Invasive Species - Unwanted Invaders (1985)

Invasive species are among Canada's greatest threats to the survival of our native plant and animal life. These unwanted invaders are transported, often accidentally, from other parts of the world and threaten to transform the wildlife, woodlands, and waterways on which we rely.

In the absence of natural predators, these non-native plants and animals are able to outcompete native species in their new surroundings. Over the years, many invasive species have made their presence known across the Lower Trent watershed region – dog strangling vine, garlic mustard, zebra mussels, and phragmites to name just a few. Due to the impact to the natural environment across the watershed region, including our Conservation Lands, Lower Trent Conservation has been involved with the monitoring and control of some of these invaders.

The invasion of gypsy moth was one of the first invasive species that garnered Lower Trent Conservation's attention. During the mid 1980s, the infestations of gypsy moth, an insect native to Europe and Asia, resulted in extensive defoliation of hardwood trees such as oak, birch, poplar, willow, and maple across the watershed. Lower Trent Conservation worked with the Ministry of Natural Resources, municipalities, and private landowners to control gypsy moth through extensive spray programs.

In the early 1990s, Lower Trent Conservation partnered with the Ontario Federation of Anglers and Hunters on 'Project Purple', a campaign to increase public awareness of purple loosestrife, a plant that invaded wetlands and ditches throughout Southern Ontario. In 1994, researchers with the Biological Control Laboratory at the University of Guelph released 300 pairs of *Galerucella pusilla,* a European beetle that feeds solely on purple loosestrife, in King's Mill Conservation Area. At the time, an estimated 10 hectares of the 25-hectare property was infested with purple loosestrife. Follow up monitoring in 1995 and 1996 indicated a good beetle population had been established at the Conservation Area. Today, purple loosestrife populations throughout our watershed region are significantly reduced.

In 2008, the first known population of water soldier in North America was discovered in the Trent River near the hamlet of Trent River. It is a perennial aquatic plant native to Eurasia. Prior to being regulated as a prohibited species, it was sold as an ornamental plant in water gardens, which is likely how it was introduced to the Trent River. Lower Trent Conservation is participating with an interagency working group including: Ministry of Natural Resources and Forestry, Ministry of the Environment and Climate Change, Ontario Federation of Anglers and Hunters, US Army Engineers Research and Development Center, Trent University, and Parks Canada to monitor and control water soldier.

For the past 10 years, through a partnership with the Ontario Federation of Anglers and Hunters, Lower Trent Conservation has also hosted an Invading Species Hit Squad member. As part of a 20-member team working in various locations across the Province, a summer student has been hired to attend festivals and events, provide educational programs to the public, and monitor local areas for invasive species.

We continue to work with our partners to be on the lookout for, and increase awareness of, invasive species in our watershed.

Water Soldier in the Trent River

Giant Hogweed

Roadside Wild Parsnip

Trees impacted by Emerald Ash Borer

Shoreline Management
- Living along Lake Ontario (1987)

People living along the Lake Ontario shoreline are accustomed to constant change – water levels fluctuate, shorelines erode, and sands shift. In years with high water levels and big storms, the impacts can be devastating. Lawns are ripped away, buildings destroyed, and sometimes lives lost.

In 1987, to address this concern, Lower Trent Conservation began work on a shoreline management plan for its 100 kilometres of Lake Ontario shoreline, including bays and inlets. This work was in conjunction with a Province-wide effort to develop shoreline management strategies to prevent future development in hazardous areas along the Great Lakes. Lower Trent Conservation completed the Shoreline Management Plan in 1989, encompassing strategies for prevention, protection, emergency response measures, and monitoring.

In 1990, Lower Trent Conservation, in conjunction with Central Lake Ontario and Ganaraska Region Conservation Authorities, completed a joint Lake Ontario Shoreline Management Plan in conjunction with Sandwell Swan Wooster, Inc. This plan took the earlier draft one step further, with modelling and detailed surveys resulting in the identification of flood levels, erosion setbacks, and dynamic beach limits for every reach of shoreline from the Oshawa area to Wellers Bay.

Around the same time, detailed mapping delineating the flood line (at a scale of 1:2,000) was prepared for the shoreline under the Canada – Ontario Flood Damage Reduction Program.

More detailed shoreline plans were developed by Lower Trent Conservation for Cramahe and Haldimand Townships in 1997 and 2003, respectively. These plans included more specific flood, erosion, and dynamic beach limits for the municipalities, providing further direction for shorelands protection. Erosion monitoring stations, originally established in the 1970s under the Flood Damage Reduction Program, were also re-surveyed or re-established to allow for long-term monitoring.

While the information was used to provide planning advice to municipalities on shoreline development proposals, it wasn't until 2006 that the

Conservation Authority's regulations were amended to allow for regulation of the shoreline under the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation.

With climate change and the unprecedented high water experienced on the Lake Ontario shoreline throughout the summer of 2017, the need to replace the 30 year old mapping became evident. In 2018, with funding from the National Disaster Mitigation Program and local municipalities, Lower Trent Conservation (in conjunction with the Central Lake Ontario and Ganaraska Region Conservation Authorities) initiated a project to update models and mapping which will improve our ability to assist municipalities and landowners with flood damage prevention.

Lake Ontario shoreline *(early 1970s)*

Evergreen Lane, Municipality of Brighton - unprecedented high Lake Ontario water levels *(May 2017)*

Land Use Planning in Ontario (1988)

Providing input to municipalities on planning applications is a key method by which Lower Trent Conservation protects the local watersheds and community. It is a proactive approach to flood plain management and environmental protection.

The Provincial policy direction all began in 1988 when the Flood Plain Planning Policy Statement and Guidelines were released by the Province. These policies emphasized the need for minimizing development in the flood plain and encouraged local municipalities to recognize flood hazards in their planning documents. The provincial direction helped to strengthen the Conservation Authority in its bid to minimize development in the flood plain.

Lower Trent Conservation's review of planning applications considers impacts on the local environment, based on policy direction approved by its Board of Directors. In addition to the local flavour, the Province has set planning policies which reinforce the Conservation Authority's policies.

In 1992, the Minister of Municipal Affairs and the Minister of Natural Resources released a Provincial Wetland Policy under the *Planning Act*. This Policy gave direction for the protection of Provincially Significant Wetlands in southern Ontario. The policy also encouraged the conservation of other wetlands, providing much needed support to Lower Trent Conservation's policy of "no development" in wetlands.

In 1995, the Comprehensive Set of Policy Statements was released by the Province, combining flood plain and wetland protection policies in one policy statement, along with other land use policies (e.g., agriculture, mining). This policy was short lived and replaced with the Provincial Policy Statement in 1996. The new policy statement included policies related to Natural Heritage, Natural Hazards, and Water Quality and Quantity, and recognized the importance of improving natural connections.

Later, other legislation and policies released by the Province included: the *Oak Ridges Moraine Conservation Act* and Conservation Plan, *Greenbelt Act* and Plan, and *Places to Grow Act* and Growth Plan. These policies set directions for specific areas in our watershed and are taken into consideration when making planning decisions.

While Lower Trent Conservation has agreements with its member municipalities to provide advice on matters relating to natural heritage and water quality and quantity, the Province has delegated to conservation authorities the responsibilities for commenting on planning applications with respect to the provincial natural hazard policies (e.g., flooding, erosion).

In addition to providing recommendations with respect to planning policies, the Conservation Authority makes use of the opportunity of reviewing proposed development applications to advise municipalities, developers, and landowners of the applicability of our Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulation 163/06).

Through legislation, official plans and zoning by-laws, and local policies and regulations, the Province, Municipalities, and Lower Trent Conservation work together to minimize the risks of new development on flood plains, natural heritage, and water quality, helping to preserve the natural wonders so abundant in the Lower Trent watershed region.

Work in or adjacent to a watercourse, wetland or shoreline without a permit is a violation under the Conservation Authority's regulations and could result in charges being laid.

Working around Waterways requires a Permit (1989)

Starting in 1989, permits were required from Lower Trent Conservation for anyone wanting to place fill, construct or renovate any building or structure, or alter a watercourse in areas regulated by the Conservation Authority. These regulated areas included watercourses, their flood plains, and a setback.

Lower Trent Conservation received Provincial approval for its *Fill, Construction and Alteration to Waterways Regulation* (Ontario Regulation 194/89), under Section 28 of the *Conservation Authority's Act* in March 1989. The new three-part regulation enabled the Conservation Authority to ensure that new development would not increase the threat of flooding or erosion along the region's waterways.

A big change came about in 2006. The Province approved Ontario Regulation 163/06 (*Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation*). This new regulation, which is still in force today, replaced the 1989 regulations and applied to an expanded area including wetlands and the Lake Ontario shoreline. It provides the Conservation Authority with better tools to minimize flooding and erosion damage, and to conserve and enhance natural resources.

Over the years, many applications were reviewed, and most approved. Staff have always worked with applicants to help them modify their plans so that permits can be issued with no impact to the flood plain, or upstream and downstream neighbours.

Permit applications are reviewed by Lower Trent Conservation's expert team of staff (experienced in water resources, engineering, biology, ecology, and municipal planning) using digital flood plain and wetland mapping, studies and reports, and through on-site inspections of the property and proposal. Sometimes, applicants are asked to complete other surveys or studies to ensure that flooding and erosion will not be aggravated, and that wetlands will not be impacted. The number of approvals have increased from 49 applications in 1989 to 250 applications in 2017, keeping our staff very busy.

People planning a project near a watercourse, shoreline, or wetland may need a permit from the Conservation Authority. Charges can be laid for unauthorized work. So please, call first!

Partners in Conservation
- King's Mill Conservation Area (1989)

In 1989, a win-win project presented itself for two conservation organizations. The existing dam on Squires Creek at King's Mill Conservation Area was in desperate need of work. As luck would have it, Ducks Unlimited was looking to establish more wetlands for waterfowl. An opportunity to kill two birds (or two mosquitoes) with one stone! By building a weir to replace the failing mill dam, the existing marsh wetland habitat could be enlarged for the benefit of many ducks, geese, and swans.
The project went ahead. A low head weir dam was constructed by Ernie Hamilton Construction, of Kingston, just upstream of the old mill dam. Ducks Unlimited contributed approximately 25% of the project costs. Ducks Unlimited also looked after the project tendering, contracting, and site supervision. The neighbouring Crowe Valley Conservation Authority generously chipped in by providing a qualified inspector for the dam's construction.

