benefits.

- The management of water and other natural resources is a shared responsibility among conservation authorities, municipalities, government agencies and other stakeholders.

- Resource management decisions are integrated and transparent and take into consideration a broad range of community uses, needs, and values, including ecosystem needs.

- Engagement and collaboration leads to better and stronger ideas, actions and outcomes.

- Everyone deserves safe drinking water.

- Natural green spaces are critical to the community, providing environmental, economic, social, mental and physical health benefits.

- Community education leads to environmental stewardship - active participation in conservation efforts to protect land and water resources.

2.3 Objectives

LTC's strategic plan identified four high level goals to guide the Conservation Authority's programs and services:

- Protect Land and Water Resources
- Advance Watershed Knowledge
- Support Sustainable, Healthy Communities
- Inspire Others to Take Action

Under the umbrella of these broad goals, specific objectives are set out below. These objectives have been developed to meet the requirements of Ontario Regulation 686/21 and relate to *Mandatory Programs and Services* (Category 1) and support *Municipal* and *Other Programs and Services* (Category 2 and 3). Category 2 and Category 3 programs are essential to the support and delivery of Category 1 programs and services. Watershed monitoring and public education are integral in science-based watershed knowledge and decision-making processes.

- To avoid, reduce or mitigate potential risk to public health and safety, and to property.

- To mitigate potential risk to drinking water sources and ensure a sustainable and clean water supply for the watershed community.

- To characterize groundwater and surface water resource systems and other natural resources/systems, which regulate natural hazard processes and provide drinking water sources, while supporting the hydrological and ecological integrity of the watershed.

- To protect and maintain Conservation Authority owned lands for public safety, natural heritage protection, outdoor recreation, and socio-economic health.

- To identify and understand key resource issues and the primary stressors that cause them.

- To research and identify potential solutions for addressing key resource issues, advocating for government funding and policies to address these issues, and adapting/developing programs and services as required.

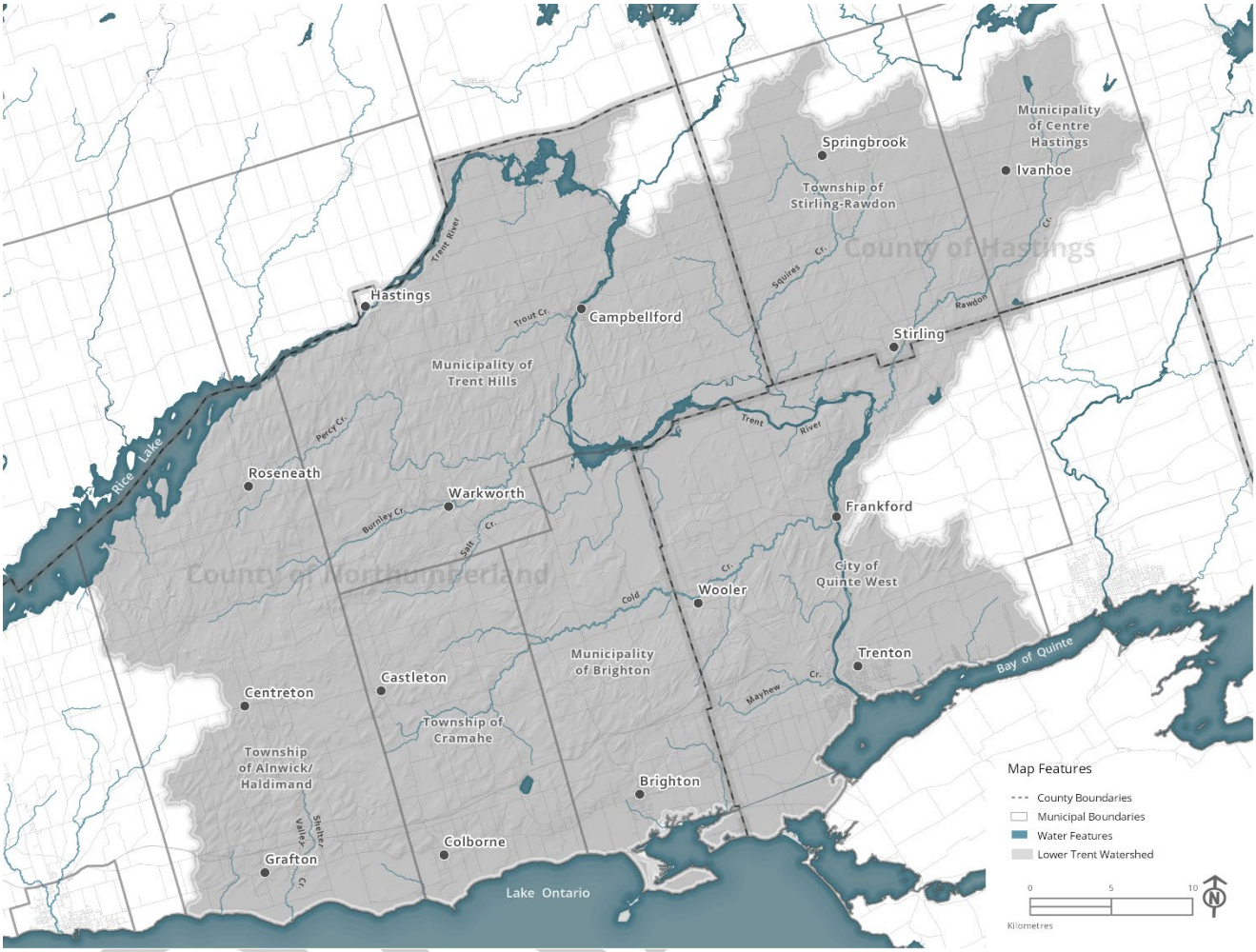
- To educate and engage the watershed community to promote awareness of natural hazards and watershed health, and to encourage the protection and restoration of land and water resources through stewardship action.

2.4 Annual Business Plan and Budget

Each year the Board of Directors issues a Business Plan and budget. The Business Plan outlines the program priorities for the year that will help the Conservation Authority meet its goals and objectives and strive towards it vision of Healthy Watersheds for Healthy Communities. The budget supports the Business Plan. The budget categorizes the programs and services into Category 1, 2 and 3 (Mandatory, Municipal and Other).

3 *WATERSHED CHARACTERIZATION*

The Lower Trent watershed region is located in southern Ontario. It is situated on the traditional territory of the Anishnabek, Huron-Wendat, and Haudenosaunee (Iroquois) First Nations, and within the context of the Williams Treaty. The watershed region covers approximately 2,070 km2, stretching from Rice Lake to Lake Ontario and the Bay of Quinte, and from just west of Grafton to Quinte West (Map 1).



Map 1: Lower Trent Region Watershed

The Lower Trent watershed region has been described in detail in the 2018 Conservation Report and 1970 Conservation Report. Watershed characterization was also completed for the Trent Source Protection Area, which encompasses the Lower Trent watershed region and approximately 28 square kilometres of the Township of Havelock-Belmont-Methuen, outside of Conservation Authority jurisdiction (see Trent Assessment Report). Below is a condensed version of these earlier works.

3.1 Physical Geography

The geologic foundation of the watershed region is Precambrian rock. These are mostly covered with sedimentary rock, formed in the Paleozoic period. While overburden covers most of the region, both Paleozoic and Precambrian bedrock outcrops occur in the north with some Paleozoic outcrops in the valley of the Trent River and near the shoreline of Lake Ontario. Where the overburden is thin in the northeast portion of the region, the bedrock is shaped by running water, and there is some evidence of karst topography.

During the ice age, massive ice sheets scoured and scraped the landscape, and deposited and molded the debris as overburden. The overburden is composed of a variety of unconsolidated materials ranging in grain size from clay to gravel to boulders. A significant portion the region was inundated by glacial Lake Iroquois, the much large predecessor of Lake Ontario, which greatly influenced the landscape of the region. The consequences of this glacial and fluvio-glacial activity took the form of till plains, kame moraines, till moraines, sand plains and clay plains. Across the southern and central parts of the region numerous beaches, bars, spits and terrace escarpments can be found - remnant shoreline features of the former glacial lake. The landforms of the region include the Oak Ridges and Dummer Moraines, Peterborough Drumlin Field, South Slope, and Iroquois Lake Plain.

Soils within the Lower Trent watershed region primarily belong to either one of the following Great Groups: the Gray Brown Podzolic Group or the Brown Forest Group. A complex array of soil types has evolved in response to the diverse geological fabric of this highly glaciated region. Soils differ greatly in composition, depth and texture depending on their parent materials, whether it be glacial till, glacial-fluvial outwash or lacustrial deposits. Sandy-loam and sand type soils are generally found in the western and southern half of the watershed region. The loams are related mainly to those till plain areas in the northeastern and the northern half of the region. The clay type soils are associated with the clay plain that skirts the northern fringe area of Percy Reach (on the Trent River south of Campbellford).

3.2 Climate

Warm summers and cool winters are characteristic of the temperature regime of the watershed region. Topography exerts a significant influence on local temperature and precipitation. The year-round open water of Lake Ontario has a pronounced effect in moderating the climate of the southern portion of the region from the more extreme conditions, which might normally be expected to prevail. With global warming, changes to the climate and hydrologic regime of the watershed region are inevitable. It is expected that average annual temperatures will increase, with the most warming occurring locally in winter. It is also anticipated that annual precipitation totals are likely to increase, but this will occur more in winter and spring, with summer and fall precipitation totals decreasing. Along with this is an increased possibility of more frequent and intense precipitation events.

3.3 Water Resources

The Trent River is the backbone of the watershed region. The watershed is comprised of the watersheds that flow into the lower Trent River, and several other watersheds that flow directly into Lake Ontario and the Bay of Quinte (Map 2). For reporting purposes, the watershed region has been divided into 12 watersheds/watershed groupings.

Nine watersheds flow into Rice Lake and the Trent River:

- Trout Creek
- Percy/Burnley (Mill) Creek
- Salt Creek
- Squires (Hoards) Creek
- Rawdon Creek
- Cold Creek
- Mayhew Creek
- Rice Lake Tributaries
- Trent River Corridor

Two flow into Lake Ontario:

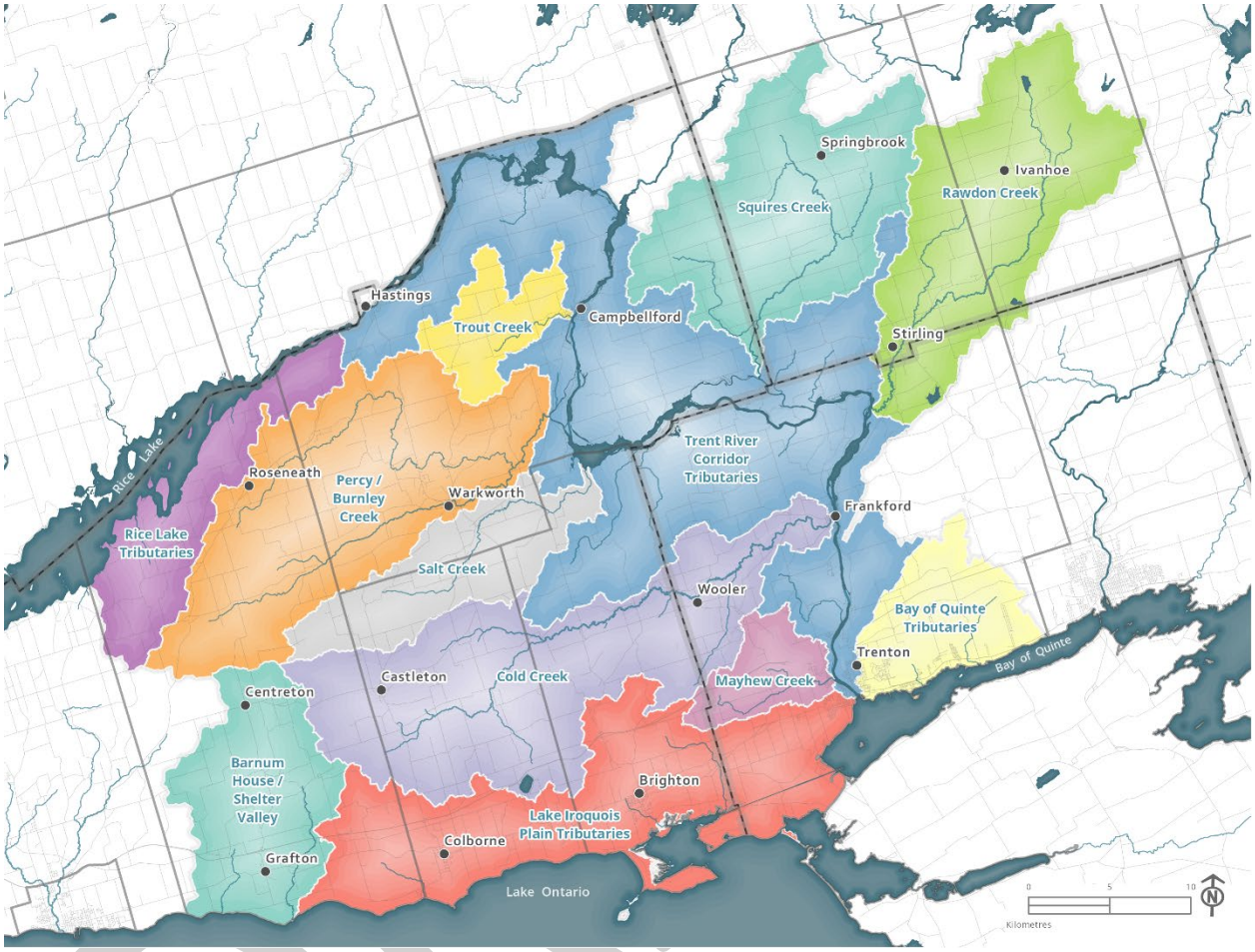
- Barnum House/Shelter Valley Creeks
- Lake Iroquois Plain Tributaries

And one flows into the Bay of Quinte:

- Bay of Quinte Tributaries

Aside from Lake Ontario, the Bay of Quinte and Rice Lake, there are no large inland lakes in the watershed region. The largest are Little (Biddy) Lake and Oak Lake, which have surface areas of

65 ha and 48 ha, respectively. The remaining lakes are smaller and are often associated with wetlands or created through the construction of dams.



