



# ENVIRONMENTAL IMPACT STUDY

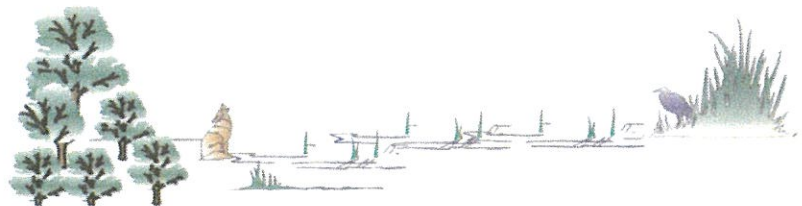


**HANLEY PARK NORTH SUBDIVISION  
CITY OF BELLEVILLE**

**Prepared for:**

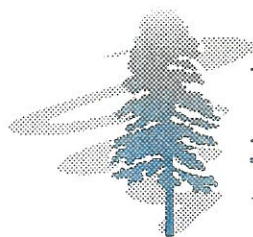
**Hanley Park Development Inc.**

**February 2020**



*Cunningham Environmental Associates*

and



**Michalski Nielsen**

**ASSOCIATES LIMITED**

ENVIRONMENTAL PLANNING    BIOPHYSICAL ANALYSIS  
LAKE CAPACITY ASSESSMENT    RESOURCE MANAGEMENT



**Michalski Nielsen**  
ASSOCIATES LIMITED

February 10, 2020

Hanley Park Development Inc.  
c/o Raj Narula and Ram Nischal  
1058A Albion Road, Suite 207  
Etobicoke, Ontario  
M9A 1A7

**Re: Hanley Park North Subdivision; Our File 3217**

Dear Messrs. Narula and Nischal:

Enclosed please find our report entitled **ENVIRONMENTAL IMPACT STUDY – HANLEY PARK NORTH SUBDIVISION, CITY OF BELLEVILLE**, (February 2020).

Should you have any questions, or if further clarification is required, do not hesitate to call.

Yours truly,

MICHALSKI NIELSEN ASSOCIATES LIMITED

Per:

Michael Michalski  
Senior Advisor and Limnologist

MM/be

Enc.

c.c.: Lorelei Jones

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## **1 INTRODUCTION**

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## 1.1 Background

On August 3, 2017, Michalski Nielsen Associates Limited was retained by Hanley Park Development Inc. to undertake an **Environmental Impact Study (EIS)** in support of a residential draft plan of subdivision known as Hanley Park North (**Figure 1**). Its legal description is part of Lots 14 and 15, Concession 1, former Township of Thurlow, now City of Belleville, Hastings County. More specifically, the site is east of Haig Road and north of Victoria Avenue; the largest block (i.e., South Parcel) will be accessed from a dead-end off Tessa Boulevard, while a smaller parcel in the northwestern corner of the property (i.e., North Parcel) will be accessed from a dead-end off Spruce Gardens (**Figure 2**). The landholding is approximately 35.2 hectares (ha) in area; however, only about 10.4 ha are developable (Ainley Graham & Associates 2019a).

The primary environmental issue is that the two developable parcels are virtually surrounded by the Provincially Significant Bell Creek Swamp Complex (PSW). A critical component of our evaluation related to ground-truthing or confirming the location of the wetland boundary; this was undertaken in collaboration with Tim Trustham Planner/Ecologist and Curtis Vance, GIS Technician, both with the Quinte Conservation Authority (QC) on September 13, 2017. On this occasion, missing parts of the wetland boundary were identified, evaluated and flagged; GPS coordinates were recorded at each flagging point for subsequent mapping. The findings from this investigation resulted in areas of developable land. Other targeted surveys that were undertaken during the spring and summer of 2018 were for breeding birds (i.e., both dawn and at night), amphibians and botanical. Also, the habitats of known Species at Risk (SAR) in the vicinity of the subject property were researched and evaluated prior to and during our field investigations; this included Endangered (END) and Threatened (THR) species, as well as species of Special Concern (SC). Through discussions with QC, it was confirmed that no field studies would be needed for fish and fish habitat. As well, a stormwater management facility was designed by Ainley Graham & Associates (2019b) to diminish impacts on the downgradient water quality of the PSW and the Bay of Quinte; the plan is summarized herein and commented on from the perspective of surface water impacts.

This **EIS** is divided into a number of sections as follows.

1. **Introduction**, locates the subject property, and briefly establishes the environmental context.



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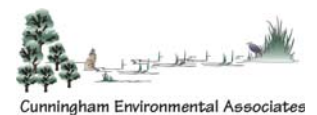
**Figure 1. Study Site Location**

Scale 1:NTS\*

**Hanley Park North**

Part of Lot 14, Concession 1  
 East of Haig Road and North of Victoria Avenue  
 City of Belleville  
 Former Township of Thurlow  
 Hastings County

 subject property







SCHEDULE OF LAND USE				
<b>NON-DEVELOPABLE LAND USE</b>				
		ha	[Ac.]	AREA %
1) Bellcreek Wetland		15.104	37.32	43.0
2) 30 m Bellcreek Wetland Buffer		8.164	20.17	23.2
3) Block G Open Space		0.632	1.56	1.8
TOTAL NON-DEVELOPABLE		23.900	59.06	68.0
<b>PROPOSED DEVELOPABLE LAND USE</b>				
	REFERENCE	Units	YIELD Lots/Blocks	AREA ha [Ac.] %
5) Detached 15.24m (50') min.	● Lots 16-29, 42-45, 80-81, 80-93, 102-107	60	60	3.889 9.61 11.1
6) Detached 9.75m (32') min.	● Lots 1-15, 30-41, 46-49, 52-59	39	39	1.513 3.74 4.3
7) Townhouse 6.0m (19.7') min.	▲ Blocks 94-101	57	8	1.581 3.91 4.5
8) Parks	● Blocks A, B, C	3	3	0.542 1.34 1.5
9) Walkways	● Blocks D, E	2	2	0.063 0.15 0.2
10) Stormwater Management Facility	● Block F	1	1	0.518 1.28 1.5
11) Roads - Public R.O.W.s	● Spruce Gardens, Steels A-D	-	-	2.519 6.22 7.2
12) Future Development	● Block I	-	-	0.634 1.57 1.8
TOTAL DEVELOPABLE		156	113	11.259 27.82 32.0
<b>TOTALS</b>				<b>35.16 86.88 100</b>

Notes:  
Bellcreek Wetland Boundary Surveyed September 13, 2017

No.	REVISION	DATE
1	Prepared Draft Plan	December 4, 2019

land use planning consultants

Toronto  
416-487-4301

Aurora  
905-593-3440

www.mshplan.ca

**MSH**

BOUNDLESS INGENUITY

SCALE 1:1500

DATE Nov 8, 2018

PROJECT NO. LJ17-1588

**OWNER'S AUTHORIZATION**  
I, BEING THE REGISTERED OWNER OF THE SUBJECT LANDS, HEREBY AUTHORIZE MACAULAY SHOMI HOWSON LTD TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_  
NAME, POSITION \_\_\_\_\_

**SURVEYOR'S CERTIFICATE**  
I HEREBY CERTIFY THAT THE BOUNDARIES OF THE SUBJECT LANDS AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN ON THIS PLAN.

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_  
KEITH WATSON, O.L.S.  
WATSON LAND SURVEYORS LTD.

- ADDITIONAL INFORMATION**  
REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT
- a SHOWN ON DRAFT PLAN AND SURVEYOR'S CERTIFICATE
  - b SHOWN ON DRAFT AND KEY PLANS
  - c SHOWN ON KEY PLAN
  - d LAND TO BE USED IN ACCORDANCE WITH LAND USE SCHEDULE
  - e SHOWN ON DRAFT PLAN
  - f SHOWN ON DRAFT PLAN
  - g SHOWN ON DRAFT AND KEY PLANS
  - h FULL MUNICIPAL SERVICES
  - i SOIL IS LOAM OVERLYING BEDROCK
  - j SHOWN ON DRAFT PLAN
  - k ALL MUNICIPAL SERVICES TO BE PROVIDED
  - l SHOWN ON DRAFT PLAN

**DRAFT PLAN OF SUBDIVISION  
HANLEY PARK NORTH**

PART OF LOT 14, CONCESSION 1  
EAST OF HAIG ROAD AND NORTH OF VICTORIA AVENUE

CITY OF BELLEVILLE  
FORMER TOWNSHIP OF THURLLOW  
HASTINGS COUNTY

**Figure 2.**



- 
2. **Environmental Development Policies/Regulations**, summarizes the relevant environmental policies and current QC regulations relating to the proposed development.
  3. **Approach**, describes the sources of background information and data collection methods for vegetation community composition, wildlife and wildlife habitats, inclusive of SAR.
  4. **Existing Conditions**, presents site specific conditions relating to terrestrial resources, the PSW, wildlife and wildlife habitat and SAR, as per the *2007 Endangered Species Act (ESA 2007)*.
  5. **Resource Significance**, evaluates the biological and/or ecological significance of the various natural heritage features on the Hanley Park North lands.
  6. **Proposed Development Plan, Impact Evaluation and Mitigation**, identifies the types of biological and physical constraints to development, confirms the development concept prepared by Macaulay Shiomi Howson Ltd. (**Figure 2**), and presents mitigation measures.
  7. **Policy Compliance, Concluding Remarks and Recommendations**.