But there is more to the King's Mill Conservation Area story than just its new wetland and dam. King's Mill Conservation Area is best known for its enduring and always picturesque grist and saw mill built around 1823. Its look is unique - huge inlaid wooden beams span the width of limestone walls - possibly inspired by elements of Scottish architecture as it was built by Robert Parker from Ayr, Scotland. Originally, it was completely water powered, used to saw logs in spring high water flows until a gasoline motor was installed in 1939. The mill was retired in the late 1960s.

This quiet Conservation Area is surrounded by a beautiful rolling landscape spotted with drumlin hills. Squires Creek squeezes between two drumlins here on its way to the Trent River just a few kilometres downstream. In addition to the large wetland, the Conservation Area also boasts mixed forest woodlots, some of which were reforested farm fields planted by Lower Trent Conservation and inmates from the Warkworth Penitentiary.

It is a little-known fact that, back in the day, King's Mill was the hub of Lower Trent Conservation's Conservation Lands operations. Lower Trent Conservation bought the property in 1970 to develop as a conservation area and to use as a workshop. There was even hope to restore the mill to demonstrate early milling methods and attract tourism, but that never

materialized. Probably fewer people still know that Lower Trent Conservation staff reared ducks, geese, and swans in pens on the property. Mute swans that spent their spring and summer at the mill pond in Warkworth overwintered in pens at King's Mill. Over time, workshop operations relocated to the current facility in Trenton.

Today, the mill sits empty, providing summer lodging to colonies of bats feasting on plentiful neighbourhood mosquitoes. It's also a draw for budding artists.

King's Mill *(originally built in 1823)*

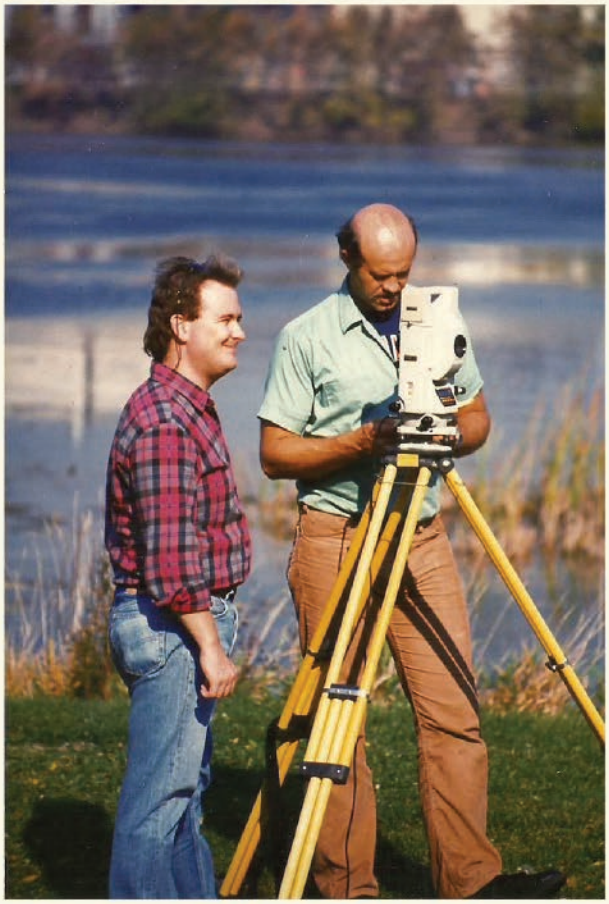
Green Acres, Municipality of Trent Hills - One of the surveyed flood damage centres *(2014)*

Surveying Trent River Flood Damage Centres (1990)

In 1990, Lower Trent Conservation completed field surveys of flood prone structures located along the Trent River. This project, initiated in 1989, was aimed at reducing flood damages along the Trent River between Hastings and Trenton.

The need for the surveys was identified through a 1987 study, which was completed following the major floods of 1980 and 1981. Several damage centres were surveyed, plotting the elevation contours, flood line, and buildings. Surveys were completed for Frankford, Sills Island, Sullivan's Hill, Glen Ross, Wilson Island, Green Acres, Percy Boom, Campbellford, the hamlet of Trent River, and the Village of Hastings.

The surveys were originally scheduled to be completed by a consultant. However, the Conservation Authority decided to rent Total Station survey equipment and purchase a Computer Aided Drafting and Design system. Staff were trained to use this technical equipment, providing a knowledge base for future projects.



The data collected through this project has been useful over the years, both in implementing our flood plain regulations and in identifying risks to property and lives in these flood prone areas.

Today, our Geographic Information System is used to create maps, layering imagery, contours, elevations, and flood lines, to implement our regulations and assess flood risk potential.

The early days of digital mapping at Lower Trent Conservation

GIS News

Published by the LTRCA for the Conservation Authorities GIS User Group

February 1993

Introduction

Welcome to the wonderful world of GIS. This newsletter is an attempt to share and compare different applications of GIS among the Conservation Authorities in Ontario. This concept of a C.A. newsletter arose from a meeting in late December at the Rideau Valley Conservation Authority. Members from several C.A's and staff from A.J. Robinson & Associates Inc. (consultants), met with staff from Intera - Tydac. GIS projects from three different C.A.'s were presented. Shoreline management practices were demonstrated through the use of SPANS Map. The meeting was a success and so far everyone that I have talked to has shown interest and is willing to cooperate in making this a successful venture. If people do not respond and participate, it will surely cease. All Authorities can contribute to this newsletter, whether you are using SPANS or Autocad or even if you do not have your GIS system running, you may have inquiries concerning start up costs etc... There are already three authorities willing to contribute to the next newsletter. Intera - Tydac will be submitting any information on upgrades and new technology. I would appreciate any comments concerning the format and approach of the newsletter. The newsletter will be divided into three sections; a column from Intera - Tydac's (news releases etc..), a section allotted for people to forward questions or problems they would like to share with other users, and a section devoted to individual C.A.'s where GIS applications are discussed. This issue will hopefully get things rolling. Next issue Terry Chapman (Ausable - Bayfield), and Warren Coulter (Ganaraska) are discussing GIS applications within their individual watersheds. I have taken editor's liberty and included a presentation on the Lower Trent Region's GIS Activities. I have mailed a copy to all SPANS users as presented by the list compiled by David Thomely from the MNR. This newsletter has been created to inform and help solve common problems encountered within the Conservation Authorities, therefore, your participation is greatly appreciated. Feel free to contact me if you have any suggestions or questions regarding the newsletter.

GIS at LTRCA

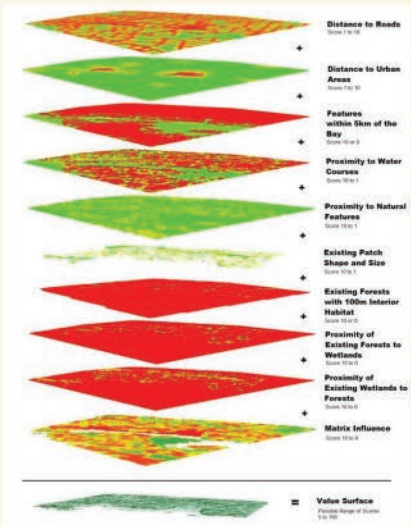
The Lower Trent Region Conservation Authority has been involved in several GIS projects over the last year. In the past we have acquired the digital data for the flood, fill and shoreline of the Trent River. We have been able to share the cost of this data by forming a partnership with the Trent-Severn Waterway, Natural Resource Department. Our present project is a joint study with the Trent - Severn. The project has spanned eight months and is almost completed.

The goal of our present project is to digitize, georeference and format the cadastral information contained in Ministry of Revenue assessment mapping and Ontario Base Maps. Also, to identify potentially hazardous sites and to utilize G.I.S. technology to display rank and provide information on identified sites.

This project provides the base maps in digital form (utilizing SPANS/ GIS) for site reconnaissance identifying potential sites of hazardous substances along the shoreline of the Trent River. The three main components of the project include; creating digital base maps of the study area, historical research, and environmental modelling.

Base maps were digitized from 1:2000 Ontario Base Maps. These maps provide a georeferenced vector set of the Trent River shoreline. Assessment mapping from the Ministry of Revenue was digitized for the same area. The assessment mapping was overlayed with the Ontario Base Mapping to create georeferenced edge matched assessment sheets. The Ministry of Revenue Realty database was appended to individual properties along the shoreline. Landuse maps were created from the Realty information.

Industrial sites in each community were researched and recorded in a database file. This file containing information on; years of industrial production, site topography and waste products was appended to corresponding properties along the shoreline (digitized from MOR data). Sites



Use of satellite imagery for Proposed Natural Heritage Strategy *(2014)*

Mapping goes Digital (1991)

The year 1991 marked a tipping point in technology use at Lower Trent Conservation. Personal computers were all the rage and we had purchased our first digitizer. Tech-pioneers in many industries recognized the value of these new tools.

Traditionally, maps were drawn by hand on large sheets of paper. The cartographers who produced them were highly artistic and very adept in geometry and mathematics. However, sharing and reproducing maps was a challenge, and updating them was costly and time consuming.

Did you know that the very first digital mapping system in the world was developed for the Government of Canada? The Canadian Geographic Information System (CGIS) was developed by a consulting company in Ottawa, Ontario to collect, store, manage, and analyze vast amounts of geospatial data for the Canada Land Inventory. This dataset documented areas most suitable for agriculture and forestry. This would have been one of the very first digital mapping datasets received by Lower Trent Conservation.

Mapping software to deal with this data was still in its infancy. Initially, Lower Trent Conservation used AutoCAD to visualize this data as points, lines, and polygons. AutoCAD allowed us to receive digital data for the flood, fill, and shoreline mapping of the Trent River. By 1992, in partnership with the Trent-Severn Waterway, Lower Trent Conservation began undertaking spatial analysis by combining different sources of digital mapping using SPANS software (SPatial ANalysis System). This project provided maps for site reconnaissance identifying potential sites of hazardous substances along the shoreline of the Trent River.

