

Kawartha Conservation Stewardship Strategy 2020-2030

January 15, 2020



**KAWARTHA
CONSERVATION**

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About Kawartha Conservation

Who we are

We are a watershed-based organization that uses planning, stewardship, science, and conservation lands management to protect and sustain outstanding water quality and quantity supported by healthy landscapes.

Why is watershed management important?

Abundant, clean water is the lifeblood of the Kawarthas. It is essential for our quality of life, health, and continued prosperity. It supplies our drinking water, maintains property values, sustains an agricultural industry, and contributes to a tourism-based economy that relies on recreational boating, fishing, and swimming. Our programs and services promote an integrated watershed approach that balance human, environmental, and economic needs.

The community we support

We focus our programs and services within the natural boundaries of the Kawartha watershed, which extend from Lake Scugog in the southwest and Pigeon Lake in the east, to Balsam Lake in the northwest and Crystal Lake in the northeast – a total of 2,563 square kilometers.

Our history and governance

In 1979, we were established by our municipal partners under the *Ontario Conservation Authorities Act*.

The natural boundaries of our watershed overlap the six municipalities that govern Kawartha Conservation through representation on our Board of Directors. Our municipal partners include the City of Kawartha Lakes, Region of Durham, Township of Scugog, Township of Brock, Municipality of Clarington, Municipality of Trent Lakes, and Township of Cavan Monaghan.



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Executive Summary

Kawartha Conservation is committed to providing leadership in watershed management and conservation. Through our 2017-2020 strategic plan, we have acknowledged the important role that stewardship has in reaching our vision of a sustainable watershed with clean and abundant water and natural resources assured for future generations. We see effective stewardship as being a balance between the knowledge that science provides and the diverse needs of the communities we serve. It is through our stewardship programs that we empower our community to care for the landscape they love so much.

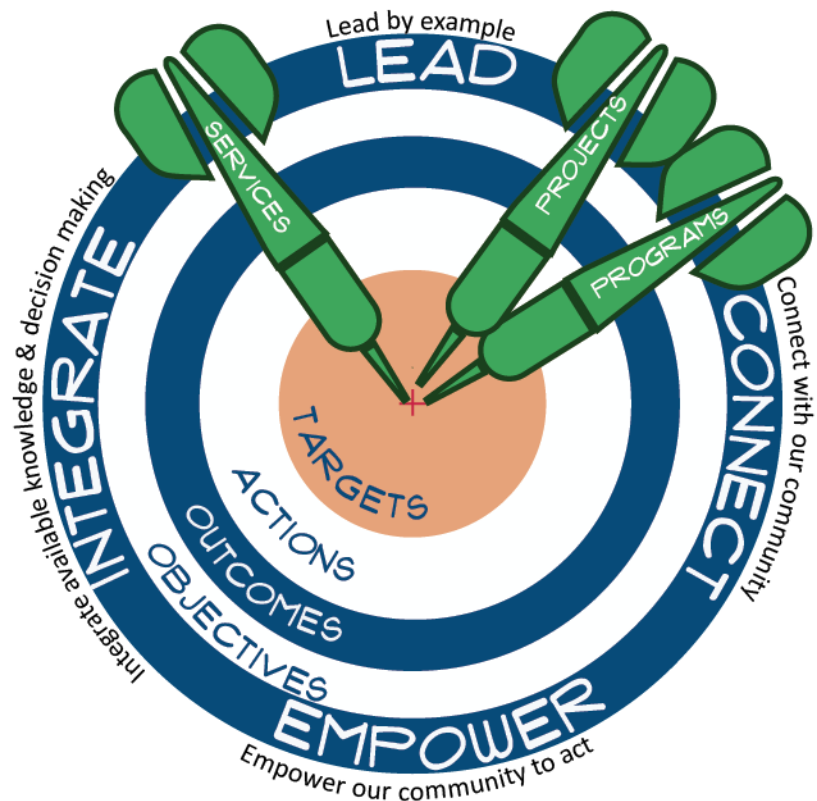
The purpose of the Kawartha Conservation Stewardship Strategy (Stewardship Strategy) is to foster a stewardship ethic where landowners, business owners, municipalities, and partners across the watershed are engaged and dedicated to having a positive impact on their own land. Positive impacts may include conserving healthy, resilient ecosystems; protecting water resources; and restoring natural features and function. This Strategy is designed to accommodate flexibility throughout its implementation, enabling our team to react to the individual needs of our community and emerging issues on the landscape while meeting the strategic targets identified.

Kawartha Conservation envisions a vibrant community with clean and abundant water and natural resources assured for future generations. We are committed to our mission of providing strong leadership to protect our lakes and water resources. Partnering with the community enables us to advance stewardship, educate and share information with the public, and develop watershed science. Together we can conserve our natural heritage, thus safeguarding our local economy and quality of life.

Details of the Strategy

Working with the Advisory Committee, a Stewardship Strategy has been developed with a vision of “natural features and functions of the Kawartha watershed are valued, protected, restored and maintained so that they can continue to provide ecosystem services for future generations.”

The strategy is based on four strategic goals which illustrate the unique components required to effectively advance ecosystem stewardship in the Kawartha watershed. The strategic goals are to **lead** by example, to **connect** with our community, to **integrate** available knowledge and decision making, and to **empower** our community to act. Each goal is supported by objectives and desired outcomes that will enable the Stewardship team to focus their efforts and develop a flexible framework guiding program planning and implementation. Actions and Targets have been set to evaluate and measure the success of project implementation over the next ten (10) years. Together the actions and targets form the practical framework around which we will plan future stewardship programming. The actions answer the question of what we will do, and the targets tell how much; laying out the required level of programming, projects and services provided to the community.



Strategy Background

The Stewardship Strategy was derived from the background information including an Ecological Goods and Service Assessment which helps us understand the economic value of our natural capital, an assessment of the stewardship programming currently offered, a breakdown of the current status of the Kawartha watershed based on existing management plans and report cards, and an assessment of projected changes to the landscape with a focus on changes caused by climate change, population growth and development.

With a clear understanding of the value of our watershed's ecosystem features, the current state of our watershed, and the changes that are expected to occur if we do nothing, Kawartha Conservation has developed this Strategy for stewardship. The Strategy will be used to guide future program design and to monitor the success of implementation.

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1.0 Introduction

Kawartha Conservation is committed to providing leadership in watershed management and conservation. Through our 2017-2020 strategic plan, we have acknowledged the important role that stewardship plays in reaching our vision of a sustainable watershed with clean and abundant water and natural resources assured for future generations. We see effective stewardship as being a balance between the knowledge that science provides and the diverse needs of the communities we serve. It is through our Stewardship programs that we empower our community to care for the landscape they love so much.

Stewardship, in this case can be defined as the voluntary act of caring for the land to the best of one's ability, to improve and maintain it in a healthy state for today and for future generations.

Stewardship is a key component of our programs. It is an essential vehicle which drives the accomplishment of actions identified within approved watershed and lake management plans, as well as supporting effective management of private properties. The delivery of stewardship programs is valuable because it leads to positive actions, resulting in tangible benefits.

This document serves two purposes. Firstly, it clearly lays out the Strategy for the delivery of Kawartha Conservation stewardship programming over the next ten years (2020-2030). The Strategy is laid out in Section 2.0 and can be read as a standalone document. Secondly, this report provides a summary of background information which has informed the development of the strategy. This includes information such as the current level of programming, the status of the Kawartha watershed, an assessment of its economic value, expected pressures which it faces, and the outcomes. The background information is outlined in section 3.0.

