

ENVIRONMENTAL PROTECTION POLICY REVIEW AND RECOMMENDATION REPORT

Prepared for the City of Pickering



Revised: March 2026



Environmental Protection Policy Review and Recommendations Report

City of Pickering, Ontario

Submitted to:
City of Pickering

Submitted by:

GEI Consultants Canada

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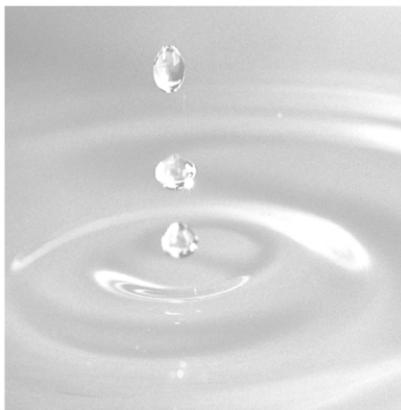


Table of Contents

Certification	vi
Record of Revisions	vii
• Acronyms and Abbreviations	viii
1. Introduction	1
1.1. City of Pickering - Official Plan Municipal Comprehensive Review	1
1.2. Report Preparation Methodology	2
2. Natural Heritage Policy Framework	3
3. Summary of Recent Legislative Updates	5
3.1. Federal Legislative Updates	5
3.2. Provincial Legislative Updates	5
3.3. Updates to Other Guidelines	8
4. Natural Heritage Features and Areas	9
4.1. Provincially Protected Features and Areas	9
4.2. Other Features and Areas	9
4.3. Areas of Influence and Vegetation Protection Zones	10
5. Wetlands	11
5.1. Provincial Policies	11
5.1.1. Provincial Planning Statement	11
5.1.2. Oak Ridges Moraine Conservation Plan	12
5.1.3. Greenbelt Plan	12
5.2. Durham Policies	13
5.3. Pickering Policies	14
5.4. Recommendations	15
5.4.1. Policy Approach	15
5.4.2. Adjacent Lands and VPZs	16
5.4.3. Definitions	16
6. Woodlands	18
6.1. Provincial Policies	18
6.1.1. Provincial Planning Statement	18
6.1.2. Oak Ridges Moraine Conservation Plan	18
6.1.3. Greenbelt Plan	19
6.2. Durham Policies	20
6.3. Pickering Policies	21

6.4.	Recommendations	22
6.4.1.	Policy Approach	22
6.4.2.	Adjacent Lands and VPZs	23
6.4.3.	Definitions	24
7.	Valleylands	27
7.1.	Provincial Policies	27
7.1.1.	Provincial Planning Statement	27
7.1.2.	Oak Ridges Moraine Conservation Plan	27
7.1.3.	Greenbelt Plan	28
7.2.	Durham Policies	29
7.3.	Pickering Policies	29
7.4.	Recommendations	30
7.4.1.	Policy Approach	30
7.4.2.	Adjacent Lands and VPZs	31
7.4.3.	Definitions	31
8.	Areas of Natural and Scientific Interest	33
8.1.	Provincial Policies	33
8.1.1.	Provincial Planning Statement	33
8.1.2.	Oak Ridges Moraine Conservation Plan	33
8.1.3.	Greenbelt Plan	34
8.2.	Durham Policies	35
8.3.	Pickering Policies	35
8.4.	Recommendations	36
8.4.1.	Policy Approach	36
8.4.2.	Adjacent Lands and VPZs	37
8.4.3.	Definitions	37
9.	Significant Wildlife Habitat	39
9.1.	Provincial Policies	39
9.1.1.	Provincial Planning Statement	39
9.1.2.	Oak Ridges Moraine Conservation Plan	39
9.1.3.	Greenbelt Plan	41
9.2.	Durham Policies	43
9.3.	Pickering Policies	44
9.4.	Recommendations	44
9.4.1.	Policy Approach	44
9.4.2.	Adjacent Lands	45
9.4.3.	Definitions	46
10.	Surface Water Features	47
10.1.	Provincial Policies	47

10.1.1.	Provincial Planning Statement	47
10.1.2.	Oak Ridges Moraine Conservation Plan	47
10.1.3.	Greenbelt Plan	48
10.2.	Durham Policies	49
10.3.	Pickering Policies	50
10.4.	Recommendations	51
10.4.1.	Policy Approach	51
10.4.2.	Adjacent Lands	52
10.4.3.	Definitions	53
11.	Fish Habitat	56
11.1.	Federal Policies	56
11.2.	Provincial Policies	56
11.2.1.	Endangered Species Act and Species Conservation Act	56
11.2.2.	Provincial Planning Statement	56
11.2.3.	Oak Ridges Moraine Conservation Plan	57
11.2.4.	Greenbelt Plan	57
11.3.	Durham Policies	57
11.4.	Pickering Policies	58
11.5.	Recommendations	58
11.5.1.	Policy Approach	58
11.5.2.	Adjacent Lands	59
11.5.3.	Definitions	59
12.	Habitat for Endangered and Threatened Species	60
12.1.	Federal Policies	60
12.2.	Provincial Policies	60
12.2.1.	Endangered Species Act and Species Conservation Act	60
12.2.2.	Provincial Planning Statement	61
12.2.3.	Oak Ridges Moraine Conservation Plan	61
12.2.4.	Greenbelt Plan	62
12.3.	Durham Policies	62
12.4.	Pickering Policies	63
12.5.	Recommendations	64
12.5.1.	Policy Approach	64
12.5.2.	Adjacent Lands	64
12.5.3.	Definitions	64
13.	Natural Heritage Systems	67
13.1.	Provincial Policies	67
13.1.1.	Provincial Planning Statement	67
13.1.1.1.	Land Use Designations and Policies for Development	68

13.1.2.	Oak Ridges Moraine Conservation Plan	68
13.1.2.1.	Land Use Designations and Policies for Development	69
13.1.3.	Greenbelt Plan	69
13.1.3.1.	Land Use Designations and Policies for Development	70
13.2.	Municipal Policies	70
13.2.1.	Durham Policies	70
13.2.1.1.	Land Use Designations and Policies for Development	71
13.2.2.	Pickering Policies	72
13.2.2.1.	Seaton Natural Heritage System	72
13.2.2.2.	Land Use Designations and Policies for Development	72
13.3.	Summary of Natural Heritage Systems	73
13.4.	Recommendations	75
13.4.1.	Natural Heritage System Composition	75
13.4.1.1.	Minimum Legislative Recommendation	75
13.4.1.2.	Aspirational Recommendation	76
13.4.1.3.	GEI's Recommendation	78
13.4.2.	Linkages and Enhancement Areas	81
13.4.3.	Natural Heritage System Land Use Designation and Policies	82
13.4.4.	Adjacent Lands	84
14.	Other Recommendations	85
14.1.	Agricultural Lands Policies	85
14.2.	Ecosystem Compensation	86
14.2.1.	Regional Official Plan	87
14.2.2.	Official Plan	87
14.2.3.	Recommendations	88
14.3.	Natural Heritage Targets	88
14.3.1.	Regional Official Plan Natural Heritage Targets	88
14.3.2.	Official Plan Natural Heritage Targets	89
14.3.3.	Recommendations	90
14.4.	Other Recommended Policy Updates	90
14.4.1.	Outdated Policies	90
14.4.2.	Policy Language	91
14.4.3.	Vegetation Protection Zones	92
14.4.4.	Climate Change Incorporation	92
14.4.5.	Traditional Ecological Knowledge Incorporation	93
14.5.	Recommended Supporting Documents	93
14.5.1.	Figures	93
14.5.2.	Guidelines, By-laws, Strategies, and Other Plans	93
15.	Conclusion	95

16. References

96

Appendices

- Appendix A Sample Figures and Illustrations
 - A.1. Toronto and Region Conservation Authority
 - A.2. Grand River Conservation Authority
 - A.3. Greenbelt Plan and Oak Ridges Moraine Conservation Plan Technical Papers
 - A.4. County of Brant
 - A.5. City of Greater Sudbury

- Appendix B Legislation and Background Review
 - B.1. Federal Legislative Update
 - B.2. Provincial Legislative Update

- Appendix C Municipal Policy Reviews
 - C.1. Durham Region Official Plan
 - C.2. City of Pickering Official Plan
 - C.3. Tree/Woodland Conservation By-law

- Appendix D Municipal Best Practice Review
 - D.1. Natural Heritage Definitions
 - D.2. Natural Heritage Targets
 - D.3. Ecosystem Compensation
 - D.4. Vegetation Protection Zones

- Appendix E Supporting Guidelines
 - E.1. Terms of Reference for Local Subwatershed Studies
 - E.2. Lake Simcoe Region Conservation Authority Checklist

Certification

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Acronyms and Abbreviations

The following acronyms and abbreviations have been referenced within this report. Where an acronym refers to a specific piece of legislation or guidance document, those resources have been linked.

AL	Adjacent Lands
AOI	Area of Influence
ANSI	Area of natural and scientific interest
CA	Conservation Authority
CLOCA	Central Lake Ontario Conservation Authority
CVC	Credit Valley Conservation
DFO	Fisheries and Oceans Canada
EAA	Environmental Assessment Act
EIS	Environmental Impact Study
ESA	Endangered Species Act
GEI	GEI Consultants Canada Inc.
GPGGH	Growth Plan for the Greater Golden Horseshoe
HDF	Headwater Drainage Feature
KHF	Key hydrologic feature
KNHF	Key natural heritage feature
LSRCA	Lake Simcoe Region Conservation Authority
MBCA/MBR	Migratory Birds Convention Act/Migratory Birds Regulations
MCR	Municipal Comprehensive Review
MECP	Ministry of Environment, Conservation, and Parks
MMAH	Ministry of Municipal Affairs and Housing
MNR/MNRF/OMNRF	Ministry of Natural Resources/Ministry of Natural Resources and Forestry/Ontario Ministry of Natural Resources
NGMH	Net Gain Mitigation Hierarchy
NHE	Natural Heritage Evaluation
NHF	Natural heritage feature
NHFA	Natural Heritage Feature and Area
NHS	Natural Heritage System
NVCA	Nottawasaga Valley Conservation Authority
O. Reg.	Ontario Regulation
OP	Official Plan (used as a general term for any municipal official plans)
OPA	Official Plan Amendment
ORM	Oak Ridges Moraine
ORMCP	Oak Ridges Moraine Conservation Plan

OWES	Ontario Wetland Evaluation System
PIC	Public Information Centre
POP	Pickering Official Plan (references the <i>Pickering Official Plan, Edition 9</i> [The Corporation of the City of Pickering, 2022])
PPS	Provincial Planning Statement
PSW	Provincially significant wetland
ROP	Region of Durham Official Plan (references <i>Envision Durham: Regional Official Plan</i> [Regional Municipality of Durham, 2024])
SAR	Species at Risk
SARA	Species at Risk Act
SCA	Species Conservation Act
SWH	Significant Wildlife Habitat
TRCA	Toronto and Region Conservation Authority
VPZ	Vegetation Protection Zone
WPA	Wellhead Protection Area

1. Introduction

GEI Consultants Canada Ltd. (GEI) has been retained by the City of Pickering (the City) to conduct a comprehensive review of natural heritage feature management and environmental protection policies within the *Pickering Official Plan (2022; POP)*, and *Envision Durham (2024; ROP)*, against relevant federal and provincial policies. This Environmental Protection Policy Review and Recommendations Report compiles results of this comprehensive review with clear recommendations which can be incorporated into *Pickering Forward*, the next iteration of the POP.

In addition to being located within the Region of Durham, the City of Pickering also contains lands that are located within the Greenbelt Area and the Oak Ridges Moraine (ORM). The City of Pickering is within the jurisdiction of two conservation authorities (CAs): the Toronto and Region Conservation Authority (TRCA) and the Central Lake Ontario Conservation Authority (CLOCA). It is located primarily within Ecoregion 6E, with a small western portion located in Ecoregion 7E (Crins et al., 2009).

The City of Pickering resides on land within the Treaty and traditional territory of the Mississaugas of Scugog Island First Nation and Williams Treaties signatories of the Mississauga and Chippewa Nations. This includes Alderville First Nation, Chippewas of Beausoleil First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, Curve Lake First Nation, Hiawatha First Nation and the Mississaugas of Scugog Island First Nation.

1.1. City of Pickering - Official Plan Municipal Comprehensive Review

In accordance with the requirements under the *Planning Act*, the City of Pickering is undergoing a municipal comprehensive review (MCR) of their POP to ensure consistency with provincial plans, matters of provincial interest, and to be consistent with policy statements (i.e. the Provincial Planning Statement; PPS). Section 26(1.1) of the *Planning Act* also requires that OPs are updated every 5 years (or 10 years, in the case of a new OP). The POP has been periodically updated on an as-needed basis, but the last comprehensive review took place in 2007. The City has decided to undertake a comprehensive review following the significant policy changes that have occurred since the last update. One of these changes, as a result of Bill 23 (discussed further in subsequent sections), is that the Region of Durham is now an “upper-tier municipality without planning responsibilities”. This means that the ROP is now considered one of Pickering’s OPs, and its policies are to be integrated into the new POP. The ROP will continue to be referred to as such, for clarity between the policies of the existing OPs. The City also anticipates a period of significant growth in the coming decades; as such, staff have recommended a review of the POP under Section 26 of the Planning Act to ensure the POP conforms to legislative changes and is prepared to guide new growth (Report to Planning and Development Committee, 2024).

The POP Review was launched at a statutory public meeting in May 2024. Since September 2024, six public information sessions (PICs) have been held on a broad range of topics relating to the City's growth and development. These sessions covered:

- Community Vision and Priorities (PIC 1, September 2024);
- Growth Management and Urban Structure (PIC 2, November 2024);
- Natural Heritage, Hazards, and Sustainability (PIC 3, February 2025);
- Agriculture and Rural Areas (PIC 4, March 2025);
- Community Elements and Infrastructure (PIC 5, May 2025); and
- Housing and Affordability (PIC 6, June 2025).

Each of these PICs were preceded by a discussion paper and included an online survey for residents to provide thoughts, comments, and preferences for the corresponding section of the POP. Further engagement will take place following the preparation of a draft POP.

1.2. Report Preparation Methodology

As part of this Environmental Protection Policy Review and Recommendations Report, GEI reviewed relevant natural heritage legislation at the federal and provincial levels. This included identifying new (or updated) legislation since the current POP was consolidated in 2022.

GEI then reviewed the POP and ROP to identify differences between the natural heritage systems (NHSs) and protection policies within each. Additional Official Plans (OPs) from other Ontario municipalities were also reviewed to collate a series of best practices and recommendations for natural heritage policies that provide natural heritage protections beyond minimum legislative requirements.

Forming conclusions based on each of these background materials reviewed, we then prepared a list of recommendations to be incorporated into the *Pickering Forward* POP update. These recommendations were focused on provincial and regional consistency and conformity, the creation of a new (updated) NHS, clear definitions, natural heritage targets, and documents to support the new POP.

2. Natural Heritage Policy Framework

The policy framework in Ontario begins with the *Planning Act* (1990), which enables land use planning at the highest level. The *Planning Act* describes matters of provincial interests; provincial interests relating to natural heritage include:

- protection of ecological systems, including natural areas, features and functions;
- conservation and management of natural resources and the mineral resource base;
- protection of public health and safety;
- co-ordination of planning activities of public bodies;
- resolution of planning conflicts involving public and private interests;
- appropriate location of growth and development;
- supply, efficient use and conservation of energy and water; and
- mitigation of greenhouse gas emissions and adaptation to a changing climate

These priorities are integrated into provincial plans, such as the PPS, the Greenbelt Plan, and the Oak Ridges Moraine Conservation Plan (ORMCP). From there, regions and municipalities can regulate land uses in their own jurisdictions through OPs and zoning by-laws. The hierarchy is displayed in the **Figure 2-1** below. The policy framework and its recent changes are described further in **Appendix B**.

Figure 2-1. Ontario Land Use Planning Hierarchy



Natural heritage-related land uses are generally regulated through the identification of an NHS, which consists of natural heritage features (NHF), like wetlands, woodlands, and significant wildlife habitat (SWH). Certain features are protected at the federal level, such as fish habitat, which is regulated by Fisheries and Oceans Canada (DFO) and the *Fisheries Act*. Other features, such as provincially significant wetlands (PSWs) SWH are protected at the provincial level through the Ministry of Natural Resources (MNR), and species at risk (SAR) through the Ministry of Environment, Conservation, and Parks (MECP). Natural hazards, wetlands, and surface water features are also regulated by the local CA. CAs and municipalities are also responsible for protecting sources of drinking water under the *Clean Water Act* and provincial source protection plans.

Policies set out in regional or municipal OPs need to be consistent with relevant federal and provincial legislation. Where none are identified, it is the responsibility of the OP(s) to specify protections, such as incompatible use prohibitions. These are then implemented through the zoning by-law, in the form of setbacks and permitted/prohibited uses.

Several federal and provincial changes have come into effect since the 2022 consolidation of the POP. The recommendations in this report are based on existing federal, provincial, and regional policies that apply to each respective NHF. The recommendations identify what must be included in the POP to meet legislative requirements/minimums, and what could be included in the POP to go above and beyond the minimum requirements.

3. Summary of Recent Legislative Updates

The following subsections provide an overview of the results of GEI’s review of key federal and provincial legislation changes since the current POP was consolidated in 2022. A full overview of each of these applicable pieces of legislation and guidelines is available in **Appendix B**.

3.1. Federal Legislative Updates

Since 2022, there have been minor updates to natural heritage policies at the federal level. These updates are described in **Table 1** below and **Appendix B.1**.

Table 1. Federal Legislation Overview

Applicable Legislation	Description	Changes
<i>Migratory Birds Regulation</i> (MBR; 2022) under the <i>Migratory Birds Convention Act</i> (MBCA; 1994)	This regulation sets out how migratory birds will be protected under the MBCA. It provides key definitions and clear prohibitions on activities (e.g., any disturbances to protected birds).	<ul style="list-style-type: none"> Updated definition for a migratory bird, and overabundant species Extends protections afforded to an individual to their sperm, eggs, and parts of the bird, and strengthens protections to their nests Added Schedule 1, which lists migratory birds that receive additional protections
<i>S.C. 2024. C. 30, an Act to amend the Interpretation Act</i> (2024)	This act is related to Section 25 of the Constitution Act.	Modified sections of the Fisheries Act, MBCA, and Species at Risk Act (SARA) that relate to the rights of Indigenous people

3.2. Provincial Legislative Updates

Since 2022, there have been substantial legislative changes within the province. This includes the introduction of, and updates to several pieces of key legislation. These updates are described in **Table 2** below and **Appendix B.2**.

Table 2. Provincial Legislation Overview

Applicable Legislation	Description	Changes
<i>Bill 5: Protect Ontario by Unleashing our Economy Act</i> (2025)	This Act had the goal of accelerating development and modified several long-standing provincial Acts.	Substantial changes to environmental legislation: <ul style="list-style-type: none"> Amended the Endangered Species Act (ESA), Environmental Assessment Act (EAA), and

		<p>Environmental Protection Act (EPA)</p> <ul style="list-style-type: none"> • Introduced the Species Conservation Act (SCA)
<i>Endangered Species Act (ESA; 2007)</i>	<p>This act is the current in-force legislation, and provides protection to all species listed as endangered, threatened, or extirpated.</p>	<ul style="list-style-type: none"> • Substantial changes to the habitat protections afforded to species at risk (SAR) • Revoked general habitat regulations and replaced it with a new standardized definition of habitat for all species
<i>Species Conservation Act (SCA; 2025)</i>	<p>This act has received royal ascent but is not yet in-force. It will eventually replace the ESA and provide protection for certain SAR.</p>	<ul style="list-style-type: none"> • Aims to expedite the review process for permits and approvals from the Ministry of Environment, Conservation, and Parks (MECP) • Species that receive protections under the SARA will no longer receive protections provincially
<i>Planning Act (1990)</i>	<p>Overarching legislation that enables land use planning in Ontario. Outlines matters of provincial interest.</p>	<p>Only minor revisions relating to natural heritage.</p>
<i>Provincial Planning Statement (2024)</i>	<p>Provincial policy document that provides a framework to incorporate provincial interests into municipal planning.</p>	<ul style="list-style-type: none"> • Replaces the previous Provincial Policy Statement (2020) • No revisions to Section 4.1 (Natural Heritage Systems) • Introduction of <i>watershed planning</i> and its requirement to be used within <i>large and fast-growing municipalities</i> • Additional modifications and clarifications relating to climate change, stormwater management, and natural hazards • Increased emphasis on providing housing and growing communities to reflect provincial priorities
<p><i>Places to Grow Act (2005)</i></p> <p><i>Ontario Regulation 416/05 and O. Reg. 328/24: Growth Plan Areas (2005; 2024)</i></p> <p><i>Growth Plan for the Greater</i></p>	<p>This act introduced regional growth plans.</p> <p>These regulations designated the City of Pickering as an area within the Greater Golden Horseshoe.</p>	<p>This act, its associated regulations, and the plan, has since been repealed. The City of Pickering is no longer subject to the policies outlined in these.</p>

<p><i>Golden Horseshoe (2020 consolidation)</i></p>	<p>The plan provided specific natural heritage policies, including those for NHSs, subwatersheds and vegetation protection zones.</p>	
<p><i>Bill 23: More Homes Built Faster Act (2022)</i></p>	<p>This Act had the goal of building 1.5 million homes by 2032 and modified several long-standing provincial Acts, including the <i>Planning Act</i>.</p>	<p>No notable changes to natural heritage policies. This act changed the planning and approval authorities of several regions, including the Region of Durham.</p>
<p><i>Conservation Authorities Act (1990)</i></p> <p><i>O. Reg. 166/06 (TRCA; 2006) and O. Reg. 42/06 (CLOCA; 2006)</i></p> <p><i>O. Reg. 41/24: Regulation of Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses (2024)</i></p>	<p>This act enables the CAs of Ontario to provide services which further conservation and restoration goals, alongside managing development and natural resources within their watersheds.</p> <p>Conservation Authorities Act amendments, O. Reg 686/21, O. Reg. 596/22 and O. Reg. 41/24 were enacted, revoking O. Reg 166/06 and O. Reg. 42/06 to streamline the permitting process and ensure consistency.</p>	<p>Substantial changes occurred in 2022, 2023, and 2024, which reduced the scope of CAs:</p> <ul style="list-style-type: none"> • CAs were restricted from commenting on natural heritage policy within the planning process but can still comment on issues of hazardous lands, wetlands, rivers, watercourses, river or stream valleys, and areas subject to shoreline or lake hazards (flooding, dynamic beach hazards, erosion). • Changes to the regulatory “tests” in the permitting process, including removal of “pollution” and “conservation of land”. • Introduced low-risk project exemptions from CA permits, the term “development” changed to “development activity” and updated definition of <i>watercourse</i> . • Reduced the area that CAs regulate around wetlands to a standard 30 metres (m) for all wetlands (from 30-120 m)
<p><i>Bill 3: Strong Mayors, Building Homes Act (2022)</i></p>	<p>This act introduces strong mayor powers to advance projects relating to provincial priorities.</p>	<p>The City of Pickering was granted strong mayor powers on July 1, 2023.</p>
<p><i>Great Lakes Protection Act (2015)</i></p>	<p>This act provides protections for the Great Lakes-St. Lawrence River Basin.</p>	<p>Sets goals, performance measures, guiding principles, and future priorities.</p>

3.3. Updates to Other Guidelines

Additionally, several key guidelines have been prepared or updated since 2022. These guidelines are not legislatively enforceable but provide technical background information. These updates are described in **Table 3** below and in **Appendix B.3**.

Table 3. Overview of Other Relevant Guidelines

Applicable Guideline	Description	Changes
Durham Region MOU with all their local CAs	Outlines each party's responsibilities for ensuring that provincial priorities are met.	Only minor revisions relating to natural heritage. This has not been updated to reflect the amended Conservation Authorities Act, O. Reg. 686/21, O. Reg. 596/22, and O. Reg. 41/24.
<i>Policy and Procedure Document for Land Use Planning and Regulation (CLOCA, 2024)</i>	Provides guidance and clarity surrounding CLOCAs implementation of the Conservation Authority Act and O. Reg. 41/24.	Entirely new document.
<i>The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority (2014)</i>	Provides guidance and clarity surrounding TRCAs implementation of the Conservation Authority Act.	Has not been updated to reflect the changes associated with the Conservation Authorities Act, O. Reg. 686/21, O. Reg. 596/22, and O. Reg. 41/24.
Ecosystem Compensation Guideline (TRCA, 2018, updated 2023)	Outlines best practices for determining ecosystem compensation rates.	Entirely new document in 2018, and updated in 2023 to remove outdated CA roles and policy references.
<i>Ontario Wetland Evaluation System Southern Manual, 4th Edition (OWES; MNRF, 2022)</i>	Technical manual that is used to evaluate wetlands for provincial significance.	Received substantial updates following Bill 23. Notable changes include removal of the ability to complex wetlands when evaluating for provincial significance, devaluation of SAR, and placing final approval in the hands of the evaluator.
Species Recovery Strategies (various, as approved by the Ministry of Environment, Conservation, and Parks)	Technical guidelines describe the habitat for SAR, and the types of activities that can impact their habitat.	New documents are released every year. The MECP is currently undertaking a comprehensive review of these documents, with drafts anticipated to be available in early 2026 to support the new SCA.

4. Natural Heritage Features and Areas

4.1. Provincially Protected Features and Areas

Natural Heritage Features and Areas (NHFAs) are those which are important for their environmental and social values as part of the natural landscape. These features are afforded protection against development which may impact them directly or indirectly.

Per the PPS (2024), NHFA include:

- significant wetlands,
- significant coastal wetlands,
- other coastal wetlands,
- fish habitat,
- significant woodlands,
- significant valleylands,
- habitat of endangered species and threatened species,
- SWH, and
- significant areas of natural and scientific interest (ANSIs).

Vegetation communities like sand barrens, savannahs, and alvars, where significant, are afforded protections as SWH. However, within some areas of the province (i.e. ORMCP, Greenbelt Plan, and the ROP) these features are protected even where deemed non-significant.

4.2. Other Features and Areas

Other natural features, such as non-significant wetlands, non-significant woodlands, headwater drainage features, hedgerows, etc., are not considered to play a significant role in the landscape (according to the PPS) and are therefore not afforded the same protection against development within Provincial policy.

Sections 5 through 12 will look at each NHFA separately and provide an overview of the relevant policy for each, followed by our recommendations for protections and recommended definitions to support the implementation of the POP. **Section 10** and **Section 11** look at surface water features for their unique contribution as fish habitat (i.e. a NHFA), a key hydrologic feature (KHF), and a natural hazard feature. Protections for these features are inclusive of limits to development and site alteration, adjacent lands and vegetated protection zones (VPZs; for a fulsome assessment of current VPZs, see **Appendix D.4**).

4.3. Areas of Influence and Vegetation Protection Zones

The Area of Influence (AOI; also referred to as adjacent lands) is the area around a feature where it is likely that development would have a negative impact on the feature or its functions. The extent of the AOI/adjacent lands can be recommended by the province, or by the municipality using a similar approach. The AOI/adjacent lands for most features is usually 120 m from the edge of the feature, but there are cases where this is reduced (e.g., some jurisdictions only mandate 50 m for life science ANSIs).

The AOI is considered a ‘trigger’ for when additional and supporting environmental studies (i.e., natural heritage evaluation (NHE), environmental impact study (EIS), etc.) are required. These studies may be scoped in nature but should be focused on whether the proposed development would pose any negative impacts to the natural heritage feature, its form, or its function. Therefore, some development is permitted within the AOI.

VPZs (or buffers) are the area immediately surrounding the feature that is kept in a naturalized state, in order to protect the feature. VPZs are smaller than AOIs/adjacent lands, and are generally 15-30 m, depending on the feature and its sensitivity.

Unlike the AOI, development is generally not permitted within the VPZ. In most instances, the current POP and the ROP do not permit the reduction of VPZs, even where it is supported through environmental studies.

5. Wetlands

Wetlands are “lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface” (PPS, 2024). Wetlands are characterized by their abundant water, hydric soils, and dominance of water-loving or water-tolerant plant species.

Wetlands are evaluated for significance based on the Ontario Wetland Evaluation System Southern Manual, 4th Edition (OWES; MNR, 2022). Evaluations take into consideration their biological, social, hydrological, and special features characteristics. The biological criteria consider the type of wetland (bog, fen, marsh, swamp), and vegetation communities present. The social criteria consider economic products, recreational activities, aboriginal values, and overall landscape aesthetics. Hydrological criteria consider the wetlands productivity related to flood attenuation ability, water quality improvements, carbon sequestration, and groundwater recharge. Lastly, the special features criteria consider wetland rarity, and the presence of significant species or habitat types.

Based on the total score (i.e., considering all criteria above), a wetland can be designated as a PSW or as an evaluated non-PSW. Where a wetland does not have a high enough score to warrant designation as a PSW, a municipality can opt to designate it as a locally or regionally significant wetland within their OP. Where wetlands have not yet undergone the evaluation process, they are designated as unevaluated wetlands.

5.1. Provincial Policies

5.1.1. *Provincial Planning Statement*

Within the PPS, protections are afforded to significant wetlands, significant coastal wetlands, and other coastal wetlands.

- **Development and site alteration are not permitted in significant wetlands or significant coastal wetlands** (Section 4.1.4.a-b).
- Development is also not permitted within coastal wetlands, unless it can be demonstrated through an environmental impact study that there will be no negative impacts on the feature or its ecological functions (Section 4.1.5.f).
- Similarly, development and site alteration are not permitted on adjacent lands to significant wetlands, significant coastal wetlands, and coastal wetlands, unless it has been demonstrated that there will be no negative impacts to the features or their ecological function (Section 4.1.8).

The PPS does not afford protections to unevaluated, non-significant, or locally or regionally significant wetlands, or their adjacent lands.

5.1.2. Oak Ridges Moraine Conservation Plan

The ORMCP includes all wetlands (significant, non-significant, regionally significant, locally significant, unevaluated, other, etc.) as a type of key natural heritage feature (KNHF). Wetlands are defined as:

“wetland” means land such as a swamp, marsh, bog or fen (not including land that is being used for agricultural purposes and no longer exhibits wetland characteristics) that,
(a) is seasonally or permanently covered by shallow water or has the water table close to or at the surface,
(b) has hydric soils and vegetation dominated by hydrophytic or water tolerant plants,
and
(c) has been further identified, by the Ministry of Natural Resources and Forestry or by any other person, according to evaluation procedures established by the Ministry of Natural Resources and Forestry, as amended from time to time.

All wetlands are afforded a minimum of 120 m area of influence (AOI; and consistent with the definition for adjacent lands) and 30 m VPZ (Part III Table; see **Figure 8, Appendix A** for an illustration).

- **Development or site alteration within a wetland or the related minimum VPZ is prohibited** (Section 22.2)
 - Exceptions include forestry/fishing/wildlife management activities, conservation and flooding/erosion control, infrastructure, and low-intensity recreation. Agricultural uses are also an exception, but only in the VPZ, not the feature itself (Section 22.2)
- Development or site alteration within the AOI (i.e., within 120 m, and outside of the 30 m VPZ) for wetlands must be accompanied by a natural heritage evaluation (considered equivalent to an EIS) completed in accordance with Section 23 of the plan (Section 22.3)
 - Section 23 indicates that the NHE must demonstrate there will be no adverse effects on the feature or its related ecological functions, explores practices to maintain or improve the feature and its connectivity to other features, and verifies that the minimum VPZ is sufficient (Section 23.1)

5.1.3. Greenbelt Plan

The Greenbelt Plan also includes all wetlands (significant, non-significant, regionally significant, locally significant, unevaluated, other, etc.) as one type of KNHF. Wetlands are defined in the Greenbelt Plan as:

Means lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water-tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens.

Periodically soaked or wet lands being used for agricultural purposes which no longer exhibit wetland characteristics are not considered to be wetlands for the purposes of this definition.

Wetlands are further identified, by the Ministry of Natural Resources and Forestry or by any other person, according to evaluation procedures established by the Ministry of Natural Resources and Forestry, as amended from time to time.

All wetlands are afforded a minimum of 120 m of adjacent lands (Section 3.2.5.5) and VPZ of 30 m (Section 3.2.5.4).

- **Development or site alteration is not permitted within a wetland or its associated minimum VPZ** (Section 3.2.5.1)
 - Exceptions include forest/fish/wildlife management, conservation and flooding/erosion control, or infrastructure, aggregate, recreational, shoreline, and existing uses, subject to Section 4 of the plan (Section 3.2.5.1)
- Development or site alteration on adjacent lands to wetlands requires an NHE or hydrological evaluation that identifies a VPZ which is of sufficient size to protect the feature and, where possible, restore or enhance the feature and/or its function (Section 3.2.5.5). The NHE may also suggest a modified VPZ (i.e., larger or smaller than 30 m), provided it can maintain the feature, its form, and its function.

5.2. Durham Policies

The ROP also includes all wetlands (i.e., significant, non-significant, and unevaluated) as one type of KNHF. The definition of wetlands within the ROP matches that of the Greenbelt Plan. The ROP defers the identification of minimum VPZs for all wetlands to local OPs.

- **Development or site alteration are prohibited in wetlands and their associated VPZ** (Section 7.4.11)
 - Exceptions include first/fish/wildlife management, stewardship/conservation/restoration/remediation and flood/erosion control, infrastructure, minor recreational uses, agriculture, stormwater management retrofits, aggregate extraction, and alterations to existing agricultural buildings (Section 7.4.11)
- An EIS completed in accordance with Section 7.4.15 is required for any development or site alteration on the adjacent lands of a wetland (Section 7.4.13)

- The EIS must identify a VPZ that applies minimum distance as determined by the municipality and examines if it is sufficient to protect the feature and its functions, and will restore or enhance the feature and/or its function, where possible Additional EIS requirements are outlined in Section 7.4.15 of the ROP.

Furthermore, the ROP also specifies that development or site alteration is not permitted within significant wetlands, significant coastal wetlands, and wetlands within provincial NHSs (i.e. the Greenbelt Plan and ORMCP; Section 7.4.27).

5.3. Pickering Policies

The POP includes all wetlands (i.e., significant, non-significant, and unevaluated) as one type of both KNHF and KHF. Wetlands are defined in the POP similarly to provincial plans, but without the inclusion of evaluating them using provincial procedures.

The POP identifies two sets of minimum AOIs, VPZs, and restrictions on development for wetlands. Wetlands within the ORMCP receive a minimum AOI of 120 m and a minimum VPZ of 30 m (per Table 17 of the POP).

- **The POP does not explicitly prohibit development within all wetlands or their minimum VPZ.** However, policy 10.12.c requires that council ensure KNHFs and KHFs are protected from development.
- For lands within the minimum AOI, but outside of the feature itself and its minimum VPZ, applications for development and site alteration require an NHE (Sections 16.42.(d))
 - The NHE must demonstrate that there will be no adverse effects on the feature or its related ecological functions, identify practices to maintain or improve the feature or its connectivity to other features, and determine if the VPZ is sufficient

Wetlands outside of the ORMCP area and the Seaton NHS receive a minimum AOI of 120 m and VPZ of 30m (per Table 18 of the POP).

- **The POP does not explicitly prohibit development within all wetlands or their minimum VPZ.** However, policy 10.12.c requires that council ensure KNF's and KHF's are protected from development.
- Any development or site alteration within the AOI requires an NHE to be completed (Section 16.8). Section 16.51 also recommends the use of smaller VPZs within the South Pickering Urban Area, as appropriate.

In both scenarios, the NHE is required to address recommendations for avoidance, mitigation, or minimization of potential negative impacts and include a monitoring plan for future assessment (Section 16.10).

5.4. Recommendations

5.4.1. Policy Approach

GEI recommends a tiered approach for the protection of wetlands within the City of Pickering.

The following are minimum legislative requirements:

- All wetlands within the ORMCP area should be protected in accordance with that plan
- All wetlands within the Greenbelt Plan area should be protected in accordance with that plan
- All wetlands are protected in accordance with relevant CA policies
- Outside of the ORMCP and Greenbelt plan areas:
 - PSWs (including significant coastal wetlands, if present) should be protected in accordance with the PPS
 - Continue requiring an NHE/EIS for any development within 120 m of all wetlands
 - Require that all unevaluated wetlands are evaluated, regardless of size, as a requirement for an application for development or site alteration

The following is GEI's recommended approach for those areas outside of provincial plan areas:

- Identify aspirational wetland cover targets to promote the retention of smaller, non-significant wetlands in place, or compensated for elsewhere
- Permit wetland removal in cases of wetlands that are small, isolated, anthropogenically influenced, low-functioning, and/or dominated by invasive species, provided there are no negative impacts to the overall system.
 - If impacts are anticipated from the removal of these wetlands, allow for compensation using native species to maintain the function provided by the feature, rather than protection in place.
 - Policies to encourage the restoration of these wetlands may also be considered, if appropriate
- Add language to allow for the identification or designation (by the City) of locally significant wetlands in the future, to encourage the protection of wetlands that are functionally important but do not meet the OWES criteria for provincial significance.
- Require development proponents to produce a Feature-Based Water Balance for City and CA review.
- It is assumed that the wetland policies above will also extend to coastal wetlands, if present. Add in language that specifies this.

5.4.2. Adjacent Lands and VPZs

The minimum AOI/adjacent lands and VPZ can vary by feature type and by jurisdictional area. The AOI or adjacent lands are generally defined as the area around a feature where development or other activities could impact the feature. VPZs are the area immediately around the feature that are generally kept in a natural state to protect the feature. The VPZ is generally a smaller area than the AOI/adjacent lands (e.g., 30 m versus 120 m).

GEI recommends a standardized approach across the City of Pickering for minimum VPZs and AOIs. For all wetlands, regardless of type or location, the current POP requirements of a minimum 30 m VPZ and 120 m AOI is recommended to be maintained. This conforms to the minimum requirements in the ORMCP and the Greenbelt Plan and is consistent with the ROP. However, it is recommended that policy provides opportunities for the refinement of ecologically appropriate buffers through appropriate studies to provide flexibility. All best practices that informed these recommendations can be found in **Appendix D.4**.

5.4.3. Definitions

GEI recommends the following modifications, additions, and removals of definitions within the POP:

- **MODIFY:** *Wetlands*

The existing definition comes from the PPS and is generally sufficient. Based on the ORMCP, Greenbelt Plan, and ROP, this definition could be updated by adding:

Wetlands are further identified, by the MNR/province or by any other person, according to evaluation procedures established by the MNR/province, as amended from time to time.

Additional criteria can also be added, if desired, such as a minimum size threshold (e.g., 0.5 ha) to be considered a wetland.

- **ADD:** Coastal Wetlands

Coastal wetlands could be present in the city due to proximity to Lake Ontario. The PPS defines them as:

Means

a) any wetland that is located on one of the Great Lakes or their connecting channels (Lake St. Clair, St. Marys, St. Clair, Detroit, Niagara and St. Lawrence Rivers); or

b) any other wetland that is on a tributary to any of the above-specified water bodies and lies, either wholly or in part, downstream of a line located 2 kilometres upstream of the 1:100-year floodline (plus wave run-up) of the large water body to which the tributary is connected.

- **ADD: Significant Wetlands/Coastal Wetlands**

This definition can be exclusive to wetlands, or can be a single, merged definition to include other features, like the PPS and Brant OP (see **Appendix D.1** for the full definition). Regardless, defining the criteria to determine a significant wetland (provincially or otherwise) is necessary. Significant Wetlands and coastal wetlands are defined together in the PPS, as:

Means:

In regard to wetlands, coastal wetlands ...: an area identified as provincially significant using evaluation criteria and procedures established by the Province, as amended from time to time.

Defining additional wetland terms would go above and beyond the minimum. Defining the following, though optional, could provide additional clarity:

- Locally significant wetlands
- Non-significant wetlands
- Unevaluated wetlands

For these definitions, clarify what criteria (size, species composition, OWES score threshold, etc.) they must meet to be considered this kind of wetland, versus a PSW. Non-significant wetlands would generally be delineated following their OWES evaluation; the definition and criteria for locally-significant wetlands (or any other kind of wetlands) should be specific to the city, its natural context, and its goals for defining different kinds of wetlands. The caveat that all wetlands or wetlands over a certain size must be evaluated as part of a development application is also possible to resolve any remaining ambiguity.

6. Woodlands

Woodlands are treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas, and vary in their level of significance at the local, regional and provincial levels.

Within the PPS, woodlands may be delineated according to the *Forestry Act* definition or the Province’s Ecological Land Classification system definition for ‘forest’ and/or ‘woodland’. Municipalities may adopt or refine this definition.

6.1. Provincial Policies

6.1.1. *Provincial Planning Statement*

Within the PPS, protections are afforded to significant woodlands and their adjacent lands.

- **Development and site alteration are not permitted in significant woodlands**, unless it has been demonstrated that there will be no negative impacts to the feature or its ecological function (Section 4.1.5.b)
- Similarly, development is also not permitted on adjacent lands to significant woodlands, unless it has been demonstrated that there will be no negative impacts to the feature or its ecological function (Section 4.1.8).

The PPS does not afford protections to non-significant or other woodlands, or their adjacent lands.

6.1.2. *Oak Ridges Moraine Conservation Plan*

The ORMCP considers only significant woodlands as a type of KNHF. Woodland definitions within the ORMCP include:

“significant”, when used with reference to valleylands, wildlife habitat and woodlands, means identified as significant using evaluation procedures established by the Ministry of Natural Resources and Forestry

“woodland” means a treed area, woodlot or forested area, other than a cultivated fruit or nut orchard or a plantation established for the purpose of producing Christmas trees

Significant woodlands are afforded an AOI of 120 m, and a VPZ of 30 m. Policies for woodlands include:

- **Development or site alteration within a significant woodland or the related minimum VPZ is prohibited** (Section 22.2; exceptions outlined in **Section 5.1.2** above)
- Development or site alteration within the AOI for significant woodlands must be accompanied by an NHE completed in accordance with Section 23 of the plan (Section 22.3; NHE requirements summarized in **Section 5.1.2** above)

The ORMCP does not afford protections to non-significant or other woodlands.

6.1.3. Greenbelt Plan

The Greenbelt Plan also includes only significant woodlands as a type of KNHF. Woodland definitions within the Greenbelt Plan include:

Significant Means:

b) in regard to woodlands, an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history. The Province (Ministry of Natural Resources and Forestry) identifies criteria relating to the foregoing;

c) in regard to other features and areas in section 3.2.5 of this Plan, ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of the Natural Heritage System. The Province (Ministry of Natural Resources and Forestry) identifies criteria relating to the foregoing; and

While some significant resources may already be identified and inventoried by official sources, the significance of others can only be determined after evaluation.

and

Woodlands:

Means treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels. Woodlands may be delineated according to the Forestry Act definition or the Province's Ecological Land Classification system definition for "forest" (PPS, 2014).

Significant woodlands are afforded a minimum AOI of 120 m (Section 3.2.5.5) and minimum VPZ of 30 m (Section 3.2.5.4). Woodland policies include:

- **Development or site alteration is not permitted within a significant woodland or its associated minimum VPZ** (Section 3.2.5.1; exceptions outlined in **Section 5.1.3** above)
- Development or site alteration on adjacent lands to significant woodlands requires an NHE (Section 3.2.5.5; NHE requirements are summarized in **Section 5.1.3** above).

The Greenbelt Plan does not afford protections to non-significant or other woodlands.

6.2. Durham Policies

The ROP includes only significant woodlands as one type of KNHF. The ROP defers the identification of minimum VPZs for significant woodlands to local OPs. The ROP defines woodlands, cultural woodlands, and significant woodlands. The definition for woodland within the ROP matches that of the PPS.

Cultural woodlands refer to an area of land at least 0.2 hectares in size with any treed vegetation community with a canopy crown cover of over 35%, but less than 60% of the ground, determinable by aerial photography.

and

Significant Woodlands: at the regional scale are identified as:

- a) any woodland occurring within the Urban or Whitebelt Area which is two hectares in size or larger; or*
- b) any woodland occurring within the Rural Area which is 10 hectares in size or larger;*
- c) any woodland occurring within the Urban or Whitebelt Area which is one hectare in size or larger or any woodland occurring within the Rural Area which is four hectares in size or larger; and*
 - i. occurs within 30 metres of a significant natural heritage feature, any wetland greater than 0.5 hectares in size, or fish habitat; or*
 - ii) occurs wholly within an identified linkage area;*
- d) any woodland occurring within the Urban or Whitebelt Area which is one hectare in size or larger or any woodland occurring within the Rural Area which is four hectares in size or larger; and includes:*
 - i. a vegetation community with a provincial ranking of S1, S2, or S3 as designated by the Natural Heritage Information Centre;*
 - ii. rare, uncommon species or species with a restricted habitat preference; or*
 - iii) characteristics of older woodlands, including:*

- i. woodlands having 10 or more trees per hectare greater than 100 years old; or*
 - ii. woodlands having 10 or more trees per hectare at least 50 centimetres in diameter, or a basal area of eight or more square metres in trees that are at least 40 centimetres in diameter.*
- e) notwithstanding, for woodlands occurring within the Oak Ridges Moraine or the Greenbelt Natural Heritage System, significant woodlands are based on the provincial criteria developed for the Oak Ridges Moraine Conservation Plan and the Greenbelt Plan.*

Significant woodlands are afforded 120 m of adjacent lands. Woodland policies include:

- **Development or site alteration are prohibited in significant woodlands and their associated VPZ** (Section 7.4.11; Section 7.4.22; exceptions are outlined in **Section 5.2** above)
- An EIS completed in accordance with Section 7.4.15 is required for any development or site alteration on the adjacent lands of a significant woodland (Section 7.4.13; EIS requirements are summarized in **Section 5.2** above)

Additional woodland policies are found in Section 7.4.19 through Section 7.4.29 which outline the regions woodland cover target (40% of total land area), introduce the regional Woodland By-law (for woodlands over one ha in size; Region of Durham, 2020), express permission for local municipalities to utilize woodland or tree conservation bylaws, introduce the idea of locally significant woodlands, and incorporate climate change into planning for conservation.

While not a policy, the Regional Woodland By-law is in effect and prohibits or regulates the destruction or injury of trees within the Woodlands across the Regional Municipality. The Regional Woodland By-law applies to Woodlands within the region that are one hectare (2.5 acres) in size and greater.

The ROP does not provide any policies restricting development or site alteration within or adjacent to (i.e., within 120 m) cultural woodlands, locally significant woodlands, non-significant woodlands, or other woodlands. Additionally, the ROP does not provide any direction for woodlands which are dominated by non-native or invasive species.

6.3. Pickering Policies

The POP identifies significant woodlands as one type of KNHF. The POP identifies two sets of minimum AOIs, VPZs, and restrictions on development for significant woodlands. The POP defines significant woodlands as:

(off the Oak Ridges Moraine) means an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size, or due to site quality, species composition, or past management history. In the Oak Ridges Moraine, significant woodlands are further defined by the Province in the Oak Ridges Moraine Conservation Plan and the associated technical guidelines.

Non-significant woodlands are not defined, leaving the establishment of woodlands (versus a thicket or other treed area) up to interpretation.

Significant woodlands within the ORMCP receive a minimum AOI of 120 m and a minimum VPZ of 30 m (per Table 17 of the POP). Policies include:

- **The POP does not explicitly prohibit development within significant woodlands or their minimum VPZ.** However, policy 10.12.c requires that council ensure KNHFs and KHFs are protected from development.
- Development or site alteration are not permitted in the AOI, unless an NHE demonstrates there will be no negative impact to the feature or its ecological function (Section 16.42.d).

Significant woodlands outside of the ORMCP area and the Seaton NHS receive a minimum AOI of 120 m and VPZ of 10m (per Table 18 of the POP). Table 18 further specifies that significant woodlands within the Greenbelt Plan Area have a minimum VPZ of 30 m.

- Development or site alteration is not permitted within the AOI, unless an NHE demonstrates there will be no negative impact to the feature or its ecological function (Section 16.51.b). Section 16.51.c also recommends the use of smaller VPZs within the South Pickering Urban Area, as appropriate.

In both scenarios, the NHE is required to address recommendations for avoidance, mitigation, or minimization of potential negative impacts and include a monitoring plan for future assessment (Section 16.10). Similar to the ROP, there are no provisions that restrict development or site alteration within or adjacent to cultural woodlands, locally significant woodlands, non-significant woodlands, or other woodlands.

6.4. Recommendations

6.4.1. Policy Approach

GEI recommends a tiered approach for the protection of woodlands within the City of Pickering.

The following are minimum legislative requirements:

- All significant woodlands within the ORMCP area should be protected in accordance with that plan
- All significant woodlands within the Greenbelt Plan area should be protected in accordance with that plan
- Outside of the ORMCP and Greenbelt plan areas:
 - Significant woodlands should be protected in accordance with the PPS
 - Require an NHE/EIS for any development within 120 m of significant woodlands, and 30 m of all other woodlands

The following is GEI's recommended approach for areas located outside of provincial plan areas:

- Identify aspirational tree cover targets to promote the retention of smaller, non-significant woodlands in place, or compensated for elsewhere
- Require that unevaluated woodlands that are greater than 1 ha in size are evaluated as part of an application for development or site alteration
- Add in language to allow for the identification or designation (by the City) of locally significant woodlands in the future
- Add in language to address compensation for woodlands that are small, isolated, and/or dominated by non-native or invasive species. This can also include hedgerows, orchards, or other treed areas that are not considered woodlands under the PPS or Forestry Act definition(s).
 - Where it is more appropriate to retain these woodlands in place, add in language to support the enhancement/restoration of these features.
- Add in language which references and is consistent with the woodland and tree removal by-laws, as appropriate
- Consideration can be given to protect additional woodlands (i.e., those that are not deemed significant), such as larger woodlands within the urban boundary, or woodlands that form crucial linkages to other features

6.4.2. *Adjacent Lands and VPZs*

GEI recommends continuing with the existing approach for minimum VPZs and AOIs for significant woodlands across the City of Pickering. Significant woodlands within the ORMCP receive an AOI of 120 m and a minimum VPZ of 30 m. Significant woodlands outside of the ORMCP receive an AOI of 120 m and a reduced VPZ of 10m, as is common best practice (**Appendix D.4**). This approach is considered balanced; it provides protections for these features but also does not unduly restrict development within more built-up areas. However, it is

recommended that policy provides opportunities for the refinement of ecologically appropriate buffers through appropriate studies.

GEI also recommends adding a minimum AOI of 30 m to all non-significant or unevaluated woodlands. The addition of this AOI will allow the City some flexibility to review applications and require additional studies. All best practices that informed these recommendations can be found in **Appendix D.4**.

6.4.3. Definitions

In the ORMCP and Greenbelt Plan areas, refer to the respective plan for their woodland definition.