Today, Lower Trent Conservation relies heavily on digital mapping for our day-to-day work. Experts from all departments can tap into centralized geodatabases which are designed to store and manage digital mapping data. Sadly, much of the artistry of traditional cartography has been lost during the digital revolution; however, nowadays the data is more current, more accurate, and more reliable. Thanks to digital data, staff always have access to the best available mapping information.

Aerial mapping of watershed approved by Lower Trent

TRENTON- The executive of the Lower Trent Region Conservation Authority (LTRCA) has voted to proceed with aerial mapping of the watershed.

Rob Messervey, general manager, said Monday the authority will spend $23,000 for the mapping.

The last aerial maps were produced in 1969 and updating of these is needed as soon as possible, he said.

"It will be used also as the basis for providing base mapping in the future. Most floodplain mapping projects we have had to assign a company to go out and provide aerial mapping for that specific study area at fairly high cost.

"If we do it in bulk we will realize a very substantial saving," Messervey said.

The maps are also used for planning purposes and watershed inventory work.

Using a stereoscope to see 3-D images of the Lower Trent Conservation landscape

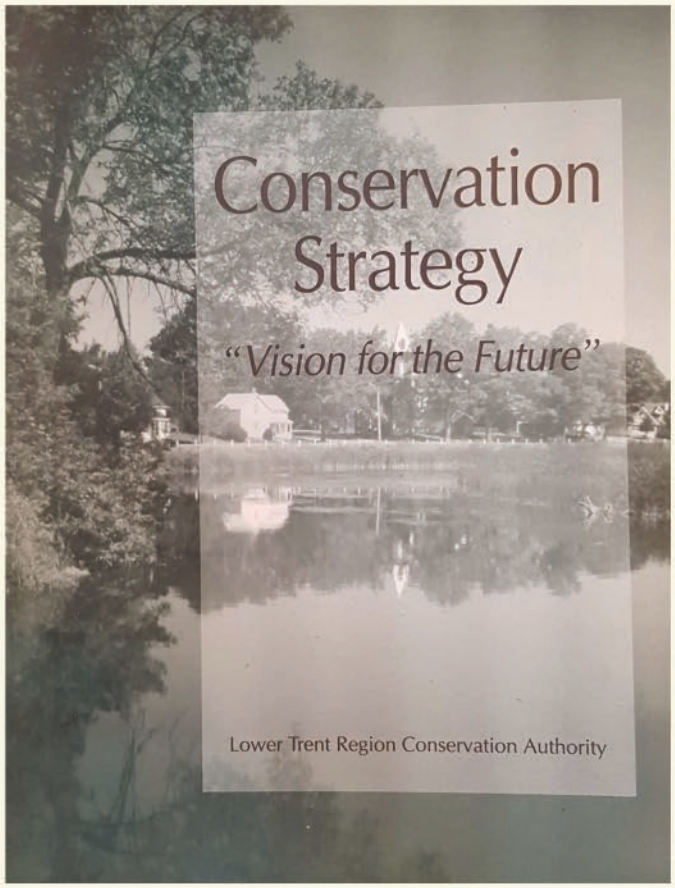
Aerial Photography
– A Picture is Worth a Thousand Words (1993)

Much of the mapping information we use at Lower Trent Conservation is gleaned from aerial photographs. Whoever said that a picture is worth a thousand words was onto something! From early black and white photos to modern digital orthophotography, Lower Trent Conservation retains all of this information.

Before 1993, aerial photos were collected about once every 10 to 15 years using black and white film. These photos were extremely valuable to staff but relatively expensive to acquire. Due to cost, these photos were taken at high altitude. This resulted in greater coverage in each photo but less detail. By 1993, improving technology permitted photos to be collected in colour and at slightly larger scales, which made significant improvements in ability to interpret.

Lower Trent Conservation retains all photos collected over the years in a historical archive. These photos are like a time capsule which allows us to see what the landscape looked like in snapshots back to the 1950s. We can easily see where old woodlands once stood and where wetlands flooded the landscape.

Trained analysts could observe apparent flood plains and areas at risk of erosion from a photo. They did this by using stereoscopic imagery. Photos were collected as duplicate pairs where the same area was photographed from two slightly different angles. Using an apparatus called a stereoscope, the analyst could view the images in 3D. This illustrated a new dimension in the imagery allowing the analyst to observe differences in topography and vegetation.



1993 Conservation Strategy

Local Leaders in Conservation – working with others for healthy watersheds with natural areas for all to share.

2018 Strategic Plan

Healthy Watersheds for Healthy Communities

Conservation Strategy (1993)

In 1993, Lower Trent Conservation released its first strategic plan – our Conservation Strategy. In developing this plan, we did a little navel gazing, and made recommendations that would guide the business operations of the organization. We established our first Vision Statement: *Local Leaders in Conservation – working with others for healthy watersheds with natural areas for all to share.* The strategic plan set out how we would achieve our vision including how we would work with others and how we would finance our conservation program. The plan was developed through extensive public consultation with the help of Pickard & Laws Consulting Group Inc.

Prior to that, the Conservation Authority was guided by the 1970 Conservation Report, prepared by the Provincial Department of Energy and Resources Management shortly after the Authority was formed, and the 1983 Watershed Plan. These documents made recommendations for addressing natural resource management issues, but didn't deal with the organization itself.

This year, fifty years since Lower Trent Conservation was formed, we released a new Strategic Plan. This document sets out new vision and mission statements, and addresses both organizational and environmental priorities. It is intended to lead the Conservation Authority through the next 10 years. This Plan was developed in house in consultation with municipalities, other agencies and organizations, and the general public.

The new vision statement - *Healthy Watersheds for Healthy Communities* - exemplifies the link between a healthy environment and the economic and social health of our communities, as well as the physical and mental health of the people who live here.

Our new mission statement is *To protect land, water and living things by working with and inspiring others*. It sets out our reason for being, to protect the local environment, and it recognizes that we can't do it alone. We need to encourage others to take environmental action and work with other partners to achieve our goals.

A strategic plan is a critical document for an organization. Our 1993 Conservation Strategy served us well and we are excited about the release of our new Strategic Plan. It will help us establish our annual priorities and guide our future actions.

Stewardship programs needed to address issues like cattle in the creek

Working with local farmers

Septic tank inspections

Shoreline improvements - *before and after*

Landowner Stewardship Programs Helping to Improve Water Quality of the Bay of Quinte (1994)

The Bay of Quinte Remedial Action Plan has a long history of implementing both urban and rural stewardship initiatives to improve water quality in the Bay. During the development of the Remedial Action Plan, the importance of rural Best Management Practices was highlighted as a key factor in improving water quality in the Bay of Quinte. The use of education/outreach and financial incentives have been effective tools in improving water quality.

Initially, the focus of rural stewardship programs was bacterial contamination due to the number of public beach closures. In 1994, the Rural Water Quality Program was initiated to encourage improved land management practices that reduced the impact of upstream pollution sources. The program provided grants and advice to landowners for: livestock access restriction and alternate watering systems; manure storage facilities; milk house washwater practices; conservation tillage equipment; and septic system upgrades.

Later, the Habitat Enhancement Program provided funding to landowners for shoreline naturalization, buffer plantings, fencing, osprey platforms, and nesting boxes. More recently, with phosphorus inputs to the Bay continuing to impact water quality, stewardship activities have focused on projects to reduce phosphorus levels. Through the septic stewardship program, landowners receive free educational site visits, septic pump outs, and inspections. The program for agricultural landowners offers free soil testing, mapping showing erosion prone areas, technical support/advice, and incentives to implement best management practices.

The continued implementation of long-term stewardship programs, with a focus on reducing phosphorus inputs to improve water quality for both rural and urban areas, will ensure the Bay of Quinte remains a healthy and vibrant ecosystem.

Land Use Planning Using Nature's Boundaries (1995)

Imagine following a stream or river to see where it flows. It may start in a wetland, run through woodlands and fields, travel through small towns and large cities, and eventually flow into a larger river or lake. All of the land that drains into that stream or river is called a watershed. Watersheds are natural geographic units – they are defined by nature. Watershed boundaries may cross municipal, provincial, and even international borders. They come in all shapes and sizes and can vary from millions of acres, like the land that drains into the Great Lakes, to a few acres that drain into a pond.

Ontario's Conservation Authorities are organized on a watershed basis. Lower Trent Conservation's watershed region includes the furthest downstream section of the Trent River watershed, encompassing 2,070 square kilometres. It includes the Trent River, which flows out of Rice Lake to the Bay of Quinte at Trenton, and the watersheds of eight main tributaries. The watershed region also includes a number of smaller watercourses that flow directly into Lake Ontario and the Bay of Quinte from Grafton to Quinte West.

As watershed managers, Lower Trent Conservation works with municipalities to ensure that the natural environment is recognized as an important part of the local community – as important as the road, sewer, and water supply systems. The development of watershed plans ensures that future growth of a municipality will not seriously impact the natural environment.

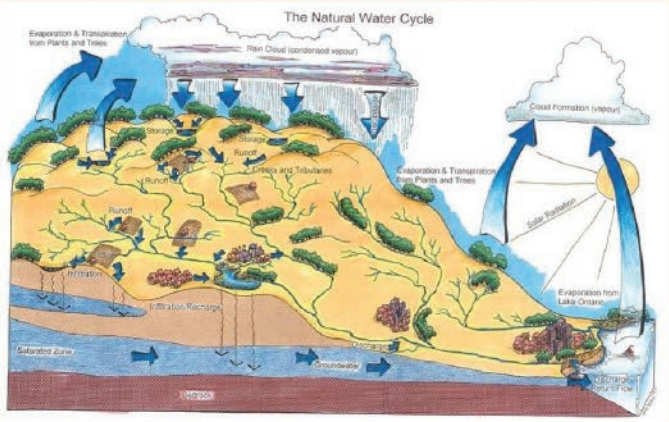
Several watershed studies have been completed in the Lower Trent Conservation watershed to respond to development pressure and the need for stormwater management. These watershed plans were completed with funding through the Bay of Quinte Remedial Action Plan. They include:

- The **South Sidney Watershed Plan** (1995) which builds upon a planning program put in place by the South Sidney Secondary Plan and the Official Plan of the former Township of Sidney.
- The **Dead & York Creek Watershed Plan** (1998) that encompasses the lands draining into Dead Creek, York Creek, and the Dead Creek Marsh north of the Murray Canal within part of the former Township of Murray and City of Trenton.