Project Background

The purpose of the Stewardship Strategy is to foster a stewardship ethic where landowners, business owners, municipalities, and partners across the watershed are engaged and dedicated to having a positive impact on their own land. Positive impacts may include conserving healthy and resilient ecosystems, protecting water resources, and restoring natural features and function. This strategy is designed to accommodate flexibility throughout its implementation, enabling our team to react to the individual needs of our community and emerging issues on the landscape while meeting the strategic targets identified.

Past and current stewardship programming has been based on lake and watershed management plans. These Management plans have focused primarily on lake-based perspectives. In 2018, the *Lake Management Implementation Action Plan (LMIAP)* was developed. The LMIAP outlines a multi-year strategy for developing programs to deliver the recommended actions in the Lake Management Plans and to support the strategic goals of our municipal partners. The LMIAP outlines the goals for protecting and enhancing water quality and utilizing the Lake Management Plans to inform decision making.



Figure 1 - The Blue Canoe Program (2009-2017) was a targeted shoreline outreach initiative offered during the plan development, and early implementation stages of lake plans.

A great deal of useful data has been gathered and analyzed over the years, telling us stories about the status of the Kawartha watershed over time, and what needs to be done to protect and enhance it. This strategy pulls the pieces of the stories and various recommendations together to form a strategy with a consistent geographic scope. Using the Lake Management Implementation Action Plan as a foundation for this Strategy, we have combined our aquatic information with our terrestrial and landscape-based data to establish strong quantitative program targets that will ensure a resilient landscape. We have also incorporated considerations from other guidance tools such as local climate change strategies, natural heritage systems and ecosystem goods and service valuations. Bringing all these tools together helped create a cohesive science-based strategy that can be applied across the entire Kawartha watershed.

2.0 A Stewardship Strategy for Kawartha Conservation

Kawartha Conservation envisions a vibrant community with clean and abundant water and natural resources assured for future generations. We are committed to our mission of providing strong leadership to protect our lakes and water resources. Partnering with the community enables us to advance stewardship, educate and share information with the public, and develop watershed science. Together we can conserve our natural heritage, thus safeguarding our local economy and quality of life.

Stewardship programming protects and maintains many values in our communities including clean water, a vibrant economy, quality of life, and investment into the community. Table 1 below outlines some of the values and benefits stewardship programming provides.

Table 1 Values and benefits provided by stewardship programming.

VALUE	BENEFITS OF STEWARDSHP PROGRAMMING
Clean Water	<p>Point and non-point sources of water contamination addressed through stewardship programs and projects.</p> <p>Increased community participation in stewardship and the dissemination of information regarding private land stewardship.</p>
Vibrant Economy Including Investment into the Community from External Sources.	<p>Improved fish habitat supports our local tourism economy, attracting anglers and their families.</p> <p>Improved water quality (especially at beaches), and conservation of natural heritage features help to maintain a sense of place, resulting in increased property values and tourism draw.</p> <p>Provision of grants to landowners to empower private stewardship actions and investment.</p> <p>Demonstration sites and restoration projects supported financially by private foundations and industry partners.</p> <p>Increased investment from foundations, other levels of government, and other organizations in the stewardship projects that promote healthy landscapes, healthy waters, and healthy communities.</p> <p>Economical and efficient low impact development projects improve water quality and support infrastructure longevity saving money over time.</p> <p>Reduced workload for municipal staff to oversee, coordinate, and implement projects.</p>
Quality of Life	<p>Community members feeling a sense of place and taking positive action on their own properties.</p> <p>Investment in stormwater management leading to safer communities.</p> <p>Increase in green infrastructure in urban areas increases aesthetics, enjoyment, comfort and health and safety for all community members.</p> <p>Community more resilient to the impacts of climate change.</p>

This Stewardship Strategy provides a framework to improve the stewardship of our watershed’s ecosystems. It includes a vision, goals and outcomes for advancing stewardship. In addition, it provides a list of actions we will take, and targets that will enable us to measure our progress. This Strategy aligns with Kawartha Conservation’s Strategic Plan, and its implementation will be enhanced through linkages to other programs and services provided by Kawartha Conservation. Working with other departments in our organization leads to synergies. For example, stewardship demonstration sites in Conservation Areas provide Conservation Area users with an opportunity for learning about improved land practices but can also address a Conservation Area management issue. Also, for example; collaboration with the Integrated Watershed Management department enables the selection of project sites that will have the most impact on the landscape. The Strategy also aligns with regional, provincial and federal objectives for enhancing and protecting ecosystem services (e.g. lake management plans, the City of Kawartha Lakes Healthy Environment Plan, Durham Region’s Community Climate Adaptation Plan, and the Ontario Soil Strategy). The intent is to provide Kawartha Conservation and the communities it serves with a path forward to ensure watershed stewardship is advanced efficiently and effectively.

In developing the plan, our Stewardship Strategy Advisory Committee developed a framework that first identified the overarching vision of what we wanted to accomplish through the implementation of stewardship projects. From this vision, key goals and objectives were identified that informed the Strategy.



Figure 2 - The Strategy aligns with regional, provincial and federal objectives for enhancing and protecting ecosystem services.

A Vision for Stewardship

The natural features and functions of the Kawartha watershed are valued, protected, restored and/or maintained so that ecosystem services are provided for future generations.

Goals, Objectives and Outcomes

The Stewardship Strategy is based on four strategic goals which illustrate the unique components required to effectively advance ecosystem stewardship in the Kawartha watershed. The strategic goals are to **lead** by example, to **connect** with our community, to **integrate** available knowledge and decision making, and to **empower** our community to act. Each goal is supported by long-term goals and desired outcomes that will enable the Stewardship team to focus their efforts and develop a flexible framework guiding program planning and implementation. The four strategic goals are outlined with their associated objectives and outcomes in Figure 1, on the following page.

Actions and Targets

Specific enabling actions have been identified that will advance stewardship of our watershed over the next ten (10) years. The actions relate to the goals and desired outcomes. Collectively, they will result in achieving our vision. In addition to actions, targets have been set to measure our success and impact. The actions and targets form the practical framework around which we will plan future stewardship programming. The actions answer the question of what we will do, and the targets tell how much; laying out the required level of programming.

This strategy contains two distinct target types – quantitative and qualitative. Quantitative targets relate mainly to the goal to lead by example. A quantitative target, for example, is to plant 21,000 native trees and shrubs. More information about this strategy's quantitative targets, can be found in Figure 3 (page 11). Qualitative targets relate to the other three goals and they will be measured by observing community behaviours and how our programs are delivered. All strategic actions and targets for this strategy are outlined in Figure 1 on the following page.

Setting quantitative targets was a two-step process. The first step was to compare the best-case scenario with respect to the state of the watershed. These scenarios were based on the targets set out by lake management plans, watershed plans, and other guiding documents. The projected watershed targets identified in the strategy are based on actual or adapted large-scale provincial and national standards. For example, the 30% forest cover watershed target is based on the standard identified by the Environment Canada report: How much Habitat is Enough?

The second step was to evaluate how much of the watershed target Kawartha Conservation could realistically expect to achieve over the ten (10) year period through stewardship programming. This was based on anticipated levels of resources available over this period.