## 1.2 Acknowledgements

The vegetation and wildlife components of this **EIS** were undertaken by David Cunningham (Terrestrial Ecologist) who also provided related text, graphics and photographs. Michael Michalski (Limnologist and Senior Advisor) directed all technical aspects of the assignment, and prepared, integrated and edited draft and final versions of the **EIS**, inclusive of sections or parts of sections on: environmental policies; resource significance; impact assessment and mitigation; policy compliance; and conclusions and recommendations.

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## **2 ENVIRONMENTAL DEVELOPMENT POLICIES/REGULATIONS**

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## **2.1 2014 Provincial Policy Statement**

The **2014 Provincial Policy Statement (PPS)** came into effect on April 30, 2014 and applies to all land use planning applications either commenced or in process on that date. As an overriding policy, the **PPS** states that natural areas shall be protected in the long term. In this connection, it states that development and site alteration shall not be permitted in PSWs and Significant Wildlife Habitat (SWH). Similarly, development and site alteration shall not be permitted in fish habitat, or in the habitat of Endangered and Threatened species, except in accordance with provincial and federal requirements. The **PPS** goes on to say that development and site alteration may be permitted on adjacent lands to PSWs, SWH and fish habitat, provided that the ecological functions of the subject lands are evaluated, and it is demonstrated that there will be no negative impacts of the features or functions. As well, the policy document reiterates the need for planning authorities to protect, improve or restore the quality/quantity of water by identifying resource systems consisting of groundwater features, hydrologic functions, natural heritage features and areas, and surface water features, and maintaining linkages between these features and their functions.

Policy 2.2.1 (h) is also important to the proposed residential development. It states that, “. . . Planning authorities shall protect, improve or restore the quality and quantity of water by ensuring that stormwater management practices minimize stormwater volumes and contaminant loads, and maintain or increase the extent of vegetative and pervious surfaces.” The part of the policy that is relevant in this circumstance relates to “contaminant loads”, and not stormwater volumes.

## **2.2 City of Belleville Official Plan**

The subject PSW is designated as Environmental Protection (EP) on Schedule “B” – Land Use Plan – Urban Serviced Area (**Figure 3**). The upland portions of the property are designated as Residential Land Use. The policies that are relevant to the PSW are as follows.

### **3.5.3 Significant wetlands and the Habitat of Endangered and Threatened Species.**

- a) Provincially significant wetlands identified through the provincial wetland evaluation process, and significant portions of the habitat of endangered and threatened species have been designated as Environmental Protection on the land use schedules.
  
- b) No new development within provincially significant wetlands or within significant portions of the habitat of endangered and threatened species, or



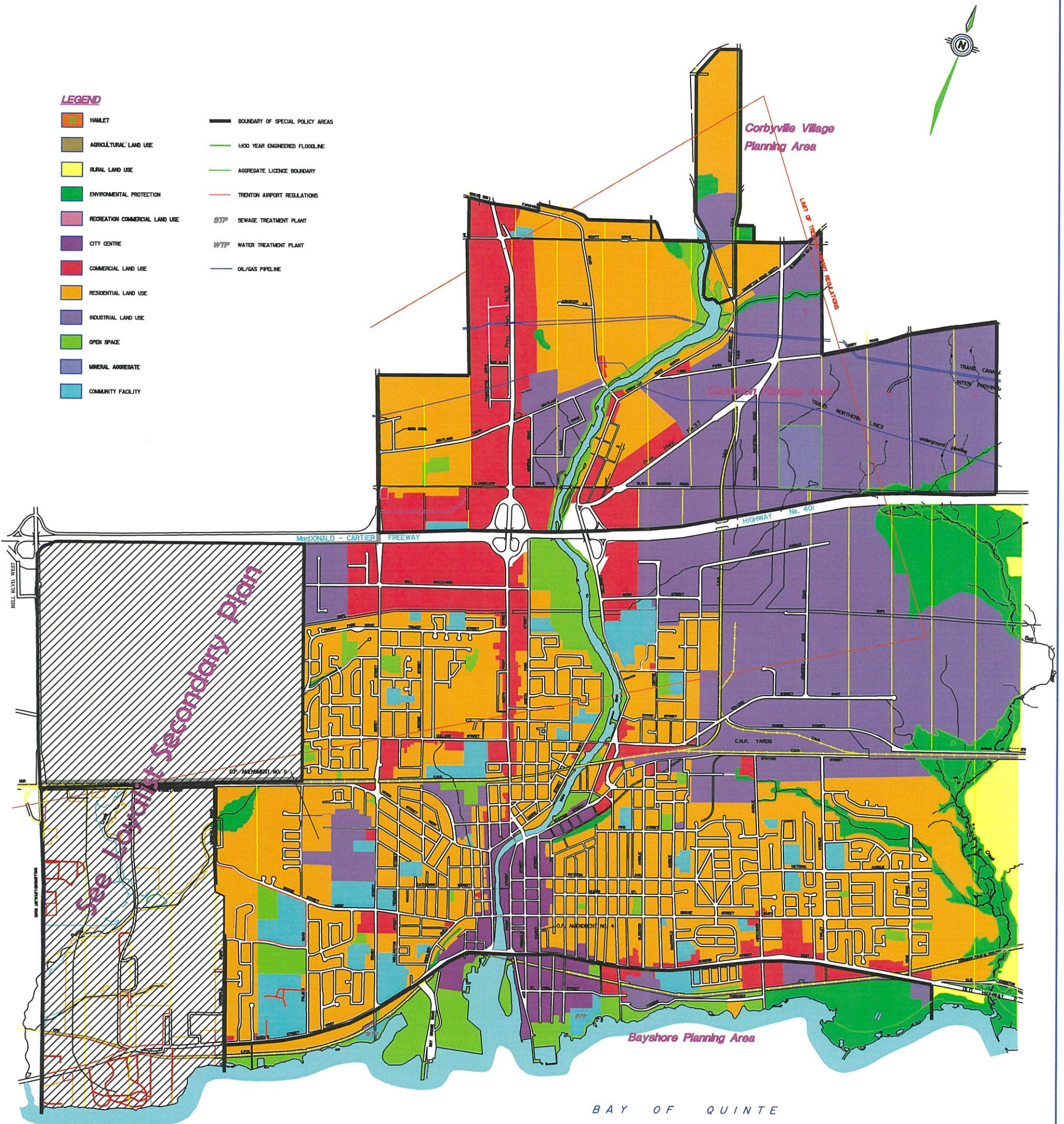
# CITY OF BELLEVILLE - OFFICIAL PLAN

## SCHEDULE 'B'

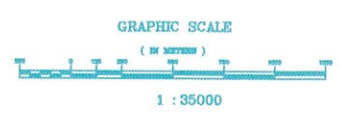
### LAND USE PLAN - URBAN SERVICED AREA



Figure 3



SCALE: M800	PLN: M85-04/052	JOB NO: 98524
DESIGN: B.A.	CHECKED: B.A.	DWG. 98520-U
DRAWN: D.J.A./B.P.	DATE: MAR/2008	



REVISED UP TO AND INCLUDING  
AMENDMENT NO. 16 (APPROVED NOVEMBER 8, 2010)



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the expansion or redevelopment of existing development within such areas (excluding established agricultural activities) shall be permitted. Conservation activities associated with maintaining and restoring wetlands and natural habitats of threatened species are strongly encouraged by this Plan.

- c) Development may be permitted on lands adjacent (within 120 metres) to provincially significant wetlands or significant portions of the habitat of threatened or endangered species where it has been or can be demonstrated through preparation of an environmental impact study (EIS) carried out in accordance with Section 3.5.6 of this Plan that there would be no adverse impact on the natural area or ecological functions.
- d) Development applications will be reviewed using the best available information on Endangered/Threatened Species location that is available from the Ministry of Natural Resources. This information shall be reviewed in a confidential manner so as not to disclose the location information related to the particular species.

### 3.5.6 Environmental Impact Studies and Natural Heritage Studies

- c) An EIS was completed for Bell Creek in 1995. The lands designated Environmental Protection in the Bell Creek area may be used for passive open space and recreational activities that result in minimal disturbance to the existing natural vegetation and topography of the area. Uses such as recreational trails, interpretive centres and similar such uses may be permitted.

## 2.3 Ontario Regulation 319/09 – Quinte Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses

Of particular relevance to the subject application is QC's Ontario Regulation 319/09. With respect to wetlands, Section 2(1) states that, “. . . Subject to section 3, no person shall undertake development in or on the areas within the jurisdiction of the Authority that are,

- (d) wetlands; or
- (e) other areas where development could interfere with the hydrologic function of a wetland, including areas within 120 metres of all provincially significant wetlands and wetlands greater than 2 hectares in size, and areas within 30 metres of wetlands less than 2 hectares in size, but not included those where development has been approved pursuant to an application made under the *Planning Act* or other public planning or regulatory process.

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Section 3 (Permission to develop) reads as follows.

- (1) The Authority may grant permission for development in or on the areas described in subsection 2 (1) if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development.
- (2) The permission of the Authority shall be given in writing, with or without conditions.