Map 2: Watersheds

3.3.1 Surface Water Quality

Surface water quality in the watershed region is monitored primarily through chemical analysis and the identification of aquatic macroinvertebrates. Using the data from the monitoring program, LTC reports on water quality every five years through its Watershed Report Card. The 2023 Watershed Report Card shows 6 of the 12 watersheds with B grades (good) and 6 with C grades (fair). Two of the watersheds, Mayhew Creek and Bay of Quinte tributaries, had improved grades compared with the 2018 Report Card. Water quality in the Bay of Quinte is a historical concern. Many of the issues have been addressed through the Bay of Quinte Remedial Action Plan, but eutrophication and undesirable algae remain a challenge.

3.3.2 Flooding and Erosion

Flooding is a natural occurrence along the Trent River, local watercourses, and along Lake Ontario and the Bay of Quinte. During flooding events and periods of high water, the rate of streambank and shoreline erosion can be accelerated. These natural hazards can negatively impact property and public safety. Floods can occur at any time of the year and are caused by heavy rainfall, rapid melting of a thick snow pack or ice jams, and, in the case of the Lake Ontario, winds and wave action. For LTC's local (inland) watercourses, the most significant flooding is usually experienced in the spring, as a result of snowmelt. In addition to the spring freshet, frazil ice formation also increases the risk for flooding on the Trent River.

3.3.3 Water Control Structures

There are a number of water control structures in the watershed region that store water to create ponds, compensate for fluctuations in river flow, and meet demands for water and energy. There are 15 dams on the Trent River, between Rice Lake and the Bay of Quinte. While the main purpose of these dams is to control water levels for navigation, they are also operated by Trent-Severn Waterway staff to help minimize flooding. Some are used for power generation. There are several small dams, some associated with historic mills, on local watercourses. Some of these dams have fallen into a state of disrepair and are maintained mainly for aesthetic or recreational purposes. LTC owns and operates one dam, the Warkworth Dam, to help alleviate the potential of flooding. It is located on Burnley (Mill) Creek, in the village of Warkworth. There are weirs on Barnum House Creek, Rawdon Creek and Mayhew Creek. Additionally, beaver dams are abundant across the watershed region, and often cause concerns for local residents. They can result in flooding of agricultural lands, roadways, and nearby properties.

3.3.4 Groundwater

In the Lower Trent watershed region, recharge areas are generally associated with deep, well-drained glacial overburden such as moraines and drumlinized till plains, where a high infiltration rate contributes to groundwater storage, providing for domestic and municipal water consumption and baseflow to creeks. The deep recharge on the moraine feeds the headwaters of the cold water streams flowing into Lake Ontario and the Trent River.

Water budgets prepared for the Trent Source Protection Assessment Report demonstrate that there is low water quantity stress for the Lower Trent watershed region. These water budgets were assessed on a fairly large scale and would not have identified specific, localized water shortages.

There is not a lot of information available on groundwater quality in the watershed region. Although, groundwater quality is analyzed for chemistry at five Provincial Groundwater Monitoring Network monitoring sites in the region, a long-term record has not been established.

3.3.5 Drought

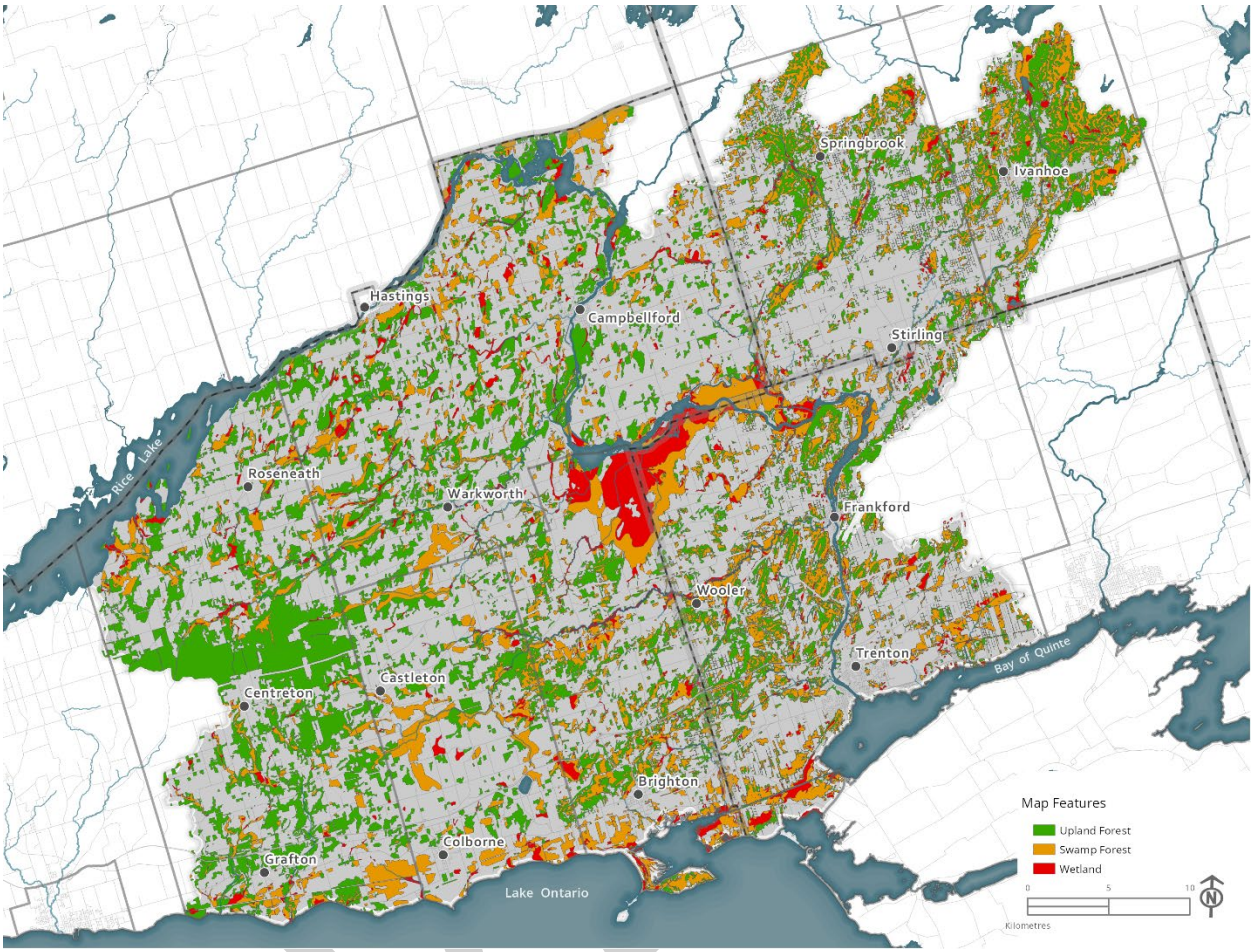
Historically, periods of dry weather and low water levels, or drought, were relatively uncommon in Ontario occurring once every 10-15 years. However, in recent years, periods of drought are becoming more common, as the demand for water steadily increases and climate change impacts weather patterns and water availability. Locally, the Oak Ridges Moraine, in the northwest part of the region, helps to maintain stream flow and groundwater levels through the drier summer months. The areas to the east of the Trent River are more susceptible to drought due to the shallow soils, resulting in limited groundwater storage.

3.4 Habitats and Wildlife

Natural habitats in the Lower Trent watershed region includes forest, wetlands, prairies and savannahs (Map 3). Forests are the most dominant, followed by wetlands. Prairies and savannahs are remnant landscapes, covering very little of region.

Living within the habitats of watershed region are several mammals, birds, reptiles, amphibians, insects, and aquatic species, typical of southern Ontario. Lake Ontario, the Bay of Quinte and the Trent River support a variety of fish species, as do the numerous cold and warm water streams flowing into these larger waterbodies.

Some of the species are at risk or have been extirpated (no longer live in the watershed). There are also invasive species that are negatively affecting existing habitats and competing with native species.



Map 3: Forests and Wetlands

3.5 Land Use

3.5.1 Settlement Patterns

Areas of settlement in the Lower Trent watershed region are generally found along the shore of Lake Ontario and the Bay of Quinte with the exception of historic settlement areas that exist along historic rail or road corridors and the Trent-Severn Waterway. Trenton, Batawa, Frankford, Bayside, Campbellford, Hastings, Warkworth, Stirling, Brighton, Colborne and Grafton are the main settlement areas, but there are a number of small villages and hamlets and rural residential areas throughout the watershed region. Additionally, cottage and trailer park development occurs adjacent to waterbodies, including Rice Lake, Trent River, Lake Ontario, Wellers Bay, the Bay of Quinte, and smaller inland lakes. Most of this development occurred historically. The trend of converting seasonal residences to permanent residences could result in negative impacts on water quality with increased septic system loading year-round.

In addition to traditional settlement areas, 8 Wing/Canadian Forces Base (CFB) Trenton is located in Quinte West, immediately adjacent to the east side of Trenton. CFB Trenton is one of the largest and busiest air force bases in Canada. It provides lodging for some of the military personnel.

Alderville First Nations Reserve lies within the northwestern portion of the watershed region. Alderville is home to the Mississauga Anishinabeg of the Ojibway First Nation. Approximately 300 members live on the Reserve with over 650 members living off Reserve (https://alderville.ca/).

Development within the watershed increases the amount of impervious area which decreases infiltration and accelerates runoff, resulting in a variety of environmental impacts. Only one of the LTC's watershed groupings, the Bay of Quinte Tributaries, has over 10% impervious surfaces of its total land area (the threshold for maintaining water quality and quantity identified by Environment Canada, 2013).

3.5.2 Infrastructure

There are 10 municipal residential drinking water systems in the watershed region, six are surface water supply systems serving about 27,500 people and four are groundwater supply systems serving about 9,600 people. Most of the region's urban settlement areas are serviced by water and wastewater systems. Grafton is only serviced by municipal water as are many residents in Bayside. Waste water treatment is through septic systems in these two areas. Additionally, there are approximately 65 non-municipal or non-residential systems that service small developments or public facilities. Over half of the population of the watershed region relies on private wells and lake sources for residential water supply. Waste water is handled by septic systems in these areas. Most residents of Alderville First Nation are served by private wells, but there are some drinking water systems operated by the First Nation. In 2021, federal and provincial grants were announced for upgrades to the First Nation's communal and point-of-entry water treatment systems.

The southern portion of the watershed region lies in the major east – west transportation corridor of southern Ontario, with Highway 401, County Road 2 and the CPR and CNR rail lines crossing the watershed. Highway 33 and 62, County roads and numerous local roads also crisscross the watershed. Potentially harmful or toxic substances (i.e., salts, herbicides) are transported along these corridors and spills of material occasionally occur. They also fragment habitat and pose a risk to wildlife through vehicle collisions and other negative road effects such as noise, light, and pollutants. Paved roads can contribute significantly to the amount of impervious surface and runoff in a watershed.

Canadian Forces Base Trenton contains a military airport with daily military flight travel over the region. In addition to CFB Trenton, there is a small airport located near Stirling which is home to the Oak Hills Flying Club.

The Trent-Severn Waterway is an important transportation corridor for recreational boating. It provides a navigable route from Lake Ontario to Georgian Bay via the Trent and Severn Rivers, their many lakes, and a series of locks and canals.

There are currently three active landfills within the watershed region, located in Brighton, Frankford and Rawdon, and four waste transfer facilities in Trenton, Seymour, Stirling, and Colborne. There are also numerous closed/historic landfill sites.

Three pipelines, running parallel to Highway 401, traverse the Lower Trent watershed region. The Trans-Northern pipeline carries refined oil, the Enbridge pipeline, crude oil, and the TransCanada pipeline, natural gas.

3.5.3 Regional Economy

The diverse economy includes agriculture, tourism, recreation, aggregates, and manufacturing. Canadian Forces Base (CFB) Trenton also has a major economic impact on the region, employing both military personnel and civilians.

Agriculture is an important economic activity within the watershed region. Approximately 57.4% of the land in the watershed region is Canada Land Inventory class 1-3 and considered prime agricultural land. Cropland is more common than pasture.

Tourism in the Lower Trent watershed region is connected to outdoor recreation opportunities in the rural landscape and on the waterbodies, with several campgrounds, prime boating and fishing locations, and an extensive network of trails. Additionally, there are at least nine public golf courses and a ski hill in Batawa.

Quarries and aggregate pits are another type of economic activity that occurs in the region. The glaciofluvial deposits in the various landforms have created abundant supplies of granular material. There are numerous gravel pits, some abandoned and others still in operation. Good quality limestone can be found in the limestone plains in the northeastern portion of the watershed region.

Most of the major industrial facilities in the region are located in Trenton and include paper packaging production and food processing. Smaller industrial facilities are located in urban areas such as Brighton, Colborne, Campbellford, Hastings and Warkworth.