The quantitative targets are focused on the physical landscape changes which will occur as a direct result of Kawartha Conservation stewardship programming. They include concrete targets such as number of trees planted, and length of shoreline naturalized.

GOALS	LEAD Lead by example.	CONNECT Connect with our community.	INTEGRATE Integrate available knowledge and decision making.	EMPOWER Empower our community to take action.
OBJECTIVES	Provide direct, measurable improvements of watershed health indicators and climate change resilience through hands-on stewardship projects.	Engage watershed partners to foster a community stewardship ethic.	Follow a data-driven approach to program design; using the best available knowledge about the landscape, including current threats such as climate change, population growth, invasive species, flooding and emerging threats. Integrate municipal, provincial and federal priorities for stewardship.	Remove the barriers which prohibit the implementation of stewardship actions by private landowners.
OUTCOMES	Increased and enhanced natural cover resulting in the improvement of ecosystem functions	Adoption of community wide stewardship ethic leading community members to embrace their role as environmental stewards.	Improved allocation of resources to maintain and improve ecosystem health.	Stewardship actions taken voluntarily by private landowners resulting in a cumulative positive impact on watershed health.
ACTIONS	<ul style="list-style-type: none"> - tree planting on private land -demonstrate best management practices on public access land - enhancement of natural areas - urban tree planting 	<ul style="list-style-type: none"> - tree planting on private land - community stewardship events - knowledge sharing - targeted outreach - track community connections 	<ul style="list-style-type: none"> - develop a prioritization tool for identifying priority stewardship sites - collaborate with Integrated Watershed Management team and partners when planning stewardship projects 	<ul style="list-style-type: none"> - provide financial and other assistance to landowners for stewardship projects -demonstrate improved land management practices to landowners and land managers
TARGETS	<ul style="list-style-type: none"> - plant 21,000 native trees & shrubs/year -establish 75% natural shoreline on all shoreline naturalization projects - establish 75% vegetation on all stream projects - green 12 acres of urban space over a 10 year period 	<ul style="list-style-type: none"> - engagement with new stakeholders and clients including municipal staff, community members, landowners, and contractors 	<ul style="list-style-type: none"> - assess work plans annually - establish priority level of all project sites based on best available data - projects completed on high priority sites when access is not an issue 	<ul style="list-style-type: none"> - facilitate the completion of 20 projects each year on private land which focus on projects that improve water quality, contribute to soil conservation, enhance natural areas, an increase climate change resilience.

Figure 3 - Goals, objectives, outcomes, action and targets of the Kawartha Conservation Stewardship Strategy (2020-2030)

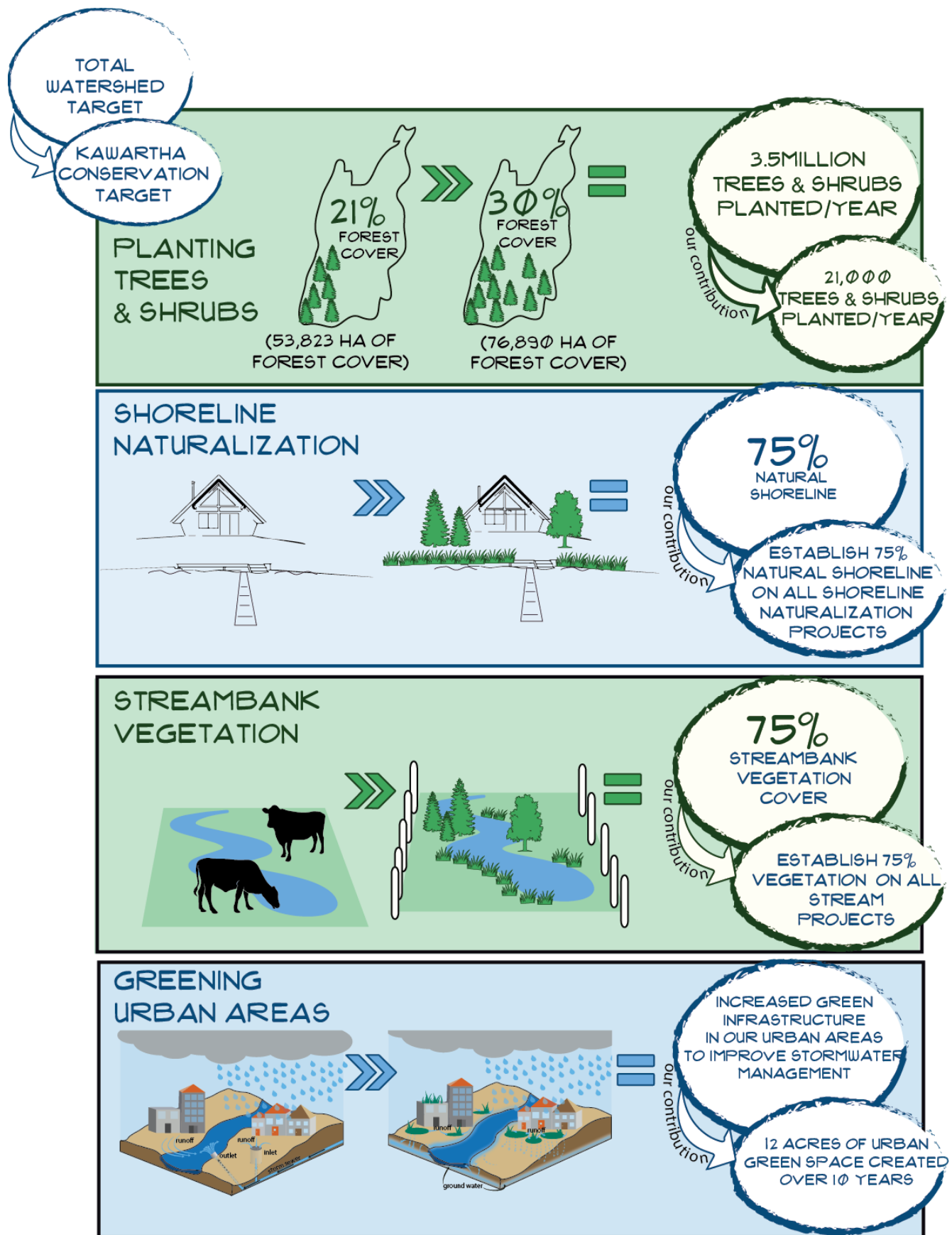


Figure 4 – Quantitative Stewardship Targets, and the Watershed Targets from which they are derived

3.0 Background Informing the Stewardship Strategy

The information in this section provides the background from which the Stewardship Strategy was derived. This includes an Ecological Goods and Service Assessment which helps us understand the economic value of our natural capital, an assessment of the stewardship programming currently offered, a breakdown of the current status of the Kawartha watershed based on existing management plans and report cards, and the acknowledgement of projected changes to the landscape with a focus on changes caused by climate change, population growth and development.

Ecological Goods and Services Assessment

The natural and cultural landscapes of the Kawartha Watershed provide many values and benefits to our communities. These values and benefits are also known as **natural capital**, or **ecological goods and services**. These are the benefits that humans receive from nature. Daily, individuals utilize ecological goods and services to fulfill their health, social, cultural and economic needs. Communities, which aim to be sustainable, depend on the maintenance or restoration of the ecosystems in both urban and rural landscapes (*Land Stewardship Center, n.d and Daily, 1997*). Some of the ecosystems goods and services provided by the Kawartha Watershed include recreation, carbon storage, air quality, water runoff control, water filtration, pollination, soil formation, waste treatment, habitat, biological (pest) control, disturbance prevention, erosion control, and sediment retention.

