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The Regional Municipality of Durham
COUNCIL INFORMATION PACKAGE
March 13, 2020

Information Reports

2020-INFO-17 Commissioner of Finance – re: Annual Reporting of Commodity Price Hedging Agreements for the Region of Durham for the 2019 Fiscal Year

2020-INFO-18 Commissioner of Planning & Economic Development – re: Carruthers Creek Watershed Plan Update, Draft for Public Review and Comment, File: D07-17-01

2020-INFO-19 Commissioner of Finance – re: Economic Update – Current Risks and Uncertainty

2020-INFO-20 Commissioner of Planning & Economic Development – re: Economic Development and Tourism Annual Report 2019

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There are no Early Release Reports

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Other Municipalities Correspondence/Resolutions

1. Township of Tyendinaga – re: Resolution passed at their Council meeting held on March 2, 2020, regarding Support for a Peaceful Conclusion to the Ongoing Rail Disruptions and Encouragement for Ongoing Discussions for a Solution to the Coastal GasLink Project

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Advisory Committee Minutes

1. Energy From Waste – Waste Management Advisory Committee (EFW-WMAC) minutes – February 25, 2020

Members of Council – Please advise the Regional Clerk at clerks@durham.ca, if you wish to pull an item from this CIP and include on the next regular agenda of the appropriate Standing Committee. Items will be added to the agenda if the Regional Clerk is advised by Wednesday noon the week prior to the meeting, otherwise the item will be included on the agenda for the next regularly scheduled meeting of the applicable Committee.

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The Regional Municipality of Durham
Information Report

From:	Commissioner of Finance
Report:	#2020-INFO-17
Date:	March 13, 2020

Subject:

Annual Reporting of Commodity Price Hedging Agreements for the Region of Durham for the 2019 Fiscal Year

Recommendation:

THAT the Committee of the Whole recommend to Regional Council that this report be received for information.

Report:

1. Background

1.1 On June 20, 2007, Regional Council approved the Commodity Price Hedging Agreements: Statement of Policies and Goals for the Region of Durham, as outlined in Report #2007-F-53. The primary purpose for the development of the Statement of Policies and Goals was to provide the Region with the appropriate framework and guidelines when considering commodity price hedging agreements which can assist in providing greater price stability and certainty during periods of price volatility.

2. Reporting Requirements

2.1 As noted in the Statement of Policies and Goals, the Commissioner of Finance and Treasurer shall report to Council annually with respect to any and all commodity price hedging agreements that are in place. The report shall contain, as a minimum, all requirements as set out in Ontario Regulation 653/05 and will consist of:

- A summary of any contingent payment obligations under the commodity price hedging agreement that, in the opinion of the Commissioner of Finance and Treasurer, would result in a material impact for the municipality, including agreement termination provisions, equipment loss, equipment replacement options and guarantee indemnities; and

- A summary of the assumptions applicable to any possible variations in the commodity price hedge agreement payment and contingent payment obligations.

3. The Region's Current Natural Gas Consulting Agreement

3.1 As approved by Council through Report #2019-F-4 (Request for Proposals RFP #348-2019), Blackstone Energy Services Inc. was awarded the contract for the provision of consulting and related services for the supply of natural gas for the Region for a three year term with an option to extend for up to two additional one year terms. The new contract was made effective November 28, 2019.

The Region's Current Natural Gas Price Hedging Strategy

3.2 The Region currently has almost over 27,600 m3/day of natural gas volumes committed to the distribution system through its Direct Purchase Agreement. The Region was billed for almost 10 million m^3 in total natural gas volumes for the 2019 calendar year at an estimated cost of almost $2.7 million, including applicable taxes (not including DRLHC accounts[1]) across over 60 end-use accounts.

3.3 In the 2019 fiscal year, in order to hedge against seasonal volatility, the Region entered into the following fixed price transactions:

2019 Fixed Block Transactions for Natural Gas Supply for Regional Managed Pools

Start Date	End Date	GJ/day	Cost per Unit	
11/01/2018	03/01/2019	209	$3.61/GJ	$0.139/$m^3$
11/01/2018	03/01/2019	214	$3.975/GJ	$0.153/$m^3$
11/01/2018	10/31/2019	214	$3.46/GJ	$0.133/$m^3$
11/01/2019	03/31/2020	214	$3.56/GJ	$0.137/$m^3$
11/01/2019	03/31/2020	184	$3.295/GJ	$0.127/$m^3$
11/01/2019	10/31/2020	230	$2.92/GJ	$0.112/$m^3$
11/01/2019	10/31/2020	214	$3.15/GJ	$0.121/$m^3$

Notes: - Costs are landed, not including local tolls from CDA Enbridge to Union Dawn.
- Gigajoule (GJ) conversion to cubic metres (m3) assumes 1 GJ = 26 m3.

[1] DRLHC accounts receive natural gas through either the Housing Services Corporation (HSC) natural gas bulk purchase program or through OEB-approved system gas rates (approved and updated on a quarterly basis).

3.4 Overall, through the execution of the hedges for 2019, it is estimated that the Region's hedging activity resulted in costs that were approximately $11,500 less than otherwise would have been incurred securing supply at prevailing index/spot market pricing under the Region's Direct Purchase Agreement.

3.5 For the 2019 fiscal year overall, it is estimated that the Region's natural gas acquisition costs were approximately $0.138/$m^3$ (weighted average), inclusive of transportation costs and tolls for its Ontario landed natural gas including all index and balancing transactions as well as fixed-block purchases. The Region's weighted average cost of gas measured favourably versus comparable pricing such as:

- Default Enbridge system gas rate as approved by the Ontario Energy Board (2019 estimated simple average of $0.116/$m^3$, including rate rider adjustments, and $0.157/m3, including transportation);
- Local Authority Services (LAS) Natural Gas Program (2018-19 program price of $0.106/m3 not including transportation rate (priced at Empress). With transportation to Union Dawn at approximately $0.059/m3 total all-in cost was estimated to be in the range of $0.165/$m^3$; and
- Housing Services Corporation (HSC) Bulk Purchase Program (2019 program commodity price of just over $0.10/$m^3$ plus transportation rate of just over $0.06/$m^3$ for total landed price of $0.163/$m^3$).

3.6 With supporting market intelligence and analysis as provided by Blackstone Energy Services, Regional staff are kept up-to-date regarding market conditions and proactively secure natural gas supply for Regional accounts where deemed financially beneficial to do so. Any price hedge is incurred primarily to ensure a secure source of supply and cost certainty given supply constraints are more often experienced over the winter heating season.

4. The Region's Current Electricity Consulting Agreement

4.1 On January 27, 2016, based on Request for Proposal RFP 529-2015, Regional Council approved the recommendation that WattsWorth Analysis Inc. ('WattsWorth') be authorized to act for the Regional Municipality of Durham to procure electricity supply as a member in WattsWorth Buying Group, and provide related consulting services. The Region's facilities, including Duffin Creek WPCP and DRLHC properties, are estimated to have consumed approximately 185 million kWh of electricity in 2019 (metered and not adjusted for losses), at a total cost of over $23 million across over 600 individual end-use accounts (including applicable taxes).[2]

4.2 Among the services provided by WattsWorth under the existing agreement is the

[2] Duffin Creek WPCP consumption and cost values are total for the plant. Duffin Creek WPCP is jointly owned by the Regional Municipality of Durham and the Regional Municipality of York.

development of procurement strategies and obtaining of competitive bids for supply of electricity to the Region's facilities using commodity price hedging agreements, where deemed appropriate.

The Region's Current Electricity Price Hedging Strategy

4.3 There are currently no fixed price hedging arrangements in place for any of the Region's electricity accounts as spot market electricity pricing has not reached a consistent level that would pose a significant risk to the Region. In addition to facilitating hedges (where required), Wattsworth also provides services such as strategic advice in account structures, pricing and exiting the Regulated Price Plan (RPP, either tiered or Time-of-Use) and shifts to spot market pricing. While the Region has used such retail billing agent services in prior years, no Regional accounts were enrolled in such services in 2019.

5. Potential Variations in Commodity Price Hedge Agreement Payment and Contingent Payment Obligations

5.1 Hedging arrangements provide for fixed commodity pricing and the Region only contracts with credit-worthy counterparties which adhere to the requirements of the Region's Commodity Hedging Policy. Given this, there are no reasonably expected variations in the price payment of related contingent payment obligations related to commodity hedge transactions(s).

5.2 Given the Region transacts with natural gas suppliers on a regular basis, it has in place base supply agreements with four natural gas suppliers (Direct Energy, BP Corporation North America, EDF Trading and RBC) which ensures a competitive process for all supply transactions. Based on recent review, all of the Region's suppliers continue to meet the minimum creditworthiness thresholds set by the Region as laid out in the Council-endorsed Statement of Policies and Goals. For electricity-related transactions, while options are frequently reviewed, the Region does not currently have any active base agreements with any electricity suppliers.

6. Conclusion

6.1 For the 2019 fiscal year, while there were no hedges in place for the Region's electricity accounts, the Region did enter into several fixed price transactions for its natural gas accounts (not including DRLHC accounts) for the purposes of providing enhanced price stability and overall cost certainty.

6.2 Regional staff continue to work collaboratively with the Region's respective energy advisors and, with evaluation of market conditions and supporting price and account analysis, will consider opportunities for additional commodity price hedging arrangements, where appropriate and where considered financially beneficial to do so.

Respectfully submitted,

Original Signed by Nancy Taylor

Nancy Taylor, CPA, CA
Commissioner of Finance

If this information is required in an accessible format, please contact 1-800-372-1102 ext. 2564

The Regional Municipality of Durham
Information Report

From:	Commissioner of Planning and Economic Development
Report:	#2020-INFO-18
Date:	March 13, 2020

Subject:

Carruthers Creek Watershed Plan Update, Draft for Public Review and Comment, File: D07-17-01

Recommendation:

Receive for information

Report:

1. Purpose

1.1 The purpose of this report is to advise of the release the draft Carruthers Creek Watershed Plan Update for public review and comment.

2. Background

2.1 Watershed planning is required by Provincial Plans, including the Oak Ridges Moraine Conservation Plan, the Greenbelt Plan and the Growth Plan, to identify and protect natural resources and areas, and to help inform future land use planning decisions. The Regional Official Plan (ROP) also recognizes the preparation and implementation of Watershed Plans as an effective planning tool in the protection of natural heritage resources.

2.2 Watershed plan documents have traditionally been prepared by conservation authorities. In southern Ontario, particularly in the Greater Golden Horseshoe area, conservation authorities have experience and expertise in watershed management and watershed planning.

2.3 Watershed planning provides a framework for establishing goals, objectives, and direction for the protection of water resources, the management of human activities, land, water, aquatic life, and resources within a watershed[1]. It also provides an opportunity for the assessment of cumulative, cross-jurisdictional and cross-watershed impacts. As defined in the Growth Plan, 2019 and outlined in the Provincial Draft Watershed Planning Guidance (February 2018), watershed planning typically includes:

a. Watershed characterization;
b. A water budget and conservation plan;
c. Nutrient loading assessments;
d. Consideration of climate change impacts and severe weather events;
e. Land and water use management objectives and strategies;
f. Scenario modelling to evaluate the impacts of forecasted growth, servicing options, and mitigation measures;
g. An environmental monitoring plan;
h. Requirements for the use of best management practices, programs, and performance measures;
i. Criteria for evaluating the protection of the quality and quantity of water;
j. The identification and protection of hydrologic features, areas, and functions and the inter-relationship between or among them; and
k. targets for the protection and restoration of riparian areas.

2.4 Watershed plans are not land use plans, nor do they constitute a land use planning decision. However, as required by Provincial Plans, the data, scientific analysis, modelling, scenario evaluation and management recommendations generated through a watershed planning process is used by municipalities to inform land use planning decisions.

2.5 The Carruthers Creek watershed is located within the City of Pickering and Town of Ajax and is on the eastern edge of the Toronto and Region Conservation Authority's (TRCA) jurisdiction. The watershed is relatively small, at approximately 3,840 hectares in size, ranging from 2 to 3 kilometres in width, and a total length of 18 kilometers. The headwaters of the Carruthers Creek form to the south of the Oak Ridges Moraine, in the City of Pickering, and the creek enters Lake Ontario in the Town of Ajax. The Carruthers Creek watershed consists of four subwatersheds[2].

1 A watershed is defined as an area that is drained by a river and its tributaries.
2 A subwatershed is defined as an area drained by a tributary, or portion of the stream, and is a more geographically specific scale than a watershed.

2.6 The watershed is mainly rural north of Highway 7 and urbanized south of Taunton Road to the lakeshore. From Highway 7 south to Taunton Road, most lands are in the protected countryside designation of the provincial Greenbelt Plan. There are approximately 41,000 residents within the boundaries of the watershed.

2.7 Policy 7.3.11 p) of the ROP applies to lands located in Northeast Pickering and within the headwaters area of Carruthers Creek Watershed[3]. The policy states: "where a *comprehensive review* of this Plan includes consideration of lands for Urban Area expansion within the City of Pickering east of the Pickering Airport lands, outside of the Greenbelt, the following additional matters will be assessed and evaluated at that time:….. (ii) the preparation and completion of a *watershed plan* update for the East Duffins and Carruthers Creek watersheds." The completion of this watershed plan is a precondition to the consideration of future development in northeast Pickering, but does not signal that the lands will be developed since that determination will be made through the Municipal Comprehensive Review process (further discussed in Section 5 of this Report).

2.8 The Work Plan to update the Carruthers Creek Watershed Plan was developed by Regional planning staff in consultation with TRCA staff and was designed to meet or exceed all Provincial requirements, while satisfying Policy 7.3.11 p) of the ROP. On April 1, 2015, Regional Council authorized staff to engage the TRCA in a consulting capacity to update the Carruthers Creek Watershed Plan on the Region's behalf. In June of 2015, the TRCA Board granted approval to enter into a service agreement with the Region and to initiate the project.

2.9 The draft Watershed Plan Update has taken place over two phases. Phase 1 was initiated in June of 2015 and culminated in the preparation of seven peer reviewed technical reports that characterize the watershed's existing conditions. Phase 2 was initiated in December of 2017 and included public consultation, further technical reports, watershed scenario analyses, and the development of management recommendations. The draft Watershed Plan Update (Attachment #1) was prepared by TRCA staff in late 2019 and is now available for public review and comment for a 90 day consultation period, along with the supporting Phase 2 technical reports (Attachment #2 through Attachment #9 are accessible via hyperlinks).

3 Policy 7.3.11 p) was incorporated into the Durham Regional Official Plan (ROPA128) by the Ontario Municipal Board through Decision PL101409 on January 9, 2013.

3. A Consultation Focused Approach

3.1 Since project initiation, the draft Carruthers Creek Watershed Plan Update has been a highly consultative and collaborative process. Following the completion of Phase 1 (technical analysis), a comprehensive consultation approach has been implemented to raise awareness of the project and to seek input and feedback. Below is a summary of consultation activities that have taken place over the course of the project thus far:

a. Project Website: **Over 2,400 visits**
b. Project information postcards: **Over 2,000 distributed**
c. Online survey: **Over 70 participants**
d. Project specific email: **Continuously maintained and monitored since October 2017.**
e. Popup displays at public events: **7 events**
f. Stakeholder Workshops (environmental non-government organizations, golf courses, etc.): **Hosted 3 workshops**
g. Update Presentations to Municipal Committees of Council: **Durham 2, Ajax 2, Pickering 2, TRCA Board of Directors 4**
h. Public Information Centres: **2 (October 8 and October 10, 2019)**
i. TRCA, Ajax, Pickering and TRCA staff to staff meetings: **7**
j. Presentations to advisory committees (Durham Agricultural Advisory Committee, Durham Environmental Advisory Committee, Ajax Environmental Advisory Committee, etc.): **6**
k. Commissioner's Reports providing project updates to Durham Planning and Economic Development Committee / Committee of the Whole and Council with circulation to Ajax and Pickering: **9**

3.2 The draft Watershed Plan Update has entered the final stage of consultation. Commencing with the publication of this Commissioner's Report, the draft Watershed Plan Update and supporting technical studies have been released via the TRCA's project website for public review and comment for a period of 90 Days. **The final date to provide written comments to the TRCA on the draft Watershed Plan Update is June 16, 2020**. During this period, an additional Public Information Centre will be held on Thursday April 30, 6:00pm to 9:00pm at the Audley Recreation Centre (1955 Audley Road, Ajax, Hall 3C) to provide members of the public with the opportunity to ask questions and review the plan with TRCA staff.

4. Watershed Plan Update Overview

4.1 The draft Watershed Plan Update (Attachment #1) is divided into nine sections. A brief summary of each section is provided below:

a. **Introduction and Background:** provides an overview of the rationale and policy basis for watershed planning, the local context and considerations, and key partners and stakeholders.
b. **Water Resources and Natural Heritage Systems:** describes the key components of the Water Resource System and Natural Heritage System, including a description of how each system was delineated.
c. **Existing Watershed Conditions:** describes the current watershed conditions based on a series of technical evaluations undertaken in Phase 1 of the study. Four key issue areas, being the Water Resource System, the Natural Heritage System, Water Quality and Natural Hazards (including flooding) are described and rated against benchmark indicators.
d. **Future Watershed Conditions:** describes the three future land use scenarios that were modelled to predict the response in the watershed, the results of the modelling analysis, and the implications of these scenarios.
e. **Management Framework:** outlines what needs to be done to protect, enhance and restore the watershed's health. The management framework includes 34 recommendations divided into three goal areas of: Land Use, Water Resource System, and Natural Heritage System. A separate sub-section (5.4) details the management recommendations, should a settlement area boundary expansion occur within Northeast Pickering.
f. **Monitoring and Evaluation:** details the indicators, frequency, and methods in which monitoring will occur. The performance of the Watershed Plan implementation will be evaluated on an ongoing basis.
g. **Maps, Glossary and References:** contains supporting resources in the form of maps, a glossary of terms, and references.

4.2 In addition to the draft Watershed Plan Update, a series of supporting technical reports have also been completed as part of Phase 2 of the study. The Phase 2 technical reports measure and model the watershed in response to different high level land use scenarios, which were used to inform the preparation of the draft Watershed Plan Update and its management recommendations. Similar to Phase 1, the Phase 2 technical reports were subject to an external peer review process to ensure the analysis was rigorous and completed at or above technical / industry standards.

5. Key Outcomes

5.1 The draft Carruthers Creek Watershed Plan Update is being released for public review and comment. The technical analysis undertaken to characterize the watershed's existing conditions indicate that:

a. The aquatic ecosystem is sensitive and is near the level of development that it can sustain long term without additional and improved mitigation;
b. There is not enough natural cover, or good quality habitat;
c. Water quality is impaired; and
d. The flow of water through the watershed is out of balance with natural conditions, resulting in flooding and erosion issues.

5.2 A management framework (Section 5) has been developed to protect, enhance and restore the watershed by addressing existing issues and mitigating the impacts from potential future land uses.

5.3 Scenario analysis is used to help inform the municipal planning process by identifying potential impacts and by providing management recommendations on potential future land uses. One of the land use scenarios assumes post-2031 urban development within the Carruthers Creek headwaters, within the white belt area of Northeast Pickering, for modelling purposes. The watershed plan update does not provide recommendations on the type or configuration of future land uses.

5.4 As part of "Envision Durham", the Region's Municipal Comprehensive Review (MCR) of the Regional Official Plan (ROP), a Land Needs Assessment (LNA) will be completed to comprehensively assess the Region's urban structure, its intensification potential, and future urban land needs to accommodate the provincially mandated population and employment forecasts. Upon the completion of the LNA, a determination will be made on whether additional urban land will be required through a settlement area boundary expansion to accommodate the provincially mandated growth forecasts. Should the LNA determine that additional urban land is required to accommodate the growth forecast, then candidate areas (i.e. areas outside of existing urban areas that are outside of the Greenbelt Plan area) would be evaluated and assessed for a settlement area boundary expansion.

5.5 The draft Watershed Plan Update has modelled likely implications associated with the potential for urban development within the headwaters. Should it be determined through the LNA that additional urban land is required in this general area, the implications and the related recommendations of the Watershed Plan Update would also be considered.

6. Next Steps and Conclusion

6.1 The draft Carruthers Creek Watershed Plan Update is now available for public review and comment. The Watershed Plan Update and the supporting Phase 2 technical reports are posted on the TRCA project website. A Public Information Centre will be held on Thursday April 30, 6:00pm to 9:00pm at the Audley Recreation Centre (1955 Audley Road, Ajax, Hall 3C). An email notification will be sent by TRCA staff to all individuals who previously provided comments on the Watershed Plan Update and to those who requested to be notified of project progress. A notice outlining the date, place and time of the April Public Information Centre will be distributed via TRCA's social media platforms and posted on the project website. The final date to provide comments to the TRCA on the draft Watershed Plan Update is June 16, 2020.

6.2 TRCA staff will respond to any written comments that are received during the public review period and incorporate any necessary modifications into a final draft Watershed Plan. Following this process, the final draft Watershed Plan and the summary package of public comments / submissions will be presented to the Durham Region Planning and Economic Development Committee for its consideration, and ultimately for endorsement by Regional Council.

6.3 A copy of this report will be forwarded to the Toronto and Region Conversation Authority, the Town of Ajax and the City of Pickering.

7. Attachments

Attachment #1: Draft Carruthers Creek Watershed Plan Update, March 2020;

Attachments via Hyperlinks Only

Attachment #2: Aquatic Impact Assessment, September 2019;

Attachment #3: Fluvial Geomorphic Assessment, October 2019;

Attachment #4: Groundwater Modelling Report, March 2019;

Attachment #5: Soil Water Assessment Tool (SWAT) Modelling Report, September 2019;

Attachment #6: Stormwater Management Report, May 2019;

Attachment #7: Terrestrial Impact Assessment, September 2019;

Attachment #8: Urban Forest Assessment, May 2019;

Attachment #9: Hydrological Assessment, November 2019;

Respectfully submitted,

Original signed by

Brian Bridgeman, MCIP, RPP
Commissioner of Planning and
Economic Development

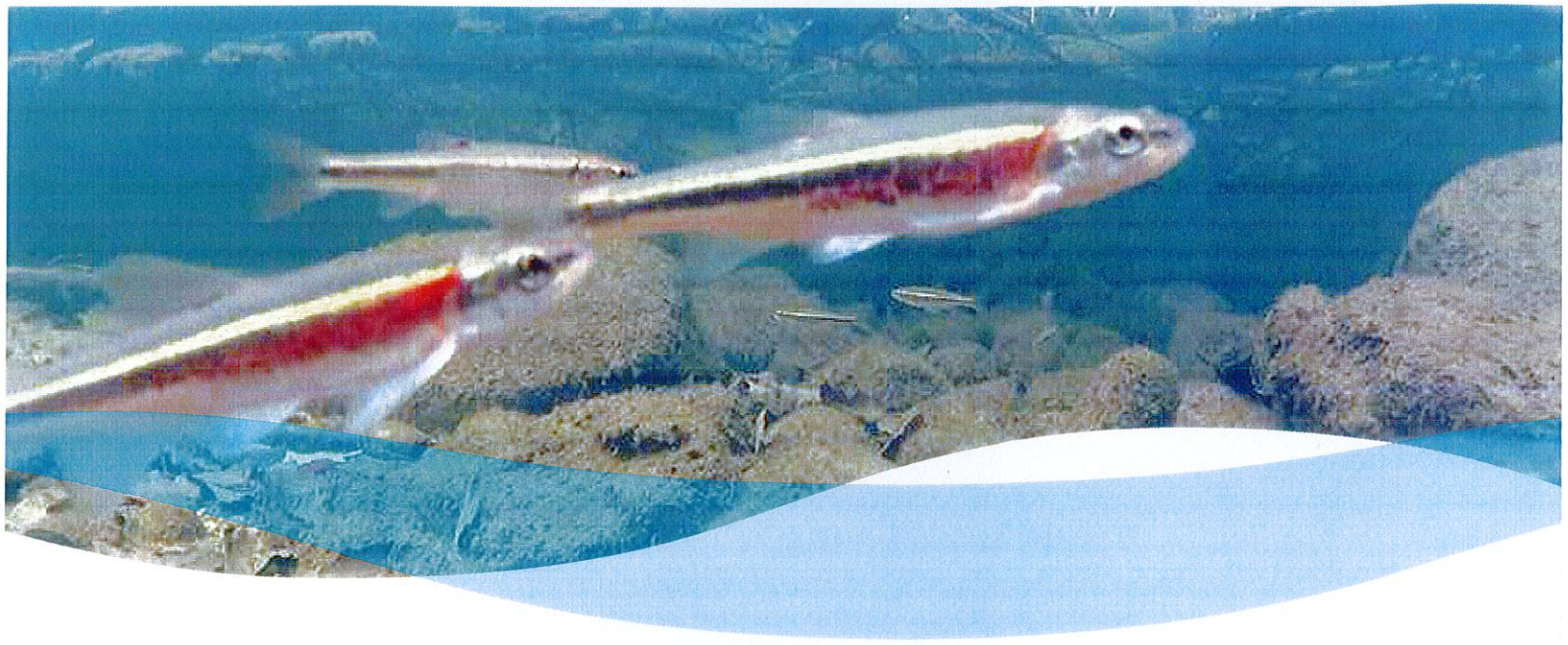
Attachment #1

Carruthers Creek
WATERSHED PLAN
2020 - 2030

Developed in collaboration with
the Town of Ajax and City of Pickering

DURHAM REGION

Toronto and Region Conservation Authority



Executive Summary

A watershed is an area that is drained by a river and its tributaries. Healthy watersheds provide numerous ecosystem services; from sustaining drinking water, supporting biodiversity, reducing flood and erosion hazards, protecting the quality and quantity of water, and replenishing aquifers. Due to the importance of healthy watersheds, they merit collaborative efforts to ensure their long-term sustainability.

The purpose of a watershed plan is to understand the current conditions of the watershed, and identify measures to protect, enhance and restore the health of the watershed. Watershed planning integrates natural systems into land use and infrastructure decision-making by identifying natural features to protect and by recommending how to mitigate impacts from land use and infrastructure development on natural systems. Ontario's provincial planning framework recognizes that watershed planning is important to informing land use and infrastructure planning decisions.

The development of this watershed plan has been a collaborative effort between the Toronto and Region Conservation Authority (TRCA), the Region of Durham, the Town of Ajax and the City of Pickering. Additional stakeholders and members of the public have been involved throughout the watershed planning process.

Carruthers Creek is a small watershed that crosses rural and urban lands, including portions of the provincial Greenbelt, before entering Lake Ontario. Urbanization and the impacts of climate change will continue to stress the health and resiliency of the watershed. Watershed planning is a means to identify opportunities to mitigate and adapt to potential changes in watershed health arising from land use and infrastructure development patterns.

The development of the Carruthers Creek Watershed Plan was a multi-year process that consisted of:

1. Watershed characterization, which involves the identification of current conditions in the watershed.

   The key issues with Carruthers Creek were identified to be:

   a. The aquatic ecosystem is sensitive and near the level of land use development it can sustain long-term (without additional and improved mitigation).
   b. There is not enough natural cover, or good quality habitat, needed to maintain ecosystem resilience (i.e. capacity to respond to change) due to changing land use patterns and climate change.
   c. Water quality is impaired (i.e. degraded), requiring improvements to stormwater management.
   d. The flow of water through the watershed is out of balance from natural conditions resulting in flooding and erosion issues.

2. Understanding future conditions through the analysis of potential land use scenarios. Three potential future scenarios were compared to 2015 land use conditions as part of the Carruthers Creek watershed planning process.

   a. **Scenario 1 (+OP)** – assumes all lands south of the Greenbelt are developed as planned in approved Official Plans up to the year 2031.
   b. **Scenario 2 (+NHS)** – assumes the same development as scenario 1 but includes the proposed enhanced Natural Heritage System (includes natural features and areas, such as forests, meadows, wetlands, and potential natural cover enhancement areas).
   c. **Scenario 3 (+Potential Urban)** – assumes post-2031 development in the headwaters of Carruthers Creek outside the proposed enhanced Natural Heritage System.

   These three potential future scenarios help determine how the watershed would react to these potential land use changes, which can help inform future land use and infrastructure planning decisions. In other words, would these potential changes have a positive, neutral, or negative effect on the health of the Carruthers Creek watershed? Scenario analysis does not result in decisions about the type and configuration of land uses. Instead, scenario analysis helps to inform decisions through the municipal planning process (e.g. Official Plans, secondary plans).

3. The development of a management framework to provide recommendations on how to protect, enhance and restore the watershed. The management framework consists of goals, objectives, indicators and management recommendations. This management framework is designed to address existing issues in the watershed and mitigate impacts from potential future land uses, while recommending appropriate actions to protect, enhance and restore the watershed. Decisions on the configuration of future growth and land use throughout the watershed are the purview of the applicable municipality (e.g. Region of Durham for decisions such as settlement area boundary expansions and local municipalities for site-specific decisions).

4. A monitoring and evaluation program to track implementation progress and ensure mechanisms are in place to adjust approaches as needed. The indicators identified as part of the management framework will help determine if actions taken in the watershed are having the desired benefit. Adaptive management will be used to adjust the management framework as needed.

Through the implementation of the Carruthers Creek Watershed Plan, TRCA and its municipal partners, can improve the health of the watershed and ensure integrated long-term planning for land use and infrastructure decision-making. Protecting, enhancing and restoring the natural systems within the watershed; accompanied by sustainable land use and infrastructure planning of redevelopments and future growth is essential for a healthy Carruthers Creek watershed.

WHAT IS A WATERSHED?

An area that is drained by a river and its tributaries. Wherever you are right now, you are in a watershed.

WATERSHEDS DELIVER IMPORTANT BENEFITS

Human – provide safe drinking water and food, and help to reduce flooding and erosion.

Economic – produce energy, and supply water for agriculture, industry and homes.

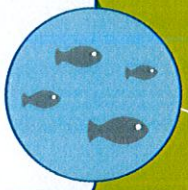
Environment – promote a healthy water cycle, and provide vital habitat for wildlife and plants.

What is the Natural Heritage System?

Consists of natural features and areas, including wetlands, forests, meadows and valleylands, that are needed to maintain biodiversity and healthy ecosystems.

What is the Water Resource System?

Consists of groundwater and surface water features and areas, including streams, lakes, groundwater recharge areas and springs, needed to sustain healthy aquatic and terrestrial ecosystems, and human water supply.



What causes flooding?

Rivers naturally flood with heavy rain or snowmelt, but flooding can become a problem when buildings and other structures are placed in floodplains. Climate change and urbanization can make flooding worse.