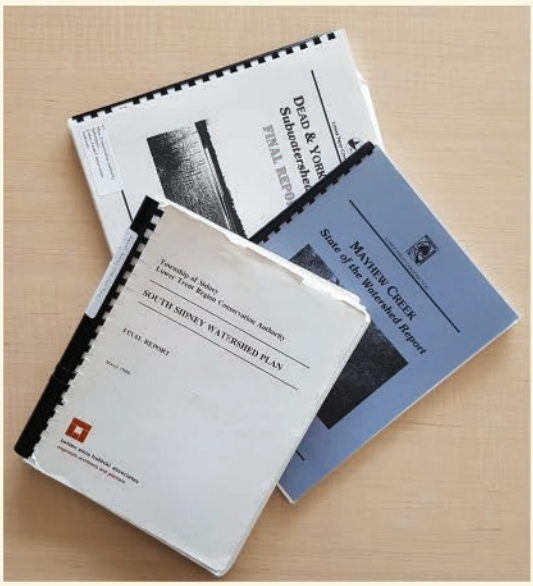
· A **State of the Watershed Report** (2000), completed for **Mayhew Creek**, which flows from west to east through an agricultural setting into the urbanized north end of Trenton.

A lack of funding has prohibited Lower Trent Conservation from completing other watershed plans. Hopefully, with updates to provincial policies and plans such as the 2014 Provincial Policy Statement, 2017 Oak Ridges Moraine Conservation Plan, Greenbelt Plan and Growth Plan, all calling for watershed planning, there will be a renewed interest in undertaking watershed plans in the region.

Regardless of what formal plans are completed in conjunction with local municipalities, one fundamental principle needs to be kept in mind. Water continuously moves through watersheds and influences numerous life cycles and physical processes throughout. It is important to make decisions based on watersheds, because activities in one part of the watershed may have impacts upstream or downstream. "Nothing exists in isolation ... everything is connected to everything else. If we alter one part of the environment, the effects will be felt elsewhere, like ripples on a pond after a stone is thrown in." (David Crombie, Royal Commission on the Future of the Toronto Waterfront, 1990). Since watersheds follow natural boundaries, they are ideal units for planning, managing, and protecting our precious land and water resources.



"Everything is connected to everything else"



Natural Wonders
- Expanding Knowledge of Natural Areas (1995)

Have you ever heard the saying, "You can't manage what you don't measure"? It is akin to trying to improve your golf game or lose weight, but never keeping score or weighing yourself. It is also like trying to care for natural areas such as unique landforms, rare habitats, and wildlife hotspots without knowing where they are. Without measuring or evaluating natural areas, you can't tell how well they are protected over time.

Prior to the 1990s, Lower Trent Conservation's information about natural areas, especially those on private lands, was weak at best. Fortunately, the appetite for protection of nature was starting to grow in Ontario during this time. The approach was changing from the traditional strategy of buying lands to protect them from development, to cooperative programs encouraging voluntary private land stewardship. It became fashionable to inventory natural areas and funding became available for detailed field studies of our "natural wonders".

In the 1990s, our knowledge of the unbelievably diverse natural areas within our watershed region started to grow. In 1993, the Waterfront Natural Areas Report included evaluations of natural areas along the Lake Ontario shoreline from Burlington to Trenton, including 37 in our watershed region. It was a very impressive start.

Then, in 1995, a series of Lower Trent Region Natural Areas reports were completed that provided assessments of an incredible 38 natural areas throughout the entire watershed region, recognizing most as "Sensitive Natural Areas". Each natural area was scored for ecological significance using 10 criteria including:

1. landform representation & rarity
2. hydrological function
3. vegetation community representation & diversity
4. vegetation community rarity
5. condition/quality of habitats & communities
6. species diversity
7. significant species
8. habitat for seasonal concentrations of wildlife
9. area size, shape & buffering capability
10. linkage & clustering

An area was designated as a Significant Natural Area if at least 3 of the 10 criteria were met. In addition, 43 wetlands were also evaluated as part of the inventory work.

Many rare species were recorded, some for the first time in eastern Ontario. Habitats of note included old growth sugar maple forest, prairie, savannah, shore cliff forests, spicebush seeps, limestone alvar, and numerous others.

The reports catalogued and mapped a remarkable field-based physiographic and biological inventory, focusing on vegetation communities, birds and plants, on a scale never completed before for the Lower Trent Conservation watershed region. This work was possible only because landowners granted access to private properties for in-depth field work.

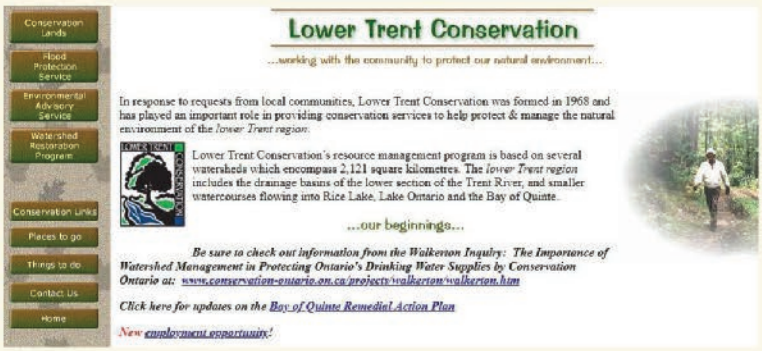
The reports made recommendations for ambitious ecological restoration of several prairie and savannah sites. As a result, restoration efforts followed at remnant prairie and savannah sites at Keating-Hoards Natural Habitat Area, as well as Trenton Greenbelt, Goodrich-Loomis, Glen Miller, and Seymour Conservation Areas. Various methods have been tried, the most exciting of which were controlled burns, to prepare sites for planting of oak saplings, tall native grasses, and wildflowers.

Today, our natural areas are long overdue for a second on the ground look to "measure" how well they are being protected. If only we had the funding.

Alderville Black Oak Savannah

Butterfly Milkweed
- Asclepias Tuberosa

Lower Trent Conservation communications expands from traditional media to social media, with the rise of the digital age



Lower Trent Conservation @LowerTrent @LowerTrentConservation

New Age of Communications (1999)

Since the formation of Lower Trent Conservation in 1968, keeping the public informed about the conservation programs and services of the organization has always been a key priority.

Traditional marketing and communications through print, broadcast, and direct mail, as well as face-to-face and telephone communications, were the tools used to connect with people through the 1970s, 1980s, and 1990s.

In the early 1990s, the communications toolbox became much bigger when the World Wide Web was introduced, revolutionizing the computer and communications world like nothing before. With its world-wide broadcasting capability, it provided a mechanism for immediate information dissemination and a medium for collaboration and interaction between individuals or businesses, regardless of geographic location.

Lower Trent Conservation responded to this new way of communicating in 1999 with the launch of its first website, www.LTC.on.ca. A further step in digital communications was made in 2010 when the organization signed on with a number of social media platforms including Facebook, Twitter, and YouTube. Electronic mailing lists and digital press releases have also provided a means to deliver messages quickly.

Today, Lower Trent Conservation continues to develop and expand its use of various communications tools to reach out to the watershed community. The digital revolution has proven to be a great forum for not only providing easy access to information, but interacting with the community in real-time and where members of the public can interact with one another to share and exchange information.

Nowadays, everyone is encouraged to follow us on Facebook, Instagram or Twitter and sign up for Mainstream E-News to join the conservation conversation.

The Oak Ridges Moraine
- Southern Ontario's Rain Barrel (2002)

The unique concentration of environmental, geological, and hydrological features of the Oak Ridges Moraine makes its ecosystem vital to south-central Ontario. In 2002, the Minister of Municipal Affairs and Housing established the Oak Ridges Moraine Conservation Plan under the authority of the *Oak Ridges Moraine Protection Act, 2001.*

The Oak Ridges Moraine Conservation Plan was implemented to provide land use and resource management planning direction to provincial ministries and agencies, municipalities, municipal planning authorities, landowners, and other stakeholders on how to protect the Moraine's ecological and hydrological features and functions. Through planning service agreements, Lower Trent Conservation provides advice regarding implementation of the Oak Ridges Moraine Conservation Plan to local municipalities.

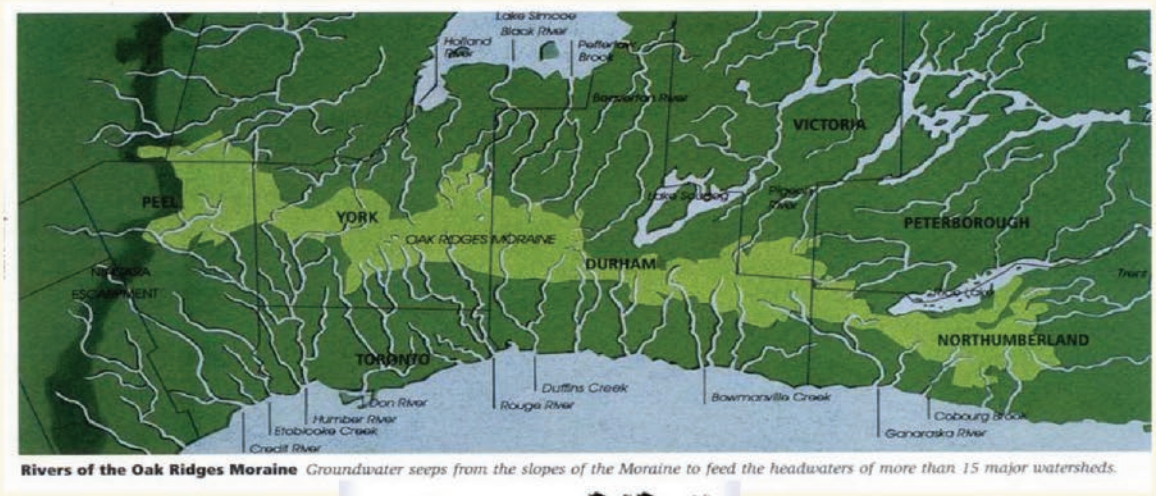
The Oak Ridges Moraine is a hummocky ridge of land that stretches 160 kilometres from the Niagara Escarpment near Orangeville in the west to almost the Trent River in Northumberland County in the east. Formed over 15,000 years ago during the retreat of the last great ice age, it is one of the most significant landforms in southern Ontario. The Oak Ridges Moraine is called an interlobate moraine, meaning that it was created between two lobes of ice, or glaciers.