Why Do We Need to Check on the Health of Our Watersheds?



We rely on nature for multiple benefits for both a healthy environment and healthy people.

Figure 5 – The benefits provided by the natural features of an ecosystem contribute directly to the health and well-being of the people in a community (Watershed Check Up, 2018).

More and more communities are looking for ways to assign monetary value to our natural capital in order to ensure they are protected. It is understood that protecting and enhancing existing natural capital is critical from an economic perspective. Failure to do so often leads to the degradation of services which results in us having to pay to replace what had been previously provided for free. Understanding what the value of our natural capital is within the Kawartha Watershed allows us to understand the areas that require forms of restoration, maintenance and protection.

In 2019, we completed the *Kawartha Conservation - Ecological Goods and Services Assessment (EGSA)*. The assessment included a land cover analysis, a literature review to determine the ecological goods and services that exist within our watershed, and the use of values gleaned from EGSA's done in similar landscapes (a benefit transfer) to obtain the value for the goods and services. A benefit transfer enabled us to use values from similar locations, ecosystems, and ecological goods and services, and apply them to the Kawartha Watershed. Benefit (value) transfers are commonly used throughout many valuations of natural capital. To obtain the value of natural capital for the Kawartha watershed, the land area from the ELC review was applied to the per hectare value of each ecosystem type present in our watershed.

Table 2, below, provides a breakdown of the value obtained for each ecosystem type found within the Kawartha watershed as well as the total area and value for each ecosystem type. Here you can see that the annual value of our combined ecological goods and services are an estimated \$1.2 Billion dollars/year. For a full detailed analysis see the 2019 report entitled *Ecological Goods and Services Assessment for the Kawartha Watershed*.

Table 2 - Breakdown of the Ecological value of existing ecosystems in the Kawartha watershed. Values are rounded

Ecosystem	Value (dollars/ha/year)	Area (ha)	Value (dollars/year)
Forests	\$4,618.74	51,549.15	\$238.1 million
Grasslands	\$3,401.71	11,227.37	\$38.2 million
Wetlands	\$12,759.22	37027.9	\$472.4 million
Open Water	\$12,399.83	23,398.33	\$290.1 million
Agricultural	\$1,479.88	105,060.16	\$155.5 million
Total	-	228,262.91	\$1.2 billion

When we look at our natural landscape through this lens, it becomes clear that it is abundant with valuable features. These features require protection so that current and future generations will continue to benefit from the associated goods and services. Without protection, the cost to replace natural features with man-made infrastructure can become an excessive burden for taxpayers. Considering the information provided through this study, we can identify key areas within our watershed where stewardship and restoration services can have a significant positive impact on the natural landscape and the communities it serves.

Current Stewardship Programming

Existing stewardship programming was designed to recognize the landscape pressures that different communities in our watershed are subject to. Landscape pressures identified during the lake management planning process include among others: nutrient loading, sedimentation and erosion, habitat loss, and invasive species.

Current programming provides services which enable landowners to implement stewardship projects as well as direct implementation which improves the natural landscape while providing examples to landowners. Services to landowners include education and outreach, technical consultation, and cost-sharing. These services are designed to serve to the urban, shoreline, agricultural and rural communities throughout our watershed, enabling landowners to have a significant impact on their property, and the watershed. Direct implementation simply means that our staff works with community partners to complete ‘shovel-in-ground’ projects such as LID projects and shoreline restoration. These projects have an immediate, measurable impact on the watershed health as well as a long-term accumulative impact as a valuable education and outreach tool.





Figure 6 The series of photos above shows the progression of a "shovel in ground" project conducted as a part of an Urban Stewardship program. The project addressed issues of shoreline erosion (top left), and an infestation of invasive Japanese knotweed (top right). A restoration construction project followed by a community planting restored this stretch of shoreline in Port Perry to a more natural and functional state.

Stewardship programming is conducted at the community level, based on recommendations from lake and watershed management plans, or the identification of priority areas through other projects carried out by Kawartha Conservation and our partners.

Lake management plans have provided a strong basis for the development of current stewardship programs. Implementation of the stewardship strategy will enhance programming by making it consistent across the Kawartha watershed and by addressing other management plans such as fisheries management plans, stormwater management plans, local climate change strategies, natural heritage systems, etc. The result will be a more holistic approach to stewardship program delivery. To truly determine what needs to happen on the landscape, we have examined the current status of our watershed as well as the projected future pressures that we are likely to face. This has enabled us to develop a strategy that protects and enhances the natural features on the land that have significant value to our communities, our natural environment, and our future.

Current Status of the Kawartha Watershed

The Kawartha Watershed consists of a combination of diverse natural and cultural features. Agricultural land encompasses 42.8% of the watershed, supporting a strong agricultural community. Development (rural infrastructure, seasonal and permanent shoreline communities, and vibrant urban centers) makes up 5.8% of the watershed area and provide opportunities for community members to thrive as residents and business owners. This cultural landscape is supported by the regions' natural backdrop which encompasses 50.2% of the landscape. Among these features are large forest stands, many lakes and approximately 2,500 km of shoreline which provide fishing and recreational opportunities, abundant wetlands, and other unique natural features. The natural and cultural features of the Kawartha Watershed provide benefits which supports a healthy environment and a healthy human population.

The status of a watershed is measured using a combination of Geographical Information System (GIS) tools and field data. The Ecological Land Classification (ELC) system is an integrated and ecological GIS approach to describing the type and quantity of ecosystems that exist within our watershed. ELC information is important to show us the unique habitats, features, and environments in our community. In 2013, Kawartha Conservation completed an update to the ELC mapping for our watershed indicating that we have 33 different ecosystems across the landscape. By

evaluating the distribution of significant features across the landscape we can identify opportunities for stewardship or restoration projects which improve connectivity, reduce nutrient loading in our surface water, and improve the quality of our community.

In addition to GIS analysis, we have been collecting and analyzing field data to tell the story of our watershed's health for many years. We use many current and historical data sets and reports to inform management plans and will continue to integrate information into our project planning and implementation as it becomes available. This information includes lake and stream water quality and groundwater quality and quantity, and other data that helps characterize the landscape.

Together this is carefully collected and interpreted and becomes the backbone for the management plans and report cards outlined below. These resources indicate that generally the Kawartha watershed has an abundance of natural landscapes, however there are areas of concern: habitat fragmentation, development pressures, and poor localized water quality. Many of the lakes in the region are mature lakes that were created or enlarged during the construction of Trent Severn Waterway. These types of lakes yield higher productivity; meaning that they are nutrient rich and support a great deal of aquatic life.

MANAGEMENT PLANS

Lake and environmental management planning provide a scientific approach to protecting the environment over the short, and long terms. Plans involve detailed field inventories of sub-watersheds, rivers, and lakes to identify natural features and factors affecting their health. The intent of management planning is to first assess and record the health of the environmental management areas in its current status, and second to identify common objectives and set specific targets that will lead to the desired results such as improved lake water quality, stormwater management, or habitat for key species. These plans provide a framework for the development of this strategy.