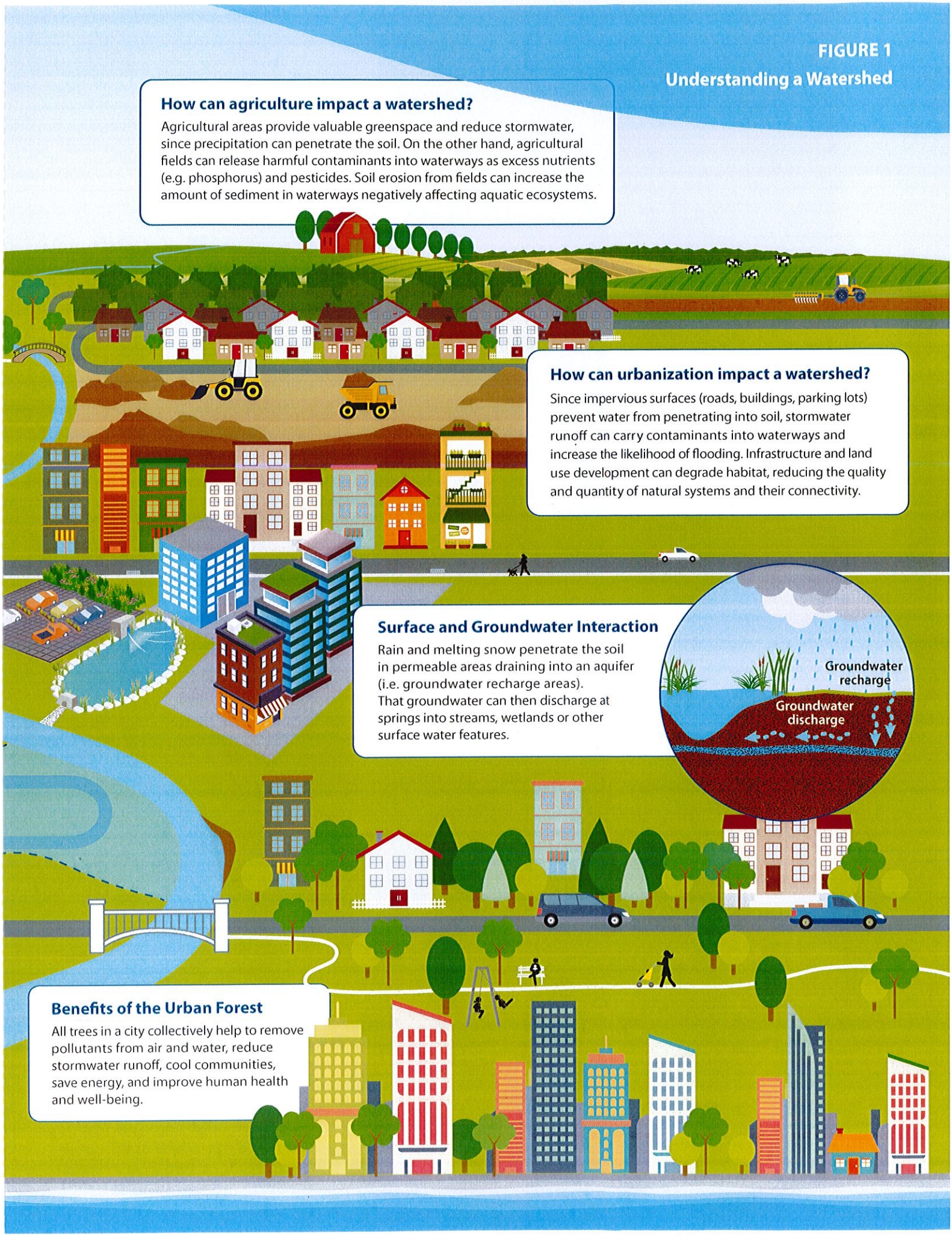
How can salt impact a watershed?

Chlorides can contaminate drinking water and negatively affect the health of aquatic species.

What is stormwater?

Rain and melting snow rushes off roofs, sidewalks and parking lots into pipes and pours into streams and lakes. Without proper stormwater control and treatment, flooding and erosion can increase, waterways can become polluted and local ecosystems can be damaged.

FIGURE 1
Understanding a Watershed



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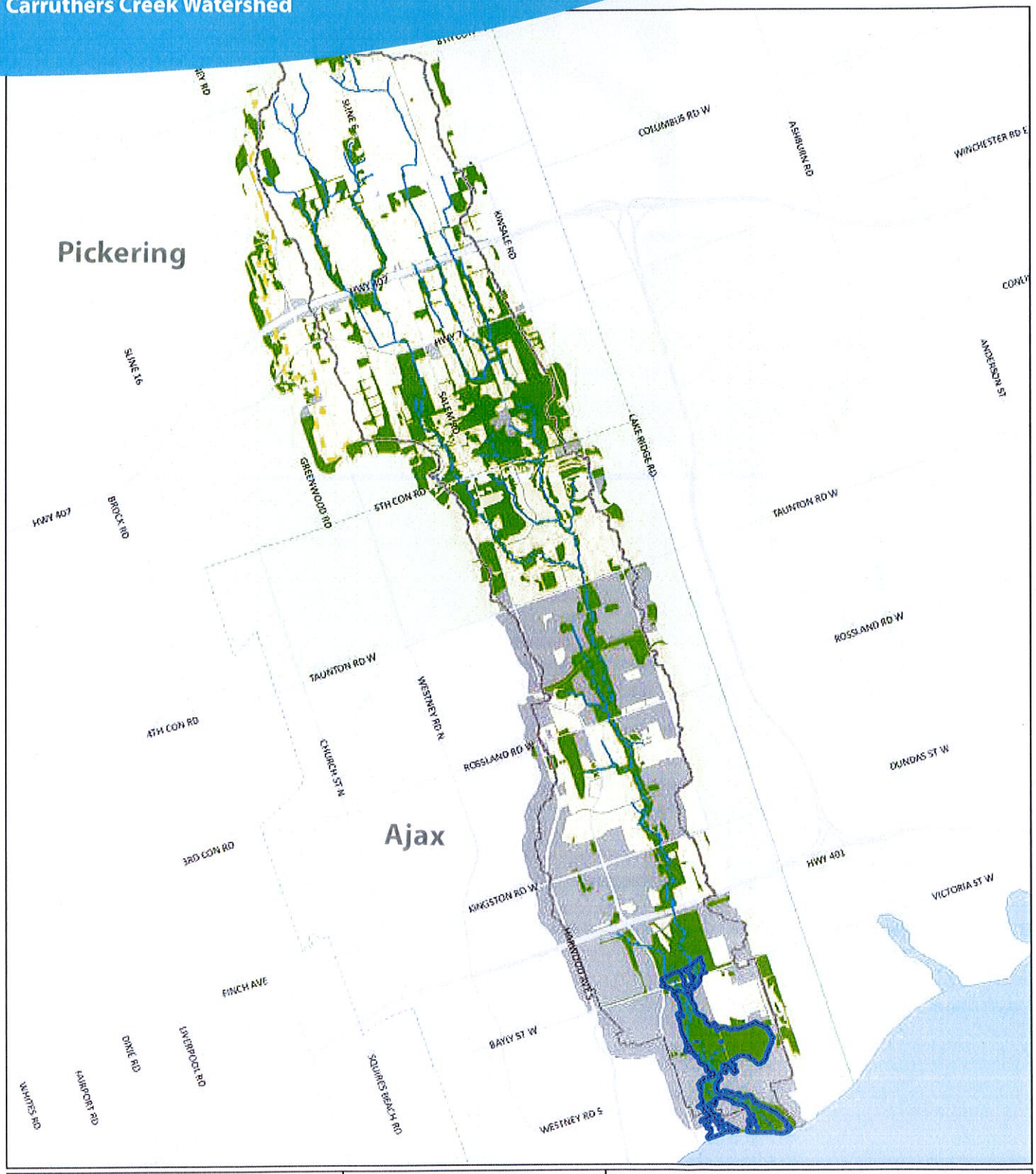
ACRONYMS

ANSI	Areas of Natural and Scientific Interest
CCME	Canadian Council of Ministers of the Environment
CTC	Credit Valley, Toronto and Region and Central Lake Ontario
DFO	Department of Fisheries and Oceans
ESGRAs	Ecologically Significant Groundwater Recharge Areas
FBI	Family Biotic Index
FVC	Flood Vulnerable Cluster
GIS	Geographic Information System
Growth Plan	Growth Plan for the Greater Golden Horseshoe, 2019
GTA	Greater Toronto Area
IBI	Index of Biotic Integrity
IRP	Integrated Restoration Prioritization
LAM	Landscape Analysis Model
MECP	Ministry of the Environment, Conservation and Parks
MNRF	Ministry of Natural Resources and Forestry
NHS	Natural Heritage System
PPS	Provincial Policy Statement
PWQO	Provincial Water Quality Objectives
ROP	Regional Official Plan
TRCA	Toronto and Region Conservation Authority
TSS	Total Suspended Solids
WRS	Water Resource System

Indigenous Land Acknowledgement

As we strive to develop a comprehensive watershed plan for the Carruthers Creek watershed, Toronto and Region Conservation Authority (TRCA) acknowledges that this watershed planning was undertaken within the traditional territory and treaty lands of the Anishinaabeg of the Williams Treaty First Nations, and the traditional territory of the Huron-Wendat Nation. As stewards of land and water resources within the Greater Toronto Area (GTA), TRCA appreciates and recognizes the history and diversity of the land, as well as our shared values and interests and is respectful of working in this territory.

FIGURE 2:
Carruthers Creek Watershed



Toronto and Region Conservation Authority

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Carruthers Creek Watershed Plan: 2015 Land Use Conditions

0 0.5 1 2 3 KM

Municipal Boundary
Watercourse

Land Use
Natural
Rural
Urban

Flood Vulnerable Cluster
Greenbelt Boundary
Carruthers Creek Watershed Boundary
Carruthers Creek Watershed Plan Study Area

Date: September 2019
Created by: TRCA Information Services/Information Technologies

Disclaimer
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1. Introduction and Background

Carruthers Creek is a small, yet important watershed that crosses rural and urban areas before entering Lake Ontario. This watershed plan represents a collaborative effort to determine the current state of the watershed, assess potential future land use scenarios, and determine an appropriate management framework to ensure the long-term sustainability and resiliency of the watershed.

See **Figure 2** for a map of the Carruthers Creek watershed and its land use conditions as of 2015. This watershed plan has a ten-year time frame. However, regular monitoring and evaluation, including adaptive management, will ensure that the watershed plan is updated, or refined, as needed on an ongoing basis.

Vision for the Carruthers Creek watershed:

Carruthers Creek watershed is a healthy and resilient natural system that is managed through partnerships to balance resource protection with human activity. Sound science and best management practices will protect and restore ecosystem functions, protect watershed residents from natural hazards like flooding, and maintain our natural heritage and water resources for present and future generations.

1.1 RATIONALE AND POLICY BASIS

Watershed planning is important because it helps to understand the current conditions of the watershed (i.e. watershed characterization), and identify measures to protect, enhance and restore the health of a watershed. Watershed plans provide a comprehensive understanding of the ecological forms and functions of the various features and areas that comprise the water resource and natural heritage systems. Additionally, watershed planning helps to inform how land use and infrastructure planning influence and affect the natural ecology of the watershed.

This subsection will explain the provincial policy basis for watershed planning and the roles of municipalities and TRCA in implementing that policy framework.

Provincial Watershed Planning Policy Basis

Ontario's planning policy framework recognizes the importance of watershed planning to inform land use and infrastructure decision-making. The key policy driver for watershed planning is applicable provincial policy direction in the Provincial Policy Statement (PPS, 2014) and provincial plans such as the Growth Plan for the Greater Golden Horseshoe, 2019 (Growth Plan) and the Greenbelt Plan, 2017 (Greenbelt Plan)[1].

PPS policies encourage a coordinated approach to planning that recognizes the watershed as the ecologically meaningful scale for integrated and long-term planning. The PPS also directs the protection, improvement or restoration of the quality and quantity of water by minimizing potential negative impacts. Growth Plan and Greenbelt Plan policies require watershed planning to be undertaken to support the protection, enhancement or restoration of the quality and quantity of water within a watershed[2].

Furthermore, watershed planning is to be used to identify the Water Resource System (WRS), inform decisions on allocation of growth and planning for water, wastewater and stormwater infrastructure[3].

Provincial policies also recognize the importance of protecting, enhancing and restoring the Natural Heritage System (NHS) to maintain long-term ecological and hydrologic functions of the features and areas[4], and demonstrating that there will be no negative impacts from development and site alteration. The integrated nature and importance of the natural heritage and water resource systems is discussed in greater detail in **Section 2**.

[1]There are other geographically specific provincial plans that do not apply to the Carruthers Creek watershed (e.g. Lake Simcoe Protection Plan, Oak Ridges Moraine Conservation Plan and Niagara Escarpment Plan).

[2]Growth Plan policy 4.2.1.1 and Greenbelt Plan policy 3.2.3.2

[3]Growth Plan policy 4.2.1.3 and Greenbelt Plan policies 3.2.3.3 and 3.2.3.4.

[4]Natural Heritage System policies for the Growth Plan are 4.2.2 and the Greenbelt Plan are 3.2.2.

Municipalities are required to conform to the PPS and applicable provincial plans through the municipal planning process and when updating their Official Plans. This Carruthers Creek Watershed Plan identifies management recommendations necessary to demonstrate conformity with provincial policies related to watershed planning. By implementing the recommendations included in this watershed plan, municipalities will be able to demonstrate how the features and areas that comprise the natural heritage and water resource systems, as well as water quality and quantity, will be protected, enhanced and restored.

Ontario's *Clean Water Act, 2006* is designed to protect existing and future sources of drinking water. Under the *Clean Water Act, 2006*, source protection plans were developed by source protection committees representing municipal, Indigenous, public and business interests. The Credit Valley – Toronto and Region – Central Lake Ontario (CTC) Source Protection Plan applies in the Carruthers Creek watershed. The CTC Source Protection Plan is a strategy and suite of policies developed by residents, businesses and the municipalities, which outlines how water quality and quantity for municipal drinking water systems will be protected. The CTC Source Protection Plan includes its own set of policies and compliance mechanisms, in accordance with the *Clean Water Act, 2006*, that are not repeated in this watershed plan. The management recommendations identified in this watershed plan are broader than drinking water and complement the requirements of the applicable source protection plan.

Reducing Natural Cover Losses in the Carruthers Creek Watershed

There have been losses and impacts to natural cover in the watershed, including parts of the Greenbelt. These changes have continued since the enactment of the *Greenbelt Act, 2005*.

POLICY FRAMEWORK

As discussed in this section, the Greenbelt Plan is one part of Ontario's land use planning framework. One vital policy tool for maintaining natural cover in both the Growth Plan and the Greenbelt Plan is the NHS policies. Once a NHS is designated in a municipal Official Plan, any development or site alteration must meet certain policy requirements in the applicable provincial Plan.

Observed land use changes within the Carruthers Creek portion of the Greenbelt include fill sites, road widenings, land clearing on existing lots, farming and non-farm business operations and vehicle and other storage.

MOVING FORWARD

This watershed plan identifies recommendations to strengthen municipal policies to protect the NHS, in accordance with provincial policy, and identifies opportunities for restoration programs.

If community members are concerned about any development, large scale tree cutting or fill activities, please contact your local municipality, Region of Durham, or conservation authority for assistance.

Ontario's provincial planning policies recognize the importance of the Great Lakes[5]. Carruthers Creek flows into Lake Ontario. The series of Great Lakes agreements, legislation and policies set binational, national and provincial commitments to protect and restore the Great Lakes. This watershed plan is intended to improve the conditions within the Carruthers Creek watershed, thereby reducing negative impacts to Lake Ontario from this single watershed.

Role of Municipalities

Within the Greater Golden Horseshoe, most municipalities in Ontario are organized into two-tier systems. Upper-tier municipalities, such as the Region of Durham, are comprised of several lower-tier municipalities. The role of regional government is to address issues and concerns that apply to broader geographic areas, crossing the borders of lower-tier municipalities.

For land use planning, regional government's primary planning tool is a Regional Official Plan (ROP). The ROP implements the requirements of any relevant provincial legislation, provincial plans, and the PPS. Area municipalities develop their own, more detailed Official Plans (and may include more detailed secondary plans, Part II Plans, or tertiary plans as the case may be), as well as implementing zoning by-laws. While the ROP is required to implement provincial policy, area municipal planning tools are required to conform with both Regional and provincial policy.

Municipalities are granted decision-making powers through the *Municipal Act* and *Planning Act*. Watershed planning helps municipalities to make informed decisions on where and how to grow, while identifying opportunities to improve natural watershed conditions (e.g. restoration opportunities).

Role of TRCA

Conservation authorities were established and granted responsibilities under the *Conservation Authorities Act*. Conservation authorities play an important role in land use planning and environmental protection processes in partnership with municipalities, but are not the decision-makers in land use and infrastructure planning. Conservation authorities deliver programs and services related to natural hazard protection and management (i.e. flooding), conservation and management of conservation authority lands, drinking water source protection (as prescribed under the *Clean Water Act, 2006*), and conserving natural resources. Through its watershed expertise, TRCA, in partnership with the Region of Durham, Town of Ajax, and City of Pickering, has developed this watershed plan to help inform land use and infrastructure planning decisions.

[5]The PPS identifies the importance of considering the priorities identified in various agreements related to the protection or restoration of the Great Lakes – St. Lawrence River Basin. The Growth Plan and Greenbelt Plan require the consideration of the Great Lakes Strategy and the Great Lakes Protection Act, 2015, and any applicable Great Lakes agreements as part of watershed planning.

1.2 LOCAL CONTEXT AND CONSIDERATIONS

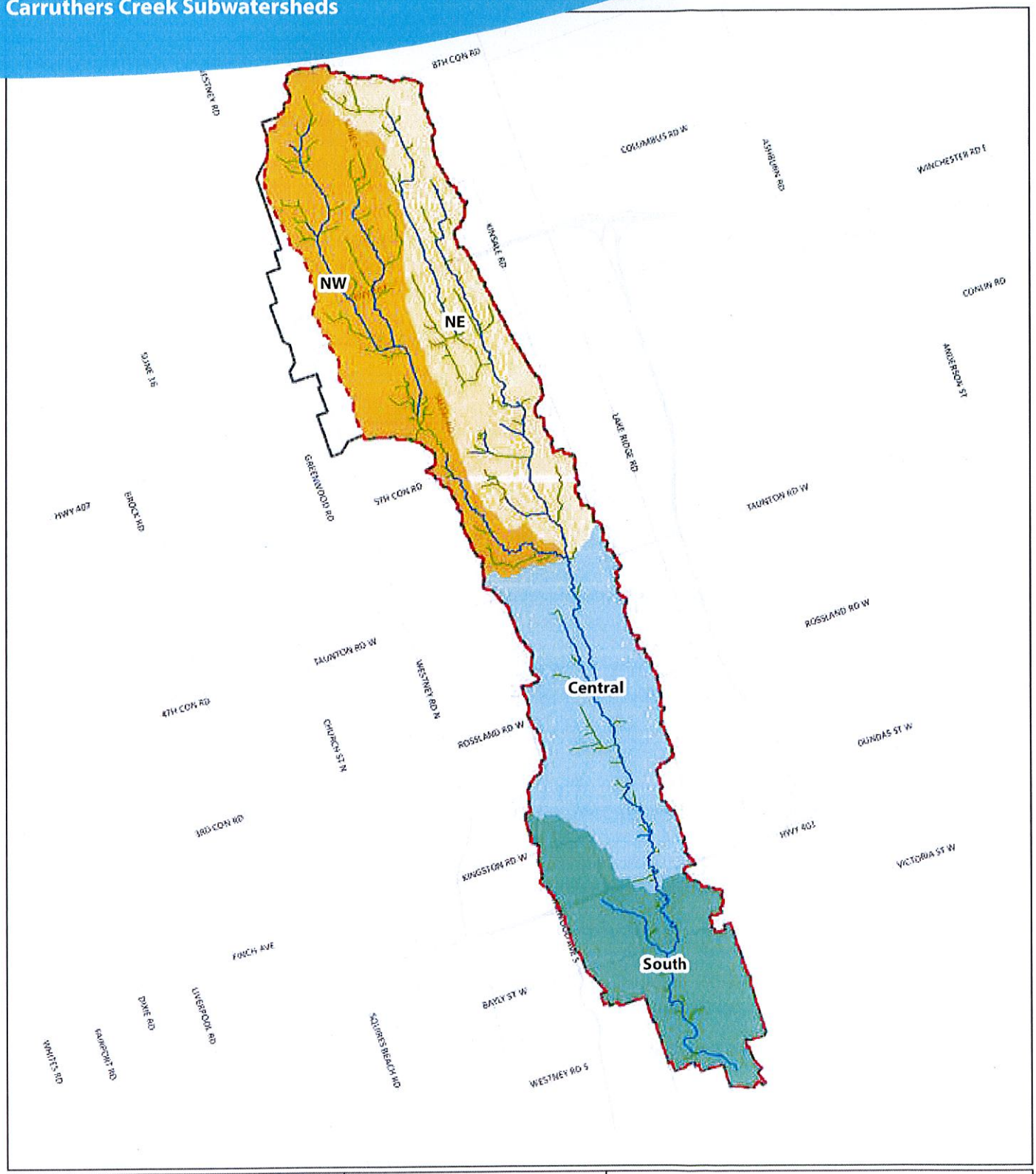
Carruthers Creek is a relatively small watershed with a drainage area of approximately 38 km^2, ranging from 2-3 km in width and 18 km in length, and occurs within the South Slope and glacial Lake Iroquois physiographic regions. It is the easternmost watershed in TRCA's jurisdiction and is bordered by the Duffins Creek watershed to the west and the Lynde Creek watershed in the east. The watershed has approximately 41,000 residents and is located entirely within the Region of Durham. Carruthers Creek's headwaters form to the south of the Oak Ridges Moraine, in the City of Pickering, and the creek enters Lake Ontario in the Town of Ajax. The watershed is mainly rural north of Highway 7 and urbanized south of Taunton Road to the lakeshore. From Highway 7 south to Taunton Road, most lands are in the protected countryside designation of the provincial Greenbelt Plan.

Carruthers Creek watershed consists of four subwatersheds, for the purposes of this watershed plan. Subwatersheds are defined as areas drained by a tributary, or portion of the stream, and are a more geographically specific scale than watersheds. Some of the technical analyses conducted as part of this watershed planning process used the four subwatersheds identified in **Figure 3** to evaluate the conditions of the watershed from a more refined geographic location.

The previous 2003 Duffins and Carruthers Creek Watershed Plan evaluated existing watershed conditions and identified recommendations to protect, restore, and enhance the natural systems and water quality of Carruthers Creek. The issues identified in the 2003 plan are still prevalent in the Carruthers Creek watershed, such as the need to protect and restore natural areas, improve stormwater management and address water quality concerns. Since 2003, the Carruthers Creek watershed has undergone significant changes associated with urbanization and the impacts of climate change (See **Section 3** for more information). Since many of the issues identified in the previous watershed plan are still occurring, an updated watershed plan using the latest advancements in watershed science, monitoring programs and computer modelling was necessary.

Periodic reviews of watershed plans are an integral component of the watershed planning process and allow for adaptive management to incorporate new scientific approaches and to address emerging initiatives. This watershed plan update is also more reflective of current provincial policies around watershed planning, which have evolved since the 2003 plan. At the request of the Region of Durham, a small section of lands in the East Duffins Creek subwatershed, which are immediately adjacent to Carruthers Creek watershed and outside of the provincial Greenbelt, were included in the study area to provide a more complete analysis of lands in the area. However, only watershed planning processes that occur at the regional, rather than the watershed scale, were assessed (i.e. NHS planning and groundwater modelling), as these processes extend beyond the watershed boundary.

FIGURE 3:
Carruthers Creek Subwatersheds



Toronto and Region Conservation Authority

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Date: Janurary 2019
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Carruthers Creek Watershed Plan: Subwatersheds

0 0.5 1 2 3 KM

Subwatershed Boundary
- Central
- NE
- NW
- South
- Intermittent Streams
- Permanent Streams
- Carruthers Watershed Boundary
- Carruthers Watershed Plan Study Area

The development of this Carruthers Creek Watershed Plan was a multi-year process completed in the following sequence:

- Field work on existing watershed conditions (2015-2016)
- Watershed characterization technical reports completed (2017) – See **Section 3** for the results of watershed characterization.
- Potential future scenarios modelling and analysis undertaken (2018)
- Scenario analysis technical reports completed (2019) – See **Section 4** for information on the potential future scenarios and results
- Water Resource and Natural Heritage Systems identified (2019) – See **Section 2** for more information on these systems
- Management framework for Carruthers Creek developed (2019) – See **Section 5** for the Carruthers Creek management framework

1.3 PARTNERS AND STAKEHOLDERS

In 2015, the Region of Durham engaged TRCA to develop a watershed plan for Carruthers Creek. The key partners involved in the process to develop this watershed plan are TRCA, the Region of Durham, the Town of Ajax and the City of Pickering.

Throughout the multi-year process discussed in **Subsection 1.2**, TRCA engaged the Mississaugas of Scugog Island, stakeholders and the public to raise awareness of the watershed planning process and solicit feedback on components of this watershed plan. Stakeholders engaged include watershed residents, landowners, farmers, developers, golf course operators and environmental non-governmental organizations.

Stakeholders were engaged at various points during this watershed planning process, as follows:

LATE 2015 – LATE 2017

Promoted and raised awareness of the watershed planning process for Carruthers Creek through reports and presentations to Councils and Committees of the Region of Durham, Town of Ajax, and City of Pickering.

LATE 2017 – EARLY 2019

Continued to raise awareness of the watershed planning process for Carruthers Creek and gathered feedback from the public on a vision for the watershed plan. This was completed by launching an interactive website and hosting information booths at various events across the watershed.

MID 2019 – LATE 2019

Gathered feedback on the draft management framework for the Carruthers Creek Watershed Plan from partners and stakeholders. Two public open houses were held in October 2019.

Feedback received from partners and stakeholders was invaluable in the development of this watershed plan. The Carruthers Creek Watershed Plan reflects the diversity of issues and concerns raised throughout the planning process and represents a realistic and manageable plan to improve the overall health of the Carruthers Creek watershed.

All the partners and stakeholders engaged as part of this process play a key role in the effective implementation of the management recommendations identified in **Section 5**.

2. Water Resource and Natural Heritage Systems

The aquatic and terrestrial features and areas that maintain the ecological integrity of a watershed consist of two integrated systems, the WRS and NHS. Together, these two systems provide essential ecosystem services, including water storage and filtration, cleaner air, support to biodiversity and habitats, carbon storage, as well as resiliency to climate change. Maintaining extensive, connected and high-quality ecological and hydrological features and areas of both systems is essential for the long-term health and sustainability of Carruthers Creek, as shown in **Figure 1**.

As mentioned in **Subsection 1.1**, identifying and protecting both systems is a key policy requirement in the Growth Plan and Greenbelt Plan.

The features and areas that comprise both systems are explained in **Table 1** below.

TABLE 1:
Description of the Water Resource System and Natural Heritage System

Water Resource System	Natural Heritage System
A system consisting of groundwater features and areas and surface water features (including shoreline areas), and hydrologic functions, which provide the water resources necessary to sustain healthy aquatic and terrestrial ecosystems and human water consumption.	A system made up of natural heritage features and areas, and linkages identified to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems.
The WRS consists of: **Key Hydrologic Areas** • Significant Groundwater Recharge Areas (including Ecologically Significant Groundwater Recharge Areas) • Highly Vulnerable Aquifers • Significant Surface Water Contribution Areas **Key Hydrologic Features** • Permanent Streams • Intermittent Streams • Inland Lakes and their Littoral Zones • Seepage Areas and Springs • Wetlands*	The NHS consists of*: • Significant Wetlands* • Significant Coastal Wetlands • Other Coastal Wetlands in Ecoregions 5E, 6E and 7E • Fish habitat* • Significant Woodlands • Significant Valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River) • Habitat of Endangered Species and Threatened Species • Significant Wildlife Habitat • Significant Areas of Natural and Scientific Interest (ANSIs) • Sand barrens, savannahs, tallgrass prairies and alvars • Federal or provincial parks, and conservation reserves

***Notes:**

Wetlands are important features in both systems. For the purposes of mapping in **Section 7**, wetlands are shown separately in Map 1A for the WRS and included as natural cover in Map 2 for the NHS. Fish habitat in the NHS overlaps with features and areas in the WRS.

The majority of these terms are defined in the Growth Plan, 2019. Some, but not all definitions, have been included in the Glossary (**Section 8**) of this watershed plan.

Not all of the NHS features or areas identified in this table are part of the proposed enhanced NHS for Carruthers Creek, since some of these features do not exist in this watershed (e.g. sand barrens, savannahs, etc.), or are not distinguished specifically from natural cover areas (e.g. significant woodlands and significant wildlife habitat).

Due to the importance of both systems, the protection, enhancement and restoration of the WRS and NHS are goals of this watershed plan (**Section 5**).

See **Section 7** for maps of the WRS and the recommended NHS.

How the WRS was delineated?

The key hydrologic areas and key hydrologic features that comprise the WRS were delineated using various techniques and methodologies.

Highly Vulnerable Aquifers and Significant Groundwater Recharge Areas were determined through Technical Rules established under the *Clean Water Act, 2006* for the purposes of regional source water protection planning. Ecologically Significant Groundwater Recharge Areas (ESGRAs) were determined using a model developed by the Oak Ridges Moraine Groundwater Program to optimize the protection of groundwater dependent ecosystems. The model results for ESGRAs were assessed to minimize the land area covered by these key hydrologic areas while maintaining a high degree of hydrological function protection for these ecosystems. Significant Surface Water Contribution Areas include many of the intermittent streams in the headwaters (northern portion) of Carruthers Creek.

Each of the five key hydrologic features were delineated using a combination of satellite imagery, ArcHydro GIS and field site verification.

The WRS provides habitat for aquatic life (e.g. fish). The conditions of aquatic habitat in Carruthers Creek were assessed as part of this watershed planning process.

How the NHS was delineated?

The components of the NHS were delineated using a robust methodology that incorporated ecological models (e.g. Landscape Analysis Model), information from satellite imagery, monitoring data, field site verification and expert based knowledge.

The components of the NHS were identified for their ecological value as existing and potential natural cover (i.e. areas targeted for restoration and enhancement), to:

- Increase natural cover (e.g. forests, wetlands, meadows, etc.) quantity and quality by improving habitat size, shape, and connectivity in and around existing natural areas, as well as in areas for potential restoration;
- Protect and restore species and vegetation communities by incorporating diverse habitat types, mitigating the impacts of urban development, and improving the ecological connectivity across the watershed; and
- Incorporate natural system vulnerabilities to climate change in planning processes to build a more resilient NHS.

Protecting the WRS and NHS

As mentioned in **Subsection 1.2**, provincial policies recognize the importance of protecting the WRS and NHS. Municipalities are required to demonstrate how these systems will be protected. Through its technical and scientific expertise, TRCA delineated both systems as part of this watershed planning process.

For the recommended NHS, the areas identified as potential natural cover (enhancement areas) should be restored to maintain the long-term resiliency and sustainability of terrestrial ecosystems, in addition to protecting the existing natural cover. TRCA's *Terrestrial Natural Heritage System Strategy* has a minimum target of 30% natural cover across the entire jurisdiction, while recognizing there will be variability among TRCA's nine watersheds due to existing land uses. The Carruthers Creek watershed is currently below that target (see **Subsection 3.3** for more information).

The management framework (**Section 5**) of this watershed plan, recognizes that land use and/or infrastructure decisions may impact, or occur, within the WRS or NHS, and establishes recommendations to avoid these features and areas, mitigate impacts, or when impacts are unavoidable, provide for ecosystem compensation. Municipalities are responsible for designating a NHS that is consistent with provincial policies and informed by the goals and objectives of this watershed plan.

3. Existing Watershed Conditions

Watershed characterization is a vital part of watershed planning, which helps to determine the current conditions of the watershed. As part of this watershed plan, TRCA produced technical reports on different components of the watershed, which are summarized in this section.

3.1 CONTEXT AND BACKGROUND

Since the previous watershed plan is from 2003, the existing conditions of the watershed were evaluated using more recent data and science. TRCA produced eight peer-reviewed technical reports as part of watershed characterization. These technical reports helped determine the current state of the watershed, as discussed in **Subsection 3.3**.

Watershed characterization includes the following topics (see full technical reports listed in **Section 9**):

Aquatic Crossing and Barrier Assessment

Involved the assessment of existing structures in Carruthers Creek that represent barriers to fish passage, such as perched culverts and online ponds.

Aquatic Habitat and Community Characterization

Involved the assessment of aquatic habitat conditions, stream temperature, fish community richness and composition, and benthic invertebrate richness and composition.

Fluvial Geomorphology

Involved the assessment of the creek's flow and sediment movement processes, drainage patterns, and potential erosion risks.