## **2.4 Quinte Conservation Development and Interference with Wetlands and Watercourses Regulation – Policies and Procedures Manual (Revised, January 2017)**

QC provides direction for development applications having areas that are “. . . subject to flooding during the 1:200 year event (flood plains), potential wave uprush areas (on the Bay of Quinte and Lake Ontario shorelines), erosion prone areas (slopes greater than 5:1 [h:v] or 20 degrees), dynamic beaches, wetlands (marsh, swamp, fen and bog), karst topography or any other areas identified as a hazardous land. A vegetated setback of 15 metres where the extent of the hazard is known, or 30 metres if the extent of the hazard is not known, will be a requirement for all *Planning Act* applications.”

Reproduced below are a number of policies that are relevant to the subject application.

- 2) A ‘site plan’ (prepared by an Ontario Land Surveyor, at the expense of the proponent), which indicates hazard land area, and the appropriate setbacks applied to the development (both by Quinte Conservation or Municipal setbacks) may be required prior to approval of the planning application.
- 4) Draft plans of subdivision shall illustrate the limits of hazardous land and the appropriate setback to the satisfaction of Quinte Conservation prior to draft plan approval. These areas may be delineated in the field in consultation with the Authority staff (at the expense of the proponent), and be incorporated in the lot layout shown on the draft plan of subdivision. The lot lines of any proposed lot within the development should be outside of the appropriate setback area.
- 5) For any development application which is greater than 1 hectare in size, Quinte Conservation shall require the proponent to submit a storm water management report (prepared by a qualified professional engineer at the expense of the proponent). Any new development on the subject land must demonstrate that post-development flows do not exceed pre-development levels for design storms from the 5-year to 100-year events.

- 
- 6) Applications for Site Plan approval should illustrate the extent of hazardous lands, any appropriate setback requirements (applied by Quinte Conservation and/or the Municipality), stormwater control facilities and sedimentation & erosion control measures on the submitted drawings.
- 9) Quinte Conservation may require an environmental impact study (prepared by a qualified professional with expertise in biology, ecology, landscape ecology or any other relevant fields of study and at the expense of the proponent) prior to approval of any planning act application within 120 metres of a Provincially evaluated wetland and wetlands greater than 2 hectares in size, or an Provincially evaluated Area of Natural Scientific Interest. An environmental impact study should:
- For areas on and adjacent to the site, include descriptions and clearly legible scaled maps of the existing land uses, and the proposed development and site alteration, including all proposed buildings, structures, driveways and parking areas, and sources of human intrusion;
  - Provide a thorough inventory of flora and fauna and related habitat features (field data collected during at least 3 field visits at varying times of the year), as well as relevant information on soils and geology, slope, hydrology and hydrogeology;
  - Review the ecological functions of the natural features identified above, including the habitat needs of species that utilize adjacent lands;
  - Predict the impacts of the proposed development and site alteration on the various attributes of the environment on and adjacent to the site, such as habitat, vegetation, soil, surface and ground water, air, and any other relevant attributes;
  - Evaluate the significance of all predicted positive and negative impacts on the environment;
  - Recommend extents of land where: disturbance must be avoided, or where disturbance must be limited in order to maintain the natural features and ecological functions of the area, supported by a detailed rationale;
  - Review alternative development options and recommend measures that could be implemented to avoid or mitigate the predicted negative impacts;
  - Identify any measures needed to monitor the mitigation measures and to assess the long-term impacts associated with the proposal;
  - Conclude with an independent professional opinion as to whether or not the development and site alteration is appropriate, and consistent with the intent of the Provincial Policy Statement.

---

## 2.5 2007 Endangered Species Act

The *ESA 2007* came into effect in Ontario in 2007, and provided for immediate protection of all species on the Species at Risk in Ontario (SARO) list. This protection is afforded under Section 9(1) of the *Act*, which reads as follows:

### **Prohibition on killing, etc.**

- 9.(1) No person shall,
- a) kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;
  - b) possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,
    - (i) a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;
    - (ii) any part of a living or dead member of a species as referred to in subclause (i),
    - (iii) anything derived from a living or dead member of a species referred to in subclause (i); or
  - c) sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b)(i), (ii) or (iii). 2007, c.6, s.9(1).

Additionally, the *ESA* affords habitat protection to species on the SARO list. The relevant portions of the *Act* are found under Sections 10(1) through 10(3) and are reproduced as follows.

### **Prohibition on damage to habitat, etc.**

- 10(1) No person shall damage or destroy the habitat of,
- (a) a species that is listed on the Species at Risk in Ontario List as an endangered or threatened species; or
  - (b) a species that is listed on the Species at Risk in Ontario List as an extirpated species, if the species is prescribed by the regulations for the purpose of this clause. 2007, c.6, s. 10(1).

---

Also important is the definition of habitat under the *ESA*, which is described under Section 2(1) as follows.

- “Habitat” means,
  - (a) With respect to a species of animal, plant or other organism for which a regulation made under clause 55 (1) (a) is in force, the area prescribed by that regulation as the habitat of the species, or
  - (b) With respect to any other species of animal, plant or other organism, 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, and includes places in the area describe in clause (a) or (b), whichever is applicable, that are used by members of the species as dens, nests, hibernacula or other residence; (habitat).
- Definition of “habitat”, cl. (b)
  - (2) For greater certainty, clause (b) of the definition of “habitat” in subsection (1) does not include an area where the species formerly occurred or has the potential to be reintroduced unless existing members of the species depend on that area to carry on their life processes. 2007,c.6, s.2 (2).

It is important to note that the landowner, as well as the individual or organization carrying out any activities on those lands, are both subject to the enforcement and penalty provisions of the *ESA* should Sections 9 or 10 be contravened.

The Ministry of Natural Resources and Forestry (MNR<sup>1</sup>) provides a document entitled **Categorizing and Protecting Habitat Under the *ESA*** that outlines the overall approach and considerations that it uses in determining whether a proposed activity is likely to damage or destroy habitat protected under subsection 10(1). The following is provided from that document.

*Not every activity that occurs within or near habitat will damage or destroy that habitat. Determining whether a proposed activity is likely to damage or destroy the habitat of an endangered or threatened species requires the consideration of the activity details, which parts of habitat are likely to be altered by the activity, and how the alteration may affect the species’ ability to carry out its life processes.*

*3.1.1 Damaging Habitat*

*An activity that damages the habitat of a species is one that alters the habitat in ways that impair the function (usefulness) of the habitat for supporting one or more of the species’ life processes.*

*3.1.2 Destroying Habitat*

---

<sup>1</sup> Note that the Ministry of Natural Resources (MNR) changed to the Ministry of Natural Resources and Forestry in 2014, and for purposes of this **EIS**, the acronyms are interchangeable.



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*An activity that destroys the habitat of a species is one that alters the habitat in ways that eliminate the function (usefulness) of the habitat for supporting one or more of the species' life processes.*

*In some cases, the anticipated alteration that a proposed activity will have on habitat may be so minor that the function of the habitat for supporting the species' life processes will not become impaired or eliminated. In such cases the activity would not contravene subsection 10(1) of the ESA and would not require authorization under the Act with respect to this provision. In other cases, the alteration may be more significant such that the function of the habitat for supporting one or more of the species' life processes may become impaired or eliminated. Such activities would contravene subsection 10(1) of the ESA and would require authorization under the Act prior to proceeding.*

While in most projects, mitigation measures can be implemented to protect against killing, harming or harassing a living member of a protected species, in many geographic areas it is more difficult to carry out a project without damaging, or having some influences on, the habitat of all SARO listed species. MNRF has a permitting process which allows activities which would otherwise be prohibited under Sections 9 or 10 of the *ESA 2007*, which is described under Section 17. The most relevant portions of that Section, as it pertains to this project, are included as follows:

**Permits**

- 17.(1) The Minister may issue a permit to a person that, with respect to a species specified in the permit that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species, authorizes the person to engage in an activity specified in the permit that would otherwise be prohibited by section 9 or 10. 2007, c.6, s. 17(1).

**Limitation**

- (2) The Minister may issue a permit under this section only if,
- (a) the Minister is of the opinion that the activity authorized by the permit is necessary for the protection of human health or safety;
  - (b) the Minister is of the opinion that the main purpose of the activity authorized by the permit is to assist, and that the activity will assist, in the protection or recovery of the species specified in the permit;
  - (c) the Minister is of the opinion that the main purpose of the activity authorized by the permit is not to assist in the protection or recovery of the species specified in the permit, but,

- 
- (i) the Minister is of the opinion that an overall benefit to the species will be achieved within a reasonable time through requirements imposed by conditions of the permit,
  - (ii) the Minister is of the opinion that reasonable alternatives have been considered, including alternatives that would not adversely affect the species, and the best alternative has been adopted, and
  - (iii) the Minister is of the opinion that reasonable steps to minimize adverse effects on individual members of the species are required by conditions of the permit.

Section 17(2)(c)(i) establishes the principle of “overall benefit” in providing an opportunity to allow projects to proceed where there has been an holistic approach to understanding the relationship of that project to the environment, where the habitat of species regulated under the *ESA* has been properly considered, and where the proponent has designed the project in a manner that achieves an overall benefit to such species.

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### **3 APPROACH**

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### **3.1 Collection and Review of Background Information**

In preparing this EIS, existing information pertaining to the natural environmental features was obtained mostly from the Natural Heritage Information Centre (NHIC) dataquery web-site for significant natural areas and site element occurrence records for rare species (NHIC 2020). Land Information Ontario (LIO 2019), as well as the Peterborough Regional Office and Kingston District Office of the MNR were also contacted. The **Ontario Breeding Bird Atlas (OBBA)** web-site was reviewed for general data on typical breeding birds in the area (**Birds Studies Canada et al.** 2006). A meeting and site visit were also conducted with staff of QC, who supplied file material.