Lake and Watershed Management Plans.

There are two sets of lake and watershed plans that were integrated into this strategy. Each plan addresses the management of a specific study area. The Oak Ridges Moraine (ORM) watershed plans, and Kawartha lake management plans address four watersheds: East Cross Creek, Blackstock Creek, Southern Lake Scugog Tributaries, and the Nonquon River. The Kawartha lake management plans address the watersheds of the major lakes in the region.

While each study area faces its own unique challenges, some common issues are identified such as dense urban development occurring along lake shorelines and some tributaries and fragmentation of aquatic and terrestrial habitats. Some common stewardship actions have also been identified in our region's lake and watershed management plans, including the following:

- Lake and Stream Shoreline naturalization
- Urban stormwater BMP Projects
- Invasive species management
- Septic system management
- Agricultural BMP projects
- Reforestation

Fisheries Management Plan

The Nonquon River Fisheries Management Plan is currently Kawartha Conservation's only fisheries management plan. The Nonquon River watershed provides spawning, nursery, refuge, feeding, transient and residential habitats, all of which are important for supporting the life stages and processes of 32 fish species. The Nonquon River supports both a cold and warm water fishery and is especially known for supporting walleye and muskellunge spawning habitat. The recommendations from the fisheries management plan provide information on priority areas for fish habitat conservation, restoration and development.

Stormwater Management Plan

The only Stormwater Management Plan that exists is for the urban center of Port Perry within the Township of Scugog. At the time the Port Perry Stormwater Management Plan (PPSMP) was developed, there was over 1,000 hectares of developed areas that were draining into sensitive habitats. The purpose of the PPSMP is to mitigate the effects of stormwater runoff on Lake Scugog and surrounding water bodies. Stewardship initiatives and the reduction of urban stormwater can work hand in hand through low impact development (LID) projects and retrofitting current developed areas, which will help to improve infiltration and decrease nutrient loading into Lake Scugog.

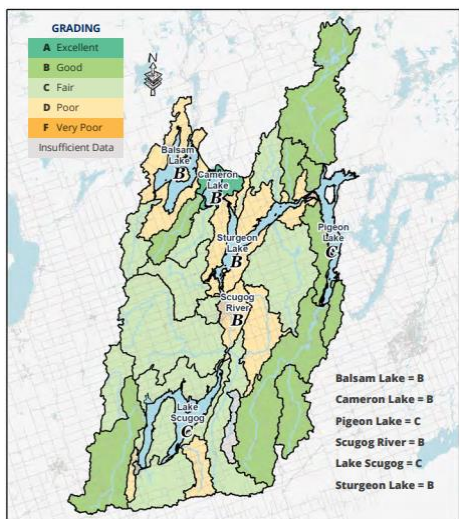
Climate Change Strategy

The goal of the Kawartha Conservation Climate Change Strategy is to increase the resiliency of our watershed and communities in order to adapt to and evolve with the changing climate. The Climate Change Strategy actions are based on the idea of Integrated Watershed Management and collaboration with watershed partners. These actions are grouped into three streams: Protecting, Conserving and Restoring, and Discovering. Stewardship action is integrated throughout the three groupings, which provides us with direction in understanding the current status of how resilient our watershed is, and where work projects can be completed across our watershed to continue responding to a changing climate.

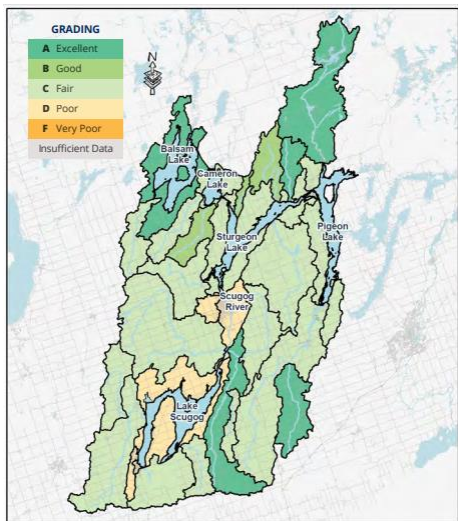
WATERSHED REPORT CARD PROGRAM

Just like school report cards tell us how well students are doing, we assign grades to the health of our environment. The grades provide a quick summary of conditions based on different types of environmental indicators, such as water quality, the size of forests and wetlands, and the quality of stream habitat. In 2018, Kawartha Conservation completed the most recent Watershed Report Card evaluation, which indicated an overall good rating for our watershed. The indicators used to determine that status are surface water quality, forest conditions, groundwater quality and wetland cover.

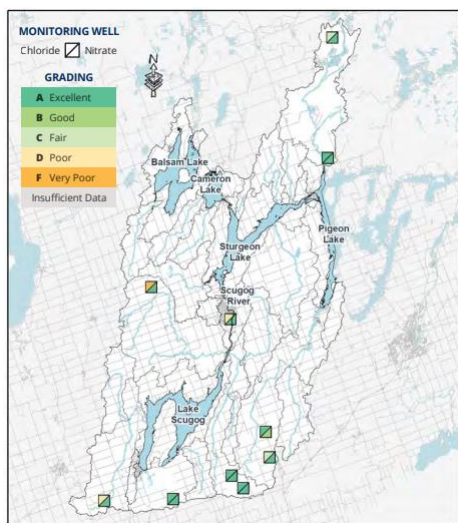
The watershed report card program provides us with information for targeting stewardship programming. They help us decide where to do stewardship and what type of stewardship is most required in an area. For example, when selecting sites for reforestation, priority will be given to sites that are in sub watersheds with lower forest condition grades.



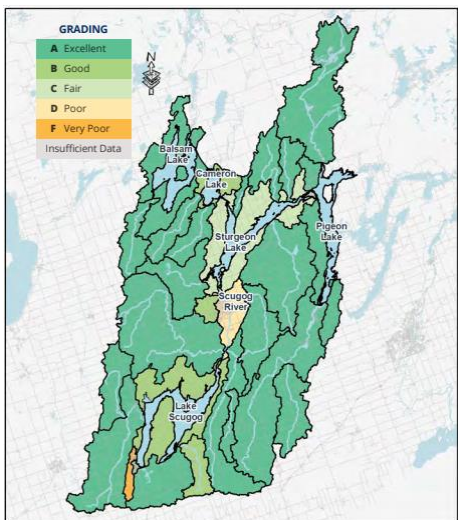
Surface Water Quality: Our surface water features include lakes, ponds, streams, and rivers. They provide many critical services to our communities including beaches for swimming, recreation, fishing, irrigation, drinking water, and habitat. The current surface water quality conditions within the Kawartha Watershed range in grades from B-D (good to poor). Our watershed average rating for surface water quality is C (fair). This tells us that work should be done to improve our surface water quality.



Forest Conditions: Forests are the lungs of the earth. They help improve air quality, they store carbon, and improve water quality by reducing erosion and encouraging infiltration during heavy rain events. They also provide many proven human health benefits. With a landscape as vast as ours, there is little wonder that some areas of our watershed have excellent forest cover, while other areas suffer from very poor coverage. The current forest condition within the Kawartha Watershed range in grades from A-D (excellent to poor); with mostly C (fair) grades. This means that we have some important work to do to increase the amount of forest cover, and the quality of those forests.