Headwater Drainage Features

Involved the assessment of small streams in the upper portions of the watershed that may not flow year-round (i.e. intermittent and ephemeral). These features provide hydrologic and ecological functions to maintain downstream watershed conditions.

Hydrogeology

Involved the assessment of groundwater conditions within the watershed, such as groundwater recharge and discharge, and groundwater flow and quality.

Surface Water Quality Characterization

Involved the assessment of current and past water quality conditions to determine trends and factors influencing water quality.

Terrestrial Natural Heritage

Involved the assessment of natural cover, terrestrial habitat and species across the watershed.

Water Quantity Characterization

Involved the assessment of the volume, velocity, spatial distribution and timing of water moving through the stream network (i.e. streamflow).

3.2 HISTORICAL AND CURRENT LAND USES

Ongoing urbanization in the Greater Toronto Area continues to convert natural and agricultural lands to other uses. This is true in the Carruthers Creek watershed as well. In 1999, the watershed consisted of 28% natural cover, 53% agricultural lands, and 12% urban area[6]. As of 2015, natural cover had dropped to 25% and agricultural lands to 34%. Urban land use increased to approximately 37% during that time period. See **Figure 2** for a map of 2015 land use conditions. This historical context is important for characterizing the current conditions of the watershed as it helps to understand the rate of change within the watershed and provides a useful benchmark for comparison.

3.3 CURRENT STATE OF THE WATERSHED

Based on the technical assessments conducted as part of watershed characterization (discussed in **Subsection 3.1**), there are four key issues in Carruthers Creek:

1 WATER RESOURCE SYSTEM: the aquatic ecosystem is sensitive and near the level of land use development it can sustain long-term (without additional and improved mitigation).

The current state of the WRS includes assessments of headwater drainage features, fish communities, instream barriers to fish movement and groundwater.

The analysis of the small stream features north of Highway 7 (i.e. headwater drainage features), showed that 67% of the features have been altered (i.e. reducing hydrologic connectivity and increasing surface runoff) in some way by human activities, primarily through tile drainage.

Tile Drainage

Tile drainage is a common and important land management practice in many agricultural parts of Ontario. Tile drains are corrugated plastic tubing, clay or concrete drains installed beneath the surface of fields to drain excess water from the crop root zone.

Working with the agricultural community is important to identify opportunities to mitigate the potential impacts of tile drainage.

Consult the Ontario Ministry of Agriculture, Food and Rural Affairs, or the Ontario Soil and Crop Improvement Association for more information.

[6]Additional land use categories such as water, recreational, golf courses, cemeteries and hydro corridors make up the remaining percentages not included in the categories of natural, agricultural and urban land uses.

Currently, the fish communities within the watershed are dominated by cool water native species. Redside Dace, an endangered species, is currently found within the watershed.

Urbanization results in impervious land cover (i.e. pavement, or areas where water cannot penetrate the ground). Imperviousness can increase the severity and duration of peak flows during storm events, cause erosion and sedimentation, and increase stream temperatures, which impacts aquatic habitat for all species. Some areas of the watershed are impacted by poor water quality, which negatively impacts the aquatic ecosystem (see key issue number three, water quality for more information).

Existing instream barriers to fish movement associated with development and infrastructure adversely impacts the aquatic system in Carruthers Creek by limiting access to feeding and spawning areas, increasing water temperature, and affecting sediment transport. Instream structures that act as barriers to fish passage include dams, weirs, road and rail crossings, and some culverts.

From a groundwater perspective, there are three aquifer systems present in the watershed. These aquifer systems include one shallow system (Oak Ridges Moraine/ Mackinaw Interstadial aquifer complex) and two deep systems (Thorncliffe and Scarborough aquifer complexes). Long-term groundwater quality information for specific sites within the Carruthers Creek watershed are unavailable, but there have been a number of studies conducted in adjacent watersheds to provide an indication of background groundwater quality. The available information from Duffins Creek and Rouge River indicate elevated levels of nitrates and chlorides in groundwater attributed to road salts and fertilizer use. Maintaining the flow between groundwater and surface water (i.e. recharge and discharge) is essential for a healthy watershed.

2 NATURAL HERITAGE SYSTEM: there is not enough natural cover, or good quality habitat, needed to maintain ecosystem resilience (i.e. capacity to respond to change) due to changing land use patterns and climate change.

As of 2015, approximately 25% of the watershed consisted of natural cover. Approximately 9% of that natural cover is forest, 7% wetland, 4% successional (transitioning to forest), and 3% meadow [7]. Current habitat conditions are overall poor in terms of patch size, shape and influences from surrounding land uses.

In addition to this assessment of natural cover within the watershed, TRCA also conducted terrestrial inventories of plants and animals. These inventories found 845 vascular plant species, of which only 57% are native species. These results indicate a significant presence of invasive species, such as dog-strangling vine, garlic mustard, and common buckthorn. The inventory also identified 153 flora species of regional conservation concern including four species that have not been found anywhere else in TRCA's jurisdiction. Inventories documented a total of 133 breeding vertebrate fauna species over the past decade comprised of 106 breeding birds, 18 mammals, and 9 herpetofauna (i.e. reptiles and amphibians).

The urban forest within the Carruthers Creek watershed contains 94 types of woody plant species, with over 270 varieties. Maples make up the most common type of tree within the watershed. In 2017, approximately 23% of the watershed consisted of tree and shrub canopy.

[7] The remaining natural cover percentages are around, or less than, one percent, consisting of water, hydro corridors, and beach/bluff.

FIGURE 4
Comparing Urban Forest and Natural Cover

Difference between urban forest and natural cover

The term **urban forest** is used to describe the trees and woody shrubs located on all private and public property within a watershed, including urbanized spaces (e.g. along roads) and in forests. The percentage of urban forest within a watershed is determined by the area covered by the canopies of all trees and shrubs.

Natural cover, expressed in hectares, or as a percentage of the overall watershed area, is the area of the watershed covered by natural habitats including forests, meadows, and wetlands.

Natural cover includes habitats with varying degrees of trees and shrubs. Meadows for example are open habitats that do not contain trees. Although meadows, and other non-treed habitats, are natural cover, they are not part of the urban forest. Similarly, the urban forest includes trees located within built portions of the watershed, outside of natural habitats. For these reasons, the amount of natural cover and the amount of urban forest in a watershed will not be equal as is the case of the Carruthers Creek Watershed.

See **Figure 4** for a visual representation of this explanation.

3 WATER QUALITY: is impaired within the watershed, requiring improvements to stormwater management.

The headwaters of Carruthers Creek contain elevated concentrations of total phosphorus, phosphate, total ammonia, E. coli, total suspended solids (TSS), turbidity, and some trace metals. These elevated concentrations in the headwaters were likely influenced by agricultural practices and the construction of Highway 407. Just upstream of urban development, concentrations were reduced for most parameters except chloride. Chloride levels regularly exceeded the threshold for the protection of aquatic life in the reaches of Carruthers Creek with urban influences. Additionally, increased concentrations of total ammonia, nitrite, phosphate, turbidity, and trace metals are often observed downstream of the urban area. As expected, the concentrations of many water quality parameters were elevated during high flow conditions that occur during storm runoff and wet weather.

Prior to the 1980s, stormwater management focused solely on flood control (stormwater quantity). Modern stormwater management provides a higher level of protection for the environment, property, and residents by incorporating mitigation provisions for water quality, erosion, and water balance in addition to water quantity control. The Carruthers Creek watershed has various levels of stormwater control that are indicative of the age of development and the prevailing stormwater management practices at the time.

4 NATURAL HAZARDS: the flow of water through the watershed is out of balance and there are flooding and erosion issues.

Urbanization converts formerly pervious surfaces (e.g. forests, meadows, agricultural lands) to impervious surfaces (e.g. roads, parking lots, rooftops). From 1999 to present day, the increase in urban cover has greatly altered the natural water balance. In addition, existing agricultural lands located in the headwaters of the watershed are extensively tile drained. Several sites with erosion issues were identified as part of the fluvial geomorphic assessment.

During storm events, the increase in surface runoff associated with impervious surfaces can result in excessive riverine flooding and stream erosion. Currently, a Flood Vulnerable Cluster (FVC) exists in the lower part of the Carruthers Creek watershed in the Town of Ajax (see **Figure 2** or **5** for the location of this FVC). There have been both historical and recent flooding events in the Carruthers Creek watershed due to extreme precipitation events.

These four key issues provide the basis for the management framework of this watershed plan, discussed in **Section 5**.

Table 2 summarizes benchmarks for the four key watershed issues previously discussed. The benchmarks are important reference points for understanding how watershed conditions can change over time to evaluate success of this watershed plan. **Table 2** also identifies targets (or rating scales) to show the ideal state of that particular watershed component. The targets are informed by relevant TRCA strategies, provincial or federal guidance, and established conservation science. The scenario analysis, described in **Subsection 4.3**, summarizes how the watershed will respond to potential future scenarios in comparison to the benchmarks. **Section 6** uses indicators to evaluate the success of implementation through a watershed monitoring program. The indicators identified in **Section 6** will track watershed conditions relative to the benchmarks discussed in **Table 2**. Where a monitoring station is referenced in **Table 2**, see **Figure 7** for the location of that monitoring station within the watershed.

TABLE 2:
Current Watershed Conditions Benchmarks

<table>
<tr><th>Key Watershed Issues</th><th>Sub-Issue</th><th>Benchmarks</th><th>Targets (if applicable)</th></tr>
<tr><td rowspan="5">WATER RESOURCE SYSTEM</td><td>Aquatic Health</td><td>Family Biotic Index (FBI)[8] – rating of fairly poor and poor across Carruthers Creek:
• Poor = 6.59 (Average from 2013 – 2017 at monitoring station Aquatic 1)
• Fairly poor = 6.19 (Average from 2013 - 2017 at monitoring station Aquatic 2)
• Fairly poor = 6.07 (Average from 2013 - 2017 at monitoring station Aquatic 3)

Index of Biotic Integrity (IBI)[9]:
• Rating of poor at three sites (2015)
• Rating of fair at two sites (2015)
• Rating of good at six sites (2015)</td><td>Rating scale for FBI:
<table><tr><th>Value</th><th>Rating</th></tr><tr><td>0 – 3.75</td><td>Excellent</td></tr><tr><td>3.76 – 4.25</td><td>Very good</td></tr><tr><td>4.26 – 5.00</td><td>Good</td></tr><tr><td>5.01 – 5.75</td><td>Fair</td></tr><tr><td>5.76 – 6.50</td><td>Fairly poor</td></tr><tr><td>6.51 – 7.25</td><td>Poor</td></tr><tr><td>7.26 – 10</td><td>Very poor</td></tr></table>
Rating scale for IBI:
<table><tr><th>Value</th><th>Rating</th></tr><tr><td>0 – 3.75</td><td>Excellent</td></tr><tr><td>3.76 – 4.25</td><td>Very good</td></tr><tr><td>4.26 – 5.00</td><td>Good</td></tr><tr><td>5.01 – 5.75</td><td>Fair</td></tr></table></td></tr>
<tr><td>Riparian corridor (30 m buffer around streams)</td><td>Within the riparian corridor natural cover is 49%.</td><td>75% of stream length is naturally vegetated</td></tr>
<tr><td>Streamflow (surface water)</td><td>Carruthers Creek at Achilles Road had an average total volume of 1.14 x 10^7 m^3 over the 2008 – 2016 period. This corresponds to a discharge rate of 0.360 m^3/s when averaged on an annual basis.</td><td>Not applicable (should not vary significantly from natural fluctuations year to year)</td></tr>
<tr><td>Groundwater Recharge</td><td>Average recharge rate is estimated at 118 mm/year</td><td>Not applicable (should not decrease significantly from natural rates)</td></tr>
<tr><td>Groundwater Discharge</td><td>Average discharge rate is estimated at 130 mm/year</td><td>Not applicable (should not decrease significantly from natural rates)</td></tr>
</table>

[8]The Family Biotic Index is often used to assess the quality of water in rivers and is a scale for showing the quality of an environment by indicating the types of organisms present in it.

[9]The Index of Biotic Integrity measures a chosen set of metrics (in this case number of fish species, presence of sensitive fish species, abundance and food chain classifications) to assign a rating of very poor to excellent.

<table>
<tr><th>Key Watershed Issues</th><th>Sub-Issue</th><th>Benchmarks</th><th>Targets (if applicable)</th></tr>
<tr><td rowspan="5">NATURAL HERITAGE SYSTEM</td><td>Natural cover</td><td>Approximately 25% total natural cover, consisting of 9% forest, 7% wetland, 4% successional (transitioning to forest) and 3% meadow.</td><td>Minimum 30% natural cover.

TRCA recommended NHS for Carruthers Creek: 36% natural cover; 16% forest, 7% wetland, 13% other (primarily successional forest and meadow)</td></tr>
<tr><td>Habitat quality</td><td>Evaluated using Landscape Analysis Model (LAM), which assigns a score based on total number of habitat patches, patch size, patch shape, and influences from surrounding land uses. Overall patch quality in the Carruthers Creek watershed was found to be 'poor'.</td><td>Rating scale:<table><tr><th>Patch Score</th><th>Quality Condition</th></tr><tr><td>13 - 15</td><td>Excellent</td></tr><tr><td>11 - 12</td><td>Good</td></tr><tr><td>9 - 10</td><td>Fair</td></tr><tr><td>6 - 8</td><td>Poor</td></tr><tr><td>0 - 5</td><td>Very poor</td></tr></table></td></tr>
<tr><td>Animal (i.e. fauna) species of concern</td><td>North of Taunton Road = 39

South of Taunton Road = 56</td><td>Not applicable (ideally maintained or improved)</td></tr>
<tr><td>Number and area of sensitive vegetation communities</td><td>Entire watershed number = 43

Area = approximately 54 hectares</td><td>Not applicable (ideally maintained or improved)</td></tr>
<tr><td>Tree and Shrub Canopy (urban forest)</td><td>Approximately 23% tree and shrub canopy for the entire watershed (2017).</td><td>Not applicable (targets to be established through management recommendation 3.3.2)</td></tr>
<tr><td rowspan="2">WATER QUALITY (SURFACE)

Water quality benchmarks are based on average concentration of 17 water quality samples collected monthly from June 2015 to May 2016.</td><td>Chlorides</td><td>• 183 mg/L at monitoring station Water Quality 1
• 72 mg/L at monitoring station Water Quality 2
• 35 mg/L at a no longer active monitoring station that was located west of Salem Road at Hwy 7</td><td>The long-term water quality guideline for the protection of aquatic life (CCME) for chlorides is 120 mg/L.</td></tr>
<tr><td>Total suspended solids</td><td>• 20 mg/L at monitoring station Water Quality 1
• 11 mg/L at monitoring station Water Quality 2
• 59 mg/L at a no longer active monitoring station that was located west of Salem Road at Hwy 7</td><td>CCME water quality guideline for TSS is based on increases over background levels. Monitoring results show large fluctuations in TSS in Carruthers Creek.</td></tr>
</table>

Key Watershed Issues	Sub-Issue	Benchmarks	Targets (if applicable)
WATER QUALITY (SURFACE) cont'd	*E. coli*	• 706 CFU/100 ml at monitoring station Water Quality 1 • 517 CFU/100 ml at monitoring station Water Quality 2 • 475 CFU/100 ml at a no longer active monitoring station that was located west of Salem Road at Hwy 7	CFU – Colony Forming Units. Provincial Water Quality Objective (PWQO) for E. coli is 100 CFU/100 ml. Averages for Carruthers Creek exceed this guideline.
	Total phosphorus	• 0.044 mg/L at monitoring station Water Quality 1 • 0.031 mg/L at monitoring station Water Quality 2 • 0.091 mg/L at a no longer active monitoring station that was located west of Salem Road at Hwy 7	PWQO to avoid excessive plant growth in river and stream concentrations below 0.03 mg/L. Averages for Carruthers Creek exceed this guideline.
	Stormwater management[10]	As of 2003, approximately 64% of the developed portion of the watershed has stormwater controls that meet TRCA criteria. Of the remaining percentages, 29% have no stormwater controls and 7% have water quantity control only.	Established by municipalities, in collaboration with TRCA, through stormwater master planning and secondary planning
NATURAL HAZARDS	Peak flows (flooding)	Regional Storm (i.e. Hurricane Hazel) • 71.61 m^3/s at Taunton Road • 140.52 m^3/s at Shoal Point Road 5-year Storm (i.e. 1 in 5 probability of flow being exceeded in any one year) • 7.27 m^3/s at Taunton Road • 11.00 m^3/s at Shoal Point Road	Not applicable (peak flows should not increase)
	Flood vulnerable roads and structures	Metres of impassable road length affected: • Average annual = 91 m • Regulatory flood event = 2,532 m Number of households affected: • Average annual = 1 • Regulatory flood event = 89	Not applicable (ideally a reduction in vulnerable roads and structures)

Notes: See **Section 6** for map and description of monitoring station locations referenced in this table. Other surface water quality parameters were characterized as part of TRCA's technical analysis, but only parameters of concern are included in this table.

[10]For the purposes of determining the current state of the watershed, stormwater management has been grouped with water quality. However, inadequate stormwater management can also increase the frequency and duration of flooding (i.e. natural hazards) and impact aquatic habitat (i.e. WRS).

4. Future Watershed Conditions

An important part of watershed planning is assessing future conditions based on potential future land use scenarios. The results of watershed characterization discussed in **Section 3** were used to inform the potential future land use scenarios discussed in this section. TRCA produced peer-reviewed technical reports on different components of the watershed as part of scenario analysis, which are referenced in **Section 9**.

4.1 FUTURE STRESSORS

To determine what land use scenarios to assess requires identifying potential future stressors on a watershed. For Carruthers Creek, urbanization continues to drive land use change, converting natural and agricultural areas to residential, commercial and industrial lands. This urbanization impacts the health of a watershed largely through the loss of natural cover and increase in impermeable surfaces, which alter the hydrologic regime. Despite some positive watershed management efforts to date in Carruthers Creek, the watershed exhibits signs of stress due to the impacts of urbanization and climate change. By 2041, the population of the Region of Durham is expected to nearly double from 682,000 to 1.2 million. Some of that growth will certainly be in the Carruthers Creek watershed.

Climate change is expected to increase precipitation, annual average temperatures and the frequency of extreme weather events, which will impact watersheds within the Region of Durham. Some of the implications of a changing climate include localized flooding, violent storm damage, changes to ecosystem composition, and changes to agricultural conditions and production.

These stressors were evaluated as part of assessing future watershed conditions. The management framework in **Section 5** of this watershed plan recognizes these stressors by identifying recommendations to mitigate potential future watershed impacts.

4.2 FUTURE SCENARIOS

An effective way to assess how a watershed will respond to potential future change is to develop, analyze, and compare several alternate scenarios, each reflecting a different composition of possible land use conditions. In this way, land use scenario analysis is used as a tool to compare how possible future land uses might add to existing pressures on the natural system, and how these pressures might affect watershed health. Land use scenario analysis is a technical exercise that is typically undertaken when developing watershed plans to ensure management recommendations are based on the best available science. The results help guide the development of management recommendations and support municipalities in land use and infrastructure planning decision-making.

Climate Change

Climate change was incorporated into the scenario analysis for various technical components of this watershed planning process, where possible. For example, the terrestrial impact assessment completed as part of the NHS planning specifically incorporated climate change vulnerabilities as one of its criteria for determining priority NHS sites. The impacts of future climate change were factored into potential stresses on the aquatic system as part of that technical assessment. Additionally, hydrologic modelling completed as part of this watershed planning process incorporates storm events considered to be more frequent under climate change scenarios.

The management framework recognizes the importance of climate change by prioritizing the protection of the WRS and NHS, which can, if properly protected and restored, improve climate adaptation and increase ecosystem resilience. The use of green infrastructure and low impact development combined with improvements to stormwater infrastructure are also important management recommendations to adapt to a changing climate.

TRCA, the Region of Durham, Town of Ajax and City of Pickering all recognize the challenge of climate change and have various strategies and action plans to address this challenge, in addition to the recommendations identified in this watershed plan (e.g. *Durham Community Climate Adaptation Plan* and *Durham Community Climate Change Local Action Plan*).

Note:
Additional climate modelling is being completed for the Region of Durham, in collaboration with conservation authorities, that can be used to inform future watershed or subwatershed studies.

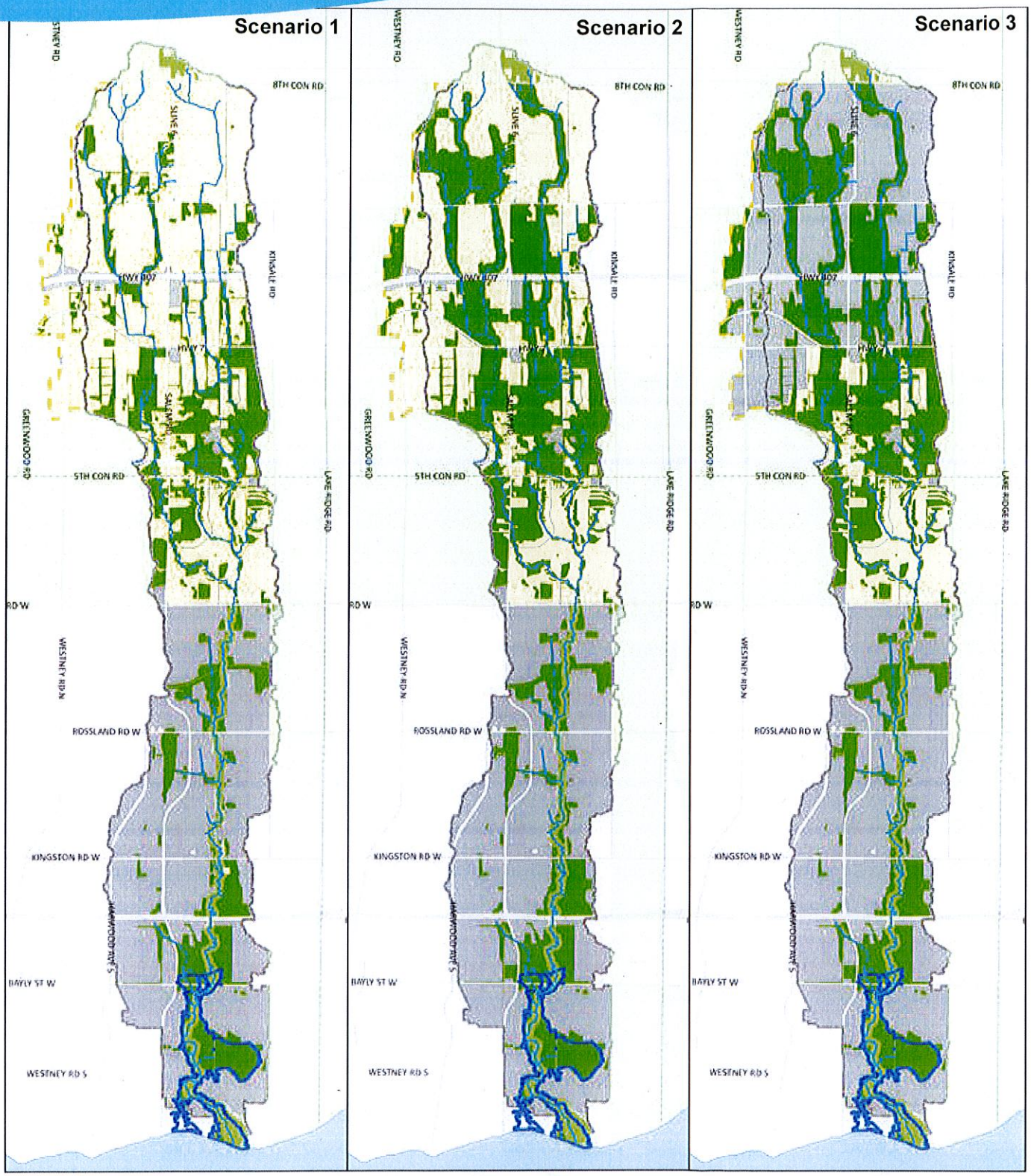
Three potential future land use scenarios were developed and analyzed as part of this watershed planning process to assess possible changes and impacts in both the built and natural environments. The year 2015 was used as the baseline for this watershed planning process due to the availability of data sets at the initiation of this project. It is worth noting that since 2015 was used as the baseline for scenario analysis, potential impacts from the extension of Highway 407 (completed in 2016) through the headwaters of Carruthers Creek can only be assumed. Ongoing monitoring of the Carruthers Creek watershed will help determine any potential changes to overall watershed health arising from the construction of this highway infrastructure.

TABLE 3:
Potential Future Land Use Scenarios

Scenario 1 (+Official Plan)	This scenario assumes that all lands south of the Greenbelt are developed up to 2031 based on approved Official Plans. This scenario included municipally designated NHS's that were part of Official Plans. This scenario provides insight into how watershed conditions will likely change as approved Official Plans are implemented.
Scenario 2 (+NHS)	This scenario assumes the same development as Scenario 1 but includes the enhanced NHS (i.e. potential natural cover). New and updated information from natural heritage science and practice was incorporated to identify potential areas for natural cover that would improve ecosystem functions and services in the future. This scenario provides insights into how watershed conditions will likely change with increased consideration of additional natural cover.
Scenario 3 (+Potential Urban)	This scenario assumes post-2031 development in the headwaters of Carruthers Creek (north of the Greenbelt), outside the enhanced NHS. This scenario provides insights into how watershed conditions will likely change if potential full growth is approved in the watershed.

See **Figure 5** for representative maps of each scenario.

FIGURE 5:
Future Scenarios Mapping



Toronto and Region Conservation Authority

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Date: September 2019
Created by: TRCA Information Services/Information Technologies
Disclaimer:
The Data used to create this map was compiled from a variety sources and dates. The TRCA takes no responsibility for errors or omissions in the data and retains the right to make changes and corrections at anytime without notice. For further information about the data on this map, please contact the TRCA GIS Department (416) 661-6600

Carruthers Creek Watershed Plan: Future Scenarios 1-3

0 0.5 1 2 3 KM

Municipal Boundary
Watercourse

Land Use
Natural
Rural
Urban

Flood Vulnerable Cluster
Greenbelt Boundary
Carruthers Creek Watershed Boundary
Carruthers Creek Watershed Plan Study Area

4.3 SCENARIO ANALYSIS

As part of this watershed planning process, key components of watershed health were assessed using the previously discussed three future scenarios.

The results of these scenario analyses were used to:

1. Understand the implications of each scenario on overall watershed health and integrity

2. Develop the management framework for this Carruthers Creek Watershed Plan, which can be used to inform land use and infrastructure decisions

It is important to note that scenario analysis does not result in decisions about the type and configuration of land uses. Instead, scenario analysis helps to inform decisions through the municipal planning process (e.g. Official Plans).

It is the responsibility of the applicable municipality to determine the ultimate land use configuration for any future changes within the watershed.

Table 4 explains the implications of the three potential future scenarios for each of the key watershed issues as identified in **Subsection 3.3**. Based on the technical assessments completed as part of this watershed planning process, **Table 4** identifies whether the watershed responds positively (conditions improve), neutrally (conditions remain the same), or negatively (conditions deteriorate) to the potential future scenario in comparison to the identified benchmark.

The colour coding in **Table 4** indicates the severity of how the watershed component reacts:

GREEN UP ARROW: **>+5% change**
indicates watershed conditions improve from a hydrologic or ecological perspective

EQUAL SIGN: **0 to +5% or 0 to -5% change**
indicates a roughly equal comparison from a hydrologic or ecological perspective

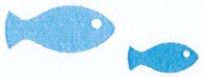
YELLOW DOWN ARROW: **-6% to -10% change**
indicates watershed conditions deteriorate from a hydrologic or ecological perspective

PURPLE DOWN ARROW: **>-10% change**
indicates watershed conditions significantly deteriorate from a hydrologic or ecological perspective

The changes identified in **Table 4** are calculated by comparing scenario 1 to the current conditions, whereas scenarios 2 and 3 are compared to scenario 1. Since scenario 1 represents the currently approved Official Plan, it represents a future scenario that will occur, therefore it is more realistic to compare scenarios 2 and 3 to scenario 1. Some of the scenario analysis technical reports referenced in **Section 9** compare the three future scenarios to current conditions. The numbers identified in **Table 4** have been adapted accordingly to compare scenarios 2 and 3 to scenario 1.

TABLE 4:
Scenario Analysis Implications

WATER RESOURCE SYSTEM[11]



Includes: the features and areas of the WRS, including aquatic habitat, and their functions. Percent change is based on changes to impervious cover mentioned under aquatic health. Impervious cover is a critical measure of various factors[12] that impact aquatic health.

See **Figure 9** in **Section 7** for an illustration of subwatershed quality.

CURRENT CONDITIONS (From subsection 3.3[13])	SCENARIO 1 (+OP) (Compared to Current Conditions)	SCENARIO 2 (+NHS) (Compared to Scenario 1)	SCENARIO 3 (+POTENTIAL URBAN) (Compared to Scenario 1)
% change →	↓ -6%	= +1%	↓ -12%
Aquatic Health			
Subwatershed quality: NW and NE good – fair; central and south fair – poor Impervious cover at 24% across the watershed	**Subwatershed quality:** no change from current conditions Impervious cover at 30% across the watershed	**Subwatershed quality:** NW shows improvement to good Impervious cover at 29% across the watershed	**Subwatershed quality:** all four have fair – poor conditions Impervious cover at 42% across the watershed
Riparian corridor (30 m buffer along streams)			
49% natural cover along the corridor	50% natural cover along the corridor	65% natural cover along the corridor	65% natural cover along the corridor
Streamflow (average surface water discharge)			
0.52 m^3/s	0.53 m^3/s	0.53 m^3/s	0.56 m^3/s
Groundwater discharge (average rate)			
201 mm/year	197 mm/year	201 mm/year	194 mm/year
Groundwater recharge (average rate)			
152 mm/year	147 mm/year	152 mm/year	141 mm/year

[11]This assessment does not consider protection measures for the WRS. For example, if impervious surfaces were minimized in groundwater recharge areas, hydrologic function would be maintained.

[12]These factors include channel stability, water quality, stream biodiversity and natural flow. See the Aquatic Impact Assessment technical report for more information.

[13]The numbers for streamflow, groundwater discharge and recharge are different in table 4 from table 2 due to models used for the scenario analysis.

NATURAL HERITAGE SYSTEM

Includes: the the features and areas of the NHS, including terrestrial habitat and their functions. Percent change is based on an equally weighted average of the total natural cover and habitat quality values.

CURRENT CONDITIONS (From subsection 3.3)	SCENARIO 1 (+OP) (Compared to Current Conditions)	SCENARIO 2 (+NHS) (Compared to Scenario 1)	SCENARIO 3 (+POTENTIAL URBAN) (Compared to Scenario 1)
% change →	= +1%	↑ +7%	↑[14] +6%
Total natural cover			
25% natural cover	25% natural cover	36% natural cover	36% natural cover
Habitat quality (average LAM[15] score)			
7.6	7.5	7.9	7.6
Habitat connectivity (regional at watershed-scale)[16]			
28%	28%	45%	45%
Climate vulnerabilities (average of five high vulnerabilities indicators)[17]			
51%	51%	55%	55%

[14]While habitat quantity (as represented by natural cover) increases under scenario 3 relative to scenario 1, the habitat quality results require a caveat. LAM scores are an equally rated average of patch size, shape and matrix influence. Under scenario 2, the matrix influence score increases threefold from scenario 1, indicating improved habitat quality. Under scenario 3, the matrix influence score decreases, indicating decrease in habitat quality. So, while patch size and shape increase under scenarios 2 and 3, scenario 3 negatively affects the matrix influence of habitat quality.

[15]These LAM scores, known as Landscape Analysis Model, combines the metrics of patch size (larger patches support larger populations), patch shape (habitat fragmentation) and matrix influence (influence of surrounding land uses). A LAM score of 6 – 8 = poor. See the Terrestrial Impact Assessment technical report for more information.