In addition to the NHIC and LIO web-sites, various published natural environmental reports for the subject property and local geographical area were reviewed. These included but were not limited to the following:

- **Life Science Areas of Natural and Scientific Interest in Site District 6-15 - A Review and Assessment of Significant Natural Areas in Site District 6-15** (Macdonald 1987);
- **Natural Heritage Resources of Ontario: Bibliography of Life Science Areas of Natural and Scientific Interest (ANSIs) in Ecological Site Regions 6E and 7E, Southern Ontario** (Riley *et al.* 1997);
- **Ontario Breeding Bird Atlas Square 18UP19** (Bird Studies Canada *et al.* 2006);
- **Bell Creek Swamp Complex Wetland Data Record and Map** (Muldal and Boxall 1993);
- **Google Earth Pro Coloured Orthophotography** (2002, 2009, 2011, 2012, 2013, 2016 and 2017); and
- **Hanley Park Subdivision, City of Belleville, Environmental Impact Study, Bell Creek Swamp Complex**, Michalski Nielsen Associates Limited (2005).

As part of the discussions with QC regarding proposed access to the subject property and the protection of the PSW attributes and functions, QC policy setbacks/buffers from wetlands and floodlines were confirmed.

### **3.2 Aerial Photograph Interpretation**

As part of the site inspection and inventory, coloured orthophotographs were obtained and interpreted to ascertain the general biophysical (i.e., terrestrial, wetland and aquatic) characteristics on the subject property. Based on the aerial photograph interpretation and site visits conducted on July 25, 2008 (i.e., as

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part of environmental investigations of the initial Hanley Park residential subdivision to the south), and September 13, 2017, the boundaries and types of general terrestrial vegetation communities were delineated. The wetland boundary of the PSW was further refined in-situ with QC on September 13, 2017. Additional field surveys and inventories were conducted in 2018 to ground-truth and classify the internal terrestrial vegetation communities. Given the myriad of wetland units within the PSW, the boundaries of each were not delineated, nor warranted. Descriptive notes and photographs were compiled on the types of wetland units, with QC wetland and floodline policy buffers applied to the Draft Plan.

### **3.3 Field Investigations and Inventories**

As noted above, knowledge of the existing natural environmental features on and adjacent to the subject property was obtained from two site visits with QC (i.e., July 25, 2008 and September 13, 2017) to assess, delineate, flag and GPS the on-site boundaries of the PSW, as well as compiling preliminary descriptive notes on the terrestrial and wetland features.

As part of our 2018 field survey program, following MNRF protocols, site inventories were conducted on April 12, May 2, and 21, June 11, 28 and 29, 2018. In addition to determining the boundaries of the subject property wetland features, the general conditions and characterization of the terrestrial natural vegetation communities, aquatic resources and adjacent land uses were documented and photographed. Vegetation community boundaries delineated from aerial photographic interpretation and previous site visits were revised in-situ, where applicable.

The dominant vegetation species composition and condition of the existing natural environmental features were documented, delineated and mapped using qualitative sampling techniques. Natural features included vegetation communities, floristics (plants species), surface water courses (tributaries and main branch of Bells Creek) and wildlife species. General notes were compiled on the condition, age, size, and form of the woodland stands, where applicable, as well as disturbances. Wildlife species observed during visits were considered to be either as year-round residents and/or summer breeders.

In addition to the information sources listed above, various databases were searched for floral and faunal records on-site or in the surrounding area. These websites and databases included:

- **Atlas of the Mammals of Ontario** (Dobbyn 1994);
- **Ontario's Reptile and Amphibian Atlas** (Ontario Nature 2019); and

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- **Hanley Park Subdivision, City of Belleville, Environmental Impact Study, Bell Creek Swamp Complex** Michalski Nielsen Associates Limited (2005)

Coloured orthophotography (2002 to 2018) was obtained from Google Earth Pro that provided complete coverage of the subject property and adjacent lands within approximately 100 metres (m). These orthophotos were used as a base map to initially identify the general types and boundaries of the vegetation communities, as well as to plot evening amphibian call stations and breeding bird point station locations (**Figure 4**). Background information was also garnered to assess the potential for SAR and candidate Significant Wildlife Habitat (SWH) on the subject property, based on either species presence and/or habitat characterizations garnered from the wildlife surveys.

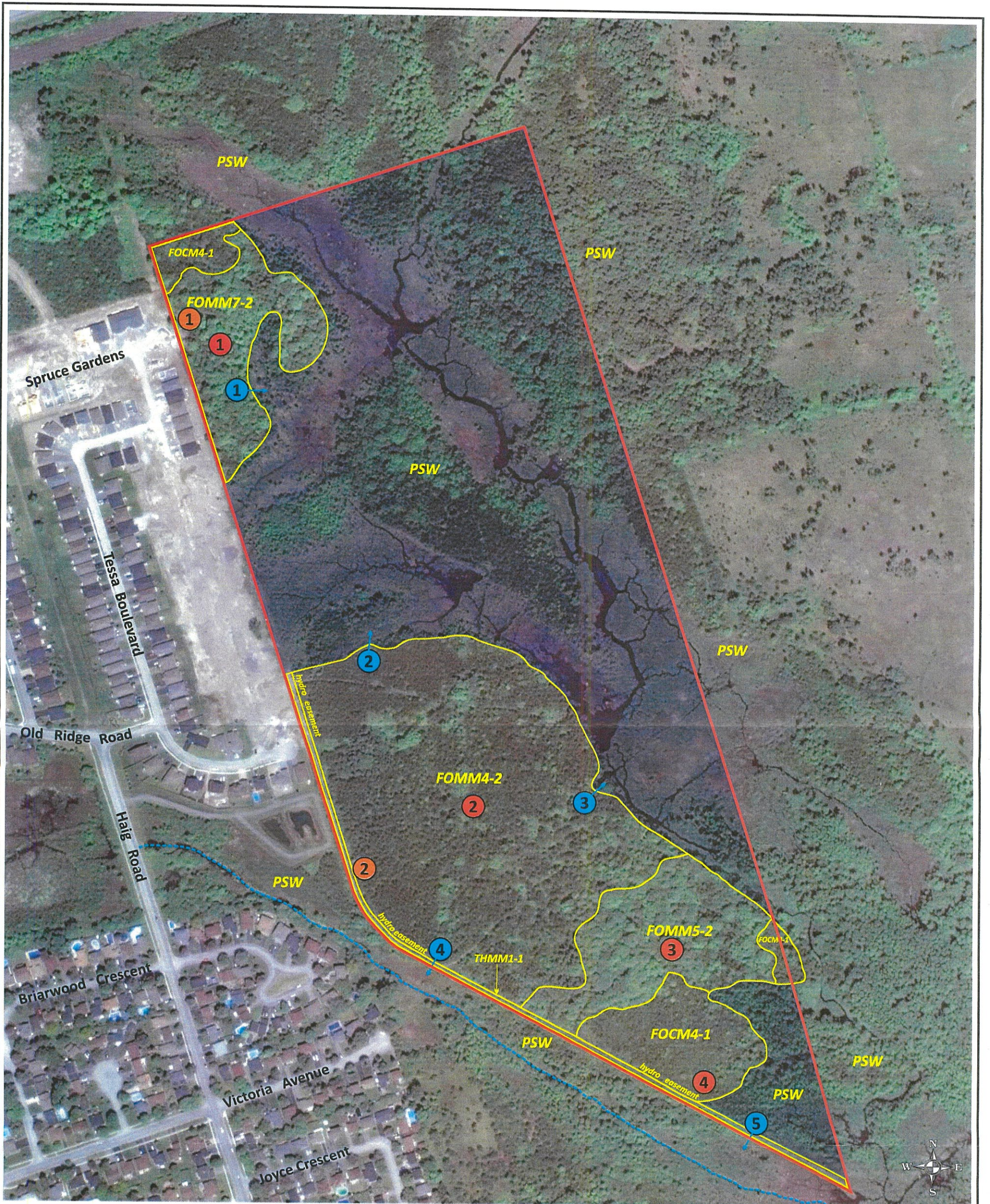
In addition to the data sources listed above, consultant team reports and drawings reviewed during preparation of the **EIS** included:

- Hanley Park North Residential Subdivision – Servicing Report (Ainley Graham & Associates 2019a)
- Hanley Park North Residential Subdivision – Stormwater Management Report (Ainley Graham & Associates 2019b)
- Hanley Park Draft Plan Application – Flow Monitoring Review (Ainley Graham & Associates 2019c)
- Hanley Park North Development – Preliminary Watermain Design Brief (Ainley Graham & Associates 2019d).

### **3.3.1 Vegetation Communities and Floristics**

The boundaries of the vegetation communities were delineated through aerial photograph interpretation and ground-truthing. The botanical inventories included those upland tableland features within the subject property, as well as the lowland wetland features on and along the property perimeter. Classification of the vegetation communities and boundaries were determined according to species composition and physiognomic characteristics. Dominant plant species (i.e., trees, shrubs and vines) observed within each woodland stand and other community types (e.g., hydro easement) were compiled. Given the predominantly woodland feature compositions dominated by eastern white cedar and poplars, a master





\*www.google.com/earth/earth-pro  
Scale 1:4000 (approx.)