For the rest of the City, GEI recommends the following changes:

- **ADD: Tree**

The Regional Tree By-law, as well as other OPs, define tree(s) to support woodland policies and definitions. The recommended definition comes from the Markham and Vaughan OPs, and builds on the definition provided in the Regional Tree By-law:

means any species of woody perennial plant, including its root system, that has reached or can reach a height of at least 4.5 metres at physiological maturity, provided that where multiple stems grow from the same root system, the number of trees shall be the number of stems that can be counted at a point of measurement 1.37 metres from the ground.

Shrubs, bushes, grasses, flowers, and other non-woody plants that do not meet the height criteria are not considered trees. Young tree species that are shorter than 4.5 m are still considered trees, as they would be expected to meet that criteria at physiological maturity. It is also worth considering excluding non-native species (e.g., buckthorn) from the tree definition to encourage the replacement of invasive species with native species.

- **ADD: Woodlands**

The POP only defines significant woodlands, causing confusion as to what constitutes a non-significant woodland. The Tree Protection By-law also does not define woodlands. The definition used in the PPS, Greenbelt Plan, and ROP is:

means treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and

the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels. Woodlands may be delineated according to the Forestry Act definition or the Province’s Ecological Land Classification system definition for “forest.”

The Forestry Act uses a quantifiable definition of woodland, which means land with at least:

- (a) 1,000 trees, of any size, per hectare,*
 - (b) 750 trees, measuring over five centimetres in diameter, per hectare,*
 - (c) 500 trees, measuring over 12 centimetres in diameter, per hectare, or*
 - (d) 250 trees, measuring over 20 centimetres in diameter, per hectare,*
- but does not include a cultivated fruit or nut orchard or a plantation established for the purpose of producing Christmas trees.*

ELC uses a more flexible approach, which defines forest as all ELC codes starting with “FO” and having greater than 60% tree cover. This excludes cultural plantations (i.e. communities maintained by anthropogenic-based disturbances) which receive a “CUP” code. Most municipalities opt to also include cultural woodlands (“CUW”) communities, and other treed ecosystems like Treed Rock Barrens (“RBT”) and “Treed Sand Barren”. The minimum size to be considered an ELC polygon is generally 0.5 ha, but can be smaller, where warranted. For small yet diverse study areas, 0.1 ha ELC polygons are common practice.

While both definitions are appropriate and commonly used in many municipalities, should the City of Pickering wish to choose only one definition, the ELC definition of forest provides a more holistic approach as it considers the ecological landscape as a whole, versus just the number or size of trees present. The Region of Niagara (2024) is one municipal example that utilizes the ELC definitions only.

- **MODIFY:** *Significant Woodlands*

The existing definition is consistent with the PPS and Greenbelt Plan definitions. However, the ROP goes above and beyond this definition and adds additional criteria. The current definition should be modified to conform with the ROP. It is also possible to merge this term under a wider “significant” term, like the Brant OP. The ROP definition is:

- a) any woodland occurring within the Urban or Whitebelt Area which is two hectares in size or larger; or*
- b) any woodland occurring within the Rural Area which is 10 hectares in size or larger;*

c) any woodland occurring within the Urban or Whitebelt Area which is one hectare in size or larger or any woodland occurring within the Rural Area which is four hectares in size or larger; and

i) occurs within 30 metres of a significant natural heritage feature, any wetland greater than 0.5 hectares in size, or fish habitat; or

ii) occurs wholly within an identified linkage area;

d) any woodland occurring within the Urban or Whitebelt Area which is one hectare in size or larger or any woodland occurring within the Rural Area which is four hectares in size or larger; and includes:

i) a vegetation community with a provincial ranking of S1, S2, or S3 as designated by the Natural Heritage Information Centre;

ii) rare, uncommon species or species with a restricted habitat preference;
or

iii) characteristics of older woodlands, including:

i. woodlands having 10 or more trees per hectare greater than 100 years old; or

ii. woodlands having 10 or more trees per hectare at least 50 centimetres in diameter, or a basal area of eight or more square metres in trees that are at least 40 centimetres in diameter.

e) notwithstanding, for woodlands occurring within the Oak Ridges Moraine or the Greenbelt Natural Heritage System, significant woodlands are based on the provincial criteria developed for the Oak Ridges Moraine Conservation Plan and the Greenbelt Plan.

The existing definition is also specific to significant woodlands off the ORM. As stated above, significant woodlands within the ORMCP NHS should be defined using the ORMCP definition.

Defining additional woodland terms would go above and beyond the minimum. Defining the following, though optional, could provide additional clarity:

- Locally significant woodlands
- Additional sub-types, like core and contributory woodlands
- Hedgerows

Like with wetlands, it is recommended to clearly state the differences in criteria (e.g., size, species) used to determine woodland types through clear definitions. It may also be advantageous to include caveats within the woodland definitions to exclude communities dominated by invasive or non-native species.

7. Valleylands

Valleylands are natural areas that occur in a valley or other landform depression that has water flowing through or standing for some period of the year. They are linear systems that connect natural areas, from their origins in headwater areas to other aquatic systems. They provide important habitat and linkages on a landscape scale. They are often dynamic systems as well; valleylands are most often associated with permanent and intermittent streams, and are subject to watercourse dynamics (e.g. flooding, meandering), in addition to erosion of the valley wall. As such, valleylands are considered both a natural heritage and natural hazard feature. Valleylands can be identified by the planning authority, the CA, or the province as being provincially, regionally, or locally significant based on their features, functions, and other important values. Planning authorities collaborate with CAs to identify hazardous lands associated with valleylands, in accordance with provincial guidance (PPS Section 5.2.1).

7.1. Provincial Policies

7.1.1. *Provincial Planning Statement*

Within the PPS, protections are afforded to significant valleylands and their adjacent lands.

- **Development and site alteration are not permitted in significant valleylands**, except where it has been demonstrated that there will be no negative impacts to the feature or its ecological function (Section 4.1.5.c)
- Development and site alteration are also not permitted on adjacent lands to significant valleylands, unless it has been demonstrated that there will be no negative impacts to the feature or its ecological functions (Section 4.1.8).

The PPS does not afford protections to non-significant valleylands.

7.1.2. *Oak Ridges Moraine Conservation Plan*

The ORMCP considers only significant valleylands as one type of KNHF. Valleyland definitions within the plan are:

“significant”, when used with reference to valleylands, wildlife habitat and woodlands, means identified as significant using evaluation procedures established by the Ministry of Natural Resources and Forestry;

and

“valleyland” means a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year

Significant valleylands are afforded a minimum 120 m AOI and 30 m VPZ (Part III Table).

Valleyland policies include:

- **Development or site alteration within a significant valleyland or the related minimum VPZ is prohibited** (Section 22.2; exceptions outlined in **Section 5.1.2** above)
- Development or site alteration within the AOI for significant valleylands must be accompanied by an NHE completed in accordance with Section 23 of the plan (Section 22.3; NHE requirements summarized in **Section 5.1.2** above)

The ORMCP does not afford protections to non-significant valleylands.

7.1.3. Greenbelt Plan

The Greenbelt Plan also includes only significant valleylands as a type of KNHF. Valleyland definitions in the Greenbelt Plan include:

Significant Means:

c) in regard to other features and areas in section 3.2.5 of this Plan, ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of the Natural Heritage System. The Province (Ministry of Natural Resources and Forestry) identifies criteria relating to the forgoing; and

While some significant resources may already be identified and inventoried by official sources, the significance of others can only be determined after evaluation.

and

Valleylands Means:

a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year (PPS, 2014).

Significant valleylands are afforded a minimum AOI of 120 m (Section 3.2.5.5). They are not afforded a minimum VPZ. Policies include:

- **Development or site alteration is not permitted within a significant valleyland or its associated minimum VPZ** (Section 3.2.5.1; exceptions outlined in **Section 5.1.3** above)
- Development or site alteration on adjacent lands to significant valleylands requires an NHE, which will identify the minimum VPZ (Section 3.2.5.5).

The Greenbelt Plan does not afford protections to non-significant valleylands.

7.2. Durham Policies

The ROP includes only significant valleylands as a type of KNHF. The ROP only defines significant valleylands:

Significant: means:

c) in regard to valleyland: means an area which is ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system. These are to be identified using criteria established by the province.

Significant valleylands are afforded 120 m of adjacent lands. The ROP defers the identification of minimum VPZs to local OPs.

- **Development or site alteration are prohibited in significant valleylands and their associated VPZ** (Section 7.4.11; exceptions are outlined in **Section 5.2** above)
- An EIS completed in accordance with Section 7.4.15 is required for any development or site alteration on the adjacent lands of a significant valleyland (Section 7.4.13; EIS requirements are summarized in **Section 5.2** above)

The ROP does not afford protections to non-significant valleylands. Additionally, the ROP misses a key component of valleylands being natural corridors and linkages, which is highlighted in other provincial plans.

7.3. Pickering Policies

The POP includes only significant valleylands as a type of KNHF. Significant valleylands are defined as:

means a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year, which is ecologically important in terms of features, functions, representation or amount, and contribute to the quality and diversity of the natural heritage system.

Non-significant valleylands are not defined.

The POP provides a minimum AOI of 120 m and minimum VPZ of 30 m for significant valleylands that are located within the ORMCP, and in addition to those located outside of it (Table 17 and Table 18 of the POP).

- **The POP does not explicitly prohibit development within significant valleylands or their minimum VPZ.** However, policy 10.12.c requires that council ensure KNHFs and KHFs are protected from development.

- Both within and outside of the ORMCP, development and site alteration is prohibited in the adjacent lands of significant valleylands, unless an NHE demonstrates that there will be no negative impact to the feature or its ecological functions (Section 16.42.d; Section 16.51.b).

The POP does not afford protections to non-significant valleylands.

7.4. Recommendations

7.4.1. Policy Approach

GEI recommends a tiered approach for the protection of valleylands within the City of Pickering.

The following are minimum legislative requirements:

- All significant valleylands within the ORMCP area should be protected in accordance with that plan
- All significant valleylands within the Greenbelt Plan area should be protected in accordance with that plan
- Outside of the ORMCP and Greenbelt plan areas:
 - Significant valleylands should be protected in accordance with the PPS
- Provide clarification in policy that valleylands are also regulated by the Conservation Authority for their role as a natural hazard feature. When reviewing valleyland policies, both valleylands as a natural heritage feature and valleylands as a natural hazard feature should be considered.

The following are Best Practice/Aspirational approaches outside of provincial plan areas:

- Add in language to allow for the identification or designation (by the City) of locally significant valleylands in the future, with associated policies for protections
- Consider reducing the minimum VPZ for significant valleylands and/or allowing some development to occur within these areas (subject to all necessary studies)
- Consider whether requiring valleyland evaluations is warranted for all valleylands or only for those associated with major river or landform features
- Provide a comprehensive list and/or mapping of significant valleylands within the City
- Add in language to reflect all valleylands' contribution as a natural linkage and corridor. This language would be suitable within the descriptions of natural corridors and linkages, which are a component of the NHS.

7.4.2. Adjacent Lands and VPZs

The City of Pickering currently uses a standard approach for minimum VPZs and AOIs for significant valleylands. Regardless of their location, they are all provided with a minimum AOI of 120 m and VPZ of 30m. Valleylands will also be subject to natural hazard regulation setbacks as outlined in O. Reg 41/24 and regulated by the CA. It is recommended that the POP clearly distinguish that recommended buffers for significant valleylands as a natural heritage feature are separate from the CA regulated limits for valleylands as a natural hazard feature.

As the Greenbelt Plan does not provide for a minimum VPZ, GEI recommends using a standard approach across the City of Pickering. All significant valleylands can be afforded a minimum AOI of 120 and minimum VPZ of 30 m. GEI recommends adding additional language to support a reduced VPZ, subject to completion of technical studies and approval by the City, in areas outside of the ORMCP. Areas within the ORMCP area will still be governed by the ORMCP. All best practices that informed these recommendations can be found in **Appendix D.4**.

7.4.3. Definitions

In the ORMCP and Greenbelt Plan areas, refer to the respective plan for their valleyland definition.

For the rest of the City, GEI recommends the following definitions:

- **ADD: Valleylands**

The POP only defines significant valleylands, causing confusion as to what constitutes a non-significant valleyland. The definition used in the PPS, ORMCP, and Greenbelt Plan is:

means a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year

- **MODIFY: Significant Valleylands**

The existing definition is generally consistent with provincial definitions but is missing the addition of its identification by the province/MNR or other evaluation criteria, as is included in the ROP, Greenbelt Plan, and ORMCP. It is also possible to merge this term with other features under a broader “significant” term. The following should be added to the definition:

Valleylands may also be identified as significant using criteria established by the Province.

Should the City wish to identify locally significant valleylands, that can be included in the definition as well (e.g., “established by the province or the city, for locally significant valleylands”).

Defining additional valleyland terms would also go above and beyond the minimum. Defining the following, though optional, could provide additional clarity:

- Locally significant valleylands
- Non-significant valleylands

Clearly state the differences in criteria used to determine what kind of valleyland is which in the definition.

8. Areas of Natural and Scientific Interest

The PPS defines ANSIs as areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education. Life science ANSIs are representative of important segments of the province’s biodiversity and natural landscapes, often containing rare vegetation or species. They are also generally in an undisturbed state. Earth science ANSIs relate to geologic or landform features, such as bedrock, fossils, or landforms, including examples of ongoing geologic processes.

Significant ANSIs are the best examples of natural heritage or geologic features and may also be associated with other significant features such as wetlands or woodlands. Candidate ANSIs are those that have been identified and recommended for protection but have not been formally confirmed. Planning authorities may choose to identify locally or regionally significant ANSIs to protect candidate ANSIs.

8.1. Provincial Policies

8.1.1. *Provincial Planning Statement*

Within the PPS, protections are afforded to significant areas of natural and scientific interest (ANSIs) and their adjacent lands.

- **Development and site alteration are not permitted in or on *adjacent lands* to significant ANSIs, unless it has been demonstrated that there will be no negative impacts to the feature or its ecological functions** (Section 4.1.5.e; Section 4.1.8).

These protections apply to both life science ANSIs and earth science ANSIs. The PPS does not afford protections to non-significant ANSIs.

8.1.2. *Oak Ridges Moraine Conservation Plan*

The ORMCP considers all life science ANSIs as one type of KNHF. Life science ANSIs are defined within the ORMCP as:

“means an area that has been, (a) identified as having life science values related to protection, scientific study or education, and (b) further identified by the Ministry of Natural Resources and Forestry using evaluation procedures established by that Ministry, as amended from time to time

Life science ANSIs are afforded a minimum 120 m AOI and 30 m VPZ (Part III Table).

- **Development or site alteration within a life science ANSI or the related minimum VPZ is prohibited** (Section 22.2; exceptions outlined in **Section 5.1.2** above)
- Development or site alteration within the AOI for life science ANSIs must be accompanied by an NHE completed in accordance with Section 23 of the plan (Section 22.3; NHE requirements summarized in **Section 5.1.2** above)

Although earth science ANSIs are not considered a type of KNHF, they are mentioned elsewhere in the plan. Earth science ANSIs are defined as:

“area of natural and scientific interest” (earth science) means an area that has been, (a) identified as having earth science values related to protection, scientific study or education, and (b) further identified by the Ministry of Natural Resources and Forestry using evaluation procedures established by that Ministry, as amended from time to time

Section 30.10 identifies that development or site alteration must prepare a site plan that demonstrates protections for earth science ANSIs. Development within an earth science ANSI or its AOI must be accompanied by an earth science heritage evaluation that demonstrates protections for the feature (Section 30.10) and determines a suitable minimum VPZ (if required) (Section 30.12.b). The ORMCP does not prohibit development or site alteration within significant earth science ANSIs, though these are covered by the PPS.

8.1.3. Greenbelt Plan

The Greenbelt Plan also only includes life science ANSIs as one type of KNHF. Life science ANSIs are defined within the plan as:

Life science areas of natural and scientific interest (ANSIs) Means an area(s) that has been:

- a) identified as having life science values related to protection, scientific study or education; and*
- b) further identified by the Ministry of Natural Resources and Forestry using evaluation procedures established by that Ministry, as amended from time to time.*

Life science ANSIs are afforded a minimum AOI of 120 m (Section 3.2.5.5). They are not afforded a minimum VPZ.

- **Development or site alteration is not permitted within a life science ANSI or its associated minimum VPZ** (Section 3.2.5.1; exceptions outlined in **Section 5.1.3** above)
- Development or site alteration on adjacent lands to life science ANSIs requires an NHE, which will identify the minimum VPZ (Section 3.2.5.5).

Earth science ANSIs are not mentioned within the plan and are not defined or afforded protections.

8.2. Durham Policies

The ROP includes all life science and earth science ANSIs as a type of KNHF. ANSIs are defined in the ROP as:

means areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education. Earth science values refer to values that relate to the geological, soil and landform features (i.e. distinctive physical attributes of land such as slope, shape, elevation and relief) of the environment. Life science areas refer to areas that has been:

- a) identified as having life science values (i.e. values that relate to the living component of the environment) related to protection, scientific study or education; and*
- b) further identified by the Ministry of Northern Development, Mines, Natural Resources and Forestry using evaluation procedures established by that Ministry, as amended from time to time.*

and

Significant: means:

d) in regard to wetlands, coastal wetlands and areas of natural and scientific interest means an area identified as provincially significant by the Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry using evaluation procedures established by the province, as amended from time to time.

ANSIs are afforded 120 m of adjacent lands and defers the identification of minimum VPZs to local OPs. Policies include:

- **Development or site alteration are prohibited in ANSIs and their associated VPZ** (Section 7.4.11; exceptions are outlined in **Section 5.2** above)
- An EIS completed in accordance with Section 7.4.15 is required for any development or site alteration on the adjacent lands of an ANSI (Section 7.4.13; EIS requirements are summarized in **Section 5.2** above)

8.3. Pickering Policies

Both life and earth science ANSIs are considered a type of KNHF in the POP. Neither type are defined, though other significant features identified in Section 2.1 of the 2020 Provincial Policy

Statement (now Section 4.1 of the 2024 PPS) or Section 3.2.4 of the Greenbelt plan are defined as:

means those other features and areas ... that are ecologically important in terms of features, functions, representation, or amount, and contribute to the quality and diversity of an identifiable geographic area or natural heritage system. While some significant resources may already be identified and inventoried, the significance of others can only be determined after evaluation.

The POP does not include ANSIs within Table 17 and therefore does not provide a minimum AOI or VPZ for those ANSIs located within the ORMCP. As such, **the policies within Section 16.42.d do not apply, and there are no requirements for additional studies or restrictions on development within or adjacent to ANSIs** located within the ORMCP, beyond those outlined in the ORMCP directly.

All ANSIs that are located outside of the ORMCP area and the Seaton NHS receive a minimum AOI of 120 m, with the minimum VPZs determined on a site-specific basis through an NHE (Table 18). Section 16.51.c recommends the use of smaller VPZs within the South Pickering Urban Area, as appropriate. Other policies include:

- **The POP does not explicitly prohibit development within ANSIs or their minimum VPZ.** However, policy 10.12.c requires that council ensure KNFs and KHFs are protected from development.
- Development or site alteration is not permitted within the AOI of an ANSI unless an NHE demonstrates no negative impact to the feature or its ecological function (Section 16.51.b).

8.4. Recommendations

8.4.1. Policy Approach

Under the current approach, the policies for significant ANSIs and other ANSIs are somewhat difficult to navigate. The ROP has taken a conservative approach in protecting all ANSIs regardless of significance and therefore is consistent with all provincial plans. In contrast, both the ORMCP and Greenbelt Plan only provide protections for life science ANSIs, missing key protections for significant earth science ANSIs which are required under the PPS.

The following are minimum legislative requirements:

- Outside of the ORMCP and Greenbelt Plan areas:
 - All significant ANSIs (earth science and life science) should be protected in accordance with the PPS

- All significant ANSIs (earth science and life science) should be afforded a minimum AOI of 120 m, and a minimum VPZ of 30 m, as determined on a site/feature-specific basis through an NHE
- All life science ANSIs within the ORMCP and Greenbelt Plan areas should be protected in accordance with the respective plan (i.e. 120 m AOI and 30 m VPZ)

The following is GEI's recommended approach, for lands that are located outside of provincial plan areas:

1. Add in language to allow for the identification or designation (by the City) of locally significant ANSIs in the future
2. Consider reducing the minimum VPZ for non-significant ANSIs and/or allowing some development to occur within these areas (subject to all necessary studies)
3. Consider whether requiring ANSI evaluations are warranted for all ANSIs
4. Consider whether allowing the removal of ANSIs which do not meet the criteria for significance is warranted
5. Provide a comprehensive list of significant ANSIs within the City

8.4.2. *Adjacent Lands and VPZs*

GEI recommends that all ANSIs within the City of Pickering (including those within the ORMCP and Greenbelt Plan) should receive a minimum AOI of 120 m and minimum VPZ of 30 m. In areas outside of the ORMCP and Greenbelt Plan area, the VPZ can be reduced on a site-specific basis for both significant and non-significant ANSIs, where recommended through an NHE. All best practices that informed these recommendations can be found in **Appendix D.4**.

8.4.3. *Definitions*

In the ORMCP and Greenbelt Plan areas, refer to the respective plan for their ANSI definition(s).

For the rest of the City, GEI recommends the following definitions:

- **ADD:** *Areas of Natural and Scientific Interest*

Earth and life science ANSIs are defined together in the PPS and ROP, and separately in the ORMCP; only life science ANSIs are defined in the Greenbelt Plan. The definition in the ROP is the most comprehensive and is generally consistent with the other three definitions. A modified definition that incorporates all four could be:

means areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to

protection, scientific study or education. These areas may also be further identified by the Ministry of Natural Resources using evaluation procedures established by that Ministry, as amended from time to time.

Earth science refers to values that relate to the geological, soil and landform features (i.e. distinctive physical attributes of land such as slope, shape, elevation and relief) of the environment. Life science refers to values that relate to the living component of the environment.

Though not technically specified, the provincial definitions only refer to provincially significant ANSIs. The City may also choose to identify locally significant ANSIs. Criteria should also be included in the POP text or an additional definition.

9. Significant Wildlife Habitat

The PPS defines wildlife habitat as areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. SWH generally include habitats that are important to specific species, such as those that are rare, seasonal, or geographically limited, or are significant in terms of their characteristics, such as size or vegetation type. SWH is further described within the *Significant Wildlife Habitat Technical Guide* (MNR, 2000) and the Ecoregion Schedules for each ecoregion in the province. For the majority of the City of Pickering, this is the *SWH Criteria Schedules for Ecoregion 6E* (OMNRF, 2015); for sections of the 7th Concession/North Road area and the Green River and Rosebank neighbourhoods on the west side of the City, this is the *SWH Criteria Schedules for Ecoregion 7E* (OMNRF, 2015). These manuals contain criteria for determining significance, such as the presence of certain indicator species, habitat size, or vegetation type. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species.

9.1. Provincial Policies

9.1.1. Provincial Planning Statement

Within the PPS, protections are afforded to SWH and its adjacent lands.

- **Development and site alteration are not permitted in or on adjacent lands to SWH, unless it has been demonstrated that there will be no negative impacts to the feature or its ecological functions** (Section 4.1.5.d; Section 4.1.8).

The PPS does not afford protections to wildlife habitat where it is deemed non-significant.

9.1.2. Oak Ridges Moraine Conservation Plan

The ORMCP considers SWH as one type of KNHF. SWH definitions include:

“significant”, when used with reference to valleylands, wildlife habitat and woodlands, means identified as significant using evaluation procedures established by the Ministry of Natural Resources and Forestry.

and

“wildlife habitat” means areas where plants, animals and other organisms live and find adequate amounts of food, water, shelter and space needed to sustain their populations and includes areas where certain species concentrate at a vulnerable point in their annual or life cycle and areas that are important to migratory or nonmigratory species.

SWH is afforded a minimum 120 m AOI, with the appropriate VPZ being determined through an NHE (Part III Table).

- **Development or site alteration within SWH is prohibited** (Section 22.2; exceptions outlined in **Section 5.1.2** above)
- Development or site alteration within the AOI for significant woodlands must be accompanied by an NHE completed in accordance with Section 23 of the plan (Section 22.3)
 - In addition to the NHE requirements summarized in Section 5.1.2 above, the NHE must also determine if a VPZ is required and, if so, the minimum dimensions of the VPZ

In addition to SWH, the ORMCP also provides additional protections to some types of SWH regardless of significance; all sand barrens, savannahs and tallgrass prairies are also considered a type of KNHF. The ORMCP provides specific definitions for these features within the plan:

“sand barrens” means land (not including land that is being used for agricultural purposes and no longer exhibits sand barrens characteristics) that,

- a) *has sparse or patchy vegetation that is dominated by plants that are,*
 - i. *adapted to severe drought and low nutrient levels, and*
 - ii. *maintained by severe environmental limitations such as drought, low nutrient levels and periodic disturbances such as fire,*
- b) *has less than 25 per cent tree cover,*
- c) *has sandy soils (other than shorelines) exposed by natural erosion, depositional process or both, and*
- d) *has been further identified, by the Ministry of Natural Resources and Forestry or by any other person, according to evaluation procedures established by the Ministry of Natural Resources and Forestry, as amended from time to time.*

and

“savannah” means land (not including land that is being used for agricultural purposes and no longer exhibits savannah characteristics) that,

- a) *has vegetation with a significant component of non-woody plants, including tallgrass prairie species that are maintained by seasonal drought, periodic disturbances such as fire, or both,*
- b) *has from 25 per cent to 60 per cent tree cover,*
- c) *has mineral soils, and*
- d) *has been further identified, by the Ministry of Natural Resources and Forestry or by any other person, according to evaluation procedures established by the Ministry of Natural Resources and Forestry, as amended from time to time.*

and

“tallgrass prairie” means land (not including land that is being used for agricultural purposes and no longer exhibits tallgrass prairie characteristics) that,

- a) has vegetation dominated by non-woody plants, including tallgrass prairie species that are maintained by seasonal drought, periodic disturbances such as fire, or both,*
- b) has less than 25 per cent tree cover,*
- c) has mineral soils, and*
- d) has been further identified, by the Ministry of Natural Resources and Forestry or by any other person, according to evaluation procedures established by the Ministry of Natural Resources and Forestry, as amended from time to time.*

These features are afforded the same protections noted above for SWH. These features are also afforded a 120 m AOI and 30 m VPZ (except where determined otherwise through an NHE; Part III Table).

9.1.3. Greenbelt Plan

The Greenbelt Plan considers SWH as one type of KNHF. The Greenbelt Plan defines SWH as:

Significant Means:

c) in regard to other features and areas in section 3.2.5 of this Plan, ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of the Natural Heritage System. The Province (Ministry of Natural Resources and Forestry) identifies criteria relating to the forgoing; and While some significant resources may already be identified and inventoried by official sources, the significance of others can only be determined after evaluation.

and

Wildlife habitat Means:

areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species (PPS, 2014).

SWH is afforded a minimum 120 m AOI. It is not afforded a minimum VPZ.

- **Development or site alteration is not permitted within SWH or its associated minimum VPZ (Section 3.2.5.1; exceptions outlined in Section 5.1.3 above)**

- Development or site alteration on adjacent lands to SWH requires an NHE, which will identify the minimum VPZ (Section 3.2.5.5).

Like the ORMCP, the Greenbelt Plan also provides additional protections to specific types of SWH, regardless of significance, including all sand barrens, savannahs, tallgrass prairies, and alvars, which are all considered a type of KNHF. They are defined within the plan as: The Greenbelt Plan provides specific definitions for these features within the plan:

Sand barrens Means land (not including land that is being used for agricultural purposes or no longer exhibits sand barrens characteristics) that:

- a) *has sparse or patchy vegetation that is dominated by plants that are:*
 - i. *adapted to severe drought and low nutrient levels; and*
 - ii. *maintained by severe environmental limitations such as drought, low nutrient levels and periodic disturbances such as fire;*
- b) *has less than 25 per cent tree cover;*
- c) *has sandy soils (other than shorelines) exposed by natural erosion, depositional process or both; and*
- d) *has been further identified, by the Ministry of Natural Resources and Forestry or by any other person, according to evaluation procedures established by the Ministry of Natural Resources and Forestry, as amended from time to time.*

and

Savannah Means land (not including land that is being used for agricultural purposes or no longer exhibits savannah characteristics) that:

- a) *has vegetation with a significant component of non-woody plants, including tallgrass prairie species that are maintained by seasonal drought, periodic disturbances such as fire, or both;*
- b) *has from 25 per cent to 60 per cent tree cover;*
- c) *has mineral soils; and*
- d) *has been further identified, by the Ministry of Natural Resources and Forestry or by any other person, according to evaluation procedures established by the Ministry of Natural Resources and Forestry, as amended from time to time.*

and

Tallgrass prairies Means land (not including land that is being used for agricultural purposes or no longer exhibits tallgrass prairie characteristics) that:

- a) *has vegetation dominated by non-woody plants, including tallgrass prairie species that are maintained by seasonal drought, periodic disturbances such as fire or both;*
- b) *has less than 25 per cent tree cover;*
- c) *has mineral soils; and*
- d) *has been further identified, by the Minister of Natural Resources and Forestry or by any other person, according to evaluation procedures established by the Ministry of Natural Resources and Forestry, as amended from time to time.*

and

Alvars Means naturally open areas of thin or no soil over essentially flat limestone, dolostone or marble rock, supporting a sparse vegetation cover of mostly shrubs and herbs.

These features are afforded a 120 m AOI (Part III Table). No minimum VPZ is identified. **These features and their adjacent lands are afforded the same protections noted above for SWH.**

9.2. Durham Policies

The ROP includes significant wildlife habitat, alvars, sand barrens, savannahs, and tallgrass prairies as types of KNHFs. The ROP defines SWH. The definition for SWH within the ROP matches that of the PPS, with the addition of a note about designation using provincial criteria.

Significant: means:

e) in regard to wildlife habitat: means an area that is ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system. These are to be identified using criteria established by the province; and

Criteria for determining significance for resources identified in c) to e) above are recommended by the province, but municipal approaches that achieve or exceed the same objective may also be used. While some significant resources may already be identified and inventoried by official sources, the significance of others can only be determined after evaluation

The ROP does not provide a separate definition for wildlife habitat or tallgrass prairies. The definition for alvar matches that of the Greenbelt Plan, and the definitions for savannahs and sand barrens match both the ORMCP and Greenbelt Plan. The ROP assigns 120 m of adjacent lands to SWH and defers the identification of minimum VPZs to local OPs.

- **Development or site alteration are prohibited in SWH and its associated VPZ** (Section 7.4.11; exceptions are outlined in **Section 5.2** above)

- An EIS completed in accordance with Section 7.4.15 is required for any development or site alteration on the adjacent lands of SWH (Section 7.4.13; EIS requirements are summarized in **Section 5.2** above).

9.3. Pickering Policies

The POP defines SWH as:

means areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations, which are ecologically important in terms of their features, functions, representation or amount, and contribute to the quality and diversity of the natural heritage system. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species.

The POP provides a standardized approach for SWH located both within the ORMCP and outside of it. SWH received a minimum AOI of 120 m, with the minimum VPZ being determined on a site-specific basis through an NHE (Table 17 and Table 18 of the POP).

- **The POP does not explicitly prohibit development within SWH or their minimum VPZ.** However, policy 10.12.c requires that council ensure KNFs and KHF are protected from development.
- Development or site alteration within the minimum AOI is not permitted unless an NHE demonstrates that there will be no negative impact to the feature or its ecological function (Section 16.42.d; Section 16.51.b).

Non-SWH, like alvars, sand barrens, savannahs, and tallgrass prairies have not been included within Table 17 or Table 18. As such, these features are not provided with a minimum AOI or VPZ, are not subject to most of the policies within Section 16.42 and Section 16.51, and therefore do not have any requirements for additional studies or restrictions on development within or adjacent to them. Therefore, the POP does not meet the minimum requirements for protection of these features, as set out in the provincial plans.

9.4. Recommendations

9.4.1. Policy Approach

GEI recommends a standardized approach for the protection of significant wildlife habitat within the City of Pickering.

The following are minimum legislative requirements:

- Within the entire City (i.e. including the ORMCP, Greenbelt Plan area, and the remainder of the City of Pickering):
 - All SWH should be protected in accordance with the PPS
 - All SWH should be afforded a minimum AOI of 120 m
 - All SWH should be afforded a minimum VPZ of 30 m, except where determined otherwise on a site-specific basis through an NHE
- All sand barrens, savannahs, and tallgrass prairies within the ORMCP should be protected in accordance with that plan
- All alvars, sand barrens, savannahs, and tallgrass prairies within the Greenbelt Plan area should be protected in accordance with that plan

The following is GEI's recommended approach, for lands that are located outside of provincial plan areas:

- Outside of ORMCP and Greenbelt Plan areas, consider policies for the removal of and compensation for SWH, where supported through an NHE/EIS
- Include reference to the applicable SWH guidelines and criteria for evaluation (i.e., the SWH Technical Guide, Ecoregion Criteria Schedules, and the SWH Mitigation Support Tool)
- Include flexibility in the policies that allow for a VPZ larger than 30 m where warranted for especially sensitive habitat types, in accordance with SWH guidelines (i.e., the SWH Technical Guide and the SWH Mitigation Support Tool)

9.4.2. *Adjacent Lands*

The City of Pickering currently uses a standard approach for minimum VPZs and AOIs for SWH. Regardless of their location, they are all provided with a minimum AOI of 120 m and a minimum VPZ as determined through an NHE. This approach meets the minimums set out through the ORMCP and Greenbelt Plan. GEI recommends continuing with this approach for SWH.

Non-SWH, like alvars, sand barrens, savannahs, and tallgrass prairies also receive protections within the ORMCP and Greenbelt Plan. The POP does not currently provide a minimum AOI or VPZ for these features and therefore does not currently meet the minimum requirements set out in the provincial plans. GEI recommends deferring to the provincial plans for these. As such, within the ORMCP a minimum AOI of 120 m and 30 m VPZ is recommended and within the Greenbelt Plan area an AOI of 120 m and no VPZ is recommended. Where one of these features meets the criteria for significance, it would be afforded the additional protections for SWH, as noted above. Where these features exist outside of the ORMCP and Greenbelt Plan Area, it is recommended that a minimum AOI of 120 m and VPZ of 30 m be afforded, with the flexibility of

modifications based on an appropriate technical study, based on the sensitivity and type of SWH. All best practices that informed these recommendations can be found in **Appendix D.4**.

9.4.3. Definitions

In the ORMCP and Greenbelt Plan areas, refer to the respective plan for their wildlife habitat and/or SWH definitions.

The POP already defines SWH, and the definition is generally consistent with the PPS, ORMCP, Greenbelt Plan, and ROP. For additional clarity between significant and non-significant wildlife habitat, GEI recommends the following definitions for the rest of the City:

- **ADD: Wildlife Habitat**

The PPS, ORMCP, Greenbelt Plan, and ROP define wildlife habitat as:

means areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species.

- **MODIFY: Significant Wildlife Habitat**

Like other significant features, SWH can be defined as its own term, or combined under a *significant* umbrella, as is done in the PPS, ORMCP, Greenbelt Plan, and ROP. The existing definition is sufficient, but to avoid repetition, it could be changed to match the ROP:

means an area that is ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system. These are to be identified using criteria established by the province.

Specific features, which are also sometimes identified as types of SWH, should also be defined if they are present in the city. Some examples defined by the ORMCP, Greenbelt Plan, and/or ROP include:

- Sand barrens
- Savannahs
- Tallgrass Prairies
- Seepages areas and springs
- Alvars

10. Surface Water Features

Surface water features, as defined in the PPS, include headwaters, rivers, permanent and intermittent streams, inland lakes, seepage areas, recharge/discharge areas, springs, wetlands, and associated riparian lands. Sensitive surface water features further mean those noted above that are particularly sensitive to water withdrawal, pollutants or other impacts. As such, development near surface water features is limited to protect their functions. They are typically considered hydrologic features, but are also protected as NHFs (for their functions as fish habitat or location within valleylands) or as hazard lands (for their flooding and erosion potential).

10.1. Provincial Policies

10.1.1. *Provincial Planning Statement*

Within the PPS, watercourses and waterbodies are not afforded individual protections as a NHF. Instead, they are protected for their ability to contain fish or fish habitat, where they are considered a natural hazard feature, and/or where they are considered a sensitive surface water feature.

Development and site alteration are restricted within or near sensitive surface water features, unless their hydrologic functions can be protected, improved, or restored, which may require mitigative measures and/or alternative development approaches (Section 4.2.2). Where a feature also has the potential to contain fish or fish habitat, additional restrictions apply, which are identified in **Section 11** below.

10.1.2. *Oak Ridges Moraine Conservation Plan*

Within the ORCMP, KHFs include permanent and intermittent streams, wetlands, kettle lakes, and seepage areas and springs (Section 26.1). Of these, only wetlands are also considered a KNHF (discussed further in **Section 5** above). The ORMCP does not provide a definition for permanent or intermittent stream, or seepage areas and springs, however, does provide a definition for kettle lake:

“kettle lake” means a depression formed by glacial action and permanently filled with water

The ORMCP also provides definitions for hydrologic features, hydrologic functions, hydrologic integrity, meander belt, saturated zone, and surface catchment area, which all aid in the interpretation of the plan.

KHFs receive similar protections as KNHFs. Permanent and intermittent streams, kettle lakes, and seepage areas and springs are each afforded a minimum 120 m AOI and 30 m VPZ (Part III Table). For kettle lakes, the VPZ is measured as 30 m of the feature or the entire surface catchment area, whichever is greater. For intermittent and permanent streams, it is measured as 30 m from the meander belt. Lastly, for seepage areas and springs, it is measured as 30 m from the feature. The minimum VPZs may be modified through an NHE (Section 26.4.c).

- **Development or site alteration within a KHF or the related minimum VPZ is prohibited** (Section 26.2; exceptions match those of KNHFs, outlined in **Section 5.1.2** above)
- Development or site alteration within the AOI for significant woodlands must be accompanied by a hydrological evaluation completed in accordance with Section 26.4 of the plan (Section 26.3)
 - Similar to an NHE for KNHFs, the hydrological evaluation must demonstrate that there will be no adverse effects to the feature or its hydrological functions, identify practices to maintain or improve the feature and its connectivity with other features, and determine whether the minimum VPZ is sufficient (Section 26.4)

Furthermore, for development within the AOI for permanent and intermittent streams or seepage areas and springs, an analysis of land use and soils is required (Section 26.5).

10.1.3. Greenbelt Plan

Within the Greenbelt Plan, KHFs include permanent and intermittent streams, wetlands, lakes and their littoral zones, and seepage areas and springs (Section 3.2.5). Of these, only wetlands are also considered a KNHF (discussed further in **Section 5** above). The Greenbelt Plan defines permanent and intermittent streams, lakes, and seepage areas and springs, as follows:

Permanent stream Means a stream that continually flows in an average year

and

Intermittent streams Means stream-related watercourses that contain water or are dry at times of the year that are more or less predictable, generally flowing during wet seasons of the year but not the entire year, and where the water table is above the stream bottom during parts of the year.

and

Lake Means any inland body of standing water, usually fresh water, larger than a pool or pond or a body of water filling a depression in the earth's surface.

and

Seepage areas and springs Means sites of emergence of groundwater where the water table is present at the ground surface.

The Greenbelt plan is missing a key definition for littoral zones, however, provides definitions for hydrologic function and significant surface water contribution areas, both of which aid in the interpretation of the plan.

KHFs receive similar protections to KNHFs. Within the protected countryside (only), KHFs are afforded a minimum AOI of 120 m (Section 3.2.5.5) and a minimum VPZ of 30 m (Section 3.2.5.4).

- **Development or site alteration is not permitted within a KHF or its associated minimum VPZ** (Section 3.2.5.1; exceptions outlined in **Section 5.1.3** above)
- Development or site alteration on adjacent lands to KHFs requires an NHE or hydrological evaluation (Section 3.2.5.5; NHE/hydrological evaluation requirements are summarized in **Section 5.1.3** above).

Additional policies for urban river valleys are found within Section 6.1 of the Greenbelt Plan; however, these only apply to publicly owned lands.

10.2. Durham Policies

The ROP includes lakes and their littoral zones, permanent and intermittent streams, kettle lakes, seepage areas and springs as types of KHFs (Section 7.4.10). Permanent and intermittent streams, kettle lakes, and seepage areas and springs are defined as follows:

Permanent and/or Intermittent Streams: means a stream that continually flows in an average year, as in the case of a permanent stream; or, a stream-related watercourses that contain water or are dry at times of the year that are more or less predictable, generally flowing during wet seasons of the year but not the entire year, and where the water table is above the stream bottom during parts of the year, as in the case of an intermittent stream.

and

Seepage Areas and Springs: means sites of emergence of groundwater where the water table is present at the ground surface.

and

Kettle Lake: means a depression formed by glacial action and permanently filled with water

The ROP is missing key definitions for lakes and littoral zones; however, it provides definitions for ecological and hydrological integrity, hydrological functions, key hydrologic areas, KHF, significant surface water contribution area, and water resource system, all of which aid in the interpretation of the plan.

Like KNHFs, KHFs are afforded 120 m of adjacent lands.

- **Development or site alteration are prohibited in KHFs and their associated VPZ** (Section 7.4.11; exceptions are outlined in **Section 5.2** above)
- An EIS completed in accordance with Section 7.4.15 is required for any development or site alteration on the adjacent lands of a KHF (Section 7.4.13; EIS requirements are summarized in **Section 5.2** above)

Section 7.4.14 provides policies for the Lake Simcoe shoreline, which are not applicable to the City of Pickering, however, are worth considering for the Lake Ontario shoreline. These policies extend the AOI to 240 m, and the VPZ to 100 m outside of residential and settlement areas. This extended AOI and VPZ is intended to protect the natural corridors and linkages along the shoreline.

As most surface water features are also regulated by CAs, the requirements for additional studies or reports, at their request, are outlined in Section 7.4.15.

KHFs are also a component of the water resource system, where additional policies from Section 7.5 apply. Notably, they require that piped or buried watercourses within the urban area boundary are restored at the surface where possible (Section 7.5.5), and that surface water features and their associated riparian areas be retained in a natural state (Section 7.5.7). Furthermore, alterations to watercourses or permanent or intermittent streams are discouraged but can be considered where approved under the *Conservation Authorities Act* (Section 7.5.8).

10.3. Pickering Policies

Within the POP, KHFs include wetlands, permanent and intermittent streams, kettle lakes, seepage areas and springs, Lake Ontario, and the Lake Ontario Shoreline. The POP does not provide any definitions for permanent and intermittent streams, kettle lakes, seepage areas and springs, Lake Ontario, or the Lake Ontario Shoreline. The POP identifies two sets of minimum AOIs, VPZs, and restrictions on development for surface water features: within the ORMCP area, and outside of the ORMCP area and Seaton NHS. Based on the existing POP, there is no table that outlines AOIs, VPZs, or specific restrictions on surface water features for the Seaton NHS. Instead, a framework of policies has been prepared for these lands, as per Section 11, including guidelines for the protection of the identified NHS for the Seaton Lands as per 11.51.

Within the ORMCP area, permanent and intermittent streams and seepage areas and springs receive a minimum AOI of 120 m and a minimum VPZ of 30 m (per Table 17 of the POP), as measured from the meander belt for streams.

- **The POP does not explicitly prohibit development within KHF or their minimum VPZ.** However, policy 10.12.c requires that council ensure KNFs and KHF are protected from development.
- Development or site alteration within the minimum AOI is not permitted unless a hydrologic evaluation demonstrates that there will be no negative impact to the feature or its hydrologic function (Section 16.42.e).

Outside of the ORMCP area and the Seaton NHS, seepage areas and springs receive a minimum AOI of 120 m and VPZ of 10 m, the Lake Ontario shoreline receives a minimum 120 m AOI and 30 m VPZ (per Table 18 of the POP). Permanent and intermittent streams are further divided. Outside of the Pickering urban area, they receive a minimum AOI of 120 m and VPZ of 30 m (measured from the limit of the floodplain or hazard lands). Within the urban area, this is reduced to a 50 m AOI and 10 m VPZ (measured from the stable top of slope or the floodplain, whichever is greater).

- **The POP does not explicitly prohibit development within KHF or their minimum VPZ.**
- Development or site alteration within the minimum AOI is not permitted unless a hydrologic evaluation demonstrates that there will be no negative impact to the feature or its hydrologic function (Section 16.51.d).

The POP does not define, nor provide any policies for headwaters or headwater drainage features (HDFs).

10.4. Recommendations

10.4.1. Policy Approach

GEI recommends the policies related to surface water features within the City of Pickering be revised for clarity.

The following are minimum legislative requirements:

- Add text that reflects the assumption that all surface water features are assumed to contain fish habitat (extending KNHF protections as well, discussed below) unless demonstrated otherwise through an appropriate technical study
- All development policies should reference the applicable federal and provincial legislation for development and site alteration permissions where fish habitat is present (i.e., development within fish habitat can occur where it is supported through applicable legislation)

- Add text to identify the features that are regulated by CAs and the requirements to receive a permit prior to development (e.g. wetlands, watercourses, etc.)

The following is GEI's recommended approach that could be taken:

- Consider adding policies that support and encourage conservation and restoration, where recommended through an NHE (i.e., removing barriers, riparian plantings, etc.)
- Incorporate standard definitions and terms (see below)
- Provide policies for surface water features by feature type (i.e. for watercourses, waterbodies, seepage areas and springs, headwater drainage features, etc.) rather than sweeping policies for the whole category of features
- Consider providing exemptions for HDFs, as well as municipal drains (under the Drainage Act) and other anthropogenic features (i.e. agricultural swales/ponds, road ditches, etc.), if supported by an appropriate technical study and with approval from the CA
- Where the surface water feature is a HDF, policies for their management should be based on or refer to the TRCA and CVC's *Evaluation, Classification and Management of HDFs Guidelines* (2013), which recommend scenarios in which the features can be removed, or should be retained in place

10.4.2. Adjacent Lands

The following are minimum legislative requirements:

- Within the ORMCP a standard 120 m AOI and 30 VPZ is provided for permanent and intermittent streams, wetlands, kettle lakes, and seepage areas and springs.
- The Greenbelt follows this standard, also extending it to all lakes and their littoral zones.

GEI recommends continuing with the existing approach for minimum VPZs and AOIs for surface water features and KHFs across the City of Pickering. The POP currently follows this standard as well, except for permanent and intermittent streams within the Pickering urban area where the AOI is reduced to 50 m and the VPZ is reduced to 10 m.

GEI considers this a balanced approach as it provides protections for these features but does not unduly restrict development within built-up areas. Where a permanent or intermittent stream is also considered fish habitat, a more restrictive VPZ already applies.

As the minimum VPZ for permanent and intermittent streams is already measured from the limit of floodplain or hazard lands or the stable top of slope, instead of from the top of bank or the stream itself, careful consideration should be given to any increases.

All best practices that informed these recommendations can be found in **Appendix D.4**.

10.4.3. Definitions

In the ORMCP and Greenbelt Plan areas, refer to the respective plan for their definitions.

For the rest of the City, GEI recommends the following definitions:

- **ADD: Surface Water Feature**

The POP does not define any surface water features, except KHF. The PPS, ORMCP, Greenbelt Plan, and ROP all define and refer to these features differently. It is recommended to use the PPS definition:

means water-related features on the earth's surface, including headwaters, rivers, permanent and intermittent streams, inland lakes, seepage areas, recharge/discharge areas, springs, wetlands, and associated riparian lands that can be defined by their soil moisture, soil type, vegetation or topographic characteristics.

Another option is to define the features individually, and specify that they are all considered surface water features:

- **ADD: Permanent and/or Intermittent Stream**

This term conforms to the ROP. They could also be defined as two separate terms, like the Greenbelt Plan. The ROP defines them as:

means a stream that continually flows in an average year, as in the case of a permanent stream; or, a stream-related watercourses that contain water or are dry at times of the year that are more or less predictable, generally flowing during wet seasons of the year but not the entire year, and where the water table is above the stream bottom during parts of the year, as in the case of an intermittent stream.

- **ADD: Lake**

The ROP does not define lakes. If present, they should be defined using the Greenbelt Plan definition:

Means any inland body of standing water, usually fresh water, larger than a pool or pond or a body of water filling a depression in the earth's surface.

If kettle lakes are present in the city, it is also recommended to define them. The definition used in both the ORMCP and ROP is:

means a depression formed by glacial action and permanently filled with water.

- **ADD: Watercourse**

This term comes from O. Reg. 41/24 under the Conservation Authorities Act:

means a defined channel, having a bed and banks or sides, in which a flow of water regularly or continuously occurs.

- **ADD: Headwater Drainage Feature**

This term comes from the Evaluation, Classification, and Management of Headwater Drainage Features Guidelines (TRCA, 2014):

non-permanently flowing drainage features that may not have defined bed or banks; they are first-order and zero-order intermittent and ephemeral channels, swales and connected headwater wetlands, but do not include rills or furrows.

- **ADD: Municipal Drain**

This term is based on the Drainage Act (1990):

A municipal drain is a form of municipal infrastructure designed to move water. They are created pursuant to a bylaw passed by the local municipality under the Drainage Act; the municipality is responsible for their management.

- **ADD: Floodplain**

This term comes from the PPS:

means the area, usually low lands adjoining a watercourse, which has been or may be subject to flooding hazards.

If a two-zone floodplain is determined, then *floodway* and *flood fringe* should also be defined:

means the portion of the floodplain where development and site alteration would cause a danger to public health and safety or property damage.

Where the one zone concept is applied, the floodway is the entire contiguous flood plain. Where the two-zone concept is applied, the floodway is the contiguous inner portion of the flood plain, representing that area required for the safe passage of flood flow and/or that area where flood depths and/or velocities are considered to be such that they pose a potential threat to life

and/or property damage. Where the two-zone concept applies, the outer portion of the flood plain is called the flood fringe.

and

means the outer portion of the flood plain between the floodway and the flooding hazard limit. Depths and velocities of flooding are generally less severe in the flood fringe than those experienced in the floodway.

- **ADD:** *One Hundred Year Flood*

This term comes from the County of Brant OP (2023):

means that flood, based on an analysis of precipitation, snow melt, or a combination thereof, having a return period of 100 years on average, or having a 1% chance of occurring or being exceeded in any given year.

The *One Hundred Year Flood Level* may also be defined:

means lake levels and wind setups that have a 1% chance of being equaled or exceeded in any given year, except that, where sufficient water level records do not exist, the one-hundred-year flood level is based on the highest known water level and wind setups.

If the *Regulatory Flood* standard is used in the municipality (rather than the One Hundred Year Flood standard), it should also be defined. The County of Brant OP uses the Hurricane Hazel standard, and defines it as:

the approved standard(s), inundation under a flood resulting from the rainfall experienced during the Hurricane Hazel storm (1954), used in a particular watershed to define the limit of the flood plain for regulatory purposes.