3.5.4 Protected Areas

Within the Lower Trent watershed region there are a number of areas that are protected for their natural values through ownership and conservation easements by government (federal, provincial, municipal), the Conservation Authority, and non-governmental organizations. They include LTC owned lands; three Provincial Parks; Northumberland County Forest; Cramahe Township Forest; federal lands along the Trent-Severn Waterway and a sand spit along the

mouth of Wellers Bay; and several properties owned and managed by the Nature Conservancy of Canada, Northumberland Land Trust and other Land Trust organizations.

3.6 Watershed Challenges

LTC identified a number of challenges in the 2018 Conservation Report that may influence program priorities and services over the next few years. These watershed challenges include:

Increased Development Pressure

Growth pressure from the Greater Toronto Area is resulting in increased development in the LTC watershed, impacting land and water resources and sensitive areas. Development areas are increasingly limited to remaining marginal lands.

Septic Systems

Almost 50% of the homes in the watershed are service by septic systems. Septic systems close to waterways that are not properly maintained contribute nutrients and pathogens to groundwater and surface water.

Agricultural Runoff

Agriculture covers a substantial percentage of the land base in the watershed. While many farmers have implemented best management practices to minimize soil and nutrients loss, there are still farms that could benefit from practices such as planting vegetated buffers, installing fencing along watercourses, conservation tillage, and improved manure storage and handling.

Climate Change

Climate change is the most significant environmental challenge occurring today. It will have a dramatic effect on natural environments, resulting in increased flooding and drought, affecting plant and animal habitats, and leading to acceleration in biodiversity loss in some areas.

Invasive species

Increasing numbers of invasive species are being introduced to the region. These species compete with and displace native species, impacting the health of local ecosystems.

Species at Risk

The list of endangered, threatened, and special concern animals and plants in Ontario grows each year.

Biodiversity and Habitat loss: wetlands, forest, shoreline vegetation

The loss of forest cover, shoreline vegetation, and wetlands, along with the increasing numbers of invasive species are all resulting in habitat loss and declining biodiversity. Human activity

continues to encroach on natural environments in the local region, deteriorating and destroying the habitats of countless species.

Water Quality

Phosphorus concentrations occasionally exceed the Provincial Water Quality Objectives in local streams and has long been a concern in the Bay of Quinte. Additionally, chloride from road salt is becoming a bigger issue in urban areas, particularly in groundwater where salt can accumulate over time. With a push for more development in the watershed region, deterioration in water quality could occur.

With a warming climate, the likelihood of blue-green algae blooms in shallow, slow moving water bodies like the Bay of Quinte and Rice Lake is likely to increase. Even more worrisome is that the relative composition of the genus of cyanobacteria that can potentially produce toxins is increasing in the Bay of Quinte, corresponding to the advent of invasive zebra/quagga mussels. This is a concern for human health, with the Bay being a source of drinking water. (Note: Harmful algal blooms have actually decreased in the Bay of Quinte in recent years, corresponding with higher than average Lake Ontario water levels.)

Other emerging water quality issues include microplastics and pharmaceuticals.

4 *PROGRAMS AND SERVICES*

4.1 Categorization of Programs and Services

Section 21.1 of the CA Act lists the *Mandatory Programs and Services* that conservation authorities must provide. Section 21.1.1 of the CA Act refers to the *Municipal Programs and Services* that conservation authorities are permitted to provide under agreement with its member municipalities. Section 21.1.2 sets out the *Other Programs and Services* that conservation authorities are permitted to deliver.

Ontario Regulation 687/21 (Transition Plans and Agreements for Programs and Services under Section 21.1.2 of the *Act*) required that all conservation authorities develop a transition plan which was to include an inventory of programs and services (see Appendix 1). This Regulation introduced the concept of categories of programs and services. Category 1 are those programs and services mandated by the Province to be delivered by conservation authorities. Category 2 services are those being delivered by a Conservation Authority on behalf of a municipality. Category 3 services are those initiated by the Conservation Authority for the benefit of watershed municipalities and residents.

LTC's Programs and Services have been reviewed, modified and categorized to ensure conformity with the CA Act and regulations. The Conservation Authority developed its Program and Services Inventory (Appendix 1) and delivered it to its municipal watershed partners and the Province by February 2022. In 2023, LTC revised its inventory of programs and services based on changes in legislation and regulations, and in response to improved understanding and clarification of programs and services categorization.

The categorization of the Programs and Services outlined below, and the rationale for the categorization are set out in the final version of the Inventory.

Memorandums of Understanding (MOUs) have been established with local municipalities for the Category 2 Programs and Services and any municipally funded Category 3 programs.

4.2 Mandated Programs and Services: Category 1

LTC delivers a number of *Mandatory Programs and Services* as set out in the CA Act and Regulation 686/21. These programs and services are funded through provincial funding, municipal levy, and municipal special benefitting levies, with user fees for some services.

> ***Conservation Authorities Act***
>
> **Mandatory programs and services**
>
> **21.1** (1) An authority shall provide the following programs or services within its area of jurisdiction:
>
> 1. Programs or services that meet any of the following descriptions and that have been prescribed by the Regulations:
>
> i. Programs and services related to the risk of natural hazards.
>
> ii. Programs and services related to the conservation and management of lands owned or controlled by the authority, including any interests in land registered on title.
>
> iii. Programs and services related to the authority's duties, functions and responsibilities as a source protection authority under the *Clean Water Act, 2006*.
>
> iv. Programs and services related to the authority's duties, functions and responsibilities under an Act prescribed by the Regulations.

4.2.1 Enabling Services

Enabling Services are key services provided to all departments of the Conservation Authority, Board of Directors, member municipalities and the general public to enable LTC to operate in an accountable, transparent, efficient and effective manner. These general operating expenses and capital costs, permitted as Mandatory Program and Services under Part IV and Section 21.1 of the CA Act, are not directly related to the provision of a specific program or service that an authority provides (Ontario Regulation 402/22: Budget and Apportionment). Funding for these services are both municipally funded and self-generated.

4.2.1.1 Governance

Governance is the overall framework for managing and decision making of the organization. Governance costs cover those required for operation and support of the Board of Directors, any associated Boards or Advisory Committees, and for the Office of Chief Administrative Officer/Secretary-Treasurer.

4.2.1.2 Administration

Business administration is a critical part of day to day operations and provides support to all LTC programs. It includes operating services and capital costs which are not directly related to the delivery of any specific program or service, but are the overhead and support costs of the Conservation Authority (e.g., program planning and development, program oversight, and policy development and review.)

4.2.1.3 Human Resources

Human Resources includes recruitment, administration, compensation and benefits, training and development, health and safety, employee relations, and performance management. It also includes LTC's "Volunteers for Conservation Program" which allows individuals and groups to devote time and energy to local environmental projects and/or help out with the delivery of wide range of LTC programs. Partnership building and external relationships are also important enabling services that reach across LTC's programs and services.

4.2.1.4 Financial Services

Financial services ensures the wise use of funds and fiscal accountability. Ongoing vigilance is needed to ensure that the funding received from member municipalities, the provincial and federal governments, other partners, agencies and donors is used wisely for the betterment of the watershed region. It includes development of the annual budget, accounts payable and receivable, payroll, financial analysis, financial audit, administration of reserves and investments, asset management, financial reports for funding agencies, preparing and submitting reports to the Canada Revenue Agency, and administration of the benefits program.

Also included under Financial Service is fundraising. As a non-profit registered charity, LTC undertakes fundraising to support its conservation efforts. This includes: grant writing, direct requests to businesses and private donors, and fundraising campaigns.

4.2.1.5 Legal Expenses

Legal expenses include costs related to administering agreements/contracts, human resources, etc.

4.2.1.6 Communications and Outreach

The Communications and Outreach Program includes municipal and public relations and engagement. It informs the Board of Directors, municipal partners, staff, watershed residents and other stakeholders about LTC programs, services and activities including governance, policies, and conservation lands. It is also key to the delivery of the flood forecasting and warning and low water response programs and educational aspects of the natural hazards program.

Website and social media content management and media relations are key components of this program along with traditional communication products such as brochures, displays, and public information sessions/centres. The preparation of annual reports and progress reporting is included in this program area.

4.2.1.7 Administration Buildings

LTC has an administration building at 714 Murray Street, Quinte West and a workshop at 39 Wall Street, Quinte West. These buildings are used to house LTC staff and equipment, enabling delivery of programs and services. Ongoing costs include utilities, routine and major maintenance, and property taxes.

4.2.1.8 Vehicles and Equipment

LTC's has a small fleet of vehicles that is needed for staff to deliver its programs and services. Fleet management includes vehicle purchases, leases, fuel, licenses, repairs, and maintenance. Equipment for both office and workshop are required to be purchased, leased, maintained and repaired to meet program and service needs.

4.2.1.9 Information Management, Information Technology and Geographic Information Systems (GIS)

Information Management, Technology and GIS is the hardware, systems, and methods which enable the creation, collection, storage, processing, analysis, and dissemination of data and information. It is key to the functioning of the Conservation Authority.

Information Management is the process of collecting, storing, organizing, retrieving, and managing information to support conservation authority goals and objectives effectively. It is the systematic handling of data and information resources to ensure they are accessible, secure, accurate, and relevant to the organization and its stakeholders.

Information Technology is the hardware and software foundations including computer hardware, software, networks, internet connections, and phone systems. To keep up to date and functional, ongoing upgrades and repairs are needed and new technology must be investigated and purchased.

GIS is mapping software that is critical to LTC's work. It is used to transform data to information, undertake analyses, and illustrate the data and findings through mapping. Other informatics used by LTC include hydrologic information systems, document/records management systems, asset management systems, web-based services, and reporting. Ongoing staff effort is required to support staff and the board with accessible information and enable collaborative public engagement.

ISSUES AND RISKS

4.2.1 Enabling Services:

1. Municipal funding required for capital costs.
2. Funding support for operational costs.
3. Self-generated funding is unpredictable.
4. Legal expenses are not consistent annually.
5. Future major maintenance or alterations to buildings and other equipment could result in increased costs.
6. Staff turnover, knowledge transfer.
7. Keeping current and acquiring technology to sustain program functions and to meet expectations.
8. E-Commerce/improved online customer service processes and tracking required.
9. Cyber security.
10. Public expectations for Open Data.
11. Enhanced mapping, data, and analytical tools to facilitate faster, sound decision making.
12. Funds for purchase of necessary data products (i.e. Orthophotography).

4.2.2 Natural Hazard Management

Conservation authorities are the lead provincial agencies for Natural Hazard Management. The goal is to protect life and property from flooding and erosion. This mandatory, watershed-wide, comprehensive program applies to the Lake Ontario shoreline (including the Bay of Quinte and Wellers Bay), the Trent River flood plain, stream valleys, wetlands and other hazardous lands.

4.2.2.1 Section 28 Permit Administration

LTC administers Section 28 regulations under Part IV of the CA Act. Administrating this Regulation, known as the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulation 163/06), is a preventative approach, intended to ensure that development will not be impacted by flooding, erosion or dynamic beaches and that new development does not aggravate or create new hazards upstream or downstream. LTC regulates development and activities in or adjacent to river and stream valleys, watercourses, the Lake Ontario and the Bay of Quinte shorelines, wetlands, and other hazardous areas. Environmental impacts are considered during the review process.

Written permission (permits) from the Conservation Authority are required before work can take place in a regulated area. Section 28 Permit Administration includes: reviewing and processing permit applications and associated technical reports, site inspections, communication with applicants, agents, and consultants. A fee schedule is reviewed and approved annually to partially cover the costs of permit administration and the associated technical review and to reduce the amount required from municipal levy.

4.2.2.2 Enforcement and Compliance

Under Part VII of the CA Act (enforcement and compliance to Part VI Section 28 permits) staff review additional technical reports; conduct site visits; participate in ongoing communications with applicants, agents, and consultants; and prepare reports for the LTC Board of Director's Hearings Board.

Occasionally, when development has occurred without a permit and when negotiation with landowners are unsuccessful, provincial courts are engaged. Legal costs are incurred for complicated or escalated issues.

4.2.2.3 Municipal Plan Input and Review

The Municipal Plan Input and Review Program is a preventative approach that aims to ensure that new development will not result in increased risks to public safety or property damage from natural hazards. Through this program, LTC provides advice to its member municipalities and watershed residents, both through the formal commenting process under the *Planning Act* and on an informal basis through general inquiries and pre-consultation meetings.

In 1995, the Ministry of Natural Resources and Forestry delegated responsibility to conservation authorities for provincial interests related to natural hazards under Section 3.1 of the Provincial Policy Statement. Natural hazards include flooding, erosion and dynamic beach

hazards and hazardous sites. LTC provides plan input, with respect to these matters on behalf of the Province, on circulated Secondary Plans, Official Plans, and Comprehensive Zoning By-Laws. LTC also comments on the applicability of Ontario Regulation 163/06 (the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation) to these applications. LTC may be requested by the Province to provide support to the Ministry of Municipal Affairs and Housing for appeals on applications or other matters under the *Planning Act*.

In addition to plan input, LTC provides plan review services to its member municipalities and upper tier municipalities on circulated subdivisions, condominiums, severances, official plan and zoning by-law amendments, minor variances, and site plan control. These comments are related to natural hazards (Section 3.1 of the Provincial Policy Statement) and applicability of Ontario Regulation 163/06. LTC's regulatory policies provide guidance for commenting on these planning applications.

Fees for the plan input and review service form part of LTC's fee schedule, which is reviewed and approved annually to partially cover the review costs.

In addition to commenting on Natural Hazards, LTC provides plan input and review services with respect to restrictions/requirements in vulnerable areas set out in the Trent Source Protection Plan under the *Clean Water Act*.