The Moraine is often referred to as the rain barrel of southern Ontario, providing a source of water for over 200,000 people. Like a sponge, it absorbs rain and snowmelt into its deep sandy layers, eventually releasing it to rivers, streams, and springs. In fact, the groundwater within the Oak Ridges Moraine provides a source for about 65 rivers and streams. Within the Lower Trent watershed region, it is a significant headwater area for most of the stream systems west of the Trent River including Burnley, Percy, Salt, Cold, Shelter Valley, and Barnum House Creeks.

The Oak Ridges Moraine is also one of the last remaining green corridors in southern Ontario; its rivers, streams, and forests are important to wildlife. Lower Trent Conservation is involved with the Rice Lake Plains Joint Initiative, a multi-partner venture aimed at the preservation and enhancement of the globally rare tallgrass communities found on the

eastern end of the Moraine including prairies, savannas, barrens, and oak woodlands.

Lower Trent Conservation is dedicated to protecting the natural integrity of the Oak Ridges Moraine. We continue to work with many partners, as well as municipalities, landowners, other Conservation Authorities, and various government agencies to ensure 'southern Ontario's rain barrel' remains full and clean.



Rivers of the Oak Ridges Moraine *Groundwater seeps from the slopes of the Moraine to feed the headwaters of more than 15 major watersheds.*

What Lies Beneath
- Groundwater Monitoring (2002)

Roughly 4.3 million or 30% of Ontarians rely on groundwater as the source of their drinking water, through either municipal systems or private wells. In the Lower Trent Conservation watershed region, this number climbs to nearly 50%.

Groundwater is found below the earth's surface and is usually held in porous soil or cracks in rocks, much the same way as water is held in a sponge. It is withdrawn from wells to provide water for everything from crop irrigation and industrial processing to drinking water for homes and businesses.

Groundwater can be contaminated by human activities. Oil spills, winter road salt, landfills, and leaky septic tanks are all threats to groundwater quality. Water supplies can also be depleted by excessive water taking or during periods of drought.

Groundwater monitoring is a component of Lower Trent Conservation's monitoring program, which focuses on the health of aquatic resources. In partnership with the Ministry of the Environment, Conservation and Parks, Lower Trent Conservation participates in the Provincial Groundwater Monitoring Network, collecting and managing groundwater data for water levels, temperature, and quality at 10 locations within the watershed. This data contributes to provincial databases and helps inform the assessment and projection of long-term water quality trends, and will be useful to help identify trends in the face of climate change.

Groundwater Monitoring in 2002

2002 proved to be an important year for advancing the understanding of groundwater across Ontario. In the previous year, the Ontario Government launched the $6 million Provincial Groundwater Monitoring Network, a program to begin collecting vital baseline information about groundwater resources. Responsible in part for this initiative were the drought-like conditions southern Ontario experienced in 1999 and again in 2001. As a result of this, groundwater resources had become increasingly stressed. The Provincial Groundwater Monitoring Network would help determine what effects such conditions have on groundwater supplies.

The Provincial Network consists of almost 400 wells equipped with electronic monitoring instruments, ongoing periodic chemical analysis of water samples, and the development and implementation of a groundwater information database.

With this initiative, Lower Trent Conservation began seeking unused, drilled wells to incorporate into the new Monitoring Network. The goal was to gain better understanding of local groundwater conditions and processes. Accurate assessment of current groundwater conditions allows the Province and municipal governments to make better informed decisions on critical matters such as managing low water levels and water takings, land use planning, and monitoring climate change. Throughout the year, water levels and temperatures are monitored and recorded hourly in each of the wells using an automated instrument called a level logger. Water samples are also taken annually from the wells to provide data about changes in water quality in the vicinity of the well.

Groundwater is a hidden natural treasure – please help protect it and use it wisely!

Groundwater monitoring equipment

Water Quality Monitoring

Lower Trent accepts offer of Bleasdell Boulder property

Jack Evans – The Trentonian

May 16/05 Trentonian

Lower Trent Conservation voted Thursday to accept an offer from Maria Heissler and a volunteer board for a unique 68-acre property near Glen Miller.

The offer was made at last month's meeting, but members deferred decision pending study by staff.

General manager Jim Kelleher reported Thursday the property has significant value and includes probably one of the largest "glacial erratics" in North America. The erratic is a huge single boulder, known as the Bleasdell Boulder, left over in a field from the retreat of glaciers in the last ice age.

One person present pointed out while the boulder is impressive, it remains much smaller than a similar glacial erratic in nearby Ameliasburgh Ward of Prince Edward County.

Kelleher said the property has been well maintained and developed and a designated reforestation tract on the parcel can mean an easement in municipal taxes.

Meanwhile, the authority is also pursuing a potential gift of another significant property in Alnwick-Haldimand.

Paul and Maria Heissler

Lower Trent Conservation Board of Directors and staff visit the Big Rock *(2011)*

Remnant from the Past
– Bleasdell Boulder Conservation Area (2005)

The only thing that Paul and Maria Heissler ever wanted for a 2 million pound (900,000 kilogram) rock located at Glen Miller, just north of Trenton, was for the glacial remnant to be forever accessible to everyone. Known locally for many, many years as the Glen Miller Rock, or simply the Big Rock, the gargantuan ice age remnant was left behind 12,000 years ago when the mammoth glacier covering North America during the last great "Ice Age" receded from the area. Unfortunately, the site was largely inaccessible to the public.

The Heisslers' interest in the Big Rock began in the 1950s through their love of the outdoors. Their interest in the large glacial erratic, and the property on which it rested, became public in the 1960s. When Lower Trent Conservation was formed in 1968, the organization was urged to purchase and develop the rock property but, unfortunately, it did not happen.

The opportunity to purchase the 68-acre (28 hectares) property presented itself to the couple in 1997 and, with no hesitation, they became owners of the geological gem. Over the next several years, they worked tirelessly, with the help of many volunteers, to build a trail in order to provide public access to the renowned rock. They founded the Bleasdell Boulder Preservation Corporation in 2001 to protect the site for future generations.

At the official opening of the new trail site on October 3, 1998, the rock's name was restored to what it was first known as, the "Bleasdell Boulder". It was Reverend William Bleasdell, an amateur geologist and rector of St. George's Anglican Church in Trenton, who discovered it in 1862. Bleasdell wrote of the rock in scientific journals and so brought it to the attention of geologists and biologists across Canada. The boulder is considered to be one of the largest glacial erratics in North America.

The small group of community members who made up the Bleasdell Boulder Preservation Corporation continued to work tirelessly for several years to establish trails, parking areas, and interpretive signage. In 2005, the property was donated to Lower Trent Conservation. With new trail improvements, bridges and signage, Lower Trent Conservation is proud to be caretaker of this important piece of our natural history and remains committed to Paul and Maria's vision of providing public access to this very special place!

Protecting Drinking Water at the Source (2005)

Water, water, everywhere, nor any drop to drink. There is a warning in this old rhyme – we must protect our water supplies, both quality and quantity.

The drought of 2016 gave us a taste of what dry conditions can mean – water use restrictions, wells drying up, and creeks running dry. And then there was the Walkerton incident, a tragic reminder of what can happen when a community's drinking water supply becomes contaminated.

As plentiful as water can sometimes seem in a province crisscrossed by many streams and rivers and nestled along the shores of the Great Lakes, for Ontarians, clean water in the right place at the right time is an increasing concern.

In 2006, the Ontario Government introduced the *Clean Water Act,* legislation focusing on the protection of rivers, lakes, and groundwater that supply municipal drinking water systems. The call for legislation was in response to the tragic event that took place in Walkerton, Ontario in May 2000. Water contaminated by a deadly strain of E. coli bacteria made its way into the municipal water system. Seven people died and thousands became ill from drinking the contaminated water. As a result, the provincial government launched the Walkerton Inquiry. In 2002, Justice Dennis O'Connor revealed a number of recommendations with respect to protecting the Province's drinking water sources. Among his recommendations, Justice O'Connor noted the importance of taking a "multi-barrier approach" to preventing contamination, starting with protecting water at its source. Hence, the term Source Protection was born.

Under the *Clean Water Act*, nineteen source protection regions were established across Ontario. Each region has a Source Protection Committee to oversee its program. Locally, the Trent Conservation Coalition Source Protection Committee is comprised of multi-stakeholders from local municipalities, industry, agriculture, commerce, First Nations, environmental interests, and the general public.

Early in 2005, Lower Trent Conservation hired a Project Manager and launched its source protection program. Appointed as the lead for the source protection region, an area that spans 13,830 square kilometres covering the

Trent and Ganaraska watersheds, Lower Trent Conservation began working with four neighbouring Conservation Authorities (Crowe Valley, Ganaraska Region, Kawartha Region, and Otonabee Conservation) and the community to protect sources of municipal drinking water.

The Trent and Ganaraska Source Protection Plans were approved by the Ministry of the Environment and Climate Change in the fall of 2014 and came into effect on January 1, 2015. The Source Protection Plans are the result of years of research, data collection, and extensive consultation and collaboration with local government, potentially-affected stakeholders, and the general public. The Trent Conservation Coalition Source Protection Committee developed policies, with the aid of municipalities and other stakeholders, to ensure that identified activities cease to be, or never become, significant threats to the sources of our drinking water. Implementers of policies in the plan include municipalities, conservation authorities, and the provincial government.

Public consultation during development of Source Protection Plan

Road sign

Even Watersheds get a Report Card (2007)

Everyone is familiar with school report cards which communicate an assessment of a student's work, progress, and conduct to parents and guardians. In response to increased public demand for easily understood environmental information, Conservation Ontario undertook a pilot study to develop standardized reporting across watersheds. Similar to a school report card, the Watershed Report Cards are intended to provide an overview on the current state of many of Ontario's watersheds in terms of lakes, rivers, streams, groundwater, wetlands, and forest cover.