11. Fish Habitat

Fish habitat generally includes the spawning grounds and nursery, rearing, food supply, and migration areas that fish (including shellfish, crustaceans, and other marine animals) depend on for their annual or life cycles. Protections for fish habitat generally defer to provincial or federal regulations (e.g., DFO or MECP). Fish habitat often requires greater development protections than are afforded to surface water features, due to their sensitivity to nutrient runoff, vegetation removal, and temperature regime changes that can result from nearby land use change. All surface water features are considered fish habitat until proven otherwise.

11.1. Federal Policies

DFO administers the Fisheries Act (1985) which prohibits the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat. Where a project has the potential to impact fish or fish habitat, DFO will review the project to determine whether there is potential to impact an aquatic SAR, cause the death of fish, or result in harmful alteration, disruption, or destruction of fish habitat (HADD).

In addition to the protections afforded to all aquatic species, aquatic SAR designated at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and added to Schedule 1, are protected under the *Species at Risk Act* (SARA) wherever they occur. DFO administers SARA related to aquatic species.

11.2. Provincial Policies

11.2.1. *Endangered Species Act and Species Conservation Act*

Aquatic SAR and their habitat are also currently afforded protections under the *Endangered Species Act* (ESA). The enactment of the *Species Conservation Act* (SCA) will remove these provincial protections, as Threatened and Endangered aquatic SAR are protected at the federal level under SARA.

11.2.2. *Provincial Planning Statement*

Within the PPS, additional protections are afforded to fish and fish habitat.

- **Development and site alteration are not permitted within fish habitat, except in accordance with all applicable provincial and federal requirements** (Section 4.1.6).
- Development and site alteration are not permitted on *adjacent lands* to fish habitat, unless it has been demonstrated that there will be no negative impacts to the feature or its ecological functions (Section 4.1.8).

11.2.3. Oak Ridges Moraine Conservation Plan

The ORMCP considers fish habitat as a type of KNHF. Fish habitat is defined as:

“fish habitat” means the spawning grounds and any other areas, including nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out the life processes, as further identified by the Department of Fisheries and Oceans (Canada).

Fish habitat is afforded a minimum 120 m AOI and 30 m VPZ (Part III Table). The minimum VPZ may be adjusted based on the recommendations provided within an NHE (Section 23.1.d).

- **Development or site alteration within fish habitat or the related minimum VPZ is prohibited** (Section 22.2; exceptions outlined in **Section 5.1.2** above)
- Development or site alteration within the AOI for fish habitat must be accompanied by an NHE completed in accordance with Section 23 of the plan (Section 22.3; NHE requirements summarized in **Section 5.1.2** above)

The exceptions provided in Section 22.2 are not consistent with those project exemptions within the *Fisheries Act*.

11.2.4. Greenbelt Plan

The Greenbelt Plan also includes *fish habitat* as a type of KNHF and uses the same definition for fish habitat as the ORMCP. Fish habitat is afforded a minimum AOI of 120 m (Section 3.2.5.5) and minimum VPZ of 30 m (Section 3.2.5.4).

- **Development or site alteration is not permitted within fish habitat or its associated minimum VPZ** (Section 3.2.5.1; exceptions outlined in **Section 5.1.3** above)
- Development or site alteration on adjacent lands to fish habitat requires an NHE (Section 3.2.5.5; NHE requirements are summarized in **Section 5.1.3** above).

11.3. Durham Policies

The ROP includes fish habitat as KNHFs. The ROP uses the same definition for fish habitat as the ORMCP and Greenbelt, which refers back to the Fisheries Act definition.

Fish habitat is afforded 120 m of adjacent lands. The ROP defers the identification of minimum VPZs to local OPs.

- **Development or site alteration are prohibited in fish habitat and its associated VPZ** (Section 7.4.11; exceptions are outlined in **Section 5.2** above)

- An EIS completed in accordance with Section 7.4.15 is required for any development or site alteration on the adjacent lands of fish habitat (Section 7.4.13; EIS requirements are summarized in **Section 5.2** above)

The exceptions outlined in the ROP (**Section 6.2** above) are not consistent with exempt projects under the *Fisheries Act*.

11.4. Pickering Policies

The POP considers fish habitat to be a type of KNHF. The POP does not provide definitions for fish habitat.

The POP provides a minimum AOI of 120 m and minimum VPZ of 30 m for fish habitat that is located both within the ORMCP and outside of it (Table 17 and Table 18 of the POP). Protection policies also apply to both scenarios:

- **The POP does not explicitly prohibit development within fish habitat or its minimum VPZ.** However, policy 10.12.c requires that council ensure KNHFs and KHFs are protected from development.
- Development or site alteration within the minimum AOI is not permitted unless an NHE demonstrates that there will be no negative impact to the feature or its ecological function (Section 16.42.c; Section 16.8). The NHE is to be completed in accordance with requirements set out by the DFO (Section 16.42.d.v; Section 16.51.d.v).

Where a draft plan of subdivision or site plan approval application is submitted in the Seaton Urban Area, there are additional policies in Section 11.73 for protection of fish habitat, including the requirement for a fish habitat assessment for watercourse crossings or HADD, and sediment and erosion control plans.

11.5. Recommendations

11.5.1. Policy Approach

The following are minimum legislative requirements:

- All development policies should defer to federal and provincial legislation (i.e. development within fish habitat can occur where it is supported through applicable legislation)
- Add text to refer to the project exemptions under the *Fisheries Act*
- Incorporate standard definitions and terms from the *Fisheries Act*
- Add text to reflect that VPZs for fish habitat may be larger than 30 m for some aquatic SAR

- Add text that reflects the assumption that all surface water features are assumed to contain fish habitat until proven otherwise

The following is GEI's recommended approach, for lands that are located outside of provincial plan areas:

- Consider maintaining the larger VPZ for cold water streams (30 m)
- Consider allowing a reduced VPZ for warm and cool water streams (15 m)
- Consider allowing a reduced VPZ for the Pickering urban area to match the policies for permanent and intermittent streams (10 m)
- Consider adding policies that support conservation, restoration, and/or the removal of fish barriers, where recommended through an NHE
- Consider adding additional language for aquatic SAR, which may require a larger VPZ

11.5.2. Adjacent Lands

The City of Pickering currently uses a standard approach for minimum VPZs and AOIs for fish habitat. Regardless of their location and temperature system, they are all provided with a minimum AOI of 120 m and VPZ of 30 m. This is consistent with the ORMCP, the Greenbelt Plan, and the ROP. GEI recommends continuing with this approach, but also offering flexibility for warmwater streams and streams within already built-up and urbanized areas to have a reduced VPZ, based on ecological studies. Coldwater streams and those within greenfield areas should continue with a firm 30 m VPZ, as is best practices provincially. All best practices that informed these recommendations can be found in **Appendix D.4**.

11.5.3. Definitions

In the ORMCP and Greenbelt Plan areas, refer to the respective plan for their definition of fish habitat. For the rest of the City, GEI recommends the following definition:

- **ADD:** *Fish Habitat*

The POP currently does not define fish habitat. The PPS, ORMCP, Greenbelt Plan, and ROP generally define fish habitat the same, based on the Fisheries Act definition. The following matches the wording used in ROP and the Greenbelt Plan:

means, as defined in the Fisheries Act, spawning grounds and any other areas, including nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes.

12. Habitat for Endangered and Threatened Species

For the habitat of Endangered and Threatened species, the PPS refers to the definition for habitat in the ESA. It is considered an NHF, and the same protections generally apply. However, development is only permitted within SAR habitat in accordance with federal and provincial regulations (i.e., SARA, ESA, SCA).

The ESA (as it stands) and PPS provide similar protections; though the ESA adds additional habitat information, species-specific regulations, and other considerations for the MECP, such as the ability to issue permits. Special concern and extirpated species, though listed as SAR under the ESA, are not afforded habitat protections. Instead, the habitat for species listed as special concern are protected as SWH.

12.1. Federal Policies

SAR, as designated at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), are protected under SARA on federal lands. In addition, aquatic SAR and migratory birds protected under the Migratory Birds Convention Act (MBCA) are protected wherever they occur. COSEWIC reviews research information on population and habitat status, trends and threats, and applies assessment criteria based on international standards. Once a species is added to *Schedule 1 – List of Wildlife Species at Risk*, it benefits from legal protection and the mandatory recovery planning required under SARA.

12.2. Provincial Policies

12.2.1. *Endangered Species Act and Species Conservation Act*

The ESA protects all Threatened, Endangered, and Extirpated species listed on the Species at Risk in Ontario List (SARO; *O. Reg. 230/08*). These species are legally protected from harm, and their habitats are legally protected from damage or destruction.

The definition of SAR habitat within the ESA has recently changed, and now includes:

“habitat” means,

- a) *in respect of an animal species,*
 - i. *a dwelling-place, such as a den, nest or other similar place, that is occupied or habitually occupied by one or more members of a species for the purposes of breeding, rearing, staging, wintering or hibernating, and*
 - ii. *the area immediately around a dwelling place described in subclause (i) that is essential for the purposes set out in that subclause.*

- b) *in respect of a vascular plant species, the critical root zone surrounding a member of the species, and*
- c) *in respect of all other species, an area on which any member of a species directly depends in order to carry on its life processes.*

On June 5, 2025, *Bill 5, the Protect Ontario by Unleashing our Economy Act (2025)* received Royal Assent, which will eventually replace the ESA with the SCA on a date to be determined. The SCA has the goal of expediting the review process for permits and approvals from the MECP. In doing so, species that are protected under SARA will no longer be protected provincially under the SCA.

12.2.2. Provincial Planning Statement

The PPS provides protections for the habitat of endangered and threatened species (i.e. SAR habitat). SAR habitat is not afforded adjacent lands under the PPS.

- **Development and site alteration are not permitted in SAR habitat, except in accordance with provincial and federal requirements (Section 4.1.7).**

12.2.3. Oak Ridges Moraine Conservation Plan

The ORMCP considers *habitat of endangered and threatened species* as a type of KNHF. The ORMCP provides definitions for *habitat of endangered and threatened species*, *endangered species*, *threatened species*, and *special concern species*:

“habitat of endangered and threatened species” means,

- a) *with respect to an endangered or threatened species for which a regulation made under clause 55 (1) (a) of the Endangered Species Act, 2007 is in force, the area prescribed by that regulation as the habitat of the species, or*
- b) *with respect to any other endangered or threatened species, the area on which the species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, migration, or feeding, and includes places in the area described in clause (a) or (b), whichever is applicable, that are used by members of the species as dens, nests, hibernacula or other residences.*

and

“endangered species” means a species that is classified as an endangered species in Ontario Regulation 230/08 (Species at Risk in Ontario List) made under the Endangered Species Act, 2007.

and

“threatened species” means a species that is classified as a threatened species in Ontario Regulation 230/08 (Species at Risk in Ontario List) made under the Endangered Species Act, 2007.

and

“special concern species” means a species that is classified as a special concern species in Ontario Regulation 230/08 (Species at Risk in Ontario List) made under the Endangered Species Act, 2007.

SAR habitat is not afforded a minimum AOI or VPZ (Part III Table).

- **Development or site alteration within the habitat of endangered or threatened species or the related minimum VPZ is prohibited** (Section 22.2; exceptions outlined in **Section 5.1.2** above)
- Development or site alteration within the AOI for the habitat of endangered and threatened species must be accompanied by an NHE completed in accordance with Section 23 of the plan (Section 22.3; NHE requirements summarized in **Section 5.1.2** above)

Development within the habitat of endangered or threatened species where it is the only KNHF is generally permitted, so long as it is not prohibited under the ESA and complies with regulations and restrictions within the Act, and the habitat is not within another NNHF or its VPZ.

12.2.4. Greenbelt Plan

The Greenbelt Plan considers *habitat of endangered species and threatened species* as a type of KNHF. The Greenbelt Plan definitions for habitat of endangered and threatened species, endangered species, and threatened species match those within the ORMCP. The Greenbelt Plan does not provide a definition for special concern species.

SAR habitat is not afforded a minimum AOI or VPZ; as such, the NHE requirements of Section 3.2.5.5 do not apply for development near the habitat of endangered or threatened species, where it is the only KNHF present (Section 3.2.5.6).

- **Development or site alteration is not permitted within the habitat of endangered or threatened species** (Section 3.2.5.1; exceptions outlined in **Section 5.1.3** above)

12.3. Durham Policies

The ROP includes habitat of endangered and threatened species as KNHFs. The ROP definition for habitat of endangered and threatened species defers to that of the ESA, but includes:

Habitat of Endangered and/or Threatened Species: means habitat within the meaning of Section 2 of the Endangered Species Act, 2007:

- a) with respect to a species listed on the Species at Risk in Ontario List as an endangered or threatened species for which a regulation made under clause 55(1)(a) of the Endangered Species Act, 2007 is in force, the area prescribed by that regulation as the habitat of the species; or*
- b) with respect to any other species listed on the Species at Risk in Ontario List as an endangered or threatened species, an area on which the species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, migration or feeding, as approved by the Ministry of Northern Development, Mines, Natural Resources and Forestry; and*
- c) places in the areas described in clause a) or b), whichever is applicable, that are used by members of the species as dens, nests, hibernacula or other residences.*

SAR habitat does not receive adjacent lands nor VPZs. As such, the policies of Section 7.4.13 requiring an EIS for development adjacent to KNHFs do not apply.

- **Development or site alteration are prohibited in the habitat of endangered and threatened species and its associated VPZ** (Section 7.4.11; exceptions are outlined in **Section 5.2** above)
 - These exceptions are consistent with those exempt projects under the ESA, SCA, and SARA (Section 7.4.11).

12.4. Pickering Policies

The POP uses non-traditional language, referencing significant portions of habitat of endangered, rare, and threatened species, as well as a known location of the habitat of endangered, rare, and threatened species, however, does not provide a definition for either.

Within the ORMCP areas, significant portions of habitat of endangered, rare and threatened species are afforded a minimum AOI of 120 m and a minimum VPZ as determined on a site-specific basis through an NHE (per Table 17 of the POP).

Outside of the ORMCP areas and Seaton NHS, a known location of the habitat of endangered, rare, and threatened species receives a minimum AOI of 120 m, and a minimum VPZ as determined on a site-specific basis through an NHE (per Table 18 of the POP). Requiring a minimum AOI and/or VPZ for SAR habitat is uncommon within other jurisdictions. SAR habitat is mapped according to the ESA and already includes the total extent of area that is required to protect the species and their habitat. Therefore, no additional lands are required.

- **The POP does not explicitly prohibit development within SAR habitat in either scenario, nor does it provide reference to current federal or provincial legislation.** However, policy 10.12.c requires that council ensure KNFs and KHF are protected from development.
- Any development or site alteration within the AOI requires an NHE that demonstrates there will be no negative impact (Section 16.8; Section 16.42.c).

12.5. Recommendations

12.5.1. Policy Approach

GEI recommends revisions to the policies related to SAR habitat within the City of Pickering:

- All development policies should defer to federal and provincial legislation (i.e., development within SAR habitat can occur where it is supported through applicable legislation)
- Incorporate standard definitions and terms from the ESA (SCA) and SARA

The following is GEI's recommended approach, for lands that are located outside of provincial plan areas:

- Remove the requirement for an NHE when a feature is only considered SAR habitat (i.e., is not also another type of KNHF)

12.5.2. Adjacent Lands

SAR habitat is not commonly afforded adjacent lands, AOIs or VPZs. There is no provincial policy supporting this requirement, nor is it common across other jurisdictions. GEI recommends removing AOIs and VPZs for SAR habitat and identifying them within the POP as a feature with separate policies and recommendations (i.e., outside of the standard text provided for the remainder of the KNHFs). Appropriate limits of SAR habitat should be determined through appropriate consultation and approvals with the provincial/federal authorities responsible for SAR. All best practices that informed these recommendations can be found in **Appendix D.4**.

12.5.3. Definitions

In the ORMCP and Greenbelt Plan areas, refer to the respective plan for their definition for the habitat of Endangered and Threatened species. For the rest of the City, GEI recommends the following definitions:

- **ADD:** *Habitat of Endangered and Threatened Species*

The PPS, ORMCP, Greenbelt Plan, and ROP all define habitat of Endangered and Threatened species, though the PPS definition simply refers to the ESA definition for habitat. The recommended definition comes from the ESA/SCA, with the addition of clause d):

means, subject to subsection (3),

a) in respect of an animal species,

i) a dwelling-place, such as a den, nest or other similar place, that is occupied or habitually occupied by one or more members of a species for the purposes of breeding, rearing, staging, wintering or hibernating, and

ii) the area immediately around a dwelling place described in subclause (i) that is essential for the purposes set out in that subclause.

b) in respect of a vascular plant species, the critical root zone surrounding a member of the species, and

c) in respect of all other species, an area on which any member of a species directly depends in order to carry on its life processes; and

d) any other areas as described by the policies of the Species at Risk Act, the Endangered Species Act, the Species Conservation Act, or other relevant, in-force provincial and federal legislation.

Should additional changes or modifications occur, the addition of clause d) ensures that the definition remains valid after legislative changes. It is expected that the new SCA will change how habitat is defined. This definition may need to be revised following its enactment.

- **ADD: Endangered Species and Threatened Species**

The PPS, ORMCP, and Greenbelt Plan also define endangered species and threatened species. These definitions for endangered and threatened species, respectively, should be added for additional clarity:

means a species that is classified as an endangered species in Ontario Regulation 230/08 (Species at Risk in Ontario List) made under the Endangered Species Act, 2007.

and

means a species that is classified as a threatened species in Ontario Regulation 230/08 (Species at Risk in Ontario List) made under the Endangered Species Act, 2007.

As stated above, Special Concern species are generally not included in the habitat protections for endangered and threatened species but are still classified as SAR. Special concern species can still be offered protections outside of the ESA requirements through other wildlife habitat identification, SWH delineation, or the identification of corridors and linkages.

Definitions for the following terms may also be useful within the POP:

- SAR
- Special Concern Species
- Rare Species (regionally or locally)
- Uncommon Species
- Habitat for Special Concern Species

These definitions will be important to support both the public and the city with distinguishing between SWH and SAR habitat.

13. Natural Heritage Systems

NHSs are intended to support natural processes including biological diversity, geological diversity, viable populations of indigenous species, and ecosystems. Municipalities are required, at a minimum, to identify their NHS, however the exact composition can be determined by each municipality based on their local conditions, so long as it meets the minimum standard set out in the PPS (Section 4.1.3).

Some documents also refer to a Hydrologic System, which is comprised of features important for maintaining water resource systems. This involves the protection of the quality and quantity of surface water and groundwater. Protecting these resources ensures that municipal drinking water sources are protected in the long term, as are aquatic habitats.

The following subsections will provide an outline of what features comprise each NHS at the provincial level (i.e. PPS, Greenbelt Plan, ORMCP), and municipal level (ROP, POP). At a minimum, the Pickering NHS is required to contain those features included within the PPS NHS. Within those areas that are subject to ORMCP and/or Greenbelt Plan, the minimum NHS is already pre-defined within those plans.

Where an NHS (or related land use designation) provides specific policies for development, those have also been included within their respective subsections.

13.1. Provincial Policies

13.1.1. *Provincial Planning Statement*

The NHS set out in the PPS (2024) is considered the minimum required NHS, and includes:

- NHFAs:
 - significant wetlands,
 - significant coastal wetlands,
 - other coastal wetlands,
 - fish habitat,
 - significant woodlands,
 - significant valleylands,
 - habitat of endangered species and threatened species,
 - significant wildlife habitat (SWH), and
 - significant ANSIs.

- Linkages intended to provide connectivity and support natural processes

The PPS also notes that municipalities can choose to include (but are not mandated to) additional features within their NHS such as:

- Federal and provincial parks
- Conservation reserves
- Other NHFs
- Lands that have been restored
- Lands with the potential to be restored to a natural state
- Areas that support hydrologic functions
- Working landscapes that enable ecological functions to continue

13.1.1.1. Land Use Designations and Policies for Development

The PPS does not utilize land use designations, nor does it provide policies for the protection of its NHS; rather it affords protection to each individual NHFA.

13.1.2. *Oak Ridges Moraine Conservation Plan*

In addition to NHFA noted above (**Section 13.1.1**), the ORMCP also includes the following features within their NHS:

- KNHFs:
 - Wetlands
 - ANSIs
 - Sand barrens, savannahs and tallgrass prairies
- Hydrological features
 - Permanent and intermittent streams
 - Wetlands
 - Kettle lakes
 - Seepage areas and springs
- Landform conservation areas

13.1.2.1. Land Use Designations and Policies for Development

The ORMCP uses land use designations to restrict development within their NHS. Land use designations include the Natural Core Areas, Natural Linkage Areas, Countryside Areas and Settlement Areas. Natural Core Areas and Natural Linkage Areas comprise most of the NHS.

Natural Core Areas contain KNHFs, KHFs, ecological functions, and landform conservation areas (Section 10.1.1). Natural Linkage Areas are the central corridor system that supports the movement of plants and animals among the Natural Core Areas (Section 10.1.2). Within both Natural Core Areas and Natural Linkage Areas, land uses are moderately restricted, only permitting certain uses like agriculture, infrastructure, home businesses or industries, bed and breakfasts, and other similar accessory uses (Section 11.3; Section 12.3).

13.1.3. Greenbelt Plan

In addition to the PPS NHFA noted above (**Section 13.1.1**), and the ORMCP NHS noted above (**Section 13.1.2**), the Greenbelt Plan also includes alvars as a KNHF, and lakes (but not kettle lakes) as a KHFs. The Plan also identifies the following features within their NHS:

- Linkage areas of the protected countryside:
 - The upper reaches of watersheds draining to Lake Ontario to the west of the Niagara Escarpment;
 - Lands around the primary discharge zones along the toe of the Niagara Escarpment and base of the ORM;
 - The major river valleys that flow from the ORM and the Niagara Escarpment to Lake Ontario;
 - The portions of the Lake Simcoe watershed and the former Lake Algonquin Shoreline within York and Durham Regions; and
 - The former Lake Iroquois shoreline in Durham and Niagara Regions.
- Water resource system:
 - Groundwater features
 - Surface water features
 - Primary recharge areas
 - Headwater and discharge areas
 - Major drinking water aquifers

13.1.3.1. Land Use Designations and Policies for Development

The Greenbelt Plan does not utilize land use designations, rather it provides protections through an overlay and geographical system (Section 1.4.2). The plan area is subdivided into the Agricultural System, the Natural System, Parkland Open Space and Trails, and Settlement Areas. Each of these systems was identified for the purpose of high-level goals and targets. The Natural System is comprised of the NHS and the water resource system.

The Greenbelt Plan utilizes overlays within the Protected Countryside, which include the NHS and Towns/Villages. Policies for the Greenbelt NHS are found in Section 3.2.2 and limit the types and extent of development permitted. These policies protect core and linkage areas, ground and surface water features, and landform features and their functions to maintain the Greenbelt's ecological integrity.

The policies that apply to the entire NHS build upon those identified for each feature that is comprised within it. Within the NHS, new development must demonstrate that there will be no negative impacts on the feature or area, and connectivity will be maintained or enhanced (Section 3.2.2.3). These policies also set the maximum impervious surface at 10%, and the minimum natural vegetated areas to 30% of the total developable area. Lastly, urban boundary expansions are not permitted within the NHS (Section 3.2.2.6). These protections do not apply outside of the Protected Countryside NHS.

13.2. Municipal Policies

13.2.1. Durham Policies

The Regional NHS aims to compile each of the NHSs that are designated within the lower tier municipalities OPs, the former GPGGH, the ORMCP, and the Greenbelt Plan into one 'master' NHS overlay. The Regional NHS is generally comprised of KNHFs and KHFs. Adjacent lands, AOIs, buffers, and VPZs are not part of the Regional NHS.

The Regional NHS consists of:

KNHFs	KHF
<ul style="list-style-type: none"> • habitat of endangered and threatened species; • fish habitat; • wetlands; • areas of natural and scientific interest, life science; • significant valleylands; • significant woodlands; • significant wildlife habitat; and • sand barrens, savannahs, tallgrass prairies, and alvars. 	<ul style="list-style-type: none"> • permanent and intermittent streams; • wetlands; • lakes and their littoral zones; and • seepage areas and springs.

The Regional NHS builds upon the ORMCP and Greenbelt NHS by specifying that all lakes and their littoral zones are included within the NHS, instead of just kettle lakes. Lake Simcoe and natural areas abutting Lake Simcoe are also included in the NHS.

13.2.1.1. Land Use Designations and Policies for Development

The ROP utilizes both a land use designation and overlay method. Land use within the Region consists of the Urban System, the Rural System, and the Greenlands System. Within the Greenlands System, it is subdivided further into Major Open Space Areas, Waterfront Areas, ORM, and Greenbelt. The Regional NHS is an overlay, which is represented in each of the three land use designations.

Policies for development within the Greenland System land use designation are located within Section 7 of the ROP. Similar to the ORMCP, these policies are intended to build upon those policies and protections for individual feature components and focus on the system as a whole for form and function.

The Major Open Space land use designation, which contains the NHS, contains additional policies for development. Within these areas, new development must demonstrate that there will be no negative impacts on KNHFs or KHF, and that the connectivity is maintained or enhanced. The ROP also sets the maximum disturbed area to 25% and impervious surface to 10%, with an exception for major recreational uses (Section 7.1.9.d). Development within Major Open Space is further restricted by only permitting agricultural uses, limited landscape industry uses, and other uses subject to an extensive list of requirements (Section 7.1.11).

The ROP also provides additional policies for Waterfront Areas (another type of land use designation), which are similar to those policies for the NHFAs and natural hazard features (Section 7.1.38-46)

13.2.2. Pickering Policies

The Pickering NHS was created to reflect the NHS within the Greenbelt Plan, the (now revoked) Central Pickering Development Plan, information obtained from the local CAs and provincial authorities/sources, among others.

Features that are considered part of the Pickering NHS include:

KNHFs	KHF
<ul style="list-style-type: none"> • Significant habitat of endangered and threatened species; • fish habitat; • wetlands; • areas of natural and scientific interest; • significant valleylands; • significant woodlands; • significant wildlife habitat; and • sand barrens, savannahs, tallgrass prairies, and alvars. 	<ul style="list-style-type: none"> • permanent and intermittent streams; • wetlands; • kettle lakes • Lake Ontario and its shoreline • seepage areas and springs.

These inclusions are consistent with the ROP, except for those policies related to lakes. The ROP includes all lakes within their NHS; however, the City of Pickering only includes kettle lakes and Lake Ontario. In addition, the POP includes all ANSIs as part of their NHS, where the ROP only includes life science ANSIs.

13.2.2.1. Seaton Natural Heritage System

Within the POP, the Seaton Urban Area is given objectives and policies additional to the general urban policies, in conformance with the revoked Central Pickering Development Plan (Chapter 11). The Seaton community is intended to be a sustainable urban community with an extensive NHS. The community is to be walkable, transit-supportive, and densely populated to promote an active streetscape. The NHS and natural features must also be integrated into all of Seaton’s neighbourhoods, and neighbourhood design is to provide appropriate views, vistas, and connections to the NHS.

It is understood that the Seaton NHS has been formalized through a Master Environmental Servicing Plan; as such, the policies associated with this NHS should be noted in the future Official Plan, should future development/site alteration be considered in this area.

13.2.2.2. Land Use Designations and Policies for Development

Similar to the ROP, the POP utilizes both a land use designation and overlay model. Land use within the City consists of the Ecological System (Open Space System), Rural System (Rural

Settlements), and the Urban System (Urban Residential Areas, Mixed Use Areas, Employment Areas, and Freeways and Major Utilities).

The Pickering NHS is one component of the Open Space System, which also contains natural areas, parks and recreation areas, marinas, the ORMCP Natural Core Areas and Linkages, and the Seaton NHS. High-level goals are located within Section 2.3-2.5 (ecological system), with more descriptive policies within Section 3.5 (open space system). Within Natural Areas, development is severely limited, and only conservation, agriculture, stormwater management, or existing type uses are permitted. **Natural Areas are not defined within the plan**; however, a map is available (Schedule I).

13.3. Summary of Natural Heritage Systems

The PPS defines NHFs as including PSWs, fish habitat, significant woodlands, significant valleylands, SWH, ANSIs, and SAR habitat. The ORMCP and Greenbelt Plan refine this further and differentiate between KNHFs and KHF and add additional feature types to both. Additional features include permanent and intermittent streams, lakes, kettle lakes, seeps and springs, sand barrens, savannahs and tallgrass prairies, and alvars. The ROP is generally consistent with the designation and feature types from the ORMCP and Greenbelt Plan, with the addition of Lake Simcoe and its shoreline.

The POP exceeds the provincial minimums, by differentiating between wetlands, PSWs, and locally significant wetlands, and by including Lake Ontario and its shoreline. The ROP and POP also include locally significant wetlands as a KNHF. The POP meets the minimums of the ROP, except for the exclusion of Lake Simcoe and its shoreline, but this is because Lake Simcoe is not located within the City. The POP is not currently consistent with provincial minimums due to the exclusion of lakes as a KHF. However, the City may not have any features that meet the definition of an inland lake, and would therefore not require these policies, unless applicable.

A summary chart showing which NHFs have been included within each of the NHSs for the PPS, Greenbelt Plan, ORMCP, ROP, and POP has been included within **Table 4** below.

Table 4. Summary of the Natural Heritage Features Included within Each Natural Heritage System.

Feature Type:	Provincial Planning Statement	Greenbelt Plan		Oak Ridges Moraine Conservation Plan		Durham Region Official Plan		Pickering Official Plan	
	NHF	KHF	KNHF	KHF	KNHF	KHF	KNHF	KHF	KNHF
PSWs	X							X	
Significant Coastal Wetlands	X								
Other Coastal Wetlands	X								
Wetlands		X	X	X	X	X	X	X	X
Fish Habitat	X		X		X		X		X
Significant Woodlands	X		X		X		X		X
Significant Valleylands	X		X		X		X		X
SWH	X		X		X		X		X
ANSIs (life science)	X		X		X		X		X
ANSIs (earth science)	X								X
Habitat of Endangered and Threatened Species	X		X		X		X		X
Permanent and Intermittent Streams		X		X		X		X	
Lakes		X				X			
Kettle Lakes				X		X		X	
Lake Ontario + shoreline								X	
Lake Simcoe + shoreline									
Seeps and Springs		X		X		X		X	
Sand barrens			X		X		X		X
Savannahs and tallgrass prairies			X		X		X		X
Alvars			X				X		X

Notes:

- Where X means that the feature is included within that designation/overlay
- NHF – Natural Heritage Feature
- KNHF – Key Natural Heritage Feature
- KHF – Key Hydrologic Feature

13.4. Recommendations

13.4.1. *Natural Heritage System Composition*

To support the development of a new and modernized NHS within the City of Pickering, GEI has proposed three approaches, the first being the minimum NHS required, the second being an aspirational NHS which includes all potential features, and the third is our recommendation of a balanced approach.

13.4.1.1. **Minimum Legislative Recommendation**

At a minimum, the Pickering NHS should be consistent with that of the PPS for all areas that are located outside of the ORMCP and the Greenbelt Plan. Within areas subject to either of these plans, a separate NHS can be identified, according to the applicable plan.

This recommendation will include the following features within the Pickering NHS:

- NHFAs:
 - significant wetlands,
 - significant coastal wetlands,
 - other coastal wetlands,
 - fish habitat,
 - significant woodlands,
 - significant valleylands,
 - habitat of endangered species and threatened species,
 - SWH, and
 - significant ANSIs.
- Linkages intended to provide connectivity and support natural processes

This option provides the minimum protections for NHFs, focusing on the features that are most sensitive to disturbance and development.

For areas subject to the ORMCP and the Greenbelt Plan, the POP would defer to the NHS's that are identified in those plans and not provide additional details or policies. Instead, the OP would defer to the actual provincial plans. Sample policy language could include a variation of the following

1. A blanket statement for conformity to the provincial plans:

“Development and site alteration within the Greenbelt Natural Heritage System shall conform to the policies of the Greenbelt Plan regarding key natural heritage features and vegetation protection zone”

2. Feature-specific commentary with a notwithstanding caveat such as seen in the Proposed Vaughan OP (2025):

*“That notwithstanding policy **XX** of this Plan, prior to Development or Site Alteration approval, [FEATURE(s)] that may be impacted will be assessed through detailed studies that identify their features and ecological functions. For [FEATURE(s)] within the Oak Ridges Moraine and Greenbelt Plan Areas they shall be subject to the requirements of those Plans”*

Choosing to utilize four separate NHSs (i.e., the City of Pickering NHS, the Seaton NHS, the ORMCP NHS, and the Greenbelt NHS) is considered the simplest option. It avoids the use of sweeping legislation and protections for all features and focuses on providing protections to those features that are the most sensitive or important in the landscape. In addition, when changes are made to the ORMCP and/or the Greenbelt Plan, the POP would stay in conformance and not require additional updates or modifications.

For mapping purposes, any of the following mapping methods could be use to support OP schedules:

1. All four NHS' could be depicted on the same schedule, with clear labels;
2. Two schedules could be created; one that shows provincial NHS' (ORMCP and Greenbelt), and one that shows local NHS' (Pickering and Seaton); or,
3. Four separate maps/schedules for each of the NHS's.

Option 1 or Option 2 would be preferred; there is a benefit to having fewer maps to ensure access to NHS information is easy to find and interpret.

The assumption for each mapping option is that when reviewing a schedule, a viewer would be able to see which NHS' apply to a particular property/site and would then confirm applicable policies and procedures as per the OP sections for each.

13.4.1.2. Aspirational Recommendation

Best practice/aspirational recommendations, which would provide the highest level of protections to all features, regardless of significance, would be to create an all-encompassing NHS. This NHS would apply to all areas within the City, including those areas that are also subject to the ORMCP or the Greenbelt Plan. This NHS goes above and beyond those outlined in the provincial policies and plans.

The aspirational NHS would include:

- NHFAs:
 - significant wetlands,
 - significant coastal wetlands,

- other coastal wetlands,
- fish habitat,
- significant woodlands,
- significant valleylands,
- habitat of endangered species and threatened species,
- SWH, and
- significant areas of natural and scientific interest (ANSI).
- Other NHFs:
 - Wetlands (all)
 - ANSIs (all)
 - Sand barrens, savannahs, tallgrass prairies, and alvars (all)
 - Hedgerows
 - Woodlands (all)
- Hydrological features:
 - Watercourses (all)
 - Lakes and their littoral zones (all)
 - Permanent and intermittent streams
 - Seepage areas and springs
- Water resource system:
 - Groundwater features
 - Surface water features
 - Primary recharge areas
 - Headwater and discharge areas
 - Major drinking water aquifers
- Protected Areas:
 - Federal and provincial parks
 - Conservation reserves
 - Landform conservation areas
- Areas for Restoration:
 - Lands that have been restored

- Lands with the potential to be restored to a natural state
- Linkages and Connections:
 - Linkages intended to provide connectivity and support natural processes
 - Working landscapes that enable ecological functions to continue
 - Linkage areas of the protected countryside:
 - The upper reaches of watersheds draining to Lake Ontario to the west of the Niagara Escarpment;
 - Lands around the primary discharge zones along the toe of the Niagara Escarpment and base of the ORM;
 - The major river valleys that flow from the ORM and the Niagara Escarpment to Lake Ontario;
 - The portions of the Lake Simcoe watershed and the former Lake Algonquin Shoreline within York and Durham Regions; and
 - The former Lake Iroquois shoreline in Durham and Niagara Regions.

Choosing to use one single NHS that applies to the entire City (including those areas subject to the ORMCP and Greenbelt Plan) is considered the most complex approach. Some of the features that would comprise the NHS are difficult to identify or map or are insufficient in data. As such, it would require additional policy text that enables the confirmation and/or refinement of features through an NHE or other appropriate technical study. This method also protects all features equally, ignoring those that are more sensitive and providing them the same level of protections as those that are less sensitive. This could result in burdens on both City staff and proponents, as a high-level of review would be required in all scenarios.

Lastly, this method would require regular updates or modifications whenever changes are made to the Greenbelt Plan or ORMCP. Over time, without these regular reviews and updates, the POP may lose conformity with these provincial plans.

13.4.1.3. GEI's Recommendation

Our team has prepared the following recommendations for the Pickering NHS, which provides a balanced approach of protecting the features that are most sensitive, while considering the impacts that sweeping protections may have on future development and growth within the City of Pickering. All best practices that informed these recommendations can be found in **Appendix D**.

Differentiating NHS policies based on geography, as the City already does, is a good approach; it balances flexibility in urban areas, while also remaining in conformity with provincial plans

where they apply. GEI recommends that the City of Pickering continues to utilize four separate NHS based on geography:

- The Greenbelt NHS (applies to all areas within the Greenbelt Plan)
- The ORMCP NHS (applies to all areas within the ORMCP)
- The Seaton NHS (applies to all areas within the Seaton Community)
- The Pickering NHS (applies to all areas within the City; with an exemption for areas that are within the above noted NHS's)

At a minimum, the Pickering NHS must conform to provincial policies and plans. As part of the current OP review process (**Section 1.1**), the City should consider the policies within the current ROP and POP and provide updates or modifications where warranted. City of Pickering - Official Plan Municipal Comprehensive Review

To remain in conformity, the Pickering NHS should include:

- PSWs
- All Coastal Wetlands
- Provincially Significant Woodlands
- Provincially Significant Valleylands
- Provincially Significant ANSIs
- SAR habitat¹
- Fish Habitat¹
- SWH¹

- Linkages (see **Section 13.4.2** for further discussion on the rationale for the inclusion on Linkages)

Note 1 – Denotes a feature that should be included as part of the NHS but not included within the NHS mapping. The extent of these features should be determined through a site-specific NHE/EIS.

In addition to the above noted features, GEI also recommends the inclusion of the following items within the Pickering NHS:

- Locally Significant Woodlands
- Locally Significant Wetlands

- Special features/specific SWH present in the City, such as sand barrens, savannahs, tallgrass prairies, alvars, and seepage areas and springs, even where deemed non-significant based on relevant SWH criteria
- Surface Water Features/KHFs, such as watercourses and waterbodies, permanent and intermittent streams, headwater features, etc., regardless of the presence of fish habitat
- Future restoration areas or suitable linkages, as identified within an NHE/EIS

The following features that are not recommended for inclusion within the Pickering NHS, but should still be afforded special consideration include:

- Contributory, and Non-significant woodlands
- Non-provincially significant, and all other wetlands
- Non-significant ANSIs (life science and earth science)

These are features that may be warranted for inclusion into the Pickering NHS where they form part of a linkage to or support another more significant feature. In all cases, the City should consider whether the inclusion of these features within the NHS is warranted, and whether the City would like to obtain these lands through conveyance during development applications. Where certain features are not included within the Pickering NHS, they would still be afforded individual feature protections (as described in **Section 5.4.1 and Section 6.4.1**).

Where they do not form part of a linkage to or support another more significant feature, the following features are not recommended for inclusion within the Pickering NHS:

- Woodlands dominated by non-native species or invasive tree species (buckthorn, hawthorn, etc.; this should also be addressed by revising Tree Protection By-law #8073/24)
- Hedgerows or treed features less than 30 m in width
- Anthropogenic features (i.e. man-made ponds, drains under the drainage act, agriculture swales)
- Adjacent Lands
- Areas of Interference
- Vegetation Protection Zones

GEI recommends against the inclusion of VPZs and AOIs into the NHS, as is the standard across other jurisdictions. Neither the PPS, Greenbelt Plan, nor the ORMCP include VPZs or AOIs within their designated NHS. Rather these policy documents focus on the overarching goal of a NHS which is to support and provide connectivity across ecosystems. In many situations, VPZs and AOIs can be refined at the site-specific stage through supporting studies; this can prove difficult to track and map accurately across the municipality, leading to confusion both from the public and staff review. In addition, including these additional lands would result in a significantly

larger, almost unwieldy NHS, losing track of the true goal, which is to protect the most sensitive features.

Instead, VPZs can be formalized through development applications, with the intention of these VPZs being zoned/designated as EP or OS as part of that planning process.

However, should the preference be to integrate a minimum VPZ as part of the NHS, GEI would recommend providing clear policy language that requires “final VPZs” to be determined through an EIS or similar study to adequately address feature sensitivity.

The following should also not be included in the NHS, due to the existence of feature-specific land use designations and/or policies:

- Lake Iroquois Shoreline
- Rouge-Duffins Wildlife Corridor
- Landform features (i.e., steep slopes, kames, ravines, kettles, and ridges that should be kept in their natural form)

As the current POP has specific policies and text related to each of these features and areas, GEI recommends that their extent be clearly defined within the POP, where possible, within a Schedule (i.e. publicly available map).

13.4.2. Linkages and Enhancement Areas

The PPS states that natural heritage, surface water, and groundwater features and the connectivity between them should be maintained, restored, or improved, where possible. The ORMCP also identifies key linkage areas within the plan area to support their preservation and enhancement. Broadly, linkages are generally associated with valleylands, stream corridors, and open spaces between KNHFs and KHF. The ROP identifies enhancement opportunity areas, which are potential linkage areas adjacent to the regional NHS, where the system can be enhanced through stewardship and restoration efforts.

Area municipalities are required to identify enhancement areas and linkages within their OP, where appropriate, per the ROP. The ROP identifies the Rouge-Duffins Wildlife Corridor as an example of a natural linkage between the Rouge and Duffin valley systems. In keeping with this direction from the region, it is recommended to undertake a mapping exercise to identify regional-scale connections between KNHFs and KHF within the city and broader region (i.e., major north-south and east-west movement corridors, major river valleylands, etc.).

Policies in the POP should be included to support the identification of additional, local-scale linkages through site-specific applications, as well as enhancement targets to maintain them. Valleyland policies should also be expanded to acknowledge their function as a natural linkage,

and should be evaluated as such when undergoing development impact assessments within an EIS.

13.4.3. Natural Heritage System Land Use Designation and Policies

Once the Pickering NHS is identified, development policies can then be reflective of the overall NHS and related land use designation, or they could be further broken into feature-specific development policies. The NHS can be designated as a land use type, or it can be considered an overlay to the existing land uses.

1. Natural Heritage System Overlay Approach:

An overlay approach can be used to improve efficiencies associated with Official Plan Amendments (OPAs), and may be an appropriate tool where development is expected to take place. This method relies on an environmental protection layer mapped on top of an underlying land use designation (e.g., rural, urban, etc.). In order to remove the environmental protection layer/overlay, a detailed EIS would be required to clearly identify features and minimum VPZs. Policy language would be required to clearly outline that where these overlays exist, an OPA is not required to apply an 'Environmental Protection' or similar land use designation to all features and VPZs identified through the development process, if approved through an alternative development application.

If the POP looks to implement this approach, it should be inclusive of all KNHFs that comprise the Pickering NHS, as well as the Seaton NHS, Greenbelt NHS, and ORMCP NHS.

2. Land Use Designation Approach:

There are two main approaches to implementing land use designations to identify permitted uses and prohibitions for an NHS:

1. One overarching 'Environmental Protection' land use designation:
 - One land use designation would be applied to the entire NHS within Pickering, with overarching land use policies that are applicable to all features within the NHS. This would establish key permitted and prohibited activities/uses within this designation. This would be inclusive of all provincial NHSs.
 - If this is the approach taken, GEI recommends creating further feature-specific policies as outlined in **Sections 5** through **12** to provide appropriate protections for features based on existing legislation and their sensitivity
2. Tiered land use designations:

- Additional land use designations may be appropriate to differentiate between permitted uses and development policies; this could include separate designations for the Seaton NHS, Greenbelt NHS, and ORMCP NHS.
 - Definitions of these land use designations and associated policies should be provided in the POP.
 - An alternative option is to apply a tiered land use designation system (similar to the Town of Caledon (Future Caledon OP, 2025)). This option separates features out into different land use designations and provides clear permitted uses and prohibitions.
 - One example of this would be to implement two land use designations within the “Pickering NHS”, ‘core features’ and ‘supporting features’. A core feature land use designation would apply to more sensitive features that have more restrictive development opportunities as per the PPS; supporting features would consist of non-significant NHFs such as woodlands and non-significant wetlands.
3. Hybrid Approach: Apply an Overlay, and have distinct policy that identifies conditions required to remove the overlay (e.g., EIS or similar study), and require that all NHFAs that comprise the NHS are delineated, an appropriated VPZ is implemented, and these features are designated as ‘Environmental Protection’ without requiring an amendment to the POP. This may be best suited for urban areas where features are less contiguous and where development is expected to advance to support future growth. Where systems are better understood, for example, valleylands, PSWs, and features within the regional/provincial systems, and where development is not anticipated, an Environmental Protection land use designation could be implemented with more certainty.

The tiered land use and hybrid overlay and designation approaches may add more complexity for planning staff and reviewer. As such, either an overlay or single land use designation is recommended.

GEI offers the following additional recommendations for Natural Heritage System Policies:

- Update POP language to specify which features are components of the NHS, clearly, in a list format
- Provide overarching NHS goals and objectives (i.e., no net loss)
- Provide policies for the refinement of a NHS (i.e., through an NHE/EIS)
- Utilize a series of sweeping policies and protections for the entire Pickering NHS, including:
 - Maximum impervious surface area

- Minimum vegetation cover
- Maintenance or enhancement of linkages or corridors
- Consider non-significant features (i.e., woodlands/wetlands) as a natural linkage
- Ensure that the Seaton NHS is clearly defined and that necessary documents are available to the public for reference

13.4.4. Adjacent Lands

The NHS is not considered a KNHF itself, it is merely a land use designation to define permitted land uses; as such, GEI does not recommend that adjacent lands/AOIs or VPZs be applied to the NHS land use designation. Their application to the NHS designation is not standard within other jurisdictions, nor is it advised through any of the provincial policies or plans, the ROP, or the POP. Instead, adjacent lands, AOIs, and VPZs should be feature-specific, as described in **Sections 5-12**.

14. Other Recommendations

The following section provides an overview of our other key recommendations, that are not necessarily feature specific. These recommendations are intended to enhance policy clarity, integration of new/enhanced policy directions, and aspirational policies that are beyond the minimums required by provincial and regional plans. Recommendations for each of the specific NHFA and NHSs are found in **Section 5** through **13**.

14.1. Agricultural Lands Policies

Most agricultural uses are generally exempt from the natural heritage policies outlined in federal, provincial, and municipal legislation. These exemptions are critical to ensure that our agri-food network is protected for the long-term, and that it is not limited in its ability to perform or expand.

The PPS clearly states that none of the natural heritage policies apply where they limit the ability of agricultural use to continue (Section 4.1.9), where agricultural use is defined as:

Agricultural uses: means the growing of crops, including nursery, biomass, and horticultural crops; raising of livestock; raising of other animals for food, fur or fibre, including poultry and fish; aquaculture; apiaries; agro-forestry; maple syrup production; and associated on-farm buildings and structures, including, but not limited to livestock facilities, manure storages, value-retaining facilities, and housing for farm workers, when the size and nature of the operation requires additional employment.

Furthermore, within the Natural Core Area, Natural Linkage Area, and Countryside Area sections of the ORMCP, agricultural (or similar) uses are among the few permitted uses in Core Areas and Linkage Areas. The ORMCP further exempts agriculture-related development within a feature's adjacent lands, but outside of the VPZ, from requiring an NHE.

Within the Greenbelt Plan, agriculture is not subject to restrictions for new development in natural heritage and hydrologic features in the Protected Countryside, such as demonstrating no negative impact, maintaining connectivity, and the maximum disturbed site area.

In the ROP, agriculture uses are promoted in the Open Space designation alongside conservation and environmental protection. Within the ORM and Greenbelt areas, new agricultural uses are not permitted within KNHFs or KHF but are permitted within the VPZ (other than those associated with buildings or structures). Agricultural uses and buildings within the ORM are also exempt from an NHE/hydrological evaluation if the development is set back at least 30 m and is carried out based on best management practices. Agricultural uses are also permitted within the NHS, outside of the ORM and Greenbelt Plan areas, provided they meet the KNHF and KHF restrictions.

In the POP, agricultural and similar uses are permitted in Natural Areas, outside of the key natural heritage/hydrologic features. Agricultural uses are further noted in their role as a functional linkage or corridors. The POP provides an exemption for agricultural uses, where a NHE is generally required (Section 16.9).

Many of the technical guidelines, such as OWES, have specific exceptions for agricultural uses. The manual provides a specific and common example of agricultural use within wetlands: where a wetland no longer meets the definition of a wetland (i.e. based on water, soil/substrate and vegetation characteristics), then it should no longer be considered a wetland (MNR, 2022). For example, where hydric soils exist such as a low spot in an agricultural field, but the area is currently planted as cropland, both the water/substrate and vegetation characteristics are not met, and therefore the area is no longer considered a wetland, per OWES. Should the agricultural use cease, the area may revert back to its naturalized state with wetland vegetation quickly, and therefore be considered a wetland again.

14.2. Ecosystem Compensation

Ecosystem Compensation is a tool used by municipalities when impacts to a NHF or area cannot be avoided, minimized, or mitigated, as per the Net Gain Mitigation Hierarchy (NGMH), further discussed in **Appendix D.3** below.

It is acknowledged that the TRCA ecosystem guidelines are based on best practices and evidence-based decision making (see **Appendix D.3** for more discussion). As these documents are often updated regularly, GEI recommends that the City provide clarity within the POP that the City will rely on the TRCA's guidelines in one of two ways:

1. Explicitly referencing the name and date of the document so there is no confusion on which version is being referenced; or,
2. Provide clarity which version was referenced at the time of the update, and include flexible language such as *“according to compensation guidelines established by the TRCA, as amended from time to time”* (similar to that of the reliance on MNR for wetland evaluation criteria)

Where provincial and POP policies support the removal of a NHF or area, Ecosystem Compensation can be utilized by municipal staff in order to ensure that the connectivity and function of the landscape as a whole are maintained. Ecosystem Compensation can look like replication of the features and functions within the same property, adjacent lands, or elsewhere in the municipality, or payment in lieu to support other restoration projects and priorities. The types of Ecosystem Compensation will vary based on each unique situation, and replacement of a differing feature type may be recommended in some instances (e.g. removal of a non-PSW and creation of an upland meadow habitat).

14.2.1. Regional Official Plan

The ROP refers to Ecosystem Compensation in some specific areas and scenarios, generally relating to the removal of trees and water recharge. However, it provides open ended policies to support its use in other situations.

A few examples of where compensation is permitted include:

- For major development north of the downgradient line within the Wellhead Protection Area (WPA), use LID/best practices to maintain recharge, but offsite compensation may be considered if pre-development rates cannot be maintained (Section 7.5.40)
- For the Elgin Park Drive development in Uxbridge – tree removals will be compensated based on the offsetting policies of the Lake Simcoe Region Conservation Authority (LSRCA; Section 10.5.9)

14.2.2. Official Plan

The POP has several references to Ecosystem Compensation and directly references guidelines by the DFO and TRCA. Overall, the POP makes it clear that avoidance of features should be the first priority, and only where avoidance is not possible should mitigation and compensation occur. However, there is limited discussion on minimizing impacts. It may be advantageous to the POP to include policy language that emphasizes a mitigation hierarchy prioritizing avoidance, minimization, mitigation, and compensation, in that order. For example, for freeways and major utilities, the City *encourages* maintaining or improving connectivity between features using mitigation and compensation where development encroaches on the NHS or into key natural heritage or hydrologic features, rather than requiring avoidance and compensation (Section 3.12).