Figure 4. Count, Call and Survey Stations (Birds, Amphibians, Nocturnal Wildlife)

**Hanley Park North**

Part of Lot 14, Concession 1  
East of Haig Road and North of Victoria Avenue  
City of Belleville  
Former Township of Thurlow  
Hastings County

- subject property boundary (approx.)
- - - Bell Creek
- 1 Dawn Breeding Bird Point Count Station
- 1 → Evening Amphibian Call Station (listening direction)
- 1 Nocturnal Wildlife Survey Station
- FOCM4-1** Fresh-Moist White Cedar Coniferous Forest
- FOMM4-2** Dry-Fresh White Cedar- Poplar Mixed Forest
- FOMM7-2** Fresh-Moist White Cedar-Hardwood Mixed Forest
- FOMM5-2** Dry-Fresh Poplar-White Cedar Mixed Forest
- THMM1-1** Dry-Fresh Native Mixed Regeneration Thicket
- PSW** Provincially Significant Wetland (part of Bell Creek Swamp Complex)

\* Google Earth Pro (June 2, 2017)





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vascular plant species list was compiled for the entire subject property. Representative photographs of the vegetation resources on and adjacent to the subject property were compiled.

The delineation and characterization of the vegetation communities followed the MNR Ecological Land Classification (ELC). Where applicable, these communities are described following the terminology of the ELC system, an **Ecological Land Classification for Southern Ontario – First Approximation and Its Application** (Lee *et al.* 1998), with updated codes contained in Lee (2008). In addition to the ELC system, additional characterization of the on-site vegetation communities was aided through a review of the Natural Heritage Resources of Ontario: Vegetation Communities of Southern **Ontario** (Bakowsky 1997).

As defined in Lee *et al.* (1998), an Ecosite, “is a mappable landscape unit defined by a relatively uniform parent material, soil and hydrology, and consequently supports a consistently recurring formation of plant species which develop over time (vegetation chronosequence).” Within each ecosite landscape unit, there are a variety of vegetation types. A vegetation type, “is a part of an ecosite, and represents a specific assemblage of species which generally occur in a site with a more uniform parent material, soils and hydrology, and a more specific stage within a chronosequence.”

The classification of the general vegetation communities was characterized according to species composition and physiognomic characteristics. The nomenclature for the flora observed is consistent with and relied on the following authorities:

- Lycopodiaceae to Aspleniaceae Cody, W. J., and D. F. Britton. 1989. Fern and Fern Allies of Canada. Publication 1829/E, Agriculture Canada, Research Branch, Ottawa.
- Taxaceae to Orchidaceae – Voss, E. G. 1972. Michigan Flora. Part 1: Gymnosperms and Monocots. Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 55.
- Saururaceae to Cornaceae – Voss, E. G. 1985. Michigan Flora. Part 2: Dicots. Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 59.
- Pyrolaceae to Compositae – Voss, E. G. 1996. Michigan Flora. Part 3: Dicots. Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 61.
- Newmaster, S. G., A. Lehela, P. W. C. Uhlig, S. McMurray, M. J. Oldham, and Ontario Forest Research Institute. 1998. Ontario Plant List. FRI Paper No. 123.

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- Bradley, D. J. 2013. Southern Ontario Vascular Plant Species List. 3rd Edition. Science & Information Branch Southern Science and Information Section. Ontario Ministry of Natural Resources, Peterborough, Ontario. SIB SSI SR-03, 78 p.

### 3.3.2 Wildlife and Wildlife Habitat

The subject property was visited on various dates from April to July, 2018 to collect qualitative and quantitative data on the local wildlife resources (i.e., birds, mammals, amphibians, and reptiles). The site visits included dawn breeding bird point count station surveys following the **Ontario Breeding Bird Atlas (OBBA)** inventory protocols (**Bird Studies Canada et al.** 2006). Amphibian call count surveys were also conducted following the protocols outlined in the **Marsh Monitoring Program (Bird Studies Canada et al.** 2009). Incidental wildlife observations were also recorded during other field visits, namely during the botanical inventories and from data contained in Michalski Nielsen Associates Limited (2005). Evidence of the presence of wildlife included both direct, and indirect observations such as calls, tracks, scats, nests, dens, browse, carcasses, etc. Small mammal trapping was not undertaken. The following subsections provide details on the methods used to ascertain wildlife and wildlife usage within subject property.

**Birds:** Dawn breeding bird surveys were completed between starting times of 0600 hours (hr) and end time 0830 hr on June 11 and June 28, 2018. A total of four (4) breeding bird point count stations were used to document the bird species present, with durations of 10 minutes per station, in addition to roving routes undertaken during the botanical inventories (April 12, May 2 and 21, and June 11, 28 and 29, 2018) and wetland boundary staking (July 25, 2008 and September 13, 2017), as well as those listed in Michalski Nielsen Associates Limited (2005). The breeding bird surveys were conducted more than one week apart under favourable weather conditions (i.e., calm wind, partly sunny to cloudy conditions and no precipitation) following the survey methods and breeding evidence codes of the **OBBA (Bird Studies Canada et al.** 2006).

All birds seen and heard on or adjacent to the subject property were tallied. Observations were coded using the behavioural codes (i.e., breeding evidence codes of the **OBBA** (e.g., S – Singing Male, P – Pair, etc.). Weather conditions during each survey date were recorded, and included parameters such as air temperature, wind speed and direction, cloud cover, and precipitation.

In addition to the dawn breeding bird surveys, two nocturnal wildlife surveys were conducted under full moon conditions (June 28 and June 29, 2018) for eastern whip-poor-will (*Antrostomus vociferous*), a bird

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species listed as Threatened in the Ontario *ESA 2007*, and for common nighthawk (*Chordeiles minor*), a bird species listed in the Ontario as a Special Concern (SC) species (**Figure 4**).

**Mammals:** Incidental observations of mammals were recorded during all day-time and night-time field surveys related to wetland boundary staking, wildlife, vegetation communities and floristics (July 25, 2008; September 13, 2017; and April 12, May 2 and 21, and June 11, 28 and 29, 2018).

**Reptiles:** Incidental observations of reptiles were recorded during all day-time and night-time field surveys related to wetland boundary staking, wildlife, vegetation communities and floristics (July 25, 2008; September 13, 2017; and April 12, May 2 and 21, June 11, 28 and 29, 2018).

**Amphibians:** Incidental observations of amphibians were recorded during all day-time and night-time field surveys related to wetland boundary staking, wildlife, vegetation communities and floristics (July 25, 2008; September 13, 2017; and April 12, May 2 and 21, June 11, 28 and 29, 2018).

Evening calling amphibian (e.g., frogs and toads) surveys were completed on three evenings; April 12, May 21 and June 29, 2018, following the methods of the **Marsh Monitoring Program (Bird Studies Canada 2009)**. Surveys were completed from five (5) on-site fixed stations and an off-site control station (**Figure 4**).

### **3.3.3 Species at Risk Screening**

For the purposes of this report, SAR are considered to be those species formally designated (Endangered, Threatened and Special Concern) by The Committee on the Status of Species at Risk in Ontario (COSSARO) (Ministry of Natural Resources and Forestry 2020) and listed in Ontario's *ESA 2007*. SAR listings at the provincial level were reviewed. The Natural Heritage Information Centre (NHIC 2020) data-query web-site was accessed to review relevant observational data records (e.g., element occurrences) for the data squares that overlap the subject property, and included NHIC SRank (S1, S2, S3) species as well. As part of due diligence regarding compliance with the *ESA 2007*, a SAR information request (i.e., a listing for County of Hastings and/or City of Belleville) was submitted to the MNRF – Peterborough Office and to the Ministry of Environment, Conservation and Parks (MECP) – Kingston Office, with no replies received to-date.

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### **3.3.4 Candidate Significant Wildlife Habitat Screening**

The results of the wildlife field investigations also identified habitat features (attributes) and their inherent wildlife functions. Candidate SWH and the criteria used to identify and assess this potential designation are outlined in the MNRF's Ecoregion 6E Criterion Schedule (Ministry of Natural Resources and Forestry 2015). For purposes of this **EIS**, a SWH assessment was not undertaken, given that the only significant feature, the PSW. As indicated in **Section 2.2**, the PSW is designated as EP on Schedule "B" – Land Use Plan – Urban Serviced Area, City of Belleville Official Plan (**Figure 3**).

### **3.3.5 Aquatic Environment and Fish Habitat**

No fish habitat or fish biomass inventories along the tributaries and main branch of Bells Creek were undertaken. Fisheries data was generated from the Bells Creek Swamp Wetland Evaluation (Muldal and Boxall 1993), and from in-situ observations. Photographs were compiled of these aquatic environments along with descriptive notes of in-stream and abutting aquatic vegetation.

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## **4 EXISTING CONDITIONS**

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## 4.1 Vegetation

### 4.1.1 Regional Vegetation Community Characteristics

Based on a forest classification system developed by Rowe (1972), the vegetation cover of Canada is divided into eight major forest regions, or formations, based on the presence and distribution of dominant tree species. Formations are considered to reflect direct responses to broad climatic regimes. Within each of the major forest regions are a number of distinct sections which are delineated according to local patterns in tree composition associated with the local physiographic and geological features. Forest classification mapping indicated that the Hanley Park North property lies at the interface of the Deciduous and Huron-Ontario Sections of the Great Lakes-St. Lawrence Forest Region (Rowe 1972).