[16]Habitat connectivity values represent the percentage of area for connectivity priorities that overlap with the proposed enhanced NHS. Improved connectivity has benefits for habitat quantity and quality. In other words, higher percentages indicate more habitat connectivity corridors.

[17]The average high vulnerability indicators are ground surface temperature, climate sensitive community, habitat patch quality, soil drainage and wetlands. The climate vulnerabilities values represent the percentage of climate vulnerable features represented in the proposed enhanced NHS. A higher percentage indicates more habitat included in the system, and therefore, if protected, improved resiliency to climate change.

WATER QUALITY[18]

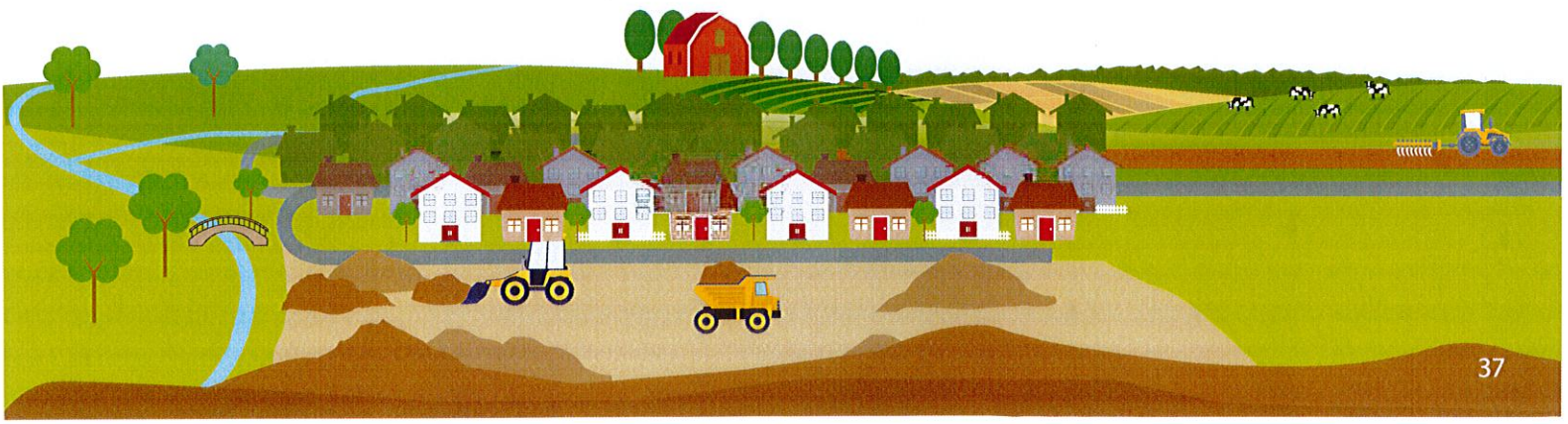
Focused on parameters of concern associated with urbanization and agricultural land uses. Amounts are based on a comparison of 2005 to 2015 average flow.

CURRENT CONDITIONS (From subsection 3.3)	SCENARIO 1 (+OP) (Compared to Current Conditions)	SCENARIO 2 (+NHS) (Compared to Scenario 1)	SCENARIO 3 (+POTENTIAL URBAN) (Compared to Scenario 1)
% change →	It is difficult to draw a conclusion on the percent change for water quality solely. As mentioned in the WRS row of this table, water quality is one of the factors considered under the impacts of impervious cover. Of the parameters of concern identified in Table 2, TSS and total phosphorus were assessed as part of scenario analysis.		
Total Suspended Solids[19]			
4,602 tonnes	4,674 tonnes	4,641 tonnes	4,939 tonnes
Total Phosphorus[20]			
9,843 tonnes	9,864 tonnes	9,295 tonnes	8,602 tonnes

[18]Stream water quality in urbanized watersheds is generally degraded by increased turbidity, nutrients, metals, E. coli and other contaminants due to more impervious surfaces and increased runoff. See the Aquatic Impact Assessment technical report for more information.

[19]Table 2 in Subsection 3.3 identified TSS readings at three monitoring stations in mg/L. For the purposes of scenario analysis, TSS was measured in tonnes at the outlet of the watershed (i.e. where it drains into Lake Ontario).

[20]Table 2 in Subsection 3.3 identified total phosphorus readings at three monitoring stations in mg/L. For the purposes of scenario analysis, total phosphorus was measured in tonnes at the outlet of the watershed (i.e. where it drains into Lake Ontario).



NATURAL HAZARDS
(Flooding and Erosion)

Focused on flood modelling as measured by peak flows[21]. Percent change is based on an average from both locations for the regional storm only (as the worst-case scenario).

CURRENT CONDITIONS (From subsection 3.3)	SCENARIO 1 (+OP) (Compared to Current Conditions)	SCENARIO 2 (+NHS) (Compared to Scenario 1)	SCENARIO 3 (+POTENTIAL URBAN) (Compared to Scenario 1)
% change →	= -2%	= 0%	↓[22] -77%
Regional Storm (i.e. Hurricane Hazel)			
71.61 m^3/s at Taunton Road	69.90 m^3/s at Taunton Road	68.59 m^3/s at Taunton Road	148.84 m^3/s at Taunton Road
140.52 m^3/s at Shoal Point Road	149.50 m^3/s at Shoal Point Road	147.19 m^3/s at Shoal Point Road	210.63 m^3/s at Shoal Point Road
5-year Storm (i.e. 1 in 5 probability of flow being exceeded in any one year)			
7.27 m^3/s at Taunton Road	7.18 m^3/s at Taunton Road	6.58 m^3/s at Taunton Road	6.80 m^3/s at Taunton Road
11.00 m^3/s at Shoal Point Road	11.71 m^3/s at Shoal Point Road	11.11 m^3/s at Shoal Point Road	11.83 m^3/s at Shoal Point Road

[21]Peak flows are the maximum rate of discharge during the period of runoff caused by a storm. Potential erosion issues were not assessed. However, erosion is likely to be worse with increased peak flows.

[22]The flood modelling completed as part of scenario analysis did not factor in potential mitigation measures (e.g. modern stormwater infrastructure).

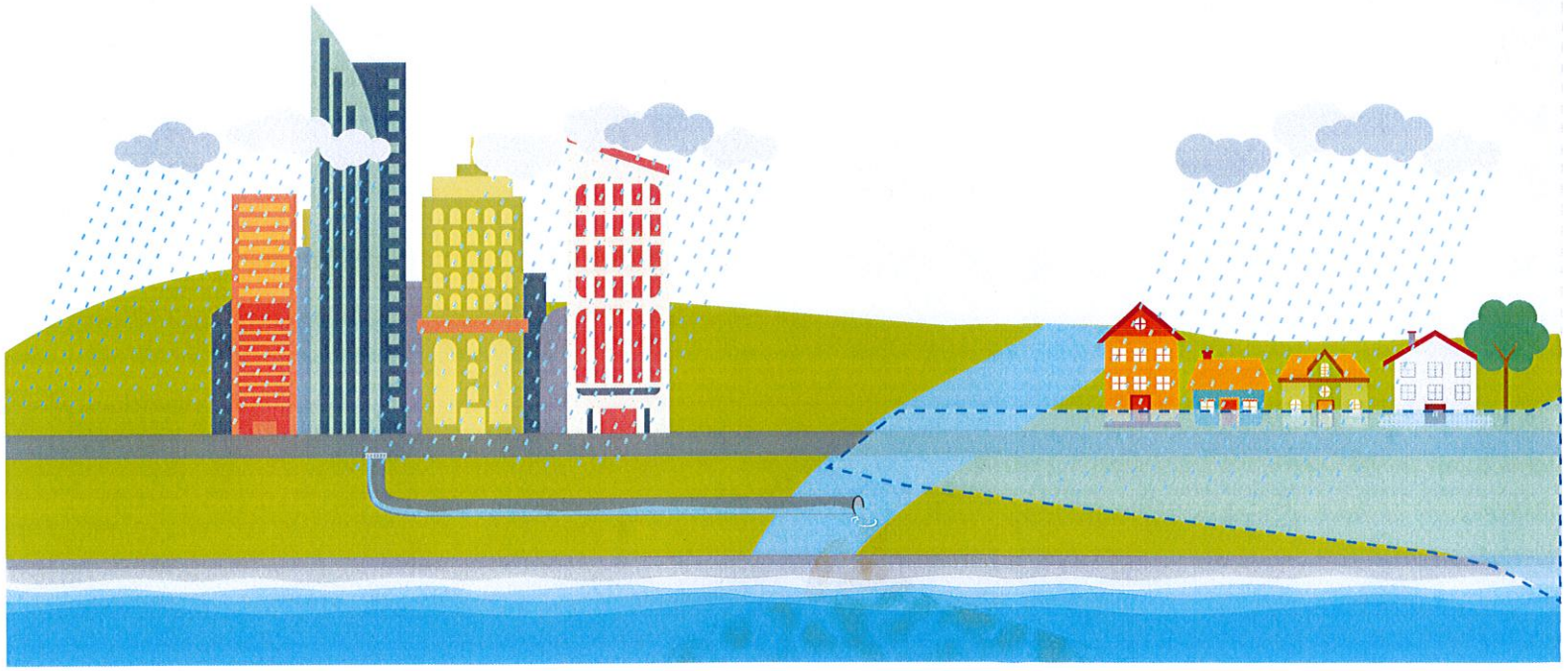


Table 4 illustrates expected changes to watershed conditions based on available information and assessments conducted as part of this watershed planning process. The management framework in **Section 5** identifies what is necessary to protect, enhance and restore watershed conditions. It also identifies management recommendations to encourage more sustainable land uses.

Summary of implications:

- One of the four subwatersheds shows improved aquatic conditions under scenario 2. Conversely, all four subwatersheds have fair – poor aquatic conditions under scenario 3, likely resulting in the loss of Redside Dace, a listed endangered species, within the Carruthers Creek watershed.
- The amount of natural cover and habitat quality improves under scenario 2. Under scenario 3, the amount of natural cover improves, while habitat quality decreases compared to scenario 2 due to the influence of surrounding urban development.
- Water quality is currently impaired in the watershed for parameters like chloride, phosphorus, TSS and *E. coli*. Without improvements to land use practices, salt and stormwater management, water quality is likely to continue to deteriorate with increased urbanization (scenario 3).
- There are existing flooding issues in the watershed, which will significantly increase under scenario 3 without the implementation of considerable mitigation measures. The hydrologic assessment shows a reduction in peak flows associated with the recommended NHS for smaller design storms (i.e. 2-year storm).

These hypothetical future scenarios are illustrative of potential watershed conditions. In addition to the summary of implications, it is important to recognize the following:

- Protecting, enhancing and restoring the recommended NHS provides vital watershed benefits as illustrated by Scenario 2 and is consistent with targets as identified in **Table 2**.
- Limiting impervious cover in any potential future growth areas, or through redevelopments, provides significant benefits to aquatic biodiversity. Federal guidance recommends urbanizing watersheds maintain less than 10% impervious land cover, while already degraded urban systems should not exceed a second threshold of 25 to 30%. Scenario 1 shows impervious cover reaching this 30% threshold with only a marginal improvement to 29% under Scenario 2. See **Figure 9** in **Section 7** for more information.

The management framework developed as part of this watershed plan contains recommendations to improve watershed conditions regardless of potential future land use decisions. The management

5. Management Framework

The management framework for the Carruthers Creek Watershed Plan represents what needs to be done to protect, enhance and restore watershed health[23]. The management framework consists of goals, objectives, indicators and management recommendations.

TRCA developed this management framework in collaboration with its municipal partners and refined it based on feedback from stakeholders and the public.

The goals, objectives and management recommendations were developed to address the issues identified through watershed characterization and account for potential different future land use scenarios. Many of the management recommendations are expected to mitigate many of the potential impacts associated with potential land use changes, as identified through the scenario analysis.

Each of the goals are complementary, with no one goal being more important than another. To fully realize the vision for Carruthers Creek will require the implementation of each goal area. Management recommendations were grouped under the most appropriate objective and are also listed in no particular order.

Any recommendations contained in the scenario analysis technical reports are consolidated in this management framework. Refer to the technical reports for detailed methodologies and findings beyond what was summarized in **Sections 3** and **4**. This watershed plan is the final source for goals, objectives, indicators and management recommendations related to Carruthers Creek. Readers are encouraged to refer to the technical reports for more detailed implementation suggestions.

[23]As mentioned in Subsection 1.1, the CTC Source Protection Plan also applies in the Carruthers Creek watershed and includes policies to protect drinking water. Implementation of this Source Protection Plan is required under the *Clean Water Act, 2006*. Consideration of Great Lakes agreements and legislation is also important for effective watershed management. These requirements are in addition to, and complementary of, the management framework identified in this watershed plan.

TABLE 5:
Management Framework Explanation

Management Framework Components	Description
GOALS	Represent the outcomes to achieve.
OBJECTIVES	Are the specific statements about desired results, or steps to be undertaken, to achieve the goal.
INDICATORS	Explain how progress on implementing the objective is going to be tracked or measured. Some indicators are compared to the benchmarks identified in **Table 2**. Other indicators are about reporting on implementation progress as it relates to policies, best practices, or infrastructure improvements and do not have an associated benchmark in **Table 2**. Where applicable, the targets identified in **Table 2** can be used as a measure to achieve.
MANAGEMENT RECOMMENDATIONS	Specifically explain what should be done to accomplish the relevant objective.

The management framework consists of three goals, nine objectives and 11 indicators (see **Figure 6**). The management recommendations for each goal area are described in **Subsections 5.1 – 5.3**.

The management recommendations apply to the entire watershed; identifying opportunities to improve conditions in the developed portion of the watershed and the types of studies and best practices that should be utilized for any potential future development, or redevelopment. **Subsection 5.4** summarizes recommendations that would specifically apply to any potential Settlement Area Boundary Expansion in the headwaters of Carruthers Creek.

FIGURE 6:
Overview of Management Framework

GOAL 1

Land Use

Achieve sustainable land use and infrastructure development patterns to protect, enhance and restore water quality and maintain stable water balance.

OBJECTIVE 1
Minimize the impacts of land uses through sustainability policies and the use of low impact development and green infrastructure.

Indicators:
Report on implementation of sustainable development policies/standards

OBJECTIVE 2
Install and upgrade stormwater infrastructure using best available technologies to reduce runoff; resulting in improved water balance and water quality.

Indicators:
Report on the status of stormwater management

OBJECTIVE 3
Manage the risks of natural hazards through appropriate mitigation measures and restoration.

Indicators:
Reduce number of flood vulnerable structures and roads

OBJECTIVE 4
Encourage the use of agricultural best management practices to minimize agricultural runoff and improve rural land stewardship.

Indicators:
Work with the agricultural community to track implementation of best management practices

GOAL 2

Water Resource System

Protect, enhance and restore the areas and features that make up the Water Resource System (including aquatic habitat) for ecosytem resilience and sustainabilty.

OBJECTIVE 1
Implement appropriate policies and programs that protect, enhance and restore the areas and features that comprise the Water Resource System.

Indicator:
Appropriate policy designations are in place for the Water Resourse System

OBJECTIVE 2
Promote aquatic habitat connectivity to faciltate native fish movement throughout the watershed.

Indicator:
Maintain, or improve, aquatic health rankings

GOAL 3

Natural Heritage System

Protect, enhance and restore the Natural Heritage System and urban forest within the watershed to improve ecosystem resilience and sustainability.

OBJECTIVE 1
Improve the quality and quantity of the Natural Heritage System across the watershed through ecosystem protection, enhancement and restoration, and implementation of relevant policies.

Indicators:
Increase total natural cover in the watershed

Appropriate policy designations are in place for the Natural Heritage System

OBJECTIVE 2
Ensure habitat exists for native terrestrial species to thrive throughout the watershed.

Indicators:
Maintain, or increase, the number and area of species and vegetation communities of concern

OBJECTIVE 3
Increase the urban forest cover within the developed portion of the watershed to improve social and environmental well-being.

Indicator:
Increase total tree canopy in the watershed

5.1 LAND USE / INFRASTRUCTURE GOAL

GOAL 1

Achieve sustainable land use and infrastructure development patterns to protect, enhance and restore water quality and maintain stable water balance.

This goal area focuses on the policy, land use and infrastructure planning processes that influence the health of the watershed. The management recommendations are numbered to correspond with their applicable goal and objective.

TABLE 6:
Land Use Management Recommendations

Land Use Objective	Management Recommendations
LAND USE OBJECTIVE 1 Minimize the impacts of land uses through sustainability policies and the use of low impact development and green infrastructure.	**1.1.1** Lower-tier municipalities, in collaboration with the Region of Durham and TRCA, to adopt green development policies, or standards, and require new developments, and re-developments, to utilize low impact development and green infrastructure techniques to limit the impacts of increased impervious cover. The following should apply to any municipal policies, or standards, in particular within ESGRAs, as identified on **map 1b**: a. new developments should minimize impervious cover and strive to achieve 90th percentile volume control of annual rainfall b. redevelopments should minimize impervious cover and strive to achieve 75th percentile volume control of annual rainfall
	1.1.2 The Region of Durham and lower-tier municipalities, in collaboration with TRCA, to develop mechanisms to track and report on implementation of sustainable development practices to assess the effectiveness of policies and standards.
	1.1.3 If it is determined that a Settlement Area Boundary Expansion is required in the headwaters of Carruthers Creek, in accordance with Growth Plan policies, the Region of Durham, in collaboration with lower-tier municipalities and TRCA, to develop a Terms of Reference outlining requirements for further studies in support of subwatershed planning that includes, but is not limited to:

Land Use Objective	Management Recommendations
LAND USE OBJECTIVE 1 cont'd	a. a hydraulic assessment b. how natural hazards will be assessed and mitigated (i.e. the risk of flooding will not increase) c. how the Natural Heritage System and Water Resource System will be protected, enhanced and restored d. how water quality and quantity will be protected.
	1.1.4 During planning for transportation infrastructure improvement projects, or new projects, the Region of Durham and lower-tier municipalities to implement best management practices for design, expansions and widenings in accordance with TRCA's Crossing Guideline for Valley and Stream Corridors, and ensure consistent policies and standards are in place to facilitate hydraulic function (e.g. prevent flooding) and ecological connectivity (e.g. wildlife passage). See **map 3** for priority crossings.
	1.1.5 Lower-tier municipalities to improve the management of excess soils and prevent fill deposition that is incompatible with the soils and hydrology of the area by: a. ensuring adequate policies and bylaws are in place to manage excess soil b. improving compliance and enforcement of policies through collaboration between TRCA and municipalities c. conducting education and outreach on: i. the importance of proper soil management ii. existing regulatory requirements iii. regulatory responsibilities of various agencies, including who to contact with concerns. d. collaborating with agencies and other levels of government, including the Region of Durham, to ensure infrastructure projects that generate, or receive excess soil follow best management practices.
	1.1.6 The Region of Durham and lower-tier municipalities, in collaboration with other levels of government and TRCA, to work to reduce the amount of chlorides entering the watershed by: a. continuing to implement best management practices for winter de-icing procedures on public property b. continuing education and outreach on salt management for private property.
	1.1.7 TRCA, in collaboration with the Town of Ajax, to identify and promote opportunities for sustainable community retrofits in priority planting neighbourhoods (See **map 8**).

Land Use Objective	Management Recommendations
LAND USE OBJECTIVE 2 Install and upgrade stormwater infrastructure using best available technologies to reduce runoff; resulting in improved water balance and water quality.	**1.2.1** Lower-tier municipalities, in collaboration with the Region of Durham and TRCA, through stormwater master planning continue to: a. employ best management practices for stormwater management and consistent design criteria to manage runoff quantity and quality b. consider stormwater funding options for cost recovery and to reduce impervious surfaces in the watershed c. examine opportunities to retrofit outdated stormwater infrastructure and install stormwater controls in areas without controls through long-term planning and investment strategies d. refine existing policies to ensure modern stormwater controls are required e. adaptively manage stormwater infrastructure through operation maintenance schedules and procedures.
	1.2.2 Lower-tier municipalities, in collaboration with the Region of Durham and TRCA, to develop mechanisms to track the status and effectiveness of stormwater management infrastructure.
	1.2.3 Lower-tier municipalities to explore opportunities to enhance stormwater management in neighbourhoods with outdated or no stormwater facilities by retrofitting infrastructure to meet modern stormwater design criteria, as much as possible, given site characteristics.
	1.2.4 For new developments, lower-tier municipalities to require hydrologic analysis and erosion threshold assessments downstream of potential stormwater management facilities that need to demonstrate no negative, or adverse, downstream impacts, prior to municipal approvals.
LAND USE OBJECTIVE 3 Manage the risks of natural hazards through appropriate mitigation measures and restoration.	**1.3.1** TRCA, in collaboration with lower-tier municipalities, to prioritize the restoration of the erosion hazard sites identified on **map 4**. Additional channel restoration, or increased stream bank protection may be required as preventative measures in areas downstream of new developments.
	1.3.2 The Region of Durham and lower-tier municipalities, in collaboration with TRCA, to identify potential hazard risks to sewer and existing road infrastructure associated with in-stream creek erosion and implement strategies to eliminate identified risks.

Land Use Objective	Management Recommendations
LAND USE OBJECTIVE 3 cont'd	**1.3.3** Implement appropriate flood mitigation measures for the Flood Vulnerable Cluster in the Town of Ajax, which could involve: a. reopening, or initiating, a new environmental assessment to provide a more comprehensive list of alternatives to offset impacts associated with potential development in the headwaters b. the application of regional control in the headwaters of Carruthers Creek, if developed, and required by the updated flood modelling (see management recommendation 1.3.5).
	1.3.4 TRCA, in collaboration with the Region of Durham and lower-tier municipalities, to educate property owners in high flood risk areas about proper lot level practices (e.g. removing hydraulic impairments).
	1.3.5 TRCA to complete comprehensive floodplain mapping based on new models and best available information to inform land use and infrastructure decisions.
LAND USE OBJECTIVE 4 Encourage the use of agricultural best management practices to minimize agricultural runoff and improve rural land stewardship.	**1.4.1** In collaboration with the agricultural community and provincial ministries, TRCA, the Region of Durham and lower-tier municipalities to identify opportunities to expand best management practices that reduce agricultural runoff and improve water management, such as: a. use cover crops and / or leave crop residue b. adopt no till farm practices during non-growing season c. conduct soil testing for nutrients and adjust fertilizer application rates, if required.
	1.4.2 In collaboration with the agricultural community, rural land owners, and provincial ministries, TRCA, the Region of Durham and lower-tier municipalities to identify opportunities to improve rural land stewardship best management practices through: a. natural buffers between agricultural lands and natural and / or water resource features and areas b. implementation of Environmental Farm Plans and other rural land stewardship programs (e.g. TRCA's Rural Clean Water Programs) c. education / outreach about the benefits of utilizing best management practices to improve habitat (e.g. meadows for sensitive bird species).

5.2 WATER RESOURCE SYSTEM GOAL

GOAL 2

Protect, enhance and restore the areas and features that make up the Water Resource System (including aquatic habitat) for ecosystem resilience and sustainability.

This goal area focuses on ensuring policies are in place for the long-term protection of the WRS and undertaking priority restoration initiatives to benefit the long-term resiliency of the WRS. The WRS is presented in **map 1A** and **map 1B**. The areas and features that comprise the WRS are to be protected in accordance with the recommendations laid out in this subsection.

TABLE 7:
WRS Management Recommendations

WRS Objective	Management Recommendations
WRS OBJECTIVE 1 Implement appropriate policies and programs that protect, enhance and restore the areas and features that comprise the Water Resource System.	**2.1.1** The Region of Durham and lower-tier municipalities, in collaboration with TRCA, to ensure the protection of the Water Resource System (**map 1A** and **B**) and its functions, by: a. updating Official Plans and zoning bylaws to adequately protect the Water Resource System b. assessing existing standards and guidelines for land use and infrastructure development to ensure they reflect current provincial policy direction to protect, enhance and restore the quality and quantity of water c. avoiding development near key hydrologic features through the establishment of appropriate buffers d. requiring the implementation of appropriate mitigation measures where avoidance of key hydrologic areas is not possible, in order to maintain hydrologic function
	2.1.2 TRCA, in collaboration with the Region of Durham and lower-tier municipalities, to routinely update mapping data layers for all components of the Water Resource System as new information becomes available.

WRS Objective	Management Recommendations
WRS OBJECTIVE 1 cont'd	**2.1.3** TRCA, in collaboration with the Region of Durham and lower-tier municipalities, to prioritize the restoration of the aquatic sites identified on **map 4**, which have been selected for contributing to the following: a. enhancing habitat quality and watershed connectivity b. ensuring biodiversity persists c. improving watershed resiliency to climate change.
	2.1.4 If it is determined that a Settlement Area Boundary Expansion is required in the headwaters of Carruthers Creek, in accordance with Growth Plan policies, the City of Pickering, in collaboration with the Region of Durham, Town of Ajax and TRCA, as part of secondary planning to demonstrate through a subwatershed plan (or equivalent) that: a. key hydrologic features will be protected b. where avoidance of key hydrologic areas is not possible, appropriate mitigation measures are to be implemented to maintain downstream hydrologic function, and c. there will be no negative or adverse downstream effects, such as increased flooding, erosion, or deteriorated water quality.
WRS OBJECTIVE 2 Promote aquatic habitat connectivity to facilitate native fish movement throughout the watershed.	**2.2.1** TRCA, in collaboration with the Region of Durham and lower-tier municipalities and landowners, to remove the six priority barriers to fish movement identified in **map 5**.
	2.2.2 TRCA, through its application review function, to identify and implement avoidance, conservation, design and mitigation measures for the protection and / or recovery of native aquatic species, including Redside Dace and its habitat. For activities that affect Redside Dace habitat, consult the *Guidance for Development Activities in Redside Dace Protected Habitat* (MNRF 2016), MECP and DFO to determine requirements under species at risk legislation.

5.3 NATURAL HERITAGE SYSTEM GOAL

GOAL 3

Protect, enhance and restore the Natural Heritage System and urban forest within the watershed to improve ecosystem resilience and sustainability.

This goal area focuses on improving the quality and quantity of natural systems throughout the watershed. The proposed enhanced NHS identified on **map 2** is recommended by TRCA to achieve this goal. It will be up to municipalities to adopt a NHS that is consistent with provincial policy and informed by the goals and objectives of the CCWP. The proposed enhanced NHS includes areas with existing natural cover and areas that are targeted to be potential natural cover through restoration. The exact configuration and size of the NHS could fluctuate due to other factors (e.g. construction of infrastructure), assuming the analysis is comparable to the one that resulted in the proposed enhanced NHS recommended by TRCA. The recommended NHS is designed to move towards the minimum target for natural cover in an urban and urbanizing watershed as established in TRCA's *Terrestrial Natural Heritage System Strategy* (2007) and *How Much Habitat is Enough?* (Environment and Climate Change Canada, 2013). Assuming that the identified potential natural cover areas are restored, the recommended NHS achieves approximately 36% natural cover across the watershed, including approximately 25% forests and successional forests and 7% wetlands, consistent with the minimum targets. A large amount of the land recommended for potential natural cover occurs in the headwaters of Carruthers Creek. If development proceeds in this area, it will be essential to restore and protect (i.e. through securement) an amount of land consistent with the recommended NHS.

To appropriately implement a NHS will require updates to municipal Official Plans, which can then guide future land use decisions to avoid development in the municipally adopted NHS, mitigate any impacts or, where impacts are unavoidable, provide ecosystem compensation. The management recommendations related to the NHS in this subsection are consistent with TRCA's protection hierarchy of avoid, minimize, mitigate and as a last resort compensate.

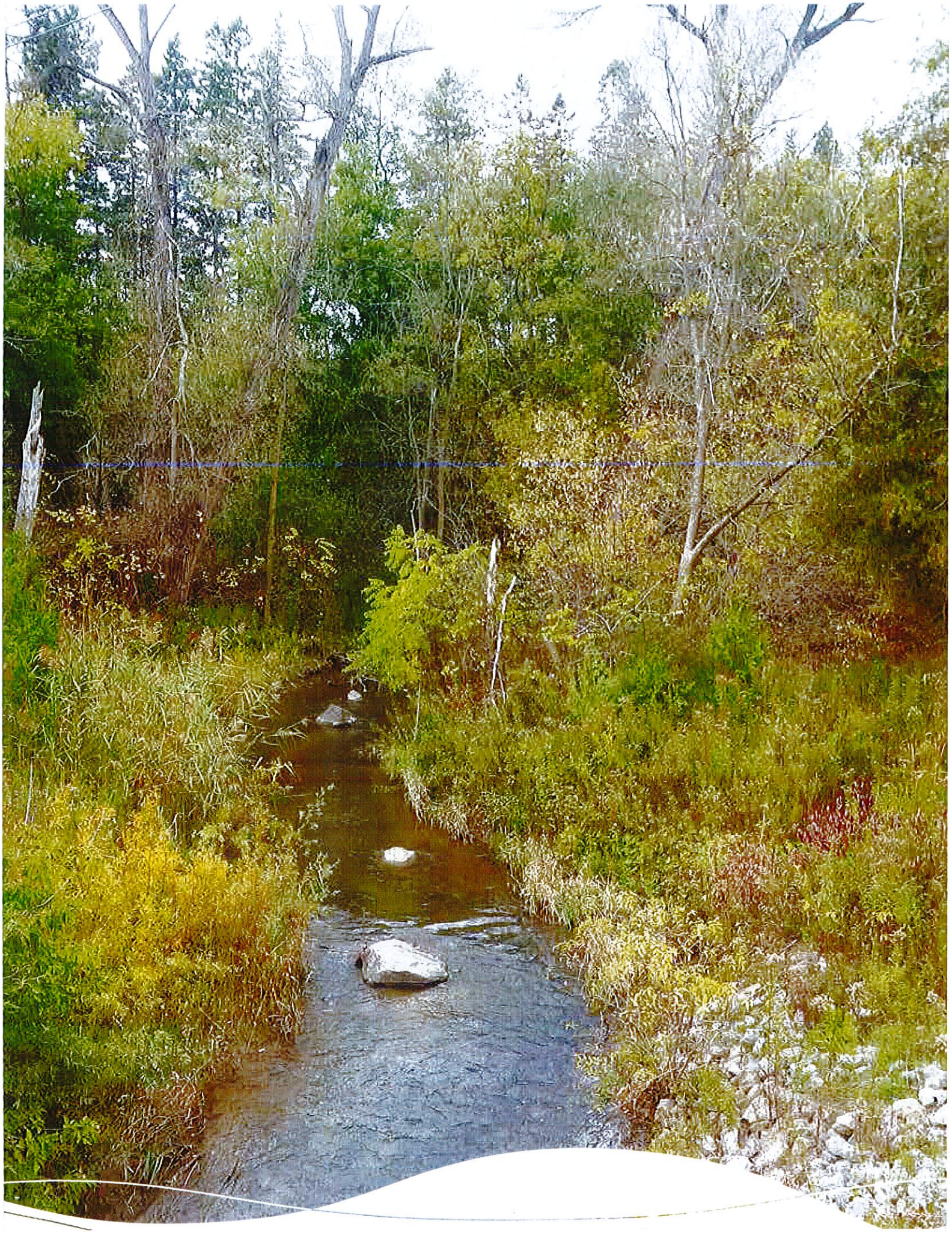
Urban forests provide valuable terrestrial habitat, help manage stormwater, provide clean air and other socio-economic benefits (e.g. regulates local temperatures, improves personal well-being). Including urban forestry under this NHS goal recognizes the integrated nature of natural areas (i.e. NHS) and the ecological value of additional natural cover in parks, on streets, or private property (i.e. urban forests).