A few examples of where compensation is currently permitted include:

- Compensation in the form of on or off-site tree planting or alternative methods of compensation is required to maintain the urban forest, provided that removal without compensation is already permitted as part of an approved application (Section 10.15.(a).(v))
- Neighbourhood plans must include a Neighbourhood Functional Servicing and Stormwater Report with a fisheries habitat assessment that discusses net gain compensation for fish habitat where development will harm it (Section 11.73.(o))
- In the Duffin Heights neighbourhood – for areas identified in the Environmental Servicing Plan, applicants must provide a compensation report that demonstrates how environmental impacts will be mitigated using best practices and other sustainable measures to the satisfaction of the City and in consultation with the TRCA (Section 12.17.(l))

OPA 35, discussed in **Appendix C.2**, also provided additional compensation requirements under Section 10.12 of the POP. It amends the POP policy to require compensation for the loss of ecosystem functions due to development impacts, after exhausting all other options for protection, minimization, and mitigation. Compensation is not required where compensation has already been agreed upon, or removal has been approved within an application or plan.

14.2.3. Recommendations

At a minimum, it is recommended that the POP require new development to ensure no net loss of natural functions.

Recommendations could include:

- Require a net-gain approach, whereby a proponent must demonstrate an improvement to the natural system,
- Require an EIS/NHE that demonstrates application of the NGMH to support the evaluation of impacts to various feature types, provide minimum feature compensation ratios (for example, “greater than 1:1” or “2:1 for wetlands over 0.5 ha”,
- Require a compensation report for all new development, or at a minimum, areas beyond the Duffin Heights neighbourhood,

Best practices are discussed in **Appendix D.3**.

14.3. Natural Heritage Targets

The development of Natural Heritage Targets is a long-term planning tool, which can be used by municipalities to ensure that the goals of the NGMH are met, ensuring at minimum, no-net habitat loss. When developing Natural Heritage Targets, a municipality must consider all provincial priorities, including but not limited to protecting ecological systems, conserving and managing natural resources, and adapting to a changing climate. These priorities are considered the minimum target, with peak targets focusing on regional and local priorities, including feedback from stakeholders and members of the public. Best practices and other examples are discussed in **Appendix D.2**.

14.3.1. Regional Official Plan Natural Heritage Targets

The ROP has a few natural heritage targets, which include 40% woodland cover and maintaining wetland cover in the Region (Sections 7.4.19 and 7.4.26). There is also a target to achieve a 30% reduction in annual GHG emissions by 2030, compared to 2019 levels, and to be net-zero by 2050 (Section 3.2.1).

Targets for new development in Major Open Space Areas and/or the Greenbelt also include maintaining or enhancing connectivity between features within 240 m of each other and keeping the maximum disturbed area at 25% of the site, or 40% for golf courses (Section 7.1.9). The maximum imperviousness of the developable area must also not exceed 10%, and the amount of developable area to return to self-sustaining vegetation is 30% (Section 7.1.9).

In addition to the above, the ROP generally defers to watershed plans to establish natural heritage targets and identify suitable areas for restoration (Section 7.4.19). The watershed plans applicable within Pickering are the Petticoat Creek, Carruthers Creek, Duffins and Carruthers Creeks, and Rouge River Watershed Plans. Some of the targets within these plans include:

- Petticoat Creek WP:
 - 39% NHS cover
- Carruthers Creek WP (2021):
 - 36% natural cover target across watershed
 - 75% of stream lengths are vegetated
- Duffins and Carruthers Creeks WP:
 - 49% natural land cover in the Duffins Watershed
 - Increase in the urban canopy
 - Increase in naturalization of private lands
- Rouge River WP:
 - Attain complete coverage of stream corridors
 - 10% wetland cover across the watershed
 - No additional loss in stream length
 - Maintain or reduce the disturbance ratio (severely disturbed area to ELC area)
- Lynde Creek Watershed:
 - 75% of watercourse length (currently at 38% riparian cover)

These targets, among others, should be integrated directly into the POP. Objective #3 in the Carruthers Creek WP is to increase forest cover in the developed portion of the watershed. One of the management recommendations to achieve this objective states that lower-tier municipalities will collaborate with the Region and TRCA to update and consolidate forest studies; the consolidated study will include targets for forest cover on private and public land. These targets will be included in the urban forest strategy (currently in development, per the City's website), and can also be included directly into the POP.

14.3.2. Official Plan Natural Heritage Targets

The POP currently provides natural heritage targets in Appendix I. These targets are outlined in **Table 5** below.

Table 5. Appendix I Natural Heritage Targets

Livability Indicator	Possible Performance Target (by 2016)
Percent of mature forest area	increase from 17 (target to be determined)
Percent of wetland area (including areas designed for storm water detention)	increase from 0.02 (target to be determined)
Water quality (surface/sub-surface)	improve (targets to be determined)
Total amount of prime agricultural land	to be determined
Total contiguous natural areas 100 hectares or more in area	increase (target to be determined)
Total amount of waste generated on average (per household/business/industry) per year	decrease (target to be determined)
Energy consumption per capita	decrease (target to be determined)
Water consumption	decrease (target to be determined)
Air quality	to be determined

The current targets are vague, only indicating an increase or decrease, and many are still “to be determined”; the baseline values for which these targets are based on are also missing (e.g., achieve an increase in mature forest area by 2016, *compared to 2000*). Without these details, the current POP targets are not currently consistent with other plans and guidelines.

14.3.3. Recommendations

The existing targets listed above are a good starting point. However, the current metrics leave room for ambiguity and may prevent the City from meeting its ecological goals. To remain in conformity with provincial priorities, more specific targets will need to be determined; it is up to the City to determine how aspirational these are and could be based on similar feature targets around southern Ontario or based on local CA targets (see **Appendix D.2**).

14.4. Other Recommended Policy Updates

This section provides additional recommendations for consideration beyond those related to definitions, ecosystem compensation, and targets.

14.4.1. Outdated Policies

The following is a list of recommendations for policy modifications to resolve irrelevant or repealed policies:

- Modify references to the Provincial Policy Statement and Growth Plan for the Greater Golden Horseshoe (GPGGH) to refer to the PPS (2024), and update policies accordingly to ensure consistency
- Where there are references to guidelines written by external agencies, recommend providing explicit references for accuracy “TRCA compensation guidelines, XX year”.
- Remove language that implies the CA has jurisdiction over all NHFs; clarity is required to confirm that the CA Act and O. Reg. 41/24 only refer to river and stream valleys, shorelines, wetlands, watercourses, and associated natural hazards and gives them regulation authority to comment on these items only
- Continue to reference the ESA, where applicable, until the SCA comes into effect; in the meantime, indicate that the SCA is forthcoming. Using flexible language (e.g., “in accordance with provincial guidelines”, rather than “in accordance with the ESA”) will ensure that POP policies remain in conformity with whichever Act is in place, as well as any future updates to the ESA and SCA. If the SCA is in effect at the time of completion of the new POP, remove all reference to the ESA and ensure any key SCA requirements are included.

Flexibility should be integrated where provincial legislation is referenced within the POP as there have been regular revisions to many key Acts related to natural heritage as demonstrated in **Section 2**. It is recommended that where references to legislation are made, add caveats noting “or applicable legislation as revised” or “according to provincial legislation, as amended from time to time” to capture the potential for ongoing changes and to ensure consistency as these changes occur.

14.4.2. Policy Language

Policy language and descriptions of features, areas, and designations should be updated for clarity:

- Review instances where the following language is used, and replace with more firm language (i.e., “the City will”): “will consider”
- Ensure terms that will dictate development permissions are well-defined; e.g. woodland versus significant woodland
- Continue using different NHS policies based on geography, but ensure their boundaries and policies are clearly defined
- Reassess “Ecological System” at this time, it is easily confused with the idea of a NHS and a land use designation. Instead, GEI recommends that this information can be integrated into the Natural Heritage section to provide overarching goals for the NHS and/or the EIS/NHE Terms of Reference guidelines for consideration in technical studies to support development applications
- Properly define the ‘Open Space System’ and its components

- Confirm that KNHFs and KHF do not receive their own protections, rather they are just a term that defines a group of features.
- Update SAR habitat definitions to differentiate between threatened and endangered species that have ESA/SCA protections, and species of special concern which are generally covered under Significant Wildlife Habitat
- GEI recommends that language within subsections 10.12.f) and g) be better aligned. At the moment, they make reference to CAs and features within their jurisdiction. The ideal resolution would be to reference the TRCA compensation guidelines directly and provide a single list of exempt project/application types
- The ROP requires an EIS, while the current POP requires an NHE – it is recommended that the preferred study type is clearly defined in the POP for clarity on what is expected for applicants and their technical teams. An EIS is the more commonly used term for studies that assess the impacts due to development, meanwhile NHE is the more commonly used term for studies that evaluate the existing conditions but pose no changes.

14.4.3. Vegetation Protection Zones

As discussed in the sections above, VPZs of varying sizes are required for most features. In addition to the policies delineating their size, policies should also be included describing their composition. Provincial plans, other Greater Toronto Area municipal OPs, and various Conservation Authorities stipulate that VPZs should consist of naturally self-sustaining vegetation to ensure they continue to buffer the feature from adjacent land uses and reduce erosion potential. Similar requirements should also be included in the OP to ensure that VPZs are vegetated appropriately for the ecological functions they provide.

14.4.4. Climate Change Incorporation

Under the PPS, planning authorities are required to incorporate climate change considerations in designing their communities to reduce greenhouse gas emissions by being compact, active transportation and transit-supportive, and complete communities. Integrating green infrastructure, LID, and other measures for reducing greenhouse gas emissions and build community resilience are to be considered.

Climate change should be integrated into natural asset management. Increasing flooding, heat, and other hazards are expected as climate change progresses, increasing vulnerability across all sectors. Compensation rates should reflect the services provided by the features and ecosystems proposed for removal to ensure the natural environment maintains resiliency through these changes, and would be determined on a site-specific basis.

14.4.5. *Traditional Ecological Knowledge Incorporation*

The PPS states that the Province will continue to recognize the role of Indigenous communities and traditional knowledge in land use planning and decision making. Engagement with Indigenous communities should be done early in the development process, and should be meaningful, constructive, and cooperative in order to facilitate relationship-building and knowledge sharing.

Indigenous communities have a unique, spiritual relationship with the land. As such, traditional ecological knowledge in particular is central to natural heritage planning, ensuring that development decisions are cognizant of the value of the environment and its natural resources. Incorporating Indigenous knowledge and consultation requirements into natural heritage policies ensures that any refinements or land use changes in the NHS and other natural features keep an alignment with Indigenous values and the Province's commitment to incorporating them.

14.5. Recommended Supporting Documents

To support municipal staff in reviewing development applications, we recommend that a series of support documents be prepared, discussed below.

14.5.1. *Figures*

As part of our review of best management practices and strategies from other municipalities and agencies in Ontario, we have compiled a list of figures and illustrations depicting NHFs and protections for the public audience. These figures are included within **Appendix A**.

14.5.2. *Guidelines, By-laws, Strategies, and Other Plans*

The City should also develop supporting guidelines for development applications. A clear terms of reference is a useful tool for both planning staff and applicants to understand the essential requirements for natural heritage studies to satisfy the policies of the OPA. This should also clearly define the type of natural heritage study required (i.e. EIS versus NHE). The Terms of Reference can be as simple as a check list for applicants to review as they work to identify their study scopes, or more comprehensive and robust outlining discrete reporting requirements and scope. See **Appendix E** for examples from other municipalities and CAs. In the meantime, one option is to directly reference certain technical guidelines that have been prepared by the TRCA, but which may now be outside of their scope of review. Direct reference of these guidelines would allow the City to review applications based on the criteria noted within them.

There are several other municipal strategies, plans, and by-laws that require consideration of NHFs and their functions. As the POP is revised, it is recommended that the following documents be reviewed and revised to conform with the updated POP:

- Integrated Sustainable Design Standards: it is recommended that the scope be expanded to apply to all new development and consider revised natural heritage policies. At a minimum, requirements within the ISDS cannot conflict with the policies of the new POP;
- Tree Protection By-law 8073/24 and supplementary information available to residents on tree protection and removal should be reflective of woodland policies outlined in the POP such as definition changes and/or consideration of non-native/invasive species.

Consistency between natural heritage and future strategies, such as the ongoing Community Climate Adaptation Plan and/or the Urban Forest Strategy, should also be reviewed to ensure they are supportive and consistent.

15. Conclusion

This Environmental Protection Policy Review provides a comprehensive analysis of prevailing natural heritage legislation and policy framework, outlines best practices for environmental protection, and provides recommendations for environmental protection policy updates for the future POP.

Key recommendations include:

- Minimum protections, buffers, and adjacent lands for provincially significant features wetlands, woodlands, valleylands, wildlife habitat, and other NHFs, ensuring conformity with provincial plans such as the PPS, Greenbelt Plan, and ORMCP.
- Recommendations for minimum, GEI recommended (balanced), and aspirational policies to enhance protections beyond the minimum legislative requirements.
- Clear and consistent definitions for all natural heritage and hydrologic features to ensure effective implementation.
- Integration of ecosystem compensation and natural heritage targets to achieve no net loss and, where possible, net ecological gain.
- Opportunities to provide flexibility based on geography, and for refinement of features and VPZs based on technical studies.
- Alignment of supporting documents, by-laws, and strategies to ensure consistency and clarity for staff, applicants, and the public.
- Incorporation of climate change and traditional ecological knowledge into policy frameworks, enhancing resilience and inclusivity.

By adopting these recommendations, the City of Pickering will be well-positioned to modernize the POP, strengthen protections for its NHS, and guide sustainable growth in alignment with provincial priorities and community values. Continued engagement with stakeholders, regular policy updates, and adaptive management will be essential to maintaining ecological integrity and meeting long-term environmental goals.

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Appendix A Sample Figures and Illustrations

A.1. Toronto and Region Conservation Authority

A.2. Grand River Conservation Authority

A.3. Greenbelt Plan Technical Documents

A.4. County of Brant

A.5. City of Greater Sudbury



A.1. Toronto and Region Conservation Authority

The TRCA has prepared a number of guidelines that are available for members of the public to review and consult with, prior to submitting development applications on their properties. A full overview of the guidelines and procedures from the TRCA is available in **Appendix B3** below.

The following figures have been included:

Figure 1 comes from The Living City Policies (TRCA, 2014) and shows a depiction of example setbacks and buffers from TRCA regulated features, including wetlands, meander belts, floodplains, long-term stable top of slope, and the dynamic beach hazard. Particularly, this figure depicts examples of where more than one feature is present, as often is common on properties.

Figure 2 comes from the Crossing Guidelines for Valley and Stream Corridors (TRCA, 2015) and shows three examples of culvert installation methods, with the second and third being the preferred options to maintain and enhance (respectively) fish passage.

Figure 3 comes from the Guideline for Determining Ecosystem Compensation (TRCA, 2023) and depicts an example of a landscape plan for riparian planting. The riparian plan clearly shows different vegetation and habitat areas, including the existing canopy cover to be maintained, native tree and shrub cover to be planted, and sample locations for nest boxes and woody debris piles.

Figure 4 also comes from the Guideline for Determining Ecosystem Compensation (TRCA, 2023) and shows a simplified aerial view of how compensation should occur on-site or off-site. The images clearly show the areas to be removed, and those areas that will be restored or enhanced.

Figure 1. Setbacks for Conservation Authority Regulated Features (TRCA, 2014).



Figure 2. Culvert Installation Methods for Fish Passage (TRCA, 2015).

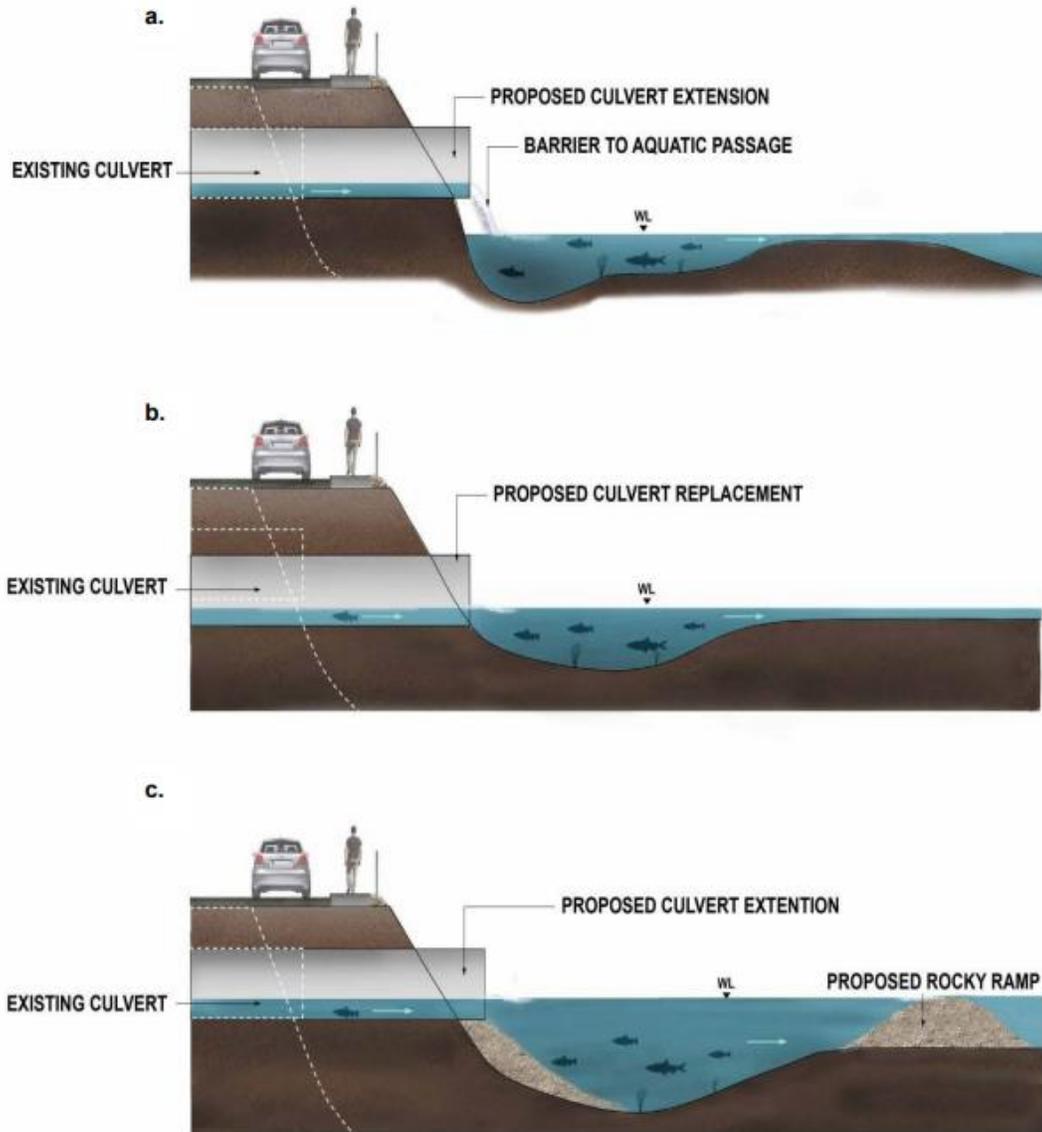
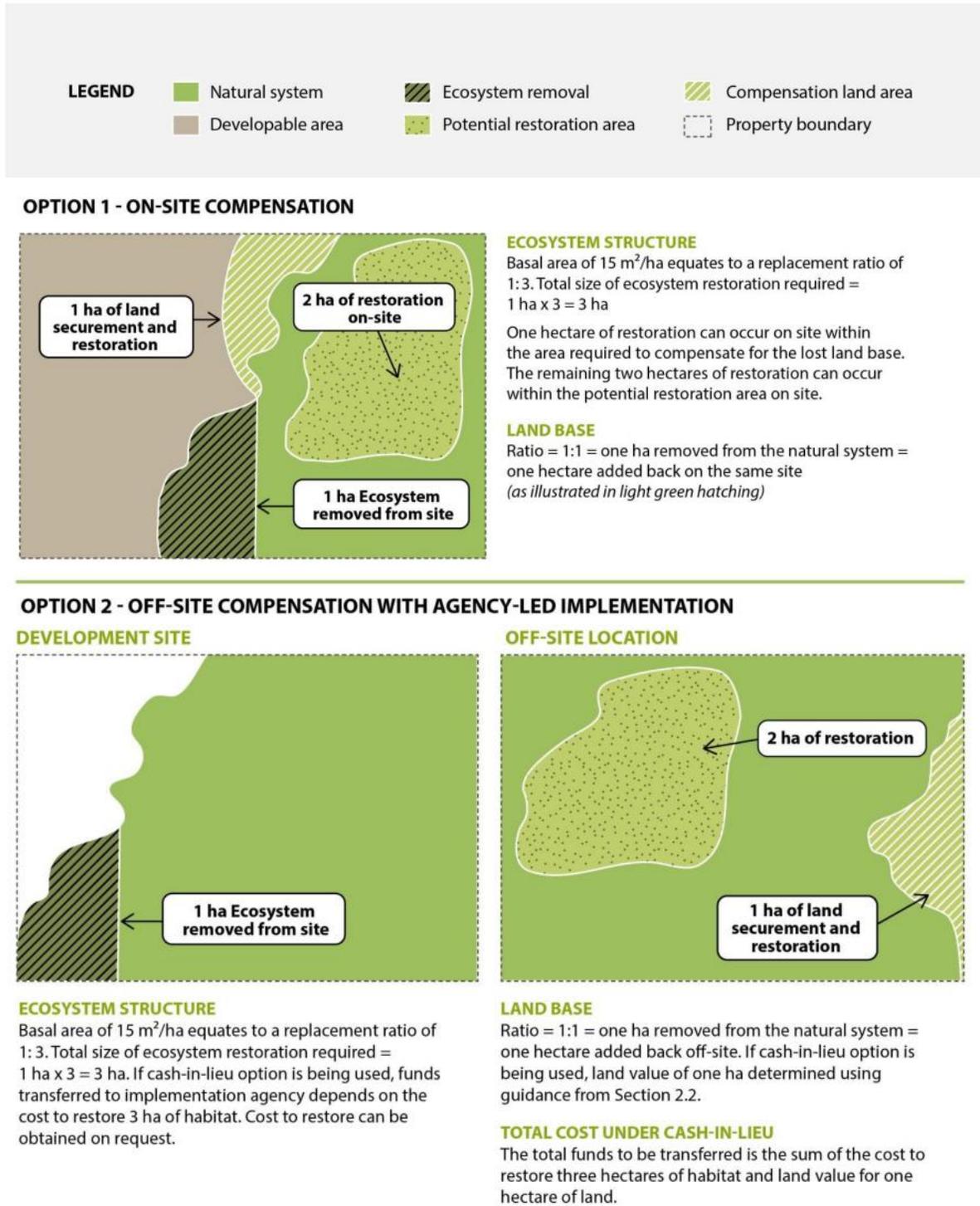


Figure 10: Crossing extensions can exacerbate existing barriers to aquatic passage (a) a perched structure (b) an embedded replacement structure (c) extension with mitigation that improves aquatic passage.

Figure 3. Landscape Plan Depicting Riparian Plantings (TRCA, 2023).



Figure 4. How Compensation Should Occur On-Site or Off-Site (TRCA, 2023).



A.2. Grand River Conservation Authority

The Grand River Conservation Authority (GRCA) has helpful diagrams within their policy and procedure document (Grand River Conservation Authority Policies for the Administration of the Prohibited Activities, Exemptions and Permits Regulation. Ontario Regulation 41/24; GRCA, 2024).

The following figures from this document have been included:

Figure 5 shows the meander belt and the riverine erosion hazard plus their allowance, for a watercourse with no apparent valley (i.e. unconstrained).

Figure 6 shows the flooding hazard limit and allowance, which makes up the GRCA regulated area.

Figure 7 is a series of three figures depicting the natural hazard constraints present along the Lake Erie shoreline. This includes the shoreline flooding hazard, the shoreline erosion hazard, and the dynamic beach hazard.

Figure 5. Riverine Erosion Hazard for Unconstrained Streams (GRCA, 2024).

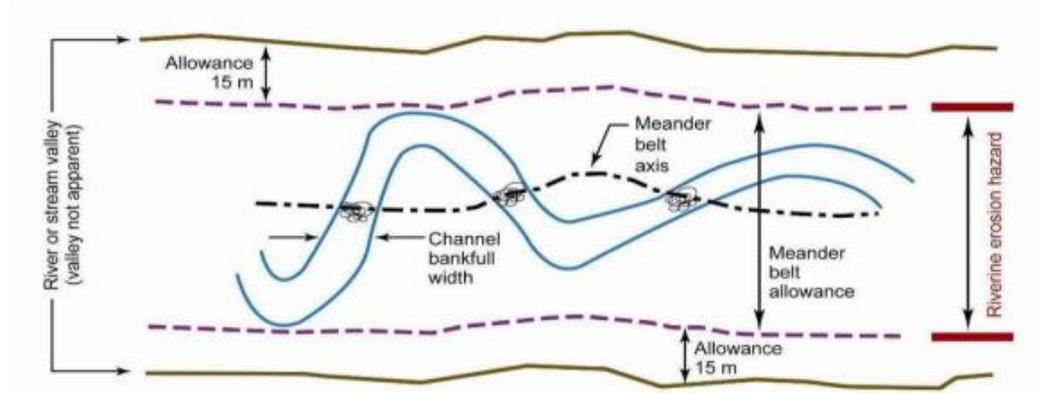


Figure 7. Riverine Erosion Hazard – Regulated Area – No Apparent Valley

Figure 6. Riverine Flooding Hazard and Regulated Area (GRCA, 2024).

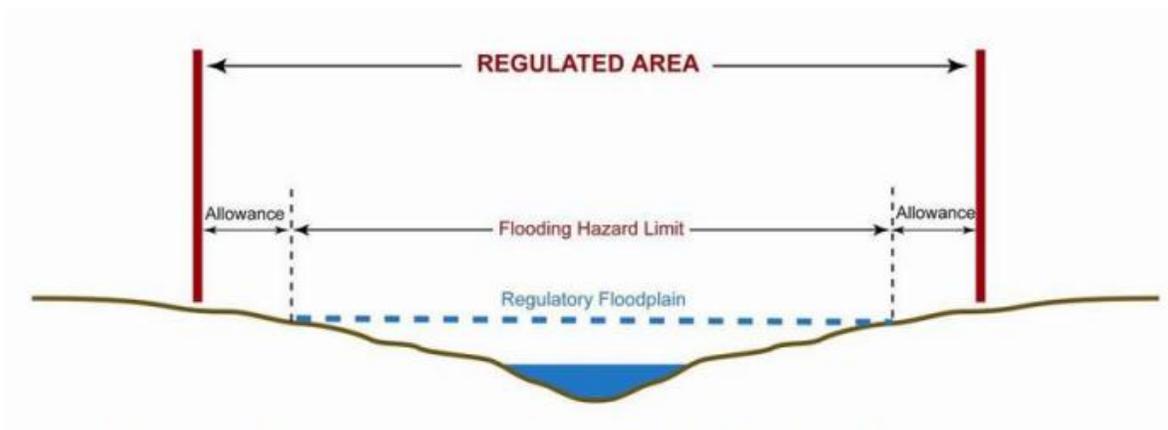


Figure 3. Riverine Flooding Hazard – Regulated Area for One Zone Policy Areas

Figure 7. Natural Hazards Present on the Lake Erie Shoreline (Flooding Hazard, Erosion Hazard, and Dynamic Beach Hazard) (GRCA, 2024).

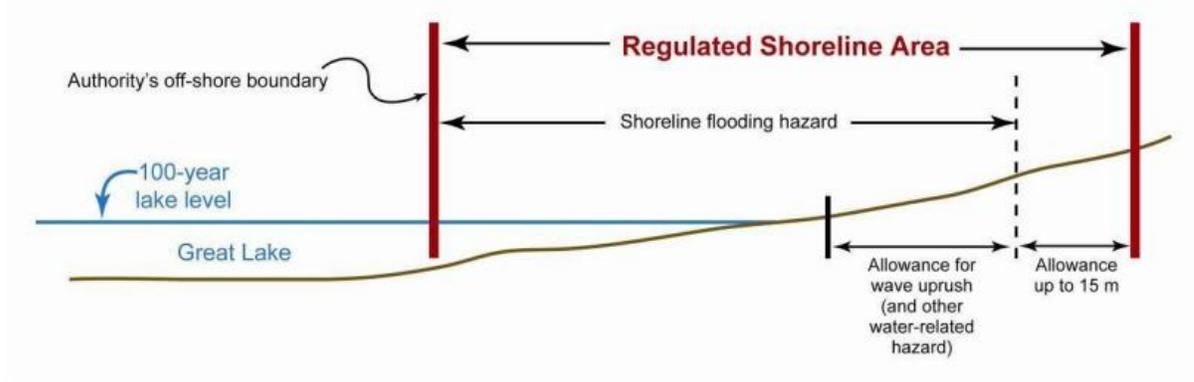


Figure 8. Lake Erie Shoreline Flooding Hazard - Regulated Area

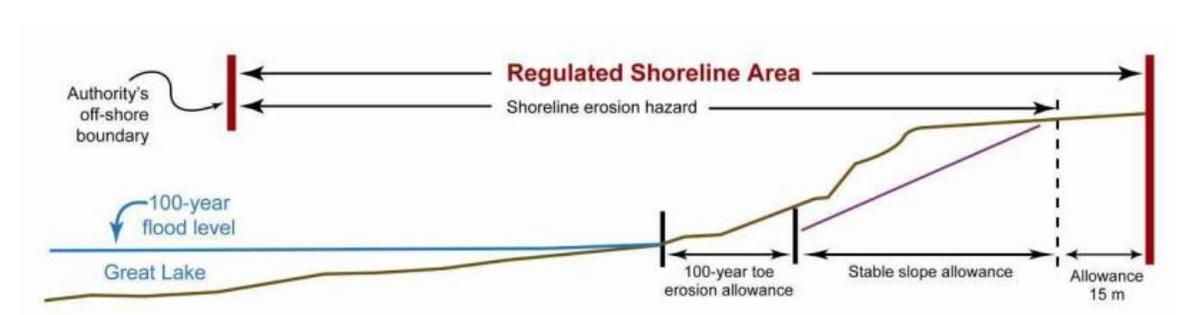


Figure 9. Lake Erie Shoreline Erosion Hazard - Regulated Area

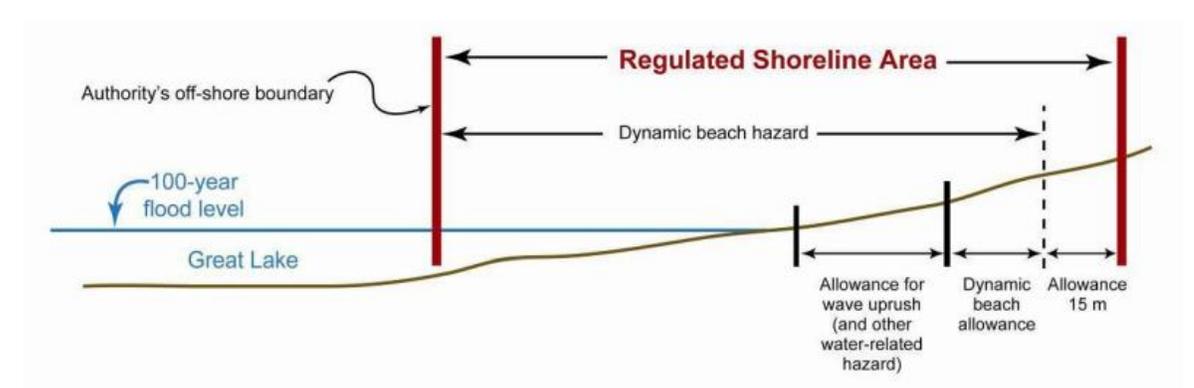


Figure 10. Lake Erie Dynamic Beach Hazard - Regulated Area

A.3. Greenbelt Plan and Oak Ridges Moraine Conservation Plan Technical Papers

The Ontario Ministry of Natural Resources (OMNR) prepared a paper on Technical Definitions and Criteria for Key Natural Heritage Features within the Greenbelt Plan areas (2012). Similarly, the Oak Ridges Moraine Land Trust has prepared a series of technical papers, including Technical Paper 12 – Hydrological Evaluations for Hydrologically Sensitive Features (2025).

The following figures from these technical papers have been included:

Figure 8 comes from the ORMCP Technical Paper 12 and depicts the minimum VPZ and the potential area of influence for a wetland community.

Figure 9 comes from the Greenbelt Plan Technical Paper 1 and depicts the minimum VPZs within an area that has multiple natural heritage constraints present. Specifically, this area contains a Life Science ANSI, a wetland, significant woodland, and watercourses.

Figure 10 also comes from the Greenbelt Plan Technical Paper 1 and provides technical clarity on how to determine the correct boundaries of a woodland within the Greenbelt Plan Area. Similar figures are also present within the ORMCP Technical Papers.

Figure 8. Minimum Vegetation Protection Zone for a Wetland Community (Oak Ridges Moraine Land Trust, 2025).

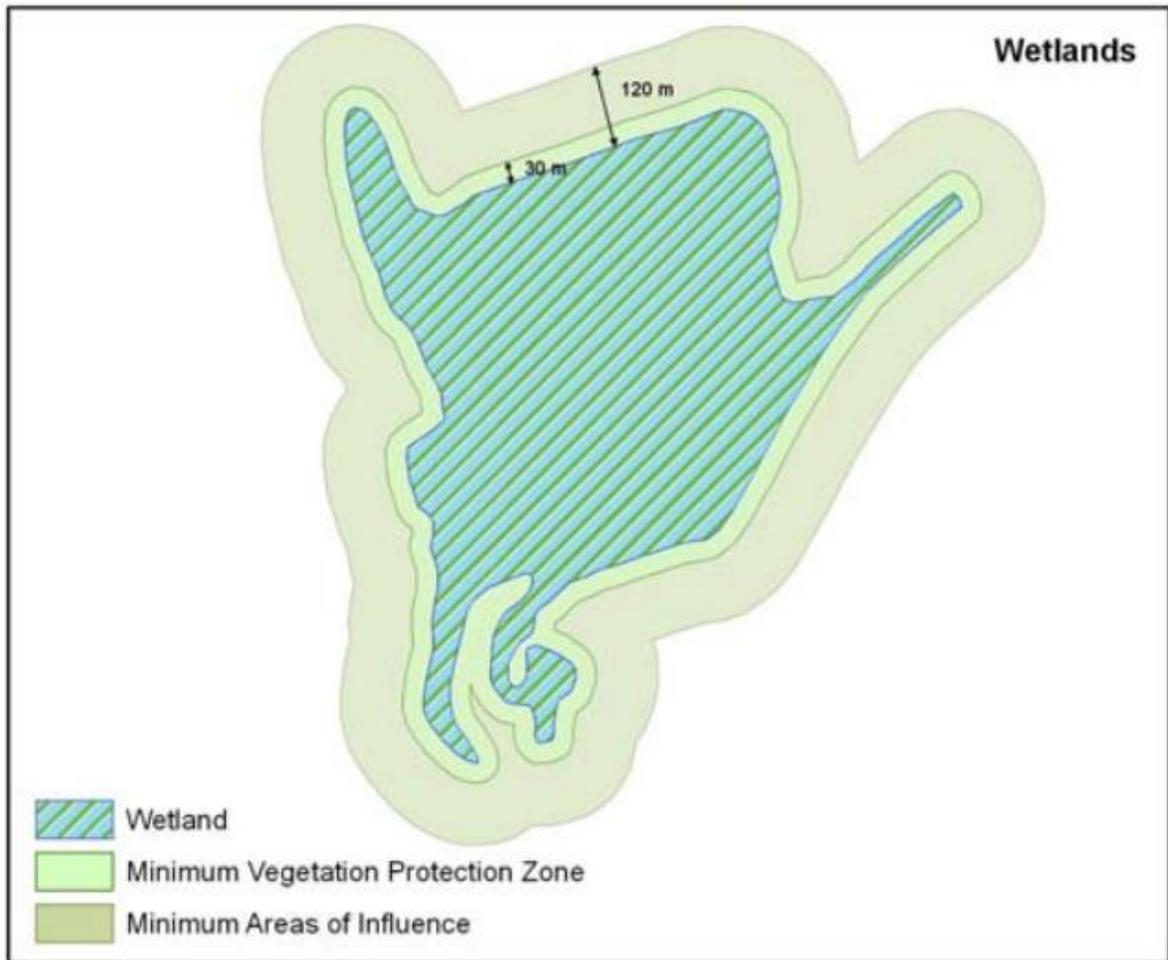
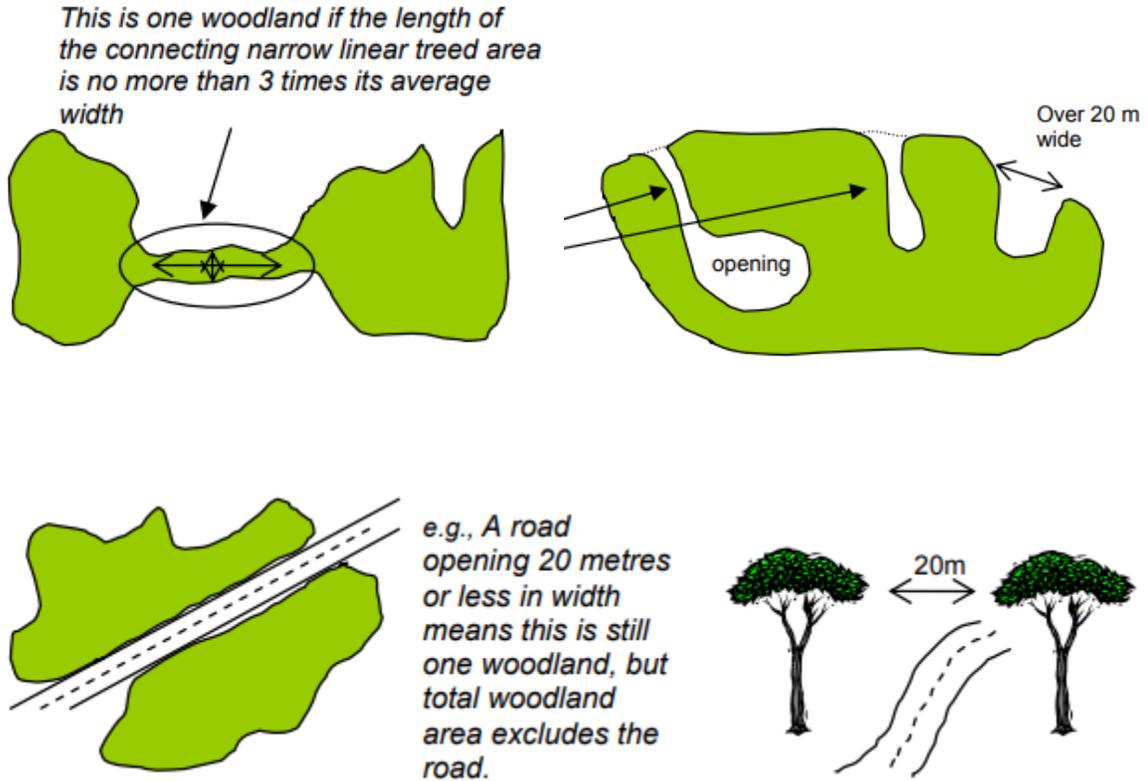


Figure 10. Diagram Depicting Woodland and Tree Considerations (OMNR, 2012).



A.4. County of Brant

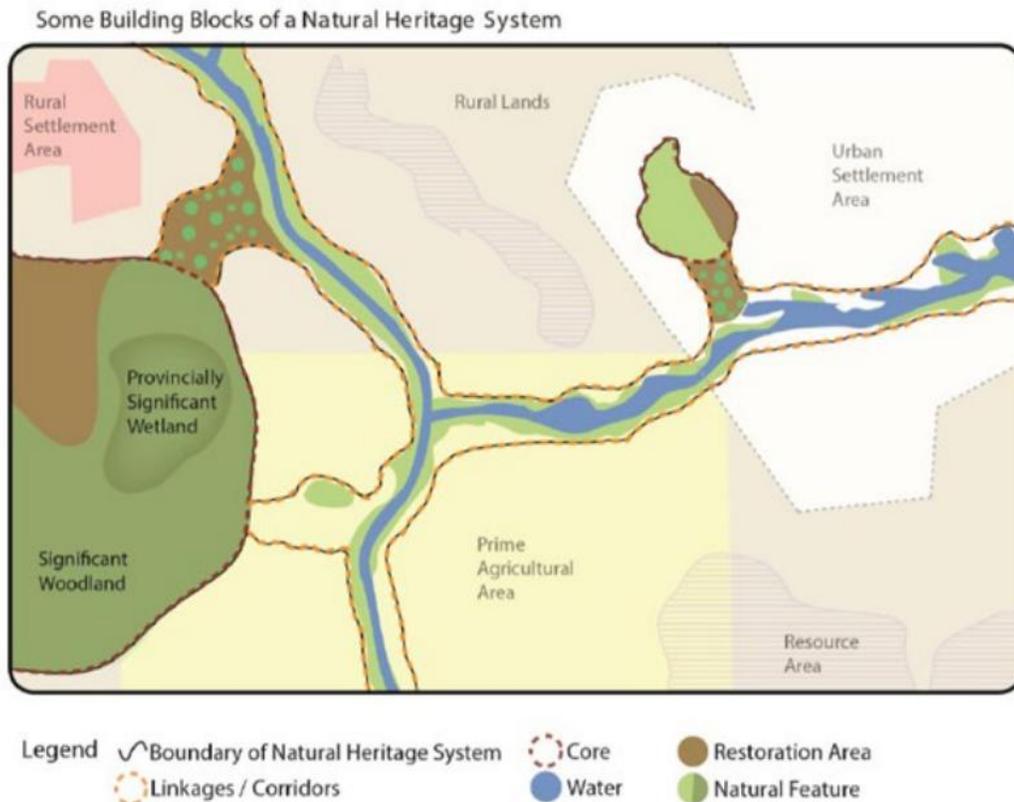
The County of Brant has also prepared a number of technical guidelines for development within their municipal boundaries. These documents are found within their Development Toolbox (2025).

The following figures have been included in documents prepared by the County of Brant:

Figure 11 comes from their Environmental Impact Studies and Environmental Implementation Plans Terms of Reference Submission Guidelines (County of Brant, 2024) and depicts a sample NHS. The diagram clearly shows the components of the NHS, which include NHFs, linkages and corridors, restoration areas, and water, and also showcases how it flows through agricultural, rural, and urban areas.

Figure 12 comes from their Tree Protection Guide (County of Brant, n.d.) and clearly depicts how they expect the DBH of trees to be measured. It provides nine examples of commonly observed trees.

Figure 11. Sample Natural Heritage System Map (County of Brant, 2024).



Source: Growth Plan Regional NHS Mapping - Technical Report (MNRF, 2018)

Figure 12. Technical Material Used to Measure Diameter-at-Breast-Height for Trees to be Removed (County of Brant, n.d).

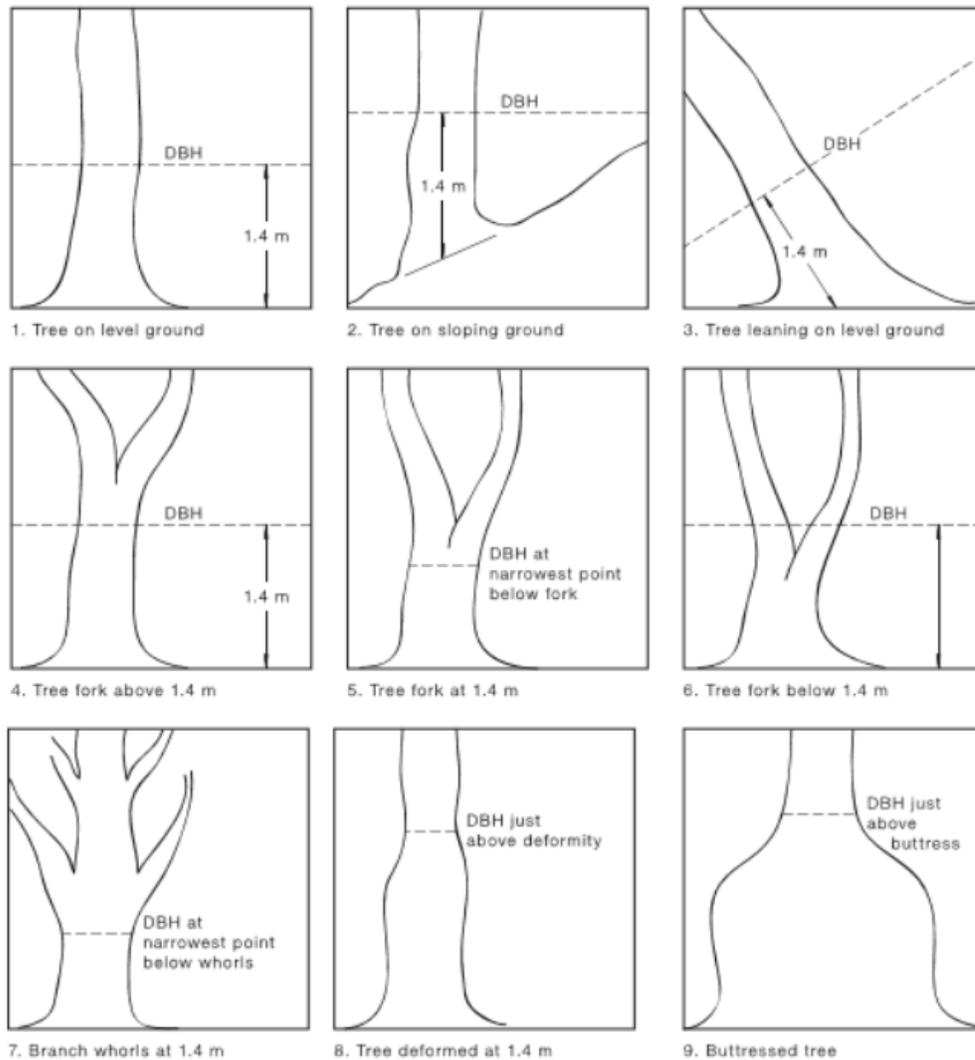


Figure 1: How to measure your tree

A.5. City of Greater Sudbury

The City of Greater Sudbury has prepared a unique illustration of setbacks to shoreline areas. This illustration is available on their website (City of Greater Sudbury, 2025) and is shown as **Figure 13** below.

Figure 13. Diagram Depicting Setbacks for Shoreline Development (City of Greater Sudbury, 2025).



Appendix B Legislation and Background Review

B.1. Federal Legislative Updates

B.2. Provincial Legislative Updates

B.3. Other Guidelines

B.4. Durham Region Official Plan

B.5. Pickering Official Plan

B.1. Federal Legislative Updates

Since 2022, there have been minor updates to natural heritage policies at the federal level since the OP was approved in 2022. This includes minor updates to the MBCA (1994), the SARA (2002), and the *Fisheries Act* (1985).

1. Migratory Birds Regulations

The *Migratory Bird Regulations, 2022* (MBR; SOR/2022-105) was enacted in 2022 to replace the previous *Migratory Birds Regulations (C.R.C., c.1035)*. These changes represented a significant overhaul of the protections for migratory bird species within Canada, and re-defined key terms, including ‘migratory bird’ and ‘overabundant species’. ‘Migratory bird’ now means “a migratory bird referred to in the Convention, and includes the sperm, eggs, embryos, tissue cultures and parts of the bird” and ‘overabundant species’ now means “a species of migratory game bird that causes damage or is likely to cause damage to agricultural, environmental or other similar interests as a result of the rate of increase of the population of that species or the abundance of that population, and that is set out in column 2 of Table 2 of any Part of Schedule 3”.

The MBR also sought clarifications to the prohibitions of the MBCA with the introduction of Section 5(1) which states:

A person must not engage in any of the following activities unless they have a permit that authorizes them to do so or they are authorized by these Regulations to do so:

- *(a) capture, kill, take, injure, or harass a migratory bird or attempt to do so;*
- *(b) destroy, take, or disturb an egg; and*
- *(c) damage, destroy, remove, or disturb a nest, nest shelter, eider duck shelter, or duck box.*

The MBR also introduces Schedule 1, which includes a list of migratory birds that receive additional protections. Where a bird is listed on Schedule 1, removal of their nest (regardless of occupation) can only occur when the nest has been unoccupied for a set length of time ranging from 12-36 months and must be accompanied by notice to the Minister (Section 5(2)).

2. S.C. 2024. c. 30: Fisheries Act, Migratory Birds Convention Act, and Species at Risk Act

S.C. 2024, c. 30, *An Act to amend the Interpretation Act and to make related amendments to other Acts* was passed in 2024. This act is related to Section 35 of the *Constitution Act* and ensures that all other Federal Acts and Regulations uphold the Aboriginal and treaty rights of Indigenous peoples.

As a result, sections of the *Fisheries Act*, *MBCA*, and *SARA* specifically relating to the rights of indigenous peoples were repealed and replaced with text from the above noted Act.

B.2. Provincial Legislative Updates

Since 2022, there have been substantial legislative changes within the province. This includes the introduction of and updates to of a number of pieces of key legislation.

1. Bill 5: Protect Ontario by Unleashing our Economy Act (2025)

Bill 5 received Royal Assent on June 5, 2025, to accelerate development and reduce regulatory barriers. Upon its enactment, Bill 5 amended several Acts, including the *ESA* (2007; outlined in **Section 2** below), *Environmental Assessment Act* (*EAA*; 1990; outlined in **Section 3** below), and *Environmental Protection Act* (*EPA*; 1990). Bill 5 also enacted the *Special Economic Zones Act* (2025), which allows the Lieutenant Governor in Council to designate special economic zones where special development regulations apply. In addition, it introduced the *SCA* (outlined in **Section 2a** below), which upon a later date (to be determined) will repeal and replace the *ESA*.

2. Endangered Species Act

The *ESA* is the current provincial legislation, and provides protections to all species listed as endangered, threatened, or extirpated within the province. In addition to individual protections, species listed as endangered or threatened also receive habitat protections. Prior to the enactment of Bill 5, these habitat protections were outlined in species specific recovery strategies. With the enactment of Bill 5 on April 17, 2025, it revoked the general habitat regulations (and species recovery strategies), and replaced them with a new, standardized habitat definition. The provincial species recovery strategies are now considered guidance documents to be reviewed alongside the new habitat definitions.