Groundwater Quality: The health of our groundwater is vital. It maintains the flow in rivers and streams, in addition to providing drinking water in many of our communities. Our rating for groundwater is predominantly A (excellent), with the occasional lower grade. None of the parameters evaluated exceed the maximum allowable concentrations under the Ontario Drinking Water Standards. It is important to manage our wells and the land surrounding them to ensure that our drinking water continues to be safe and abundant.



Wetland Cover: Wetlands are a very important part of the natural ecosystem and the water cycle. They also provide natural flood control, acting like a sponge to absorb water, and gradually releasing it over time. The status of our wetland cover ranges from A-F (excellent to very poor), with mostly an excellent status. On a sub-watershed level, there are areas that rate very poor for wetland because of the pressure of land development. As our urban areas expand, we must find ways to protect existing cover and compensate for wetland that has already been lost. We will support the work of organizations like Ducks Unlimited to enhance and protect our wetlands. We will also improve urban hydrology, through urban greening projects.

Projected Changes to the Kawartha Watershed

Understanding the major pressures our watershed faces over time allows us to develop relevant and effective programming. We can tailor our programs as existing pressures and their impacts are better understood, or as new pressures are identified. For example, we can modify the species available through our bulk seedling program as we gain a better understanding on regional forest ecology in a changing climate. To address expanding urban areas, we can work to increase the use of lot level LIDs to mitigate the loss of green space, helping to prevent flooding, heat islands and excessive sedimentation from runoff.

We must continue to develop and update programs to best mitigate the impacts of all major pressures with the goal of no significant loss in natural cover or natural features. In addition, understanding the impacts occurring within the watershed allows for the development of strategic targets that will lead to the increase, protection, and restoration of natural cover.

By interpreting the data collected over the years for Ecological Land Classification, Management Plans, and Watershed Report Cards, we can estimate the changes that have occurred across the Kawartha watershed dating back to 1988. We have seen a decline in forest and meadows (grassland) cover, as well as agricultural land use. On the other hand, there has been an increase in wetland cover, and an increase in urban development and resource extraction land use.

There are environmental pressures or factors that can cause environmental change within the Kawartha watershed and lead us to anticipate an accelerated loss of natural watershed features. These environmental pressures include climate change, population growth, and development. These expected changes can affect the quality and quantity of natural watershed features, in turn affecting the natural capital value and the ecological goods and services that are provided by the Kawartha Watershed.

CLIMATE CHANGE

Climate change can be defined by “long-term shifts in weather conditions identified by changes in temperature, precipitation, winds and other indicators. Climate change can involve both changes in average conditions and changes in variability, including, for example, extreme events” (Government of Canada, 2015).

The long-term daily minimum, daily maximum, and yearly average temperatures were recorded by the Lindsay Frost climate station (Environment Canada) from 1975 to 2006. It was determined that all three parameters showed the rising trends, where the most obvious increase is detected for the daily minimum temperatures



In several regions of Southern Canada, including the Kawartha Watershed, there has been a shift in precipitation type, with decreasing snowfall and increasing rainfall, as would be expected with warming temperatures.

The results of local research-based climate change projections can be found in two recent publications: *Towards Resilience: Durham Community Climate Adaptation Plan* and *The City of Kawartha Lakes Healthy Environment Plan (HEP)*. Both reports outline significant changes in local climate over the next 50-year period. These changes will bring consequences affecting the environment, water resources, agriculture and farming, human health, safety and wellbeing. Some of the expected changes and resulting impacts are outlined in Table 3, on the next page.

Table 3 – Some of the changes we can expect due to the changing climate and the resulting impacts on our communities. (adapted from the City of Kawartha Lakes Healthy Environment Plan, the Durham Community Adaptation Plan, and the Kawartha Conservation Climate Change Strategy).

<p>Temperature Change:</p> <ul style="list-style-type: none"> • On average annual temperatures will increase by 4.7 °C by the 2080s • We can expect to see more hot days and fewer cold days. For example, In the Kawartha Lakes we used to record an average of 6 days above 30°C in the summertime, in the coming decades it is projected that we will experience an average of 54 days 	<p>Impacts:</p> <ul style="list-style-type: none"> • damage to infrastructure such as roads, bridges, and buildings, • damage to our ecosystems, and • health risks for outdoor workers and vulnerable populations.
<p>Precipitation Changes</p> <ul style="list-style-type: none"> • More rain is expected to fall during an average rainy day as well as during extreme weather events. We will see precipitation falling at a faster rate, shorter storms with increased intensity, and shorter breaks between heavy storms. • Less snow and more rain in winter • More frequent and intense summer rain events 	<p>Impacts:</p> <ul style="list-style-type: none"> • flash flooding, • more frequent flooding, • road washout, • basement flooding, • crop damage, • infrastructure damage, • habitat destruction, and • construction delays and increased demand on emergency services.
<p>Increased occurrences of invasive species</p> <ul style="list-style-type: none"> • New species of plants, pests, insects and other organisms migrating and persisting in our environment • Populations of exotic species becoming dominant in ecosystems, displacing native species 	<p>Impacts:</p> <ul style="list-style-type: none"> • damage to our ecosystems, and • reduced habitat for pollinators, fish, and other native species.

Climate change will impact natural resources and features across the Kawartha watershed. Our communities will be impacted by these changes in significant ways. Both climate change strategies released by municipalities in the Kawartha watershed note the importance of protecting and enhancing our natural environment. Creating and maintaining abundant and resilient natural area will make our communities more resilient to the impacts of climate change. They both note the importance of increasing carbon sequestration and building resiliency into our forests, water bodies, open spaces and natural heritage systems. Kawartha Conservation stewardship programming must contribute to these critical climate change mitigation and adaptation goals.

POPULATION GROWTH AND DEVELOPMENT

Portions of the Kawartha Watershed are located within the Greater Golden Horseshoe (GGH), which is one of the most dynamic and fast-growing regions in North America. It is an area of significant ecological and hydrologic value, and includes the Oak Ridges Moraine, the Niagara Escarpment and the other natural areas. These landscapes support biodiversity, supply drinking water, sustain resource-based industries, support recreational activities, and help moderate the impacts of climate change (Growth Plan for the Greater Golden Horseshoe, 2017).

To be able to determine the impacts of a growing population, we must first understand the current population of the municipalities within our watershed. Table 4 below looks at the most recent Statistics Canada information regarding population within the Kawartha Conservation watershed and shows potential growth projections based on the rate of increase derived from the 2016 census. Growth in the City of Kawartha Lakes and the Municipality of Clarington will likely be the most significant of our municipal partners. This growth area represents the largest area within the Kawartha watershed.

Table 4 - Population information of municipalities present within the Kawartha Watershed based on 2016 census data (Statistics Canada, 2016).

Population and Dwelling Counts	Kawartha Lakes	Municipality of Trent Lakes	Township of Scugog	Township of Cavan Monaghan	Township of Brock	Municipality of Clarington
Pop. In 2016	75,423	5,397	21,617	8,829	11,642	92,013
% Change 2011-2016	2.9	5.8	0.2	2.7	2.7	8.8

The challenge within our watershed will be accommodating this increased population and level of development, while maintaining the integrity of the environmental features which have become the hallmark of these areas. Landscapes within the GGH contribute significantly to the ecological goods and services of the Kawartha Watershed. Losing natural and cultural land area to population growth, urban sprawl, and land development will lead to a decrease in the value of the ecological goods and services provided to local communities (which may be lost, misunderstood or under-valued when compared to the direct (and more obvious) economic impacts of residential and commercial developments).