TABLE 8:
NHS Management Recommendations

NHS Objective	Management Recommendations
NHS OBJECTIVE 1 Improve the quality and quantity of the Natural Heritage System across the watershed through ecosystem protection, enhancement and restoration, and implementation of relevant policies.	**3.1.1** The Region of Durham and lower-tier municipalities, in collaboration with TRCA, to ensure the protection, enhancement and restoration of a Natural Heritage System consistent with the goals and objectives of this watershed plan (**map 2** for recommended NHS) by: a. updating Official Plan policies and associated zoning bylaws to protect a municipally adopted enhanced Natural Heritage System b. assessing existing standards and guidelines for land use and infrastructure development to ensure they reflect current provincial policy direction to maintain, restore or enhance the municipally adopted Natural Heritage System c. avoid infrastructure development (i.e. buildings and structures) and minimize infrastructure linear feature crossings, in a municipally adopted enhanced Natural Heritage System d. adopting municipal policies for ecosystem compensation, in accordance with TRCA's *Guideline for Ecosystem Compensation*, where development in a municipally adopted enhanced Natural Heritage System is unavoidable e. applying a minimum 30 metre vegetation protection zone along features at the boundary of a municipally adopted enhanced Natural Heritage System to protect ecological function f. requiring development and redevelopments be designed and approved to prevent encroachment into a municipally adopted enhanced Natural Heritage System.
	3.1.2 TRCA, in collaboration with the Region of Durham and lower-tier municipalities, to prioritize the restoration of the terrestrial sites identified on **map 4**, which have been selected for contributing to the following: a. increasing habitat quantity b. enhancing habitat quality and connectivity c. ensuring biodiversity persists d. adapting for climate vulnerabilities.
	3.1.3 TRCA, in collaboration with the Region of Durham and lower-tier municipalities, to explore opportunities to secure the sites identified on **map 6** for ecological protection and to increase public land ownership and connectivity along the main channel of Carruthers Creek south of Taunton Road.

NHS Objective	Management Recommendations
NHS OBJECTIVE 1 cont'd	**3.1.4** TRCA, the Region of Durham and lower-tier municipalities to regularly update their trail guidelines and standards for consistency, and to ensure that any new, or modifications to existing trails, use best practices, such as prioritizing the use of boardwalks in sensitive areas (e.g. wetlands), and implementing methods to ensure trail users stay on marked trails (e.g. signage, barriers to humans and dogs, but not other species, and limited access during breeding season).
	3.1.5 TRCA, in collaboration with the Region of Durham and lower-tier municipalities, to minimize impacts to the municipally adopted Natural Heritage System from any active recreation and human activity by: a. ensuring proper trail management and signage b. providing education and outreach on the importance of the municipally adopted Natural Heritage System c. promoting community stewardship to maintain and monitor the municipally adopted Natural Heritage System for improper trail usage (e.g. off-trail compaction and erosion), illegal dumping and invasive species, while encouraging community restoration programs (e.g. tree plantings).
	3.1.6 Wetland water balance studies that demonstrate how the hydrological function of the wetland should be protected will be undertaken by the landowner for any potential future growth in the areas identified on **map 7**, or other areas identified during subwatershed planning, prior to applicable planning approvals.
NHS OBJECTIVE 2 Promote terrestrial habitat connectivity to ensure native species thrive throughout the watershed.	**3.2.1** The Region of Durham, lower-tier municipalities, TRCA, landowners and other agencies will collaborate to manage problematic invasive species.
	3.2.2 TRCA will continue to work with landowners to restore meadow habitat areas in support of open country bird species at risk, in accordance with the terrestrial restoration priorities identified on **map 4**.

NHS Objective	Management Recommendations
NHS OBJECTIVE 3 Increase the urban forest cover within the developed portion of the watershed to improve social and environmental well-being.	**3.3.1** Lower-tier municipalities, in collaboration with the Region of Durham and TRCA, to update existing urban forest studies and consolidate them into a comprehensive study that: a. accounts for all public and private lands b. develops targets for public and private lands for inclusion in an urban forest strategy c. develops indicators for the quality and quantity of the urban forest for inclusion in an urban forest strategy.
	3.3.2 The Region of Durham and lower-tier municipalities, in collaboration with TRCA, to develop a comprehensive urban forest strategy that: a. enhances tree and soil conservation in accordance with *Preserving and Restoring Healthy Soil: Best Practices for Urban Construction* at any new development, or redevelopment, (e.g. Carruthers Creek Business Area), and on regional property (e.g. along Taunton Road) as depicted on **map 8** b. focuses urban forest tree planting programs in the Town of Ajax as depicted on **map 8** c. encourages an urban forest with diverse and native (or non-invasive) tree species and class sizes d. ensures consistent policies and bylaws for tree conservation on public and private lands e. explores opportunities to increase the capacity of the Region of Durham to implement an Urban Forest Strategy consistent with this management recommendation f. encourages participation in knowledge-sharing and collaboration through the Regional Public Works Commissioners of Ontario's Urban Forestry Sub-working Group and Ontario's Municipal Arborist and Urban Foresters Association g. includes urban forest targets for existing developed areas and any future development as part of the strategy.



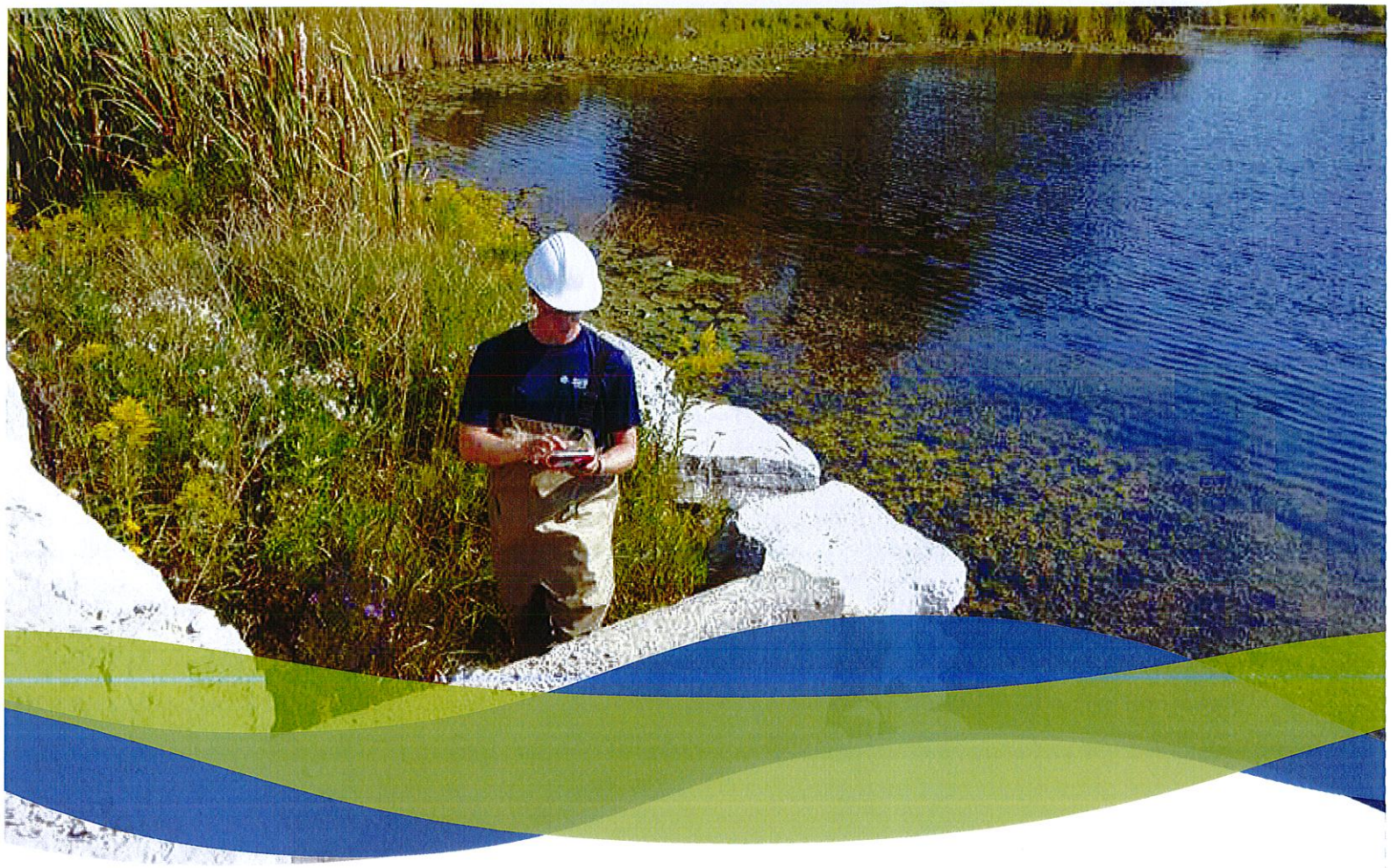
5.4 CARRUTHERS CREEK HEADWATERS MANAGEMENT

There are several management recommendations that refer to potential future studies, subwatershed planning, or potential development in the headwaters of Carruthers Creek. The headwaters that could potentially have development in the future are the lands outside of the Greenbelt north of Highway 7. At the moment, these lands are not designated as part of the settlement area of the City of Pickering in their Official Plan, or the Region of Durham's urban area boundary. For any future development to occur, a Settlement Area Boundary Expansion, in compliance with the Growth Plan, would need to occur. The following management recommendations speak to what would be required based on provincial policy and the recommendations in this watershed plan. These management recommendations were already discussed under their relevant goal, but are repeated here as they are specific to the headwaters of Carruthers Creek. Should a decision be made to proceed with a Settlement Area Boundary Expansion, the full suite of management recommendations in **Subsections 5.1 – 5.3** would apply to that area.

TABLE 9:
Headwaters Specific Management Recommendations

	Relevant Management Recommendations	Rationale and Provincial Policy Basis
1.1.3	If it is determined that a Settlement Area Boundary Expansion is required in the headwaters of Carruthers Creek, in accordance with Growth Plan policies, the Region of Durham, in collaboration with lower-tier municipalities and TRCA, to develop a Terms of Reference outlining requirements for further studies in support of subwatershed planning that includes, but is not limited to: a. a hydraulic assessment b. how natural hazards will be assessed and mitigated (i.e. the risk of flooding will not increase) c. how the Natural Heritage System and Water Resource System will be protected, enhanced and restored d. how water quality and quantity will be protected.	Appropriate scoping of any subwatershed studies for potential future Settlement Area Boundary Expansions will allow those studies to build upon work completed through this watershed planning process in a collaborative fashion. Growth Plan policies 2.2.8.3 (d) / (e) and 4.2.1.3 (c).
1.1.4	During planning for transportation infrastructure improvement projects, or new projects, the Region of Durham and lower-tier municipalities to implement best management practices for design, expansions and widenings in accordance with TRCA's Crossing Guideline for Valley and Stream Corridors, and ensure consistent policies and standards are in place to facilitate hydraulic function (e.g. prevent flooding) and ecological connectivity (e.g. wildlife passage). See **map 3** for priority crossings.	This management recommendation is intended to ensure hydrological and ecological connectivity by improving crossings when new transportation infrastructure is built, or existing infrastructure is upgraded. This recommendation will help protect the integrity of the WRS and NHS, consistent with Growth Plan policies 4.2.1 and 4.2.2.

	Relevant Management Recommendations	Rationale and Provincial Policy Basis
1.2.4	For new developments, lower-tier municipalities to require hydrologic analysis and erosion threshold assessments downstream of potential stormwater management facilities that need to demonstrate no negative, or adverse, downstream impacts, prior to municipal approvals.	This management recommendation is intended to identify potential changes to the functions of the WRS arising from new development. It is consistent with Growth Plan policies related to stormwater management (3.2.7).
1.3.3	Implement appropriate flood mitigation measures for the Flood Vulnerable Cluster in the Town of Ajax, which could involve: a. reopening, or initiating, a new environmental assessment to provide a more comprehensive list of alternatives to offset impacts associated with potential development in the headwaters b. the application of regional control in the headwaters of Carruthers Creek, if developed and required by updated flood modelling.	This management recommendation is in reference to existing flooding issues in the lower part of the Carruthers Creek watershed in the Town of Ajax. The exact nature of the flood mitigation measure will depend on whether development proceeds in the headwaters of Carruthers Creek.
2.1.4	If it is determined that a Settlement Area Boundary Expansion is required in the headwaters of Carruthers Creek, in accordance with Growth Plan policies, the City of Pickering, in collaboration with the Region of Durham, Town of Ajax and TRCA, as part of secondary planning to demonstrate through a subwatershed plan (or equivalent) that: a. key hydrologic features will be protected b. where avoidance of key hydrologic areas is not possible, appropriate mitigation measures are to be implemented to maintain downstream hydrologic function, and c. there will be no negative or adverse downstream effects, such as increased flooding, erosion, or deteriorated water quality.	Similarly, to management recommendation 1.1.3, this management recommendation identifies what is necessary to protect the integrity of the WRS and NHS. Growth Plan policies 2.2.8.3 (d) / (e), 4.2.1.3 (c), 4.2.2.3 and 4.2.2.7.
3.1.6	Wetland water balance studies that demonstrate how the hydrological function of the wetland should be protected will be undertaken by the landowner for any potential future growth in the areas identified in **map 7**, or other areas identified during subwatershed planning, prior to any planning approvals.	Wetlands are vital features to both the WRS and NHS. Any development in proximity to wetland features should demonstrate the protection of hydrologic functions. Growth Plan policies 4.2.1.2, 4.2.1.4 and 4.2.2.3.



6. Monitoring and Evaluation

Monitoring is vital to the successful implementation of this watershed plan. Monitoring will help evaluate trends in watershed conditions and track the implementation of plan objectives. Monitoring will help determine what is working to maintain or improve conditions and what, if necessary, needs to change should conditions deteriorate.

The Carruthers Creek monitoring program is designed to evaluate both watershed health and indicators associated with objectives of this watershed plan. The monitoring stations map (**Figure 7**) identifies monitoring stations by category based on what they monitor. **Table 10** explains the Carruthers Creek monitoring program in detail. The stations identified in the monitoring stations map are cross referenced in the station's column in **Table 10** (e.g. the first station listed in the table is an aquatic station, which is the yellow number 1 on the map).

Additional monitoring stations are likely necessary to adequately track watershed health trends and the identified indicators over time. TRCA, in collaboration with its municipal partners, will identify opportunities to expand watershed monitoring with appropriate resourcing. It will be particularly important to ensure monitoring stations are collecting data in all parts of the watershed. Currently, monitoring stations are limited in the northern part of the watershed.

FIGURE 7
Monitoring Stations Map

Toronto and Region Conservation Authority

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Date: September 2019
Created by: TRCA Information Services/Information Technologies
Disclaimer
The Data used to create this map was compiled from a variety sources and dates. The TRCA takes no responsibility for errors or omissions in the data and retains the right to make changes and corrections at anytime without notice. For further information about the data on this map, please contact the TRCA GIS Department (416) 661-6600

Carruthers Creek Watershed Plan: Monitoring Stations

0 0.5 1 2 3 KM

- Aquatic
- Groundwater
- Terrestrial
- Water Quality
- Water Quantity

- Municipal Boundary
- Watercourse
- Greenbelt Boundary

Land Use

- Natural
- Rural
- Urban

- Carruthers Creek Watershed Boundary
- Carruthers Creek Watershed Plan Study

TABLE 10:
Carruthers Creek Monitoring Program

Monitoring Category	Stations	Monitoring Frequency	What is monitored?	Why do we monitor it?
WATER RESOURCE SYSTEM (aquatic ecosystems)	ID#: CC001WM (Yellow #1 on map)	Every three years	Fish community, aquatic habitat and benthic invertebrate community	**Indicator:** Maintain, or increase, aquatic health rankings. Applicable to WRS Objective 2. Monitoring these aquatic habitat characteristics allows for the assessments of the overall health of the aquatic ecosystem.
	ID#: CC002WM (Yellow #2 on map)			
	ID#: CC003WM (Yellow #3 on map)			
NATURAL HERITAGE SYSTEM (terrestrial ecosystems)	ID#: FV-18 & FV-18_1 (Orange #1 on map)	Annually	Vegetation and forest birds	**Indicator:** Maintain, or increase, the number and area of species and vegetation communities of concern. Applicable to NHS Objective 2. Monitoring these terrestrial habitat characteristics helps to understand how the system is functioning and if there are changes to species composition over time. **Note:** This indicator requires inventory data from across the watershed to be properly assessed. The identified monitoring stations only collect data at that particular location and therefore do not assess trends across the watershed. An inventory would need to be conducted within the next ten years to update information regarding current conditions.

Monitoring Category	Stations	Monitoring Frequency	What is monitored?	Why do we monitor it?
SURFACE WATER QUALITY	ID#: 107002 (Red #1 on map)	Monthly samples	Water chemistry (e.g. nutrients), metals, bacteria and temperature	Applicable to overall watershed health and trends to know whether water quality conditions are improving or not. Monitoring water quality helps to understand the impacts of land uses on local water quality that ultimately flows into Lake Ontario.
	ID#: CC005 (Red #2 on map)			
SURFACE WATER QUANTITY	ID#: HY013 (Blue #1 on map)	Continuous water level data collected, reported in 15-minute intervals	Stream level, discharge and temperature	Applicable to overall watershed health and trends to know whether hydrology conditions are improving or not. Monitoring stream level, discharge and temperature helps to understand the interconnections between groundwater and surface water. This information can be used to guide the management and protection of baseflow levels to protect aquatic life and ensure sustainable human use of surface water.
	ID#: HY090 (Blue #2 on map)			
	ID#: HY089 (Blue #3 on map)			
	ID#: WQ002 (Blue #4 on map)	Continuous water level and certain water quality data collected, reported in 15-minute intervals. Monthly grab samples for full suite of water quality parameters. Also takes event-based (i.e. heavy rainfall) water quality samples.	Stream level, discharge and temperature Note: also measures water quality as part of Lake Ontario tributary monitoring	Applicable to overall watershed health and trends to know whether hydrology and water quality conditions are improving or not. The primary purpose of this station is to assess nutrient loadings to Lake Ontario.

Monitoring Category	Stations	Monitoring Frequency	What is monitored?	Why do we monitor it?
	TBD (New in 2019) (Blue #5 on map)	Continuous real-time (reporting every 5 minutes)	Rainfall and snowfall amount and temperature	Applicable to overall watershed health and trends to know whether hydrology conditions are improving or not. Precipitation monitoring information assists with flood forecasting and warning, event-based sampling, and watershed planning.
	TBD (New in 2019) (Blue #6 on map)			
GROUNDWATER QUANTITY AND QUALITY	TBD (New in 2019) (Purple #1 on map)	Hourly groundwater level and temperature, monthly manual groundwater level measurements and periodic water chemistry	Water level and water chemistry	Applicable to overall watershed health and trends to know whether hydrogeology conditions are improving or not. Groundwater and surface water interactions are essential for a functioning WRS. Understanding groundwater conditions is vital to understanding the nature of these interactions.

Note:

The following indicators are not evaluated through a particular monitoring station in Carruthers Creek, but will be periodically assessed through GIS analyses:

- Reduce number of flood vulnerable structures and flood vulnerable roads (Land Use Objective 2)
- Increase total natural cover in the watershed (NHS Objective 1)
- Increase total tree canopy in the watershed (NHS Objective 3)

The remaining indicators are qualitative (e.g. ensuring policies are in place) and will be reported on by TRCA in collaboration with its municipal partners.

Reporting

As part of the Carruthers Creek monitoring program, TRCA, in collaboration with its municipal partners, will conduct annual reporting to communicate on the health of the watershed and plan implementation progress.

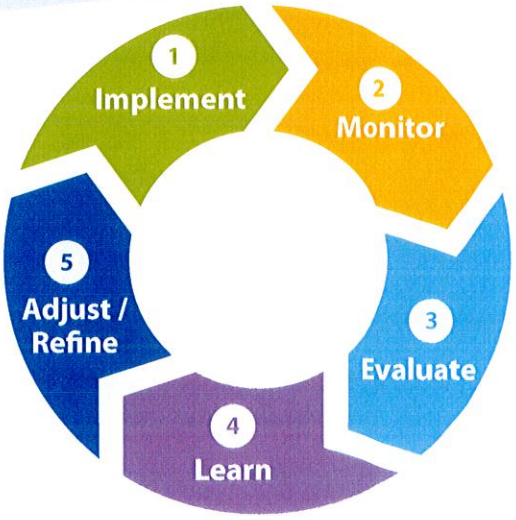
Annual reporting will help to track watershed health trends and the indicators identified as part of this watershed plan.

Some components of this watershed plan may not be reported on annually (e.g. aquatic community and terrestrial species). This is due to different monitoring frequencies for certain components (e.g. aquatic species are surveyed every three years).

Adaptive Management

Adaptive management is a systematic process (see **Figure 8**) for continually improving practices by learning and applying updated knowledge to improve project outcomes. In the context of this watershed plan, adaptive management, in combination with the monitoring program, will allow modifications and refinements to management recommendations, and/or the monitoring program throughout the life cycle of this watershed plan. For example, if water quality continues to deteriorate, certain land use management recommendations may not be resulting in the desired outcome, requiring adjustment.

FIGURE 8:
Adaptive Management Cycle



7. Maps

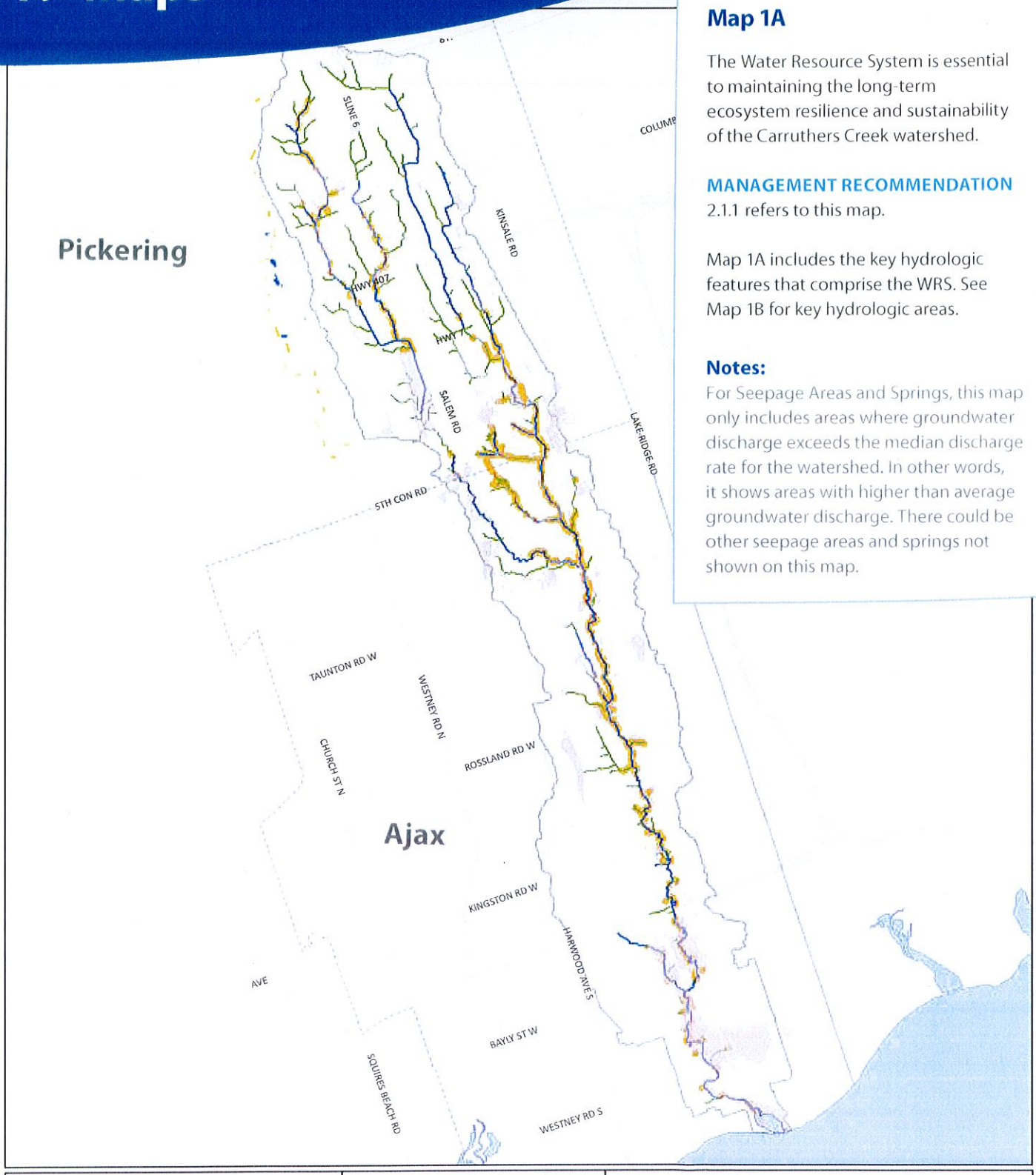
Map 1A

The Water Resource System is essential to maintaining the long-term ecosystem resilience and sustainability of the Carruthers Creek watershed.

MANAGEMENT RECOMMENDATION
2.1.1 refers to this map.

Map 1A includes the key hydrologic features that comprise the WRS. See Map 1B for key hydrologic areas.

Notes:
For Seepage Areas and Springs, this map only includes areas where groundwater discharge exceeds the median discharge rate for the watershed. In other words, it shows areas with higher than average groundwater discharge. There could be other seepage areas and springs not shown on this map.



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Carruthers Creek Watershed Plan: Water Resource System - Map A

0 0.5 1 2 3 KM

Key Hydrologic Features
- Inland Lakes
- Intermittent Streams
- Permanent Streams
- Seepage Areas and Springs
- Wetlands

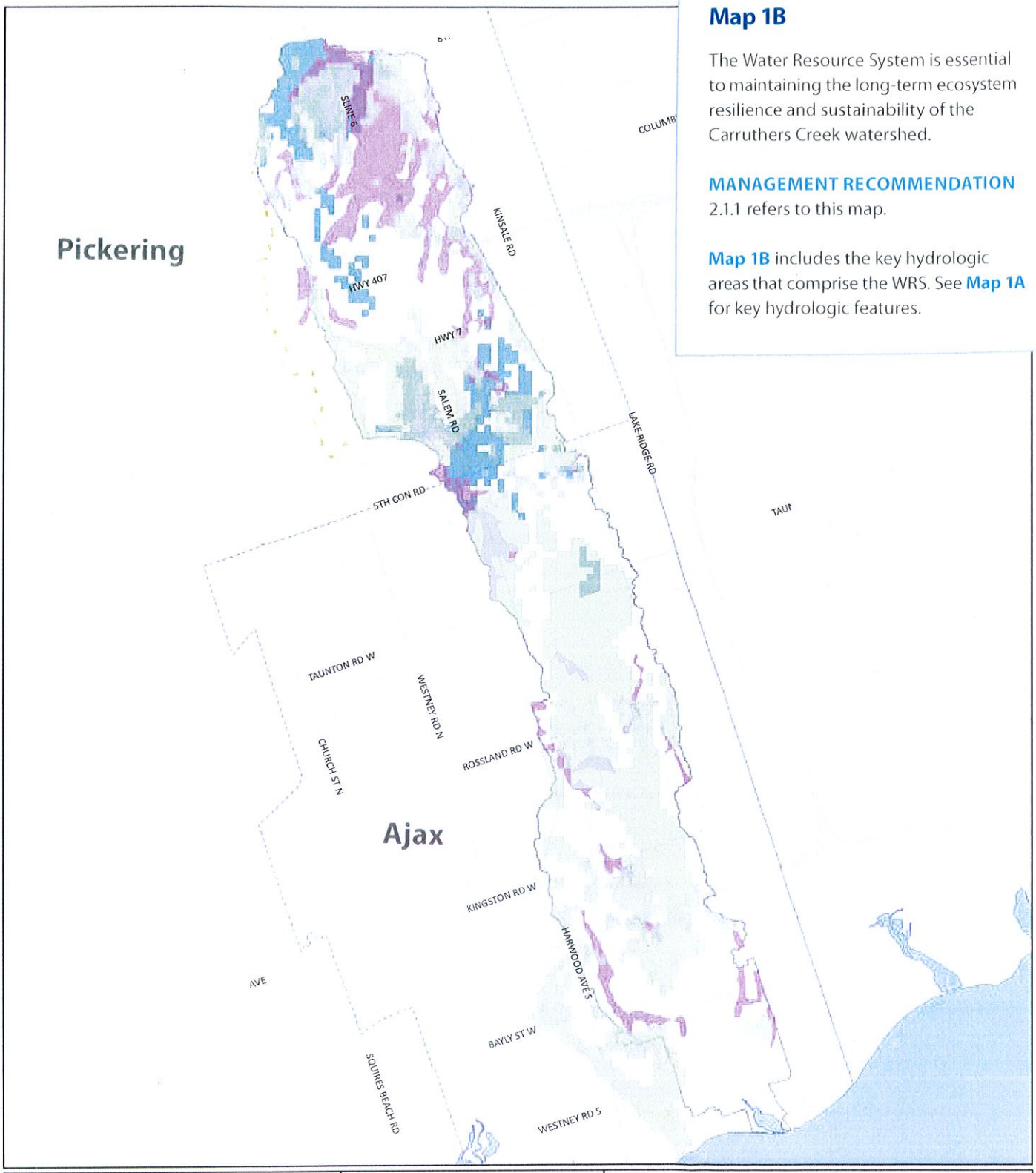
Municipal Boundary
Carruthers Creek Watershed Boundary
Carruthers Creek Watershed Plan Study

Map 1B

The Water Resource System is essential to maintaining the long-term ecosystem resilience and sustainability of the Carruthers Creek watershed.

MANAGEMENT RECOMMENDATION
2.1.1 refers to this map.

Map 1B includes the key hydrologic areas that comprise the WRS. See **Map 1A** for key hydrologic features.