The forest cover comprising the Huron-Ontario Section consists of a relatively rich mixture of hardwood and conifer tree species, including some elements of both the deciduous forest region to the south and the boreal forest region to the north, part of the Precambrian Shield. Natural forest stands on well-drained sites are dominated by sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), basswood (*Tilia americana*), white birch (*Betula papyrifera*), white ash (*Fraxinus americana*), red oak (*Quercus rubra*), and white pine (*Pinus strobus*). These well-drained habitat types are lacking on the subject property, with the exception of part of the North Parcel – with eastern white cedar and hardwoods dominating. Eastern hemlock (*Tsuga canadensis*), eastern white cedar (*Thuja occidentalis*), yellow birch (*Betula alleghaniensis*), white spruce (*Picea glauca*), and balsam fir (*Abies balsamea*) generally occur on slightly moister and cooler sites, such as in river valleys and wetland margins. Most of the upland stands on the subject property are dominated by fresh-moist of pole-sized to semi-mature eastern white cedar and dry-fresh stands of eastern white cedar, along with trembling aspen (*Populus tremuloides*), large-toothed aspen (*Populus grandidentata*), and a dense shrub stratum of common buckthorn (*Rhamnus cathartica*). Red cedar (*Juniperus virginiana*) is scattered in these stands and is ubiquitous to the City of Belleville and abutting lands to the west of the subject property.

Wet areas and wetland habitats in the Huron-Ontario Section support a variety of tree species such as red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), black ash (*Fraxinus nigra*), white elm (*Ulmus americana*), eastern white cedar, and less frequently, tamarack (*Larix laricina*).

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Trembling aspen, large-toothed aspen (*Populus grandidentata*), and balsam poplar (*Populus balsamifera*) are widespread in young, successional forests, and commonly occur at the ecotones between fields and more mature phases of forest growth and as part of treed swamps. These species are also found on poor to imperfectly drained soils and on disturbed sites.

Maycock (1979) and Burger (1993) present a more detailed, but similar forest cover pattern based on compositional trends with respect to environmental gradients (e.g., site moisture, soils, and microclimate). However, apart from the forest cover component of the vegetation of this region, their classification systems also describe a wide range of minor treed, shrub and/or groundcover communities that occupy marginal sites (e.g., too open and dry, or too wet to support forest growth) or secondary successional sites. Typical examples of such communities include the following.

- Old fields (mixed meadow) dominated by a wide variety of native, naturalized, and weed species, such as Canada goldenrod (*Solidago canadensis*), New England aster (*Aster novae-angliae*), blue grass (*Poa compressa*) and St. John's-wort (*Hypericum perforatum*).
- Dry upland thickets dominated by species such as staghorn sumac (*Rhus typhina*), gray dogwood (*Cornus racemosa*), common buckthorn, alder-leaved buckthorn (*Rhamnus alnifolia*), and common juniper (*Juniperus communis*).
- Wet lowland thickets dominated by various willows (*Salix discolor*, *Salix eriocephala*, *Salix petiolaris*, *Salix exigua*, *Salix bebbiana*), speckled alder (*Alnus rugosa*), gray dogwood and red-osier dogwood (*Cornus stolonifera*) and winterberry (*Ilex verticillata*).
- Wet meadow and shallow marsh communities dominated by grasses such as reed canary grass (*Phalaris arundinacea*), Canada blue joint (*Calamagrostis canadensis*), fowl manna grass (*Glyceria striata*), creeping bentgrass (*Agrostis stolonifera*), rice cutgrass (*Leeria oryzoides*) and sedges (*Carex retrorsa*, *Carex lacustris*, *Carex stricta*, *Carex bebbii*, *Carex stipata*, *Carex deweyana*, *Carex communis*, *Carex lupulina*, and *Carex hystericina*).
- Emergent aquatic communities dominated by common cattail (*Typha latifolia*), narrow-leaved cattail (*Typha angustifolia*), hybrid cattail (*Typha x glauca*), soft-stem bulrush (*Scirpus validus*) common reed (*Phragmites australis*), Canada rush (*Juncus effusus*), dark green bulrush (*Scirpus microcarpus*), wool-grass (*Scirpus cyperinus*), and spikerush (*Eleocharis spp.*).



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- Floating and submergent aquatic plant communities dominated by American white water lily (*Nymphaea odorata*), yellow pond lily (*Nuphar variegatum*), common duckweed (*Lemna minor*), greater duckweed (*Spirodela polyrhiza*), pondweeds (*Potamogeton gramineus*, *Potamogeton pectinatus*, *Potamogeton natans*), Canada waterweed (*Elodea canadensis*) and Eurasian milfoil (*Myriophyllum spicatum*).

As with many parts of southern and central Ontario, much of the original forest cover has been cleared for cultivation and settlement; consequently, contiguous, extensive forest tracts are relatively uncommon (Rowe 1972). However, in areas having limited agricultural capability or erosion susceptible soils, many abandoned farmlands have been planted with extensive conifer plantations, or have been left unattended and are reverting to natural plant cover in varying stages of successional development (e.g., wet meadow, old fields, thickets, young pioneer stands, etc.).

#### **4.1.2 Site Vegetation**

The terrestrial vegetation communities on the subject property (Hanley Park North Subdivision lands (comprised of a South Parcel, North Parcel, PSW) consists of upland woodlands dominated by eastern white cedar and poplars, with a dense shrub stratum of common buckthorn along with prickly-ash (*Zanthoxylum americanum*) in the somewhat open portions of the woodland canopies. The wetland vegetation communities that are within the subject property and those that border the subject property are part of the Bell Creek Swamp Complex (Mulal and Boxall 1993).

The location and extent of the cultural, natural and wetland features (ELCs) are characterized and delineated within the subject property, as schematically illustrated on **Figure 5**. The ELC vegetation mapping and boundaries of their component features were initially delineated through aerial photograph interpretation and later verified through ground-truthing.

The subject property with the exception of the PSW features has a vegetation cover of dry-fresh to fresh-moist upland woodland features which are contiguous on the South Parcel and contiguous on the North Parcel. Upland woodland units on the South Parcel include: Fresh-Moist White Cedar Coniferous Forest (FOCM4-1); Dry-Fresh White Cedar-Hardwood Mixed Forest (FOMM4-2); Dry-Fresh Poplar-White Cedar Mixed Forest (FOMM5-2); and Dry-Fresh Native Mixed Regeneration Thicket/Dry-Fresh Mixed Meadow (THMM1/MEMM3). Upland woodland units on the North Parcel include: Fresh-Moist White Cedar Coniferous Forest (FOCM4-1); and Fresh-Moist White Cedar-Hardwood Mixed Forest (FOMM7-2).

**Table 1. List of Vegetation Communities (ELC Units)\* on the Subject Property (South and North Parcels – excluding PSW features\*\*).**

ELC Code	Vegetation Type	Summary Description
FOCM4-1	Fresh-Moist White Cedar Coniferous Forest	<ul style="list-style-type: none"> <li>- three blocks of this coniferous woodland feature were delineated on the subject property, two on the South Parcel and one on the North Parcel (see <b>Figure 5</b>, and <b>Photographs 1</b> and <b>2</b>).</li> <li>- dominant tree species were principally eastern white cedar, pole-sized to early successional, along with scattered trembling aspen and red cedar, with an edge of green ash and white elm.</li> <li>- the shrub stratum is dominated by common buckthorn, with sub-dominants of prickly-ash, gray dogwood, choke cherry, shrub cedars, red-berried elder, crab apple, and tartarian honeysuckle.</li> <li>- given the dense distribution of cedars, the groundcover was characterized as clumped to sparse to barren, with species noted such as mosses, poplar seedlings, white ash seedlings, Philadelphia fleabane, poison ivy, wild strawberry, herb-robert, enchanters nightshade, common dandelion, forget-me-not, woodland strawberry, St. John’s-wort, field horsetail, Virginia creeper, riverbank grape, yellow avens and field sow-thistle.</li> </ul>
FOMM4-2	Dry-Fresh White Cedar-Poplar Mixed Forest	<ul style="list-style-type: none"> <li>- approximately 3/5ths of the South Parcel is covered with a mixed stand dominated by early to mid-successional eastern white cedar, sporadically intermixed with trembling aspen, large-toothed aspen, along with scattered hardwoods (sugar maple, hop hornbeam, black cherry) with a full dense canopy (see <b>Figure 5</b>, and <b>Photographs 3</b> and <b>4</b>).</li> <li>- the shrub stratum contains similar species to those found in FOCM4-1.</li> <li>- the ground stratum was sparse to barren to clumped and contains similar species as those found in FOCM4-1, with a moss covering on the moister soils.</li> </ul>
FOMM7-2	Fresh-Moist White Cedar-Hardwood Mixed Forest	<ul style="list-style-type: none"> <li>- the majority of the North Parcel is covered with a woodland cover characterized as eastern white cedar and hardwoods, which is somewhat bisected by a “finger-like projection of wetland habitat (MAMM2-1 part of the PSW) (see <b>Figure 5</b>, and <b>Photographs 5</b> and <b>6</b>) at the interface with the PSW which consists of green ash swamp and shrub thicket swamp (<b>Photograph 7</b>).</li> <li>- woody associates red oak, white ash, sugar maple, red maple, blue beech, buckthorn, red-berried elder, choke cherry, tartarian honeysuckle and high-bush cranberry.</li> <li>- typical groundcover stratum species include sensitive fern, spotted jewelweed, spinulose wood-fern, enchanters nightshade, herb-robert, wild sarsaparilla, large-leaved aster, deadly nightshade, common dandelion, woodland strawberry and field horsetail.</li> </ul>