In 2007, Lower Trent Conservation issued its first Watershed Report Card, using the standardized environmental indicators and grades developed by Conservation Ontario. Sources of information used to evaluate and grade the environmental indicators included: Provincial Water Quality Monitoring Network, Provincial Groundwater Monitoring Network, Ontario Benthos Biomonitoring Network, GIS Mapping Data, Southern Ontario Land Resource Information System, and Ontario Base Maps.

Watershed Report Cards help identify environmental problems and issues within local watersheds, identifying specific areas we need to protect, restore, or manage.

Based on the recommendation that Watershed Report Cards be released every five years, on March 22, 2018 Lower Trent Conservation, along with other Conservation Authorities across the Province, released its third Watershed Report Card.

With each report card, Lower Trent Conservation has gained a greater understanding of the state of the watershed region. Forest conditions within the Lower Trent watershed region generally ranked from good to fair, or Grade "B" to "C". While the percentage of total forest cover across the entire watershed is above the minimum target set by Environment Canada, or Grade "B", the amount of forest interior (larger forested areas) and riparian forest cover (forested shorelines on lakes, rivers, and streams) falls short.

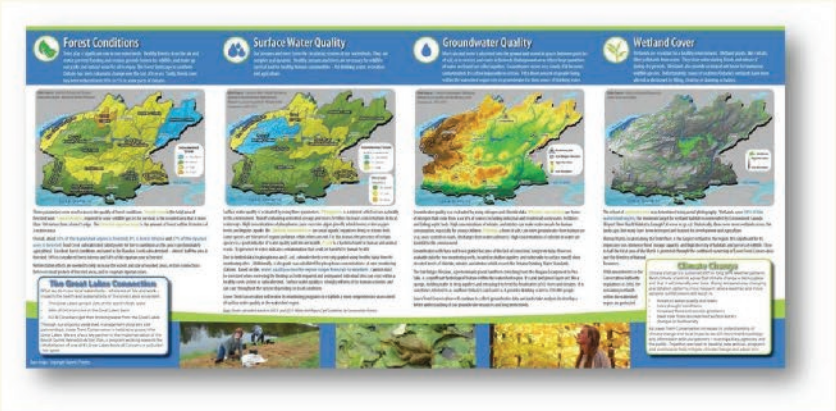
Surface water quality grades, ranging from good to fair, were only assigned for 5 of 12 watersheds across the region. The assignment of grades for

surface water quality, as well as groundwater quality and wetlands, was limited due to insufficient data.

The lack of data to fully evaluate and grade our entire watershed for all the indicators has been the consistent theme in our Watershed Report Cards over the last decade. Some monitoring programs had to be completely abandoned in the late 1990s/early 2000s when deep funding cuts from the provincial government gutted many Conservation Authority programs.

The good news is that, starting in 2018, nine new sampling sites will be added to the surface water monitoring program along with expanded water sample analysis. This means that Lower Trent Conservation will have sufficient data to fully grade surface water across the entire watershed region for the next Watershed Report Card in five years.

As Lower Trent Conservation continues to build on our knowledge and understanding of our watershed region and how it is changing, it is our hope that the next Watershed Report Card, in 5 years' time, will provide an even better picture of the state of the Lower Trent watershed region.



Water Festival Activity Centres

Learning About the Wonders of Water (2009)

In 2009, Lower Trent Conservation saw an opportunity to collaborate with the Children's Water Education Council and community partners to create the Quinte Children's Water Festival. Geared towards the grade 4 curriculum, students from all over the watershed have become more water aware. The festival features close to 35 interactive, hands-on learning activity centres, providing youth with opportunities to learn about our most precious natural resource – water!

First located at Centennial Park in Trenton, this one-day event was a huge success. Even through the rain and wind, the students went home with a smile on their face, and water in their shoes! The committee realized that this festival could easily fill up two days of learning and the following year it was bumped up to a two-day event.

Renamed to "Tri-County" to represent the catchment area, the Children's Water Festival is now held at Batawa Ski Hill and still going strong. This annual event educates almost 1,000 students each year about the importance of water. Donations from Children's Water Education Council, RBC Blue Water, Ontario Power Generation, TD Friends of the Environment, and over 100 annual volunteers have made the Tri-County Children's Water Festival what it is today.

Water Festival at Batawa Ski Hill

Land Stewardship Renewed (2010)

In 2010, Lower Trent Conservation delved back into landowner stewardship programming, through introduction of its *Healthy Shorelines Clean Water Program*. The very popular, long-term Conservation Services Program was discontinued in the mid-90s, following drastic budget cuts announced in 1995. Unfortunately, for many years to follow, there were no stewardship programs delivered by Lower Trent Conservation.

A $50,000 grant was received from the RBC Blue Water project in 2011 for the *Healthy Shorelines Clean Water Program*. It helped to revitalize our stewardship initiatives, focusing on streamside restoration projects. The program was available to landowners on shorelines of streams, lakes, and rivers; it provided technical advice on site preparation, planting techniques, appropriate native species to plant, as well as after care. Financial assistance to a maximum of $300 was available to cover the cost of native plant stock.

Several projects were approved and implemented over a 3 year time span across the watershed region. In addition, three shoreline demonstration sites were planted at: Warkworth Conservation Area, Trenton Greenbelt Conservation Area, and Brighton's Harbour Street Parkette, to educate and inspire shoreline residents to be good waterfront stewards.

Today, the stewardship program continues as the Healthy Lands Clean Water Program, servicing the watershed with a broadened focus on land and shoreline restoration efforts.

But let's take a step back. It's not quite correct to say that we weren't involved in stewardship at all in the 15 years leading up to 2010.

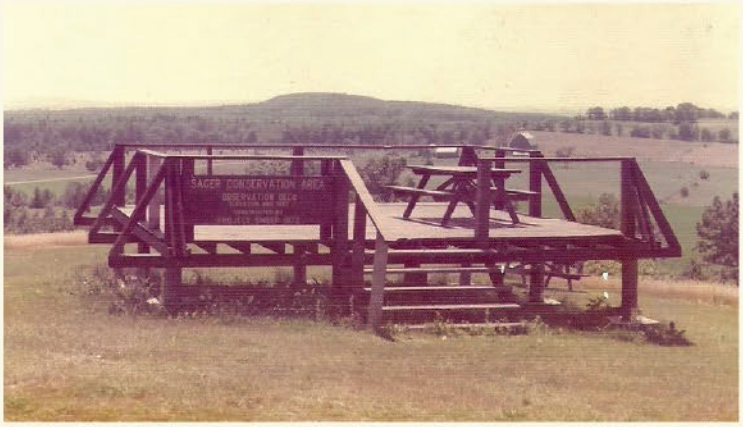
For instance, in 2007, the Rice Lake Plains Joint Initiative partnership received funding to undertake a Landowner Stewardship program under the umbrella of the Caring for the Moraine program. Lower Trent Conservation was approached to host a Landowner Contact Specialist to undertake this project on behalf of the partnership. In addition, in 2007, the Ministry of the Environment introduced the Ontario Drinking Water Stewardship Program to provide assistance to landowners adjacent to municipal water supplies to take early action to protect the sources of these water supplies.

And for many years, the Bay of Quinte Remedial Action Plan provided stewardship advice and financial assistance through programs such as the Rural Water Quality Program, Habitat Enhancement Program, and Septic Stewardship Program.

Lower Trent Conservation embraces programs that provide opportunities to engage watershed residents in stewardship activities. We are always looking for more opportunities and funding to build a long-term, sustainable program and enhance our stewardship efforts throughout the watershed.

Trenton Greenbelt Conservation Area demonstration site - before and after *(2012)*

Work in progress
students



The first lookout at Sager Conservation Area *(1972)*

New lookout tower *(2010)*

Spectacular view from the Sager tower

Sager Conservation Area – a view like no other! (2010)

In 2010, the view got a lot better from Sager Conservation Area. A new, taller lookout tower was built providing scenic panoramic views of the Trent River valley along with skyline glimpses of Quinte West, Consecon, Belleville, Campbellford, and Marmora. Landmarks up to 30 kilometres away can be viewed on a clear day.

Sager Conservation Area is located on a glacial feature known as Oak Lake Island, a series of large drumlins that formed an island in glacial Lake Iroquois. The drumlin in the Conservation Area is one of the highest points of land in the area, and provides an excellent point from which to view the surrounding countryside.

A short 1 kilometre trail starts at the base of the drumlin and climbs steeply to a 9 metre high lookout tower. There's a total of 97 steps on the trail plus another 48 steps on the tower - a bit of a hike, but the view is worth it! Once you reach the top, interpretive signs tell a story about some of the natural and cultural features of the area.

The property, located just south of Stirling, was purchased from the Sager Family in 1971. The unique viewing experience from the top of the drumlin was the inspiration for erecting a low observation deck in 1972. In 1976, the observation deck was replaced by a wooden tower to increase the visitor experience and expand the vantage point. After 33 years of use, the wooden tower was removed for safety reasons. In 2010, with the support of Trenval Development Corporation, the Parrott Foundation, RBC Foundation, Township of Stirling-Rawdon, City of Quinte West, TD Friends of the Environment Foundation and the surrounding community member donations, Lower Trent Conservation was able to build a higher tower made from steel and recycled plastic lumber.

Sager Conservation Area has been recognized as a landmark of significance along the new Ontario Champlain Scenic Route. The Provincial government has created a 1,500 km tourist route closely aligned with the footsteps of explorer Samuel de Champlain's historic journey along the Ottawa River to Georgian Bay, and through the Severn and Trent Rivers. The 1,500 km route will shine the spotlight on Francophone culture and heritage, and will highlight local culture and heritage, culinary experiences, and outdoor attractions. The route was officially launched in 2018.