A general ‘habitat’ definition for *SAR* is provided in the updated Section 2(1) of the *ESA*. Wildlife habitat is defined as a dwelling-place (i.e. den, nest, or similar) that is occupied (presently or habitually) by a species for the purposes of breeding, rearing, staging, wintering or hibernating, and the area immediately around it. Habitat for vascular plants is defined as the critical root zone.

Where any impacts to *SAR* or their habitat are anticipated, the first step of planning any undertaking should be to determine if the impacts can be avoided through changes to project timing, location, or methods. Where impacts to *SAR* cannot be avoided, authorization from the Ministry of Environment, Conservation, and Parks (*MECP*) is required.

a. Species Conservation Act

The SCA is not yet in-force but will eventually replace the ESA (anticipated in 2026), with the goal of expediting the review process for permits and approvals from the MECP. In addition, species that are protected under the SARA (i.e. aquatic species and migratory birds) will no longer be protected provincially under the SCA.

3. Environmental Assessment Act

The Environmental Assessment Act (EAA, 1990) was developed to provide for protection, conservation and wise management of the environment within Ontario. It outlines the process for projects to obtain Class Environmental Assessments (Class EA's), comprehensive Environmental Assessments, and Streamlined Environmental Assessments (not yet in-force). Projects that are exempt from the EAA are listed in O. Reg. 51/24: Exemptions from the Act and From Part II.1 of the Act, as well as O. Reg. 50/24: Part II.3 Projects – Designations and Exemptions. It was updated in 2024 to streamline the EA process by moving to a project list approach and clarifying requirements under applicable legislation.

4. Planning Act (1990)

The *Planning Act* is the overarching legislation in Ontario that enables land use planning. Its purpose is to provide for planning processes that are fair, promote sustainable economic development, provide for a land use system based on provincial policy, encourage coordination and cooperation, recognize the decision-making authority and accountability of municipal councils, and integrate provincial interests into planning decisions. Provincial interests are recognized through provincial plans and policies; the Act also enables the Minister of Municipal Affairs and Housing to issue provincial statements, such as the PPS (2024), to provide this province-wide policy direction. Provincial interests related to natural heritage are described in Section 2 of the *Planning Act* and include the:

- protection of ecological systems, including natural areas, features and functions;
- conservation and management of natural resources and the mineral resource base;
- protection of public health and safety;
- co-ordination of planning activities of public bodies;
- resolution of planning conflicts involving public and private interests;
- appropriate location of growth and development;
- supply, efficient use and conservation of energy and water; and
- mitigation of greenhouse gas emissions and adaptation to a changing climate.

Although there have not been significant changes relating to natural heritage policy within the *Planning Act* since 2022, we felt that it was important to include the provincial interests as they

set the framework for municipal goals and targets. Matters of provincial interest have remained the same since 2017.

a. Provincial Planning Statement (2024)

The PPS came into effect on October 20, 2024, replacing the previous *Provincial Policy Statement* and *Places to Grow: Growth Plan for the Greater Golden Horseshoe*. The PPS provides municipalities with the tools and flexibility they need to:

- Build more homes
- Plan for and support development
- Align development with infrastructure
- Foster the long-term viability of rural areas
- Protect agricultural lands, the environment, and public health and safety

The updates were intended to address 5 key areas:

1. Generate an appropriate housing supply
2. Make land available for development
3. Provide infrastructure and support development
4. Balance housing with resources
5. Implementation

The PPS saw no changes to Section 4.1, Natural Heritage System (section 2.1 of the *Provincial Policy Statement*).

Section 4.2, Water (section 2.2 of the *Provincial Policy Statement*) had several updates to policies relating to natural heritage. Provisions for climate change impacts were moved from Section 2.2.1.c to 2.9, and stormwater management (SWM) moved from Section 2.2.1 to 3.6. Sections 4.2.3, 4.2.4, and 4.2.5 were also added to include provisions for ‘watershed planning’ in ‘large and fast-growing municipalities’. The City of Pickering is considered a large and fast-growing municipality (per Schedule 1 of the PPS). This means that the City is now responsible for providing a framework (including goals and objectives) for the protection/enhancement/restoration of water resources which considers the impacts of a changing climate.

b. Places to Grow Act (2005)

The *Places to Grow Act* (2005) provides the basis for the development of regional growth plans to guide government investments and land use planning policies. Growth plans under the Act may contain population projections, growth strategies, assessment and identification of priority, emerging, and future growth areas, and policies, goals, and criteria relating to:

- Land supply for various land uses;
- Expansions and amendments to settlement area boundaries;
- Protection of sensitive and significant features;
- Non-renewable resources; and Energy conservation.

When the OP was approved in 2022, the *Places to Grow Act*, along with *Ontario Regulation 416/05: Growth Plan Areas* (O. Reg. 416/05) and the *Growth Plan for the Greater Golden Horseshoe* (GPGGH; 2019) were in-force.

Since then, O. Reg. 328/24 was enacted, which revoked Section 2 of O. Reg. 416/05

i. O. Reg. 416/05 and O. Reg. 328/24: Growth Plan Areas (2024)

Growth Plan Areas are designated within O. Reg. 416/05, with the Greater Golden Horseshoe (GGH) growth areas identified in Section 2 and the Northern Ontario growth areas in Section 3. At the time, the GGH growth area included Brant, Dufferin, Durham, Haldimand, Halton, Hamilton, Kawartha Lakes, Niagara, Northumberland, Peel, Peterborough, Simcoe, Toronto, Waterloo, Wellington, and York.

Following the enactment of the PPS in October 2024, *O. Reg. 328/24* was introduced, which revoked Section 2 of *O. Reg. 416/05* under the *Places to Grow Act* (2005). Revoking this section means the *Places to Grow Act* no longer has application in the GGH, as the PPS consolidated the policies of the GPGGH with the *Provincial Policy Statement*.

ii. Growth Plan for the Greater Golden Horseshoe (2019)

The GGH is considered to be one of Ontario's most significant areas due to its diverse economy, ecological and hydrological landscapes, and highly productive farmland. The GPGGH established a framework for sustainable long-term growth and development in the area. It established more compact development patterns, a greater variety of housing options, mixed use development in urban growth centers and strategic growth areas, and better integration of transit and land use planning.

The GPGGH built upon the policies of the *Provincial Policy Statement* and was to be read in conjunction with it. Where conflicts arose, the *Provincial Policy Statement* prevailed. Although the PPS repealed the GPGGH to create a streamlined planning document, the GPGGH still applies where referenced in the Greenbelt Plan.

The PPS integrated policies on watershed planning and collaboration with CAs from the Growth Plan but removed several protections for natural heritage and hydrologic features. Several protective policies were not carried into the PPS, such as the required connectivity between features within 240 m of each other, and caps on the extent of permitted disturbed area and impervious surfaces. A provincial NHS is also not identified through the PPS and therefore is not

required to be incorporated into local OPs. As such, natural heritage policies in the PPS do not include many of the protections for KNHFs and KHF within the Growth Plan natural heritage system (NHS), such as minimum vegetation protection zones (VPZs), site-specific permitted uses within features, and the retention of other natural features that are not key natural heritage or hydrologic features. Additionally, density targets were reduced and more flexibility in land uses were introduced. These changes facilitate new greenfield development, rather than infill in existing urban areas.

c. Bill 23: More Homes Built Faster Act (2022)

Bill 23 was enacted on November 28, 2022, to help achieve the goal of building 1.5 million homes by 2032 (Dentons, 2024). It amended several Acts to better enable development and reduce costs, including:

- *City of Toronto Act*
- *Conservation Authorities Act*
- *Development Charges Act*
- *Municipal Act*
- *Ontario Land Tribunal Act*
- *Planning Act*

It also enacted the *Supporting Growth and Housing in York and Durham Regions Act* to expedite the proposed York Region sewage works project to expand the York Durham Sewage System and the Lake Simcoe phosphorus reduction project. Modifications have also changed the planning authority of several Regions, including Durham, giving the municipalities within the affected regions approval authority over the regional Official Plans.

5. Conservation Authorities Act

The *Conservation Authorities Act* (1990) saw significant changes in 2022, 2023, and again in 2024. In 2022, language was modified to allow CAs to provide municipal programs and services for municipalities within its area of jurisdiction under a memorandum of understanding (or similar agreement). Part VI of the *Conservation Authorities Act*, which outlines the areas in which CAs have jurisdiction over, also received significant updates in 2022. These updates gave the CA jurisdiction over:

- “Activities to straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or to change or interfere in any way with a wetland” (Section 28(1)1); and
- Development activities in areas that are within the authority’s area of jurisdiction and are: hazardous lands, wetlands, river or stream valleys, areas that are adjacent or close to the shoreline of the Great Lakes-St. Lawrence River System or to an inland lake and

that may be affected by flooding, erosion or dynamic beach hazards, and other areas in which development should be prohibited or regulated (Section 28(1)2).

Furthermore, Section 28.1 (1) was also updated to reflect the circumstances where a CA may issue a permit. Additional clarification was also added to the sections relating to orders made by the Minister of Municipal Affairs and Housing. Within the Conservation Authorities Act, the definitions of ‘development activity’, ‘hazardous land’, ‘watercourse’ and ‘wetland’ are deferred to those in the regulations.”

Prior to the 2022 updates, each CA had their own unique O. Reg. The TRCA operated within O. Reg. 166/06 and CLOCA operated within O. Reg. 42/06.

a. Ontario Regulation 41/24: Regulation of Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses

O. Regs. 166/06 and 42/06 were filed under the Conservation Authorities Act in 2006 to grant the TRCA and CLOCA, respectively, permission to regulate development adjacent to shorelines, watercourses, and wetlands. They outline prohibitions on development and alterations, and provisions for permits. They also specify the regulatory flood event standard for defining their regulated areas. Both regulations were revoked under Bill 23.

O. Reg. 41/24 was filed under the Conservation Authorities Act and came into effect April 1, 2024. It replaced O. Regs. 166/06 and 42/06 (among others) in order to streamline the permitting process and make enforcement more consistent. It provides a unified regulation that applies to all CAs and clarifies various definitions of terms and requirements under Section 28 of the Act. It also outlines the different flood event standards across different jurisdictions. Provisions relating to prohibited activities around wetlands and water features in the repealed O. Regs. are included under Part VI of the *Conservation Authorities Act*, though the specific development setbacks are found under O. Reg. 41/24. With this update, a consistent 30 m setback from wetlands was also implemented, rather than varying the setback based on size, which was seen in some jurisdictions.

O. Reg. 41/24 combines permit requirements from the various repealed O. Regs. to ensure consistency across jurisdictions. For example, permit requirements for the CLOCA were expanded to require details about the proposed alteration or interference with features, a confirmation of authorization for the activity (where the applicant is not the landowner), and the inclusion of any other technical information or studies requested during pre-consultation, though these were already required of applicants by the TRCA. O. Reg. 41/24 also extends the permit validity period to 60 months in all scenarios. The previous flood event standard for both the TRCA and CLOCA was the Hurricane Hazel Flood Event Standard; now, Pringle Creek, Darlington, and Lake Ontario in CLOCA’s jurisdiction use the 100-year Flood Event Standard.

6. Bill 3: Strong Mayors, Building Homes Act (2022)

Bill 3 received Royal Assent on September 28, 2022. The main change was the introduction of Strong Mayor Powers, which gives mayors or other heads of council of certain municipalities special power to advance provincial priorities. These powers include permission to appoint/hire certain positions, veto power and the ability to override council, propose by-laws, and prepare the municipal budget. The Bill amended the *City of Toronto Act*, the *Municipal Act*, and the *Municipal Conflict of Interest Act*. It originally applied to the Cities of Toronto and Ottawa but has since expanded three times to include 45 additional municipalities in July and October of 2023, and an additional 168 municipalities in May 2025.

Pickering's head of council was granted Strong Mayor Powers on July 1, 2023. Pickering's Mayor first used these powers on July 1, 2023, to delegate his powers under section 284 of the *Municipal Act* pertaining to employment powers and Committees to the Chief Administrative Officer and City Council, respectively. On March 10, 2025, the Mayor revoked his decision that delegated the power over committees to Council, assigning himself as the Chair for the Executive Committee, assigning the Deputy Mayor as Chair for the Planning and Development Committee, and two Councillors as the Vice-Chairs. This decision also changed the functions of the Planning and Development Committee, removing Statutory Public Meetings. The Mayor has not yet exercised his veto powers.

7. Greenbelt Modifications (2022-2023)

To accommodate additional growth in the GGH, the Province amended the Greenbelt Plan, Greenbelt Area Boundary Regulation (O. Reg. 59/05), and the ORMCP (O. Reg. 140/02) in 2022. These changes removed land from the Greenbelt Area, while adding new lands (ERO, 2022).

These changes were reversed in December 2023, when Bill 136: Greenbelt Statute Law Amendment Act received royal assent. Bill 136 amended the *Greenbelt Act*, and the *Oak Ridges Moraine Conservation Act*, re-instating the previous regulations that set out plan areas.

Concurrent to this timeline, we also saw similar changes to the *Duffins Rouge Agricultural Preserve Act (DRAPA; 2005; 2023)*. The *Duffins Rouge Agricultural Preserve Repeal Act* was passed in 2022, repealing the DRAPA and removing protections for the prime agricultural lands contained within. These changes were then reversed when DRAPA 2023 was enacted.

8. Great Lakes Protection Act (2015)

The *Great Lakes Protection Act* was enacted 2015 to protect the Great Lakes-St. Lawrence River Basin due to its economic, ecological, and cultural importance. It also aims to provide opportunities for the community to be involved in protection and restoration work. It also establishes the Great Lakes Guardians' Council, which includes Great Lakes ministers, CAs,

Indigenous representatives, and representatives of other groups that may have an interest. This Council meets to determine priorities for action, potential funding and partnerships for projects, enable information-sharing, and gain input on items like targets, geographic areas for specific initiatives, and the implementation of interjurisdictional agreements.

The Act also maintains the Great Lakes Strategy, which outlines environmental conditions, goals, performance measures for progress, guiding principles for projects, future priorities, among other matters determined by the Minister. Under the Act, the Minister of Natural Resources may set targets relating to wetland loss, and the Minister of Environment, Conservation and Parks may set targets relating to algae blooms and achieving other purposes in the Act.

B.3. Other Guidelines

This section provides a review of guidelines that are not legislatively enforceable but provide information and recommendations for environmental protection based on research and best practices. This includes guidance from the CAs in the area, as well as information about wetland evaluation and significance and SAR recovery.

1. Central Lake Ontario Conservation Authority Guidelines

CLOCA has prepared a *Policy and Procedure Document for Land Use Planning and Regulation* (2024) which provides further guidance (complementing O. Reg. 41/24) for development within their area of jurisdiction. This document is considered a living document and is updated periodically, including when legislation or technical practices are changed. CLOCA also has an existing memorandum of understanding (MOU) with both the Region of Durham (2024) and the City of Pickering (2023).

a. CLOCA Policy and Procedure Document

The *Policy and Procedure Document for Land Use Planning and Regulation* (CLOCA, 2024) provides guidance for CLOCA's flooding and erosion hazard planning responsibilities and the administration and implementation of O. Reg. 41/24. This includes the considerations, restrictions, and requirements applicable to proposed development and associated interference/alteration that are within CLOCA's jurisdiction.

This document outlines the statutory requirements and the relevant CLOCA policies for development in Lake Ontario shoreline hazard lands, river or stream valleys, watercourses and wetlands, and areas of unstable soil or bedrock. The procedures for regulatory approvals, including permit information and pre-consultation, are also outlined.

b. CLOCA Memorandum of Understanding

CLOCA and the City of Pickering prepared a MOU in 2023. It governs the terms and conditions for CLOCA to deliver programs and services, as requested by the City. These terms include:

- The City gives due consideration to CLOCA when procuring services related to CLOCA's mandate and area of expertise;
- Use either the City's or CLOCA's standard form of purchase order and procurement agreements;
- CLOCA will maintain insurance policies required by the City;
- CLOCA will retain all financial and project records for audit purposes;
- Programs and services will be in accordance with any standards and requirements under subsection 21.1.1(4) of the Act; and
- User fees will only be imposed, if required, in accordance with CLOCA's fee policy and fee schedules or in accordance with provisions agreed on between CLOCA and the City.

The MOU between Durham Region and CLOCA was prepared in partnership with all of the CAs with jurisdiction in the Region. It is outlined in **Section 2a** below. A separate MOU between the Region and the CLOCA was made in 2024 to prescribe the identification of Category 1, 2, and 3 services and their inclusion within the annual CLOCA budget.

2. Toronto and Region Conservation Authority Guidelines

The TRCA has prepared *The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority* (Living City Policies; 2014) which provides further clarity surrounding development within their jurisdiction. The Living City Policies, along with many of the other TRCA guidelines have not yet been updated to reflect the changes associated with the enactment of O. Reg. 41/24 (and revocation of O. Reg. 166/06).

In addition to the Living City Policies, the TRCA has also prepared additional guidelines and checklists to support in the preparation of development applications; as well as other technical guidelines that are widely used across the province.

a. TRCA MOU

The TRCA has a single Memorandum of Understanding (MOU) that covers the entire Region of Durham. This MOU was prepared alongside the other CA's with jurisdiction within the region (CLOCA, LSRCA, Ganaraska Region Conservation Authority, and Kawartha Region Conservation Authority). It recognizes the expertise of CA's in watershed management, natural heritage, and natural hazard planning and serves as a guide for all parties to carry out Plan Review functions, such as reviewing applications, identifying the need for studies, surveys, and reports, and specifying the conditions of approval. Under this agreement, the Region's responsibilities include ensuring that provincial priorities are communicated, the CAs are consulted during the planning process and sharing any relevant regionally owned data. The CAs will also share

relevant authority-owned data, advise the Region on the technical information required for complete applications, and provide comments and recommendations with respect to relevant legislation, information and analysis of NHFs, floodplain and hazard management, and stormwater management. The CA may also assist the Region with the technical aspects of applying innovated and sustainable development standards as best practices.

b. The Living City Policies for Planning and Development in the Watersheds of the TRCA

The Living City Policies outline the principles, goals, objectives, and policies approved by the TRCA Board for the administration of TRCA's legislated and delegated roles and responsibilities in the planning and approval process, issued under Section 20 of the Conservation Authorities Act. It communicates the TRCA's vision, mission, and the corresponding goals, objectives, principles, and policies for planning and development. The policies reflect the latest science as revealed through the latest watershed plans and other research from the TRCA and emphasizes the need for restoration, remediation, and enhancement of natural heritage and water resources.

The Living City Policies provide an overview of the TRCA's goals related to climate change, transportation, green infrastructure, agricultural and rural areas, and ecological design, and forms the framework for the remaining guidelines and documents that the TRCA has prepared.

Section 8 of the Living City Policies focuses on the administration and implementation of O. Reg. 41/24 (formerly O. Reg. 166/06). Furthermore, the appendices provide illustrative examples of TRCA regulated areas.

c. TRCA Ecosystem Compensation Guideline

The TRCA's compensation guideline (TRCA, 2023) outlines currently known best practices for determining compensation rates, where the removal of a NHF is warranted. These guidelines are updated periodically to reflect new research and priorities.

d. Other TRCA Guidelines

The TRCA has prepared a number of other guidelines and procedural documents including:

- TRCA Pre-Consultation and Complete Application Checklist (2019)
- TRCA Field Staking Protocol (2017)
- TRCA Environmental Impact Statement Guidelines (2014)
- TRCA Valley and Stream Corridor Crossing Guideline (2015)

- TRCA Evaluation, Classification and Management of Headwater Drainage Feature Guideline (2014)
- Channel Modification Design and Submission Requirements (2007)
- TRCA Forest Edge Management Plan Guidelines (2004)
- Minor Works Criteria (2014)
- Erosion and Sediment Control Guide for Urban Construction (2019)
- Preserving and Restoring Healthy Soil: Best Practices for Urban Construction (2012)
- Post-Construction Restoration Guidelines (2004)
- Seed Mix Guideline (2022)
- Flora Species Native to the TRCA Jurisdiction (2022)
- TRCA Stormwater Management Criteria Document (2012)
- TRCA Wetland Water Balance Monitoring Protocol (2016)
- TRCA Wetland Water Balance Risk Evaluation (2017); and
- TRCA Low Impact Development Stormwater Management Plan and Design Guide (2010).

3. Ontario Wetland Evaluation System (2022)

The *Ontario Wetland Evaluation System Southern Manual, 4th Edition* (OWES; 2022). OWES was updated following Bill 23. Notable changes included: removal of the ability to complex wetlands, devaluation of SAR, and removal of oversight from the province.

With these edits, wetland complexes are no longer being identified, so their interconnections and complementary functions will no longer be factored into their evaluation. Within the previous version, wetlands could be complexed where the distance between wetland units was less than 750 m. In the current version, wetlands are no longer complex, and each wetland unit is evaluated individually. In both cases, it is standard to not evaluate wetlands that are less than 2 ha in size. As part of these updates, the re-evaluation of a single wetland unit that is part of a PSW complex is possible without re-evaluating the PSW in its entirety. The existing evaluation is considered a point-in-time document used to assign a status to each individual wetland unit; each unit will retain its status (significant or non-significant) until the unit is reevaluated.

SAR were also removed from the criteria and instead are lumped under “provincially significant species”, which are worth fewer points. For example, where a wetland had reproductive habitat for SAR, it received 250 points and was automatically deemed a PSW. Under the new guidelines, the wetland would only receive 50 points for having a tracked species present.

In addition, the MNR is also no longer directly involved in the evaluation process. The approval authority was downloaded to municipalities, and it is the evaluator's responsibility to inform the municipality and the MNR of the evaluation outcome.

4. SAR & Recovery Strategies

Recovery strategies for SAR identify what measures are needed to stop or reverse their decline. The recovery strategy describes the species and its needs and habitat, identifies threats or activities that will destroy habitat, sets the goals, objectives, and approaches for recovery, identifies information gaps, and states when the action plan(s) for the strategy will be completed. Recovery strategies are updated frequently to reflect species' changing statuses and needs. The MECP is currently undergoing a comprehensive review of these, with drafts anticipated to be available by the end of 2025.

5. Oak Ridges Moraine Technical Papers (various dates)

The Oak Ridges Moraine Land Trust has published several educational resources about the ORM in the form of a technical paper series. The papers act as a reference guide for practitioners and educators, covering topics like SWH, connectivity, landform conservation, identifying features, watershed planning and conservation, SWM, among others.

6. Greenbelt Technical Paper (2012)

The MNR prepared a technical paper to help implement the policies and address technical requirements contained in the Greenbelt Plan. It is intended for use by planning authorities, developers, landowners, and other interested stakeholders. It is not considered part of the policy but instead was developed for clarification and assistance in implementing the Greenbelt Plan.

7. Lake Ontario Greenway Strategy (1995)

The Lake Ontario Greenway includes the lands and waters that have a direct ecological, cultural, or economic connection to the waterfront between Burlington Bay and the Trent River. It includes the area within the lake to an approximate depth of 10 m (where most coastal processes and habitats exist) and to the first significant rise in elevation inland, which is generally consistent with the former Lake Iroquois shoreline. It also generally extends into major river valleys where significant natural areas exist. The *Lake Ontario Greenway Strategy* aims to foster commitments to actions that will generate a healthy and sustainable waterfront that is clean, green, accessible, connected, open, useable, diverse, affordable, and attractive. A separate report, the *Lake Ontario Greenway Strategy: Next Steps*, provides more detailed, area-specific mapping and regeneration recommendations.

Appendix C Municipal Policy Review

The following subsections provide an overview of the overarching environmental policies as identified through GEI's review of the natural heritage systems and protection policies within the OP and ROP.

C.1 Durham Region Official Plan (2024)

The ROP was consolidated in December 2024. As of January 1st, 2025, the Region no longer has planning authority, and the ROP is considered an Official Plan of Durham's eight municipalities. Natural heritage policies are spread throughout the ROP, with most policies in Chapter 7 (Protected Greenlands System), and additional policies within Chapters 3 (Healthy Communities), 5 (Vibrant Urban System), and 6 (Thriving Rural System).

Natural heritage goals within the ROP include:

- Protect, restore, and enhance the natural environment
- Promote low carbon, low impact development and climate resilience
- Increase tree canopy
- Protect wetlands
- Direct development outside of flooding and erosion hazards
- Manage invasive species

The ROP divides the Region into the Urban System and the Rural System, with the Greenland System weaving through both.

1. Greenlands System

The Greenlands System was developed in order to preserve land for its ecological and environmental benefits. It consists of:

- Major Open Space;
- ORM Areas;
- Waterfront Areas;
- Greenbelt Urban River Valleys;
- Regional Natural Heritage System (consisting of the Area Municipal NHS, Growth Plan NHS, ORM Natural Core and Natural Linkage Areas and Greenbelt NHS),
- KNHFs & KHF,

- Water Resources System, and
- Natural & Human Made Hazards.

a. Major Open Space Areas

Major Open Space Areas consist of permanent and intermittent streams and valleys, in addition to areas where key NHFs and KHFs are in high concentration. Land use within these areas should consist of environmental protection and conservation, and agricultural and related uses.

b. Oak Ridges Moraine Areas

The ORM Areas are defined by the OORMCP (2017) and form part of the Greenbelt. Land within this area is designated as a Natural Core Area, Natural Linkage Area, or Countryside Area, and development must conform to the ORMCP.

c. Waterfront Areas

The Waterfront Areas are located along shoreline of Lake Ontario. Lands within this area is generally designated as environmental protection and recreation, however policies exist for other development types, where impacts can be minimized or mitigated.

d. Greenbelt Urban River Valleys

Greenbelt Urban River Valleys are designated within the Greenbelt Plan (2017) and include major valley systems consisting of watercourses and coastal wetlands which link the Greenbelt to Lake Ontario. Development within these areas must conform to the Greenbelt Plan.

e. Regional Natural Heritage System

The Regional Natural Heritage System (NHS) was developed to identify, protect, restore, and enhance NHFs and functions. It aims to compile each of the NHS's that are designated within the lower tier municipalities Official Plans, the GPGGH, the ORMP, and the Greenbelt Plan into one 'master' NHS overlay.

The Regional NHS is generally comprised of KNHFs and KHFs.

KNHFs	KNFs
<ul style="list-style-type: none"> • habitat of endangered and threatened species; • fish habitat; • wetlands; • areas of natural and scientific interest, life science; • significant valleylands; • significant woodlands; • significant wildlife habitat; and • sand barrens, savannahs, tallgrass prairies, and alvars. 	<ul style="list-style-type: none"> • permanent and intermittent streams; • wetlands; • lakes and their littoral zones; and • seepage areas and springs.

Adjacent lands, buffers, and vegetation protection zones (VPZs) are not part of the Regional NHS; however, the Region does require that an Environmental Impact Study (EIS) be completed for any development located within 120 m of the Regional NHS.

The ROP prohibits development within the Regional NHS, except where it is permitted by provincial plans, or is a legally existing use that conforms to municipal official plans and zoning. Some permitted uses exist, including agriculture and associated uses, naturalized SWM facilities, passive recreation, and, if no other alternatives exist, infrastructure, conservation, restoration, and flood and erosion control works. It also requires that local municipalities identify minimum VPZs.

Aspirational goals within the ROP include achieving 40% woodland cover. Ultimately, while the Region has outlined high level goals and objectives for the protection of the regional NHS, the implementation and particulars are up to the lower-tier municipalities. Where hedgerows are located within the Regional NHS, they should be maintained for their linkage functions.

f. Water Resource System

The Water Resource System consists of wetlands, lakes, aquifers and groundwater recharge and discharge areas. It was designated to maintain, restore, and enhance features, and protecting drinking water within the Region. Development is permitted where it protects or improves these areas or where they are retained in a natural state.

g. Natural & Human Made Hazards

The Natural and Human Made Hazards consist of areas that are prone to flooding, erosion, slope failures, dynamic beach hazards, and/or have wildland fire potential. These areas have been designated to reduce risk to public health and safety. Development is permitted, in some instances, where the risk can be mitigated.

2. Environmental Stewardship

Partnerships between the Region, area municipalities, CAs, Indigenous communities, local organizations, the province, and residents are necessary to protect the natural environment and ensure sustainability in the Region's communities. It also enables a collaborative effort to manage invasive species through monitoring and by discouraging non-native species in new development. Council supports the use of land securement for the Region or CAs to protect important features and areas.

C.2 City of Pickering Official Plan (2022)

The OP was adopted in 1997, and the 9th edition was consolidated in March 2022. Pickering is a lower-tier municipality, so the OP builds on the ROP and must conform to the Region's priorities. Natural heritage policies are dispersed throughout the OP, though they are mainly contained in Chapter 2 (The Planning Framework), Chapter 3 (Land Use, specifically regarding the Open Space system), and Chapter 11 (Seaton Urban Area). Policies are also outlined throughout Chapters 12 and 13, which focuses on specific urban and rural neighbourhoods and settlement areas. Several OP amendments (OPAs) related to natural heritage have been integrated since the last consolidation that will need to be integrated into the OP update. The relevant OPAs are discussed in **Section 4** below.

Natural heritage goals within the OP include:

- Conserve and protect NHFs and functions, promote stewardship and ecosystem health, respect carrying capacity and resources
- Protect people and development from hazards
- Restoration and rehabilitation of degraded, damaged, and/or contaminated ecosystems
- Integrated natural features into both urban and rural areas
- Use natural channel design, low impact development, and other natural methods

Similar to the ROP, the OP divides the City into the Urban System and the Rural System, with the Ecological System weaving through both. The Ecological System, the Open Space System, and the individualized NHFs are somewhat disjunct within the OP. Although each concept has its own series of goals, there is no clear hierarchy or defined path to follow. Specifically, there is no clear guidance that describes each feature and system and describes what each system is comprised of.

1. Ecological System

The Ecological System is not a land use designation made up of specific components of the environment, but rather is an overarching concept with a series of high-level goals for general conservation and protection of natural resources

2. Open Space System

The Open Space System consists of Natural Areas, Active Recreational Areas, Marina Areas, ORM Natural Core Areas, ORM Natural Linkage Areas, and the Seaton Natural Heritage System. Each of these is considered a land use designation, where specific OP policies (or secondary plan policies) apply. Land use within the Open Space System is primarily conservation and recreation.

Although the Natural Areas land use designation has not been explicitly defined within the OP, based on our review, it can be assumed to include:

- significant valleylands and stream corridors;
- shorelines;
- areas of natural and scientific interest;
- wetlands;
- significant woodlands;
- significant habitat of endangered and threatened species;
- significant wildlife habitat; and
- fish habitat.

In some parts of the OP, the Open Space System is also noted to contain the Rouge-Duffins Wildlife Corridor and the Lake Iroquois Shoreline; however, their inclusion is not consistent.

The OP contains general policies for development, i.e. related to restrictions on land use, within the overall Open Space System. More detailed policies for development are described within each of the sections (in a different part of the OP) relating to each of the components of the system.

3. Key Natural Heritage Features and Key Hydrologic Features

Both the terms KNHFs and KHFs are used throughout the OP, however they are not outlined within the policy. Definitions for each are found in Section 15.15 (Glossary). The definitions of each are similar to those found within the ROP, except with regard to lakes. The ROP includes all

lakes and their littoral zones as a KNF, meanwhile the OP only includes Lake Ontario and its shoreline and kettle lakes, thus excluding other inland lakes.

KNHFs	KNFs
<ul style="list-style-type: none"> • Significant habitat of endangered and threatened species; • fish habitat; • wetlands; • areas of natural and scientific interest; • significant valleylands; • significant woodlands; • significant wildlife habitat; and • sand barrens, savannahs, tallgrass prairies, and alvars. 	<ul style="list-style-type: none"> • permanent and intermittent streams; • wetlands; • kettle lakes • Lake Ontario and its shoreline • seepage areas and springs.

4. Official Plan Amendments

The current OP was consolidated to include Official Plan Amendments (OPAs) through to March 2022. Since then, an additional ten OPAs have been approved, including:

- [Amendment 35](#), in effect as of October 7, 2024
- [Amendment 38](#), approved in-part by the Ontario Land Tribunal on December 19, 2024
- [Amendment 40](#), in effect September 5, 2023
- [Amendment 44](#), in effect as of May 3, 2022
- [Amendment 45](#), in effect as of July 21, 2022
- [Amendment 47](#), in effect as of April 27, 2023
- [Amendment 48](#), approved by the Ontario Land Tribunal on July 8, 2024
- [Amendment 49](#), in effect as of September 26, 2023
- [Amendment 50](#), in effect as of December 29, 2023
- [Amendment 51](#), in effect as of July 30, 2024

GEI reviewed OPA’s 35, 38, 49, and 50 to gather information on natural heritage changes or implications. The other six OPAs above are not relevant to natural heritage and do not include modifications to sections that concern natural heritage.

a. Official Plan Amendment 35

OPA 35 came into effect on October 7, 2024, with the goal of adding new (and updating existing) policies related to ecosystem loss and compensation. Ecosystem compensation was already included in the OP and used on many site-specific examples; however, the OPA allowed these changes to be incorporated City-wide.

The OPA updated Section 10.12 of the OP was updated, adding f) and g). 10.12.) **requires** ecosystem compensation, where the feature cannot be protected, impacts minimized or mitigated. This section mentions the CAS' guidelines for compensation (i.e. the TRCA's compensation guideline (TRCA, 2023)). 10.12.g) provides examples of where compensation is **not required**, specifically for removals that have been previously approved under other applications.

b. Official Plan Amendment 38

OPA 38 was approved in part on December 19, 2024, by the OLT, and applies to a list of properties located within the Kingston Road Corridor and the Specialty Retailing Node. OPA 38 is mostly related to urbanization and increased density, however some small changes to protections of the NHS exist.

For example, Section 11A.5 includes provisions for the Dunbarton-Liverpool Precinct, which include consultation with the TRCA to revise the floodplain boundary for Pine Creek, and the **requirement** to prepare a plan to rehabilitate Pine Creek. Section 11A.9.7 further **encourages** restoration and rehabilitation of creeks within the Kingston Road Corridor.

c. Official Plan Amendment 49

OPA 49 came into effect on September 26, 2023, to bring the OP into conformance with Bill 23 and Bill 108; therefore, adding new policies for additional dwelling units (ADUs). Per OPA 49, ADUs must be located outside of KNHFs, KHFs, hazardous lands, and Natural Core or Linkage Areas of the ORM.

d. Official Plan Amendment 50

OPA 50 came into effect on December 29, 2023, introducing the new Integrated Sustainable Design Standards (ISDS) and applies to all lands within the City. A sustainable development report (or similar) is **required** as part of all OPA, ZBA, draft plan of subdivision, and draft plan of condominium applications. The exact requirements of the report depend on the time of project approval and location of the project (i.e. within the Seaton Urban Area, or outside of it).

5. Seaton NHS

Within the OP, the Seaton Urban Area is given objectives and policies additional to the general urban policies, in conformance with the revoked Central Pickering Development Plan (Chapter 11). The Seaton community was intended to be a sustainable urban community with an extensive natural heritage system. The community is to be walkable, transit-supportive, and densely populated to promote an active streetscape. The NHS and natural features must also be integrated into all of Seaton's neighbourhoods, and neighbourhood design provides appropriate views, vistas, and connections to the NHS.

6. Environmental Assessments

The OP generally notes the requirement for Environmental Assessments (EAs) in regard to future roads' width and alignment, infrastructure within the Natural Areas designation, and for GO transit stations and tracks. Within the Seaton NHS, EAs for road crossings will require the consideration of road conditions, wildlife movement patterns, habitat types/sizes, land use adjacent to the crossing, nearby topography, alternative sites for the crossing, restoration opportunities, and appropriate mitigation measures. Where the old version of the EAA is referenced within the OP, the OP should ensure to reference the updated EAA and revise relevant policies accordingly.

7. Definitions

While completing our review of the natural heritage policies within the OP, GEI noted that definitions and terms for NHFs within the OP are not consistent with those used by federal and provincial agencies, and those commonly used within other municipalities in Southern Ontario. This section provides an overview of the definitions used within the OP and compares and contrasts these definitions to those used within other relevant legislation. It also provides an overview of natural heritage definitions that have been used within recent and robust Official Plan updates within other municipalities.

a. Overview of Current Definitions at the OP and ROP Levels

Within the OP, definitions are missing for most of the natural heritage and hydrologic features listed which are discussed in the OP text. Additionally, standard definitions for woodlands, valleylands, and wildlife habitat are missing. Definitions for special features, such as landform features, that may be present in the City are also missing. Terminology also does not follow the provincial standard. For example, the definition of *Significant Other Features and Areas* generally matches what would typically be defined as *Significant*. An overview of the terms used in the OP, compared to those in the ROP, are shown in **Table C.2-1** below.

Table C.2-11. List of Natural Heritage Terms Defined in the Pickering Official Plan and the Durham Region Official Plan.

Term	Definition Provided	
	Durham Official Plan	Pickering Official Plan
Significant	X	
Natural Heritage System	X	
Key/Natural Heritage Feature and Area	X	X
Key/Hydrologic Feature	X	X
Wetland	X	X
Woodlands	X	
Significant Woodlands	X	X
Valleylands		
Significant Valleylands		X
ANSI	X	
Wildlife Habitat	X	
Significant Wildlife Habitat		X
SAR Habitat	X	
Fish Habitat	X	
Surface Water Feature		
Watercourse/river/stream/etc.	X	
Waterbody/Lake/etc.		
Endangered Species		
Threatened Species		
Special Concern Species		
Landform Feature/Conservation Area		
Kettle Lake	X	
Sand Barrens, Savannah, Tallgrass Prairie	X	
Alvar	X	
Seepage Areas and Springs	X	
Significant Other Features and Areas*		X

* means those other features and areas referred to in Policy 2.1 (Natural Heritage) of the Provincial Policy Statement and Section 3.2.4 of the Greenbelt Plan that are ecologically important in terms of features, functions, representation, or amount, and contribute to the quality and diversity of an identifiable geographic area or natural heritage system. While some significant resources may already be identified and inventoried, the significance of others can only be determined after evaluation.

C.3 Tree/Woodland Conservation By-law

Within the City of Pickering, individual trees and woodlands are regulated at both the City and the Regional level. The removal of either would require permits or approvals under all applicable bylaws.

1. Durham Region

The Region administers Woodland By-law 30-2022 to regulate the destruction and injury of trees in woodlands over 1 ha in size. Area municipalities are encouraged to develop tree conservation by-laws for trees not covered by the Region's By-law to assist the Region in meeting their 40% coverage target.

2. City of Pickering

It is the policy of Council to consider and implement the Region's tools for tree conservation, including the Woodland By-law. The City has also implemented Tree Protection By-law 8073/24 to prevent the destruction of healthy trees in the specified tree protection areas. The City also coordinates a tree planting program and works to establish partnerships with businesses and community partners to increase tree coverage.

Appendix D Municipal Best Practices

D.1 Natural Heritage Definitions

The PPS, ORMCP, and Greenbelt Plan all provide a standard for regional and municipal plans to adhere to, including the definitions of terms. Though varying slightly in language, they generally all define *Significant, Key/Natural Heritage Features, Key/Hydrologic Features, Wetlands, Woodlands, Valleylands, ANSIs, Wildlife Habitat, SAR Habitat, Fish Habitat, Endangered Species, and Threatened Species*. These terms are important features to define and include policy for at all levels, in alignment with these provincial plans but also with regard to local circumstances. Water features, such as watercourses and lakes, are only defined in the PPS and Greenbelt Plan, despite likely being present within the ORMCP plan area. Special features, like landform features or conservation areas and prevalent SWH (Sand Barrens, Savannahs, and Tallgrass Prairies), are also only defined in the ORMCP and Greenbelt Plan. Features that are specific to the plan area can define terms like these in greater detail. See Table D.1-1 for a list of provincial definitions.

Table D.1-1. List of Natural Heritage Terms Defined in the Provincial Planning Statement, Oak Ridges Moraine Conservation Plan, and the Greenbelt Plan.

Term	Definitions Provided		
	Provincial Planning Statement	Oak Ridges Moraine Conservation Plan	Greenbelt Plan
Significant	X	X	X
Natural Heritage System	X		
Key/Natural Heritage Feature and Area	X	X	X
Key/Hydrologic Feature	X	X	X
Wetland	X	X	X
Woodlands	X	X	X
Valleylands	X	X	X
ANSI	X	X	X (Life Science)
Wildlife Habitat	X	X	X
SAR Habitat	X	X	X
Fish Habitat	X	X	X
Surface Water Feature	X		
Watercourse/river/stream/etc.	X		X
Waterbody/Lake/etc.	X		X
Endangered Species	X	X	X
Threatened Species	X	X	X
Special Concern Species		X	
Landform Feature/Conservation Area		X	X

Kettle Lake		X	
Sand Barrens, Savannah, Tallgrass Prairie		X	X
Alvar			X
Seepage Areas and Springs			X

Green highlight: defined in all three provincial plans; Orange highlight: defined in two of the three plans

Some municipal Official Plans use the definition from provincial plans or include a note to refer to that plan, as is the case with many definitions in Ottawa, or may adopt their own definitions based on provincial direction and best practices. Several note definitions for key features or specific land areas as well, which are more relevant and specific to the characteristics of their plan area. It is noted that several are missing definitions for *Significant*, or merge with the standard feature definition; this is an important consideration to include to clarify the conditions to be considered significant in that plan area.

Table D1-2 below provides a summary of definitions commonly used in Official Plans.

Below this table is an example from Brant County where terms are clearly defined.

Table D.1-2 2. List of Natural Heritage Terms Defined in other Official Plans.

Term	Definitions Provided				
	Mississauga Official Plan (2025)	City of Kingston Official Plan (2024)	City of Ottawa Official Plan (2021)	The Garden City Plan: St. Catharines Official Plan (2012)	Town of Caledon Official Plan (2024)
Significant		X		X	X
Natural Heritage System		X	*		
Key/Natural Heritage Feature and Area	X	X	*		X
Key/Hydrologic Feature					X
Wetland	X	X	*	X	X
Significant Wetland	X		*		
Other Wetland	X				
Wetland Core Area					X
Woodlands	X	X	*	X	X
Significant Woodland	X				
Cultural Woodland	X				
Contributory Woodland		X			
Woodland Core Area					X
Other Woodland					X
Valleylands	X	X	*	X	X
ANSI		X	*	X	X
Significant ANSI	X				
Wildlife Habitat		X	*	X	X
SWH	X				X
Other Wildlife Habitat					X
SAR Habitat		X	*		X
Fish Habitat		X	*	X	X
Surface Water Feature		X	X		
Watercourse/river/stream/etc.	X	X	*		

Waterbody/Lake/etc.					
Endangered Species	X	X	*	X	X
Threatened Species	X	X	*	X	X
Special Concern Species	X				
Landform Feature/Conservation Area					X
Kettle Lake					X
Sand Barrens, Savannah, Tallgrass Prairie	X				X
Alvar					
Seepage Areas and Springs					
Environmentally Significant/Sensitive Area	X				X
Core Natural Areas			X		X
Natural Linkage Areas			X		X

*Refers to PPS definition

Green highlight: defined in all five official plans; Orange highlight: defined in four of the five plan

1. County of Brant Official Plan – Best Practice

The Brant Official Plan has a particularly fulsome definition for *significant*; it merges all features into a single definition, similar to the PPS, rather than defining a standard feature and a significant feature separately:

Significant Means:

- ***In regard to areas of natural and scientific interest***, an area of natural and scientific interest identified as regionally or provincially significant by the Province of Ontario
- ***In regard to valleylands***, an area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year. This may include but not be limited to riverine flooding hazards, riverine erosion hazards and other valleylands that are ecologically important in terms of features, functions, representativeness, or amount, and contributing to the quality and diversity of an identifiable geographic area or the Natural Heritage System.
- ***In regard to wetlands***, an area identified as provincially significant using evaluation procedures established by the Province, as amended from time to time.
- ***In regard to wildlife habitat***, a wildlife habitat is ecologically important in terms of features, functions, representation, or amount, and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System. These are to be identified using criteria established by the Province.
- ***In regard to woodlands***, any woodland including forested areas, treed areas, plantations, and hedgerows that meet any one of the following criteria:
 - A woodland with a patch size as measured from the dripline of the canopy that is:
 - 4 hectares or greater in size where located outside of a settlement area; or
 - 1 hectare or greater in size where located within a settlement area;
 - A woodland having interior habitat more than 100 metres from the boundary of the woodland;
 - A woodland 0.2 hectare in size or greater providing any one of the following ecological functions or uncommon characteristics:
 - Consisting of a forest patch with 10 or more trees per hectare greater than 100 years old or with a diameter greater than 50 cm; or

- *Located in or within 20 metres of a key natural heritage feature or key hydrologic feature;*
- *Providing a linkage function by being located within 240 metres of a key natural heritage feature and/or key hydrologic feature;*
- *Located in a sensitive groundwater discharge, sensitive recharge or sensitive headwater area;*
- *Providing woodland diversity such as a naturally occurring composition of native species that have declined significantly south and east of the Canadian Shield or having high native diversity;*
- *Consisting of a vegetation community with a provincial ranking of S1, S2, or S3 as ranked by the Natural Heritage Information Centre or any successor thereto, or habitat with 10 individual stems or 100 m² of a rare, uncommon or restricted woodland plant species; and/or*
- *Having high economic, cultural or social value. Includes woodlands that have high productivity in terms of economically valuable products; provide a high value in social services such as air quality or recreation at a sustainable level; and/or*
- *are identified as important appreciation, educational, cultural or historical value including those identified by Indigenous communities.*

D.2 Natural Heritage Targets

1. International Standards

The International Union for Conservation of Nature (IUCN) has prepared a list of targets within their *Sustaining Development* paper (2017). Of these, five relate to natural heritage planning:

- Clean water and sanitation
 - protects and restores ecosystems and ensures effective management of water resources
- Sustainable cities and communities
 - Works with governments, the private sector, and the scientific community to develop and implement ‘nature-based solutions’ to urban challenges

- Climate action
 - assesses the risks that species and ecosystems face from climate change and develops conservation responses to these. It also advances practical ‘nature-based solutions’ to tackling climate change based on the effective conservation, management and restoration of the world’s ecosystems
- Life below water
 - works to ensure that the biodiversity and productivity of coastal, marine and polar ecosystems are restored and maintained, and that their resources are used sustainably and equitably
- Life on land
 - works to conserve terrestrial ecosystems by assessing species’ extinction risk, improving land use management and restoring degraded landscapes

International targets are generally broader in nature, allowing lower-tier governments to incorporate them in ways that are the most relevant and effective for them. Several of these objectives, such as climate action, are already implemented into provincial plans and local official plans. Translating these broader goals into measurable targets, such as increasing the net area of restored sites by a specific amount or percent, is the best way to implement these kinds of targets on a local scale.

2. Other Municipalities

a. Brant County

The County uses Environment Canada’s *How Much Habitat is Enough* guideline to achieve minimum targets in conserving, restoring, and enhancing the NHS and water resource system. Targets include:

- No net loss of wetlands
- Achieving greater wetland coverage by rehabilitating wetlands
- Determine and establish critical function zones around wetlands
- The greater of 10% of each major watershed and 6% of each subwatershed, or 40% of the historic wetland coverage should be protected and restored, at a minimum
- Urbanizing watershed should maintain less than 10% impervious cover or where already degraded; a second threshold should be 25%
- Achieve minimum 30% woodland coverage by conserving woodlands, growing tree canopy, replacing injured/destroyed trees
- Enhancement linkages should be designed to be 50 m minimum in width

b. Caledon

Section 5.5.9.2 of the Caledon Official Plan (2024) requires that subwatershed studies for New Employment Area secondary plans establish minimum targets that maintain, restore, and enhance existing conditions, as well as management strategies and actions to meet the targets. The Caledon Official Plan also encourages going above and beyond the targets established in the (now repealed) Growth Plan (Section 6.6.3.3.6). The Town utilizes a sustainability checklist, which uses measurable criteria and targets to evaluate development proposals against the Official Plan's sustainability objectives.

c. Ottawa

In Ottawa, targets vary by location. For example, the target for tree canopy cover in urban areas is 40%, and no net loss of forest cover and wetlands in the rural area. The City also has targets relating to the organization of greenspaces and natural areas within the urban area as it relates to equitable access. Per Section 4.8.3, greenspaces should be dispersed in such a way that urban residents are within 5 minutes walking distance (400 m) of a public greenspace, 10 minutes walking distance (800 m) from two public greenspaces, and a 15-minute transit ride from a publicly owned natural area.

3. Other Guidelines

Targets can also come from other guidelines that complement the Official Plan, such as green development standards, urban forest strategies, and urban design guidelines. These kinds of guidelines often inform Official Plan policies but delve into greater detail, providing context and rationale for the natural heritage policies.

D.3 Ecosystem Compensation

1. Net Gain Mitigation Hierarchy

The IUCN and the Society for Ecological Restoration (SER) prepared the *Achieving Net Gain for Biodiversity and Human Well-being: Integrating Ecological Restoration with other Nature-based Solutions* report in 2021, that outlines the Net Gain Mitigation Hierarchy (NGMH) for Ecosystem Compensation. This report builds off previous standards for practice by the SER and IUCN and also forms the framework for Ecosystem Compensation Guidelines prepared within Ontario.

The NGMH establishes a strategic framework that endeavours to protect, restore, or enhance ecological functions during land use planning and development. It aims to achieve net ecological benefits by adhering to a progressive, stepwise process that prioritizes

avoidance of harm, mitigation of impacts, and enhancement of ecosystems. The hierarchy’s principles align with provincial policies and best practices for sustainable development.

The guiding principles of the Net Gain Mitigation Hierarchy emphasize the importance of long-term monitoring and adaptive management to ensure that mitigation and enhancement measures remain effective over time. Continuous monitoring allows for the identification of emerging challenges, enabling adaptive strategies to be implemented as needed. Additionally, the hierarchy aligns with climate resilience goals by incorporating climate adaptation measures at every stage to enhance the ecosystems’ capacity to withstand environmental changes. This structured approach not only emphasizes conservation-first planning but also ensures that unavoidable impacts are minimized and offset through science-based mitigation and enhancement efforts.