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Carruthers Creek Watershed Plan: Water Resource System - Map B

0 0.5 1 2 3 KM

Key Hydrologic Areas
- Highly Vulnerable Aquifers
- Significant Groundwater Recharge Areas
- Ecologically Significant Groundwater Recharge Areas

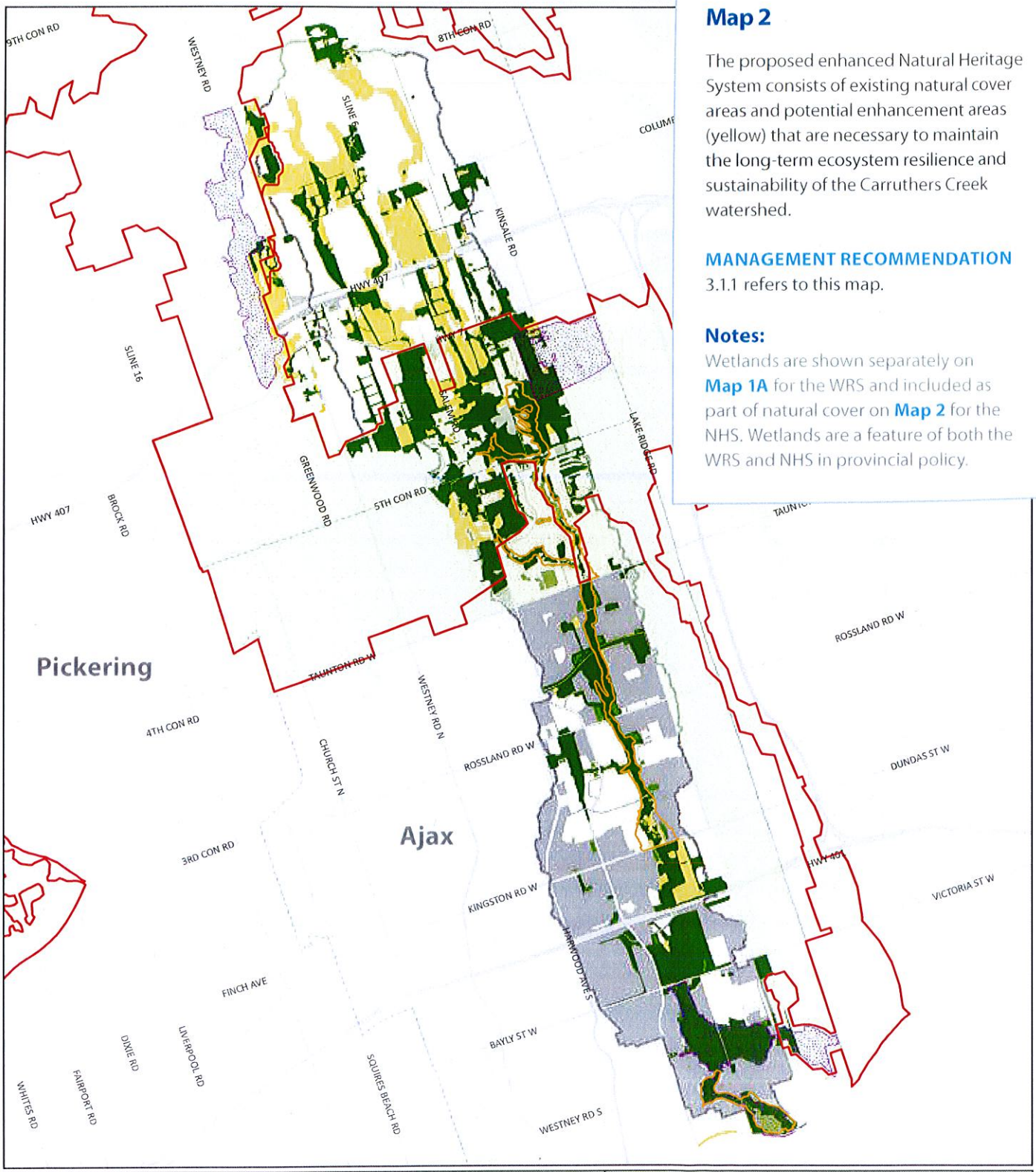
Municipal Boundary
- Carruthers Creek Watershed Boundary
- Carruthers Creek Watershed Plan Study

Map 2

The proposed enhanced Natural Heritage System consists of existing natural cover areas and potential enhancement areas (yellow) that are necessary to maintain the long-term ecosystem resilience and sustainability of the Carruthers Creek watershed.

MANAGEMENT RECOMMENDATION
3.1.1 refers to this map.

Notes:
Wetlands are shown separately on **Map 1A** for the WRS and included as part of natural cover on **Map 2** for the NHS. Wetlands are a feature of both the WRS and NHS in provincial policy.



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Carruthers Creek Watershed Plan: Enhanced Natural Heritage System

0 0.5 1 2 3 KM

- Valleyland
- ANSI
- Natural Cover (Existing)
- Natural Cover (Potential)
- Provincial NHS
- Municipal Boundary
- Greenbelt Boundary
- Carruthers Creek Watershed Boundary
- Carruthers Creek Watershed Plan Study Area

Land Use

- Natural
- Rural
- Urban

Map 3

This map represents both priority hydrological and ecological connectivity (i.e. habitat connectivity) improvements.

MANAGEMENT RECOMMENDATION
1.1.4 refers to this map.

The hydrological crossings are where roads intersect with the stream network and have been identified as needing improved infrastructure (e.g. culverts).

The ecological crossings are road segments that are priorities for improved infrastructure to facilitate wildlife crossings.

These priorities are intended for when the identified portions of roads are undergoing maintenance or upgrades.

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Carruthers Creek Watershed Plan: Priority Crossing Improvements

0 0.5 1 2 3 KM

- Priority Hydrologic Crossings Improvement Areas
- Priority Ecological Connectivity Areas
- Watercourse
- Greenbelt Boundary
- Carruthers Creek Watershed Boundary
- Carruthers Creek Watershed Plan Study Area

Land Use
- Natural
- Rural
- Urban
- Municipal Boundary

Note: Priorities shown in this map are for regional roads only

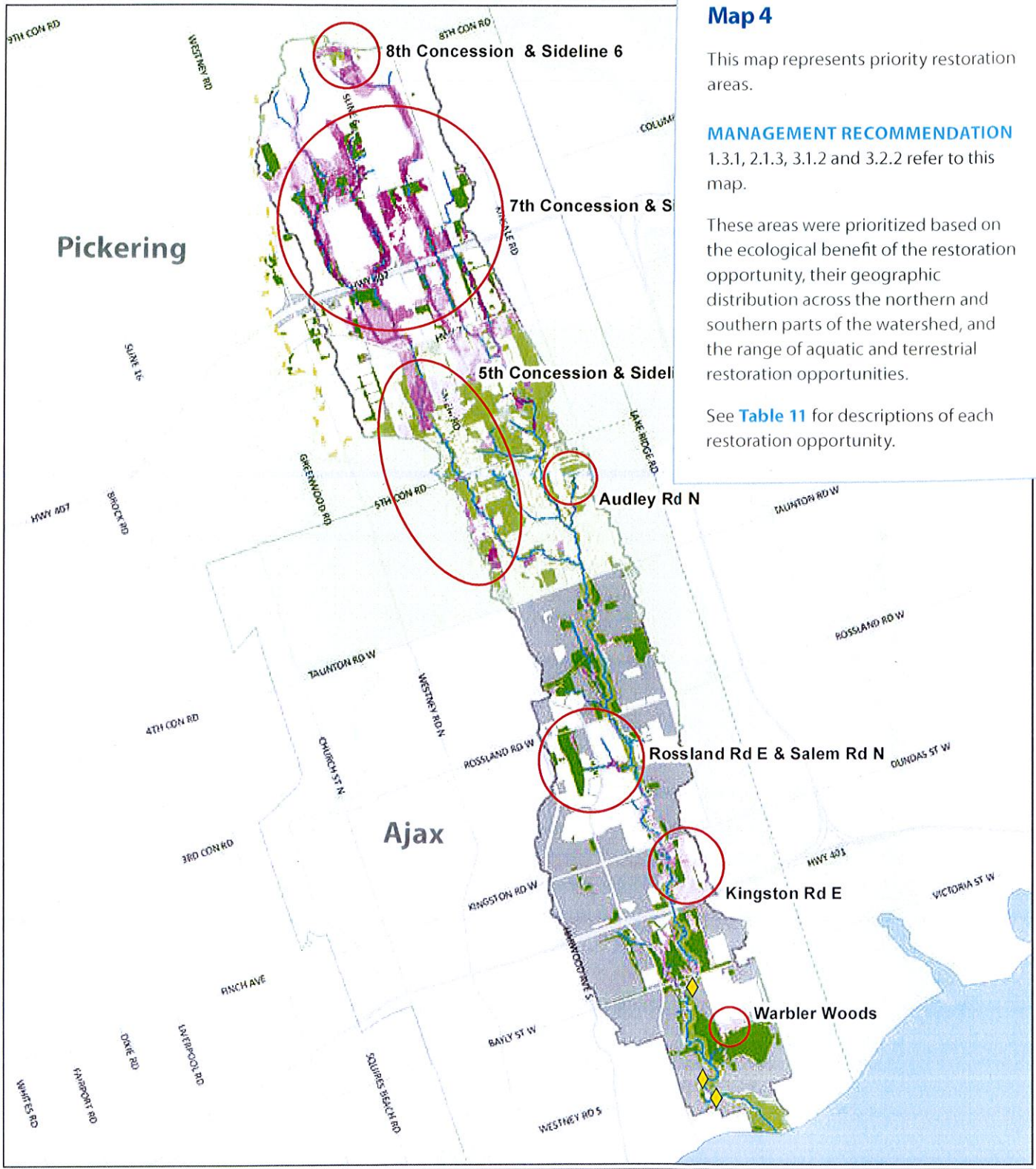
Map 4

This map represents priority restoration areas.

MANAGEMENT RECOMMENDATION
1.3.1, 2.1.3, 3.1.2 and 3.2.2 refer to this map.

These areas were prioritized based on the ecological benefit of the restoration opportunity, their geographic distribution across the northern and southern parts of the watershed, and the range of aquatic and terrestrial restoration opportunities.

See **Table 11** for descriptions of each restoration opportunity.



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Carruthers Creek Watershed Plan: Restoration Priorities

0 0.5 1 2 3 KM

- Erosion Priority Restoration Sites
- Restoration Opportunity Priority Areas
- Municipal Boundary
- Watercourse
- Greenbelt Boundary
- Carruthers Creek Watershed Boundary
- Carruthers Creek Watershed Plan Study Area

Land Use
- Natural
- Rural
- Urban

Ecological Benefit of Restoration Opportunity
- Highest Benefit

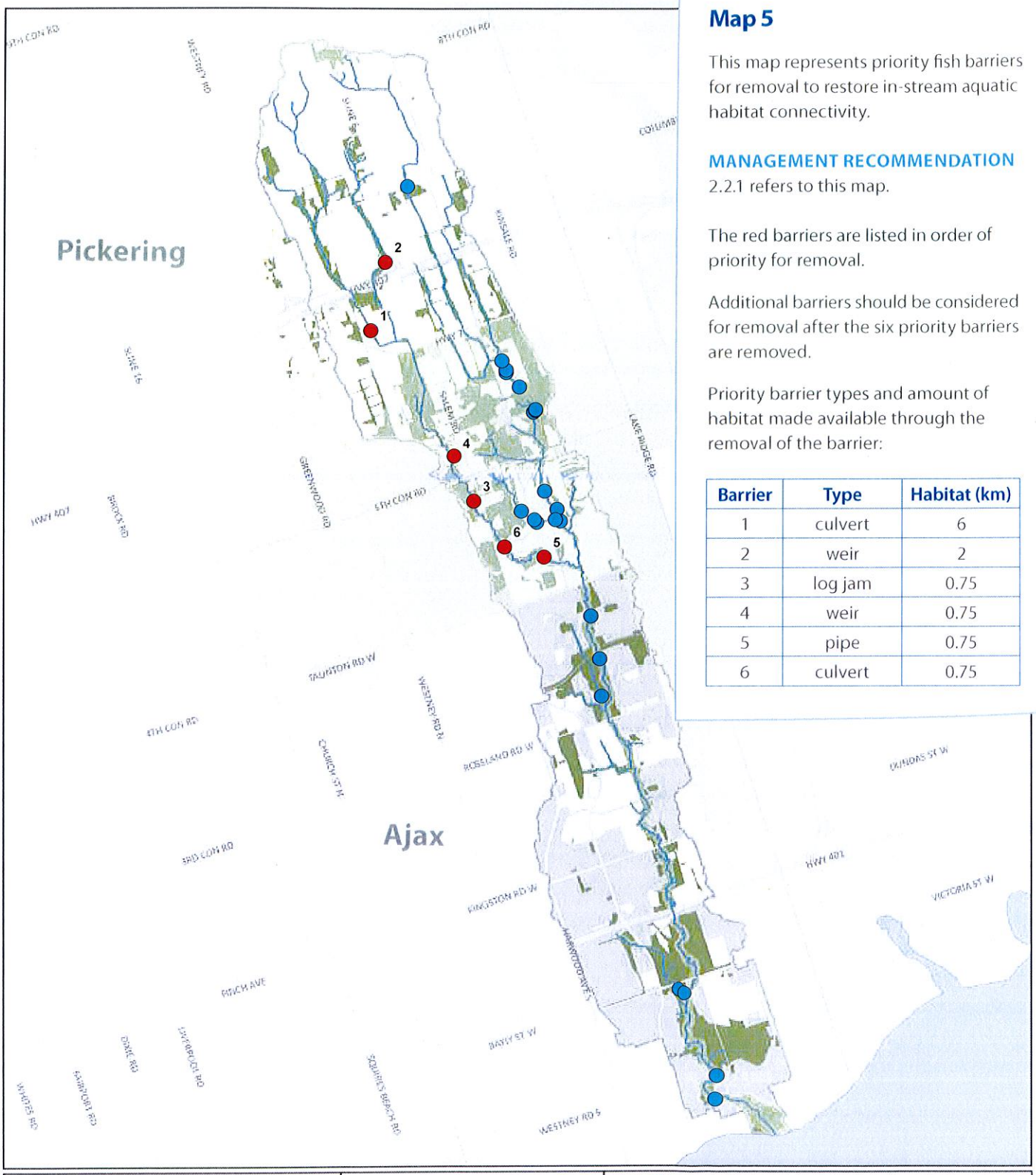
Restoration Opportunity Planning for Carruthers Creek

Restoration opportunity planning is TRCA's current process for identifying and recording site-level information for terrestrial and aquatic restoration opportunities (e.g. wetland, riparian, forest, meadow and stream restoration). TRCA's Integrated Restoration Prioritization (IRP) tool is used to help select priority restoration opportunities where ecological impairments exist and, if restored, could contribute most to the terrestrial natural heritage and water resource systems.

Restoration opportunities in the Caruthers watershed were originally identified using desktop assessment techniques as per the restoration opportunity planning methodology. For the Carruther's Creek Watershed Plan, a more detailed prioritization method using additional data identified the most important areas to consider for restoration. This involved combining the IRP scores with the criteria listed in management recommendations 2.1.3 for aquatic and 3.1.2 for terrestrial. TRCA then overlaid these scores with the restoration opportunity planning information to identify the highest scoring areas, which are circled in **Map 4** (Note: the Audley Road N opportunity was selected for meadow restoration potential in support of management recommendation 3.2.2).

TABLE 11:
Restoration Opportunity Summaries

Location	Restoration Opportunity
8th Concession and Sideline 6	• Forest, wetland, stream and riparian restoration opportunities have been identified in areas of residential and agricultural land uses. • Forest restoration will help connect and expand existing forest to the north. • Large-scale wetland and riparian restoration would restore headwater drainage feature functions and benefit downstream habitat. Existing land use patterns have altered streams, wetlands and riparian areas. • With agriculture as the predominant land-use, the focus of restoration should be to work with property owners to restore and maintain marginal lands that do not negatively impact agricultural use but promote best management practices and contribute to the potential enhanced natural heritage system.
7th Concession and Sideline 6	• Forest, wetland, stream and riparian restoration opportunities were identified in this largely agricultural area. • Highest priority areas include riparian corridors and around existing forest patches. • Portions in the north-east and along hydro corridors of this area provide meadow restoration opportunities. • Areas of wetland restoration will increase habitat diversity, contribute to the reduction of run-off and increase water infiltration and storage.
5th Concession and Sideline 6	• Forest, wetland, riparian and meadow restoration opportunities were identified in this priority area. • Restore large area of wetland and riparian habitat in the northern portion of this area. • Meadow habitat can be created along the hydro corridor running east to west in this area. • Existing forests can be expanded along the proposed enhanced NHS.
Audley Road North	• Restore wetland and meadow habitat to the east of the stream, in collaboration with golf course. • Meadow restoration potential in the hydro corridor to the south of the area to support habitat for sensitive species.
Rossland Road East and Salem Road North	• Restore riparian buffer to the west of the main branch of the creek and create a forest buffer between future development and the NHS. • Work with developer to restore wetlands and riparian corridors and encourage the use of best management practices such as low impact development and buffers as part of any development.
Kingston Road East	• Restore riparian cover along the main channel of Carruthers Creek. • Restore large wetlands to the east of this area and plant riparian and forest habitat around the wetlands. • Restore ponds in floodplain north of Kingston Road East to enhance wetland habitat and connect corridor along the stream network.
Kingston Road East	• Restore wetland habitat north of existing wetland to provide a buffer between this area and potential development.
Warbler Woods	• Restore wetland habitat north of existing wetland to provide a buffer between this area and potential development.



Map 5

This map represents priority fish barriers for removal to restore in-stream aquatic habitat connectivity.

MANAGEMENT RECOMMENDATION
2.2.1 refers to this map.

The red barriers are listed in order of priority for removal.

Additional barriers should be considered for removal after the six priority barriers are removed.

Priority barrier types and amount of habitat made available through the removal of the barrier:

Barrier	Type	Habitat (km)
1	culvert	6
2	weir	2
3	log jam	0.75
4	weir	0.75
5	pipe	0.75
6	culvert	0.75

Map 6

This map represents priority areas for public land securement. It is focused south of Taunton Road due to the amount of existing development in that area.

MANAGEMENT RECOMMENDATION
3.1.3 refers to this map.

This map does not imply the entirety of the identified areas should become public ownership, but rather where to focus securement efforts when opportunities arise.

These areas are in close proximity to existing public land ownership and the main channel of Carruthers Creek.

Notes:
Should development proceed north of Taunton Rd., the priority securement areas would be the existing and potential natural cover areas identified as part of the recommended NHS on **map 2**.

Toronto and Region Conservation Authority

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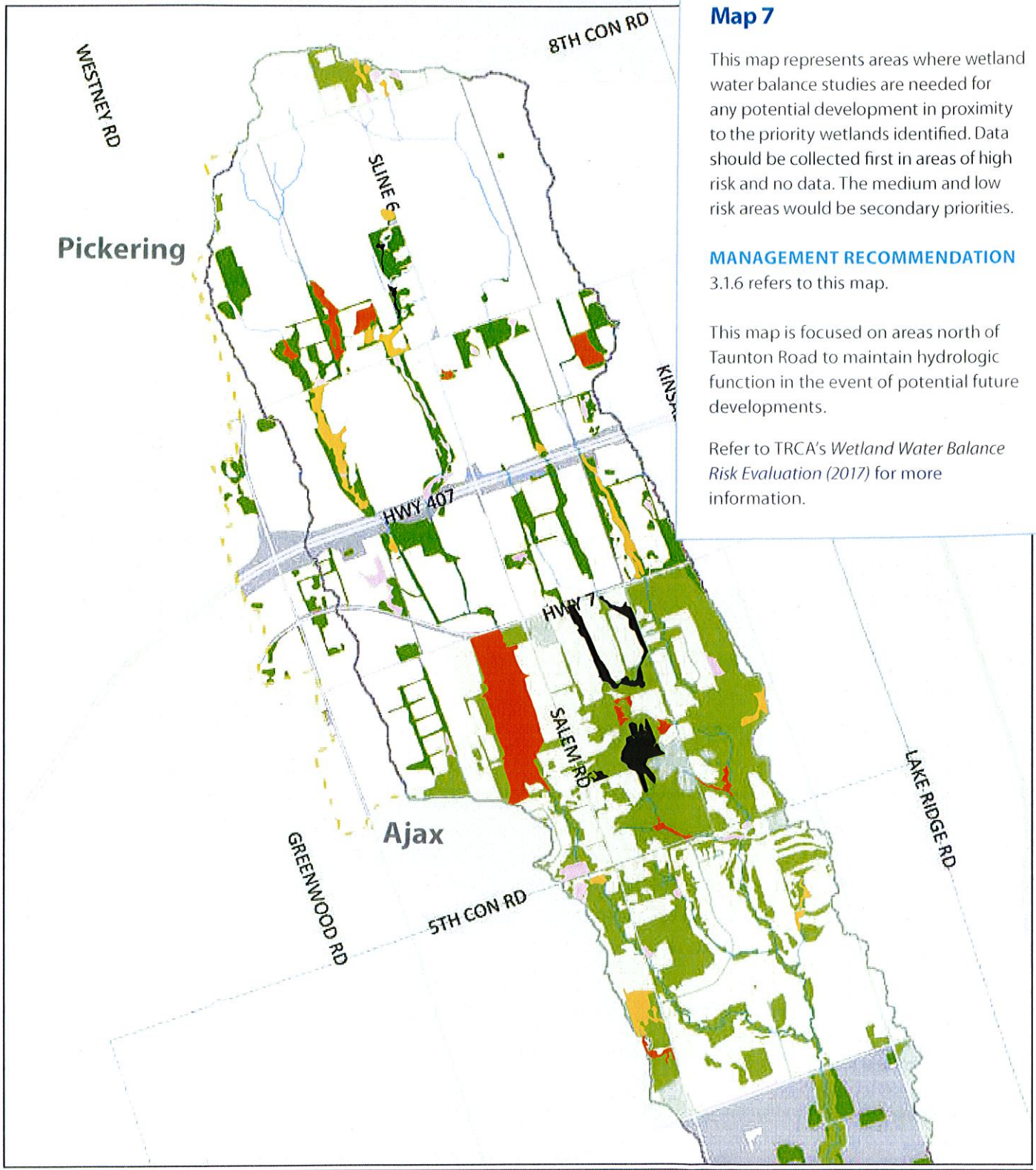
Carruthers Creek Watershed Plan: Priority Securement Areas

0 0.4 0.8 1.6 KM

- Priority Securement Areas
- Municipal Boundary
- Watercourse
- Inland Lakes
- Greenbelt Boundary
- Carruthers Creek Watershed Boundary
- Carruthers Creek Watershed Plan Study Area

Land Use
- Natural
- Rural
- Urban



Map 7

This map represents areas where wetland water balance studies are needed for any potential development in proximity to the priority wetlands identified. Data should be collected first in areas of high risk and no data. The medium and low risk areas would be secondary priorities.

MANAGEMENT RECOMMENDATION
3.1.6 refers to this map.

This map is focused on areas north of Taunton Road to maintain hydrologic function in the event of potential future developments.

Refer to TRCA's *Wetland Water Balance Risk Evaluation (2017)* for more information.

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Carruthers Creek Watershed Plan: Wetland Water Balance Study Priorities

0 0.5 1 KM

Wetland Priorities*
- No Data
- High
- Medium
- Low
- Municipal Boundary
- Watercourse

Greenbelt Boundary
Carruthers Creek Watershed Boundary
Carruthers Creek Watershed Plan Study Area

Land Use
- Natural
- Rural
- Urban

*Classifications based on TRCA Wetland Water Balance Risk Evaluation framework

Map 8

This map represents areas to prioritize tree conservation and tree planting within the developed portion of the watershed (i.e. urban forestry projects).

MANAGEMENT RECOMMENDATION
3.2.2 refers to this map.

This map is focused on areas south of Taunton Road due to the urbanized nature of that part of the watershed.

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Carruthers Creek Watershed Plan: Priority Urban Forestry Areas

0 0.25 0.5 1 KM

- Road Priorities
- Parks in Priority Neighbourhoods
- Priority Conservation Neighbourhood
- Priority Planting Neighbourhoods
- Municipal Boundary
- Watercourse
- Greenbelt Boundary
- Carruthers Creek Watershed Boundary
- Carruthers Creek Watershed Plan Study Area

Land Use

- Natural
- Rural
- Urban

FIGURE 9
Subwatershed Quality Due to Impervious Cover

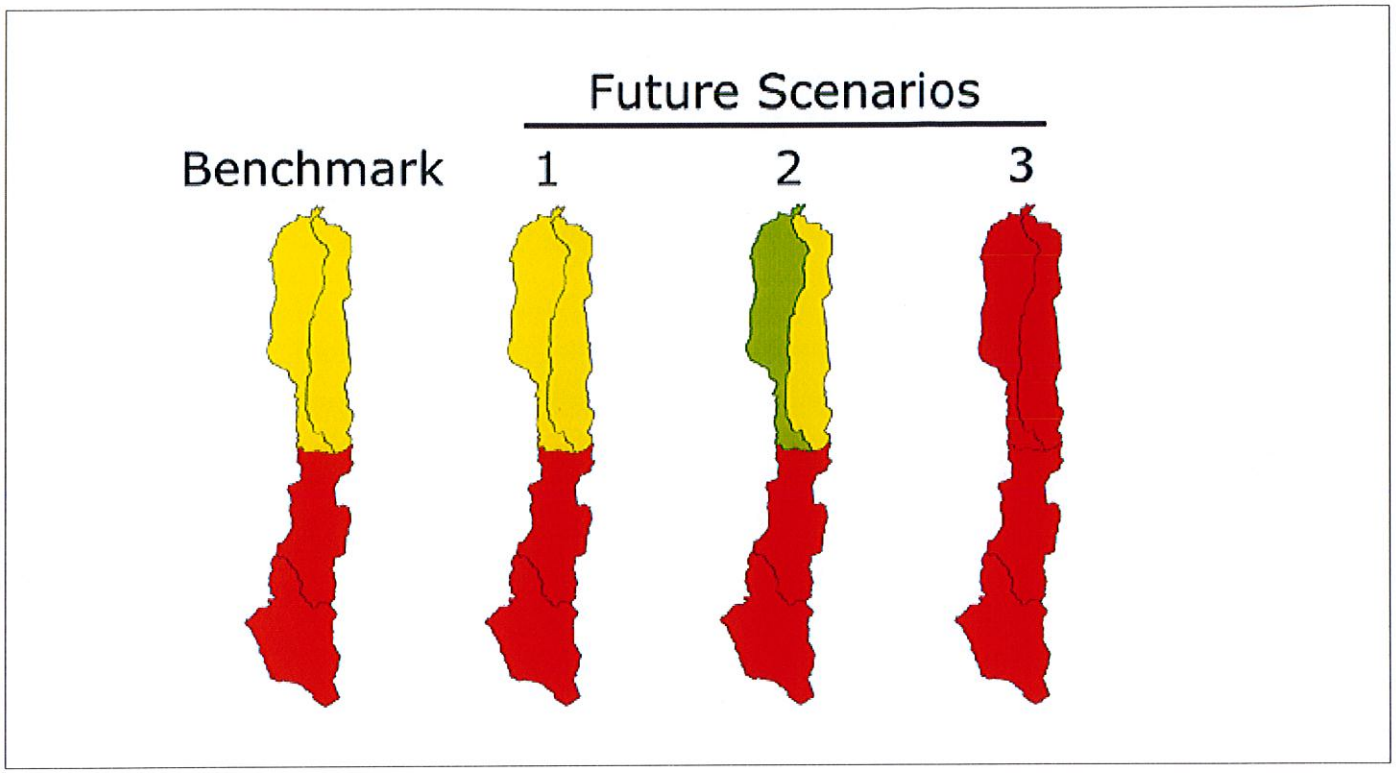

Figure 9

As discussed in **Table 4** for the aquatic health of the WRS, subwatershed quality was assessed based on impervious cover under the existing benchmark conditions and the three future scenarios. The proposed enhanced NHS benefits the aquatic ecosystem in scenario 2 where the north-west subwatershed improves from good – fair to good. The increase in impervious cover associated with scenario 3 results in all four subwatersheds degrading to fair – poor conditions, and will likely result in the loss of Redside Dace, a listed endangered species, within the Carruthers Creek watershed. Implementing the management recommendations identified in this watershed plan, especially limiting impervious cover and undertaking restoration activities will help Redside Dace habitat.

The rating scale for subwatershed quality is based on the amount of impervious cover, with:

- Good (green) = 0 to 10% imperviousness
- Good – fair (yellow) = 10 to 25% imperviousness
- Fair – poor (red) = greater than 25% imperviousness

Notes: the percent imperviousness identified in **Subsection 4.3** is for the entire watershed; while the subwatersheds may have different imperviousness values (e.g. Scenario 1 has 30% imperviousness across the entire watershed, whereas imperviousness by subwatershed is as follows: 10% north-west, 11% north-east, 53% central and 49% south).

See Aquatic Impact Assessment technical report for more information.

8. Glossary

Aquifer

A saturated permeable geologic unit that can transmit significant quantities of groundwater under ordinary hydraulic gradients. They can be classified as confined or unconfined. In southern Ontario, aquifers are typically comprised of sand and/or gravel, or fractured limestone.

Source: TRCA's Living City Policies, 2014

Biodiversity

The variability among organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species and ecosystems.

Source: TRCA's Living City Policies, 2014

Ecological Integrity

Which includes hydrologic integrity, means the condition of ecosystems in which,

a. the structure, composition and function of the ecosystems are unimpaired by stresses from human activity,
b. natural ecological processes are intact and self-sustaining,
c. the ecosystems evolve naturally.

Source: Greenbelt Plan, 2017

Ecosystem Services

The benefits provided by ecosystems that are critical to the environment's life support systems and that contribute to human welfare both directly and indirectly and therefore represent social and economic value.

Source: TRCA's Living City Policies, 2014

Green Infrastructure

Natural and human-made elements that provide ecological and hydrologic functions and processes. Green infrastructure can include components such as natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces, and green roofs.

Source: Growth Plan, 2019

Headwater Drainage Features

Ill-defined, non-permanently flowing drainage features that may not have defined beds and banks.

Source: TRCA's Living City Policies, 2014

Highly Vulnerable Aquifer

Aquifers, including lands above the aquifers, on which external sources have or are likely to have a significant adverse effect.

Source: Growth Plan, 2019

Hydrologic Function

The functions of the hydrologic cycle that include the occurrence, circulation, distribution and chemical and physical properties of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere, and water's interaction with the environment including its relation to living things.

Source: Growth Plan, 2019

Hydrogeology

A science that describes the movement of groundwater, and its interaction with water that moves on the ground surface in rivers, lakes, streams, and over land. Groundwater seeps into the ground to varying depths and collects in aquifers. Groundwater can remain stored underground for periods ranging from a few days to thousands of years.

Source: TRCA's Living City Policies, 2014

Hydrology

The engineering science that analyzes the different components of the hydrologic cycle, and takes into account that the natural cycle can be altered by human and natural activities.

Source: TRCA's Living City Policies, 2014

Life Science Areas of Natural and Scientific Interest (ANSIs)

An area that has been identified as having life science values related to protection, scientific study, or education; and further identified by the Ministry of Natural Resources and Forestry using evaluation procedures established by that Ministry, as amended from time to time.

Source: Growth Plan, 2019

Low Impact Development

An approach to stormwater management that seeks to manage rain and other precipitation as close as possible to where it falls to mitigate the impacts of increased runoff and stormwater pollution. It typically includes a set of site design strategies and distributed, small-scale structural practices to mimic the natural hydrology to the greatest extent possible through infiltration, evapotranspiration, harvesting, filtration, and detention of stormwater. Low impact development can include, for example: bio-swales, vegetated areas at the edge of paved surfaces, permeable pavement, rain gardens, green roofs, and exfiltration systems. Low impact development often employs vegetation and soil in its design, however, that does not always have to be the case and the specific form may vary considering local conditions and community character.

Source: Growth Plan, 2019

Natural Hazards *(Consisting of Erosion Hazard and Flooding Hazard)*

EROSION HAZARD

Means the loss of land, due to human or natural processes, that poses a threat to life and property.

FLOODING HAZARD

Means the inundation of areas adjacent to a shoreline or a river or stream system not ordinarily covered by water.

Source: PPS, 2014

Natural Heritage System

A system made up of natural heritage features and areas, and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems. The system can include key natural heritage features, key hydrologic features, federal and provincial parks and conservation reserves, other natural heritage features and areas, lands that have been restored or have the potential to be restored to a natural state, associated areas that support hydrologic functions, and working landscapes that enable ecological functions to continue.

Source: Growth Plan, 2019

Negative Impacts

Means:

a. in regard to policy 1.6.6.4 and 1.6.6.5 degradation to the quality and quantity of water, sensitive surface water features and sensitive ground water features, and their related hydrologic functions, due to single, multiple or successive development.

b. in regard to policy 2.2, degradation to the quality and quantity of water, sensitive surface water features and sensitive ground water features, and their related hydrologic functions, due to single, multiple or successive development or site alteration activities;
c. in regard to fish habitat, any permanent alteration to, or destruction of fish habitat, except where, in conjunction with the appropriate authorities, it has been authorized under the Fisheries Act; and
d. in regard to other natural heritage features and areas, degradation that threatens the health and integrity of the natural features or ecological functions for which an area is identified due to single, multiple or successive development or site alteration activities.

Source: PPS, 2014

Regional (flood) Control

Stormwater management control of flood flows from the regional storm event (Hurricane Hazel) to mitigate increases in flood risk associated with development (urbanization).

Source: TRCA's Living City Policies, 2014

Riparian

The areas adjacent to water bodies such as streams, wetlands and shorelines. Riparian areas form transitional zones between aquatic and terrestrial ecosystems.