ELC Code	Vegetation Type	Summary Description
FOMM5-2	Dry-Fresh Poplar-White Cedar Mixed Forest	<ul style="list-style-type: none"> <li>- this tableland woodland feature lies on the South Parcel and is contiguous with FOMM4-2 and FOCM4-1 and bordered on the east edge by PSW and west edge with the hydro easement (see <b>Figure 5</b>).</li> <li>- dominant trees in the canopy include trembling aspen, large-toothed aspen and eastern white cedar, along with scattered hardwoods such as sugar maple, hop hornbeam, basswood and white elm.</li> <li>- eastern white cedar dominates the understory, along with younger trembling aspen.</li> <li>- the shrub and vine stratum contains eastern white cedar, common buckthorn, red cedar, tartarian honeysuckle, red-berried elder, prickly-ash, choke cherry, pasture gooseberry, poison ivy, riverbank grape and Virginia creeper.</li> <li>- the ground stratum was slightly more diverse than FOMM4-2 and contained similar species to those found in FOCM4-1, with mosses dominant on the moister soils.</li> </ul>
THMM1-1/MEMM3	Dry-Fresh Native Mixed Regeneration Thicket/ Dry-Fresh Mixed Meadow	<ul style="list-style-type: none"> <li>- bordering the western edge of the upland woodland units (FOMM4-2, FOMM5-2 and FOCM4-1) on the South Parcel was a hydro easement with hydro poles and overhead hydro lines.</li> <li>- the southern portion of the hydro easement traverses parts of the on-site PSW and extends (see <b>Figure 5</b>, and <b>Photograph 8</b>).</li> <li>- vegetation cover on the inner and outer edges of the hydro easement consisted of dry-fresh native mixed regeneration thicket (THMM1-1) and the ground stratum was hard-packed with dry-fresh mixed meadow.</li> <li>- trees, shrubs and vines in the regeneration thicket edges consists of green ash, eastern white cedar, white elm, gray dogwood, red cedar, common buckthorn, European buckthorn, choke cherry, honeysuckles, dog-rose, crab apple, and willows.</li> <li>- typical mixed meadow ground stratum species include Canada goldenrod, New England aster, wild carrot, awnless brome grass, reed canary grass, eastern bracken fern, common dandelion, wintercress, common burdock, cow vetch, daisy fleabane, common milkweed, common buttercup, Canada thistle, chicory, white sweet-clover, common strawberry, bouncing –bet, Canada blue grass, timothy and rough-fruited cinquefoil.</li> </ul>

\* ELC Codes based on Lee (2008).

\*\* Given the abundance and interwoven nature of wetland features (part of the Bell Creek Swamp Complex), the wetland features both on and off-site were not mapped on **Figure 2** but are described in Section 4.1.2 based on visual observations in conjunction with selective photographs. The interfaces of the upland terrestrial woodlands with the PSW edges were flagged and surveyed in-situ (GPS'd) with Quinte Conservation, MNAL and CEA staff on June 25, 2008 and September 13, 2017.

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The constituent vascular plant species, characterized and recorded in the cultural, natural and wetland features are documented in a master plant list contained in **Appendix A**. The master list is a comprehensive listing of plant species found during the 2008, 2017 and 2018 wetland boundary delineation and botanical field inventories. Given the relative homogeneity of the woodland features (comprised mainly of eastern white cedar, poplars, common buckthorn and prickly-ash) of similar heights, stratum, age classes and distribution densities, it is our professional opinion that a separate plant species list for each upland mixed and conifer woodland, hydro-line and abutting on-site wetland features was not warranted, as it would not provide any added-value to the database. However, typical wetland species are indicated on the master plant list with an asterisk (\*) and those found on-site and in the PSW with a double asterisk (\*\*).

The following sub-sections provide summary descriptions of the subject property features, including their ELC characterization, approximate boundaries and inherent plant species composition in the overstorey, understorey, shrub and groundcover stratum, where applicable. **Figure 5** is a schematic illustration of the vegetation communities and in conjunction with the following text, representative photographs and **Table 1** provides a qualitative descriptive summary and visual context of the cultural, natural and wetland features found and documented within the tableland (upland) areas of the subject property during the 2007, 2017 and 2018 field inventories, as well as the abutting wetland features, all part of the provincially significant Bell Creek Swamp Complex,

#### **Terrestrial Vegetation Communities – South Parcel and North Parcel**

***Fresh-Moist White Cedar Coniferous Forest (FOCM4-1)***: Three blocks of this upland coniferous woodland feature were delineated and characterized on the subject property. **Photographs 1** and **2** show typical aspects of this upland fresh-moist coniferous woodland feature which is dominated by eastern white cedar, with stands found on both the South and North Parcels. These woodland stands are also contiguous with other woodland stands on-site and typical of the local geographic area.

The dominant tree species were principally pole-sized to early successional eastern white cedar, along with scattered trembling aspen and red cedar, with an edge of green ash and white elm. The shrub stratum is dominated by common buckthorn, with sub-dominants of prickly-ash, gray dogwood, choke cherry, shrub white cedars, red-berried elder (*Sambucus pubens*), crab apple (*Malus coronaria*), and tartarian honeysuckle (*Lonicera tatarica*).



**Table 1. List of Vegetation Communities (ELC Units)\* on the Subject Property (South and North Parcels – excluding PSW features\*\*).**

ELC Code	Vegetation Type	Summary Description
FOCM4-1	Fresh-Moist White Cedar Coniferous Forest	<ul style="list-style-type: none"> <li>- three blocks of this coniferous woodland feature were delineated on the subject property, two on the South Parcel and one on the North Parcel (see <b>Figure 5</b>, and <b>Photographs 1</b> and <b>2</b>).</li> <li>- dominant tree species were principally eastern white cedar, pole-sized to early successional, along with scattered trembling aspen and red cedar, with an edge of green ash and white elm.</li> <li>- the shrub stratum is dominated by common buckthorn, with sub-dominants of prickly-ash, gray dogwood, choke cherry, shrub cedars, red-berried elder, crab apple, and tartarian honeysuckle.</li> <li>- given the dense distribution of cedars, the groundcover was characterized as clumped to sparse to barren, with species noted such as mosses, poplar seedlings, white ash seedlings, Philadelphia fleabane, poison ivy, wild strawberry, herb-robert, enchanters nightshade, common dandelion, forget-me-not, woodland strawberry, St. John’s-wort, field horsetail, Virginia creeper, riverbank grape, yellow avens and field sow-thistle.</li> </ul>
FOMM4-2	Dry-Fresh White Cedar-Poplar Mixed Forest	<ul style="list-style-type: none"> <li>- approximately 3/5ths of the South Parcel is covered with a mixed stand dominated by early to mid-successional eastern white cedar, sporadically intermixed with trembling aspen, large-toothed aspen, along with scattered hardwoods (sugar maple, hop hornbeam, black cherry) with a full dense canopy (see <b>Figure 5</b>, and <b>Photographs 3</b> and <b>4</b>).</li> <li>- the shrub stratum contains similar species to those found in FOCM4-1.</li> <li>- the ground stratum was sparse to barren to clumped and contains similar species as those found in FOCM4-1, with a moss covering on the moister soils.</li> </ul>
FOMM7-2	Fresh-Moist White Cedar-Hardwood Mixed Forest	<ul style="list-style-type: none"> <li>- the majority of the North Parcel is covered with a woodland cover characterized as eastern white cedar and hardwoods, which is somewhat bisected by a “finger-like projection of wetland habitat (MAMM2-1 part of the PSW) (see <b>Figure 5</b>, and <b>Photographs 5</b> and <b>6</b>) at the interface with the PSW which consists of green ash swamp and shrub thicket swamp (<b>Photograph 7</b>).</li> <li>- woody associates red oak, white ash, sugar maple, red maple, blue beech, buckthorn, red-berried elder, choke cherry, tartarian honeysuckle and high-bush cranberry.</li> <li>- typical groundcover stratum species include sensitive fern, spotted jewelweed, spinulose wood-fern, enchanters nightshade, herb-robert, wild sarsaparilla, large-leaved aster, deadly nightshade, common dandelion, woodland strawberry and field horsetail.</li> </ul>