As our communities grow, and development occurs within growth areas the natural features of the Kawartha watershed will be faced with several significant challenges. Urban sprawl can degrade the region's air quality; water resources; natural heritage resources, such as rivers, lakes, woodlands, and wetlands; and cultural heritage resources. Based on these impacts, there are accelerated rates of change that will occur within the Kawartha watershed in addition to what is expected from trends experienced over previous years.

Summary

Kawartha Conservation's existing stewardship programming is offered on a sub-watershed level and is based on the implementation of lake management plans. This strategy provides a more measured approach to stewardship, establishing realistic and challenging targets that will enable us to measure success and report on achievements over the next ten years.

Completion of the 2019 *Kawartha Conservation - Ecological Goods and Services Assessment (EGSA)* estimated the value of natural capital in Kawartha watershed to be \$1.2 Billion dollars/year in combined ecological goods and services. This illustrates the importance of continued investment in stewardship programming to protect and enhance the valuable natural features of the watershed, and to protect municipalities against future costs to natural features with man-made infrastructure.

The key projected environmental pressures considered for this strategy include climate change, population growth, and development. These factors will impact the composition and quality of natural features across the Kawartha watershed creating stress points that will need to be addressed. Impacts of climate change, urban development and population growth will continue to put stress on our natural resources. Establishing programs that help achieve the targets laid out in this Strategy will ensure that our community remains resilient.

This strategy addresses a complex array of information and management factors and creates opportunities to be reactive to changing conditions over time. By working within the goals laid out in this Strategy, our team will be able to develop detailed programs and projects that will **lead** by example, **connect** with our community, **integrate** available knowledge and decision making and **empower** our community to act.

In doing so we will affect positive change on our landscape which will contribute to bringing our vision of "ensuring that the natural features and functions of the Kawartha watershed are valued, protected, restored and/or maintained so that ecosystem services are provided for future generation" into being.

Appendix - Kawartha Conservation Stewardship Strategy 2020-2030, further detail

The four goals of the Kawartha Conservation Stewardship Strategy are to: **lead** by example, **connect** with our community, **integrate** available knowledge and decision making, and to **empower** our community to take action. Details for these goals and our strategy to achieve them; including a description of activities are outlined in this section.

Goal: Lead by Example

The goal to lead by example, requires that we complete several “shovel-in-the-ground” projects annually. By providing direct, measurable improvements of watershed health indicators and our communities resilience to climate change impacts through hands-on stewardship projects, we will increase and enhance natural cover resulting in the improvement of ecosystem functions. Accomplishment of this goal will be achieved in four activity types: tree planting on private land, demonstration of best management practices on public access land, enhancement of natural areas, and delivering urban tree planting events.

These activities will enable us to meet our program targets which are to:

- plant 21,000 native trees & shrubs/year
- establish 75% natural shoreline on all shoreline naturalization projects
- establish 75% vegetation on all stream project
- green 12 acres of urban space over 10-year period.

LEAD -ACTIVITY 1: PLANT TREES ON PRIVATE LAND

Our team will take an active role in the establishment of forest cover on privately owned rural and agricultural land in the Kawartha watershed. We will find suitable, priority properties for the establishment, expansion or enhancement of woodland. We will then develop relationships with landowners who are willing to offer space for tree planting, and work with them to develop planting prescriptions. Finally, we will facilitate the tree planting projects, follow up to assess tree survival, and ensure that the trees are cared for under agreement with the landowner.

As a program delivery agent for Forests Ontario programs such as the 50 Million Tree Program and Forest Recovery Canada, we will access resources which will enable us to establish tree cover on rural and agricultural private properties. We will also seek out funding from additional partners allowing us to provide deeper incentive for planting on high priority properties, complete more planting projects annually, and/or maintain funding for tree planting projects.

LEAD -ACTIVITY 2: DEMONSTRATE BEST MANAGEMENT PRACTICES ON PUBLIC ACCESS LAND

Our team will consult with municipal partners and industry leaders to identify sites shoreline and urban restoration and stewardship projects. These projects may include rain gardens, urban and shoreline naturalization, stormwater harvesting and low impact development. The sites will be chosen based on multiple criteria including the characteristics and the presence of known environmental issues, as well site visibility. Sites with significant pedestrian traffic, such as parks, will be prioritized for site selection.

These projects will be designed, implemented and maintained as a collaborative effort with our municipal partners and industry leaders. They will demonstrate leadership in the community and provide tangible examples of creative solutions for environmental issues and inspire community members to act.



Figure 7 The Port Perry site shown above was chosen as the location for an urban demonstration site because large volumes of stormwater accumulate to this point, contributing to sedimentation into nearby Lake Scugog. The project demonstrates the Township of Scugog’s willingness to implement green infrastructure projects as an approach to water management – contributing to the restoration of the natural water cycle and a more resilient community.

LEAD -ACTIVITY 3: ENHANCE NATURAL AREAS

By taking direct actions on the landscape our work will enhance natural areas in the Kawartha watershed. Natural areas of focus may have already suffered the impacts of pressures such as climate change, and invasive species. In other cases, they may be well adapted to current conditions and enhancements are aimed to increase resilience to anticipated future pressures. In either situation, enhancing natural areas helps us protect the things we value in our community: our clean water, our vibrant economy and our excellent quality of life. This action will be achieved by a variety of activities including:

- planting trees, managing invasive species and performing other stewardship activities in Conservation Areas,
- creating and maintaining demonstration sites which include elements such as trees, green infrastructure, native plant communities, enhanced habitat, and reduced invasive species in municipal parks and on other public access properties,
- planting trees on shoreline demonstration sites as well as on marginal farmland and open rural land.

LEAD -ACTIVITY 4: FACILITATE URBAN TREE PLANTING

Trees improve our urban environment significantly by helping to prevent flooding, heat islands and excessive sedimentation from runoff.

With partners such as TD Friends of the Environment, Tree Canada and others, we will continue to incorporate urban tree planting into our programming.

Incorporating trees into the design of BlueScaping demonstration sites as features to facilitate improved stormwater management, provides opportunity for additional urban tree planting.

Goal: Connect with our Community

Creating connections within our community by engaging watershed partners is an important goal because it will help to foster a community stewardship ethic and lead community members to embrace their role as environmental stewards. Accomplishment of this goal will be achieved by completing four activity types which are further described below. The key activities include facilitating tree planting on private land, public stewardship events, knowledge sharing, targeted outreach, and tracking community connections.

We will measure our success with achieving this goal by monitoring the level of engagement with new stakeholders and clients including municipal staff, community members, landowners, and contractors.

CONNECT – ACTIVITY 1: FACILITATING TREE PLANTING ON PRIVATE LAND

We will connect with landowners who wish to use tree planting to address land, soil, water and wind management issues as well as those who wish to create and expand woodlands as a living legacy on their property.