4.2.2.4 Flood Forecasting and Warning

LTC maintains a flood forecasting and warning system to provide early warning of possible risks to people and property from flooding. Because of the complexity of the watershed, there are three distinct forecast areas: the Trent River, local streams, and Lake Ontario including the Bay of Quinte. The Conservation Authority provides local municipalities, other agencies and the public with advance notice, information, and advice so that they can respond to potential flooding and flood-related emergencies. This program includes daily data collection from provincial and local water level gauges, monitoring weather forecasts, monitoring watershed conditions, snow surveys, site inspections/river watch, development/running of computer models, review of provincial and upstream water level forecasts, and liaising with federal and provincial agencies, municipalities, upstream conservation authorities, and the public. With this information staff undertake flood forecasting and warning.

Flood Forecasting and Warning Monitoring Stations

LTC stream gauges
Burnley (Mill) Creek-02HK009
Cold Creek-02HK007
Crowe River-02HK003
Squires (Hoards) Creek-02HK017
Mayhew Creek-02HK011
Rawdon Creek-02HK008
Salt Creek-02HK015
Trout Creek-02HK016
Proctor/Butler Creek-02HD018
Shelter Valley Creek-02HD010

Trent River water level gauges
Trent River (Lower Glen Ross)
Trent River (Upper Glen Ross)
Healey Falls

Snow survey courses
Campbellford-SNOW-MNR-3801
Orland-SNOW-MNR-3803
Huntingdon-SNOW-MNR-3802
Brighton-SNOW-MNR-3901

Precipitation Stations
Burnley (Mill) Creek
Cold Creek
Proctor (Butler) Creek
Rawdon Creek
Salt Creek
Shelter Valley Creek
Squires (Hoards) Creek
Trout Creek
LTC Office

Ongoing communications takes place with the media, municipalities, the public, and others, as required. An annual meeting is held with the municipal flood emergency coordinator from each municipality. Ongoing maintenance of water level and rain gauge equipment is required, along with annual maintenance of the snow courses to facilitate delivery of the program.

4.2.2.5 LTC Owned Flood and Erosion Control Infrastructure

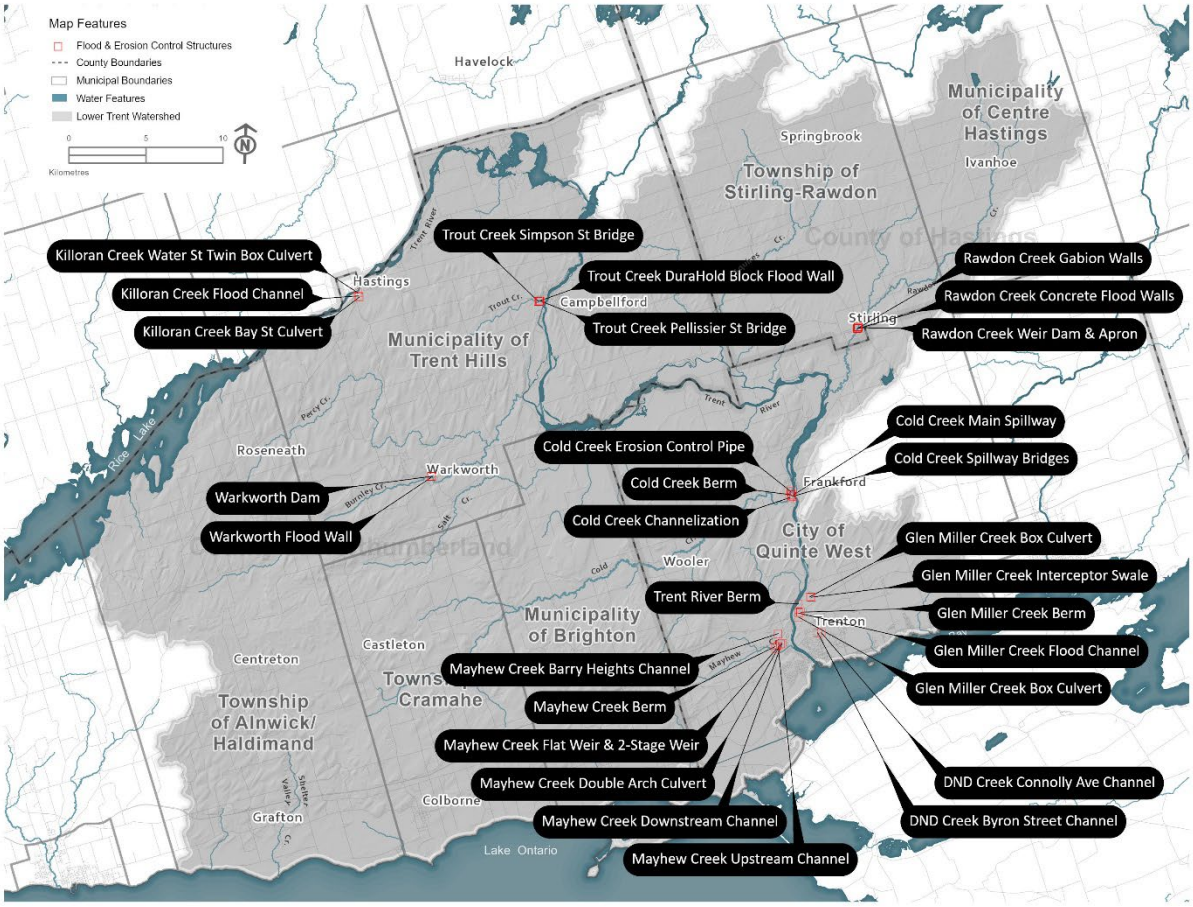
Following the flood of 1980, LTC constructed flood and erosion control projects at several locations in various municipalities throughout the region (Map 4). These structures protect existing development in the flood plain from impacts resulting from a flood. Grants were provided by the Province of Ontario to construct these structures with the remaining funds coming from the individual municipalities that directly benefited from the project. Five of these structures are owned by LTC:

- **Trout Creek Channel - Vacant Property (Campbellford, Municipality of Trent Hills)** – This vacant property is located along the Trout Creek channel. It provides access to the channel.
- **Warkworth Dam and Reservoir** (Warkworth, Municipality of Trent Hills) – Construction of a new dam was completed in the summer of 1972, with two 17-foot wide spillways which increased the discharge capacity from 85 cubic metres per second to 147 cubic metres per second. A 24 inch (0.6 metre) low flow pipe was installed to ensure a controlled downstream flow.
- **Warkworth Flood Wall** (Warkworth, Municipality of Trent Hills) – A concrete floodwall was constructed downstream of the Warkworth dam in the early 1980s. The flood wall protected over 50 homes from the 100-year flood hazard.
- **Barry Heights Flood Channel** (Trenton and former Murray Township, City of Quinte West) – This project was undertaken to reduce flooding due to insufficient drainage in the Barry Heights Subdivision. The work included excavating a 335 metre channel to connect into a Mayhew Creek tributary at the CN Railway property and installation of a culvert. The project was designed to protect up to the 1:50 year event.
- **Cold Creek Pipe** (Frankford, City of Quinte West) – During the flood control works on Cold Creek, it was determined that the old steel flume pipe (58 metres long, 2 metres in diameter) would remain in place to provide erosion control along the final bend of Cold Creek. It was purchased by LTC.

Other LTC Owned Structure

- **Kings Mill Dam** (Rawdon Ward, Township of Stirling-Rawdon**)** – The dam was re-built in 1989 in partnership with Ducks Unlimited Canada. A management plan forms part of the signed agreement between Ducks Unlimited and LTC.

More details about these projects are provided in LTC's Flood and Erosion Control Structures Operation and Maintenance Manual (2023).



Map 4: Flood and Erosion Control Structures

4.2.2.5.1 Operation and Management

The flood and erosion control structures noted above were constructed over 30 years ago; therefore, regular inspections and routine maintenance are required to ensure that they are in good condition and continue to function as designed. This is outlined in the Flood and Erosion Control Structures Operation and Maintenance Manual. The work is carried out by staff, in cooperation with the local municipalities.

LTC's only flood control dam is located on Warkworth Conservation Area. The operations of the Warkworth Dam are geared towards flood protection for the village, and consist of removal of logs in the fall by LTC staff to prepare for winter and spring runoff and replacement of the logs in the spring to replenish the pond and allow stream flow below the dam.

4.2.2.5.2 Major Maintenance

In addition to managing and operating the Flood and Erosion Control Infrastructure, and carrying out routine maintenance, major maintenance is periodically required. The need for major maintenance is identified by staff through regular inspections. Staff apply for Water and Erosion Control Infrastructure (WECI) funding from the Province for major maintenance. Major maintenance projects are dependent on funding from the Province and financial support from LTC's municipal partners.

4.2.2.6 Low Water Response

The Province established the Ontario Low Water Response Program to respond to increasing drought conditions. Low rainfall and hot weather can result in low stream flows and groundwater levels. This can affect the amount of water available for drinking water, agriculture and industry, as well as the health of the ecosystem. LTC's role in the program is to establish, coordinate and support a Water Response Team for the Lower Trent watershed region should low water become an issue. This Team may consist of municipal, agriculture, industry, business, recreation, government representatives and other decision makers from the watershed region. Staff monitor weather forecasts, local water levels, and precipitation daily and analyze the data.

The Water Response Team recommends drought levels and response actions based on information and advice provided by staff. The response could range from issuing communications to municipalities, the media, local water users, and the public advocating voluntary water conservation practices, advising on water use reductions, to making recommendations to the Province concerning water allocations.

4.2.2.7 Technical Studies and Policy Review

LTC undertakes studies and projects to inform natural hazards management programs including shoreline studies, flood plain mapping, regulations areas mapping updates, flood forecasting system assessments, and capital works integrity studies. Staff also develop, review and update policies that inform the natural hazards program. Technical studies and projects can be short or long duration depending on their complexity and are completed based on the availability of human resources and necessary funding.

4.2.2.8 Natural Hazards Awareness

Public education and awareness of natural hazards is key to preparedness and safety and LTC strives to advise and educate municipalities and the public about natural hazards in the watershed. The Conservation Authority promotes public awareness of natural hazards including flooding, drought, and erosion through its website, with social media, through media relations, by attending public events, and by preparing and supplying educational products and materials. It also educates the public and elementary school students, particularly through the Spring Water Awareness Program about the danger of floodwaters, ice, slippery stream banks, and dams.

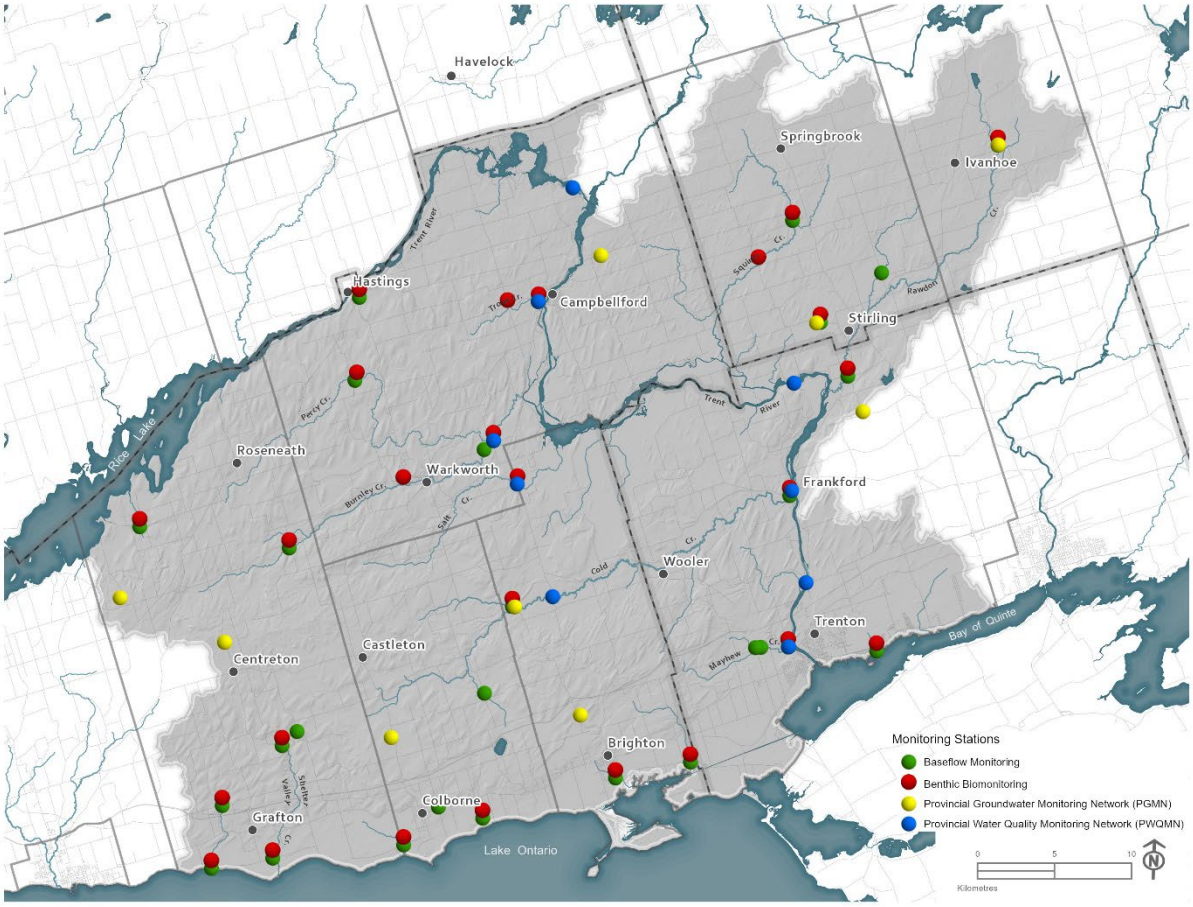
ISSUES AND RISKS

4.2.2 Natural Hazard Management:

1. LTC does not currently provide stormwater management review, due to the changes under the CA Act. Should direction change or clarification be provided by the Province, the Board may decide to reassess this decision to ensure that stormwater management is reviewed consistently across the watershed.
2. Conservation authorities are restricted by the Province from commenting on planning applications regarding natural heritage, as has been done under agreement with municipalities for several years. The health of natural heritage systems and features within the watershed could be negatively impacted without this regional, watershed based review.
3. Climate change could result in more frequent flooding and low water events resulting in the need for more rain gauges and stream gauges, computer models for flood forecasting, and demand for more staff time and resources.
4. Major maintenance for Flood and Erosion Control works could be required when no provincial funding is available; most of the flood and erosion control structures at LTC are not eligible for provincial funding due to the nature of the scoring matrix for funding.
5. Plans and Technical Studies require considerable staff time and/or outside expertise. Municipal/provincial/federal funds and municipal agreements are needed to support completion of technical studies or mapping projects.
6. An increase in natural hazards enforcement and complaints results in an increased demand for staff time. The ability to hire new staff is paramount but limited by funding shortfalls.