Source: TRCA's Living City Policies, 2014

Seepage Areas and Springs

Sites of emergence of groundwater where the water table is present at the ground surface.

Source: Growth Plan, 2019

Significant Groundwater Recharge Area

An area that has been identified:

a. as a significant groundwater recharge area by any public body for the purposes of implementing the PPS, 2014;
b. as a significant groundwater recharge area in the assessment report required under the Clean Water Act, 2006; or
c. as an ecologically significant groundwater recharge area delineated in a subwatershed plan or equivalent in accordance with provincial guidelines.

For the purposes of this definition, ecologically significant groundwater recharge areas are areas of land that are responsible for replenishing groundwater systems that directly support sensitive areas like cold water streams and wetlands.

Source: Growth Plan, 2019

Sustainable Community Retrofits

Focus on actions in older, urban neighbourhoods by retrofitting buildings and infrastructure, regenerating habitats and urban ecology, and revitalizing a community's social fabric. TRCA's Sustainable Neighbourhood Action Program provides examples of sustainable community retrofits.

Source: Sustainable Neighbourhood Action Program, TRCA, 2020

Urban Forest

All trees, shrubs and understorey plants, as well as the soils that sustain them, on public and private property within an urban setting.

Source: TRCA's Living City Policies, 2014

Vegetation Protection Zone

A vegetated buffer area surrounding a key natural heritage feature or key hydrologic feature.

Source: Growth Plan, 2019

Water Balance

The hydrologic cycle of precipitation, groundwater infiltration, evapotranspiration (into the atmosphere and by plant interception), and surface runoff. .

Source: TRCA's Living City Policies, 2014

Water Resource System

A system consisting of ground water features and areas and surface water features (including shoreline areas), and hydrologic functions, which provide the water resources necessary to sustain healthy aquatic and terrestrial ecosystems and human water consumption. The water resource system will comprise key hydrologic features and key hydrologic areas.

Source: Growth Plan, 2019

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Developed in collaboration with
the Town of Ajax and City of Pickering

DURHAM REGION

Toronto and Region Conservation Authority

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The Regional Municipality of Durham
Information Report

From:	Commissioner of Finance
Report:	#2020-INFO-19
Date:	March 13, 2020

Subject:

Economic Update – Current Risks and Uncertainty

Recommendation:

Receive for information.

Report:

1. Purpose

1.1 The Regional Finance Department monitors economic conditions on an ongoing basis and prepares periodic summary reports to Regional Council. The economy, both domestically and internationally, has recently experienced significant shocks that have created uncertainty with respect to future economic conditions. The following is a brief summary that could have implications for both Regional expenditures and revenues.

2. Major Economic Risks

2.1 The global economy is currently facing tremendous risk with uncertainty surrounding the spread of COVID-19 (novel coronavirus). The threat of the virus has produced a global economic shock affecting both aggregate demand (consumption) and aggregate supply (production). As a result of the virus, policy makers have been forced to adjust macroeconomic policies towards settling the fears and stabilizing the economy.

2.2 The global economy is also facing uncertainty with respect to oil prices as disputes between Russia and Saudi Arabia are impacting supply and prices.

2.3 In addition to these global risks, the Canadian economy has been dealing with labour disputes and rail blockades which have impacted domestic production.

2.4 Most estimates on the Canadian economy have GDP growth slowing in the first quarter of 2020. Some estimates also have GDP growth turning negative in the second quarter of 2020 before turning positive again in the third quarter.

COVID-19 (novel coronavirus)

2.5 The fear of the spread of COVID-19 has had a significant impact on the global economy. The United Nations has estimated that global exports declined by $50 billion in February 2020 alone. The decline in international exports is largely due to restricted trade with China, which is one the world's largest manufacturers of goods.

2.6 Domestic production in China has significantly declined as a result of COVID-19, with the country's Purchasing Manager's Index (an important index of production) dropping 22 points in February. This equates to a 2 per cent reduction in annualized exports and is the lowest PMI level since 2004.

2.7 The production decline in China is having spillover effects on some of the world's largest trading partners. The United Nations Conference on Trade and Development (UNCTAD) suggests that the production decline in China has had a $15.6 billion impact on the European Union economy, with a $5.8 billion and $5.2 billion impact on the American and Japanese economies respectively.

2.8 In terms of Canadian trade, Canadian international merchandise trade for January 2020, as reported by Statistics Canada, showed significant reductions in imports and exports with China. Exports to China fell 8.6 per cent in January, with imports from China declining 12.1 per cent. China is Canada's second largest trading partner behind the United States.

2.9 Continued reductions in international trade are expected until signs begin to emerge that COVID-19 is being contained.

Global Oil Prices and Production

2.10 The fallout from COVID-19 and its impact on Chinese economic output is having a corresponding impact on oil production. China accounts for approximately one-third of the world's new oil consumption each year. As Chinese manufacturing declines significantly, so to does its demand for oil.

2.11 As global demand for oil declines, the Organization of the Petroleum Exporting Countries (OPEC) and its allies typically agree to cut production in order to stabilize prices. However, a disagreement between Saudi Arabia and Russia on how much production to cut led to a breakdown in talks and no agreement being made.

2.12 In response, Saudi Arabia aggressively cut the world selling price of its oil and is considering increasing production of its oil above 10 million barrels per day, up from the current 9.7 million.

2.13 The reaction of Saudi Arabia caused oil prices to drop 24 per cent on March 9th, 2020, the first day of trading after the announcement, which was the second highest decline in single day trading on record.

2.14 Continued tensions between Russia and Saudi Arabia will perpetuate uncertainty about oil prices and production, which could lead to increased price volatility in the near future.

2.15 The Canadian economy relies on oil exports as a major contributor to economic output. Canada sells its Western Canadian Crude oil in Canadian dollars on the global market. If the price of oil declines, it will lead to a decrease in demand for Canadian dollars as foreign consumers would require less Canadian dollars to purchase the same amount of oil. The resulting effect would be a decline in the price and strength of the Canadian dollar relative to other currencies.

3. Financial Market Reaction

3.1 The impacts of COVID-19, combined with oil price volatility, have caused major instability in the financial markets.

3.2 Since the outbreak of COVID-19, the world's largest equity markets have experienced extreme volatility associated with uncertainty around production and consumption. Since the end of February, the New York Stock Exchange (NYSE) saw the S&P 500 Index swing up and down by 2 per cent for four consecutive days. This type of volatility has not been seen since the financial crises of 2008.

3.3 On March 9th, 2020 the S&P 500 Index fell 7 per cent after the start of trading, causing a circuit breaker to kick in that halted trading on the NYSE for fifteen minutes. Trading was also halted on the Toronto Stock Exchange after a 10 per cent decline.

3.4 Similar volatility has been seen in international equity markets in Europe and Asia. The uncertainty around equities has driven investors toward fixed income securities, such as bonds and government debt securities.

3.5 The influx of cash towards fixed income securities has caused a dramatic decrease in bond yields. The bond yields on all U.S Treasury Bills, from short term to 30-year maturities, fell below one percent for the first time in history on March 9th, 2020.

3.6 On March 9th, 2020, Canadian bond yields also suffered a dramatic decline with the 10-year Government of Canada Benchmark Bond yielding 0.53 per cent.

4. Monetary Policy Response

4.1 In response to the economic impacts and financial market reactions, Central Banks have begun taking actions to calm the fears, stimulate aggregate demand and stabilize the economy.

4.2 On March 3rd the U.S Federal Reserve announced an emergency 50 basis point cut to its federal funds rate ahead of its scheduled policy meetings on March 19 - 20. This was the first time that the Federal Reserve cut its rate outside its regularly scheduled meetings since the 2008 financial crises.

4.3 The Bank of Canada followed suit by cutting its key interest rate target by 50 basis points to 1.25 per cent. This was the first interest rate cut by the Bank of Canada since 2015. It is widely expected that the bank will initiate further rate cuts in the coming months.

4.4 The Australian Central Bank also cut its key interest rate by 25 basis points while the Bank of England will be making a decision at their next scheduled meeting at the end of the March.

4.5 The European Central Bank (ECB) will be making a decision on interest rates at its next meeting on March 12th. The ECB has not cut interest rates as of yet; however, they have also not raised rates since the financial crises of 2008. The deposit rate at the ECB is currently -0.5 per cent.

4.6 Central Banks have all stated that fears of a continued spread of COVID-19 is the reason for the rate cuts. The cuts are meant to encourage business investment, stimulate the global supply chain, and increase consumer spending.

5. Federal Government Response

5.1 On March 11th, 2019, the Government of Canada announced $1.0 billion in funding to help provincial healthcare systems deal with the increasing number of COVID-19 cases in Canada, as well as to provide financial assistance to Canadian workers who have been forced into self-isolation.

5.2 The federal government will provide $500 million to provincial and territorial healthcare systems for the purchase of medical gear and supplies, such as face masks.

5.3 The federal government will direct $275 million toward medical research focused on developing a vaccine and conducting clinical trials. This funding is in addition to the previously announced research funding of $27 million.

5.4 An additional $100 million will be directed toward enhanced surveillance, increased testing at the National Microbiology Laboratory, and ongoing support for preparedness in First Nations and Inuit communities. The federal government will also be providing $50 million in aid to help the World Health Organization address the global outbreak.

5.5 In order to assist Canadian workers, the federal government will waive the mandatory one-week wait period for claiming Employment Insurance sickness benefits for workers under quarantine or mandatory self-isolation.

5.6 The government is also enhancing the Work-Sharing program to support employers and employees experiencing a downturn in business activity as a result of COVID-19. These enhancements will double the time that employers and employees are eligible to use Work-Share from 38 to 76 weeks. The Work-Share program helps keep employees employed and able to receive income support while hours of work have been reduced.

6. Additional Domestic Disruptions

6.1 In addition to COVID-19, the Canadian economy has been dealing with its own domestic supply shocks in the form of labour disputes and rail blockades.

6.2 The ongoing labour dispute among teachers in Ontario caused actual hours worked in educational services to decline in February 2020. Although the actual hours worked had declined, the actual levels of employment were unchanged from January.

6.3 The labour dispute at CN Rail caused major disruptions to Canadian international merchandise trade. In November 2019, Canadian merchandise exports declined by 1.4 per cent and imports declined by 2.4 per cent.

6.4 Additional rail disruptions occurred over January and February when protesters set up rail blockades across Canada. The effects of these blockades on the Canadian economy will likely negatively impact Canadian GDP in the first quarter of 2020.

7. Conclusions

7.1 A number of global and domestic economic shocks have occurred over the last few months. The full economic impact of COVID-19 has not yet been realized as uncertainty remains as to when the virus will be contained. The economic impacts will become clearer when GDP estimates for the first quarter of 2020 are released at the end of May.

7.2 The Regional Finance Department will continue to monitor economic conditions and provide timely updates as required.

Respectfully submitted,

Original Signed By

Nancy Taylor, BBA, CPA, CA
Commissioner of Finance and Treasurer

If this information is required in an accessible format, please contact 1-800-372-1102 ext. 2564

The Regional Municipality of Durham
Information Report

From:	Commissioner of Planning and Economic Development
Report:	#2020-INFO-20
Date:	March 13, 2020

Subject:

Economic Development and Tourism Annual Report 2019

Recommendation:

Receive for information

Report:

1. Purpose

1.1 The purpose of this report is to provide Council with a brief overview of the 2019 Economic Development and Tourism Division's activities and programs.

2. Background

2.1 The Economic Development and Tourism Division provides updates on its activities and programming to the Planning and Economic Development Committee regularly. The Annual Activity Report is presented as a high-level summary in addition to these regular updates.

2.2 The Annual Report reflects activities undertaken by the various sections of the Division which include Business Development & Investment, Agri-Business & Rural Economic Development, Marketing and Cluster Development, Tourism, and Broadband.

2.3 In addition, the Annual Report includes an economic snapshot, and spotlights on entrepreneurship and innovation initiatives, sector development initiatives, highlights from Sport Durham and Film Durham, as well as awards and recognized achievements.

3. Conclusion

3.1 The Economic Development and Tourism Division Annual Report will be produced on an annual basis going forward.

4. Attachments

Attachment #1: Durham Region Economic Development and Tourism Annual Report 2019

Respectfully submitted,

Original signed by

Brian Bridgeman, MCIP, RPP
Commissioner of Planning and
Economic Development

Invest Durham

2019 Durham Region

Economic Development and Tourism Annual Report

2019 Year in Review

- Economic Snapshot
- Business Investment and Attraction
- Entrepreneurship and Innovation
- Tourism
- Rural and Agriculture
- Film Durham
- Marketing
- Awards

I found myself inspired time after time during the past year as Durham's Director of Economic Development and Tourism, and energized by the innovative community that we serve.

Durham Region is growing rapidly, and transformation is underway. New post-secondary programs are announced all the time, designed to equip our talented students for the needs of a changing economy. Exciting developments are underway in our tourism sector. We're home to an emerging cannabis cluster. A new tech business accelerator opened in Durham Region in 2019, and our businesses, institutions, and partners are all working together as an innovation community.

From the over 2000 visitors who supported our agri-business sector during the Gates Open farm tours, to the thousands of fans who supported athletes at the 2019 Durham Region Ontario Parasport Games, our residents came together to show their community spirit.

As our economy transitions, and technology and innovation-focused sectors grow, the entrepreneurial spirit of our community shone through. Businesses across the Region that served more traditional industries pivoted, adapted, and diversified their business models to take advantage of emerging opportunities.

The ability to pivot is central to business, but also to any organization. This year, Durham Region Economic Development has been transforming as well. We are focusing more on our local employers, and what we can do to support their growth. We have refreshed and modernized our brand under Invest Durham, and developed new economic development strategies to attract new investment and jobs. It has also been exciting to collaborate with many new partners across our vibrant innovation community.

At the heart of what we do—and why we do it—is our team's support for the growth and prosperity of our community. And I'm full of optimism about what we can do next.

Simon Gill
Director, Economic Development and Tourism

Economic Snapshot

Durham Region is one of the fastest growing municipalities in Ontario, experiencing a **13% growth in population from 2008 to 2018.***

*Ontario Ministry of Health

1,200,000
Durham Region's expected population by 2041

12,599
Businesses in Durham Region (2018)

$581 million
of non-residential investment in Durham Region in 2018

27%
of businesses indicated they plan to hire in the next year (2018)

Business Investment Highlights

The following non-exhaustive list details some key new businesses, strategic investments and retained/expanded businesses in Durham Region in 2019. Please note that this list does not include any retail or franchise opportunities and may include opportunities that our team did not directly support.

Durham Live, Entertainment Facility, Pickering
Construction underway and expected 2020 opening of the Pickering Casino Resort

Le Spa Nordik, Whitby
World-class spa facility, construction underway

Port Lands Silos, Oshawa
State-of-the-art grain-handling terminal located at the Port of Oshawa

Toyota Facility, Clarington
Parts distribution and management

Ontario Power Generation, Clarington
Announcement of new HQ in Clarington

1855 Whitby
Innovation Accelerator opens downtown Whitby

Responded to 132 Business Investment Inquiries

5 International Investment Missions

CannaPiece Corp, Clarington
Construction begins on new facility, part of Durham Region's emerging cannabis cluster

Durham College, Oshawa and Whitby
Esports Arena opens and construction begins on new skilled trades training facility

Trent University Durham GTA, Oshawa
Construction begins on campus expansion

General Motors, Oshawa
Development of the 55-acre Canadian Technical Centre McLaughlin Advanced Technology Track is announced

Entrepreneurship and Innovation

Invest Durham supported a wide range of innovation and entrepreneurship organizations and initiatives, including:

- Business Advisory Centre Durham (BACD)
- Spark Centre & Spark Angels
- 1855 Whitby & the 1855 Masterclass Series
- Ajax 1nnovation Village
- Clarington Innovation Cell Development Project
- Access IO
- Brock Youth Centre (now Building Youth Capacity)
- Canada's Innovation Corridor Summit with Toronto Region Board of Trade
- Enable AI
- Geekspeak Hackathon

Sector Development Initiative

Cybersecurity Month in Durham Region

In 2019 Invest Durham grew awareness of Cybersecurity and Esports industries through support of and attendance at numerous events; the CISO Forum in Niagara Falls, October Cybersecurity Month events across Durham Region, and the Global Cyberlympics Finals hosted at Durham College, with teams from 15 countries.

Tourism Activities

8,548
Monthly consumer e-newsletter subscribers

5,200
Monthly industry e-newsletter subscribers

64,680
Engagements on social media

57,000
Tourism publications distributed

Sport Tourism Initiative

Sport Durham delivered the successful multi-sport **2019 Ontario Parasport Games**, creating economic impact in Durham Region of $680,000 and a legacy fund of $112,000

Rural and Agriculture

564
Bi-monthly industry e-newsletter subscribers

38%
Growth in number of social media followers 2019

20
Ag and Rural workshops supported

2,000+
Visitors Hosted at **Gates Open 2019**

Film Durham

Approximately
1,000 Attendees
at 3 Film Industry Career Fairs

22% Increase
in Film and Television Production from 2018 to 2019

DURHAM REGION DRIFF INTERNATIONAL FILM FESTIVAL

178
Domestic and international films submitted at **2019 Durham Region International Film Festival (DRIFF)**

Marketing Activities

Launched Invest Durham LinkedIn and Twitter accounts in July 2019

2019:
236 Followers
420 Interactions

2019:
193 Followers
662 Page views

Invest Durham Brand Refresh

New InvestDurham.ca
website launched in October 2019

Refreshed Invest Durham branding
launched in December 2019

Invest Durham Marketing Initiative

In 2019 the Invest Durham team produced the first DNext: Innovation and Investors Summit, a sold-out one-day conference designed to advance a strategic investment narrative for Durham Region. 100% of attendees indicated they found the event valuable and would recommend it to a friend.

Awards

Economic Developers Council of Ontario (EDCO) Awards of Excellence

Lieutenant Governor's Award, Best Economic Development Initiative of 2019:
Durham Region 2019 Ontario Parasport Games

Award of Excellence for Tourist Attraction and Tourism Product Development:
Durham Region 2019 Ontario Parasport Games

Award of Excellence for Sector or Project Specific Strategic Plan:
Growing Resilience: Durham Region Agriculture Sector Climate Adaptation Strategy

Honourable Mention for Sector or Project Specific Strategic Plan:
Connecting Our Communities: A Broadband Strategy for Durham Region

Economic Developers Association of Canada (EDAC) Marketing Canada Awards

Winner 2019 – Single Publication under four pages award:
Durham Tourism Monthly E-Newsletter

AVA Digital Awards

Gold Award – Invest Durham Website

Durham Region Awards of Excellence

Lori Talling for outstanding dedication and leadership as Games Manager in organizing and bringing the 2019 Ontario Parasport Games to the Region.

Emily Barker, Kristyn Chambers, Roberta Honeyford for dedication and innovative support on the iCreate Working Group to ensure quality, efficient website information management and expert knowledge of complex working tools.

Emily Barker for development of the Hello Tomorrow: Durham Smart Cities Forum to engage the community in innovative solutions addressing economic, social and environmental challenges.

Invest Durham
Economic Development and Tourism Office
605 Rossland Road East, Fifth Floor
Whitby, Ontario L1N 6A3
Office: +1-905-668-7711

Durham Region, Ontario, Canada
InvestDurham.ca

Interoffice Memorandum

Date: **March 13, 2020**

To: **Health & Social Services Committee**

From: **Dr. Robert Kyle**

Subject: **Health Information Update – March 6, 2020**

Health Department

Please find attached the latest links to health information from the Health Department and other key sources that you may find of interest. Links may need to be copied and pasted directly in your web browser to open, including the link below.

You may also wish to browse the online Health Department Reference Manual available at Board of Health Manual, which is continually updated.

Boards of health are required to "superintend, provide or ensure the provision of the health programs and services required by the [Health Protection and Promotion] Act and the regulations to the persons who reside in the health unit served by the board" (section 4, clause a, HPPA). In addition, medical officers of health are required to "[report] directly to the board of health on issues relating to public health concerns and to public health programs and services under this or any other Act" (sub-section 67.(1), HPPA).

Accordingly, the Health Information Update is a component of the Health Department's 'Accountability Framework', which also may include program and other reports, Health Plans, Quality Enhancement Plans, Durham Health Check-Ups, business plans and budgets; provincial performance indicators and targets, monitoring, compliance audits and assessments; RDPS certification; and accreditation by Accreditation Canada.

Respectfully submitted,

Original signed by

R.J. Kyle, BSc, MD, MHSc, CCFP, FRCPC, FACPM
Commissioner & Medical Officer of Health

"Service Excellence for our Communities

UPDATES FOR HEALTH & SOCIAL SERVICES COMMITTEE
March 6, 2020

Health Department Media Releases/Publications

https://tinyurl.com/s42q4yd
- Novel Coronavirus (2019-nCoV) Update #5 (Feb 11)

https://tinyurl.com/rfbkc3m
- Rifampin Shortage (Feb 12)

https://tinyurl.com/shw6t2s
- COVID-19 Update #6 (Feb 27)

https://tinyurl.com/rce686l
- COVID-19 Update #7 (Mar 2)

https://tinyurl.com/w9voexg
- COVID-19 Update #8 (Mar 3)

GOVERNMENT OF CANADA

Canada Border Services Agency

https://tinyurl.com/uwvfwld
- Canada Border Services Agency Year in Review highlights (Feb 25)

Department of Justice Canada

https://tinyurl.com/wzr75f6
- Government of Canada proposed changes to medical assistance in dying legislation (Feb 24)

Deputy Minister's Office

https://tinyurl.com/vcshdpw
- Deputy Minister Chrystia Freeland convenes the new Cabinet Committee on the federal response to the coronavirus disease (COVID-19) (Mar 5)

Employment and Social Development Canada

https://tinyurl.com/tw6wrmq
- Over 1 million Canadians have been lifted out of poverty since 2015 (Feb 24)

Environment and Climate Change Canada

https://tinyurl.com/srjvdyn
- Government of Canada will defend federal climate action in the Supreme Court (Feb 24)

Innovation, Science and Economic Development Canada

https://tinyurl.com/tgezc8d
- Roadmap for Open Science to reduce barriers and speed up discovery (Feb 26)

Global Affairs Canada

https://tinyurl.com/rr4bbq4

- Government of Canada repatriates more Canadians and their families from Wuhan, China (Feb 11)

https://tinyurl.com/tg2zqvk

- Government of Canada evacuating Canadians on board Diamond Princess cruise ship (Feb 15)

https://tinyurl.com/srojtye

- Government of Canada repatriates Canadians and their families from Diamond Princess cruise ship in Japan (Feb 21)

Health Canada

https://tinyurl.com/wznfo4q

- Intergovernmental forum concludes that Canada is well prepared to respond to a nuclear or radiological emergency (Feb 19)

https://tinyurl.com/wfsdatf

- Health Minister Patty Hajdu tables Canada Health Act Annual Report in Parliament (Feb 24)

Public Health Agency of Canada

https://tinyurl.com/sj7hwjk

- Government of Canada Repatriates Canadians and their families from the Epicentre of the 2019-nCoV Outbreak in China (Feb 8)

https://tinyurl.com/snbk7ot

- Statement from the Chief Public Health Officer of Canada on the release of selected individuals from quarantine for 2019 novel coronavirus (Feb 9)

https://tinyurl.com/qkhakxh

- Update: Statement from the Chief Public Health Officer of Canada on the release of selected individuals from quarantine for 2019 novel coronavirus (Feb 10)

https://tinyurl.com/us77dur

- Update #2: Statement from the Chief Public Health Officer of Canada on the release of selected individuals from quarantine for 2019 novel coronavirus (Feb 10)

https://tinyurl.com/qvdawge

- Government of Canada Supports Initiatives to Stop Violence and Support Survivors (Feb 12)

https://tinyurl.com/v4q6ech

- Update #3: Statement from the Chief Public Health Officer of Canada on the release of selected individuals from quarantine for 2019 novel coronavirus (Feb 12)

https://tinyurl.com/r8fnh3h
- The Government of Canada releases Federal Framework on Posttraumatic Stress Disorder (Feb 13)

https://tinyurl.com/tvqjdbd
- Update #4: Statement from the Chief Public Health Officer of Canada on the release of selected individuals from quarantine for 2019 novel coronavirus (Feb 15)

https://tinyurl.com/uvvp8sl
- Statement from the Chief Public Health Officer on the release of repatriated Canadians from quarantine following 14-day stay at CFB Trenton (Feb 21)

https://tinyurl.com/ucj33ay
- Update #5: Statement from the Chief Public Health Officer on the release of selected individuals from quarantine for the 2019 novel coronavirus (Feb 23)

https://tinyurl.com/vsbyvw8
- Update: Statement from the Chief Public Health Officer on the release of the repatriated Canadians from quarantine following 14-day stay at CFB Trenton (Feb 25)

https://tinyurl.com/sybp5ua
- Update #6: Statement from the Chief Public Health Officer on the release of selected individuals from quarantine for the 2019 novel coronavirus (Feb 26)

https://tinyurl.com/sun5znv
- Statement from the Chief Public Health Officer on the release of repatriated Canadian from quarantine following 14-day stay at the NAV CENTRE (Mar 6)

Transport Canada
https://tinyurl.com/wzdvkk8
- Minister of Transport updates Ministerial Order to reduce the risks of derailment of trains transporting dangerous goods (Feb 16)

https://tinyurl.com/v88mjtp
- Statement by Minister of Transport on unsafe behaviour around railways (Feb 17)

GOVERNMENT OF ONTARIO

Ministry of the Attorney General
https://tinyurl.com/tekqfpd
- Ontario Launches Consultations on Expanding Cannabis Business Opportunities (Feb 10)

Ministry of Colleges and Universities
https://tinyurl.com/wmnx8g9
- Ontario Offering Greater Choice for Nursing Students (Feb 11)

Ministry of Education

https://tinyurl.com/sjk4g9e

- Ontario Combatting Bullying in Schools through Student Survey (Feb 26)

Ministry of Energy, Northern Development and Mines

https://tinyurl.com/tmrljea

- Minister Rickford Reinforces Ontario's Commitment to Develop Small Modular Reactor Technology (Feb 28)

Ministry of Finance

https://tinyurl.com/r429qwq

- Ontario to Release 2020 Budget on March 25 (Mar 4)

Ministry of Health

https://tinyurl.com/tqp9r4m

- Ontario Improving Access to the Right Care in the Right Place (Feb 10)

https://tinyurl.com/ur9fzay

- Ontario Confirms Resolved Case of the 2019 Novel Coronavirus (Feb 12)

https://tinyurl.com/s8k9skt

- Improving Quality and Delivery of Mental Health and Addiction Services (Feb 19)

https://tinyurl.com/v6yytrf

- Ontario Confirms Presumptive Case of COVID-19 (Feb 23)

https://tinyurl.com/rgzznlj

- Ontario Modernizing the Delivery of Home and Community Care (Feb 25)

https://tinyurl.com/wabuun6

- Ontario Confirms Positive Case of COVID-19 (Feb 26)

https://tinyurl.com/utumanu

- Ontario Confirms Positive Case of COVID-19 (Feb 27)

https://tinyurl.com/yx4mqs3q

- Ontario Confirms New Positive Case of COVID-19 (Feb 28)

https://tinyurl.com/u2m9j5n

- Ontario Protecting Children and Youth from Dangers from Vaping (Feb 28)

https://tinyurl.com/s9ypymo

- Ontario Confirms New Positive Case of COVID-19 (Feb 28)

https://tinyurl.com/wnwbw8k

- Ontario Confirms New Positive Cases of COVID-19 (Feb 29)

https://tinyurl.com/wvnvx9x

- Ontario Confirms New Positive Cases of COVID-19 (Mar 1)

https://tinyurl.com/wmto3d3
- Ontario Implementing Enhanced Measures to Safeguard Public from COVID-19 (Mar 2)

https://tinyurl.com/v5tyh29
- Ontario Unveils Plan to Build Mental Health and Addictions System (Mar 3)

https://tinyurl.com/rpjd3lz
- Ontario Confirms New Positive Cases of COVID-19 (Mar 3)

https://tinyurl.com/wlntk8p
- Ontario Confirms New Positive Cases of COVID-19 (Mar 5)

https://tinyurl.com/v75q8mr
- Ontario Confirms New Positive Cases of COVID-19 (Mar 6)

Ministry of Heritage, Sport, Tourism and Culture Industries
https://tinyurl.com/w52kynb
- Statement from Minister Elliott and MacLeod on the 2019 Novel Coronavirus (COVID-19) (Mar 6)

Ministry of Long-Term Care
https://tinyurl.com/wk7fkqm
- Ontario Taking Action on Key Recommendations from Public Inquiry into the Safety and Security of Residents in Long-Term Care Homes System (Feb 13)

Ministry of the Solicitor General
https://tinyurl.com/r8eegxv
- Ontario's Emergency Management System Made Stronger Following False Alarm at Pickering Nuclear Plant (Feb 27)

Office of the Premier
https://tinyurl.com/vtmvh2q
- Ontario Releases a New and Comprehensive Strategy to Combat Human Trafficking (Mar 6)

OTHER ORGANIZATIONS

Association of Local Public Health Agencies
https://tinyurl.com/w3cjayy
- Cannabis Letter (Feb 27)

https://tinyurl.com/ros93ap
- Vaping Letter (Mar 6)

https://tinyurl.com/r4w6tj9
- COVID-19 and Public Heath Modernization Letter (Mar 6)

Association of Municipalities of Ontario
https://tinyurl.com/rd7vys3
- Public Health Modernization Response (Feb 10)

https://tinyurl.com/wpomets
- Emergency Health Services Modernization Response (Feb 10)

Canadian Institutes of Health Research
https://tinyurl.com/vobsu6s
- Government of Canada invests $27M in coronavirus research (Mar 6)

Canadian Medical Association
https://tinyurl.com/r3j2ubz
- New report a roadmap for accelerating virtual health services in Canada (Feb 11)

Canadian Nuclear Safety Commission
https://tinyurl.com/vsnaebp
- International peer review concludes that Canada has strong regulatory practices (Feb 18)

Centre for Addiction and Mental Health
https://tinyurl.com/rmtk6nf
- Ontario student use of e-cigarettes and cannabis edibles on the rise (Feb 20)

Financial Accountability Office of Ontario
https://tinyurl.com/t6k6eel
- FAO releases Report on the Oversight, Growth and Distribution of Tax Expenditures in Ontario (Feb 19)

Heart and Stroke Foundation
https://tinyurl.com/uj28wh2
- STATEMENT: Heart & Stroke encouraged by study about new drug that protects the brain after stroke (Feb 20)

ICES
https://tinyurl.com/vxpepey
- People living with HIV diagnosed with COPD 12 years younger than HIV-negative people, study finds (Feb 18)

https://tinyurl.com/tq5jny7
- 75% of people with heart failure die in hospital, researchers find providing end-of-life care doubles likelihood of dying at home (Feb 20)

https://tinyurl.com/u8xapy4
- Reports on the way doctors prescribe antipsychotic medications in nursing homes change prescribing habits (Feb 24)

Insurance Bureau of Canada
https://tinyurl.com/wbdnftj
- Climate adaption estimated to cost municipalities $5.3 billion annually (Feb 27)

Office of the Auditor General of Canada
https://tinyurl.com/wsxzu9p
- CBSA and CSC did not do enough to maintain workplaces free of harassment, discrimination and violence (Feb 18)

Patient Ombudsman
https://tinyurl.com/u842p9x
- Year Three Highlights (Feb 25)

Public Health Ontario
https://tinyurl.com/yx3yh8fy
- PHO Communications (Feb 11)

https://tinyurl.com/ujrgzo8
- Hepatitis C in Ontario, 2018 (Feb 27)

Residential and Civil Construction Alliance of Ontario
https://tinyurl.com/v5unylv
- Ontario must tackle hallway medicine with seniors' housing near hospitals: report (Feb 18)

Resources Productivity & Recovery Authority
https://tinyurl.com/vnb2veu
- Government Approves New Regulation for Batteries (Feb 27)

Trillium Gift of Life Network
https://tinyurl.com/t2gu7ag
- Ontario Sets New Record Highs for Organ Donation and Transplantation 2019 (Feb 11)

Afreen Raza

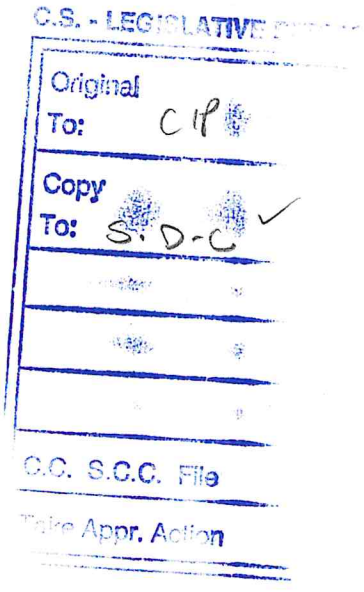
From: Hannah Leznoff <HLeznoff@oshawa.ca>
Sent: March 10, 2020 2:05 PM
To: 'gapcommittee@outlook.com'
Cc: Stephanie Sinnott; Clerks
Subject: Correspondence from Oshawa City Council
Attachments: Correspondence_GAP_Committee_FIN-20-17.pdf

Good afternoon,

Please find attached correspondence sent on behalf of Oshawa City Council.