<p>Avoid Impacts</p>	<p>Objective: Prevent harm to sensitive ecological features and functions by careful preparation of the land use plan to incorporate in-situ protection as a primary mechanism. Application: Site selection should prioritize key features and critical habitat zones. Best Practices:</p> <ul style="list-style-type: none"> • Conduct an environmental screening during early stages to identify and exclude high-risk areas from land use changes
<p>Minimize and Mitigate Impacts</p>	<p>Objective: Where avoidance is not feasible, efforts should focus on reducing the scale, scope, or duration of impacts and mitigating any unavoidable effects through compensatory measures. Application: Design strategies could include setting ecological buffers (VPZs) around watercourses, retaining native vegetation, and implementing erosion control measures. Examples of Mitigation:</p> <ul style="list-style-type: none"> • Installing wildlife corridors or crossings to maintain habitat connectivity. • Employing LID techniques (e.g., bioswales, permeable pavement) to manage stormwater and protect water quality.
<p>Restore the System</p>	<p>Objective: Restore degraded natural features and functions within the Study Area to enhance ecological performance. Application: Restoration could include activities such as naturalization of disturbed areas, restoring riparian buffers, or stabilizing stream banks to prevent future erosion. Outcomes:</p> <ul style="list-style-type: none"> • Improved hydrological performance, such as increased groundwater recharge. • Enhanced biodiversity through the re-establishment of native plant species.
<p>Enhance the System</p>	<p>Objective: Enhancements often include adding to the system by improving or expanding natural features to support greater ecological function, resilience, and biodiversity.</p>

	<p>Application: Enhancement efforts could include increasing native vegetation cover, improving wildlife habitats, and establishing ecological linkages between fragmented natural areas.</p> <p>Examples of Enhancement:</p> <ul style="list-style-type: none"> • Addition or expansion of wetlands, to improve water filtration, flood mitigation, and provide amphibian breeding habitat. • Establishing pollinator meadows to support wildlife.
<p>Replicate or Compensate</p>	<p>Objective: As a last resort, when avoidance, mitigation, and restoration efforts are insufficient, compensation may be required by replicating lost features elsewhere to maintain ecological integrity.</p> <p>Application: Compensation plans should follow a "no net loss" principle, meaning the replicated feature must perform at an equal or higher ecological value than the impacted feature.</p> <p>Examples of Compensation:</p> <ul style="list-style-type: none"> • Creating a new wetland if removal is required. • Off-site tree planting initiatives to offset woodland loss.

2. Conservation Authorities

Several CAs in Ontario have guidelines for ecosystem compensation within their area of jurisdiction.

a. TRCA Guideline for Determining Ecosystem Compensation

The TRCA prepared the *Guideline for Determining Ecosystem Compensation* in 2018, which outlines their recommended approach for replacing natural features that are lost through development or infrastructure. Compensation is intended to be a last resort within a mitigation hierarchy; avoidance, mitigation, restoration, and enhancement are always preferred. This generally aligns with the direction provided in the OP; however, the TRCA guidelines take it a step further, outlining standard compensation ratios based on the area of each feature being removed. It also states that compensation can also include off-site compensation or cash in lieu, depending on the site characteristics. Including standard ratios provides a consistent approach to feature replacement but can also incorporate some flexibility in combination with offsite or cash in lieu options.

Table 1: Compensation ratios based on basal area of impacted site.

Basal area range (m ² /ha)	Average basal area (m ² /ha)	Lag time factor – Basal area of 10-year-old restoration site (m ² /ha)	Compensation Ratio (ha: ha)
0 – 5	5	5	1:1
5.1 – 10	10	5	2:1
10.1 – 15	15	5	3:1
15.1 – 20	20	5	4:1
20.1 – 25+	25	5	5:1

Compensation of the same feature/vegetation type is generally standard. Compensation in other forms may be permitted, in consultation with the TRCA. A clause like this, stating that *other forms of compensation may be permitted in consultation with the City/Conservation Authority* allows flexibility where needed, but is prescribed for most circumstances, ensuring targets and objectives are still met.

Other considerations that the TRCA considers when determining compensation rate, type, or location include:

- Proximity (as close as possible, preferably on site)
- Contiguous to natural system (no isolated features)
- Land ownership (placed in public ownership)
- Land availability (for offsite compensation)
- Connectivity (maximize to the extent possible)
- Ecosystem configuration (improve functions, minimize adjacent land use impacts)

Similar criteria should be used when reviewing applications that include compensation and requests for alternate forms of compensation.

b. Credit Valley Conservation

The Credit Valley Conservation’s (CVC) Ecosystem Offsetting Guidelines (2020) were created as a guide for implementing compensation policies of provincial, municipal, and other policies. The CVC guidelines generally follow the TRCA’s guidelines, with modifications as they relate to CVC-specific policies and programs, as well as new requirements or methods to provide more clarity and consistency. Despite these edits, the CVC considers their guidelines to be in conformity with the TRCA guidelines. Key considerations include:

- Net gain in ecosystem value, or at a minimum no net loss – Section 1.8
- Adherence to the mitigation sequence (i.e., offsetting only after avoidance, minimization, and mitigation are considered) – Section 1.8

- Consideration of proximity to the loss, land availability, land ownership, designation, and potential viable ecosystem types. CVC provides tools to guide this decision, including the Restoration Opportunities Database – Section 3.1
- Clear metrics and methods of quantifying losses and gains, including detailed direction on collecting baseline data, determining replacement ratios, and consideration for landscape level impacts – Section 2.1, Section 2.3, and Table 7.
- Requirement for a minimum of 5 years of monitoring, or longer if the ecosystem has a longer establishment time. Results must be reported to the authority and, if the offset is failing, the appropriate adjustments must be made – Section 3.1.17

Unlike the TRCA guidelines, the CVC guidelines also include adjustments that can be made for ecosystems containing invasive species in Section 2.3.4. The guidelines have adopted the Habitat-Hectare approach used in Australia, which provides a deduction based on the percent cover of invasive species. This ensures that the important functions that some species provide are able to be maintained without encouraging further introduction of non-native species.

c. Lake Simcoe Region Conservation Authority

The LSRCA Ecological Offsetting Policy (2021) was developed in support of the LSRCA Strategic Plan by providing a consistent approach to protection, enhancement, and restoration of NHFs and areas. It was developed based on international ecological offsetting programs and the LSRCA's hierarchical approach, which involves avoidance, minimization, and mitigation before compensation. It is generally consistent with similar guidelines from other CAs. Key considerations include:

- Consideration for the principle of net gain. It is required that wetland and woodland compensation must exceed the size of the impacted ecosystem – Section 3.3
- Adherence to the mitigation hierarchy, with evidence that prior steps have been considered – Section 1.8
- Proximity to the loss is a consideration made by both the TRCA and CVC. However, they specify that off-site compensation must be as close as possible and connected to the municipality's NHS. LSRCA refines this by requiring that the compensation must be within the same watershed and enhances or expands the defined NHS - Section 3.3.
- Compensation also will not be considered for features containing rare vegetation communities, bogs or fens, watercourses, or the VPZ of the Lake Simcoe shoreline - Section 3.1.

The TRCA and CVC do not provide similar restrictions to what types of ecosystems cannot be compensated for. They do acknowledge that approval authorities should consider the

challenges present when trying to offset certain features when reviewing compensation plans/planning applications, though.

d. Nottawasaga Valley Conservation Authority

The Nottawasaga Valley Conservation Authority (NVCA) Achieving Net Gains through Ecological Offsetting (2021) was created to limit the loss of regulated NHFs in the NVCA watershed. Though offsetting was generally permitted on a case-by-case basis in the past, the guideline aims to outline a consistent, standardized approach and criteria. Key considerations include:

- The requirement to replace twice as much wetland area as is impacted – Section 3.3
- The requirement to adhere to the mitigation sequence. Rationale must also be provided to justify any inability to avoid or minimize impacts and must go beyond project efficiency or practicality – Section 3.1
- Significant features, as defined in the PPS and other important features cannot be compensated for – Section 2.2
- Offsite site selection must consider land ownership (with a preference for public ownership), geographic location (with a preference for sites in proximity to the impacted site), site suitability to support the desired ecosystem type and its ability to replace core ecosystem functions – Section 4.1.1
- The requirement for a minimum of 5 years of monitoring, or until the created feature has demonstrably reached a functional equilibrium. Replanting must be conducted if initial plantings have a survival rate under 70% two years after establishment. Results are to be reported to NVCA – Section 4.1.3

3. Other Municipalities

Though not as in-depth as the Conservation Authorities, there are municipalities that integrate compensation into their Official Plans.

Within the Brant Official Plan, a strict approach (i.e., beyond provincial minimum) to restrict development and site alteration in the NHS has been applied to provide for the long-term conservation and enhancement of the system. Development proponents need to demonstrate that impacts to the NHS have been minimized and mitigated for development within lands designated as NHS.

One example is for development in woodlands. Development in non-significant woodlands will only be considered where it can be demonstrated that there will be a net gain in features and functions through offsetting elsewhere on the property or through replacement trees and vegetation. Replacement trees shall be the greater of:

- 2x the aerial extent of trees removed, based on individual trees or canopy (determined by county)
- Ratio approved through EIS or EIP
- Ratio approved by provincial or county guidelines, or
- As required by county-approved bylaw

The Mississauga Official Plan contains provisions for tree compensation. Replacement trees must be on the same lot, where the removed trees were in residential woodlands. Within the broader Urban Forest, opportunities for replacement will be identified in the arborist report, if avoidance cannot be achieved. The City also discourages payment in lieu for tree removals. If replanting cannot be accommodated on-site, replanting elsewhere in the City will be required instead.

The Kingston Official Plan states that any removal, planting, and replacement of trees in development will be in accordance with the tree by-law. The Durham/Pickering tree by-laws provide similar provisions.

The Ottawa Official Plan prioritizes the retention of large, healthy trees over compensation wherever possible, in alignment with the mitigation hierarchy. Where tree or other vegetation removal is proposed, replacement may be included as a condition of approval for community planning permits.

The St. Catharines Official Plan requires replanting where a development removes trees or other vegetation within the public right-of-way.

Within the Caledon Official Plan, mineral aggregate operations may be permitted in core and other woodlands, other wetlands, and areas where the only NHF is SWH if there is an equal amount or gain in feature area and function. If not feasible due to site constraints, off-site compensation and other alternatives will need to be explored. D.4 VPZs and Adjacent Lands – Review and Best Practices (Natural Heritage Reference Manual and County of Brant

D.4 Vegetative Protection Zones

Vegetation Protection Zones (VPZs) are important policy elements that provide for the protection of both natural heritage features and their functions. Within provincial and municipal plans, most natural heritage and hydrologic features are given 120 m of adjacent lands, where certain development might be permitted under specific conditions and no negative impact to the feature or its functions. Provincial plans also generally mandate a 30 m VPZ where no development, or low impact development such as conservation or passive recreation may be permitted, so long as there is no negative impact as a result (see **Tables D4-1** and **D4-2** below for municipal and provincial AOI/VPZ requirements).

Table D4-1. Minimum Areas of Influence and Vegetation Protection Zones Within the OP.

Feature	Oak Ridges Moraine (Table 17)		Remainder of the City of Pickering (Table 18)	
	Minimum AOI	Minimum VPZ	Minimum AOI	Minimum VPZ
Wetlands	120 m	30 m	120 m	30 m
Woodlands	120* m	30* m	120* m	10* m
				30* m (Within Greenbelt)
Valleylands	120* m	30* m	120* m	30* m
ANSI (Earth Science)			120 m	Determined by NHE
ANSI (Life Science)				
Fish Habitat	120 m	30 m	120 m	30 m
Habitat for Species at Risk	120** m	Determined by NHE	120 m	Determined by NHE
Significant Wildlife Habitat	120 m	Determined by NHE	120 m	Determined by NHE
Permanent and Intermittent Streams	120 m	30 m	120 m (outside urban area)	30 m (outside urban area)
			50 m (inside urban area)	10 m (inside urban area)
Seepage Areas and Springs	120 m	30 m	120 m	30 m
Lake Ontario Shoreline	N/A	N/A	120 m	30 m
Former Lake Iroquois Shoreline	N/A	N/A	120 m	Determined by NHE
Rouge-Duffins Wildlife Corridor	N/A	N/A	120 m	Determined by NHE

Notes:

ANSI – Area of Natural and Scientific Interest

NHE – Natural Heritage Evaluation

AOI – Area of Influence

VPZ – Vegetation Protection Zone

* If significant

** From significant portion of feature

Table D4-2. Minimum Areas of Influence and Vegetation Protection Zones Within Other Plans.

Feature	Provincial Planning Statement		Oak Ridges Moraine Conservation Plan		Greenbelt Plan		Durham Region Official Plan		OP
	AOI/AL	VPZ	AOI/AL	VPZ	AOI/AL	VPZ	AOI/AL	VPZ	
Wetlands	Not prescribed	Not prescribed	120 m	30 m	120 m	30 m	120 m	30** m	Outlined in Table D4-1 above
Woodlands			120* m	30* m	120* m	30* m	120 m	30 m	
Valleylands			120* m	30* m	120* m		120*** m	30** m/TBD*	
ANSIs (Earth Science)			120 m	TBD*			120*** m	30** m/ TBD*	
ANSIs (Life Science)			120 m	TBD*	120 m		120*** m	30** m/ TBD*	
Fish Habitat			120 m	30 m	120 m	30 m	120*** m	30** m/ TBD*	
Habitat for Species at Risk			N/A	N/A	120 m			30** m/ TBD*	
Significant Wildlife Habitat			120 m	TBD*	120 m		120*** m	30** m/ TBD*	
Permanent and Intermittent Streams			120 m	30 m	120 m	30 m	120*** m	30** m/ TBD*	
Lakes					120 m	30 m	120*** m	30** m/ TBD*	
Seepage Areas and Springs			120 m	30 m	120 m		120*** m	30** m/ TBD*	
Lake Ontario + Shoreline			120 m	30 m					
Sand Barrens, Savannahs, Tallgrass Prairies			120 m	30 m	120 m		120*** m	30** m/ TBD*	
Alvars					120 m		120*** m	30** m/ TBD*	
Kettle Lakes	120 m	30 m			120*** m	30** m/ TBD*			

Notes:

* Based on natural heritage/hydrological evaluation, EIS, or similar

** Within the Greenbelt NHS

*** Outside of Urban or Rural Settlements

AOI – Area of Influence

AL – Adjacent Lands

VPZ – Vegetation Protection Zone

N/A – feature not defined/AOI and VPZ not specified

TBD – to be determined, minimum not prescribed

The NRHM (**Table D4-3** below) outlines recommendations for developing appropriate buffers based on the feature and provincial minimums.

The Brant Official Plan (also in **Table D4-3** below) is referenced as an example of a municipal Official Plan providing clear guidance on how buffers should be refined based on the feature within the plan area.

Table D3-3. Proposed Buffer Guidance from the Natural Heritage Resource Manual and County of Brant Official Plan.

	Description of the Proposed Buffer Area (i.e. Adjacent Lands, Area of Influence, Vegetation Protection Zone, etc.)	
Natural Heritage Feature	Natural Heritage Reference Manual	Brant Official Plan
Habitat for Species at Risk	Varies by species (Greenbelt Plan, ORMCP). Function based approach and may be expanded depending on study (e.g. EIS) findings	Based on provincial/federal requirements and EIS
Provincially Significant Wetlands	Vary based on wetland functions and proposed land use. Typical minimums would likely be 10 m (nutrient attenuation), 30 m (typical to protect the edge function), or more (depending on habitat needs)	
Significant Woodlands	30 m (Greenbelt Plan, ORMCP) or more, pending study findings. Depends on functions, location, and proposed adjacent uses. If a minimum isn't specified, the result is often none at all.	30 m (from dripline, for agricultural uses); 10 m (for other uses, in the settlement area); 30 m (other uses, outside of the settlement area)
Significant Valleylands	Based on achieving a stable TOB. 30 m minimum (ORMCP), subject to geotechnical report.	
Significant Wildlife Habitat	Determined on a case-by-case basis, depending on which habitat features need to be protected	30 m (for agricultural uses; can be reduced if there is no negative impact); EIS (other uses)
Areas of Natural and Scientific Interest (ANSI)	May be required in relation to other NHFs within the ANSI	EIS (earth science); 30 m (life science, for agricultural uses; can be reduced if no negative impact), 10 m (life science, other use)
Fish habitat	Must be naturally vegetated, and the width varies on the characteristics of the water features (e.g. steep bank would require a wider buffer). Generally ranges from 15 m to 120 m. Buffers for lake trout lakes at capacity should be 300 m. Erosion, groundwater, changes to	(for all surface water features) EIS; Greater than: <ul style="list-style-type: none"> • Development limits of hazardous lands • Development limits as established by a watershed

	Description of the Proposed Buffer Area (i.e. Adjacent Lands, Area of Influence, Vegetation Protection Zone, etc.)	
Natural Heritage Feature	Natural Heritage Reference Manual	Brant Official Plan
	infiltration, etc. can have widespread impacts and need to be controlled carefully at all times	study, subwatershed study, or similar <ul style="list-style-type: none"> • Development limits as established by an EIS • 30 m from boundary of the high-water mark • 6 m emergency access allowance from stable TOS

Notes:

ORMCP – Oak Ridges Moraine Conservation Plan

EIS – Environmental Impact Study

NHF – Natural Heritage Feature

TOS – Top of Slope

In addition to the feature-specific changes above, Table 5.2.1 of the Brant County Official Plan provides a list of minimum buffers with variation within the different areas of the County. Key things to note include:

- Minimums vary between land uses – the minimum VPZ for agricultural uses, agricultural-related uses, and on-farm diversified uses are different than those for all other uses
- Minimum buffers also vary between settlement areas and outside of settlement areas – for significant woodlands, the minimum VPZ in settlement areas is 10 m, and is 30 m outside of settlement areas

Varying minimum VPZs or adjacent lands within different areas of the City can be effective and offer flexibility ‘as-of-right’, if the requirements and differences are outlined clearly.

The recent Fort Erie Official Plan (2025) also differentiates between buffers for settlement areas and non-settlement areas; generally offering more protections to non-urban areas within the municipality. For example:

- PSWs: 120 m outside settlement areas; 30 m within settlement areas
- ANSIs: 30 metres outside settlement areas; 30 m or as determined appropriate through and EIS
- Fish Habitat: 30 metres from the high-water mark outside settlement areas; 15 metres from the high-water mark in settlement areas.

However, they also include clear policy provisions that allow for the refinement of these minimum buffers through appropriate technical studies to reflect sensitivity of a feature.

As noted in Section D.4.1.17.3 Minimum Buffer Requirements Within Settlement Areas:

“The width of the buffer would be based on the sensitivity of the ecological functions from the proposed development or site alteration, and the potential for impacts to the feature and ecological functions as a result of the proposed change in land use.”

In 2003, Carolinian Canada produced an evidence-based guideline for determining setbacks and buffers (Carolinian Canada, 2003) which continue to be implemented across a variety of municipalities and conservation authorities. These minimum buffers include:

- Woodlands: 10 m beyond the dripline of trees to protect the root zone
- Wetlands: 30 m for water quality benefits; or a ratio of 3:1 to protect smaller wetlands
- Watercourse: 30 m from the high-water mark; 50 m + 0.5 m per 1% slope for cold water streams

Ultimately, while there are no legislative minimums for buffers outside of Provincial Plan Areas, the above best practices offer examples of existing best practices and options for inclusion in Official Plans.

Appendix E Supporting Guidelines

E.1 Terms of Reference for Local Subwatershed Studies – Town of Caledon

Terms of Reference

Local Subwatershed Studies

May 2024

Contents

1.0	INTRODUCTION.....	1
2.0	GENERAL SUMMARY OF THE SUBWATERSHED STUDY PROCESS.....	5
2.1	Local Subwatershed Studies – Scope and Approach.....	5
2.2	Background Information Review/Gap Analysis/Work Plan Confirmation	9
2.2	Phase 1 – Subwatershed Characterization and Integration	10
2.2.1	Hydrology and Hydraulics.....	10
2.2.2	Hydrogeology	11
2.2.3	Stream Morphology.....	12
2.2.4	Aquatic Environment.....	13
2.2.5	Terrestrial Environment	14
2.2.6	Surface Water Quality.....	16
2.2.7	Phase 1 Report – Subwatershed Characterization and Integration.....	17
2.3	Phase 2 – Subwatershed Impact Assessment.....	17
2.3.1	Hydrologic and Hydraulic Analysis	19
2.3.2	Hydrogeology	20
2.3.3	Stream Morphology and Erosion Analysis.....	21
2.3.4	Aquatic Environment.....	22
2.3.5	Terrestrial Environment	22
2.3.6	Surface Water Quality	23
2.3.7	Phase 2 Report – Impact Assessment.....	23
2.4	Phase 3 – Management, Implementation and Monitoring Plan	23

1.0 INTRODUCTION

The Growth Plan for the Greater Golden Horseshoe (2019), along with other guiding documents, promotes integrated land use planning processes which consider multiple factors when planning for communities and neighbourhoods. These factors include the natural and physical environment, infrastructure needs, transportation, and socio-economic considerations. A cornerstone to contemporary planning, as recognized by the Growth Plan (2017), is the need for multi-disciplinary subwatershed studies which comprehensively establish a baseline characterization of the environmental conditions and natural systems and resources in a subject study area planned for growth developed based on a subwatershed unit, and from this establish an integrated management plan for the natural and water-based systems.

For each Secondary Plan within the New Urban Area (Settlement Area Boundary Expansion), a Local Subwatershed Study (Local SWS) must be completed to develop a sustainable development plan that protects and enhances the natural and human environments through the implementation of the direction, targets, criteria and guidance of the Settlement Area Boundary Expansion Scoped Subwatershed Study (Wood et. al., January 2022). The Local Subwatershed Study is intended to confirm, refine and implement a natural heritage and water resource systems management approach and will will protect, rehabilitate, and enhance the natural and water-based environments within the subject Secondary Plan Areas, and the surrounding lands in the respective subwatershed.

It is the Town's requirement that for any developer-led Secondary Plan, a Local Subwatershed Study must be completed. This document provides a framework to guide applicants on the Town's minimum requirements for a Local Subwatershed Study. For every Local Subwatershed Study completed, the Town requires the applicant to develop a Terms of Reference for their Local Subwatershed Study that outlines how they will fulfill the Local Subwatershed Study requirements. The Terms of Reference will need to be approved by the Town prior to initiation of the study.

1.1 Purpose

The lands being proposed for development through a Secondary Plan are generally referred to as the Primary Study Area (PSA) while those lands beyond the PSA within the subwatershed limits are referred to as the Secondary Study Area (SSA). Local SWS work in the PSA is typically more detailed and supported by field investigations, whereas the work in the SSA is generally less detailed and primarily supported by desktop information and limited field work, largely of a confirmatory nature. The broader watershed/subwatersheds may have existing downstream constraints beyond the identified Secondary Plan study area and, to the appropriate extent, these constraints either environmental or public safety will have to be considered in establishing the management strategies in the subject Secondary Plan area based on the overall study objectives and ultimate targets. Where there are watershed wide management strategies established through approved watershed studies, the established strategy is to be considered a minimum requirement.

The Local Subwatershed Studies will need to:

- Identify the location, extent, present status, significance, and sensitivity of the existing natural environment;
- Identify environmentally sensitive areas and natural hazards, including constraints and opportunities;
- Confirm or refine the natural environment system(s) (i.e., natural heritage system and water resource system) to protect, rehabilitate, and enhance the water quality/quantity,

- ecological form, function and the interactions and interdependences between the system within the Secondary Plan Area and local environs;
- Identify lands where development may be considered, and determine how existing and future land uses can be developed to be compatible with the natural environment system(s);
 - Undertake an iterative Impact Assessment based on an initial Preliminary Preferred Land Use Plan for the Secondary Plan area (This inherently will require establishing an initial land use concept which will need to be tested and assessed), followed by a second refined land use concept developed through the feedback from the initial testing, including input from other technical studies and feedback from stakeholders;
 - Provide direction on best management practices (BMPs) to manage impacts from the urbanization proposed through the Secondary Plan (from an environmental and water management perspective), and, where there are established BMPs for infrastructure, these are to be considered a minimum requirement;
 - Provide direction on future study requirements (i.e., Environmental Implementation Study or equivalent), infrastructure needs (i.e., Master Environmental Servicing Report (MESR) - planning and implementing servicing and transportation infrastructure from an environmental and water management perspective);
 - Establish an implementation and management strategy and requirements for environmental systems monitoring;
 - Support the Class Environmental Assessment processes being undertaken as part of the infrastructure planning for the Secondary Plan area, specific to constraints and opportunities associated with the natural and water-based systems.

As noted above, the extent and form of study varies based on the discipline and the areas of interest, with more intensive field investigations in the Secondary Plan area and less intensive desk-top forms of study in the lands beyond the Secondary Plan area to provide an overall subwatershed context. This systems-based assessment is required to examine the role of water (both surface and ground) in sustaining area resources, including creeks, wetlands, and other water-based features, including headwater drainage features. This baseline characterization is built on a period of field data collection and monitoring (minimum 2-years preferred 3-years), which then serves as the basis from which to examine and assess potential impacts due to planned urbanization. The impact assessment process includes a vetting of land use concept plans through an integrated and comprehensive planning exercise, that includes consideration of the findings and requirements of other infrastructure studies such as Master Servicing (Water/wastewater) and Transportation Plans, which need to be concurrently advanced for consideration through a consultative process involving local (Caledon) and the Regional municipality (Peel), other provincial agencies, landowners, Indigenous Nations and Peoples, and the public. This public consultation is vital to ensure that the varied interests of all stakeholders are appropriately considered in the study. Once appropriately vetted, management and monitoring recommendations to implement the recommendations of the Local Subwatershed Study and related municipal Master Plans are required to be translated into policy and strategies for community development as part of the Secondary Plan which will be enacted through an Official Plan Amendment (OPA).

1.2 Study Area

In alignment with Future Caledon Official Plan, a Local Subwatershed Study is required for each secondary plan area or new development in the New Community Areas and New Employment areas. The limits of the study area of the Local Subwatershed Study will:

- Consider Policy 21.3.3 and Figure F3 of Future Caledon Official Plan
- Ensure that the study will:
 - Characterize the location, extent, sensitivity and significant of the water resource system, and Natural Environment System form and functions, within and across the secondary plan area or development area; and,
 - evaluate the factors and influences that are important to the sustainability of the water resources system, and Natural Environment System form and functions, to the satisfaction of the Town; and,
- be determined in consultation with the Town, the Region and the Conservation Authority/Authorities; and,
- be approved by the Town.

1.2 The Secondary Planning Process

This Section is meant to assist in the understanding of the context of the Local Subwatershed Study (Local SWS) in relation to the Town's Secondary Planning Process. The relationship between the Secondary Planning process and the integrated Local Subwatershed Study and Infrastructure Planning Processes is presented in Figure 1.

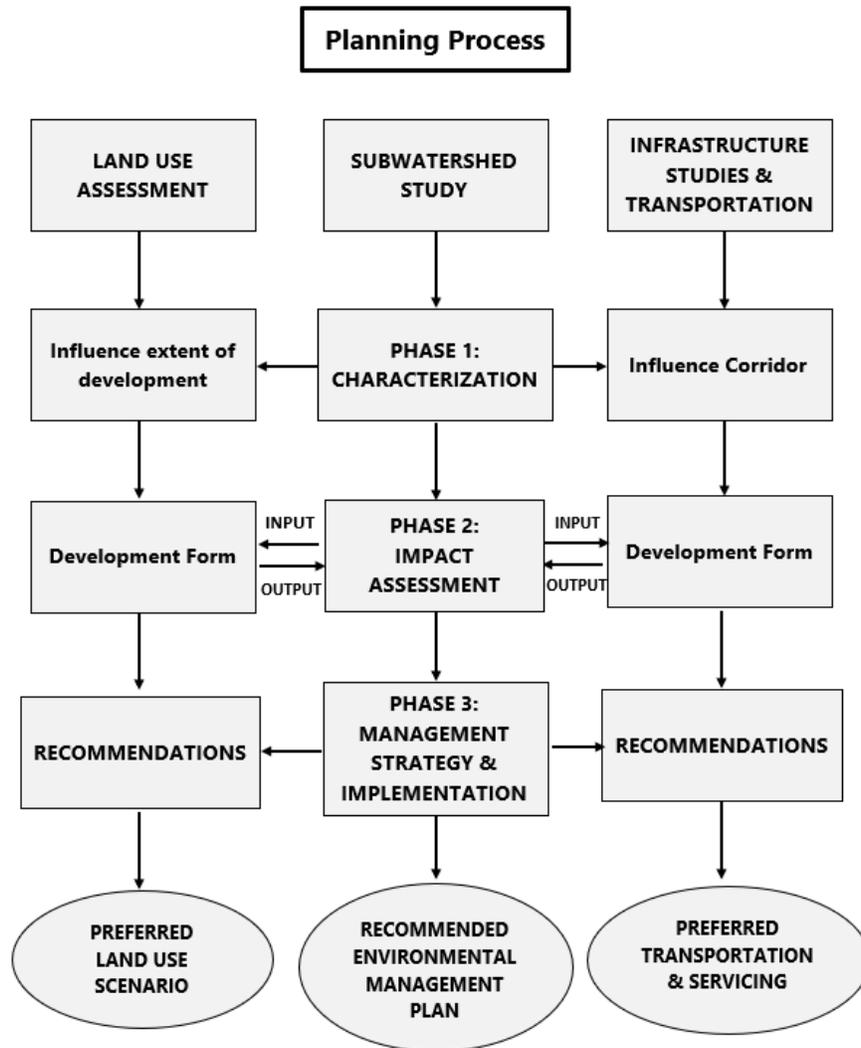


Figure 1: Integrated Land Use, Subwatershed, and Infrastructure Study Process

The Secondary Plan, with the accompanying studies, supports the development of a community development plan (with accompanying development policies). The Secondary Plan, and the related studies (i.e., Local Subwatershed Study, Transportation Master Plan, Water and Wastewater Master Plans, Agricultural Impact Study, and Fiscal Impact/Asset Management Study and others), are part of a comprehensive and coordinated planning process that will be required to meet the approvals necessary under the Planning Act and the Environmental Assessment (EA) Act.

The Local SWS will provide the environmental base and context for the natural and water-based systems to support the infrastructure planning for the Secondary Plan Area. Combining the Planning Act and Municipal Class EA process permits the Municipality and Region to plan the Secondary Plan area and its required infrastructure collaboratively in a holistic manner, whereby the Local SWS will provide important resource and management guidance to the Environmental Assessments for roads, water and wastewater servicing.

The concurrent infrastructure related studies, as part of the Secondary Plan, are intended to follow the Municipal Class EA Master Planning Process (typically adopting Approach #2). The level of investigation, consultation, and documentation will need to be sufficient to address Phases 1 and 2 of the Class EA process

to fulfill the requirements for Schedule A, A+ and B projects and thereby establish in the documentation the basis for specific future investigations if Schedule C projects are identified.

To facilitate consultation, a Technical Advisory Committee (TAC) will be formed comprising of staff from the Municipality, the Region, Conservation Authority, various applicable Provincial representatives, landowner technical representatives, and the consulting team(s). For specific and specialized matters, "sub TACs", involving discipline-specific professionals, will be established. The TAC will advise and help direct the development of the Secondary Plan and its component studies throughout the study process. The TAC will assist in ensuring that the Secondary Plan evolves from the foundational basis of the Local Subwatershed Study to a Community Development Plan in a collaborative manner through the integration of the outputs and recommendations from the concurrent studies.

Overall, the Secondary Plan will identify the community structure for the subject portion of the Settlement Area Boundary Expansion (SABE) lands to ensure appropriate integration and consideration for development opportunities within the community. The Secondary Plan will include land use categories, a road/transit/cycling/trail and municipal servicing network, a natural heritage system and open space/major community facility requirements. The objective is to ensure that the new community neighbourhoods and employment areas in the current SABE lands are developed sustainably in the optimal location, meeting the objectives and requirements of the Growth Plan (2017), as implemented through the Regional Official Plan and the Municipal Official Plan.

As noted above, the environmental base for the Secondary Plan (i.e., the natural heritage system and the water resource system) will be defined by the Local Subwatershed Study. The natural heritage system and water resource system established through the Province and Regional Official Plan, refined through the Municipal Official Plan, will be further refined or confirmed through the Local Subwatershed Study in support of the Secondary Plan.

A fundamental objective of the Secondary Plan is to ensure the Municipality develops as a sustainable community. To achieve sustainability, the community will be developed based on the vision to be a sustainable, healthy, connected and complete community.

2.0 GENERAL SUMMARY OF THE SUBWATERSHED STUDY PROCESS

2.1 Local Subwatershed Studies – Scope and Approach

The Secondary Plan Scope and related Studies will guide the development of the Secondary Plan area through a consultative, collaborative, and coordinated process to establish a sustainable, healthy, connected and complete community.

The Local Subwatershed Studies for the various Secondary Plan Areas in Caledon will need to describe the location, extent, sensitivity and significance of natural features and functions within the identified study area and evaluate the factors and influences that are important to their sustainability. The respective studies will establish goals and objectives for terrestrial and aquatic systems (i.e., natural heritage) and water resource systems in accordance with the Provincial Policy Statement, the Region's Official Plan, Future Caledon Official Plan, and the applicable Watershed Plans and Subwatershed Studies, including the Settlement Area Boundary Expansion Scoped Subwatershed Study (Wood et. al., January 2022). Using existing desktop information and available studies, as well as reconnaissance-level and detailed field work, the respective studies will document existing conditions, assess potential impacts of existing and future development and recommend management strategies to manage and mitigate the predicted impacts of urbanization, including comprehensive stormwater management strategies to protect, enhance and restore

hydrologic functions. In conjunction with the concurrent development of Secondary Plans, including Transportation and Servicing Master Plans (water and wastewater), the Local Subwatershed Studies will reflect and refine the Scoped SWS Natural Heritage System and Water Resource System in the Secondary Plan area and identify strategies to protect, enhance and restore ecological functions and promote compatible activities.

In addition, the Local Subwatershed Study will be required to include monitoring pre-development (minimum 2 years preferred 3 years, additional years may also depend on climatic conditions to characterize existing features and systems and establish baseline conditions. The initiation of monitoring prior to development is necessary to properly characterize the study area and further to conduct a thorough impact assessment at a detailed level for the local SWS and Secondary Plan. The post-development monitoring program, implemented following completion of the Local Subwatershed Study, is also required to provide appropriate recommendations for potential adaptive environmental management incorporating the findings from the environmental monitoring program in Town-led or Conservation Authority-led initiatives, such as broader scale planning strategies and secondary planning recognizing that development and secondary planning will be staged and phased with opportunities to adjust requirements in subsequent planning stages. In this regard, the Local Subwatershed Study is required to provide guidance for developing and implementing a monitoring program post-development, as well as to provide direction regarding the timing and duration associated with each monitoring component, the party responsible for the various monitoring components, and funding, timing and implementation strategy.

The Local Subwatershed Studies will be conducted in three (3) phases, discussed in further detail below and presented in the Figure 2. The formulation and TAC acceptance of the Technical Work Plan is a core component of the process for Local Subwatershed Studies. The Technical Work Plan needs to be developed under a separate process, prior to initiating the Local Subwatershed Study and site monitoring. The Technical Work Plan needs to include details on the scope of field work and monitoring along with preliminary mapping to characterize the study area and provide the basis for required modelling for the subwatershed area. **The Local Subwatershed Study process requires that the Technical Work Plan be finalized and approved by the municipality, with consultation with relevant Conservation Authority and Region prior to initiating field surveys to support the Characterization phase (Phase 1) and prior to proceeding into the Impact Assessments (Phase 2).**

An overview of each phase of the Local SWS process is provided below, with further details provided in the subsequent section.

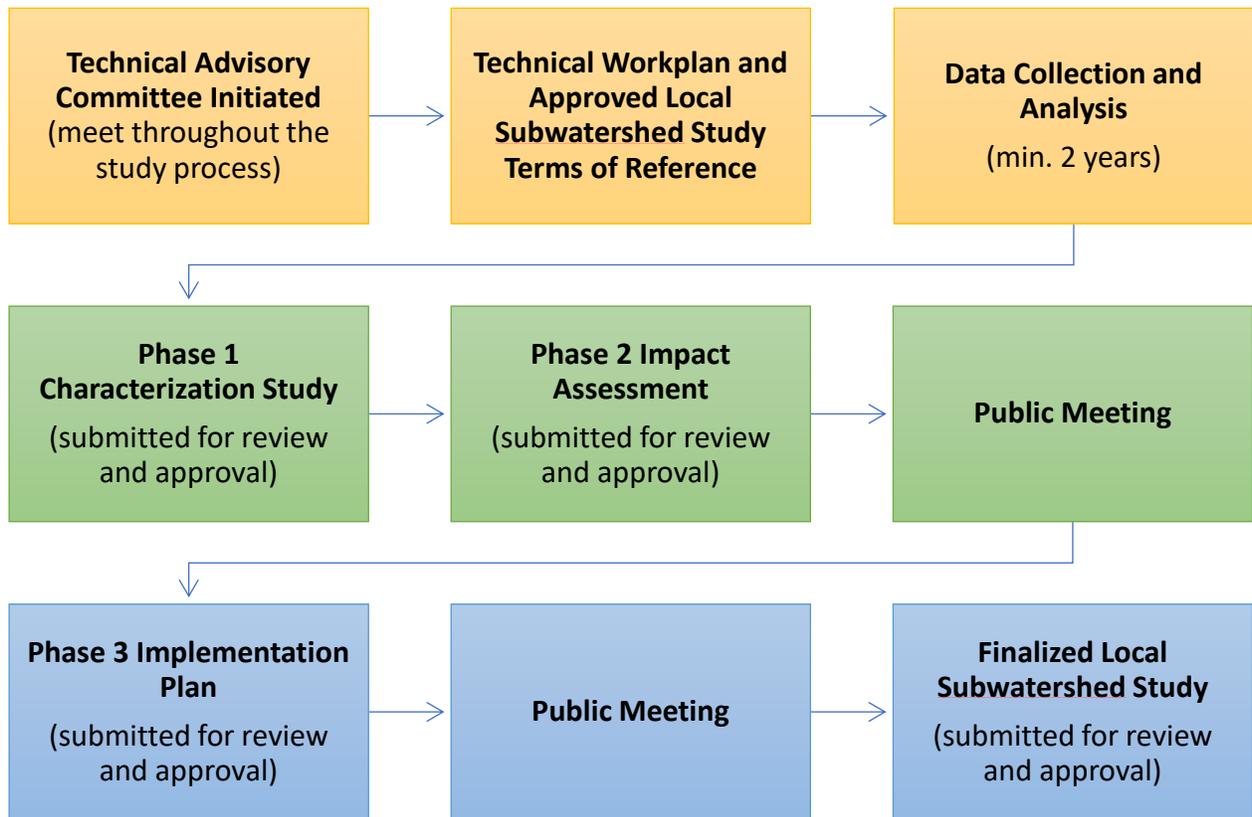


Figure 2: Local Subwatershed Study Process

Technical Workplan and Approved Terms of Reference

Developer-led Local Subwatershed Studies should commence with a proposed Terms of Reference to be submitted to the Town and approved by the Town and agency partners before initiation of the work. The proposed Terms of Reference should undertake, at minimum, the work outlined in this document and include a detailed explanation of how the work will be completed. The Local Subwatershed Study Terms of Reference will need to be accompanied by a data gap analysis and development a technical workplan that outlines the methodology (i.e. how, what and where) for collection of all of the data and the analysis of that data, including the models that will be used and how they will be calibrated and validated. The Local Subwatershed Study will need to include a Technical Advisory Committee, comprised of representatives from Caledon, Peel, CAs, landowner groups and various Provincial agencies, that meets regularly throughout the study process.

Phase 1: Characterization and Integration

Phase 1 of the Local SWS will need to fully consider the data and information in the Scoped Subwatershed Study to characterize the resources associated with each subwatershed organized by study discipline (i.e., hydrology/hydraulics, groundwater, water quality, stream morphology, aquatic, and terrestrial ecology). Background and supplemental field data are to be assessed by each discipline, and then across disciplines, to:

- establish the form, function and linkages of the environmental resources,
- confirm, refine and identify environmental constraints and opportunities related to terrestrial and aquatic habitat, features, and systems using the targets and objectives set out in the Scoped Subwatershed Study

- establish surface water and groundwater constraints and opportunities associated with flooding, erosion, water quality, water budgets, including recharge and discharge areas through new numerical tools (models) suitably calibrated to local conditions,
- Refine and implement criteria and constraints for management opportunities associated with the environmental features and systems.

Goals, objectives and targets developed through the Scoped Subwatershed Study and Future Caledon should form the basis of the goals, objectives and targets for the Local Subwatershed Study. As part of Phase 1, the Local Subwatershed Study will need to finalize the goals, objectives and targets to be area specific, carrying through, as indicated above, the goals, objectives and targets of the Scoped Subwatershed Study and including additional ones should there need to be for the specific area in consultation with the Technical Advisory Committee (TAC)..

The Phase 1 characterization will need to include a minimum of two-years of pre-development monitoring, with three-years being preferred to characterize existing systems and features, as well as to inform establishing baseline conditions for comparison with predictions associated with post-development conditions. Should the two years of minimum data be undertaken during abnormal climatic conditions, a third year will be required.

Phase 2: Subwatershed Impact Assessment

Phase 2 of the Local SWS identifies future stressors, describes (past, present) and predicts (future) impacts, and assesses these impacts against the preliminary goals, objectives, and targets developed as part of Phase 1. Future land use scenario(s) are evaluated based on input from the Secondary Plan Land Use Team. For various disciplines (i.e., groundwater, hydrology, hydraulics and water quality) analytical tools are required to be used to predict changes to existing conditions in relation to subwatershed-based targets associated with the development of the Secondary Plan area. Information and analyses from previous background studies (i.e., Watershed Plan, Regional Scoped Subwatershed Study, Hydrologic Investigations, Tier 3 Groundwater Studies, etc.) will be used to assist modelling future land use scenarios. For others (i.e., terrestrial and aquatic ecology) predictions will inherently be semi-quantitative, qualitative or conceptual, integrated with predictions from other subwatershed disciplines (i.e., hydrogeology, hydrology, hydraulics and water quality) and experience elsewhere including knowledge of habitat/biota interactions.

As noted earlier, the Subwatershed Impact Assessment process is expected to be an iterative process whereby an initial land use concept will be evaluated/tested against the preliminary targets, and the feedback from this initial test may then inform the establishment of a refined land use concept.

Phase 3: Management Strategies, Implementation, and Monitoring Plan

Phase 3 of the Local SWS will use the findings of Phase 2: Subwatershed Impact Assessment to refine and finalize the evaluation of various land use scenarios and recommend a set of preferred management strategies, addressing the preferred land use designations and form, established through broader planning input to achieve the identified goals and objectives, and to establish the recommended strategies. An Implementation Plan will be prepared to offer guidance on locations and types of SWM facilities including Low Impact Development (LID) practices, staging/phasing, future study requirements, monitoring, Environmental Assessment requirements, and general economics.

Phase 3 also involves the development of a long-term monitoring initiative that is to evaluate the effectiveness of the proposed management strategies post-development by assessing whether the assumptions made at the Local SWS scale are appropriate and predictions made are sufficiently accurate. The feedback from this post-development monitoring will then be used through a process of adaptive management to determine if parts of the Local Subwatershed Study strategies and/or recommendations

should be modified as part of future development applications. While the execution of the post-development monitoring plan is not included within the scope of work for the Local Subwatershed Studies, the Local Subwatershed Studies are nevertheless to provide framework-level direction regarding the components, methods, duration, and key locations for the execution of the monitoring program, as part of future work. In addition, the subject monitoring approach and plan should will fulfill the CLI-ECA monitoring requirements. Further details on area specifics would need to be considered as part of future neighbourhood scale studies.

Public Meetings

At minimum, two public meetings should be held to share the findings of the study with residents and to gain their feedback. The meetings should be held as part of the Phase 2 Impact Assessment work and following the Phase 3 work.

The following provides further information on the technical work that needs to be completed as part of each phase of the Local Subwatershed Study.

2.2 Background Information Review/Gap Analysis/Work Plan Confirmation

Background Information Review:

During Phase 1, the Study Area will need to be characterized and preliminary mapping of constraints and opportunities will need to be developed. Information shall be obtained through three (3) levels of investigation, including (i) review of desk-top secondary sources (compiling information from existing documents); (ii) reconnaissance-level fieldwork; and (iii) detailed field work (Minimum 2 years, 3 years preferred).

Existing desk-top information relevant to the Local Subwatershed Study Area will need to be reviewed. Appendix A has a comprehensive database and summary of the area studies relevant to these study areas and should be established as the starting point.

Gap Analysis:

Background data used to prepare the Local Subwatershed Study, will need to be documented listing its source and format (e.g., municipal report/agency website/personal communication). For map data, the map scale shall be specified. The list of source materials shall follow a generally accepted bibliographic format. The purpose of documenting the background data is to facilitate a "gap analysis" and identify possible preferred methods by which to appropriately address the information gaps in Phase 1, as required.

A summary of each document from which information was used to prepare the Local Subwatershed Study characterization will need to be prepared. For each source, a brief review shall be produced, summarizing the source's content, and describing its relevance to the Local Subwatershed Study.

Technical Work Plan Confirmation:

Once all of the background data have been collected, the need and requirements for obtaining additional information shall be determined, and a proposed program for collecting additional data shall be outlined to the TAC. This process allows for collaborative consultation on the Technical Work Plan. It will be important to receive final sign-off from the TAC prior to advancing the updated/refined work plan.

2.2 Phase 1 – Subwatershed Characterization and Integration

2.2.1 Hydrology and Hydraulics

Background information on the study area is to be collected from all available sources. Maps of the study area will be provided by the Town, Region, and Conservation Authority. For each subwatershed and associated outlet, the physical features (e.g., subwatershed boundary, physiography, topography, soils, major watercourses, drainage swales, and wetland features) within the Secondary Plan Area shall be established. Any specific areas of interest shall be defined, identifying important implications on development potential, environmental features, and / or watercourse system function.

Hydrology:

The Hydrologic Modelling should apply a hybrid approach whereby:

- the hydrologic modelling of the Local Subwatershed shall apply the approved hydrologic modelling from the Conservation Authorities for Regulatory Flood Hazard assessments, and
- new local detailed continuous hydrologic modelling will need to be prepared for assessment of frequency flows, water balance and erosion.

The detailed continuous hydrologic model shall be selected for use in the Local SWS; the model(s) will need to be developed and calibrated for the subwatershed's existing condition. The local hydrologic model shall be a continuous, deterministic, hydrologic model, approved by TAC, with a strong physical representation of surface runoff, baseflows, and surface and groundwater interaction. It will be necessary to justify the applicability and sufficiency of the proposed numerical model(s). The modelling should ensure that the hydrologic and hydraulic features are appropriately represented for each subwatershed/catchment within the study area. The development of the model(s) will need to be in accordance with applicable standards to support future Municipal or Conservation Authority use of the model, and model results.

It is recommended as part of the review of background data, that the locations for streamflow gauges and rain gauges be identified. Field data for model calibration and validation should be collected between April and November inclusive. Once calibrated and validated the model is to be executed in both event (synthetic design storms) and continuous mode (using frequency analyses) to generate peak flows for a range of return period storms including 2, 5, 10, 25, 50, 100, 350 year and Regional Storm.

The results from the surface water modelling should be used to corroborate the water budget developed as part of the Hydrogeologic assessment (ref. Section 2.2.3).

The hydrologic modelling is to establish the baseline hydrology for the subwatershed system. As noted, it is required that the model(s) will be calibrated and validated based upon both historical rainfall and flow monitoring data, as well as new hydro-meteorological data collected as part of this study. The exercise should meet Provincial standards to provide a comprehensive understanding of the existing hydrologic conditions of the study area. The model shall be calibrated and validated to provide comparable flows at the subwatershed outlets to those determined in any previous watershed or drainage studies for the given watercourses, and any differences need to be rationalized. The model input parameters shall be compared to previous studies and modified to represent more detailed subwatershed modelling and shall be completed to the satisfaction of the TAC. The extent of area modelled should be sufficient to generate results at key/important downstream locations/confluence points and locations of interest (i.e. Special Policy Areas, Flood Vulnerable Areas, Flood Vulnerable Roads etc.) to confirm that the development of the Secondary Plan Area will not have any adverse impacts on the peak flow rates and runoff volumes specific to the objectives of managing the impacts due to adverse flooding and erosion.

The Erosion potential assessment of receiving and downstream watercourses shall be carried out using continuous simulation of watercourse flows over a suitable period of time, to evaluate the duration of critical discharge exceedance, cumulative erosion index (Ontario Ministry of Environment, 2003), cumulative effective work (per TRCA SWM Criteria, 2012), and other methodologies proposed by the study team stream morphologist (e.g. cumulative effective discharge, number of exceedances), to determine erosion thresholds (discharge, velocity and shear stress) established by the study stream morphologist and the associated guidance on the appropriate methodology.

Hydraulics:

The Local SWS will involve a field inventory of creeks, road crossings (culverts and bridges), stormwater facilities, etc. The current drainage systems and outlets shall be characterized as to potential drainage constraints and opportunities. The intent of the hydraulic modelling is to define area flood hazards and system constraints.

For established and regulated watercourses located in the study area, hydraulic analyses shall be conducted. Flood lines shall be established for the Regulatory Event (i.e., based on the flows associated with the greater of the Regional Storm event or 100 Year Storm) for existing conditions. For the creeks that have floodplain delineation, as identified in previous studies, the flood lines shall be updated to reflect the current limits of the flood hazard, for land use planning purposes, but not as a formal flood plain map. The floodplain delineation should be based on hydraulic modelling, using the latest Hydrologic Engineering Center's River Analysis System (HEC-RAS) model from the U.S. Army Corps of Engineers, to generate the associated flood lines based on the peak flows established through the hydrologic analysis conducted for the Local SWS. As noted, this component of the Local SWS, while preparing preliminary floodlines for land use planning purposes, is not intended to be a formal floodline mapping study.

2.2.2 Hydrogeology

The goal of the Local SWS with respect to hydrogeology is to establish a geological conceptual model for the study area, determining the key characteristics of the bedrock and overburden systems, in addition to their functions in terms of controlling groundwater movement, availability, and quality in the subwatershed study area. An integral component of the hydrogeologic study is to assess the interactions between the groundwater system and the surface water system, and to determine the overall role or function of these interactions in an ecosystem context. It is also important to establish an understanding of the effects of future development on the local groundwater resource to assist in the need and implementation of measures to address overall water balance. This Local Subwatershed Study will build upon the understanding derived through the SABE Scoped Subwatershed Study. The incorporation of additional field monitoring using new data and refined modelling tools will provide additional spatial and temporal insights on the groundwater system. The refined analysis will be needed to achieve the primary objectives and extend the understanding of the following key matters:

- Presence of potentially significant local recharge areas, linked with local discharge,
- Shallow depth to groundwater,
- Locations of strong upward gradient,
- Groundwater/surface water interaction,
- Dewatering needs,
- Seepage areas and
- Existing tile drainage.

In order to accomplish the above, additional data made available over the course of the local study will need to be reviewed prior to finalizing the groundwater field program, as part of the Technical Work Plan. The groundwater field program, which is to be prepared by a qualified hydrogeologist, is expected to be

tailored to the characteristics and resources in the subject Subwatershed area and include but not be limited to the following: :

- Monitoring well installations with borehole logs,
- Drivepoint piezometers,
- Manual and continuous water level measurements,
- Groundwater and surface water chemistry,
- Hydraulic conductivity measurements and
- Spot baseflow measurements.