4.2.3 Provincial Water Quality & Quantity Monitoring

LTC, in partnership with Ministry of Environment, Climate Change and Parks (MECP), has established long term sites to monitor surface and ground water conditions (Map 5). This is also an investment into long-term monitoring of climate change trends.



Map 5: Monitoring Sites

Provincial Water Quality Monitoring Network (PWQMN)

Through a partnership with the MECP, LTC undertakes stream water quality monitoring at nine sites. The Conservation Authority collects the water samples at the nine sites, eight times per year and MECP is responsible for the laboratory analysis and data management. The results are made available to LTC. The data is used to prepare watershed report cards and report on watershed health. It also helps prioritize the need for watershed restoration projects.

4.2.3.1 Provincial Groundwater Monitoring Network (PGMN)

LTC has a long-standing partnership with the MCEP for groundwater level and water quality monitoring at 11 stations (10 sites) across the watershed (five are monitored for water quality) (Map 5). LTC costs include data collection, shipping, minor equipment repairs/purchases, data management, and reporting. The Province funded the installation of the network and continues to fund equipment replacements. Information collected is helping to build a database on groundwater levels and groundwater quality and is used in the preparation of watershed report cards.

ISSUES AND RISKS

4.2.3 Provincial Water Quality & Quantity Monitoring:

1. Long-term access to wells on private lands (landowner turnover).
2. Interpretation and usefulness of PGMN data to support LTC programs (e.g. low water program, watershed report card).

4.2.4 Drinking Water Source Protection (DWSP): Regional and Local

The Ontario *Clean Water Act* sets out a framework for drinking water source protection on a watershed basis. Thirty-eight source protection areas and authorities were established by the Province, based on Conservation Authority watersheds, and grouped into 19 Source Protection Regions. LTC's watershed region is within the Lower Trent Source Protection Area (slightly larger than LTC's jurisdiction as it includes a small portion of the Township of Havelock-Belmont-Methuen which is outside of Conservation Authority jurisdiction) and the Trent Conservation Coalition (TCC) Source Protection Region (Map 6). The TCC Drinking Water Source Protection Region is a complex regional grouping of five Source Protection Areas including Lower Trent, Crowe, Otonabee-Peterborough, Kawartha-Haliburton and Ganaraska Source Protection Areas. Kawartha-Haliburton and Otonabee-Peterborough Source Protection Areas include areas to the north in Haliburton and Peterborough Counties, outside of Conservation Authority jurisdiction. LTC has several responsibilities under this program through the development and implementation of Source Protection Plans aimed at the protection of municipal drinking water supplies. These responsibilities are characterized as regional, local and municipal (see Category 2 services).

Map 6: Trent Conservation Coalition Source Protection Region

4.2.4.1 Regional Drinking Water Source Protection Program (DWSP)

LTC was designated by the Ministry of the Environment and Climate Change as the lead Conservation Authority for the TCC Source Protection Region. Regionally, LTC is responsible for providing governance, administrative and technical support to the Source Protection Committee in its role of updating the Trent and Ganaraska assessment reports and source protection plans and monitoring and reporting on implementation progress. Specific duties are set out under the *Clean Water Act* and its regulations.

More information about the TCC Source Protection Program can be found under its website: www.trentsourceprotection.on.ca. The Trent and Ganaraska Source Protection Plans and Assessment Reports are available on the site.

4.2.4.2 Local Source Protection Area (DWSP)

Locally, LTC disseminates information and provides advice to local municipalities to facilitate implementation of the Source Protection Plan and to identify local priorities for future updates to the Assessment Report and Source Protection Plan. LTC is responsible for administering the Lower Trent Source Protection Authority – governance, administration, meetings, reports and the delivery of other activities required by the *Clean Water Act* and its regulations.

ISSUES AND RISKS

4.2.4 Drinking Water Source Protection (DWSP): Regional and Local:

1. Discontinuation or diminished provincial funding.
2. Keeping the science current (updated technical studies needed including issues identification, water budgets, wellhead protection areas, intake protection zones and vulnerability).
3. Protection of non-municipal systems (communal and private).
4. Challenges with implementation of the Source Protection Plan.
5. Delivery of an effective education and outreach program.
6. Program Coordinator has no supervisory role over local Source Protection Authority staff within regional staffing structure.
7. Increased development impacting vulnerable areas and the number of potential threats.

4.2.5 Watershed-based Resource Management Strategy Updates

This Watershed-based Resource Management Strategy, mandated by the Province under Section 21.1(1) of the CA Act and Section 12 of Regulation 686/21, is a watershed wide strategy that helps focus and prioritize programs and services. It includes guiding principles and objectives, summarizes and categorizes its programs, and identifies priorities and gaps.

Regulation 686/21 requires that a process for the periodic review and updating of the Watershed-based Resource Management Strategy be established, including procedures to ensure stakeholders and the public are consulted during the review and update process. These updates will become an ongoing part of the LTC program.

ISSUES AND RISKS

4.2.5 Watershed-based Resource Management Strategy Updates:

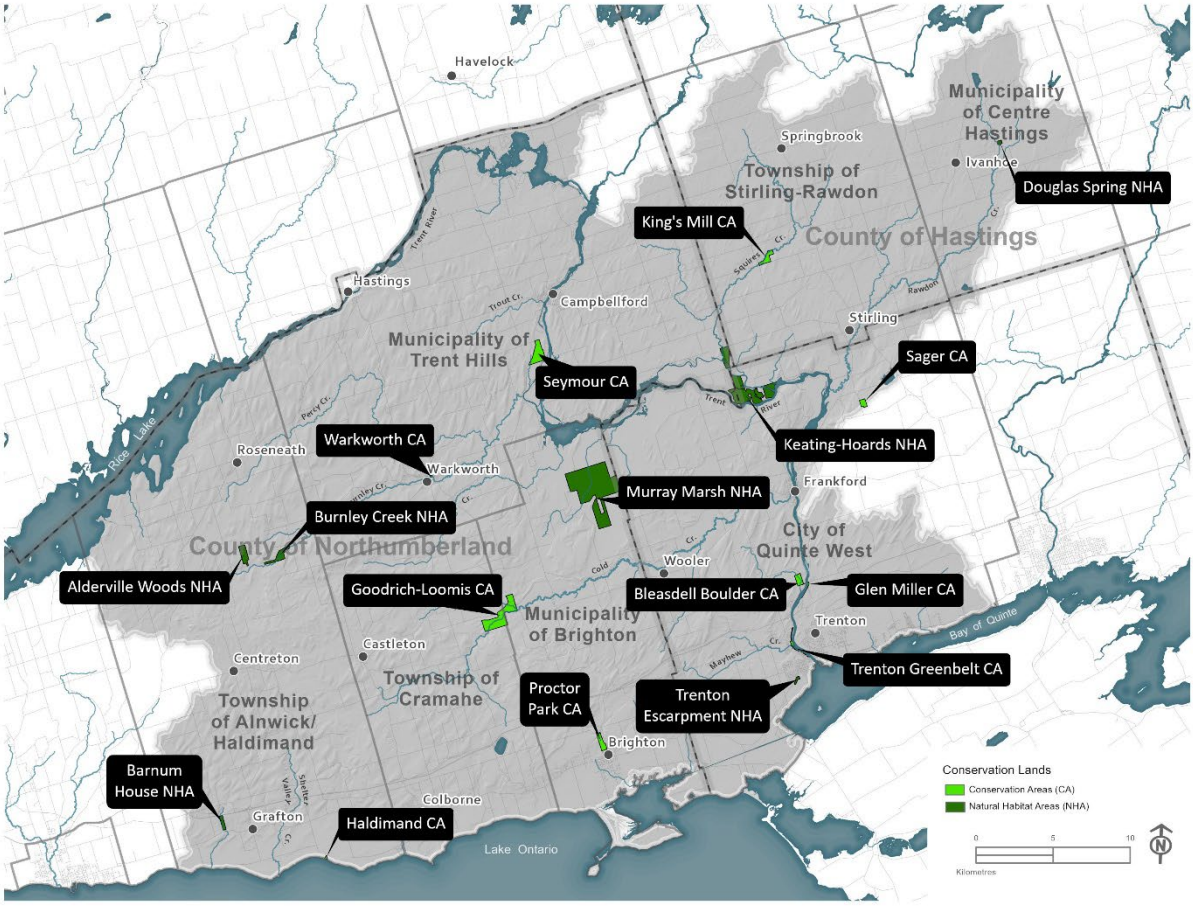
1. Lack of funding/staff capacity to update and keep current.

4.2.6 Conservation Lands

LTC's Conservation Lands are special places in the watershed where the natural world comes first. They provide a number of important benefits: water management, protection of natural ecosystems, outdoor recreation, and tourism opportunities. The properties include forests, wetlands, flood plains, prairie/savannah, farmland, and parkland. Flood control structures are located on some properties.

LTC owns over 3,707 acres (1,500 ha) of land, ranging in size from small parkettes to large natural areas (the largest being 1632 acres/660 hectares) (Map 7). The Conservation Lands Program described here does not include the Administration Building or Workshop (which are under Enabling Services) or the Public Safety Lands (included under the Natural Hazards Program), with the exception of the Mill Creek Flood Plain which is a Public Safety Land, with no flood and erosion control structures. There are 17 properties managed under the Conservation Lands Program. Ten properties are classified as Conservation Areas (passive recreation, accessible to the public) and 7 are classified as Management Areas (public accessibility varies). LTC refers to the latter as Natural Habitat Areas. LTC's Conservation Areas provide venues for healthy and active lifestyles such as hiking, bicycling, fishing, canoeing, and other recreational activities. The Natural Habitat Areas, while open to the public, are left in a natural state with no maintained trails or recreational facilities. The properties are listed below:

Conservation Areas	**Management Areas (Natural Habitat Areas)**
Bleasdell Boulder	Alderville Woods
Goodrich-Loomis	Barnum House Creek
Glen Miller	Burnley (Mill) Creek
Haldimand	Douglas Spring
King's Mill	Keating-Hoards
Proctor Park	Murray Marsh
Sager	Trenton Escarpment
Seymour	
Trenton Greenbelt	Mill Creek Flood Plain Public Safety Land
Warkworth	



Map 7: Conservation Areas

The Conservation Lands Program focusses on maintaining these properties, repairing and improving facilities and infrastructure, and improving user experiences. More information about LTC's properties and management priorities is provided in LTC's Conservation Lands and Areas Strategy.

4.2.6.1 Lands Management

This program includes the management and regular maintenance of 10 conservation areas and seven natural habitat areas with over 20 kilometers of recreational trails. Required activities include: ecological monitoring and restoration, invasive species management, forest management, hazard tree management, risk management, repairs to gates, fencing, pedestrian bridges, trails, parking lots, pavilions, roadways, and signage and communications. It also includes maintenance of the Goodrich-Loomis Conservation Centre. There are also carrying costs such as taxes and insurance.

4.2.6.2 Major Maintenance

Major maintenance and capital improvements on the Conservation Lands includes larger projects such as improved/new public access, new trails, pedestrian bridges, boardwalks, pavilions, and large-scale environmental protection/restoration projects intended to improve public safety, depending on scale.

4.2.6.3 Section 29 Enforcement and Compliance

LTC appoints Regulations Officers under Section 29 of the CA Act. Staff time is required for surveillance, enforcement and compliance with Conservation Area regulations to help protect the natural features, built structures, and ensure public safety.

4.2.6.4 Land Acquisition

LTC will consider strategic land acquisition of environmentally significant properties augment its land holdings. Any purchase or acceptance of donated land is based on careful consideration of the land acquisition policies.

4.2.6.5 Conservation Lands Equipment

LTC owns/leases equipment (tractor, lawnmowers, all terrain utility vehicle, chain saws, etc.) and maintains it to support the Conservation Lands Program. This includes purchases, leases, fuel, licenses, repairs, and maintenance.

4.2.6.6 LTC Lands Inventory Updates

Regulation 686/21 paragraph 3 of subsection 9 (1), requires that a land inventory be completed by the Conservation Authority. For every parcel of land the authority owns or controls, the land inventory includes: location, acquisition/leasing details, land use categories, a description of recreational activity, logging details, its suitability for the purposes of development, whether or not it augments natural heritage in the watershed, and whether or not it integrates with publicly accessible lands. Specific details of the requirements are set out in the Regulation.