Caring For Our Watersheds™
- Youth Discovering New Environmental Solutions (2011)

Lower Trent Conservation embarked on a new youth education venture with an added twist in 2011. At first glance, Caring for Our Watersheds™ is not unlike the annual science fairs where students are asked to select a topic, research the problem, and come up with a solution. For Caring for Our Watersheds™, Grades 7 to 9 students are asked to answer the question, "What can you do to improve your watershed?" Students identify a local environmental issue, research the problem, and prepare a proposal describing their solution.

Now for the twists! First, there is prize money involved... good prize money. In fact, $4,500 is up for grabs for the top six finalists, and their schools receive matching money. More importantly though, all students participating in the contest are given the opportunity to receive financial support to implement their environmental idea. Up to $10,000 is available each year!

Former Agrium Inc. CEO, Mike Wilson, brought the Caring for Our Watersheds™ contest to the Lower Trent watershed region. He wanted youth from his hometown of Campbellford to have the opportunity to participate in the contest. Agrium Inc., a worldwide producer and distributor of fertilizers and agricultural products and services, is the global founder of Caring for Our Watersheds™.

Thanks to a generous donation of $50,000 from Mr. Wilson and the commitment of $10,000 for five years from Agrium Inc., the contest was launched in Campbellford in 2011. During the first year, the competition involved 3 schools in the Campbellford region. Forty proposals were submitted and 80 students participated. Seven years later, with additional funding from Mike Wilson, Agrium Inc. and other generous donors, the program is still going strong, and growing. The program is now offered across the Lower Trent Conservation watershed region. Over 600 students have participated over the past seven years.

Projects that have been implemented have ranged from drinking water fountains being installed in schools, to native shoreline plantings. Fifteen projects have been completed to date including:

Battery Waste Disposal – Brighton Public School
Native Plants – Campbellford District High School
Municipal Recycling Cans – Brighton Public School
Bag it! Trash it! – East Northumberland Secondary School
Tree Huggers – Kent Public School
Red Maple Seedling Fundraiser – Murray Centennial Public School
Red Fish Route – East Northumberland Secondary School
Crayola Crayon – Murray Centennial Public School
We NEED to Recycle Batteries, Not Throw Them Away! – Murray Centennial Public School
From Garbage to Garden – St. Mary Catholic Elementary School
Lasagna Garden – École secondaire publique Marc Garneau
Keep our Bees Buzzin' – St. Mary Catholic Elementary School
Rethinking the "Scoop it, Bag it, Trash it" – Murray Centennial Public School
Sundial Project – École secondaire publique Marc Garneau
Pollinator Plant Sale – Murray Centennial Public School

To date, a total of $39,650 in prize money has been given to students, along with a matching $39,650 to their schools to help support school projects and activities.

This program would never have been part of Lower Trent Conservation youth education programming if not for the generosity of Mike Wilson and his connection and commitment to his hometown of Campbellford.

The Caring for Our Watersheds™ contest is introduced to watershed schools in the fall of each year, with the final competition involving six finalists held in April.


Mentoring the students

"On the ground" implementation

The Trent River Flood of 2014

In 2014, the people living along the Trent River experienced flood conditions from the beginning of April until mid-May. Flooding in vulnerable areas along the Trent River is something that residents should be prepared for every year. Unfortunately, many homes were built in the flood plain of the Trent River prior to flood plain mapping and regulations.

The winter of 2014 was a typical Ontario winter with very few thaw periods. By late winter, the snow pack in the Lower Trent watershed region was significantly above average - about 50 cm of snow on the ground that held the equivalent of about 160 mm of water (~6.2"). By mid-March, daytime temperatures were reaching above freezing, which started to reduce the snow pack. In early April, about 35 cm of snow still remained on the ground that held about 120 mm of water. Temperatures were beginning to stay above zero with rain in the forecast.

Lower Trent Conservation issued a Flood Watch for local creeks and streams on April 3. On April 4, 25 mm of rain had fallen with another 30 mm of rain on April 7-8. This precipitation started the Spring 2014 Freshet (or flood) in the Lower Trent watershed region. All the smaller creeks including Mayhew, Cold, Rawdon, Mill, Trout, Butler, Salt, Colborne, and Shelter Valley Creeks peaked on April 8, with flows ranging from typical 2-year flows (50% chance of occurring in any year) to 10-year flows (10% chance of occurring in any year). No significant flooding concerns were reported - a typical spring runoff!

However, due to its size, the spring freshet had not yet started along the Trent River system. The Trent River flows from Rice Lake to the Bay of Quinte, through the Lower Trent watershed, but the Trent River watershed extends far to the north. The drainage area for the Trent River is over 12,000 square kilometres with its headwaters on the fringes of Algonquin Provincial Park. All the water flowing through the upper reservoir lakes in the Haliburton region, the Kawartha Lakes, Lake Scugog, and the Otonabee and Crowe Rivers eventually flow down through the Trent River before emptying into the Bay of Quinte at Trenton. In 2014, the large snowpack in the upstream (northern) portions of the Trent River watershed contributed to the large flows in the system for a long time after all the snow in the local area was gone.

Here's what happened:

- A Flood Watch was issued for the Trent River on April 9. The local streams had significantly contributed to the Trent River flow, along with an additional 10 mm of rain on April 9th.
- The Flood Watch was updated to a Flood Warning on the Trent River on April 10.
- The Crowe River inputs to the Trent System peaked at a flow of 232 m3/s on April 19.
- On April 23, the flows in the lower portion of the Trent River (Campbellford to Trenton) peaked around 700 m3/s for 3 days. This amount of water is equivalent to a 10-year flow on the Trent River in this area (or has a 10% chance of occurring in any year).
- Water levels on Rice Lake peaked on April 24th and on April 26th. The highest flows in the upper portion of the Trent River (Rice Lake to Healey Falls) reached 528 m3/s, which exceeded 25-year flows for 4 days (has a 4% chance of occurring in any given year).
- The Municipality of Trent Hills declared a State of Emergency on April 24th and the State of Emergency was removed on May 23rd.
- Lower Trent Conservation staff conducted a flyover of the Trent River System from Rice Lake to the Bay of Quinte on April 28, 2014.
- During the entire flood season, Lower Trent Conservation staff participated in daily phone calls with local Conservation Authorities on the Trent River System, Ministry of Natural Resources and Forestry, Parks Canada (Trent-Severn Waterway), and Ontario Power Generation from April 8 to May 3.
- During the Flood Watch, Lower Trent Conservation staff communicated daily with Municipalities affected by the flooding.

Overall, no homeowners were evacuated, but many people sustained flooding impacts on their property and inundation of their septic systems. Sandbags were distributed by the affected Municipalities and these, along with plastic sheeting and pumps, were used by homeowners to protect their homes. But the 2014 flood on the Trent River was not the worst on record – it was the second highest flow observed at Healey Falls since 1950. Higher flows were observed in 1951. Lower Trent Conservation regulates development along the Trent River to the 100-year event. Fortunately, we did not see this extent of flooding on the Trent, as many more landowners would be impacted and significant property damage would result.

A look at the Flood of 2014!

Bradley Bay Road, Trent Hills

River watch gauge at Cooke Armstrong Road, Quinte West

Wilson Island in the Trent River

Percy Boom, Trent Hills

The Drought of 2016

Remember 2016? It was the 'Year of the Drought' in the Lower Trent watershed region!

The most severe drought in recent history occurred that year. The 7 month drought lasted from June 2016 into February 2017. Drought conditions were declared based on the Provincial Low Water Response Program criteria for precipitation and streamflow. A Level 1 Low Water Condition was declared by Lower Trent Conservation on June 3rd due to lack of rainfall and low flows in local creeks and streams. It was upgraded to Level 2 on July 4th, and to Level 3 (the most severe condition) for Stirling-Rawdon and Centre Hastings in the northeastern portion of the watershed region on September 1st. Several rural landowners reported dry wells and the Stirling municipal system was stressed. The drought advisory was lifted by Lower Trent Conservation on February 10, 2017.

Lack of precipitation affects the quantity of stream flow and groundwater, resulting in water shortages for human use including health, industrial development, agriculture, and recreation. In addition to impacting human activities, ecological impacts are also felt as wetlands and streams dry up and vegetation dies off. Low water in streams also results in deteriorated water quality as there is less dilution. The lowest amount of precipitation and stream flows generally occur in August and September, but January and February can also be dry months.

The Province established the Ontario Low Water Response Program in 2000 to respond to drought-like conditions. Lower Trent Conservation's role in the program is to establish and coordinate a watershed based 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, and government representatives from the watershed region. The Team assesses current precipitation and stream flow conditions in the region and responds in various ways to conserve our water resources. The response could range from issuing communications that advocate water conservation practices and water use reductions, to making recommendations to the Province concerning water allocations.

Historically, periods of dry weather and low water levels, or drought, were relatively uncommon in Ontario occurring once every 10-15 years. However, recent studies indicate that low water levels may become more common as the Province's demand for water steadily increases, and climate change impacts weather patterns and water availability.

Lower Trent Conservation monitors precipitation and stream flow as part of the Ontario Low Water Response Program. The program does not currently include groundwater indicators, but anecdotal information about local wells is taken into consideration. In average years, there are some brief localized water shortages for rural wells, but overall, there are no widespread water quantity concerns in our watershed region.

Wetland near Brighton *(2016)*

Hoards Creek *(2016)*

Donor recognition with 'The Giving Tree'
- located in the foyer at Lower Trent Conservation's Administration Office

Birth of Lower Trent Conservation's Dedicated Fund Development Program (2016)

Since its formation in 1968, Lower Trent Conservation has welcomed numerous contributions of time, talent, gifts-in-kind, and monies to assist in the ongoing support of its conservation programs and services. In 2016, our organization received a very generous gift of $100,000 from an anonymous donor along with a promise to donate the same amount in 2017 and again in 2018, for a total contribution of $300,000 over three years!

The purpose of this special funding was two-fold. First, 40% of the money was dedicated to supporting our 'Connecting KIDS with Nature' youth environmental education initiatives. The remaining 60% was earmarked to develop a dedicated fund development program with the vision of building and sustaining our youth environmental education into the future. Youth environmental education, an important watershed program, is not currently funded by traditional government sources. Youth environmental education programs like Caring for Our Watersheds™, Tri-County Children's Water Festival, and in-school programming are only made possible through donations and grants.