Depending upon the needs of the local study area, the refinement of the conceptual groundwater model provided in the Scoped Subwatershed Study may include the following:

- Refine geologic interpretation and hydrostratigraphy including surficial geology and hydrogeologic parameters.
- Refined understanding of observed shallow groundwater conditions as they relate to response to storm events, upward gradient and potential impacts on infrastructure.
- Refine mapping and interpretations groundwater discharge areas (subwatershed scale and reach scale).
- Refinements to understanding of groundwater flow including contributions to and from areas outside the subwatershed(s).

The baseline groundwater conceptual model and more detailed numerical groundwater model and analysis should incorporate observations and technical assessment from the hydrologic, terrestrial, aquatic and fluvial geomorphologic characterizations; these would include for example:

- Observations of seepage and discharge,
- Fish habitat,
- Phreatophytic observations,
- Streambed composition, and
- Low flow analysis and water quality.

In turn, the groundwater characterization should provide technical input to aid in confirming or guiding the characterization of the other component disciplines associated with the Local SWS.

Field observations for groundwater discharge must be coordinated at the outset of the field program. In order to efficiently use the field resources, observations from all disciplines should be captured, as it is expected that more field reconnaissance is carried out by terrestrial, aquatic and fluvial geomorphology in the course of their work.

The SABE Scoped Subwatershed Study provided an existing conditions water balance for the Focus Study Area utilizing the water balance parameters estimated from an Oak Ridges Moraine Groundwater Program model. This water balance methodology should be considered for the Local Subwatershed Study to provide a refined baseline water balance for comparative purposes in the Phase 2 Impact Assessment. This water balance, should be compared to the numerically-derived hydrological model water balance results described above.

2.2.3 Stream Morphology

Several objectives concerning aquatic habitat are intended to protect the morphological and fluvial character of the study area streams, with the intent (where feasible and required) to restore sinuosity, maintain physical habitat attributes (e.g., pools, riffles etc.), diversity and fluvial processes (e.g., bed load

transport, energy reduction through sinuosity, etc.), and to prevent increases in erosion and deposition through the maintenance of the hydrological regime.

The fluvial geomorphological assessments in support of Local Subwatershed Studies should meet or exceed the criteria outlined in Appendix B – Erosion and Geomorphology - of the TRCA Stormwater Management Criteria (2012).

Available data for the subwatershed and other existing sources, are to be reviewed to confirm the need for updating the existing information. Surface water feature types (watercourses and headwater drainage features) should be defined and identified appropriately as a reach delineation is performed. Reach delineations and feature types are to be confirmed and/or updated based on refined mapping and field investigations. A baseline morphologic assessment, according to stream characterization and flood /erosion considerations, is required including a detailed inventory of stream morphology observations. Through field-based observations of channel processes and stability, sensitive and/or representative sites are to be selected to complete detailed field surveys for an erosion threshold analysis at the systems scale.

An erosion potential analysis is to be conducted, based on the erosion data collected to understand the erosion processes and to identify areas which are prone to erosion, or where existing structures may be at risk. This will be completed through desktop and field analyses. The erosion potential analysis is also to determine the threshold flows for erosion at strategic points in the subwatershed for input to the hydrologic assessment to support the development of stormwater management guidance. Assessments will identify those sites most sensitive to erosion, with reasonable details covering the entire study area.

An erosion hazard delineation will be completed for each watercourse reach. The valley setting will determine whether a meander belt (unconfined systems), or a long-term stable top of slope (confined systems) is delineated. These assessments and application of setbacks will conform to Provincial Policy and applicable Conservation Authority Regulations.

In addition, the Study Team's Stream Morphologist, along with others on the Study Team including aquatic and terrestrial ecologists and surface and groundwater specialists, are to conduct an assessment of watercourse constraints (high, medium, or low constraints) to confirm or refine the results from the SABE, while also completing an assessment of the headwater drainage features (HDFs) in accordance with the application methodology presented in *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (TRCA/CVC 2014). The assessment will need to involve multi-seasonal field work (minimum two years) and an integrated interpretation of the data to establish current classification and future management (Phase 3). Any site-specific modifiers to the protocol will need to be vetted through the study's Technical Advisory Committee, prior to finalizing and proposing management recommendations. The classification and management of HDFs provides for detailed, field verified assessments to maintain overall system function and contributions, that previously may have been estimated through the application of legacy drainage density targets.

2.2.4 Aquatic Environment

The available background information on fish habitat in the study area, including information on permanence of flow and thermal regime, fish communities, fish species present, aquatic species at risk present, and benthic invertebrate communities should be acquired and used to characterize the aquatic environment. Some aspects of aquatic habitat, such as channel form and stability, headwater drainage feature classification, and riparian vegetation will be addressed by, or in conjunction with, other disciplines (e.g., fluvial geomorphology, terrestrial ecology). Data gaps should be identified, if present. If data gaps exist that will limit the effectiveness of the subsequent phases of the Local SWS, field programs should be conducted to address these gaps. In some cases, data gaps may be addressed through baseline monitoring.

Baseline monitoring sites should be established and monitoring initiated. Baseline monitoring sites should be representative of larger reaches based on key parameters such as the fish community and thermal regime and on expected susceptibility to development impacts. Baseline monitoring methods should follow established protocols (e.g., Ontario Stream Assessment Protocol, Ontario Benthic Biomonitoring Protocol) and conform with the monitoring methodologies employed by TRCA and CVC, if possible, to maximize the utility of the data.

2.2.5 Terrestrial Environment

Landscape Scale Screening

To better understand the ecological context of the proposed development area, as part of the overall subwatershed, the Local Subwatershed Studies will need to review and build upon the direction and guidance in the Regional Scoped SWS. The purpose of this review will be to generate information on the ecological context of the Study Area, consider its position and role in the overall Natural Heritage System of the Scoped SWS and potential connectivity of the Study Area within the broader landscape. This Landscape Scale Screening supports identification of terrestrial and wetland habitat connectivity, potential wildlife movements, and the ecological context of the Secondary Plan Area, in relation to the surrounding environs to help understand, confirm and, where appropriate recommend additional linkages between the ecological systems and enhancement opportunities within the Secondary Plan area and with lands beyond their boundaries on the landscape. This screening will rely on existing desktop information sources.

Building on the approaches used in the SABE Scoped SWS, a variety of metrics should be used to quantify existing landscape-scale conditions and functions. Given the broader scale of interest for the Landscape Scale Screening, the objective should be to characterize patches of natural cover that occur within the subwatershed and the area surrounding the Secondary Plan Area being studied. Metrics should include, but are not limited to, those that quantify:

- The occurrence and diversity of vegetation community types within and across patches
- The size and shape characteristics of vegetation and habitat patches
- Landscape composition (i.e., matrix influences) influence on features and/or natural area patches
- Connectivity of patches (i.e., physical and functional connectivity)
- The occurrence and coverage of features and/or habitats that have policy implications (e.g. habitat for Species at Risk, species that are provincially rare, Significant Wildlife Habitat, etc.)

Detailed Assessment of Terrestrial Resources

A detailed assessment of terrestrial resources in the subwatershed shall be undertaken. The Natural Area Inventory information from the Conservation Authority and the Town of Caledon, should be consulted prior to the initiation of field work. The data collected shall be used to ensure that future land-use planning and proposed development is consistent with Section 2.1 of the Provincial Policy Statement, Region of Peel's Official Plan, and Future Caledon Official Plan

Depending on the vegetation community, Ecological Land Classification (ELC) results and habitats determined to be present in the study area, it may be appropriate to undertake targeted surveys for certain taxa or species, rather than rely solely on incidental observation. The Significant Wildlife Habitat Eco-Region 6E Criteria Schedules (MNR, 2015) should be used in conjunction with the Significant Wildlife Habitat Technical Guide (MNR, 2000) when assessing Significant Wildlife Habitat (SWH); this analysis should incorporate advancements in SWH analysis that are provided by stakeholders and agencies (e.g., watershed-scale SWH mapping).

Detailed field assessment of the subwatershed's terrestrial resources shall be provided to characterize the terrestrial environment and establish a baseline terrestrial environment for the Secondary Plan Area,

including the proximity to, and the degree of linkage with other habitats. When assessing species, status should include federal, provincial and local rankings. In addition, maps that identify natural heritage features and the results of the terrestrial investigations shall be provided. Features are to be assessed against criteria and direction outlined in the Scoped Subwatershed Study (Part A) to inform implementation of management guidelines for features and other components of the NHS (Parts B and C of the Scoped Subwatershed Study). Specific consideration shall be given to the location and relationship of features and areas within the NHS (e.g., occurring within the Province’s NHS, linkage, proximity to Key Features, etc.). Opportunities for enhancement of the terrestrial environment shall build on those identified in the Scoped Subwatershed study, including confirmation of enhancement areas, objectives and targets.

Table 1: Terrestrial Environment Inventory Requirements

Biophysical Inventory	Inventory Requirements
Vegetation Community Identification	Use Ecological Land Classification to classify vegetation communities according to Lee et al. (1998).
Botanical Inventory	3 season survey (spring, summer and fall) to identify species.
Native / Invasive Flora Survey	Determine the percentage of Native and Invasive Species in surveyed vegetation communities.
Woodland Evaluations	Inventory within woodland areas should be sufficient to evaluate the significance of woodland features based on relevant criteria and policy definitions. Woodland boundaries should be field verified with responsible authorities where feasible.
Evaluation of Unclassified Wetlands	Document species records and wetland community types consistent with methods used in the Ontario Wetland Evaluation System (OWES).
Breeding Bird Surveys	2 surveys at least 10 days apart; the first between May 24th and June 16th and the second between June 17th and July 10th using 10-minute point counts and area searches. Breeding evidence by species should be recorded according to the Ontario Breeding Bird Atlas protocol.
Reptile Surveys	Use active searching or other commonly accepted. MNRF protocols/methods (April- July and Sept.-Oct.)
Amphibian Breeding Surveys	3 surveys between April and June corresponding to specific nighttime temperatures of >5°C, >10°C and >17°C, according to the Marsh Monitoring Protocol. Salamander surveys are required using active searching and should be completed in spring in appropriate ponds to determine the presence of salamander breeding areas.
Incidental Wildlife Observations	Incidental sightings of all wildlife (mammals, birds, butterflies, dragonflies, damselflies, amphibians, and reptiles) should be recorded during site investigations

Biophysical Inventory	Inventory Requirements
Species at Risk Screening	Screening should include results from all available sources, i.e. Natural Heritage Information Centre, wildlife atlases, MNR Municipal List and Conservation Authority database.
Significant Wildlife Habitat Screening and Assessment	This assessment will include identifying candidate and confirmed Significant Wildlife Habitat and will utilize the MNR's <i>Significant Wildlife Habitat Technical Guide 2000</i>) and associated Criteria Schedules (MNR 2015).

2.2.6 Surface Water Quality

Currently available background information shall be used to provide a preliminary understanding of the baseline water quality in the Secondary Plan Area and subwatershed. The existing datasets shall be reviewed to understand the existing water quality status to provide the baseline reference and identify any water quality concerns and constraints in the study area. Other potential studies, such as the Conservation Authority's Source Water Protection work will have some relevant data to contribute to this understanding. The study will also complete an inventory of existing SWM facilities within the subwatershed and the respective catchment areas, as the baseline reference for stormwater management in terms of water quantity/ quality control.

Local water quality monitoring data will need to be collected to support characterizing the area's surface water quality based upon the contributing land use, soils, and existing stormwater quality management practices during both wet (storm) and dry (baseflow) periods. Surface water quality monitoring at the same locations as the streamflow gauging is preferred in order to correlate the surface water quality with the study area hydrology. For all permanently flowing streams continuous monitoring of temperature, dissolved oxygen and turbidity is required between April and December for a minimum of two years. Surface water quality monitoring needs to be conducted between the months of April and December. Water quality grab sampling should be completed at each station for three (3) dry weather events and three (3) wet weather events, capturing at least one (1) wet and one (1) dry event for each season. Two (2) grab samples would be obtained for each wet weather event, with the objective of characterizing the surface water chemistry during the onset of the storm with the first sample and characterizing the surface water chemistry during the recession of the storm with the second sample. Grab sampling has been recommended over the use of automated samplers as prior experience with the use of automated samplers has demonstrated logistical issues related to the pre-determination of the sampling duration and interval, functional issues related to the "triggering" of the sampler and siting on a flat surface, as well as other issues related to protection against vandalism.

The grab samples for each wet weather and dry weather event may need to be analyzed for the following contaminants:

- Oil and Grease
- Total Phosphorus
- Anions (Nitrate, Nitrite, Phosphate, Chloride)
- Ammonia
- Total Kjeldahl Nitrogen (TKN)
- Conductivity
- Total Solids (TS)

- Total Suspended Solids (TSS)
- BOD₅
- Dissolved Oxygen
- pH/alkalinity
- Salinity
- Total Coliforms/Fecal Coliforms/E. Coli
- PAH
- Metals (Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, P, K, Se, Si, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn, Zr)
- Hardness as CaCO₃
- Turbidity

2.2.7 Phase 1 Report – Subwatershed Characterization and Integration

At the completion of Phase 1, the general characteristics of the study area subwatershed will have been identified and a clear understanding of the constraints and opportunities will have been developed. Constraints and opportunities mapping shall be developed, and a preliminary Natural Heritage System and Water Resource System should be identified, building upon that identified in the Region’s Scoped SWS. The Phase 1 Report will establish the general characteristics of the subwatershed and the Secondary Plan Area, which will be the starting point from which the proposed land uses are to be developed. Of importance, the Phase 1 Characterization report should identify/delineate all key natural heritage and key hydrologic features and assess their status and significance tied to policy requirements, as a key deliverable and component of the constraint mapping.

The Phase 1 Report shall include:

- Summary of background literature and data reviewed;
- Subwatershed study area characterization including:
 - Climate, landform, geology, and soils
 - Hydrogeology/groundwater quantity and quality
 - Surface water quantity and quality
 - Stream geomorphology
 - Aquatic and Terrestrial ecosystems
 - Natural Environment Systems
- Integrated assessment of above identified features and functions to evaluate their significance
- Summary of the subwatershed study area major issues, concerns and constraints.

The constraint-based framework that is developed should be consistent and inclusive of all relevant federal, provincial, municipal, and CA policies and clearly identify areas that are protected from development and those that provide opportunities for development.

Note: It is expected that a Draft Table of Contents will be submitted for review and comment well in advance of the Draft Report submission.

2.3 Phase 2 – Subwatershed Impact Assessment

Based on the outcomes of Phase 1, including the review of background information sources and supplementary field work, Phase 2 will require an iterative assessment of the potential impacts of proposed

future land use changes on the natural environment and water-based system within the study area. The findings from the Phase 1 Characterization Study, completed by the various disciplines, along with the outcomes of the initial servicing and transportation needs, will be considered in an integrated manner in developing the preliminary preferred land use concept. A screening of the preliminary land use concepts is to be undertaken to determine a preliminary preferred concept(s) for the impact assessment in Phase 2.

The Phase 2 Impact Assessment will be completed concurrently to the other component studies such as the Transportation Master Plan, and Water/Wastewater Master Servicing Plan, which will also assess the impacts and requirements of the preliminary preferred land use concept.

The intent of Phase 2 is to assess the impacts of the preliminary preferred land use concept and inform the preliminary establishment of initial management strategies which:

- protect the critical elements and systems of the subwatershed and local drainage system;
- prevent environmental degradation;
- provide adequate flexibility for integration with adjacent development and redevelopment areas where present;
- assist in the establishment of open space linkages;
- address opportunities and constraints to development;
- provide a strategy to manage legacy impacts from existing land uses;
- Establish details on preliminary locations and areas for stormwater management (LID BMPs and end-of-pipe facilities);
- identify restoration and enhancement opportunities to meet system targets; and
- ensure that the land use plan meets the goals, objectives and targets of the Local Subwatershed Study.

In Phase 2, a detailed analysis shall be completed to assess the impacts of future land use changes in the Secondary Plan Area. Various options and practices for mitigating these impacts shall be reviewed and management strategies to create net benefit shall be advanced. As noted, the assessment of future land use changes is premised on an iterative approach whereby the feedback from the initial land use assessment shall be provided to the TAC and the Land Use Planning Team. The impact assessment shall also consider the impacts of climate change to the Natural Heritage System and Water Resources System, and the manner in which the proposed development and management plan may exacerbate or mitigate these impacts. In this regard, the impacts resulting from the proposed development and climate change are intended to be assessed in an integrated manner, rather than evaluating the impacts separately.

As part of the Humber River Watershed Study currently being undertaken the Toronto and Region Conservation Authority an assessment of the impacts of climate change has been undertaken by applying a quantitatively or qualitatively tiered approach assessing the impact of two climate scenarios. The two climate scenarios include a moderate emissions scenario (SSP2-4.5) and a very high emissions scenario (SSP5-8.5), which translate to approximately 2.7°C and 4.4°C of global warming by the end of the century, respectively (IPCC, 2021). Further information can be provided by the Town as part of initiating the Local

¹ IPCC, 2021: *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2391 pp. doi:10.1017/9781009157896.

Subwatershed Study process. It is the intent of the Local Subwatershed Study to apply a similar methodology. For the Local Subwatershed Studies being undertaken within the Humber River Watershed this will include downscaling TRCAs approach to the applicable study area. In this case, the work done by TRCA can provide supporting information. For the areas of SABE outside of the Humber River Watershed, the same approach should be taken but can not be supported by a similar broader scale analysis. Should the applicant prefer to devise a different approach this should be provided in the Technical Workplan and approved by the TAC. Please note that both CVC and TRCA have undertaken considerable climate change impact assessment work over the last decade which may provide valuable insights and considerations including TRCA's Vulnerability Assessment for Natural Systems in Peel Region.

The information from the Local SWS at this stage, will be considered along with the information from the concurrent transportation and servicing assessments to refine the preliminary preferred land use concept option(s) to eventually develop a preferred Secondary Plan land use.

The next iteration of impact assessment will be expected to be more scoped and focused on the specific changes to the land use and proposed environmental impact management strategies. Hence the scope outlined in the following sections will need to be conducted iteratively, whereby the initial assessment will inherently be more complex and detailed than the subsequent assessments. It is expected that the majority of the impacts and associated management and land use changes will have been captured as part of the initial iteration.

2.3.1 Hydrologic and Hydraulic Analysis

Hydrology:

A hydrologic analysis shall be conducted for the initial future development land use concept to determine post-development flows, hydrographs and water balance (integrated with the groundwater assessment).

The existing conditions hydrologic model(s) shall be modified to reflect post-development conditions and executed both continuously (using flow frequency analysis) and in event mode (using design storms) to generate peak flows for all events ranging from 2, 5, 10, 25, 50, 100 and 350 year, and the Regional Storm. As in the hydrologic analysis for existing conditions, the model results shall be reviewed by the TAC. The modelling will be used to determine the potential impacts of planned development on surface water, groundwater and water budgets. The Phase 2 Impact assessment hydrologic analysis will need to:

- Delineate discrete drainage areas based on potential future development;
- Calculate post-development flows for all event storms and the Regional Storm at predetermined locations, as per the discretized drainage area plan and model schematic diagram for the study area. The post-development flows shall be compared to existing flows for all storm events at the hydrologic nodes of interest. If the Conservation Authority has an approved hydrologic model which establishes unit release rates for development, then the results of the local modelling as part of this local study are to be validated against the existing guidance from local Conservation Authorities;
- Conduct the water budget assessment at the nodes of interest coordinated with the Groundwater modelling (see below).
- Identify constraints related to imperviousness and intensity of development. Assess the requirement and/or performance of proposed stormwater management facilities including the potential approach for Regulatory flow impact management per the details outlined in the Regional Scoped SWS;
- Assess the future discharge impacts (both flows (peak and volume) and erosion potential) on the local systems and the broader creek systems based upon the methods completed as part of the

Phase 1 hydrologic assessment (critical discharge, cumulative erosion index, and cumulative effective work), in coordination with the Study Team Stream Morphologist;

- Complete a climate change assessment consisting of evaluating the hydrologic impacts for projected design storms (i.e., 2080s IDF projections applying an RCP of 8.5 (Climate Trends and Future Projections in the Region of Peel, February 2016, TRCA et al.) and four (4) local historic storms, and the formative timeseries for four (4) formative storm events which occurred in other jurisdictions, as well as applying the Humber River Watershed climate change impact assessment methodology.
- Any preliminary stormwater management strategies, required to match the post-development flows to existing conditions, shall be identified.

The future development impact assessment should evaluate the impacts on both runoff volumes and peak flow rates, without and with mitigation. SWM practices will be required to be sized to a preliminary level of detail as related to managing the flows for 2 to 100 year event. Furthermore, impacts to Regulatory flows (Hurricane Hazel) will need to be assessed including consideration for Regional Storm management facilities. Guidance from the Scoped SWS, and a review of downstream FVAs and FVRs will need to be considered as part of this task. The hydrologic impact assessment should be integrated with the ecological component impact assessments and could include environmental flows analysis (eg. Indicators of Hydrologic Alteration).

Hydraulics:

The existing hydraulic conditions shall be reviewed in the context of the proposed development, with the land use changes, runoff increases and/or channel modifications. For those watercourses which may receive additional flow or perhaps require no controls, the study shall assess the impacts of the proposed development on watercourse water levels, flow velocities and water surface profiles for all storm events. Any potential erosion based upon critical erosion parameters (i.e., critical flow, critical shear, critical velocity) and/or flood risk concerns due to the proposed development shall be identified and compared to those identified under Phase 1, in consultation with stream morphologists. Again, for any watercourses where the flow regime would change, current flood line information shall be updated for post-development scenarios. The model results shall be reviewed and approved by the TAC.

The updated future land use flood lines (where changes are considered) are to be presented on the maps, with Regulatory Event flood line locations and cross sections identified with flood elevations. The level of service for hydraulic structures within the study area and the resulting overtopping depths, caused by the Regulatory Event, shall be assessed and documented on existing roads at all crossing structures. The floodplain maps should confirm the post-development flood levels are consistent with the current condition. Any changes in the flood inundation magnitude must be listed in inventory, with explanations of such changes.

For those watercourses which are anticipated to be altered (realigned and reconfigured) as part of the watercourse management plan, full hydraulic modelling is not required however the geometry (cross-section and longitudinal slope) needs to be checked using approved methods, and documented accordingly.

2.3.2 Hydrogeology

The hydrogeologic impact analysis shall examine the potential impact of future development land use changes on the groundwater systems, as well as the impacts of climate change. An impact analysis is to be completed to evaluate the sensitivity of the groundwater flow system to changes in land use resulting from a potential reduction in recharge. Impacts are expected to include a decrease in the water table elevation,

changes to stream flow (e.g., baseflow/groundwater discharge) and the potential degradation of groundwater quality. The hydrogeological component of the subwatershed investigation shall:

- Ensure the groundwater sensitive areas are recognized and protected from future urbanization and disturbances;
- Within the water balance assessment, update the overall groundwater budget model along with the surface water components for both existing and future scenarios; the water budget for the study area shall estimate precipitation, evapo-transpiration, runoff and infiltration, in addition to the groundwater recharge and discharge; and
- Consider any relevant needs within the Source Water Protection Plan.

The baseline water balance assessment described in Phase 1, should be updated to reflect changes in the various parameters related to development scenarios and climate change to consider potential impacts particularly to changes in groundwater recharge. As presented in Phase 1, the hydrological model is also to be used to carry out a water balance, and a comparison and differences rationalized. Integration with the hydrologic modelling and consistency of the various input parameters is required. It is understood the hydrologic and groundwater analysis may have some differences in their physical representation. These potential limitations should be reflected in the overall impact assessment.

The groundwater impact assessment should be integrated with the ecological component impact assessments, as it relates to the groundwater function for discharge or water table depth.

2.3.3 Stream Morphology and Erosion Analysis

Erosion hazards as mapped and confirmed through Phase 1 will need to be evaluated against the proposed land use plan to ensure that area watercourses which are proposed to be protected in-place are protected from encroachment by development, but also to ensure that risk to property and infrastructure is minimized. Where realignments are proposed, and provided there is sufficient rationale, realignment alternatives should be evaluated through an integrated process with other members of the Study Team to maintain flood conveyance, habitat requirements, and linkages. Any realignment will require that appropriate erosion hazards and setbacks are delineated and mapped.

The continuous erosion analysis (see hydrologic assessment above) for the existing conditions shall be updated with the future development scenarios for each of the critical parameters as described in Section 2.2.2 (critical discharge, cumulative erosion index, and cumulative effective work). Erosion potential for the study area shall be estimated by applying erosion thresholds to the existing channel / bank conditions using the post-development flows. This analysis is to be completed for the same cross sections that were assessed as part of the detailed geomorphological assessment. Appropriate mitigation measures shall be recommended for sections showing a significant increase in erosion potential. Erosion thresholds shall be used to establish discharge rates for stormwater management systems for the proposed development to ensure there is no increase in downstream erosion, by applying the methodology per the approved Technical Work Plan. This process will involve determination of the impacts without mitigation and then defining the necessary levels of control in an iterative manner to ensure downstream systems are appropriately protected.

Based on the results presented in Phase 1, identify which watercourses and headwater drainage features (HDFs) in the proposed development area are stable and have sufficient conveyance capacity, and which watercourses and headwater drainage features need restoration or alteration through the application of natural channel design principles. Stream morphology shall be assessed downstream of future development areas, with a focus on existing and potential erosion concerns. The extent to which downstream areas need to be assessed will be based on a sensitivity review by the Stream Morphologist

and the Hydrologist. Existing and future development impacts shall be evaluated with the development strategy indicated to limit the potential for negative impacts, while accommodating opportunities to restore and improve the existing watercourses or HDF condition. This approach will need to consider watercourse constraints (high or medium constraint, as per the SABE Scoped SWS) and HDF management classifications (protection, conservation, mitigation, no management) which determine the recommendations for those features which remain on the landscape (protected in-place or realigned) versus those (HDFs) which can be removed subject to appropriate management practices.

For areas of new development, the size of the channel block necessary to allow natural channel design to occur shall be determined. The sizing will include the erosion hazard, hydraulic criteria, fisheries setbacks and Natural Heritage System planning, and all buffers and setbacks. The natural channel design information on which the preliminary assessments are made, shall be documented for use at the next stages of planning (i.e., neighbourhood scale and/or tertiary plan). The natural channel design strategy must clearly define that all channel blocks can convey flows associated with the Regulatory event. As noted, the size determination should be made based on stream morphology, in addition to the considerations of aquatic and terrestrial features and setbacks. The determination of which watercourses and HDFs are to be maintained and considered for relocation or removal, needs approval of the TAC. The Conservation Authority and MNRF and others will ultimately need to be consulted for any recommended channel works.

2.3.4 Aquatic Environment

Assess the potential impacts of future land uses and climate change on the aquatic habitats through direct modifications (e.g., watercourse realignments, watercourses crossings) and impacts arising from changes to the hydrologic and hydrogeologic regimes and disruption to riparian vegetation. Opportunities for aquatic habitat enhancement by direct modification (e.g., eliminating barriers to fish migration) or enhancement of riparian buffers should also be considered. The effects of the anticipated changes to aquatic habitat on aquatic biota will need to be assessed.

Consideration is to be given to the presence and role of aquatic features and functions as part of the Natural Heritage System. This is to include, at a minimum, thermal regime, species diversity, water quality and quantity, and their long-term protection within the NHS to inform the assessment of impacts at the system scale.

2.3.5 Terrestrial Environment

The Study Team is to investigate potential land use impacts and climate change on terrestrial features, their associated functions and their role within the NHS based on the integrated system analysis completed in Phase 1. Appropriate mitigation strategies, including establishing appropriate buffers/setbacks, will be identified to protect the natural heritage features and functions from disturbance. In addition, linkages and enhancement areas identified through the Scoped SWS will need to be confirmed or refined according to the Scoped Subwatershed Study, and consideration for additional linkages (e.g., site scale linkages) is to be assessed. The function and conceptual location of linkages and enhancements shall be confirmed and defined through this phase. Linkages are important in reducing the potential for adverse impacts of habitat fragmentation on natural areas. The management strategies shall be documented to:

- Demonstrate protection of features retained as components of the NHS;
- Demonstrate efficacy of mitigation measures to protect features from impacts associated with proposed development.
- Clearly identify linkages and enhancements necessary to maintain system connectivity (and thus functions).
- Demonstrate how system targets are met.

Where a continuous ELC-defined vegetation community extends beyond the subject areas, the assessment shall generally address the entire community, including portions beyond the study area boundaries.

Additionally, the impact assessment should consider the degree to which any changes in the recommendations of the Scoped SWS could have potential for negative impacts. For example, this may include assessing changes to/removal of proposed linkages and/or enhancement areas, Alterations and impacts are to be considered at both the site-scale and system-scale.

In addition to management strategies that address land use impacts, consideration should also be given to impacts or opportunities associated with the active transportation network (particularly NHS/WRS crossings) and trail networks.

2.3.6 Surface Water Quality

The Study Team shall investigate potential land use impacts (i.e., increased imperviousness, land use type changes, etc.) and develop strategies to maintain or enhance in-stream water quality. Actions to address existing point and non-point sources of pollution potentially resulting in degraded water quality shall be developed. Within the New Urban Area and New Employment Area includes occupied and contributing Redside Dace habitat. To ensure sufficient thermal mitigation the impact assessment will need to consider the resulting thermal impact of the changing land uses.

Best Management Practices (BMPs) for urban stormwater management shall be recommended for all new developments to address stormwater quality. The proposed BMPs shall be in accordance with the requirements of the MECP and the Municipality including the Provincial guidance which focuses on a treatment train approach using LID BMPs.

2.3.7 Phase 2 Report – Impact Assessment

At the completion of the Phase 2 Impact Assessment the results of the iterative land use assessments will need to be prepared (i.e., one for each iteration) outlining the findings of the Impact Assessment. The Report shall be submitted to document the results of the impact assessment and the preliminary evaluation of the stormwater management options and recommended subwatershed management strategies, as they relate to the proposed development. The water (surface/ground) modelling input and output files shall be appended to this report. In addition, constraints and opportunities present in the study area, in terms of urban expansion, environment impacts and protection, shall be clearly documented with GIS maps for the associated locations.

Note: It is expected that a Draft Table of Contents will be submitted for review and comment well in advance of the Draft Report submission.

2.4 Phase 3 – Management, Implementation and Monitoring Plan

Phase 3 shall identify and set the framework for implementation and monitoring of the preferred subwatershed's management strategy building from the results of the iterative land use impact assessments, as part of Phase 2. Management recommendations are required to address the objectives identified in the Settlement Area Boundary Expansion Scoped Subwatershed Study, as well as the goals, objectives and targets from the parent watershed plan for the respective Secondary Plan Areas. A Management, Implementation, and Monitoring Plan shall be developed, which sets out the requirements for phasing, operation of facilities, and monitoring to ensure that the future development(s) are in compliance with the recommendations associated with the approved Local Subwatershed Study and Secondary Plan Policies. The direction provided in the Settlement Area Boundary Expansion Scoped Subwatershed Study - Part C: Implementation Plan (Wood et. al., January 2022) shall be used as the foundation for developing the monitoring plan to further refine, develop and identify management recommendations and requirements established through the detailed subwatershed studies. The Phase 3

work will be completed when a preferred land use plan has been determined based upon the findings and recommendations from Phase 1 and 2 of the detailed Subwatershed Study, considering the natural heritage system and water resource system direction and guidance, as well as the companion studies for transportation and servicing. The findings of this study will provide implementation recommendations and a technical framework for future infrastructure works and support the future development proposals in accordance with the approved Secondary Plan.

The stormwater management strategy will need to outline the siting for various components of the overall stormwater management plan, including key locations for facilities and general guidance for selecting green infrastructure and LID practices to manage the impacts to the Natural Heritage System and Water Resources System. The scope for additional studies will also need to be identified that are to be completed in support of future Tertiary Plans, Draft Plans of Subdivisions or Condominium, and Site Plans as required, to meet the objectives and targets of the Local Subwatershed Study. The Local Subwatershed Study is to identify preliminary locations for logical development blocks based on contiguous drainage sheds for consideration as part of future neighbourhood plans and/or tertiary plans. The scope for additional studies should include requirements to complete hydrologic and/or hydraulic modelling to verify the stormwater management criteria established in the higher-level studies based upon more detailed information, and revise/refine the criteria as required.

Management strategies are required that will consider and preserve the local and functional linkages of sensitive groundwater recharge and discharge areas, the potential groundwater quantity impacts on the private wells and groundwater quality degradation. Groundwater management strategies should include technical input (quantitative and qualitative) into the determination or refinement of hydrogeologically sensitive areas relating to both recharge and discharge, issues related to shallow water table or strong upward gradients, potential location and function of Stormwater Management facilities and other BMPs, as well as planning and policy recommendations for groundwater quantity and quality protection.

Watercourse management recommendations will be made at the reach scale and based on an integrated characterization of feature constraints, with site-specific opportunities presented as appropriate. Similarly, headwater drainage feature management recommendations will be based on the outcome of the Local Subwatershed Study, through the application of the TRCA/CVC (2014) guidelines with reach-scale recommendations. Deviations from the recommendations of the HDF guidelines will require that site modifiers are identified to justify changes in the management recommendation. Management recommendations and opportunities are to be developed in consultation with the Study's TAC, with agreement prior to study conclusion.

Managing features of the NHS will build on the proposed strategy outlined in the Scoped Subwatershed Study following the recommended Net Gain Mitigation Hierarchy approach. Specific management strategies and implementation recommendations should be prescribed for features/areas based on - avoidance (i.e., protect in-situ), minimize and mitigate, linkage, enhance, replicate, and compensate. The framework outlined in the Scoped SWS provides a detailed overview of the various management approaches. Avoidance is required and/or recommended for key features (e.g., protected by policy) and/or supporting features included in the NHS. Minimization of impacts and mitigation strategies should identify the required set of integrated approaches that reduce the degree of disturbance and impacts on natural features resulting from the proposed land use changes. Linkage recommendations should include specific design and implementation requirements to support connectivity at multiple scales (landscape, local, and site-scale). Enhancement recommendations should identify improvements to biological composition and function of areas in the context of the local landscape (e.g., habitat diversity / availability) or within the

system (e.g., under-represented habitats). Replication and/or compensation management strategies should be identified, as a last resort, for features that cannot be protected in-situ, but require inclusion in the NHS; sufficient guidance should be presented such that the success of the proposed replication and/or compensation can be assured based on appropriate site selection, restoration protocols, financing, and long-term ownership/management responsibility

Phase 3 shall outline the agencies/organizations that are responsible for carrying out the various recommendations and specify when in the development process the various recommendations need to be initiated. Phase 3 shall include:

- Timing and Phasing recommendations for the construction of any required facilities with respect to the future development; these recommendations will inherently need to consider the influence of other infrastructure as well;
- Asset Management Strategies such as:
 - A Phasing and Funding strategy for the construction and maintenance of the facilities;
 - Recommendations for future studies;
- An Adaptive Management and Monitoring Plan to monitor the subwatershed's response to land use change and suggest adaptive responses where impacts are being observed; the monitoring program will need to ensure compliance with the Local Subwatershed Study, and a strategy for corrective actions which may be necessary based on results of the monitoring program; it is notable that MECP is advancing industry guidance for broad-based community monitoring plans to support the Consolidated Linear Infrastructure ECA process; this guidance is expected in 2024 at which point the Municipality will have 2 years to prepare a plan for MECP review and approval; the Local SWS monitoring program should take this into consideration and align with its requirements accordingly;
- Assist Secondary Plan Team with developing policies for consideration in the Secondary Plan;
- Criteria and time frame for the review/update of the Local Subwatershed Plan;

The Management, Implementation, and Monitoring Plan shall also recommend the phasing of development, and provide guidance to address climate change considerations, particularly demonstrating compliance with the Town of Caledon's Community Climate Change Action Plan and the Peel Region's Climate Change Master Plan. This will permit changes to recommend mitigation measures and management strategies for future phases of the development, in the case where results of monitoring from the initial phases suggest that changes are warranted.

Note: It is expected that a Draft Table of Contents will be submitted for review and comment well in advance of the Draft Report submission.

Consultation and Engagement:

Fulsome consultation and engagement are the cornerstone to a successful land use study process. It is important to integrate and coordinate the consultation and engagement associated with the Secondary Plan and companion studies with the Local Subwatershed Study. The reason for this is to ensure that the public understands the relationship of environmental and water-based studies to the community planning associated with the Secondary Plan.

As noted, a TAC should be formed and at minimum three (3) meetings of the TAC will be required roughly aligned with each phase of the Subwatershed Study. A minimum of two (2) Public Information Centers (PICs) should be held and can again aligned with those points of contact for the Secondary Plan.

Indigenous Peoples and Nations engagement is similarly important to consider throughout the land use planning process, hence it is again recommended that the local SWS work to align communications with Indigenous People and Nations in accordance with the protocols of the Province and the Town of Caledon, fully coordinated with the land use planning provisions.

Appendix A – Available Data and Data Sources

Table 1: Peel SABE Secondary Plan Area Screening (Water Resources and Natural Heritage System)

Proposed Secondary Plan Area	1. Are there any Secondary Plan boundaries that cross multiple watershed and subwatershed boundaries?	2. Given different sizes of Secondary Plan boundaries, are there any concerns, from a subcatchment/drainage perspective?	3. Any large contiguous natural heritage areas divided by Secondary Plan boundaries?	4. Are there important dependencies on contiguous Secondary Plan units that would need to be considered?	5. General Recommendations/Considerations of grouping Secondary Plan areas for detailed SWSs
A1	Two watershed and four subwatersheds. Overlap with Credit River includes Glen Williams to Norval, Huttonville, and Fletchers.	Subcatchments do not overlap with other Secondary Plan areas	No. Divisions are generally broken by the GTA West roadway.	Water resources are generally not dependent on other SPAs. However, being within two Conservation Authority jurisdictions and within the headwaters of four subwatersheds will result in some complexities related to downstream impacts. Natural Heritage System implications will largely relate to understanding cross watershed connectivity, and ensuring systems planning for linkages and enhancements within the Etobicoke Creek subwatershed are consistent with SPA B.	Consolidate SPAs A, B, C, and D (west and south) for west side SWS.
B1	Entirely within Etobicoke Creek.	Subcatchments overlap with Secondary Plan Area C.	Complex overlap with natural heritage and water resource system. Divides various Etobicoke Creek valley corridors. Northwest area splits two HDF corridors. Resulting in 10 +/- segregated tableland areas.	Water resources are contiguous with those in SPA A and C, as well SPA B has shared Subcatchments with the west section of SPA C. Natural Heritage System implications are complex with various linkage and enhancement considerations that will require systems coordination with SPA A and C.	Consolidate SPAs A, B, C, and D (west and south) for west side SWS.
B2, C3	Predominantly Etobicoke Creek: east section overlaps into West Humber River.	Subcatchments in west section overlap with SPA B, subcatchments in east section overlap with SPA D.	Generally supportable. Overlaps with four Etobicoke Creek valley corridors.	Water resources are generally not dependent on other SPAs. However, the west section of SPA C drains into SPA B, and the east section drains to SPA D (west). Natural Heritage System implications are complex with various linkage and enhancement considerations that will require systems planning with SPA B and D (west).	Consolidate SPAs A, B, C, and D (west and south) for west side SWS.
C2, C1, D1, E1	Overlaps Etobicoke Creek and West Humber River, and very small section of Spring Creek.	Subcatchments overlap with SPA C. East unit subcatchments overlap with SPA E.	West community area unit is most problematic, overlapping with a complex series of valley corridors. East section of west unit also crosses from Etobicoke Creek to West Humber River.	Water resources for SPA D (west) are contiguous with those in the east section of SPA C, and have overlapping subcatchments with the southeast section of SPA C. The northeast and southeast units are generally not dependent on other SPAs; however, the northeast unit does have overlapping subcatchments with SPA E. Natural Heritage System implications are complex for SPA D (west) with linkage and enhancement considerations with SPA B and SPA C. The northeast and southeast units are less complex.	Consolidate SPAs A, B, C, and D (west and south) for west side SWS. Consolidate SPAs D (east), E, F, and G for west central SWS.
D2, E2, E3, E4, E5	Entirely within West Humber River	West area subcatchments overlap with SPA D.	Secondary Plan area is divided by major valley; major features/corridors maintained.	Water resources for SPA E are generally not contiguous with other those in other SPAs. However, subcatchments within the west section of SPA E overlap with SPA D (northeast unit). Natural Heritage System linkage and enhancements are generally contained with the SPA. There are however important interfaces with major valley corridors that are shared with SPA F.	Consolidate E1, E2, E3, E4, D2, F1, F2, G1, and G2 G for west central SWS.
F1, F2	Entirely within West Humber River	East area subcatchments overlap with SPA G.	Major valley corridor splits Secondary Plan area.	Water resources in SPA F are generally not contiguous with other SPAs. There are however subcatchment overlaps with SPA E and SPA G. As well, drainage from much of the east section of SPA F flows into SPA G. Natural Heritage System linkage and enhancements are moderately complex. The west section of SPA F interfaces with the major valley corridor shared with SPA E; as well, localized linkages and enhancements along small watercourse systems are shared with SPA G.	Consolidate SPAs E1, E2, E3, E4, D2, F1, F2, G1, and G2 for west central SWS.
G1, G2	Entirely within West Humber	West area subcatchments overlap with SPA F2.	Significant headwater features	Water resources in west section of SPA G are contiguous and share subcatchments with SPA F2. The east section of SPA G is not contiguous with other SPAs.	Consolidate SPAs E1, E2, E3, E4, D2, F1, F2, G1, and G2 as part of west central SWS.

Proposed Secondary Plan Area	1. Are there any Secondary Plan boundaries that cross multiple watershed and subwatershed boundaries?	2. Given different sizes of Secondary Plan boundaries, are there any concerns, from a subcatchment/drainage perspective?	3. Any large contiguous natural heritage areas divided by Secondary Plan boundaries?	4. Are there important dependencies on contiguous Secondary Plan units that would need to be considered?	5. General Recommendations/Considerations of grouping Secondary Plan areas for detailed SWSs
				Natural Heritage System linkages and enhancements in the west section of SPA G are shared with SPA F. As well, on the east boundary interfaces with a major valley system shared with SPA H.	
H1	Entirely within West Humber River	North area subcatchments overlap with SPA H2 & H3.	No issues	Water resources in SPA H are contiguous with a complex network of watercourses and headwater drainage features in SPA I (which in turn is contiguous with water resources in SPA J). Natural Heritage System linkage and enhancements are contiguous with those proposed for SPA I. As well, the west boundary interfaces with a major valley system shared with SPA G.	Consolidate SPAs H2, H3, and H4 as part of east central SWS.
H2, H3	Entirely within West Humber River	North area subcatchments overlap with SPA H4. South area subcatchments overlap with SPA H1.	No major issues. Some HDF/valley corridors divided along boundary with SPA J.	Water resources in SPA H2 and H3 are contiguous with SPAs H1 and H4. Natural Heritage System linkage and enhancements are shared between SPAs J and H.	Consolidate SPAs H1, H2, H3 and H4 as part of east central SWS.
H4, Part of H3 (northeast of King and Emil Kolb)	Overlaps West Humber and Main Humber Rivers	South area subcatchments overlap with SPA in the south section of H3 (south of King).	Some HDF/valley corridors divided along boundary with SPA H3. North boundary bisects supporting features.	Water resources in SPA J are not dependent on other SPAs, but are contiguous with SPA I, including shared subcatchment boundaries.	Consolidate SPAs H, I, and J as part of east central SWS.
I1, I2	Entirely within Main Humber River	Subcatchments do not overlap with other Secondary Plan areas	North edge of west unit bisects key/supporting feature. East unit bisects a variety of supporting features.	Water resources and Natural Heritage System linkage and enhancements are not contiguous with or directly linked to those in other SPAs.	SPA I1 and I2 can stand alone as a separate SWS.

Table 2: Subwatershed System Summary of Available Data

SUBWATERSHED GROUPING	SUBWATERSHED SYSTEMS	SECONDARY PLAN AREAS	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
1	Credit River Systems	Partial A	<p>Streamflow Gauge: <i>Station ID: EM7</i></p> <ul style="list-style-type: none"> Data Type: flow and water level Collection method: N/A Period of record: 2012-2019 Time step: 15 mins Ownership: CVC <p><i>Station ID: EM8</i></p> <ul style="list-style-type: none"> Data Type: flow and water level Collection method: N/A Period of record: 2012-2019 Time step: 15 mins Ownership: CVC <p><i>Station ID: Huttonville Creek at Lionhead Gold Course</i></p> <ul style="list-style-type: none"> Data Type: water level and air temperature Collection method: N/A Period of record: 2013-2019 Time step: 15 mins Ownership: CVC 	<p>Floodplain Mapping:</p> <ul style="list-style-type: none"> Engineered flood lines beyond the SPA boundaries (west and downstream). <p>Hydraulic Model: <i>Huttonville Creek</i></p> <ul style="list-style-type: none"> Hydraulic Model: HEC-RAS Year Completed: 2011 Source: AMEC <p><i>Fletcher's Creek</i></p> <ul style="list-style-type: none"> Hydraulic Model: HEC-RAS Year Completed: 2011 Source: AMEC 	<ul style="list-style-type: none"> Oak Ridges Moraine Groundwater Monitoring Program (ORMGP). Provincial Water Well Information System. Provincial Permit to Take Water Database. Provincial Groundwater Monitoring Database. Ontario Geological Survey Mapping. 	<p>Watercourses:</p> <ul style="list-style-type: none"> CVC rivers and streams Scoped SWS for SABE (2021) – New mapping or geoprocessed base data – Region, updated to reflect 2018 air photo and based on LiDAR; Watercourse constraint rankings (high, medium, low constraint); Potential headwater drainage features delineated. <p>Erosion Hazard Mapping:</p> <ul style="list-style-type: none"> TRCA (2019) meander belt width. Scoped SWS for SABE (2021) - Meander belt widths updated accordingly. 	<p>Existing Data</p> <ul style="list-style-type: none"> Ecological Land Classification (TRCA and CVC) GIS layers for each Conservation Authority jurisdiction that includes identification of vegetation community types Various features layers (wetlands, woodlands, watercourses, ponds/lakes) Flora/Fauna records (TRCA and CVC monitoring; NHIC, open source data) Significant Wildlife Habitat (CVC – various types) Climate Change Vulnerability data (TRCA - various types) <p>Scoped SWS Data</p>	<p>Thermal regime by stream segment:</p> <ul style="list-style-type: none"> Identifies segments as warm, cool, or coldwater. Available from Land Information Ontario (LIO). <p>Fish sampling data</p> <ul style="list-style-type: none"> Includes sampling date, method, and species captured. Available from Land Information Ontario (LIO). <p>Locations of Redside Dace (<i>Clinostomus elongatus</i>) occupied stream reaches and potential contributing habitat</p> <ul style="list-style-type: none"> Occupied reaches present downstream.

SUBWATERSHED GROUPING	SUBWATERSHED SYSTEMS	SECONDARY PLAN AREAS	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
			<p><i>Station ID: Fletcher's Creek at Highway 7</i></p> <ul style="list-style-type: none"> Data Type: water level Collection method: N/A Period of record: 2010-2019 Time step: 15 mins Ownership: CVC <p>Water Quality Station: <i>Station ID: 06007600302</i></p> <ul style="list-style-type: none"> Monitoring condition: unknown Period of record: 1965-2016 Ownership/provider: MECP <p><i>Station ID: EM7</i></p> <ul style="list-style-type: none"> Monitoring condition: Wet and Dry weather condition Period of record: 2013 May to October, 2015 June to August Ownership/provider: CVC <p><i>Station ID: EM8</i></p> <ul style="list-style-type: none"> Monitoring condition: Wet and Dry weather condition Period of record: 2013 June to October, 2015 June to August Ownership/provider: CVC <p><i>Station ID: 501070008 (Huttonville Creek at Lionhead Golf and Country Club)</i></p> <ul style="list-style-type: none"> Monitoring condition: Unknown Period of record: 2014 August to November, 2016 January to November, 2018 January to November Ownership/provider: CVC <p>Hydrologic Models:</p> <ul style="list-style-type: none"> Hydrologic Model: HSP-F Type of Assessment: continuous simulation Year Completed: 2011 Source: Northwest Brampton Subwatershed Study, AMEC 			<p>Erosion Threshold Sites</p> <ul style="list-style-type: none"> North West Brampton Urban Development Area - Huttonville and Fletcher's Creeks Subwatershed Study (2010)– Existing erosion threshold site SW-4 downstream of FSA. Scoped SWS for SABE (2021) - Proposed erosion threshold site within FSA <p>Orthoimagery/LiDAR</p> <ul style="list-style-type: none"> Digital Air Photos of Southern Ontario (Hunter Corporation 1954) – are publicly available through University of Toronto 2018 Orthophoto (Region) – Coverage of City of Brampton 	<ul style="list-style-type: none"> Landscape sensitivity L-rank (Woodlands, Wetlands, Meadows) Landscape Connectivity Vegetation community L-rank Locally rare/sensitive species occurrence Species of Conservation Concern/Species at Risk Significant Wildlife Habitat Valley crossing sensitivity Natural Heritage System Components (Woodlands, Wetlands, Meadows, Valleylands, Watercourses, Savannah, Redside Dace) Preliminary NHS Preliminary NHS Linkages Preliminary NHS Enhancements 	
	Etobicoke Creek	Partial A1, B1, B2, C2 and C3	<p>Precipitation Gauge: <i>Station ID: Sue Grange Farms (HY061)</i></p> <ul style="list-style-type: none"> Data Type: precipitation (rain/snow) Period of Record: 1981-2019 Time Step: N/A 	<p>Floodplain Mapping:</p> <ul style="list-style-type: none"> Estimated floodplain. Flood line from engineered flood study in south of watershed Limited engineered floodplains, found in 	<ul style="list-style-type: none"> Oak Ridges Moraine Groundwater Monitoring Program (ORMGP). Provincial Water Well Information System. 	<p>Watercourses:</p> <ul style="list-style-type: none"> TRCA watercourses, waterbodies, drainage, wetlands Scoped SWS for SABE (2021) – New mapping or 	<p>Existing Data</p> <ul style="list-style-type: none"> Ecological Land Classification (TRCA and CVC) GIS layers for each Conservation Authority jurisdiction that includes 	<p>Thermal regime by stream segment:</p> <ul style="list-style-type: none"> Identifies segments as warm, cool, or coldwater. Available from Land Information Ontario (LIO).