The land inventory must be periodically reviewed and updated, as part of LTC's Conservation Lands Program.

4.2.6.7 Conservation Lands and Areas Strategy Updates

Ontario Regulation 686/21 calls for the preparation of a Conservation Area Strategy (aka Conservation Lands and Areas Strategy), to be completed on or before December 31, 2024 for all lands owned or controlled by the Conservation Authority, including any interests in land registered on title.

This strategy builds on the Conservation Areas Inventory, also required under the Regulation. It guides the management and use of Conservation Authority owned or controlled properties by setting out objectives, reviewing programs and services on the lands, reviewing land use, natural heritage, and linkages to other publicly accessible lands. Specific requirements are set out in the regulations.

Regulation 686/21 requires that a process for the periodic review and updating of the Conservation Lands and Areas Strategy must be established, including procedures to ensure stakeholders and the public are consulted during the review and update process. These updates will become an ongoing part of the LTC program.

4.2.6.8 Land Acquisition and Disposition Policies

LTC's land acquisition and disposition policies are set out in its Conservation Lands and Areas Strategy.

ISSUES AND RISKS

4.2.6 Conservation Lands Program:

1. Complete Ecological Lands Classification (ELC) mapping and identify habitat of species at risk.
2. Funding for major trail improvements.
3. Aging infrastructure.
4. Signage updates required to address legislative and social needs.
5. Invasive species inventory and management.
6. Ecosystem enhancement and regeneration
7. Engagement of volunteers to assist with Conservation Lands management.
8. Population growth and increased outdoor activity resulting in increased stresses on the Conservation Area and potential for visitor conflicts.

4.3 Municipal Programs and Services: Category 2

LTC delivers some of its programs specifically on behalf of its member municipalities. Memorandums of Understanding (MOUs) have been established with the participating municipalities for these programs. Funding is provided through these agreements.

Conservation Authorities Act

Municipal programs and services

21.1.1 (1) Subject to subsection (1.1), an authority may provide, within its area of jurisdiction, municipal programs and services that it agrees to provide on behalf of a municipality situated in whole or in part within its area of jurisdiction under a memorandum of understanding, or such other agreement as may be entered into with the municipality, in respect of the programs and services. 2020, c. 36, Sched. 6, s. 8 (1). 2022, c. 21, Sched. 2, s. 3 (1).

4.3.1 Non-LTC Owned Flood and Erosion Control Infrastructure Operation and Management

In addition to the Conservation Authority Owned Flood and Erosion Control Infrastructure noted above in Section 4.2.2.5, LTC also provides management, regular (annual) inspections and routine maintenance of non-owned Flood and Erosion Control Infrastructure in the watershed. These projects were completed in cooperation with the Province and Municipality but LTC does not have ownership of the structure. A detailed description of these structures is provided in LTC's Flood and Erosion Control Structures Operation and Maintenance Manual (Map 4)

- **Killoran Creek Flood Channel** (Hasting, Municipality of Trent Hills) - It includes two box culverts (along Bay Street and Water Street) and a concrete flood wall along Killoran Creek.

- **Rawdon Creek Flood and Erosion Control Structure** (Stirling, Municipality of Stirling-Rawdon) - The four main components are gabion walls for erosion control on both banks of Rawdon Creek, between James Street and Front Street Bridge; a concrete flood wall upstream of James Street; a weir and apron under James Street; and concrete abutments for the covered pedestrian bridge and associated concrete flood walls upstream and downstream.
- **Trent River Berm** (Trenton, City of Quinte West) - This berm is along the east bank of the Trent River, upstream of Highway 401.
- **Trout Creek Flood Control Channel** (Campbellford, Municipality of Trent Hills) - The project includes a flood wall in two sections: a DuraHold Block wall north of Inkerman Street between Simpson and Pellissier Streets and a DuraHold Block wall south of Inkerman Street between Pellissier and Balaclava Streets.
- **Glen Miller Creek Flood Control Works** (Trenton and Sidney Wards, City of Quinte West) - This project includes three separate Flood Damage Areas. The Trent Industrial Park work includes a flood control berm, flood channel on south side of Highway 401 from Gen Miller Road to Foster Stearns Road, and a box culvert for the Foster Stearns Road crossing of Glen Miller Creek. The second component is the Peterson Road Box Culvert. The third component is at Munroe Estates and Johnstown Road, but no actual flood control works were completed there.
- **Mayhew Creek Flood Control Structures** (Trenton and Murray Ward, City of Quinte West) - This work includes six separate structures:
    - A north-south flood control berm between Telephone Road and the CN Rail line in former Murray Township
    - A two-step weir flood control structure south of the CN Rail line on the main branch of Mayhew Creek in former Murray Township
    - A flat weir flood control structure in the by-pass channel for Mayhew Creek in former Murray Township
    - A flood control channel west of Old Wooler Road
    - A flood control channel east of Old Wooler Road
    - A double arch culvert under Old Wooler Road
- **Cold Creek Flood Control Works** (Frankford, City of Quinte West) - This project includes the flood control berm on the east side of the Frankford Golf Course and the weir spillway from the golf course.
- **DND Creek Flood Channel** (Trenton, City of Quinte West) -The work was completed in two separate sections: Byron Street Gabion Channel and Connolly Street Gabion Channel.

Operation and management responsibilities for the Flood and Erosion Control Infrastructures, not owned by the Conservation Authority, but undertaken by LTC staff, are set out in the

agreements with the relevant municipalities. LTC responsibilities include project management, regular inspections and reporting.

ISSUES AND RISKS

4.3.1 Non-LTC Owned Flood and Erosion Control Infrastructure Operation and Management:

1. LTC has traditionally overseen operations and management of these structures, with assistance from the municipalities as required. With staff turnover at municipalities, knowledge transfer could be impacted which could affect long term viability and function of the structures.

4.3.2 Drinking Water Source Protection (DWSP): Municipal

Under the *Clean Water Act* (Part IV), municipalities are responsible for carrying out Drinking Water Source Protection (DWSP) risk management services. They are also responsible for carrying out DWSP education and outreach, in accordance with Policy G5 under the Trent Source Protection Plan.

These tasks have been delegated to LTC, by most of its local municipalities.

4.3.2.1 DWSP Risk Management Official

Five of LTC's seven municipalities (Alnwick/Haldimand, Brighton, Colborne, Cramahe and Trent Hills) have delegated Part IV duties of the *Clean Water Act* to the Conservation Authority through a Memorandum of Understanding. Under this agreement, LTC employs a dedicated Risk Management Official/Inspector; this staff person and alternates have been officially appointed as Risk Management Officials/Inspectors by the Lower Trent Source Protection Authority.

The Risk Management Official is primarily responsible for negotiating and establishing legally binding Risk Management Plans with people engaged in (or proposing to undertake) activities considered to be a significant threat to sources of drinking water. The primary role of the Risk Management Inspector is to conduct site visits to ensure compliance with measures in Risk Management Plans and Prohibitions. LTC has assigned both roles to one staff person. This Official/Inspector can also issue notices and orders.

On behalf of the municipalities, the Risk Management Official also issues Section 59 Notices which under Part IV of the *Clean Water Act* are required for all applications under the *Planning Act* and *Building Code Act*.

4.3.2.2 DWSP Education and Outreach

Six of LTC's municipalities have entered into agreements, delegating responsibility for DWSP Education and Outreach to the Conservation Authority. The requirement for municipalities to deliver DWSP Education and Outreach is set out in the Trent Source Protection Plan. The agreements between the municipalities and LTC specify required education and outreach

responsibilities and actions under this program. Examples include: website content, social media, displays, traditional media, distribution of literature, and attending special events.

ISSUES AND RISKS

4.3.2 Drinking Water Source Protection (DWSP): Municipal:

1. Potential loss of watershed approach and consistency if municipalities undertake Part IV and Education and Outreach roles.

4.4 Other Programs and Services: Category 3

LTC delivers other programs that are not considered *Mandatory* or *Municipal Programs and Services*. These programs are either funded through municipal agreements and/or through self-generated funds. Other programs, such as the Bay of Quinte Remedial Action Plan, do not require any municipal funding, and therefore, are not included in the municipal agreements. All of the programs influence and enhance watershed health as well as LTC knowledge base and expertise. They are part of a larger integrated watershed management model and directly contribute to mandatory program delivery.

Conservation Authorities Act

Other programs and services

21.1.2 (1) Subject to subsection (1.1), in addition to programs and services described in sections 21.1 and 21.1.1, an authority may provide, within its area of jurisdiction, any other programs and services that it determines are advisable to further the purposes of this *Act*. 2020, c. 36, Sched. 6, s. 8 (1); 2022, c. 21, Sched. 2, s. 4 (1).

4.4.1 Local Water Monitoring

In addition, to the mandatory surface and groundwater quality monitoring completed through provincial programs, LTC carries out watershed wide monitoring programs to supplement its ability to monitor and report on watershed health (Map 5). The data is used to evaluate and report on existing conditions within the watershed, and helps to establish targets for protection and rehabilitation activities.

Costs include staffing, equipment and calibration, sampling, analysis, and reporting. The information collected is used for watershed report cards and watershed project prioritization.

4.4.1.1 Baseflow Monitoring

Baseflow is streamflow resulting from persistent sources of water (e.g. groundwater, lakes, wetlands, swamps) that infiltrates into the soil and eventually moves to the stream channel. This is also referred to as ground water flow, or dry-weather flow. It does not include flow or runoff from stream regulation, water diversion or human activities.

In order to understand the base amount of water that flows through the watershed region, LTC monitors the flow at several locations in the summer months using the Ontario Stream Assessment Protocol methodology. The data collected from this sampling helps identify where groundwater recharge and discharge areas are within individual watersheds. The baseflow sampling routine is structured so that 10 of LTC's 12 watersheds are sampled two times per year during low flow conditions, with multiple sites sampled per watershed, totaling 29

sampling sites. Data collected by the Water Survey of Canada (WSC) stream monitoring gauges is used for any baseflow data requirements for the two watersheds (Trout Creek and Salt Creek) that are not encompassed by LTC's baseflow sampling routine.

4.4.1.2 Surface Water Quality Monitoring

The Conservation Authority samples and analyzes water quality at nine additional sites in the watershed, in addition to the sites included in the Provincial Water Quality Monitoring Network. This gives a more comprehensive picture of water quality throughout the watershed.

Surface water quality monitoring is also undertaken in conjunction with low flow measurements at 26 baseflow monitoring sites. A digital water quality multi-parameter probe is used to measure several parameters at these sites including but not limited to: dissolved oxygen, turbidity, pH, conductivity, total dissolved solids and temperature.

4.4.1.3 Benthic Macroinvertebrate Monitoring

Aquatic macroinvertebrates, commonly referred to as benthic macroinvertebrates, are the organisms that live in the bottom of watercourses. They serve many functions in the aquatic ecosystem including acting as both decomposers and as food for larger macroinvertebrates, birds, and fish. They are excellent indicators of aquatic health and can be used to assess long term water quality.

LTC collects benthic macroinvertebrate samples at 26 Ontario Benthos Biomonitoring Network sites across the Lower Trent watershed region and analyzes the data using the Hilsenhoff Biotic Index. The Hilsenhoff Biotic Index estimates the overall tolerance of the community in a sampled area, weighted by the relative abundance of each taxonomic group.

ISSUES AND RISKS

4.4.1 Local Water Monitoring:

1. Maintenance of municipal agreement to enhance watershed knowledge and health/conditions.

4.4.2 Youth Education

LTC recognizes that the students of today are the environmental stewards of tomorrow. As a result, a youth education program has been developed its Connecting Kids with Nature Program. This includes the Tri-County Children's Water Festival and Environmental Programming (which provides presentations and workshops in schools, at children's day camps, and to youth-based community groups.)

While some of the youth education program is included in LTC's *Mandatory Programs and Services* (e.g., natural hazards) and municipal programs (drinking water source protection), supplementary programs are offered centered on watershed and natural environment curriculums, to promote environmental awareness in youth and the watershed's future land stewards.

ISSUES AND RISKS
4.4.3 Youth Education:
1. Stable funding for ongoing activities.

4.4.3 Community Outreach and Stewardship

Engaging residents in environmentally sustainable behaviours and drawing attention to conservation issues are important to LTC. The Conservation Authority hosts hikes on its Conservation Lands and other events to engage the public in outdoor environmental activities. It also hosts workshops, attends community events makes presentations to local clubs and groups, and distributes publications and other conservation information to help people learn about the protection of local natural resources and encourage them to take environmental action.

Private landowners play a key part in making sure natural resources are protected for the future. LTC works directly with watershed landowners providing technical resources, site visits, advice, and financial assistance through its Healthy Lands – Clean Water Program. The Conservation Authority also delivers specially funded stewardship programs as opportunities arise (e.g., Bay of Quinte Stewardship programs) and connects landowners to stewardship programs delivered by other organizations. The Conservation Authority sells native tree and shrub seedlings through the Tree Seedling Program, and offers native plant and wildflowers for sale.

ISSUES AND RISKS
4.4.4 Community Outreach and Stewardship:
1. Funding for staff to deliver these programs.

4.4.4 Other Programs - Non Category 3

LTC delivers programs that are not funded by local municipalities. Currently, one program falls into this “Other” category.

4.4.4.1 Bay of Quinte Remedial Action Plan Office

The Bay of Quinte was designated an Area of Concern in 1985 by the International Joint Commission under the *Great Lakes Water Quality Agreement* between Canada and the United States. The environmental concerns included excess nutrients, persistent toxic contamination, bacterial contamination, and the loss or destruction of fish and wildlife habitat. Impairments to beneficial uses, such as drinking water, fish, and recreation, are termed “Beneficial Use Impairments.”