We are all touched by the beauty of our natural world. Some of our most precious life moments happen in the great outdoors - outdoor adventures, summers camping or at the cottage, fun-filled times spent with family and friends, tranquil moments, or perhaps even spiritual experiences. To ensure these traditions continue, please consider a gift in support of Lower Trent Conservation's environmental and conservation initiatives. Gifts to our charitable organization help to ensure that the natural beauty and delicate ecosystems so abundant in our region are protected and preserved for future generations.

Lower Trent Conservation Chair Alyea addressing audience at the 50th Anniversary event *(May 16, 2018)*

Cutting the cake at the 50th anniversary event:
Glenda Rodgers, CAO, Chair Alyea, Vice Chair Sandford, and Board Directors Tadman and Clark

Celebrating 50 Years of Conservation! (2018)

This is the 50th in our 50 in 50 blog series. Over the past year, we have captured a glimpse of the past 50 years of conservation in the Lower Trent watershed.

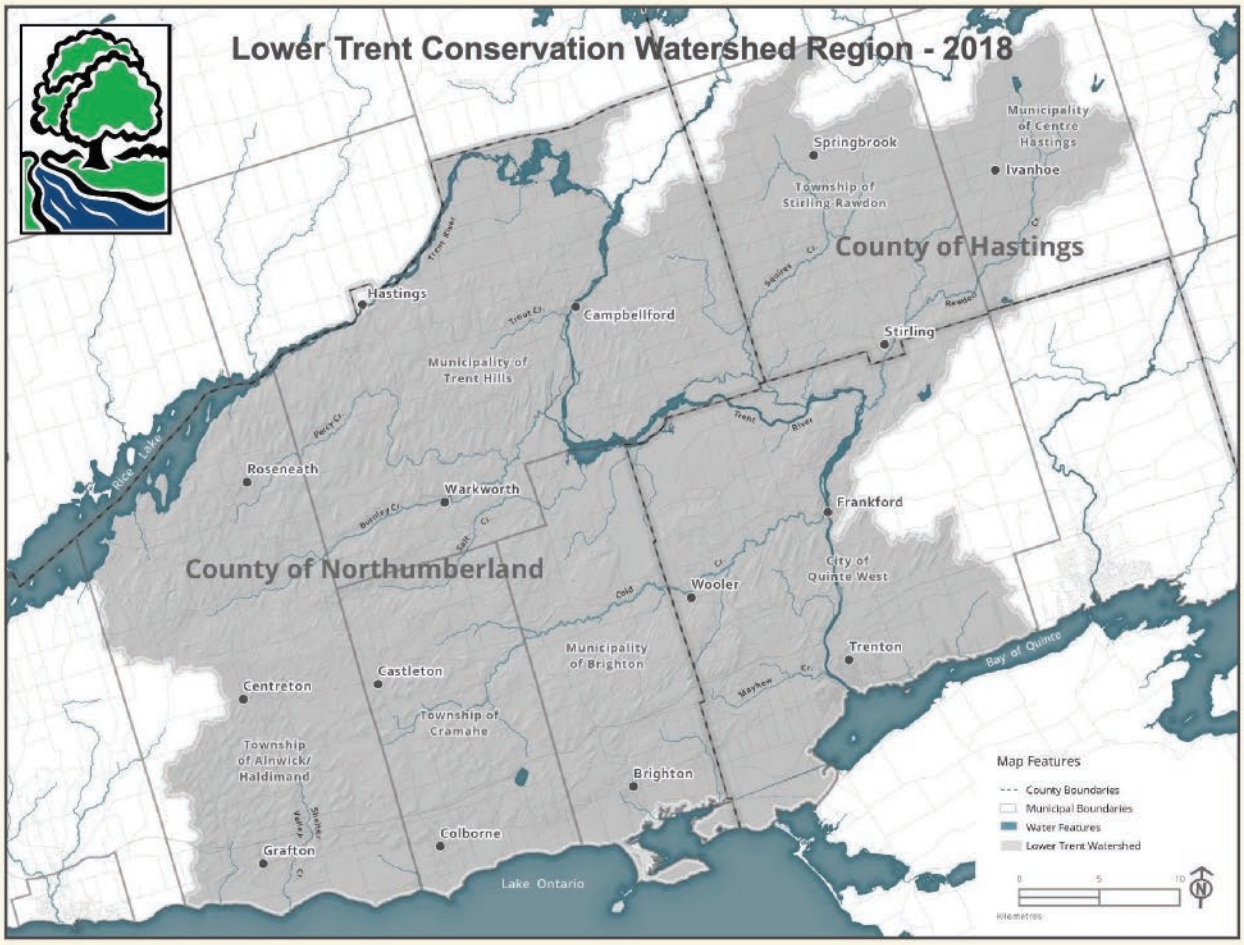
Fifty years ago, local communities joined together to pool their resources in an effort to protect the natural environment of the Lower Trent watershed region and, on May 16, 1968, our Conservation Authority was born. Funding for the Conservation Authority came through a cost sharing initiative between the Province of Ontario and local municipalities located within the watershed region.

In the early days, Lower Trent Conservation focused on acquiring land – the Conservation Areas you know and love! Today, we own approximately 1500 hectares of land – special places in the watershed where the natural world comes first.

Following a large flood in 1980, the next 10 years focussed on the construction of flood and erosion control structures to protect existing homes and businesses from potential flood damages. Our flood control structures include a dam, weirs, flood walls, berms, and overflow channels. During this period, flood plain mapping was also prepared to guide future development away from flood prone areas.

As time passed, the breadth of environmental issues expanded and the Conservation Authority adapted to emerging environmental, community, and legislative demands and it became necessary to scope out new sources of funding. Today, in addition to traditional government sources, we rely on grants, user fees, and donations to support our conservation program.

For the past 50 years, our work has contributed to building healthier communities, improving the quality of life for residents, making our area more appealing to visitors and new businesses, and helping to ensure a more vibrant regional economy. Many thanks to all our partners, the public, volunteers, donors, and staff for their past contributions and for their important work in the years to come.



LOWER TRENT
CONSERVATION
50 Years of Conservation
1968 - 2018

Mentoring the
students

Lower Trent Conservation
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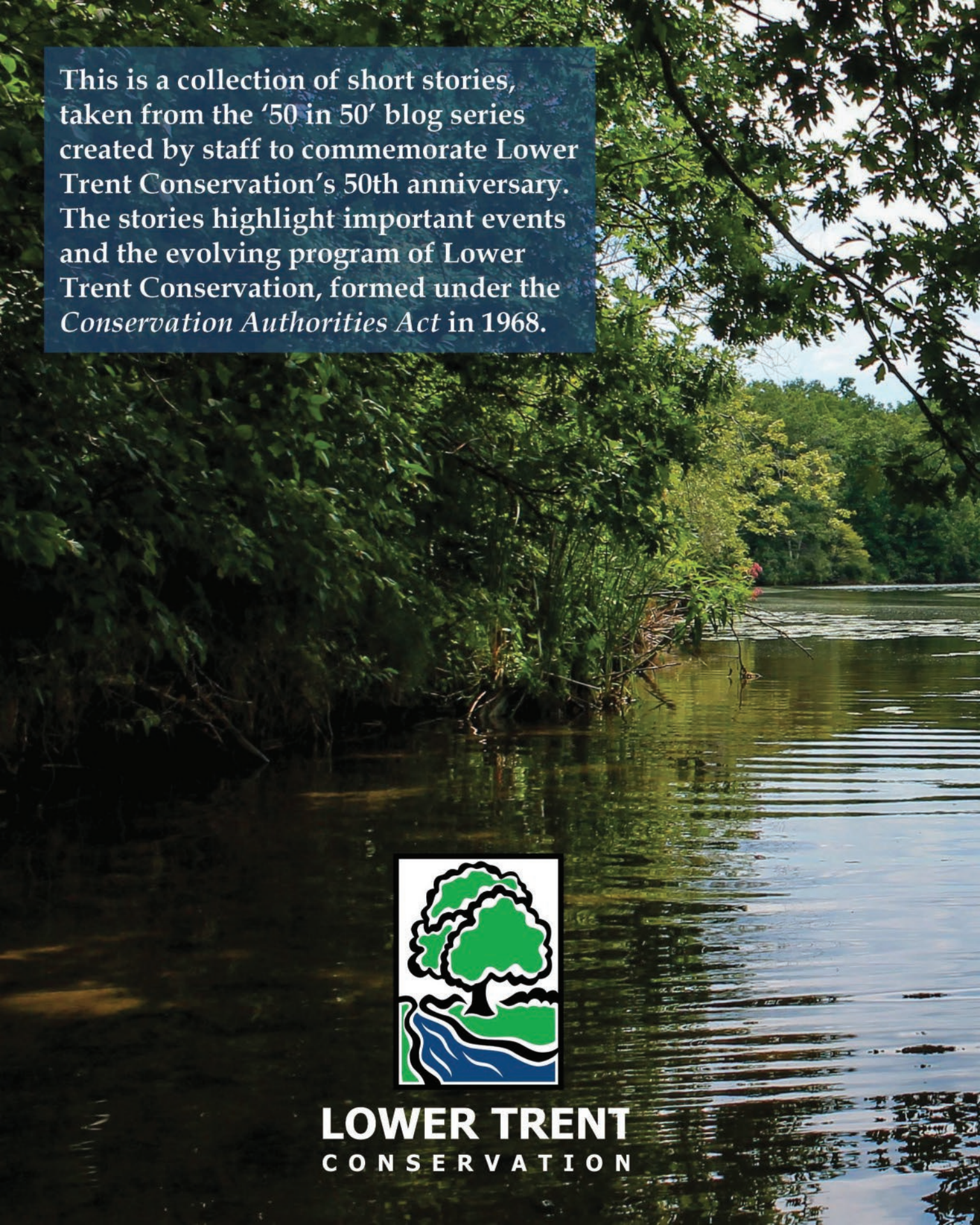

This is a collection of short stories, taken from the '50 in 50' blog series created by staff to commemorate Lower Trent Conservation's 50th anniversary. The stories highlight important events and the evolving program of Lower Trent Conservation, formed under the *Conservation Authorities Act* in 1968.

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