SUBWATERSHED GROUPING	SUBWATERSHED SYSTEMS	SECONDARY PLAN AREAS	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
			<ul style="list-style-type: none"> Ownership: TRCA <p>Streamflow Gauge: Station ID: Etobicoke at 410 (HY101)</p> <ul style="list-style-type: none"> Data Type: water level Collection method: sensors Period of record: 2017-2020 Time step: N/A Ownership: TRCA <p>Station ID: Etobicoke Creek at Brampton (02HC017)</p> <ul style="list-style-type: none"> Data Type: flow and water level Collection method: continuous recorder from 2003-2020 Period of record: 1957-2020 (active) Time step: 5 mins Ownership: Environment Canada <p>Station ID: Etobicoke at Brampton</p> <ul style="list-style-type: none"> Data Type: water level Collection method: sensors Period of record: 2007-2020 Time step: N/A Ownership: TRCA <p>Water Quality Station: Station ID: Mayfield-EC1</p> <ul style="list-style-type: none"> Monitoring condition: unknown Period of record: 2016-Jan to 2018-March Ownership/provider: TRCA <p>Station ID: Mayfield-EC3</p> <ul style="list-style-type: none"> Monitoring condition: unknown Period of record: 2016-Jan to 2018-March Ownership/provider: TRCA <p>Station ID: Mayfield-EC4</p> <ul style="list-style-type: none"> Monitoring condition: unknown Period of record: 2016-Jan to 2018-March Ownership/provider: TRCA <p>Station ID: Mayfield RWMP</p> <ul style="list-style-type: none"> Monitoring condition: unknown 	<p>southern and eastern region of watershed.</p> <p>Hydraulic Model: Etobicoke Creek</p> <ul style="list-style-type: none"> Hydraulic Model: HEC-RAS Year Completed: 2016 Source: Aquafor Beech Limited <p>Downtown Brampton SPA</p> <ul style="list-style-type: none"> Hydraulic Model: HEC-RAS Year Completed: 2014 Source: Amec Foster Wheeler <p>Hydraulic Structures: Etobicoke Creek – 26.795</p> <ul style="list-style-type: none"> HEC-RAS Coding: Bridge Structure Type: Open bridge <p>Etobicoke Creek – 26.735</p> <ul style="list-style-type: none"> HEC-RAS Coding: Multiple opening Structure Type: Open bridge 	<ul style="list-style-type: none"> Provincial Permit to Take Water Database. Provincial Groundwater Monitoring Database. Ontario Geological Survey Mapping. 	<p>geoprocessed base data – Region, updated to reflect 2018 air photo and based on LiDAR; Watercourse constraint rankings (high, medium, low constraint); Potential headwater drainage features delineated.</p> <p>Erosion Hazard Mapping:</p> <ul style="list-style-type: none"> TRCA (2019) meander belt width and crest of slope mapping Scoped SWS for SABE (2021) - Meander belt widths and erosion hazard limits updated accordingly. <p>Erosion Threshold Sites</p> <ul style="list-style-type: none"> Mayfield West, Phase 2 Secondary Plan Comprehensive Environmental Impact Study and Management Plan, Part A (2014) - Existing erosion threshold sites within FSA Scoped SWS for SABE (2021) - Proposed erosion threshold site within FSA <p>Orthoimagery/LiDAR</p> <ul style="list-style-type: none"> Digital Air Photos of Southern Ontario (Hunter Corporation 1954) – are publicly available through University of Toronto 2018 Orthophoto (Region) – Coverage of Town of Caledon LiDAR (1m) and LiDAR derived contours (1m) <p>Regulation Limits</p> <ul style="list-style-type: none"> TRCA 2019 Regulation Limits <p>Erosion Monitoring Locations</p>	<p>identification of vegetation community types</p> <ul style="list-style-type: none"> Various features layers (wetlands, woodlands, watercourses, ponds/lakes) Flora/Fauna records (TRCA and CVC monitoring; NHIC, open source data) Significant Wildlife Habitat (CVC – various types) Climate Change Vulnerability data (TRCA - various types) <p>Scoped SWS Data</p> <ul style="list-style-type: none"> Landscape sensitivity L-rank (Woodlands, Wetlands, Meadows) Landscape Connectivity Vegetation community L-rank Locally rare/sensitive species occurrence Species of Conservation Concern/Species at Risk Significant Wildlife Habitat Valley crossing sensitivity Natural Heritage System Components (Woodlands, Wetlands, Meadows, Valleylands, Watercourses, Savannah, Redside Dace) Preliminary NHS Preliminary NHS Linkages Preliminary NHS Enhancements 	<p>Fish sampling data</p> <ul style="list-style-type: none"> Includes sampling date, method, and species captured. Available from Land Information Ontario (LIO). <p>TRCA fish community monitoring data for Etobicoke Creek watershed:</p> <ul style="list-style-type: none"> Includes sampling location, date, and number and total weight of fish captured, by species. Provided to SABE team as Excel file by CVC – current to 2019. <p>TRCA benthic invertebrate monitoring data for Etobicoke Creek watershed.</p> <ul style="list-style-type: none"> Includes sampling location, date, habitat type, and number of individuals in the sample, by family. Provided to SABE team as Excel file by CVC – current to 2018.

SUBWATERSHED GROUPING	SUBWATERSHED SYSTEMS	SECONDARY PLAN AREAS	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
			<ul style="list-style-type: none"> Period of record: 2015-Jan to 2018-March Ownership/provider: TRCA <i>Station ID: Mayfield-EC6</i> Monitoring condition: unknown Period of record: 2016-Jan to 2018-March Ownership/provider: TRCA <p>Hydrologic Models:</p> <ul style="list-style-type: none"> Hydrologic Model: Visual OTTHYMO Version 2.4 Type of Assessment: Synthetic design storms Year Completed: 2013 Source: Etobicoke Creek Hydrology Update, MM Group Ltd 			<ul style="list-style-type: none"> TRCA - site locations, last year inspected, watercourse info, site status (active/inactive) and comments on site conditions/observations (details and completion of notes varies); downstream of FSA. <p>Stream Power Mapping</p> <ul style="list-style-type: none"> Scoped SWS for SABE (2021) - LiDAR based 		
2	West Humber (West)	D1, D2, E1, E2, E3, E4, E5, F1, F2, G1, G2	<p>Precipitation Gauge: <i>Station ID: Toronto Pearson Airport (6152695)</i></p> <ul style="list-style-type: none"> Data Type: precipitation (rain/snow), temperature (max/min), windspeed Period of Record: 1953-2020 (active) Time Step: hourly, daily, monthly Ownership: Environment Canada <p><i>Station ID: Laidlaw Bus Depot/Tullamore (HY041)</i></p> <ul style="list-style-type: none"> Data Type: precipitation (rain/snow) Period of Record: 2013-2020 Time Step: N/A Ownership: TRCA <p>Streamflow Gauge: <i>Station ID: Humber at Goreway</i></p> <ul style="list-style-type: none"> Data Type: flow and water level Collection method: sensors Period of record: 2012-2020 Time step: N/A Ownership: TRCA <p><i>Station ID: West Humber at Hwy 7 (02HC031)</i></p> <ul style="list-style-type: none"> Data Type: flow and water level 	<p>Hydraulic Models: <i>West Humber</i></p> <ul style="list-style-type: none"> Hydraulic Model: HEC-RAS Year Completed: 2017 Source: Cole Engineering Ltd <p>Hydraulic Structures:</p> <p>West Humber – 1380.675</p> <ul style="list-style-type: none"> HEC-RAS Coding: Culvert Structure Type: CSP Arch <p>West Humber – 1355.061</p> <ul style="list-style-type: none"> HEC-RAS Coding: Culvert Structure Type: CSP Arch <p>West Humber – 1353.874</p> <ul style="list-style-type: none"> HEC-RAS Coding: Culvert Structure Type: CSP Arch <p>West Humber – 1304.84</p> <ul style="list-style-type: none"> HEC-RAS Coding: Culvert Structure Type: CSP Arch <p>West Humber Crk – 679.4845</p> <ul style="list-style-type: none"> HEC-RAS Coding: Bridge Structure Type: Open Bridge with Pier <p>Floodplain Mapping:</p> <ul style="list-style-type: none"> Estimated floodplain. 	<ul style="list-style-type: none"> Oak Ridges Moraine Groundwater Monitoring Program (ORMGP). Provincial Water Well Information System. Provincial Permit to Take Water Database. Provincial Groundwater Monitoring Database. Ontario Geological Survey Mapping. 	<p>Watercourses:</p> <ul style="list-style-type: none"> TRCA watercourses, waterbodies, drainage, wetlands Scoped SWS for SABE (2021) – New mapping or geoprocessed base data – Region, updated to reflect 2018 air photo and based on LiDAR; Watercourse constraint rankings (high, medium, low constraint); Potential headwater drainage features delineated. <p>Erosion Hazard Mapping:</p> <ul style="list-style-type: none"> TRCA (2019) meander belt width and crest of slope mapping Scoped SWS for SABE (2021) - Meander belt widths and erosion hazard limits updated accordingly. <p>Erosion Threshold Sites</p> <ul style="list-style-type: none"> Mayfield West, Phase 2 Secondary Plan Comprehensive 	<p>Existing Data</p> <ul style="list-style-type: none"> Ecological Land Classification (TRCA and CVC) GIS layers for each Conservation Authority jurisdiction that includes identification of vegetation community types Various features layers (wetlands, woodlands, watercourses, ponds/lakes) Flora/Fauna records (TRCA and CVC monitoring; NHIC, open source data) Significant Wildlife Habitat (CVC – various types) Climate Change Vulnerability data (TRCA - various types) <p>Scoped SWS Data</p> <ul style="list-style-type: none"> Landscape sensitivity L-rank (Woodlands, Wetlands, Meadows) Landscape Connectivity Vegetation community L-rank Locally rare/sensitive species occurrence 	<p>Thermal regime by stream segment:</p> <ul style="list-style-type: none"> Identifies segments as warm, cool, or coldwater. Available from Land Information Ontario (LIO). <p>Fish sampling data:</p> <ul style="list-style-type: none"> Includes sampling date, method, and species captured. Available from Land Information Ontario (LIO). <p>TRCA fish community monitoring data for Humber River watershed:</p> <ul style="list-style-type: none"> Includes sampling location, date, and number and total weight of fish captured, by species. Provided to SABE team as Excel file by CVC – current to 2019. <p>TRCA benthic invertebrate monitoring data for Humber River watershed.</p> <ul style="list-style-type: none"> Includes sampling location, date, habitat type, and number of individuals in the sample, by family. Provided to SABE team as Excel file by CVC – current to 2018. <p>Locations of Redside Dace (Clinostomus elongatus) occupied stream reaches and potential contributing habitat</p> <ul style="list-style-type: none"> Occupied reaches provided in SABE report confirmed at the

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			<ul style="list-style-type: none"> Collection method: sensors Period of record: 2007-2020 Time step: N/A Ownership: TRCA <p><i>Station ID: West Humber at Hwy 7</i></p> <ul style="list-style-type: none"> Data Type: flow and water level Collection method: continuous recorder from 2002-2020 Period of record: 1965-2020 (active) Time step: 5 mins (real time) Ownership: Environment Canada <p>Water Quality Station: <i>Station ID: 06008310302</i></p> <ul style="list-style-type: none"> Monitoring condition: unknown Period of record: 2002-2016 <p>Ownership/provider: MECP</p>	<ul style="list-style-type: none"> Presence of engineered floodplains in southern region of watershed 		<p>Environmental Impact Study and Management Plan, Part A (2014) - Existing erosion threshold sites within FSA</p> <ul style="list-style-type: none"> Scoped SWS for SABE (2021) - Proposed erosion threshold sites within and downstream of FSA <p>Orthoimagery/LIDAR</p> <ul style="list-style-type: none"> Digital Air Photos of Southern Ontario (Hunter Corporation 1954) – are publicly available through University of Toronto 2018 Orthophoto (Region) – Coverage of Town of Caledon LiDAR (1m) and LiDAR derived contours (1m) <p>Regulation Limits</p> <ul style="list-style-type: none"> TRCA 2019 Regulation Limits <p>Erosion Monitoring Locations</p> <ul style="list-style-type: none"> TRCA - site locations, last year inspected, watercourse info, site status (active/inactive) and comments on site conditions/observations (details and completion of notes varies); downstream of FSA. <p>Stream Power Mapping</p> <ul style="list-style-type: none"> Scoped SWS for SABE (2021) - LiDAR based 	<ul style="list-style-type: none"> Species of Conservation Concern/Species at Risk Significant Wildlife Habitat Valley crossing sensitivity Natural Heritage System Components (Woodlands, Wetlands, Meadows, Valleylands, Watercourses, Savannah, Redside Dace) Preliminary NHS Preliminary NHS Linkages Preliminary NHS Enhancements 	<p>time by MOECP (current as of February 2021).</p> <ul style="list-style-type: none"> Potential contributing habitat in SABE report identified through desktop exercise.
3	West Humber (East)	H1, H2, H3, H4	<p>Streamflow Gauge: <i>Station ID: Claireville Dan</i></p> <ul style="list-style-type: none"> Data Type: water level Collection method: sensors Period of record: 2007-2020 Time step: N/A Ownership: TRCA 	<p>Floodplain Mapping:</p> <ul style="list-style-type: none"> Estimated floodplain. Presence of engineered floodplains in southern region of watershed. 	<ul style="list-style-type: none"> Oak Ridges Moraine Groundwater Monitoring Program (ORMGP). Provincial Water Well Information System. Provincial Permit to Take Water Database. 	<p>Watercourses:</p> <ul style="list-style-type: none"> TRCA watercourses, waterbodies, drainage, wetlands Scoped SWS for SABE (2021) – New mapping or geoprocessed base data – Region, updated to reflect 	<p>Existing Data</p> <ul style="list-style-type: none"> Ecological Land Classification (TRCA and CVC) GIS layers for each Conservation Authority jurisdiction that includes identification of vegetation community types 	<p>Thermal regime by stream segment:</p> <ul style="list-style-type: none"> Identifies segments as warm, cool, or coldwater. Available from Land Information Ontario (LIO). <p>Fish sampling data:</p> <ul style="list-style-type: none"> Includes sampling date, method, and species captured. Available from Land Information Ontario (LIO).

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					<ul style="list-style-type: none"> Provincial Groundwater Monitoring Database. Ontario Geological Survey Mapping. 	<p>2018 air photo and based on LiDAR; Watercourse constraint rankings (high, medium, low constraint); Potential headwater drainage features delineated.</p> <p>Erosion Hazard Mapping:</p> <ul style="list-style-type: none"> TRCA (2019) meander belt width and crest of slope mapping Scoped SWS for SABE (2021) - Meander belt widths and erosion hazard limits updated accordingly. <p>Erosion Threshold Sites</p> <ul style="list-style-type: none"> Mayfield West, Phase 2 Secondary Plan Comprehensive Environmental Impact Study and Management Plan, Part A (2014) - Existing erosion threshold sites within FSA Scoped SWS for SABE (2021) - Proposed erosion threshold sites within FSA <p>Orthoimagery/LiDAR</p> <ul style="list-style-type: none"> Digital Air Photos of Southern Ontario (Hunter Corporation 1954) – are publicly available through University of Toronto 2018 Orthophoto (Region) – Coverage of Town of Caledon LiDAR (1m) and LiDAR derived contours (1m) <p>Regulation Limits</p> <ul style="list-style-type: none"> TRCA 2019 Regulation Limits <p>Erosion Monitoring Locations</p> <ul style="list-style-type: none"> TRCA - site locations, last year inspected, watercourse info, site status (active/inactive) 	<ul style="list-style-type: none"> Various features layers (wetlands, woodlands, watercourses, ponds/lakes) Flora/Fauna records (TRCA and CVC monitoring; NHIC, open source data) Significant Wildlife Habitat (CVC – various types) Climate Change Vulnerability data (TRCA - various types) <p>Scoped SWS Data</p> <ul style="list-style-type: none"> Landscape sensitivity L-rank (Woodlands, Wetlands, Meadows) Landscape Connectivity Vegetation community L-rank Locally rare/sensitive species occurrence Species of Conservation Concern/Species at Risk Significant Wildlife Habitat Valley crossing sensitivity Natural Heritage System Components (Woodlands, Wetlands, Meadows, Valleylands, Watercourses, Savannah, Redside Dace) Preliminary NHS Preliminary NHS Linkages Preliminary NHS Enhancements 	<p>TRCA fish community monitoring data for Humber River watershed:</p> <ul style="list-style-type: none"> Includes sampling location, date, and number and total weight of fish captured, by species. Provided to SABE team as Excel file by CVC – current to 2019. <p>TRCA benthic invertebrate monitoring data for Humber River watershed.</p> <ul style="list-style-type: none"> Includes sampling location, date, habitat type, and number of individuals in the sample, by family. Provided to SABE team as Excel file by CVC – current to 2018. <p>Locations of Redside Dace (Clinostomus elongatus) occupied stream reaches and potential contributing habitat</p> <ul style="list-style-type: none"> Occupied reaches provided in SABE report confirmed at the time by MOECP (current as of February 2021). Potential contributing habitat in SABE report identified through desktop exercise

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						<p>and comments on site conditions/observations (details and completion of notes varies); downstream of FSA.</p> <p>Stream Power Mapping</p> <ul style="list-style-type: none"> Scoped SWS for SABE (2021) - LiDAR based 		
4	Main Humber	11, 12	<p>Streamflow Gauge: <i>Station ID: Bolton McFall Dam (HY006)</i></p> <ul style="list-style-type: none"> Data Type: flow and water level Collection method: sensors Period of record: 2007-2020 Time step: N/A Ownership: TRCA <p><i>Station ID: Cold Creek near Bolton (02HC023)</i></p> <ul style="list-style-type: none"> Data Type: flow and water level Collection method: continuous recorder from 2004-2020 Period of record: 1962-2020 (active) Time step: 5 mins (real time) Ownership: Environment Canada <p>Hydrologic Models:</p> <ul style="list-style-type: none"> Hydrologic Model: Visual OTTHYMO Version 4 Type of Assessment: Synthetic design storms Year Completed: 2015 Source: Humber Hydrology Update Report, Civica 	<p>Floodplain Mapping:</p> <ul style="list-style-type: none"> Estimated floodplain. Presence of engineered floodplains in southern region of watershed <p>Hydraulic Models: <i>Bolton SPA</i></p> <ul style="list-style-type: none"> Hydraulic Model: HEC-RAS Year Completed: N/A Source: N/A <p><i>Upper Main Humber</i></p> <ul style="list-style-type: none"> Hydraulic Model: HEC-RAS Year Completed: 2018 Source: N/A <p><i>Lower Main Humber</i></p> <ul style="list-style-type: none"> Hydraulic Model: HEC-RAS Year Completed: 2017 Source: Wood <p>Hydraulic Structures:</p> <p>Lower Humber – 148.4585</p> <ul style="list-style-type: none"> HEC-RAS Coding: Bridge Structure Type: Open Bridge with Pier <p>Lower Humber – 75.84924</p> <ul style="list-style-type: none"> HEC-RAS Coding: Bridge Structure Type: Open Bridge with Pier <p>Lower Humber – 4264.165</p> <ul style="list-style-type: none"> HEC-RAS Coding: Bridge Structure Type: Open Span Bridge with Pier <p>Lower Humber – 4201.13</p> <ul style="list-style-type: none"> HEC-RAS Coding: Bridge 	<ul style="list-style-type: none"> Oak Ridges Moraine Groundwater Monitoring Program (ORMGP). Provincial Water Well Information System. Provincial Permit to Take Water Database. Provincial Groundwater Monitoring Database. Ontario Geological Survey Mapping. 	<p>Watercourses:</p> <ul style="list-style-type: none"> TRCA watercourses, waterbodies, drainage, wetlands Scoped SWS for SABE (2021) – New mapping or geoprocessed base data – Region, updated to reflect 2018 air photo and based on LiDAR; Watercourse constraint rankings (high, medium, low constraint); Potential headwater drainage features delineated. <p>Erosion Hazard Mapping:</p> <ul style="list-style-type: none"> TRCA (2019) meander belt width and crest of slope mapping Scoped SWS for SABE (2021) - Meander belt widths and erosion hazard limits updated accordingly. <p>Erosion Threshold Sites</p> <ul style="list-style-type: none"> Mayfield West, Phase 2 Secondary Plan Comprehensive Environmental Impact Study and Management Plan, Part A (2014) - Existing erosion threshold sites within FSA 	<p>Existing Data</p> <ul style="list-style-type: none"> Ecological Land Classification (TRCA and CVC) GIS layers for each Conservation Authority jurisdiction that includes identification of vegetation community types Various features layers (wetlands, woodlands, watercourses, ponds/lakes) Flora/Fauna records (TRCA and CVC monitoring; NHIC, open source data) Significant Wildlife Habitat (CVC – various types) Climate Change Vulnerability data (TRCA - various types) <p>Scoped SWS Data</p> <ul style="list-style-type: none"> Landscape sensitivity L-rank (Woodlands, Wetlands, Meadows) Landscape Connectivity Vegetation community L-rank Locally rare/sensitive species occurrence Species of Conservation Concern/Species at Risk Significant Wildlife Habitat Valley crossing sensitivity Natural Heritage System Components (Woodlands, 	<p>Thermal regime by stream segment:</p> <ul style="list-style-type: none"> Identifies segments as warm, cool, or coldwater. Available from Land Information Ontario (LIO). <p>Fish sampling data:</p> <ul style="list-style-type: none"> Includes sampling date, method, and species captured. Available from Land Information Ontario (LIO). <p>TRCA fish community monitoring data for Humber River watershed:</p> <ul style="list-style-type: none"> Includes sampling location, date, and number and total weight of fish captured, by species. Provided to SABE team as Excel file by CVC – current to 2019. <p>TRCA benthic invertebrate monitoring data for Humber River watershed.</p> <ul style="list-style-type: none"> Includes sampling location, date, habitat type, and number of individuals in the sample, by family. Provided to SABE team as Excel file by CVC – current to 2018. <p>Locations of Redside Dace (Clinostomus elongatus) occupied stream reaches and potential contributing habitat</p> <ul style="list-style-type: none"> Occupied reaches provided in SABE report confirmed at the time by MOECP (current as of February 2021). Potential contributing habitat in SABE report identified through desktop exercise

SUBWATERSHED GROUPING	SUBWATERSHED SYSTEMS	SECONDARY PLAN AREAS	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
				<ul style="list-style-type: none"> Structure Type: Open Span Bridge with Pier Lower Humber – 4098.95 HEC-RAS Coding: Bridge Structure Type: Open Span Bridge with Pier 		<ul style="list-style-type: none"> Scoped SWS for SABE (2021) - Proposed erosion threshold sites within FSA <p>Orthoimagery/LiDAR</p> <ul style="list-style-type: none"> Digital Air Photos of Southern Ontario (Hunter Corporation 1954) – are publicly available through University of Toronto 2018 Orthophoto (Region) – Coverage of Town of Caledon LiDAR (1m) and LiDAR derived contours (1m) <p>Regulation Limits</p> <ul style="list-style-type: none"> TRCA 2019 Regulation Limits <p>Erosion Monitoring Locations</p> <ul style="list-style-type: none"> TRCA - site locations, last year inspected, watercourse info, site status (active/inactive) and comments on site conditions/observations (details and completion of notes varies); within and downstream of FSA. <p>Stream Power Mapping</p> <ul style="list-style-type: none"> Scoped SWS for SABE (2021) - LiDAR based 	<ul style="list-style-type: none"> Wetlands, Meadows, Valleylands, Watercourses, Savannah, Redside Dace) Preliminary NHS Preliminary NHS Linkages Preliminary NHS Enhancements 	

Table 3: Secondary Plan Area Summary of Available Data

SUBWATERSHED GROUPING	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
1	<ul style="list-style-type: none"> No existing monitoring stations within SPA. 	<ul style="list-style-type: none"> Estimated floodplain throughout SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4; one potential erosion threshold site. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Thermal regime by stream segment Fish sampling data Redside Dace (<i>Clinostomus elongatus</i>) occupied stream reaches present downstream in Fletchers Creek watershed.

SUBWATERSHED GROUPING	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
	<ul style="list-style-type: none"> No existing monitoring stations within SPA. 	<ul style="list-style-type: none"> Estimated floodplain throughout SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4; no potential erosion threshold sites. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Thermal regime by stream segment Fish sampling data TRCA fish community monitoring data TRCA benthic invertebrate monitoring data
	<ul style="list-style-type: none"> No existing monitoring stations within SPA. 	<ul style="list-style-type: none"> Estimated floodplain throughout SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4; no potential erosion threshold sites. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Thermal regime by stream segment Fish sampling data
	<ul style="list-style-type: none"> One (1) water quality monitoring location. 	<ul style="list-style-type: none"> Estimated floodplain throughout SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4; no potential erosion threshold sites. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Thermal regime by stream segment Fish sampling data TRCA fish community monitoring data TRCA benthic invertebrate monitoring data
2	<ul style="list-style-type: none"> No existing monitoring stations within SPA. 	<ul style="list-style-type: none"> Engineered and Estimated floodplain along the edges of the SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4; no potential erosion threshold sites. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Thermal regime by stream segment Fish sampling data Locations of Redside Dace (<i>Clinostomus elongatus</i>) occupied stream reaches and potential contributing habitat TRCA fish community monitoring data TRCA benthic invertebrate monitoring data
	<ul style="list-style-type: none"> No existing monitoring stations within SPA. 	<ul style="list-style-type: none"> Engineered flood lines in the northeast side and estimated floodplain in the west of SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4; 5 potential erosion threshold sites downstream of SPA. 	<ul style="list-style-type: none"> See Table 4.1 	<ul style="list-style-type: none"> Thermal regime by stream segment Fish sampling data Locations of Redside Dace (<i>Clinostomus elongatus</i>) occupied stream reaches and potential contributing habitat TRCA benthic invertebrate monitoring data
	<ul style="list-style-type: none"> No existing monitoring stations within SPA. 	<ul style="list-style-type: none"> Engineered flood lines in the center of SPA and estimated floodplain on the east and west of area. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4; one potential erosion threshold site within SPA and one downstream. 	<ul style="list-style-type: none"> See Table 4.1 	<ul style="list-style-type: none"> Thermal regime by stream segment Fish sampling data Locations of Redside Dace (<i>Clinostomus elongatus</i>) occupied stream reaches and potential contributing habitat
	<ul style="list-style-type: none"> No existing monitoring stations within SPA. 	<ul style="list-style-type: none"> Limited engineered flood lines in the east of the SPA and estimated floodplain. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4; one potential erosion threshold site within SPA and two downstream. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Thermal regime by stream segment Fish sampling data Locations of Redside Dace (<i>Clinostomus elongatus</i>)

SUBWATERSHED GROUPING	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
						occupied stream reaches and potential contributing habitat
3	<ul style="list-style-type: none"> No existing monitoring stations within SPA. 	<ul style="list-style-type: none"> Engineered flood lines in the center of SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4; one potential erosion threshold site downstream of SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Thermal regime by stream segment Fish sampling data Locations of Redside Dace (<i>Clinostomus elongatus</i>) occupied stream reaches and potential contributing habitat
	<ul style="list-style-type: none"> No existing monitoring stations within SPA. 	<ul style="list-style-type: none"> Estimated floodplain in the north side of SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4; three potential erosion threshold sites downstream of SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Thermal regime by stream segment Fish sampling data Locations of Redside Dace (<i>Clinostomus elongatus</i>) occupied stream reaches and potential contributing habitat
	<ul style="list-style-type: none"> No existing monitoring stations within SPA. 	<ul style="list-style-type: none"> Estimated floodplain in the west of SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4; no potential erosion threshold sites. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Thermal regime by stream segment Fish sampling data Locations of Redside Dace (<i>Clinostomus elongatus</i>) occupied stream reaches and potential contributing habitat
4	<ul style="list-style-type: none"> No existing monitoring stations within SPA. 	<ul style="list-style-type: none"> Estimated floodplain in north of SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4; five potential erosion threshold sites downstream of SPA. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Thermal regime by stream segment Fish sampling data Locations of Redside Dace (<i>Clinostomus elongatus</i>) occupied stream reaches and potential contributing habitat TRCA fish community monitoring data TRCA benthic invertebrate monitoring data

Table 4: Subwatershed Systems - Future Data Requirements

SUBWATERSHED GROUPING	SUBWATERSHED SYSTEM	SECONDARY PLAN AREAS	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
1	Credit River Systems	Partial A1	<ul style="list-style-type: none"> No additional monitoring stations required. 	<ul style="list-style-type: none"> No Credit River System Floodplains within SPA A. 	<ul style="list-style-type: none"> Monitoring well installations with borehole logs. Drivepoint piezometers. Manual and continuous water level measurements. Groundwater and surface water chemistry. Hydraulic conductivity measurements. Spot baseflow measurements. Seeps and springs observations. 	<ul style="list-style-type: none"> Updated watercourse mapping based on recent orthophoto Rapid Geomorphic Assessment Seasonally Based Headwater Drainage Features Assessments Confirm reach delineation, feature types, and erosion hazards Detailed surveys for erosion thresholds Confirm thresholds for MEC-R1, MEC-R2, MEC-R3, MEC-R8, MEC-R4(2), SW-4, and EM-10 	<ul style="list-style-type: none"> Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Site-specific determination of location and extent of Redside Dace contributing habitat.
	Etobicoke Creek	Partial A1, B1, B2, B3, C1, C2, and C3	<p>Precipitation Gauge:</p> <ul style="list-style-type: none"> Two (2) Rainfall Gauges <p>Streamflow Gauge:</p> <ul style="list-style-type: none"> Six (6) Stream Flow Gauges <p>Water Quality Station:</p> <ul style="list-style-type: none"> Four (4) Water Quality Stations 	<p>Hydraulic Structure Inventory:</p> <ul style="list-style-type: none"> Estimated Floodplain = Twenty-one (21) hydraulic structures requiring topographic survey Engineered Floodplain = Four (4) hydraulic structure requiring field verification 	<ul style="list-style-type: none"> Monitoring well installations with borehole logs. Drivepoint piezometers. Manual and continuous water level measurements. Groundwater and surface water chemistry. Hydraulic conductivity measurements. Spot baseflow measurements. Seeps and springs observations. 	<ul style="list-style-type: none"> Updated watercourse mapping based on recent orthophoto Rapid Geomorphic Assessment Seasonally Based Headwater Drainage Features Assessments Confirm reach delineation, feature types, and erosion hazards Detailed surveys for erosion thresholds 	<ul style="list-style-type: none"> Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined). Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined)

2	West Humber (West)	D1, D2, E1, E2, E3, E4, E5, F1, F2, G1, and G2	<p>Precipitation Gauge:</p> <ul style="list-style-type: none"> • Three (3) Rainfall Gauges <p>Streamflow Gauge:</p> <ul style="list-style-type: none"> • Thirteen (13) Stream Flow Gauges <p>Water Quality Station:</p> <ul style="list-style-type: none"> • Seven (7) Water Quality Stations 	<p>Hydraulic Structure Inventory:</p> <ul style="list-style-type: none"> • Estimated Floodplain = Sixteen (16) hydraulic structures requiring topographic survey • Engineered Floodplain = Fourteen (14) hydraulic structure requiring field verification 	<ul style="list-style-type: none"> • Monitoring well installations with borehole logs. • Drivepoint piezometers. • Manual and continuous water level measurements. • Groundwater and surface water chemistry. • Hydraulic conductivity measurements. • Spot baseflow measurements. • Seeps and springs observations 	<ul style="list-style-type: none"> • Updated watercourse mapping based on recent orthophoto • Rapid Geomorphic Assessment • Seasonally Based Headwater Drainage Features Assessments • Confirm reach delineation, feature types, and erosion hazards • Detailed surveys for erosion thresholds 	<ul style="list-style-type: none"> • Incorporate any new available background data • Ecological Land Classification – desktop analysis and field verification for all vegetated features • Botanical inventories – three season inventories for all vegetated features • Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat • Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas • Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> • Fish community information where sufficient information is not available (to be determined). • Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined) • Site-specific determination of location and extent of Redside Dace contributing habitat.
3	West Humber (East)	H1, H2, H3, H4	<p>Precipitation Gauge:</p> <ul style="list-style-type: none"> • One (1) Rainfall Gauge <p>Streamflow Gauge:</p> <ul style="list-style-type: none"> • Five (5) Stream Flow Gauges <p>Water Quality Station:</p> <ul style="list-style-type: none"> • Two (2) Water Quality Stations 	<p>Hydraulic Structure Inventory:</p> <ul style="list-style-type: none"> • Estimated Floodplain = Seven (7) hydraulic structures requiring topographic survey • Engineered Floodplain = Seven (7) hydraulic structure requiring field verification 	<ul style="list-style-type: none"> • Monitoring well installations with borehole logs. • Drivepoint piezometers. • Manual and continuous water level measurements. • Groundwater and surface water chemistry. • Hydraulic conductivity measurements. • Spot baseflow measurements. • Seeps and springs observations. 	<ul style="list-style-type: none"> • Updated watercourse mapping based on recent orthophoto • Rapid Geomorphic Assessment • Seasonally Based Headwater Drainage Features Assessments • Confirm reach delineation, feature types, and erosion hazards • Detailed surveys for erosion thresholds 	<ul style="list-style-type: none"> • Incorporate any new available background data • Ecological Land Classification – desktop analysis and field verification for all vegetated features • Botanical inventories – three season inventories for all vegetated features • Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat • Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas • Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> • Fish community information where sufficient information is not available (to be determined). • Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined) • Site-specific determination of location and extent of Redside Dace contributing habitat.
4	Main Humber	I1 and I2	<p>Precipitation Gauge:</p> <ul style="list-style-type: none"> • One (1) Rainfall Gauge <p>Streamflow Gauge:</p>	<p>Hydraulic Structure Inventory:</p> <ul style="list-style-type: none"> • Estimated Floodplain = Four (4) hydraulic 	<ul style="list-style-type: none"> • Monitoring well installations with borehole logs. • Drivepoint piezometers. 	<ul style="list-style-type: none"> • Updated watercourse mapping based on recent orthophoto 	<ul style="list-style-type: none"> • Incorporate any new available background data 	<ul style="list-style-type: none"> • Fish community information where sufficient information is not available (to be determined).

			<ul style="list-style-type: none"> One (1) Stream Flow Gauge 	<p>structures requiring topographic survey</p> <ul style="list-style-type: none"> Engineered Floodplain = Two (2) hydraulic structure requiring field verification 	<ul style="list-style-type: none"> Manual and continuous water level measurements. Groundwater and surface water chemistry. Hydraulic conductivity measurements. Spot baseflow measurements. Seeps and springs observations. 	<ul style="list-style-type: none"> Rapid Geomorphic Assessment Seasonally Based Headwater Drainage Features Assessments Confirm reach delineation, feature types, and erosion hazards Detailed surveys for erosion thresholds 	<ul style="list-style-type: none"> Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined) Site-specific determination of location and extent of Redside Dace contributing habitat.
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Table 5: Secondary Plan Area Future Data Requirements

SUBWATERSHED GROUPING	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
1	<p>Precipitation Gauge:</p> <ul style="list-style-type: none"> One (1) Rainfall Gauge <p>Streamflow Gauge:</p> <ul style="list-style-type: none"> One (1) Stream Flow Gauge <p>Water Quality Station:</p> <ul style="list-style-type: none"> One (1) Water Quality Station 	<ul style="list-style-type: none"> Estimated Floodplain = Four (4) structures requiring detailed topographic survey. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4 Confirm erosion thresholds for sites MEC-R1, MEC-R2, MEC-R3, MEC-R4(2), SW-4, and EM-10 	<ul style="list-style-type: none"> Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined). Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined) Site-specific determination of location and extent of Redside Dace contributing habitat (Credit River watershed only).
	<p>Streamflow Gauge:</p> <ul style="list-style-type: none"> Three (3) Stream Flow Gauges <p>Water Quality Station:</p> <ul style="list-style-type: none"> Three (3) Water Quality Stations 	<ul style="list-style-type: none"> Estimated Floodplain = Ten (10) structures requiring detailed topographic survey. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4 Confirm erosion thresholds for sites MEC-R1, MEC-R2, MEC-R3, MEC-R4(2), SW-4, and EM-10 	<ul style="list-style-type: none"> Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined). Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined)
	<p>Precipitation Gauge:</p> <ul style="list-style-type: none"> One (1) Rainfall Gauge (South) <p>Other Streamflow / Water Quality:</p>	<ul style="list-style-type: none"> Estimated Floodplain = Five (5) structures requiring detailed topographic survey. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4 Confirm erosion thresholds for sites MEC-R1, and MEC-R8 	<ul style="list-style-type: none"> Incorporate any new available background data 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined).

SUBWATERSHED GROUPING	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
	<ul style="list-style-type: none"> Gauges / Stations installed downstream in SPA B & D. 	<ul style="list-style-type: none"> Engineered Floodplain = Four (4) structures requiring field verification. 			<ul style="list-style-type: none"> Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined).
	<p>Precipitation Gauge:</p> <ul style="list-style-type: none"> One (1) Rainfall Gauge (North) <p>Streamflow Gauge:</p> <ul style="list-style-type: none"> Two (2) Stream Flow Gauges <p>Other Streamflow / Water Quality:</p> <ul style="list-style-type: none"> Additional Gauges / Stations installed downstream in SPA B. 	<ul style="list-style-type: none"> Estimated Floodplain = Three (3) structures requiring field verification. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> See Table 4 Confirm erosion thresholds for sites MEC-R1, and MEC-R8 	<ul style="list-style-type: none"> Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined). Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined).
2	<p>Streamflow Gauge:</p> <ul style="list-style-type: none"> One (1) Stream Flow Gauge <p>Water Quality Station:</p> <ul style="list-style-type: none"> One (1) Water Quality Station 	<ul style="list-style-type: none"> Engineered Floodplain = Two (2) structures requiring field verification. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Updated watercourse mapping based on recent orthophoto Rapid Geomorphic Assessment Seasonally Based Headwater Drainage Features Assessments Confirm reach delineation, feature types, and erosion hazards 	<ul style="list-style-type: none"> Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined). Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined)

SUBWATERSHED GROUPING	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
				<ul style="list-style-type: none"> Detailed surveys for erosion thresholds 	<ul style="list-style-type: none"> Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Site-specific determination of location and extent of Redside Dace contributing habitat.
	<p>Precipitation Gauge:</p> <ul style="list-style-type: none"> One (1) Rainfall Gauge <p>Streamflow Gauge:</p> <ul style="list-style-type: none"> Six (6) Stream Flow Gauges <p>Water Quality Station:</p> <ul style="list-style-type: none"> Four (4) Water Quality Stations 	<ul style="list-style-type: none"> Estimated Floodplain = Five (5) structures requiring detailed topographic survey. Engineered Floodplain = Nine (9) structures requiring field verification. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Updated watercourse mapping based on recent orthophoto Rapid Geomorphic Assessment Seasonally Based Headwater Drainage Features Assessments Confirm reach delineation, feature types, and erosion hazards Detailed surveys for erosion thresholds 	<ul style="list-style-type: none"> Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined). Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined) Site-specific determination of location and extent of Redside Dace contributing habitat.
	<p>Precipitation Gauge:</p> <ul style="list-style-type: none"> One (1) Rainfall Gauge <p>Streamflow Gauge:</p> <ul style="list-style-type: none"> Six (6) Stream Flow Gauges <p>Water Quality Station:</p> <ul style="list-style-type: none"> Three (3) Water Quality Stations 	<ul style="list-style-type: none"> Estimated Floodplain = Five (5) structures requiring detailed topographic survey. Engineered Floodplain = Five (5) structures requiring field verification. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Updated watercourse mapping based on recent orthophoto Rapid Geomorphic Assessment Seasonally Based Headwater Drainage Features Assessments Confirm reach delineation, feature types, and erosion hazards Detailed surveys for erosion thresholds 	<ul style="list-style-type: none"> Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined). Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined) Site-specific determination of location and extent of Redside Dace contributing habitat.

SUBWATERSHED GROUPING	HYDROLOGY	HYDRAULICS	HYDROGEOLOGY	STREAM MORPHOLOGY	TERRESTRIAL ECOLOGY	AQUATIC ECOLOGY
	<p>Precipitation Gauge:</p> <ul style="list-style-type: none"> One (1) Rainfall Gauge <p>Streamflow Gauge:</p> <ul style="list-style-type: none"> Four (4) Stream Flow Gauges <p>Water Quality Station:</p> <ul style="list-style-type: none"> One (1) Water Quality Stations 	<ul style="list-style-type: none"> Estimated Floodplain = Six (6) structures requiring detailed topographic survey. Engineered Floodplain = Two (2) structures requiring field verification. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Updated watercourse mapping based on recent orthophoto Rapid Geomorphic Assessment Seasonally Based Headwater Drainage Features Assessments Confirm reach delineation, feature types, and erosion hazards Detailed surveys for erosion thresholds 	<p>potential for Significant Wildlife Habitat</p> <ul style="list-style-type: none"> Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries <ul style="list-style-type: none"> Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined). Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined) Site-specific determination of location and extent of Redside Dace contributing habitat.
3	<p>Streamflow Gauge:</p> <ul style="list-style-type: none"> One (1) Stream Flow Gauge <p>Water Quality Station:</p> <ul style="list-style-type: none"> One (1) Water Quality Station 	<ul style="list-style-type: none"> Engineered Floodplain = Two (2) structures requiring field verification. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Updated watercourse mapping based on recent orthophoto Rapid Geomorphic Assessment Seasonally Based Headwater Drainage Features Assessments Confirm reach delineation, feature types, and erosion hazards Detailed surveys for erosion thresholds 	<ul style="list-style-type: none"> Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined). Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined) Site-specific determination of location and extent of Redside Dace contributing habitat.

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	<p>Streamflow Gauge:</p> <ul style="list-style-type: none"> One (1) Stream Flow Gauge 	<ul style="list-style-type: none"> Engineered Floodplain = Two (2) structures requiring field verification. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Updated watercourse mapping based on recent orthophoto Rapid Geomorphic Assessment Seasonally Based Headwater Drainage Features Assessments Confirm reach delineation, feature types, and erosion hazards Detailed surveys for erosion thresholds 	<p>assessment of linkage potential in high connectivity areas</p> <ul style="list-style-type: none"> Feature boundary delineation – where appropriate, field validated feature boundaries Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined). Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined) Site-specific determination of location and extent of Redside Dace contributing habitat.
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	<p>Streamflow Gauge:</p> <ul style="list-style-type: none"> One (1) Stream Flow Gauge 	<ul style="list-style-type: none"> Estimated Floodplain = Five (5) structures requiring detailed topographic survey. Engineered Floodplain = Two (2) structures requiring field verification. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Updated watercourse mapping based on recent orthophoto Rapid Geomorphic Assessment Seasonally Based Headwater Drainage Features Assessments Confirm reach delineation, feature types, and erosion hazards Detailed surveys for erosion thresholds 	<ul style="list-style-type: none"> Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined). Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined) Site-specific determination of location and extent of Redside Dace contributing habitat.
4	<p>Precipitation Gauge:</p> <ul style="list-style-type: none"> One (1) Rainfall Gauge <p>Streamflow Gauge:</p> <ul style="list-style-type: none"> One (1) Stream Flow Gauge 	<ul style="list-style-type: none"> Estimated Floodplain = Four (4) structures requiring detailed topographic survey. Engineered Floodplain = Two (2) structures requiring field verification. 	<ul style="list-style-type: none"> See Table 4 	<ul style="list-style-type: none"> Updated watercourse mapping based on recent orthophoto Rapid Geomorphic Assessment Seasonally Based Headwater Drainage Features Assessments Confirm reach delineation, feature types, and erosion hazards Detailed surveys for erosion thresholds 	<ul style="list-style-type: none"> Incorporate any new available background data Ecological Land Classification – desktop analysis and field verification for all vegetated features Botanical inventories – three season inventories for all vegetated features Wildlife Inventories – scoped based on features type and potential for Significant Wildlife Habitat Validate Connectivity model – where appropriate, rapid assessment of linkage potential in high connectivity areas Feature boundary delineation – where appropriate, field validated feature boundaries 	<ul style="list-style-type: none"> Fish community information where sufficient information is not available (to be determined). Fish and benthic invertebrate monitoring stations where existing monitoring network is inadequate (to be determined) Site-specific determination of location and extent of Redside Dace contributing habitat.

*Refers to Study Area depicted in Figure 4.

E.2 Lake Simcoe Region Conservation Authority Checklist

1. General Information:

Date: _____

Address: _____

Name of consulting firm: _____

Contact information: _____

2. Identify all potential natural heritage and hydrologic features in the study area (check all that apply):

**The LSRCA recognizes that this is a preliminary assessment to determine what studies may be suitable for the property. A site visit may be required to verify the presence/absence of features.*

- | | |
|---|---|
| <input type="checkbox"/> Wetland | <input type="checkbox"/> Drainage feature/watercourse |
| <input type="checkbox"/> Woodland | <input type="checkbox"/> Kettle lake |
| <input type="checkbox"/> Valleyland | <input type="checkbox"/> Seepage area or spring |
| <input type="checkbox"/> Grassland or meadow | <input type="checkbox"/> Lake or pond (and their littoral zone) |
| <input type="checkbox"/> Wildlife habitat | <input type="checkbox"/> Lake Simcoe shoreline |
| <input type="checkbox"/> Area of natural and scientific interest (ANSI) | <input type="checkbox"/> Natural areas abutting Lake Simcoe |
| <input type="checkbox"/> Sand barren, savannah or tallgrass prairie | <input type="checkbox"/> Habitat of endangered and threatened species |
| <input type="checkbox"/> Alvar | <input type="checkbox"/> Fish habitat |

3. Activities to be undertaken and studies required for a complete NHE/EIS submission:**

*** Some activities/studies are pre-selected () as they are a minimum requirement for NHE/EIS submissions.*

- Consult with the appropriate Municipal and Conservation Authority staff, as required, to establish the required scope of study.
- Identify an appropriate study area - generally the area of anticipated disturbance plus 120 m.
- Collect and include applicable background information and current environmental mapping for natural heritage and hydrologic features, and the natural heritage system within and surrounding the study area.
- Identify and provide detailed descriptions of natural heritage and hydrologic features in the study area, their function, and the broader natural heritage system that they are within. Determine the significance of these natural heritage and hydrologic features under applicable policy.
- Evaluate existing vegetation communities using Ecological Land Classification (ELC) for Southern Ontario (Lee et al. 1998. Ecological Land Classification for Southern Ontario: first approximation and its applications. SCSS Field Guide FG-02). Provide a description of ELC communities in the study area and include completed ELC field sheets as an appendix.
- Conduct a _____-season vegetation inventory in the late spring/summer/fall. Include the inventory categorized by ELC community as an appendix and denote any Species at Risk and/or provincially/locally rare species.
- Conduct three (3) breeding amphibian surveys as per the Marsh Monitoring Program protocol (Bird Studies Canada). Observational salamander surveys may be required if potential habitat exists in the study area. Include completed field sheets as an appendix.

- Conduct two (2) dawn breeding bird surveys between May 24 and July 15, under appropriate conditions, with a minimum of 10 days between surveys, and record all occurrences and breeding behaviors. Point counts, wandering transects or a combination of the two must be used according to features present and site conditions. Include completed field sheets as an appendix. A third survey will be required if suitable grassland bird habitat is present.
- Record observations of all wildlife occurrences and behaviours and assess wildlife habitat function.
- Screen for Species at Risk (SAR), listed under the *Endangered Species Act, 2007*, based on existing or potential habitat. Additional species-specific surveys may be required if SAR habitat is present (e.g. butternut health assessments, snag surveys, bat acoustic monitoring surveys, evening whip-poor-will surveys, etc.), please contact the Ministry of Environment, Conservation and Parks (MECP) for further direction. Include any relevant correspondence with the MECP as an appendix
- Assess for Significant Wildlife Habitat (e.g. turtle nesting or wintering area, reptile hibernaculum, woodland raptor nesting habitat, seeps, springs, etc.) as per the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNR, January 2015).
- Identify any ecological linkages or movement corridors within the study area. Demonstrate how connectivity within and between natural heritage and hydrologic features will be maintained and, where possible, improved or restored to allow for the effective dispersal and movement of plants and animals.
- Provide a general description of the methodology, dates, timing, and locations of completed field surveys.
- Confirm the boundaries of any wetland and/or woodland features on the property through a staking exercise with the LSRCA. Boundary points must be surveyed with a high-accuracy GPS device (accurate to within 10 cm). A professional Ontario Land Surveyor (OLS) may be required to attend. Wetland staking exercises must be completed between June 15 and September 30 (exceptions may apply). Note that a site visit fee may apply.
- Complete an aquatic habitat assessment for all drainage features/watercourses in the study area, including characterization of hydrologic features (i.e. permanent, intermittent, ephemeral, headwater drainage feature) and suitability as fish habitat. Include a description of instream and riparian cover, bank stability, substrate composition, stream morphology, dimensions and gradient, thermal regime indicators, potential barriers, woody debris distribution, aquatic vegetation, groundwater seepage areas, etc.
- Complete a catchment-based water balance for the study area to assess how existing drainage conditions and moisture regimes that support sensitive hydrologic features (e.g. wetland, woodlands, watercourse) may be impacted by the proposed development. Demonstrate how current hydrologic inputs will be maintained post-development. Please note, the water balance assessment may also be a requirement under other provincial policies, therefore the NHE/EIS should coordinate with/summarize the water balance work undertaken by others.
- Recommend the dimensions of an appropriate vegetation protection zone (VPZ)/buffer to natural heritage and hydrologic features required to mitigate impacts from the proposed development. Recommendations for restoration/plantings should be provided for all buffers.
- Provide a detailed description of the proposed development.

- Map the following information separately on current high quality ortho-air photos:
 - 1) ELC vegetation communities, natural heritage and hydrologic features and their associated VPZs, and the proposed development and anticipated limit of disturbance (e.g. grading limits); and,
 - 2) ELC vegetation communities, survey locations, other environmental features (e.g. linkages, wildlife corridors, seeps, springs, stick nests, wildlife habitat, rare species, invasive species, etc.), and existing structures and/or trails.
- Assess the potential direct, indirect, and cumulative impacts of the proposed development on natural heritage and hydrologic features, the natural heritage system, and related ecological and hydrologic functions.
- Develop and provide an appropriate avoidance/mitigation/restoration strategy to address the potential impacts of the proposed development.
- Demonstrate how the proposed development is in conformity with all federal, provincial, regional, and municipal natural heritage policies applicable in the Lake Simcoe watershed.
- Complete one final report for circulation and approval, prepared by qualified professionals, in an electronic format as well as one (1) hard copy.

4. Additional studies or plans that may be required include:

- Landscape/Restoration/Planting Plan
- Edge Management Plan
- Tree Inventory/Arborist Report/Tree Preservation Plan
- Trails Impact Study
- Ecological Offsetting Strategy (please refer to [LSRCA's Ecological Offsetting Policy](#))
- Environmental Monitoring Plan/Report
- Fluvial Geomorphological Assessment
- Natural Channel Design

5. Additional notes and/or requirements:

Please note that changes to the study area, the proposed development, and/or policy changes may require additional information/studies.

Please provide current field survey data in the NHE/EIS submission. Field survey data will be considered valid for five (5) years from the date the survey was conducted, except for Species at Risk screenings, which are valid for one (1) year. If outdated field data is provided, additional surveys may be required.