Remedial Action Plan reports were prepared (Stage I and Stage II Reports) which identified the issues along with the studies and actions that needed to be completed to remove the “Area of Concern” designation. To oversee the delisting process for the Bay of Quinte Area of Concern, a Restoration Council was established, co-chaired by LTC and Quinte Conservation. The Restoration Council includes agencies from all levels of government, as well as local

representatives, to implement the Remedial Action Plan and undertake actions to rehabilitate the Bay. A number of the environmental challenges have now been addressed; the assessment reports are available at https://www.bqrap.ca/environmental-challenges/. Eutrophication and undesirable algae is the most challenging of the remaining beneficial use impairments.

LTC administers the Bay of Quinte Remedial Action Plan and provides communications and technical support specifically targeted at the issues present in the Bay. This includes governance, administration, communications, stakeholder and public outreach, First Nation engagement, stewardship programs, data compilation and analysis, science coordination and review, strategic planning and reporting. No municipal funds are spent on this program; it is funded by the federal and provincial governments.

ISSUES AND RISKS

4.4.2 Bay of Quinte Remedial Action Plan Office:

1. Funding for long term monitoring and data management after delisting.
2. Implementation of the Phosphorus Management Plan.

4.5 Information Supporting LTC Programs

Ontario Regulation 686/21 requires this Strategy include a summary of existing technical studies, monitoring programs, and other information about the natural resources the Conservation Authority relies on within its area of jurisdiction or in specific watersheds that directly informs and supports the delivery of programs and services under section 21.1 of the CA Act.

LTC's monitoring programs are described elsewhere in this document. Water level monitoring is accomplished through the flood forecasting and warning, low water response, and base flow monitoring programs and the Provincial Groundwater Monitoring Network. Water quality is monitored through the Provincial Water Quality Monitoring Network and local programs (benthic macroinvertebrate monitoring and local surface water quality monitoring programs).

In addition to its monitoring programs, LTC relies on a range of technical resources to inform decision making. Some of these have been completed in-house and others have been contracted to consultants. The documents, computer models and mapping products need updated from time to time to address and respond to changes in land use, watershed conditions, the regulatory framework, and emerging issues. These resources are described in Appendix 2.

4.6 Future Initiatives

Opportunities for new programs, services and projects that benefit the watershed and its municipal partners can materialize at any time; these could be long-term or short-term initiatives. These special projects may update existing studies and mapping, help address current and emerging issues, and/or assist with delivery of programs. Not only are there

benefits to the health of the watershed, but the Conservation Authority benefits from heightened expertise, new resources, enhanced partnerships and use of the completed products.

The program, services and projects could fall into any of the three categories permitted under the CA Act: mandatory, municipal or other (Category 1, 2 or 3, respectively). In addition, the projects could fall under any of the programs and services described in this Strategy, or be new initiatives. A few examples of the types of projects are listed below, but other opportunities, not currently envisioned could also materialize.

4.6.1 Land Acquisition

Land acquisition is a potential future initiative that could fall into Category 2 or 3, depending on whether it is donated or purchased with municipal funds. LTC acquires land, as opportunities arise, in accordance with its land acquisition policies.

4.6.2 Watershed/Subwatershed Plans

Watershed/subwatershed plans are important for proactively identifying watershed opportunities and constraints and to focus program priorities. A watershed plan identifies measures to protect, enhance, and restore the health of the watershed and requires extensive public consultation. It addresses existing issues in the watershed and helps mitigate impacts from potential future land uses and activities. Special funding is required from the municipalities to facilitate this type of project. It would be a Category 2 (municipal) initiative.

4.6.3 Technical Projects/Mapping

Technical projects could include flood plain mapping, shoreline management plans, natural hazard studies and mapping, GIS/Remote Sensing Projects, monitoring, data management, etc. These may fall under any one of the three types of categories, depending on the type of study/funding arrangement.

These types of projects take a significant amount of resources and often require outside expertise. Staff time is required to seek sources of funding, prepare Requests for Proposals, review proposals and provide project management of projects completed by consultants.

4.6.4 Stewardship and Restoration Projects

Funding from the government or other agencies is sometimes made available to deliver new stewardship programs or complete restoration projects. These would likely be Category 2 or Category 3 initiatives (Municipal or Other). Restoration projects could occur on private or LTC owned land. Stewardship or restoration projects on LTC lands would be Category 1 initiatives.

4.6.5 Flood and Erosion Control Projects

New flood and erosion control projects could be required to facilitate development or to respond to a catastrophic event. These would fall into the Mandatory or potentially Municipal categories.

4.6.6 Significant Partnership Programs

In the recent past, LTC has taken on a lead role in delivery of two Significant Partnership Programs: the. Bay of Quinte Remedial Action Program and the Trent Conservation Coalition Drinking Water Source Protection Program. This type of program could arise in the future, likely falling into either Category 1 or 3.

5 *RISK ASSESSMENT AND MITIGATION MEASURES*

LTC has reviewed the issues and risks documented in this strategy and has identified mitigation measures. In most cases, the amount of funding required to mitigate the risks is "To be Determined (TBD)" as the issue may not arise or be able to be addressed in the foreseeable future, and may be outside of the review period for this document.

5.1 Mandated Programs and Services: Category 1

Issues and Risks	Mitigation Measures	Cost
4.2.1 Enabling Services		
1. Municipal funding required for capital costs.	Capital Asset Management Plan in place to anticipate and cover capital costs, to be reviewed every 5 years	
2. Funding support for operational costs.	Regular budgeting process and implementation of a Board member budget sub-committee.	
3. Self-generated funding is unpredictable.	Plan and budget on more reliable funding sources.	
4. Legal expenses are not consistent annually.	The legal reserve fund increased to cover increasing legal action. Allocated when surplus funds are available.	
5. Future major maintenance or alterations to buildings and other equipment could result in increased costs.	Capital Asset Management Plan in place to anticipate and cover capital costs, to be reviewed every 5 years	

6. Staff turnover, knowledge transfer.	Offer competitive salaries and benefits in a positive work environment. Maintain good records. Develop/maintain policies and procedures documents.	
7. Keeping current and acquiring technology to sustain program functions and to meet expectations.	Ensure sufficient annual budget. Information Technology and Operations (IT and Ops) Review recommendations to assist in prioritizing technology upgrades and apply to budget cycle.	
8. E-Commerce/improved online customer service processes and tracking required.	Include in future Business Plan/Budget.	
9. Cyber security.	Cyber insurance. Budget for external Information Technology provider and staff training, as recommended in the IT and Ops Review.	
10. Public expectations for Open Data.	Ensure staff time to develop platform.	
11. Enhanced mapping, data, and analytical tools to facilitate faster, sound decision making.	IT and Ops Review recommendations for dedicated GIS position.	
12. Funds for purchase of necessary data products (i.e. orthophotography).	Capital Asset Management Plan in place to anticipate and cover costs.	
4.2.2 Natural Hazard Management		
1. LTC does not currently provide stormwater management review, due to the changes under the CA Act. Should direction change or clarification be provided by the Province, the Board may decide to reassess this decision to ensure that stormwater management is reviewed consistently across the watershed.	Monitor requirements. If Stormwater Management review re-introduced, requirement to hire engineer or retain engineering consultant.	Some costs could be recovered by user fees.
2. Conservation authorities are restricted by the Province	Monitor requirements	The costs could be

from commenting on planning applications regarding natural heritage, as has been done under agreement with municipalities for several years. The health of natural heritage systems and features within the watershed could be negatively impacted without this regional, watershed-based review.		recovered by user fees.
3. Climate change could result in more frequent flooding and low water events resulting in the need for more rain gauges and stream gauges, computer models for flood forecasting, and demand for more staff time and resources.	Ensure staff efficiencies, budget for increased staffing. Equipment is covered under the Capital Asset Management Plan. Apply for grants for climate change resiliency when available.	
4. Major maintenance for Flood and Erosion Control works could be required when no provincial funding is available; most of the flood and erosion control structures at LTC are not eligible for provincial funding due to the nature of the scoring matrix for funding.	Continue to regulate development to lessen need for control works. Continue regular maintenance of existing projects to identify upcoming maintenance requirements. Municipal support for future maintenance requirements.	
5. Plans and Technical Studies require considerable staff time and/or outside expertise. Municipal/provincial/federal funds and municipal agreements are needed to support completion of technical studies or mapping projects.	Contribute to Special Projects Reserve when funds are available. Costs for Project Management should be built into the project when available.	

6. An increase in natural hazards enforcement and complaints results in an increased demand for staff time. The ability to hire new staff is paramount but limited by funding shortfalls.	Ensure staff efficiencies.	
4.2.3 Provincial Water Quality & Quantity Monitoring		
1. Long-term access to wells on private lands (landowner turnover).	Maintain communications. Ensure agreements are in place. Move or close wells if required.	
2. Interpretation and usefulness of PGMN data to support LTC programs (e.g. low water program, watershed report card).	Seek assistance from Province with interpretation. Move or close wells if required.	
4.2.4 Drinking Water Source Protection (DWSP): Regional and Local		
1. Discontinuation or diminished provincial funding	Lobby for continued provincial funding. The Province has an alternate funding mechanism proposed through regulation that could download the financial responsibility to the municipalities.	
2. Keeping the science current (updated technical studies needed including issues identification, water budgets, wellhead protection areas, intake protection zones and vulnerability).	Lobby for provincial support for updated technical studies and the associated funding.	
3. Protection of non-municipal systems (communal and private).	Lobby for provincial support and funding.	
4. Challenges with implementation of the Source Protection Plan.	Encourage Source Protection Committee to review policy effectiveness. Increase focus for Education and Outreach.	
5. Delivery of an effective education and outreach program.	Seek additional funding/staffing for new tools and increased outreach. Track effectiveness/of education campaigns through surveys, etc.	

6. Program Coordinator has no supervisory role over local Source Protection Authority staff within regional staffing structure.	Program Coordinator involvement in the development of local work plan targets with local Source Protection Authority managers.	
7. Increased development impacting vulnerable areas and the number of potential threats.	Increase education for municipal leaders and staff to understand the significance of unsafe development. Update vulnerability studies.	
4.2.5 Watershed-based Resource Management Strategy Updates		
1. Lack of funding/staff capacity to update and keep current.	Budget for updates and identify shortfalls to the Province.	
4.2.6 Conservation Lands Program		
1. Complete Ecological Lands Classification (ELC) mapping and identify habitat of species at risk.	Budget staffing to undertake work.	
2. Funding for major trail improvements.	Capital Asset Management Plan in place to anticipate and cover capital costs.	
3. Aging Infrastructure.	Capital Asset Management Plan in place to anticipate and cover capital costs.	
4. Signage updates required to address legislative and social needs.	Budget for work.	
5. Invasive species inventory and management.	Budget staffing to undertake work. Grant proposals.	
6. Ecosystem enhancement and regeneration	Partnerships with municipalities Grant proposals Budget staff time	
7. Engagement of volunteers to assist with Conservation Lands management.	Implement Volunteer Program.	
8. Population growth and increased outdoor activity resulting in increased stresses on the Conservation Area and potential for visitor conflicts.	Budget for increased maintenance/repairs (Asset Management Plan). Increased staff presence on CA Lands.	

5.2 Municipal Programs and Services: Category 2

Issues and Risks	Mitigation Measures	Cost
4.3.1 Non-LTC Owned Flood and Erosion Control Infrastructure Operation and Management		
1. LTC has traditionally overseen operations and management of these structures, with assistance from the municipalities as required. With staff turnover at municipalities, knowledge transfer could be impacted which could affect long term viability and function of the structures.	Regular reporting to municipal partners on status of flood and erosion control infrastructure.	
4.3.2 Drinking Water Source Protection (DWSP): Municipal		
1. Potential loss of watershed approach and consistency if municipalities undertake Part IV and Education and Outreach roles.	Regular reporting to municipal partners on Part IV and education and outreach activities.	

5.3 Other Programs and Services: Category 3

Issues and Risks	Mitigation Measures	Cost
4.4.1 Local Water Monitoring		
1. Maintenance of municipal agreement to enhance watershed knowledge and health/conditions.	Regular reporting to municipal partners on local water monitoring program results.	
4.4.3 Youth Education		
1. Stable funding for ongoing activities.	Promote the positives of youth education to municipalities. Invite councilors and Board members to youth education events to enhance the importance of the MOUs. Continue to seek donations and grants to pay for supplies and summer students.	

4.4.4 Community Outreach and Stewardship		
1. Stable funding for ongoing activities.	Continue to seek donations and grants. Promote the outreach and stewardship programs by inviting Board members to participate in associated activities.	
4.4.2 Bay of Quinte Remedial Action Plan Office		
1. Funding for long term monitoring and data management after delisting.	Provide business case to the provincial and federal governments for continued funding.	
2. Implementation and monitoring progress of the Phosphorus Management Plan.	Provide business case to the provincial and federal governments for funding/staffing to oversee implementation of the Plan.	

6 *PUBLIC ENGAGEMENT*

7 *PERIODIC REVIEW*

This document should be reviewed every four years. This will permit LTC to adapt its programs and priorities to consider evolving political and socio-economic matters and address emerging environmental issues. It will also give an opportunity for every Board of Directors (appointed every 4 years) to review, update and approve the Watershed Based Resource Management Strategy. Ongoing/annual review of the strategy by staff will facilitate the four-year review.

Stakeholders and the public should be consulted during these periodic reviews, in a manner that aligns with the degree of revisions and meets any regulatory requirements.