Landowners may wish to build windbreaks, shelter belts, or other rural green infrastructure components. They may also wish to establish woodlands on unused land, expand on an existing wooded area, or enhance it with understory plantings. We will support landowners with a variety of programs and services such as:

- tree planting programs which provide full-service tree services to landowners
- seedling sales which provide an opportunity for landowners to access smaller numbers of trees to plant themselves on their property.
- landowner grants which provide incentive grants or materials for tree planting projects
- projects like ‘Trees for Rural Roads’ which provide incentive for landowners to plant trees along rural road ways reducing the impacts of wind on their property and snow accumulation and drift on the road
- on site and remote consultation between stewardship team members which assists landowners in developing a plan for tree planting

CONNECT – ACTIVITY 2: COMMUNITY STEWARDSHIP EVENTS

Meaningful connections can also be made at community stewardship events. These include tree planting, restoration, efforts to build or maintain demonstration sites, invasive species management, and others. Participating in community stewardship activities helps build and strengthen social ties within communities, and meaningful stewardship events can provide community members with a strong sense of personal investment in their local natural environment including parks and green spaces. Action oriented events provide pathways for community members, leading them to adopt a strong stewardship ethic.



CONNECT – ACTIVITY 3: KNOWLEDGE SHARING

Another opportunity for connection is to facilitate and support activities which allow learning and networking amongst interested community members. Some examples of knowledge sharing initiatives that we can use to connect with the community are outlined below:

- stewardship workshops provide technical knowledge to help landowners manage their land. They can be either in-class, or and hands-on experiences.

- Symposiums are usually longer events providing a range of information geared to a user group. They incorporate a combination of peer-to-peer learning, as well as learning from experts from inside and outside of the organization.
- A speaker series usually addresses less technical knowledge that connects landowners to nature and reminds them of the value of the assets which they are stewarding. For example, a rural speaker session may provide information about identifying forest animals.
- In addition to hosting our own knowledge sharing events, our team can present information at partner events such as agricultural commodity group meetings, lake association meetings, garden clubs, and woodlot association meetings.
- Instructional videos, web content, and online training can provide connection and knowledge sharing opportunities to many landowners online.



CONNECT – ACTIVITY 4: TARGETED OUTREACH

When reaching out to the community, it is important that the right information is provided at the right time in the right format. Targeted outreach uses information about a property or geographic area, combined with an understanding of its user’s needs and preferences to tailor a message, and its medium. Targeted outreach efforts can take the form of mailouts to community members in areas of environmental priority, door-to-door landowner contact campaigns, information on the Kawartha Conservation website and social media platforms, and neighbourhood based meetings. Targeted outreach should be designed to encourage reciprocation in the form of feedback from its audience.

We have implemented successful targeted outreach programs such as the Blue Canoe program which engaged lakeshore residents during the early stages of Lake Management Plan implementation. Targeted outreach can be employed as a component of any of our programs or projects.

The following provides an example of targeted outreach as a project component: when planning a shoreline demonstration site, part of our planned communications may include a mailout to members of the lake community on a particularly degraded portion of the nearby shoreline. The mailout would inform the residents of the project, invite them to participate and to take advantage of Kawartha Conservation’s landowner resources to help them with their land management efforts.

CONNECT – ACTIVITY 5: TRACKING COMMUNITY CONNECTIONS

Our success in connecting with our community will be measured by monitoring the level of engagement with new stakeholders. As such, it is critical to track connections and their outcomes over time. We will establish and maintain a system to enable the provision of the best possible service to clients by building a history of stewardship connections.

Goal: Integrate available knowledge and decision making

Our goal to integrate available knowledge and decision making requires that we maintain a data-driven approach to program design; using the best available knowledge about the landscape, including current and emerging threats. By integrating municipal, provincial and federal priorities for stewardship we will optimize the allocation of resources to maintain and improve ecosystem health and community resilience. This goal will be accomplished through the

development of a prioritization tool for identifying priority sites, and collaboration with Kawartha Conservation's Integrated Watershed Management Team and municipal partners when planning stewardship projects.

Successful integration will be measured by assessing work plans annually to ensure integration, establishing a priority level of all project sites based on best available data, and completing projects on high priority sites when access is not an issue.

INTEGRATE – ACTIVITY 1: DEVELOP A PRIORITIZATION TOOL FOR IDENTIFYING PRIORITY STEWARDSHIP SITES

The Kawartha watershed is a large and diverse landscape. A range of environmental issues effect properties at varying levels. These issues are not static, over time environmental conditions can shift significantly. This makes our decisions making about resource allocation for land stewardship a complex process. The development of a GIS based tool will provide our team with a map that that helps with determining the relative value that is gained from implementing stewardship. The tool will consider a range of criteria such as:

- water quality issues identified through lake and watershed studies and upstream monitoring
- natural heritage system connectivity
- sensitive ecosystems

This tool will be developed and used when creating workplans and projects. It will be updated as new data becomes available.

INTEGRATE – ACTIVITY 2: COLLABORATE WITH INTEGRATED WATERSHED MANAGEMENT TEAM AND MUNICIPAL PARTNERS WHEN PLANNING STEWARDSHIP PROJECTS

This activity enforces the need for integration during the various stages of project management. Throughout a project's lifecycle, there are many opportunities for collaboration. We will ensure that the Integrated Watershed Management team and municipal partners are consulted at critical points throughout these stages. This includes long term project visioning, project planning, site identification, work planning, and throughout project implementation. Frequent, scheduled collaboration will ensure that projects continue to provide the intended impact and address the required issues. We will also collaborate with industry leaders who can guide and support the implementation of emerging technologies.

Goal: Empower our community to take action

By removing the barriers which prohibit the implementation of stewardship actions by private landowners, we will empower them to take actions voluntarily. This will result in a cumulative positive impact on watershed health and climate resilience. It will be achieved by providing financial and other assistance to landowners for stewardship projects, and by demonstrating improved land management practices.

These actions will enable us to meet our target of facilitating the completion of twenty private landowner projects each year which improve water quality, contribute to soil conservation, enhance natural areas, an increase climate change resilience.

EMPOWER – ACTIVITY 1: PROVIDE FINANCIAL AND OTHER ASSISTANCE TO LANDOWNERS FOR STEWARDSHIP PROJECTS

Simply put, we will help landowners to complete stewardship projects. We will provide them with services that are designed to make land management and restoration achievable. As we implement this strategy, we must continue to ensure that the services we provide, are of the most value to our community members. Services will include those such as:

- offering landowner grant programs which share the cost of investing in environmental stewardship projects
- providing technical guidance during on site consultation, over the phone on the internet, or at knowledge sharing events
- providing guidance throughout complicated processes such as permitting and record keeping
- connecting landowners to services provided by other organizations such as loan programs, external granting programs, and training
- providing physical resources such as native plants, tree seedlings and rain barrels at reduced costs
- providing services such as tree planting
- connecting landowners with peers that are dealing with similar issues, or who have knowledge and resources to help

EMPOWER – ACTIVITY 2: DEMONSTRATE IMPROVED LAND MANAGEMENT PRACTICES TO LANDOWNERS AND LAND MANAGERS

This action recognizes that often the first barrier to implementing change is a lack of awareness. Landowners might not recognize that there is a need for any changes. This need can be highlighted and demonstrated through leadership by Kawartha Conservation and its municipal partners, as well as by peers. Programs and projects will be completed and profiled in the community to create awareness these include demonstration sites on public access land. These projects and others completed by landowners and community groups (with or without our assistance) will be highlighted and celebrated at community events on our website and through online and traditional media.

Creating awareness through leadership will empower landowners to begin a journey in which they identify as watershed stewards. Once they begin down the path, our services and staff will help them along the way.