With thanks,

Hannah Leznoff, Council and Committee Coordinator | City of Oshawa
905-436-3311 ext. 2433 | 1-800-667-4292
HLeznoff@oshawa.ca | www.oshawa.ca
"Dedicated to serving our community."



Oshawa®

Corporate Services Department
City Clerk Services

File: A-2100

March 10, 2020

DELIVERED BY E-MAIL
(gapcommittee@outlook.com)

The Gap Committee

Re: First Light Foundation of Hope Warming Station Additional Funding

Oshawa City Council considered the above matter at its meeting of February 18, 2020 and adopted the following recommendation of the Finance Committee:

"Whereas on December 16, 2019, Oshawa Council authorized the City's Chief Administrative Officer to enter into an agreement with the First Light Foundation of Hope to provide a seven day per week warming station in the City of Oshawa by adding Sunday, Monday, Tuesday, Wednesday to the schedule and the time of service be extended to no later than April 30, 2020 at a cost of approximately $30,000 and be funded from the 2019 Our Program and that the agreement be in a form that is acceptable to the Chief Administrative Officer and City Solicitor; and,

Whereas for First Light Foundation of Hope to provide a seven night a week overnight warming station from December 18, 2019 until March 14, 2020 by adding Sunday, Monday, Tuesday and Wednesday to the schedule the cost to the City is $30,000 as the Region of Durham is funding the cost for Thursday, Friday and Saturday; and,

Whereas First Light Foundation of Hope has advised the cost to extend the schedule and provide an overnight warming station seven nights a week from March 15, 2020 until April 30, 2020 is $28,000; and,

Whereas the Region of Durham will provide $15,000 to share the cost of the extended schedule,

Therefore be it resolved:

1. That Oshawa Council approve additional funding of up to $13,000 to extend the warming station seven nights a week from March 15, 2020 until April 30, 2020 and be funded from the 2020 Our Program; and,

2. That the City of Oshawa include information regarding these services on the City of Oshawa website and that a copy of this resolution be provided to the Region of Durham and The Gap Committee."

If you need further assistance concerning the above matter, please contact Stephanie Sinnott Commissioner, Finance Services/Treasurer at the address listed below or by telephone at 905-436-3311.

Mary Medeiros
City Clerk

/hl

c. Region of Durham
Finance Services

Afreen Raza

From: info
Sent: March 5, 2020 4:17 PM
To: Afreen Raza
Subject: FW: Resolution- Call for a solution to the ongoing Coastal GasLink and Rail Disruption situations.
Attachments: Coastal GasLink Project.pdf

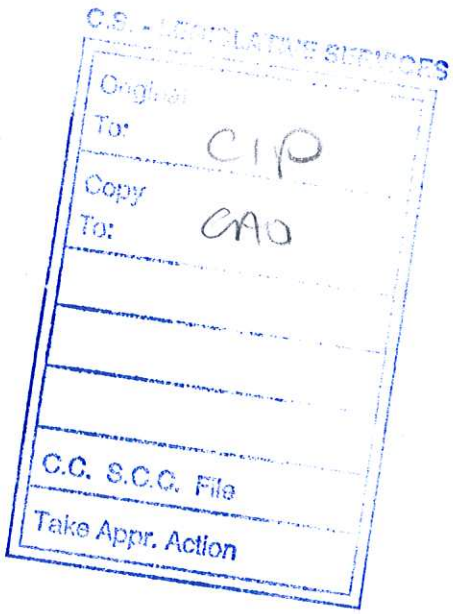
cip

From: Brad Roach <clerk@tyendinagatownship.com>
Sent: March 4, 2020 2:20 PM
To: Township of Tyendinaga <info@tyendinagatownship.com>
Subject: Resolution- Call for a solution to the ongoing Coastal GasLink and Rail Disruption situations.

On behalf of Reeve Phillips and the Council of the Township of Tyendinaga I am sending you correspondence regarding the ongoing Coastal GasLink situation and the ongoing demonstrations surrounding it.
Best Regards,

Brad Roach
CAO (Chief Administrative Officer)
Clerk-Treasurer
The Corporation of the Township of Tyendinaga
859 Melrose Road, Shannonville, ON, K0K 3A0
(613) 396-1944 | clerk@tyendinagatownship.com
www.tyendinagatownship.com

HASTINGS
Tyendinaga
COUNTY



HASTINGS
Tyendinaga
COUNTY

The Corporation of the Township of Tyendinaga
Reeve, Rick Phillips
March 3, 2020

March 3, 2020

Re: New Business- Motion of Support for a peaceful conclusion to the ongoing rail disruptions and encouragement for ongoing discussions for a solution to the Costal GasLink Project.

At its meeting of March 2, 2020, the Council of the Corporation of the Township of Tyendinaga ratified a motion, regarding the support for a peaceful conclusion to the ongoing rail disruptions and encouragement to find a path a peaceful solution regarding the Costal GasLink Project.

"WHEREAS the dispute regarding the Coastal Gas Link Project in British Columbia is continuing;

AND WHEREAS the dispute has directly affected both the Township of Tyendinaga and the Mohawks of the Bay of Quinte;

AND WHEREAS a resolution of the situation lies in discussion and negotiations with the appropriate parties;

NOWTHEREFORE the Corporation of the Township of Tyendinaga calls on those parties to work together to find a successful and peaceful resolution of the pipeline matter as quickly as possible;

AND FINALLY that the Township urges all municipalities and municipal organizations across the Country to support the parties involved in their search for a resolution of this critically important matter."

Best Regards,

Brad Roach
CAO (Chief Administrative Officer)
Clerk-Treasurer
The Corporation of the Township of Tyendinaga
859 Melrose Road, Shannonville, ON, K0K 3A0
(613) 396-1944 | clerk@tyendinagatownship.com
www.tyendinagatownship.com

West Nipissing Ouest

Joie de vivre
The Corporation of the Municipality of West Nipissing
La Corporation de la Municipalité de Nipissing Ouest
101-225, rue Holditch Street, Sturgeon Falls, ON P2B 1T1

P/T (705) 753-2250 (1-800-263-5359)
F/TC (705) 753-3950

March 5,2020

SENT VIA E-MAIL

Hon. John Yakabuski
Minister of Natural Resources and Forestry
Whitney Block 6th Flr Rm 6630,
99 Wellesley St W,
Toronto, ON M7A 1W3

Honourable Minister Yakabuski:

SUBJECT: LEGISLATIVE CHANGES IN BILL 132

At its regular meeting held on March 3, 2020, Council for the Municipality of West Nipissing passed resolution **2020/101**, attached hereto. The resolution supports a request circulated by the Township of Puslinch, supporting AMO's position on the legislative changes in Bill 132 with respect to the *Aggregate Resources Act* and the *Safe Drinking Water Act*.

We trust the enclosed is self-explanatory.

Respectfully,

Janice Dupuis

Deputy Clerk / Assistant to the
Chief Administrative Officer

\Encl.

cc: Minister of Health and Long-Term Care
Association of Municipalities of Ontario (AMO)
Ontario Municipalities

West Nipissing Ouest
Joie de vivre

The Corporation of the Municipality of West Nipissing /
La Corporation de la Municipalité de Nipissing Ouest

Resolution No.

2020 / 101

MARCH 3, 2020

Moved by / *Proposé par* :	Seconded by / *Appuyé par* :

WHEREAS the Municipality of West Nipissing received resolution no. 2020-010 from the Township of Puslinch supporting the Association of Municipalities of Ontario's (AMO) position on the Legislative Changes in Bill 132 with respect to the *Aggregate Resources Act* and the *Safe Drinking Water Act*;

BE IT RESOLVED THAT Council for the Municipality of West Nipissing also supports AMO's position on the Legislative Changes in Bill 132 with respect to the *Aggregate Resources Act* and the *Safe Drinking Water Act*, as supported by the Township of Puslinch;

BE IT FURTHER RESOLVED THAT a copy of this resolution be forwarded to the Ministry of Natural Resources and Forestry, the Ministry of Health and Long-Term Care, the Association of Municipalities of Ontario (AMO) and Ontario municipalities for their consideration.

	YEAS	NAYS
DUHAIME, Yvon		
FISHER, Christopher		
LARABIE, Roland		
MALETTE, Léo		
ROVEDA, Dan		
SÉGUIN, Jeremy		
SÉNÉCAL, Denis		
SÉNÉCAL, Lise		
SAVAGE, Joanne (MAYOR)		

CARRIED: _____

DEFEATED: _____

DEFERRED OR TABLED: _____

TOWNSHIP OF
PUSLINCH

February 20, 2020

RE: AMO's position on the Legislative Changes in Bill 132 with respect to the Aggregate Resources Act and the Safe Drinking Water Act.

Please be advised that Township of Puslinch Council, at its meeting held on January 2, 2020, considered the aforementioned topic and subsequent to discussion, the following was resolved:

Resolution No. 2020-010: Moved by Councillor Sepulis and
Seconded by Councillor Bailey

That Council receives the Intergovernmental item 7.9 Queens Park Update; and
That Council direct staff to send correspondence in support of AMO's position on the Legislative Changes in Bill 132 with respect to the Aggregate Resources Act and the Safe Drinking Water Act.

CARRIED

As per the above resolution, please accept a copy of this correspondence for your information and consideration.

Yours very truly,
Courtenay Hoytfox
Development and Legislative Coordinator

7404 Wellington Road 34, Puslinch, ON N0B 2J0
Tel: (519) 763-1226 Fax: (519) 763-5846 admin@puslinch.ca

Courtenay Hoytfox

From: AMO Communications <Communicate@amo.on.ca>
Sent: Monday, December 16, 2019 11:17 AM
To: Courtenay Hoytfox
Subject: Queen's Park Update - December 16, 2019

Association of Municipalities Ontario

December 16, 2019

Queen's Park Update

Cannabis

On December 12th, the government amended Ontario Regulation 478/18 under the *Cannabis License Act, 2018*. This opens Ontario's cannabis retail market in 2020. Retail applications begin on January 6, 2020 and the new changes in the regulation include:

- Ceasing the lottery for retail licenses
- Eliminating pre-qualification requirements for retailers
- Allowing licensed producers to open retail store connected to a production facility

On March 2, 2020, the restrictions on the total number of store authorizations permitted in the province will be revoked. Licensed operators will be allowed to have up to 10 stores until September 2020, up to 30 stores until September 2021 and up to 75 stores afterwards. Store applications will only be eligible in municipalities that have opted-in to sell cannabis.

For more information, visit www.agco.ca.

End of the Fall Legislative Session

The Legislative Assembly of Ontario ended its 2019 legislative session on December 12th and is adjourned until February 18, 2020. Here are some short summaries of Bills of municipal interest that have received Royal Assent.

Bill 132, *Better for People, Smarter for Business Act, 2019* – Received Royal Assent on Dec. 10th.

The legislative changes in Bill 132 of most municipal concern are to the *Aggregates Act*. While it is an improvement that a change will require an application process for below water table extraction, rather than just an amendment to a licence, it still allows the province to issue licences for below water table extraction while the *Safe Drinking Water Act*, Section 19 stipulates that owners of municipal drinking water sources are guilty of an offence if they fail to exercise care over a drinking water system, like a well. As aquafers are connected, a decision of the province to allow below water table extraction could lead to contamination of municipal drinking water sources.

Given the conflict between these two Acts, AMO had asked for a concurrent amendment to the *Safe Drinking Water Act* to indemnify Council members for decisions on *Aggregates Act* applications that the province makes. This amendment was not made to the legislation that now has Royal Assent. We believe this will result in municipal councils appealing all provincial decisions on below water table extraction to the Local Planning Appeal Tribunal (LPAT) to show appropriate due diligence.

As well through Bill 132, the *Highway Traffic Act* was amended to allow municipal governments to pass by-laws that will allow some off-road vehicles to be driven on municipal highways.

For more information on this omnibus bill, please refer to AMO's Bill 132 submission.

Bill 138, *Plan to Build Ontario Together Act, 2019* – Received Royal Assent on December 10th.

This omnibus Bill accompanied the 2019 Fall Economic Statement and affected 40 statutes. This included:

- Section 26.1 of the *Development Charges Act* is amended and will remove industrial development and commercial development from eligible development types that can be charged.
- Subsection 329 (2) of the *Municipal Act, 2001* and section 291 (2) of the *City of Toronto Act, 2006* has been amended regarding calculating property taxes when the permitted uses of land change.
- The *Supply Chain Management Act* specifies how the broader public sector may carry out supply chain management and procurement. AMO has confirmed that these provisions will not apply to municipalities.
- Section 37 of the *Planning Act* has been amended to set out a process for a person or public body to appeal a community benefits charge by-law to the Local Planning Appeal Tribunal.
- Section 40 (1) of the *Liquor Licence and Control Act* permits municipal councils to designate a recreational area under its jurisdiction to prohibit the possession of liquor.

Bill 136, *Provincial Animal Welfare Services Act, 2019* – Received Royal Assent on December 5th.

This bill creates an animal welfare framework. Under the Act, in the event of a conflict between a municipal by-law and the *Provincial Animal Welfare Services Act*, the provision that affords the greater protection to animals will prevail. The legislation

requires an implementation of a full provincial government-based animal welfare enforcement model.

The province has confirmed that all enforcement mechanisms will be performed by them.

Bill 124, *Protecting a Sustainable Public Sector for Future Generations Act*, 2019 – Received Royal Assent on November 7th.

Under Bill 124, broader public sector employee salary increases will be limited to 1% for the next three years. AMO has been assured that this Act does not apply to employers that are a municipality, a local board as defined in the *Municipal Act,* and persons and organizations that are appointed or chosen under the authority of a municipality.

AMO Contact:
You can contact AMO's Policy Team at policy@amo.on.ca or 416-971-9856.

Afreen Raza

From: noreply@www.durham.ca
Sent: February 28, 2020 10:28 AM
To: info
Subject: Resolution - Regional Government Review Report
Attachments: 2020-02-26 - Regional Government Review Reportf049dfa3-219f-43dd-9bd7-a1130180aabc.pdf

Good morning,

Please see the attached correspondence, as it pertains to a resolution adopted by the Township of North Dumfries Council.

Thanks,

Origin: https://www.durham.ca/Modules/contact/search.aspx?s=Yf68qh7v3ZGTb9SNJjRA3AeQuAleQuAl
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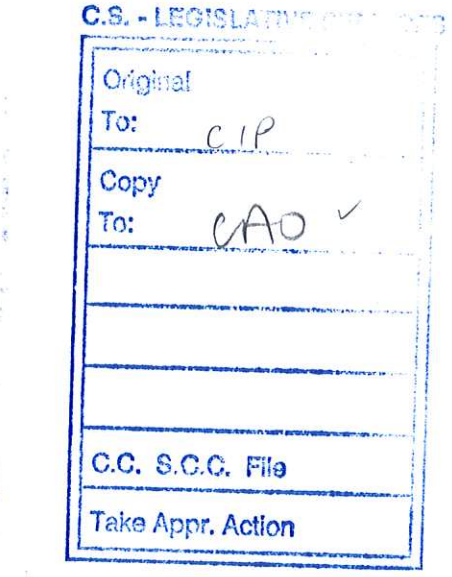
This email was sent to you by <asage@northdumfries.ca> through https://www.durham.ca.



The TOWNSHIP of
NORTH DUMFRIES
2958 Greenfield Road
PO Box 1060
Ayr, ON N0B 1E0

February 26, 2020

The Honourable Doug Ford, Premier of Ontario
Premier's Office, Room 281
Legislative Building, Queen's Park
Toronto ON M7A 1A1

RE: Regional Government Review Final Report

Dear Premier Ford:

This letter is to advise you that Township Council, at their Regular Council meeting held on February 24, 2020, passed the following resolution regarding the Regional Government Review Final Report, which was passed in response to the attached correspondence received from the City of Kitchener:

"WHEREAS in 2018 the Ontario Government announced it would appoint two special advisors to review eight regional municipalities, Simcoe County, and their lower-tier municipalities to ensure that the upper and lower-tier municipalities in these geographic areas are efficient and accountable to their residents and business; and,

WHEREAS in 2019 the Minister of Municipal Affairs and Housing received the complete report from the special advisors; and,

WHEREAS in October 2019, the Minister announced the regional review was complete, and made available $143 million to municipalities to help them lower costs and improve services for local residents; and further,

WHEREAS the Ontario Government has declined to make the final regional review report available to the public;

THEREFORE BE IT RESOLVED that the Ontario Government be urged to release the final report to the public in order for municipalities to make informed decisions regarding service delivery improvements;

BE IT FURTHER RESOLVED that if the Ontario Government does not wish to release the full and complete report, that specific recommendations and comments contained in the final report be provided to those municipalities affected;

BE IT FINALLY RESOLVED that this resolution be forwarded to the Honourable Premier of Ontario; Minister of Municipal Affairs and Housing; the Association of Municipalities of

Ontario; the Local Members of Provincial Parliament; and, to the eight regional municipalities, Simcoe County, and their lower-tier municipalities included in the regional review."

Sincerely,

Ashley Sage
Clerk
Township of North Dumfries
North Dumfries Community Complex
2958 Greenfield Road, P.O. Box 1060
Ayr, Ontario N0B 1E0

519-632-8800 ext. 122
asage@northdumfries.ca

JEFF BUNN
Manager, Council & Committee Services & Deputy City Clerk
Corporate Services Department
Kitchener City Hall, 2nd Floor
200 King Street West, P.O. Box 1118
Kitchener, ON N2G 4G7
Phone: 519.741.2200 x 7278 Fax: 519.741.2705
jeff.bunn@kitchener.ca
TTY: 519-741-2385

February 7, 2020

The Honourable Doug Ford, Premier of Ontario
Premier's Office, Room 281
Legislative Building, Queen's Park
Toronto ON M7A 1A1

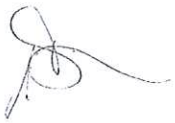
Dear Premier Ford:

This is to advise that City Council, at a meeting held on January 27, 2020, passed the following resolution regarding the Regional Government Review:

> "*WHEREAS in 2018 the Ontario Government announced it would appoint two special advisors to review eight regional municipalities, Simcoe County, and their lower-tier municipalities to ensure that the upper and lower-tier municipalities in these geographic areas are efficient and accountable to their residents and business; and,*
>
> *WHEREAS in 2019 the Minister of Municipal Affairs and Housing received the complete report from the special advisors; and,*
>
> *WHEREAS in October 2019, the Minister announced the regional review was complete, and made available $143 million to municipalities to help them lower costs and improve services for local residents; and further,*
>
> *WHEREAS the Ontario Government has declined to make the final regional review report available to the public;*
>
> *THEREFORE BE IT RESOLVED that the Ontario Government be urged to release the final report to the public in order for municipalities to make informed decisions regarding service delivery improvements;*
>
> *BE IT FURTHER RESOLVED that if the Ontario Government does not wish to release the full and complete report, that specific recommendations and comments contained in the final report be provided to those municipalities affected;*

BE IT FINALLY RESOLVED that this resolution be forwarded to the Honourable Premier of Ontario; Minister of Municipal Affairs and Housing; the Association of Municipalities of Ontario; the Local Members of Provincial Parliament; and, to the eight regional municipalities, Simcoe County, and their lower-tier municipalities included in the regional review."

Yours truly,



J. Bunn
Manager, Council & Committee Services/
Deputy City Clerk

c. Honourable Steve Clark, Minister of Municipal Affairs and Housing
Honourable Amy Fee, M.P.P.
Honourable Catherine Fife, M.P.P.
Honourable Belinda Karahalios, M.P.P.
Honourable Mike Harris, M.P.P.
Honourable Laura Mae Lindo, M.P.P.
Monika Turner, Association of Municipalities of Ontario
Kris Fletcher, Regional Clerk, Region of Waterloo
Ashley Sage, Clerk, Township of North Dumfries
Danielle Manton, City Clerk, City of Cambridge
Dawn Mittelholtz, Director of Information and Legislative Services / Municipal Clerk, Township of Wilmot
Grace Kosch, Clerk, Township of Wellesley
Olga Smith, City Clerk, City of Waterloo
Val Hummel, Director of Corporate Services/Clerk Township of Woolwich
John Daly, Simcoe County Clerk/Director, Statutory Services Corporation of the County of Simcoe
Kathy Pearl, Clerk, Township of Adjala-Tosorontio
Rebecca Murphy, Director of Corporate Services/Town Solicitor/Clerk, Town of Bradford West Gwillimbury
Pamela Fettes, Director, Legislative Services/Municipal Clerk, Clearview Township
Sara Almas, Clerk, Town of Collingwood
Lisa Lehr, Clerk, Township of Essa
Lee Parkin, Town Clerk, Town of Innisfil
Karen Desroches, Clerk, Town of Midland
Cindy Maher, Clerk, Town of New Tecumseth

Janette Teeter, Supervisor, Clerk's Services/Deputy Clerk, Township of Oro Medonte
Stacey Cooper, Clerk/Deputy CAO, Town of Penetanguishene
Cathy Wainman, Deputy Clerk, Township of Ramara
Sharon Goerke, Clerk, Township of Severn
Renee Ainsworth, Clerk, Township of Springwater
Allison Grey, Clerk, Township of Tay
Sue Walton, Director of Legislated Services/Clerk, Township of Tiny
Dina Lundy, Clerk, Town of Wasaga Beach

From: Cheryl Bandel
To: Sarah Penak
Subject: FW: Release of 'Protecting People and Property: Ontario's Flooding Strategy'
Date: March 10, 2020 12:56:04 PM

From: Great Lakes and Water Policy Section (MNRF) <mnrwaterpolicy@ontario.ca>
Sent: Monday, March 9, 2020 1:21 PM
Subject: Release of 'Protecting People and Property: Ontario's Flooding Strategy'

Hello,

Ontario is taking action to protect people and property by strengthening the province's preparedness for flooding because the safety of the public and the protection of our communities is our number one priority.

In response to Ontario's Special Advisor on Flooding report released last November, and the call from the communities around the province to address the issue of flooding, Ontario has released *Protecting People and Property: Ontario's Flooding Strategy*, available here. The Strategy introduces a series of new and enhanced actions that will help Ontario better prepare for, respond to, and recover from significant flood events.

You can also visit our updated webpage, ontario.ca/floods to find emergency preparedness information, including safety and flood mitigation tips for homeowners.

We look forward to continuing to work with you to build a more resilient Ontario.

Thank you

Water Resources Section
Policy Division
Ontario Ministry of Natural Resources and Forestry
mnrwaterpolicy@ontario.ca

If this information is required in an accessible format, please contact 1-800-372-1102 ext. 2097.

The Regional Municipality of Durham

Minutes

Energy From Waste – Waste Management Advisory Committee

Tuesday, February 25, 2020

A meeting of the Energy From Waste – Waste Management Advisory Committee was held on Tuesday, February 25, 2020 in Room LLC, Regional Headquarters, 605 Rossland Road East, Whitby, at 7:00 PM.

Present: G. Rocoski, Oshawa, Chair
W. Basztyk, Brock
W. Bracken, Clarington, attended the meeting at 7:01 PM
A. Burrows, Ajax
T. Farrell, Brock
C. McLean, Ajax, left the meeting at 8:20 PM
K. Meydam, Clarington

Absent: S. Elhajjeh, Clarington, Vice-Chair
H. Sukhu, Clarington

Non-Voting Members
Present: A. Burke, Senior Planner, Special Projects, Municipality of Clarington
Councillor Janice Jones, Local Councillor, Municipality of Clarington
M. Neild, Facility Manager, Covanta

Staff
Present: G. Anello, Manager, Waste Planning and Technical Services
M. Januszkiewicz, Director, Waste Management Services
A. Porteous, Supervisor, Waste Services
M. White, Systems Support Specialist – Information Technology
S. Penak, Committee Clerk, Corporate Services – Legislative Services

1. Declarations of Interest

There were no declarations of interest.

2. Adoption of Minutes

Moved by T. Farrell, Seconded by B. Basztyk,
That the minutes of the EFW-WMAC meeting held on Thursday, November 26, 2019, be adopted.
CARRIED

G. Rocoski on behalf of the Committee thanked M. Januszkiewicz, G. Anello, and all of the other staff involved for arranging the waste facility tours. The Committee suggested that any new members to the EFW-WMAC should attend these tours for the educational and awareness benefits.

W. Bracken referenced Section 4B), page 4, first paragraph of the November 26, 2019 EFW-WMAC meeting minutes and stated that the whistleblower did not occur at the DYEC but at a "United States facility". Staff advised they would make that correction.

3. Announcements

There were no announcements made.

4. Presentations

A) Gio Anello, Manager, Waste Planning and Technical Services, re: Report #2020-COW-02: Solid Waste Management: 2020 Strategic Issues and Financial Forecast

G. Anello provided a PowerPoint presentation regarding Report #2020-COW-02: Solid Waste Management: 2020 Strategic Issues and Financial Forecast. A copy of the presentation was provided as a handout at the meeting.

Highlights of his presentation included:

- Strategic Issues and Financial Forecast 2020
- Transition to Extended Producer Responsibility (EPR)
- Food and Organic Waste Policy Statement
- Long Term Waste Management Plan
- Strategic Issues
- Financial Implications

G. Anello responded to questions from the Committee regarding timelines for public consultation; what percentage of the regional budget is dedicated to education; and whether the Region has any connection with environmental studies students from Trent University.

At the request of the Committee, M. Januszkiewicz provided an overview of the transition to Extended Producer Responsibility at this time.

M. Januszkiewicz responded to questions from the Committee regarding when Durham will be phased in; whether the collection of special items (tires, batteries, etc.) will continue or become curbside collection; and when this project will be posted on the Environmental

Bill of Rights (EBR) website for commenting. Staff advised that the next meeting with the Province of Ontario will be held March 9, 2020, where staff will be in attendance as well as the producers and service providers.

Discussion ensued regarding the calling a special meeting in the Summer to discuss the potential impacts EPR will have on Durham Region.

Moved by B. Basztyk, Seconded by T. Farrell,

That a special EFW-WMAC meeting be called in the June/July timeframe once staff have received additional information and direction from the Province, to discuss the potential impacts on Durham Region regarding Extended Producer Responsibility (EPR), and that potential meeting dates be sent to Committee members for review.

CARRIED

B) Gio Anello, Manager, Waste Planning and Technical Services, re: the Mixed Waste Pre-Sort Facility/ Anaerobic Digestion Siting Process

G. Anello provided a PowerPoint presentation regarding the Mixed Waste Pre-Sort Facility/ Anaerobic Digestion Siting Process. A copy of the presentation was provided as a handout at the meeting.

Highlights of his presentation included:

- Siting Goal and Meeting Objectives
- Siting – Where are We?
- Siting Methodology
- Proposed Siting Methodology – Long List to Short List
- Short List of Sites
- Next Steps – Short List Evaluation

G. Anello advised that an open house will be held on Thursday, February 27, 2020 at Regional Headquarters for residents to learn about the six potential site locations for the new Anaerobic Digestion (AD) and Waste Pre-Sorting facility in Durham Region. He advised that a comparative report of the six proposed sites will be posted for a 2-week comment period.

G. Anello advised that staff plan to have a report brought to the April 15, 2020 Committee of the Whole meeting with a recommendation on whether to move forward with a partner (Epcor). The report will then be brought to the April 29, 2020 Regional Council meeting for approval. He advised that further recommendations will be brought forward on a preferred site and moving into the procurement process

(request for qualification). He noted that there is an expected operational date by 2024, pending all approvals.

G. Anello responded to questions from the Committee regarding whether the green bin materials will be separated from the mixed waste pre-sorted materials; and whether yard waste will be part of anerobic digestion.

5. Delegations

There were no delegations to be heard.

6. Correspondence

There were no correspondence items to be considered.

7. Administrative Matters

There were no administrative matters to be considered.

8. Other Business

A) Update by George Rocoski, EFW-WMAC Chair, regarding the EFW-WMAC Annual Report Presentations of December 4, 2019, to the Regional Municipality of Durham's Works Committee and of December 9, 2019, to the Municipality of Clarington's Council

G. Rocoski provided an update regarding the EFW-WMAC Annual Report presentations of December 4, 2019, to the Regional Municipality of Durham's Works Committee and of December 9, 2019, to the Municipality of Clarington's Council.

G. Rocoski advised that at the Municipality of Clarington's Council meeting on December 9, 2019, questions were raised regarding the role and effectiveness of the EFW-WMAC, and how the Committee could better increase awareness and public engagement.

Discussion ensued regarding ways to engage the public such as making a presentation to each local municipality about who the EFW-WMAC is and how the public can make delegations to the Committee. Further discussion included attending local festivals, the Annual Waste Fairs, Public Works Day and Recycling Week as opportunities for exposure.

B) Update by Gio Anello, Manager, Waste Planning and Technical Services, The Regional Municipality of Durham, re: The Durham York Energy Centre (DYEC)

G. Anello provided an update regarding the Durham York Energy Centre (DYEC).

G. Anello advised that the DYEC will be moving into its maintenance period. He advised that both boilers will be shut down February 29, 2020 for a 16-day cleaning period, as well as checking the turbine.

G. Anello advised that the spring source test will occur the week of May 11, 2020 and that the results from the fall source test have been distributed.

G. Anello responded to questions from the Committee regarding the forthcoming report on the AMESA data/workplan; whether the AMESA results are available to the public; and the possibility of there being a correlation between the AMESA data and the stack test results at any time.

In response to a request, G. Anello provided an update on the environmental assessment screening process regarding the capacity increase at the DYEC to 160,000 tonnes per year.

In response to a question with respect to Section 8.2 g) of Report #2020-COW-2 of the Commissioner of Works and Finance, G. Anello explained what the “DYEC emission compliance cost risks related to the potential for changing emission standards and facility biomass changes over time” meant.

B) Update by Mirka Januszkiewicz, Director, Waste Management Services, The Regional Municipality of Durham, re: Extended Producer Responsibility (EPR)

M. Januszkiewicz provided an update regarding Extended Producer Responsibility (EPR).

This item was discussed earlier in the meeting. See pages 2 and 3 of these minutes.

9. Next Meeting

The next regularly scheduled meeting of the EFW-WMAC will be held on Tuesday, May 26, 2020 in the Lower Level Boardroom (LL-C), at 7:00 PM, Regional Headquarters, 605 Rossland Road East, Whitby.

10. Adjournment

Moved by K. Meydam, Seconded by W. Bracken,
That the meeting be adjourned.
CARRIED

The meeting adjourned at 8:53 PM.

G. Rocoski, Chair, Energy from Waste –
Waste Management Advisory Committee

S. Penak, Committee Clerk