RESOURCES

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11. Lower Trent Conservation. 2020. Capital Asset Management Plan.
12. Lower Trent Conservation. 2024. Conservation Lands and Areas Strategy.
13. Lower Trent Conservation. 2018. Conservation Report.
14. Lower Trent Conservation. 2023. Flood and Erosion Control Structures Operation and Maintenance Manual.
15. Lower Trent Conservation. 2023. Inventory of Programs and Services.
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19. Province of Ontario. 2021. *Clean Water Act, 2006, S.O. 2006, c. 22*.

20. Province of Ontario. 2023. *Conservation Authorities Act, R.S.O. 1990, c. C.27*.

21. Province of Ontario. 2022. *Conservation Authorities Act:* Ontario Regulation 163/06: Lower Trent Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

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25. Province of Ontario. 2023. *Planning Act, R.S.O. 1990, c. P.13.*

26. Province of Ontario. 2020. *Planning Act:* Provincial Planning Statement.

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29. Trent Conservation Coalition Source Protection Committee. 2022. Trent Source Protection Plan.

30. Trent Conservation Coalition Source Protection Committee. 2023. Trent Conservation Coalition Source Protection Region. URL: https://trentsourceprotection.on.ca/

APPENDIX 1

INVENTORY OF PROGRAM AND SERVICES

APPENDIX 2

INFORMATION SUPPORTING LTC PROGRAMS

1. **LTC Conservation Report,** 2018.
    - This Report was prepared in-house to provide an understanding of the current state of the Lower Trent watershed region and the issues faced today. It updates the 1970 Conservation Report (Department of Energy and Resources Management, 1970 a, b, c) and provides background information about LTC watersheds, programs and services, and identifies data/information gaps and watershed issues. It also sets out goals and priorities for the next 10 years and is intended to help guide the Conservation Authority's program planning and priorities.

2. **Flood Plain Studies and Mapping**
    a. **One-Zone Areas**
    - **Trent River Floodplain Mapping Report,** 1975. M.M. Dillon Limited.
    - **Floodplain Mapping Study of the Trent River and Rice Lake,** 1983**.** Cumming-Cockburn & Associates.
        - Includes mapping of Flood Damage Areas:
            Hastings
            Campbellford
            Percy Boom
            Frankford
    - **Shelter Valley & Barnum House Creeks:** Shelter Valley and Barnum House Creeks Floodplain Study, 1978. Crysler & Lathem Ltd.
    - **Colborne Creek (Colborne):** Floodplain Mapping Colborne Creek, Village of Colborne, 1982. Kilborn Limited (Note: 2-Zone study undertaken but results did not support creation of a 2-Zone policy).
    - **Dead & York Creeks (Murray Ward):** Dead & York Creek Subwatershed Plan, 1998. Totten Sims Hubicki Associates.
    - **DND Creek (Trenton):** DND Creek Floodline Mapping Study, 2002. PSR Group Ltd.
    - **Glen Miller Creek (Trenton & Sidney Ward):** Floodplain Mapping and Preliminary Engineering Study, Glen Miller Creek, 1983. Cumming-Cockburn & Associates Limited (CCA); and the Spill Analysis of the Glen Miller Creek by CCA dated April 1984.
    - **Killoran Creek (Hastings):** Killoran Creek Flood Reduction Study, 1985. Totten Sims Hubicki Associates.

- **Mill/Burnley Creek (Warkworth):** Mill Creek Preliminary Engineering Study, 1983. Cumming-Cockburn & Associates Limited.
- **Rawdon Creek (Stirling other than Special Policy Area):** Flood Damage Reduction Study, Rawdon Creek, Village of Stirling, 1985. Kilborn Limited.
- **Meyers, Massey and other South Sidney Creeks (Sidney Ward):** South Sidney Watershed Plan, 1985. Totten Sims Hubicki Associates.

b. **Two-Zone Areas**

- **Butler Creek 2-Zone (Brighton):** Butler Creek Flood Reduction Study, 1988. Totten Sims Hubicki Associates.
- **Cold Creek 2-Zone (Frankford)**: Floodplain Assessment & Policy Formulation for a Two Zone Concept Application in the Village of Frankford, July 1983. Totten Sims Hubicki Associates.
- **Mayhew Creek 2-Zone (Trenton):** Mayhew Creek Two-Zone Concept, City of Trenton and Township of Murray, 1983. Totten Sims Hubicki Associates. – Note that the 2-Zone was only implemented in Trenton and not Murray Township.
- **Trout Creek 2-Zone (Campbellford)**: Final Report Trout Creek Floodplain Management Study, 1982. MacLaren Plansearch Inc.

3. **Flood Plain Studies Updates,** 2024
   - **Colborne Creek**: Update to 1982 report
   - **Mayhew Creek**: Update to the 1983 report
   - **Cold Creek**: Update to the 1983 Report
   - **Butler (Proctor) Creek and Arena Creek**: Update to the 1988 report and will be inclusive of Arena Creek
   - **Rawdon Creek**: Update for 1985 report and will provide floodplain mapping areas upstream of previous study limit
   - **Trent River:** Update to 1975 and 1983 reports
3. **Lake Ontario Shoreline Management Plan,** 2020
   - The key objective of this report is to increase the resilience of coastal communities, protect new development from coastal hazards, update existing hazard mapping and protect and enhance existing private and public properties.
4. **Bay of Quinte 100-Year Combined Flood Level –** Letter report, 2020
   - This report provides information on an updated flood hazard elevation for the Bay of Quinte.
5. **Subwatershed Plans**

- **South Sidney Subwatershed Plan**, 1995. Totten Sims Hubicki Associates. Study was completed to provide requirements for consideration of development and redevelopment in the Township of Sidney, Quinte West.
- **Dead & York Creek Subwatershed Plan**, 1998. Totten Sims Hubicki Associates. Study was initiated in order to provide recommendations to assist the Municipality and LTC during the review of *Planning Act* submissions and permit applications due to increased development pressure in Murray Township.

6. **Oak Lake Water Quality Monitoring Report and Lake Management Plan**, 2019 – City of Quinte West document.
    - This report documents the current water quality conditions of Oak Lake, provides recommendations for future monitoring opportunities, and recommendations on how to protect the health of the lake.
7. **Beacon Environmental – Recommendations for Conducting Wetland Environmental Impact Studies (EIS) for Section 28 Regulations Permissions,** 2011
    - The report was created to help Conservation Authorities establish and undertake a program designed to further the conservation, restoration, development and management of natural resources under the CA Act.
8. **FFW Contingency Plan**, 2023
    - This report and plan outlines the roles of the parties affected by, and responsible for, the anticipation of potential flood situations. LTC's role and responsibilities are highlighted within this report. This report is update annually.
9. **LTC's Flood and Erosion Control Structures Operation and Maintenance Manual**, 2023 **Capital Works Projects**
    - This in-house document summarizes the capital works projects which have been undertaken in the watershed.
10. **Warkworth Dam Operation, Maintenance, Safety and Surveillance Manual**, 2023
    - This manual, prepared by DM Wills, outlines the requirements for the operation, maintenance and surveillance of the Warkworth Dam.
11. **Conservation Lands Reports**
    a. **Conservation Lands and Areas Strategy,** 2024: The Conservation Lands and Areas Strategy was prepared by LTC to meet the provisions for a "Conservation Area Strategy" set out under Section 21.1 of the *Conservation Authorities Act* and Ontario Regulation 686/21 under the CA Act. The document sets out LTC's policies and priorities for its Conservation Lands Program and guides decision-making for lands management.
    b. **Conservation Area Master Plans:** Goodrich-Loomis (1995), Proctor Park (1999), Warkworth (2011). These documents were prepared in-house in conjunction with public consultation. The plans provide background on the property, identify issues, and set out

recommendations to ensure that future management of the areas meet the needs and expectations of Conservation Area users.

c. **Conservation Area Backgrounder & Management Plans:** Bleasdell (2017), Glen Miller (2017), Haldimand (2017), Kings Mill (2017), Sager (2017), Seymour (2017), Trenton Greenbelt (2015). These documents were prepared in-house for Conservation Areas where Master Plans have not been completed. The documents provide a description of the Conservation Area, identify issues, and future maintenance requirements.

d. **Alderville Woods Conservation Management Plan,** 2004: This document was prepared by the Nature Conservancy of Canada as part of the land transfer process to LTC. The plan was prepared to assess the conservation values and stewardship requirements of the property. It provides baseline information, identifies key conservation targets, and recommends a monitoring and stewardship program.

e. **Burnley Creek Natural Habitat Area Management Plan,** 2011: This plan was prepared in-house as a requirement of the land transfer to LTC. The purpose of the document is to guide naturalization and wildlife habitat enhancement, identify maintenance requirements, identify the potential for educational/recreational activities, and identify promoted uses, permitted uses, and prohibited uses of the property.

f. **Murray Marsh Natural Habitat Area Management Plan,** 2014: This plan was prepared in-house by LTC with extensive public consultation. The plan provides background information on the property and provides recommendations to address management concerns.

g. **Natural Habitat Area Backgrounders and Management Plans:** Barnum House Creek (2017), Douglas Springs (2017), Keating Hoards (2017), Trenton Escarpment (2017). These plans were prepared in-house for properties where management plans have not been completed. The documents provide an overview of the existing conditions and history of the properties as well as uses and land management practices. They also outline required future maintenance/upgrades and future considerations for the properties.

12. **Key Geographic Information Data:**

a. **Central Geodatabases**

- Digital OrthoImagery: 2008, 2013, 2018, 2023
- Ontario Hydro Network
- Digitized and Vector Floodlines
- LiDAR high resolution terrains
- Drinking Water Source Protection assessment report database
- Bay of Quinte Remedial Action Plan technical data

b. **Archived Aerial Photographs:** 1953/54, 1982, 1989, 1993, 2002

- The aerial photographs are a mixture of black and white and various scales. Some sets provide complete watershed coverage and others only partial coverage.

c. **Ontario Base Maps**

- Coverage of the watershed region at a scale of 1:10,000

d. **Federal National Topographic Series Maps**

- Complete coverage of the watershed at a scale of 1:50,000 and partial coverage at a scale of 1:25,000

e. **Records and Asset Management:**

- SharePoint
    - Permitting/Planning Records
    - Vehicles/ Equipment / Buildings / Lands Assets Records

f. **Water Information Systems:**

- WISKI, KiECO, and KiDAT is a suite of water and meteorological data management tools developed by the software company KISTERS. It is complementary to GIS, handling time series of watershed data. The software is used for storing, managing, analysing and reporting surface water, ground water, water quality, waste water, drinking water and meteorological data.

13. **Drinking Water Source Protection Reports**

a. **Trent Assessment Report** (updated February 2, 2022): The report was prepared by the Trent Conservation Coalition Source Protection Committee to identify the threats and risks to municipal drinking water sources in the Trent River watershed.

b. **Trent Approved Source Protection Plan** (updated February 2, 2022): The report was prepared by the Trent Conservation Coalition Source Protection Committee to set out policies to address the threats and risks to municipal drinking water sources in the Trent River watershed.

In addition to the Assessment Report and Source Protection Plan, numerous documents were prepared to support the Source Protection Committee in the development of these reports. They include:

- Watershed Characterization (2008)
- Water Budgets (2007-2010)
- Technical studies to delineate and score municipal water supply vulnerable areas. This includes the original technical studies and updated studies for Section 34 updates due to new or modified municipal water supplies (2007- 2021)
- Technical studies to delineate Significant Groundwater Recharge Areas (2009) and Highly Vulnerable Aquifers (2009)

14. **Bay of Quinte Remedial Action Plan (BQRAP) Reports**

a. **Bay of Quinte Stage 1 Remedial Action Plan Report (Environmental Setting + Problem Definition),** 1990: The report was prepared by the BQRAP Coordinating Committee. It identifies 10 environmental challenges (beneficial use impairments) needing to be addressed in the Remedial Action Plan process.

b. **Bay of Quinte Stage 2 Remedial Action Plan Report (Time to Act),** 1993: This report, prepared by the BQRAP Coordinating Committee, identifies 80 recommended actions to restore, protect and monitor environmental quality in the Area of Concern.

c. **BQRAP BUI (Beneficial Use Impairment) Assessment Reports**

These documents provide an assessment of the Beneficial Use Impairment and recommends based on scientific evidence that the Beneficial Use Impairment is restored to support delisting. The following Assessment Reports have been prepared and the recommendations accepted by the Area of Concern Leads:

- Degradation of Fish and Wildlife Populations (2016)
- Fish Tumors and other Deformities (2015)
- Degradation of Benthos (2017)
- Restrictions on Dredging Activities (2015)
- Restrictions on Drinking Water or Taste and Odour Problems (2019)
- Beach Closures (2018)
- Degradation of Aesthetics (2020)
- Loss of Fish and Wildlife Habitat (2016)

Assessment Reports for the following Beneficial Use Impairments are at various stages of development:

- Restrictions on Fish Consumption
- Eutrophication and Undesirable Algae
- Degradation of Zooplankton and Phytoplankton

In addition to the Assessment Reports a Phosphorus Management Plan is in development for the Bay of Quinte. This plan will ensure that further reductions in phosphorus levels are achieved and the progress made by the Remedial Action Plan in rehabilitating the bay is maintained.

15. **Natural Heritage Studies**

a. **Natural Heritage Report Campbellford/Seymour/Percy/Hastings/Quinte West/Belleville,** 2001: Through the BQRAP, LTC developed this report to define a Natural Heritage System for the study area.

b. **BQRAP Natural Heritage Strategy,** 2015: Through the Bay of Quinte Remedial Action Plan, LTC developed a Natural Heritage Strategy for consideration of the municipalities and the First Nation Territory of the Bay of Quinte Region.