ELC Code	Vegetation Type	Summary Description
FOMM5-2	Dry-Fresh Poplar-White Cedar Mixed Forest	<ul style="list-style-type: none"> <li>- this tableland woodland feature lies on the South Parcel and is contiguous with FOMM4-2 and FOCM4-1 and bordered on the east edge by PSW and west edge with the hydro easement (see <b>Figure 5</b>).</li> <li>- dominant trees in the canopy include trembling aspen, large-toothed aspen and eastern white cedar, along with scattered hardwoods such as sugar maple, hop hornbeam, basswood and white elm.</li> <li>- eastern white cedar dominates the understory, along with younger trembling aspen.</li> <li>- the shrub and vine stratum contain eastern white cedar, common buckthorn, red cedar, tartarian honeysuckle, red-berried elder, prickly-ash, choke cherry, pasture gooseberry, poison ivy, riverbank grape and Virginia creeper.</li> <li>- the ground stratum was slightly more diverse than FOMM4-2 and contained similar species to those found in FOCM4-1, with mosses dominant on the moister soils.</li> </ul>
THMM1-1/MEMM3	Dry-Fresh Native Mixed Regeneration Thicket/ Dry-Fresh Mixed Meadow	<ul style="list-style-type: none"> <li>- bordering the western edge of the upland woodland units (FOMM4-2, FOMM5-2 and FOCM4-1) on the South Parcel was a hydro easement with hydro poles and overhead hydro lines.</li> <li>- the southern portion of the hydro easement traverses parts of the on-site PSW and extends (see <b>Figure 5</b>, and <b>Photograph 8</b>).</li> <li>- vegetation cover on the inner and outer edges of the hydro easement consisted of dry-fresh native mixed regeneration thicket (THMM1-1) and the ground stratum was hard-packed with dry-fresh mixed meadow.</li> <li>- trees, shrubs and vines in the regeneration thicket edges consists of green ash, eastern white cedar, white elm, gray dogwood, red cedar, common buckthorn, European buckthorn, choke cherry, honeysuckles, dog-rose, crab apple, and willows.</li> <li>- typical mixed meadow ground stratum species include Canada goldenrod, New England aster, wild carrot, awnless brome grass, reed canary grass, eastern bracken fern, common dandelion, wintercress, common burdock, cow vetch, daisy fleabane, common milkweed, common buttercup, Canada thistle, chicory, white sweet-clover, common strawberry, bouncing –bet, Canada blue grass, timothy and rough-fruited cinquefoil.</li> </ul>

\* ELC Codes based on Lee (2008).

\*\* Given the abundance and interwoven nature of wetland features (part of the Bell Creek Swamp Complex), the wetland features both on and off-site were not mapped on **Figure 2** but are described in Section 4.1.2 based on visual observations in conjunction with selective photographs. The interfaces of the upland terrestrial woodlands with the PSW edges were flagged and surveyed in-situ (GPS'd) with Quinte Conservation, MNAL and CEA staff on June 25, 2008 and September 13, 2017.





**Photograph 1.** View inside part of Fresh-Moist White Cedar Coniferous Forest (FOCM4-1) on South Parcel, with pole-sized to immature eastern white cedar and a sparse, to clumped to barren groundcover



**Photograph 2.** View inside part of Fresh-Moist White Cedar Coniferous Forest (FOCM4-1) on North Parcel, with pole-sized to immature eastern white cedar and a sparse, to clumped to barren groundcover, as found on South Parcel



**Photograph 3.** View inside part of Dry-Fresh White Cedar-Poplar Mixed Forest (FOMM4-2) on South Parcel, with dense to semi-mature eastern white cedar intermixed with small copses of poplars and scattered hardwoods



**Photograph 4.** View inside part of Dry-Fresh White Cedar-Poplar Mixed Forest (FOMM4-2) on South Parcel, with dense to semi-mature eastern white cedar intermixed with poplars (Pot, Pol) and scattered hardwoods (Mh, Hh Chb)



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As a result of the dense distribution of eastern white cedar and lack of penetrating light through the canopy, the groundcover was characterized as clumped to sparse to barren. Typical species include mosses, poplar seedlings, white ash seedlings. Philadelphia fleabane (*Erigeron philadelphicus*), poison ivy (*Rhus radicans*), wild strawberry (*Fragaria virginiana*), herb-robert (*Geranium robertianum*), enchanters nightshade (*Circaea lutetiana*), common dandelion (*Taraxacum officinale*), yellow lady slipper (*Cypripedium parviflorum*), forget-me-not (*Myosotis laxa*), woodland strawberry (*Fragaria vesca*), St. John's-wort, field horsetail (*Equisetum arvense*), Virginia creeper (*Parthenocissus inserta*), riverbank grape (*Vitis riparia*), yellow avens (*Geum aleppicum*), and field sow-thistle (*Sonchus oleraceus*).

**Dry-Fresh White Cedar-Poplar Mixed Forest (FOMM4-2):** The majority (approximately 3/5<sup>ths</sup>) of the South Parcel is dominated by dry-fresh white cedar-poplar mixed forest, with early to mid-successional cedars (**Photographs 3 and 4**). Other woody associates include trembling aspen, large-toothed aspen and scattered hardwoods such as sugar maple, hop hornbeam, black cherry, red maple and white elm. The shrubs stratum is similar in structure and composition to that found in FOCM4.1.

The ground stratum was sparse to barren to clumped given the lack of light penetration and is comprised of similar species as those found in FOCM4-1. Mosses cover and are dominant on the moister soils, depending on the micro-topography.

**Fresh-Moist White Cedar-Hardwood Mixed Forest (FOMM7-2):** This woodland feature covers most of the North Parcel and is dominated by eastern white cedar and mixed hardwoods (**Photographs 5 and 6**). This fresh-moist somewhat lowland woodland is partially bisected by a finger-like projection of wetland habitat (MAMM2-1), part of the Bell Creek Swamp Complex PSW. The interface with the PSW consists of green ash swamp and willow thicket swamp (**Photograph 7**). Woody hardwood associates include white ash, red oak, sugar maple, red maple, blue beech (*Carpinus caroliniana*), common buckthorn, red-berried elder, choke cherry, tartarian honeysuckle, and high-bush cranberry (*Viburnum trilobum*).

Typical groundcover species include sensitive fern (*Onoclea sensibilis*), spotted jewelweed (*Impatiens capensis*), spinulose wood-fern (*Dryopteris carthusiana*), enchanters nightshade, herb-robert, wild sarsaparilla (*Aralia nudicaulis*), large-leaved aster (*Euribia macrophylla*), deadly nightshade (*Solanum dulcamara*), common dandelion, woodland strawberry and field horsetail.

**Dry-Fresh Poplar-White Cedar Mixed Forest (FOMM5-2):** This tableland woodland feature lies on the South Parcel and is contiguous with FOMM4-2 and FOCM4-1 and bordered on the east edge by PSW and





**Photograph 5.** View inside part of Fresh-Moist White Cedar-Hardwood Mixed Forest (FOMM7-2) on North Parcel, dominated by eastern white cedar, poplars, white birch, hop hornbeam, white elm and common buckthorn



**Photograph 6.** View inside part of Fresh-Moist White Cedar-Hardwood Mixed Forest (FOMM7-2) on North Parcel, dominated by eastern white cedar, poplars, white birch, hop hornbeam, common buckthorn and scattered white ash



**Photograph 7.** View of interface of Fresh-Moist White Cedar-Hardwood (FOMM7-2) on North Parcel with green ash, white elm, willow shrubs and dogwoods, interspersed with cattails, part of PSW



**Photograph 8.** View of south end of hydro easement in PSW showing open water in combination with cattail marsh/shrub thicket swamp, with Dry-Fresh Native Mixed Regeneration Thicket (THMM1-1) and Mixed Meadow (MEMM3)



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west edge with the hydro easement (see **Figure 5**). Dominant trees in the canopy include trembling aspen, large-toothed aspen and eastern white cedar, along with scattered hardwoods such as sugar maple, hop hornbeam, basswood and white elm. The shrub and vine stratum contains eastern white cedar, common buckthorn, red cedar, tartarian honeysuckle, red-berried elder, prickly-ash, choke cherry, pasture gooseberry (*Ribes cynosbati*), poison ivy, riverbank grape, and Virginia creeper.

The ground stratum structure and composition is slightly more diverse than FOMM4-2 and contained similar species to those found in FOCM4-1, with mosses dominant on the moister soils.

***Dry-Fresh Native Mixed Regeneration Thicket/Dry-Fresh Moist Meadow (THMM1/MEMM3):***

Bordering the western edges of upland woodland units FOMM4-2, FOMM52 and FOCM4-1 on the South Parcel is a hydro easement with hydro poles and overhead hydro lines. The southern portion of the hydro easement traverses parts of the on-site and abutting PSW and extends southward (**Photograph 8**). Vegetation cover on the inner and outer edges of the hydro easement consists of dry-fresh native mixed regeneration thicket (THMM1-1) and the ground stratum was hard-packed with dry-fresh mixed meadow (MEMM3).

Trees, shrubs and vines in the regeneration thicket edges consist of green ash, eastern white cedar, white elm, gray dogwood, red cedar, common buckthorn, alder-leaved buckthorn, choke cherry, honeysuckles, dog-rose (*Rosa canina*), crab apple and willows (*Salix spp.*).

Typical mixed meadow groundcover stratum species include Canada goldenrod (*Solidago canadensis*), New England aster (*Symphyotrichum novae-angliae*), wild carrot (*Daucus carota*), awnless brome grass (*Bromus inermis*), reed canary grass (*Phalaris arundinacea*), eastern bracken fern (*Pteridium aquilinum*), common dandelion, wintercress (*Barbarea vulgaris*), common burdock (*Arctium minus*), cow vetch (*Vicia cracca*), daisy fleabane (*Erigeron annuus*), common milkweed (*Asclepias syriaca*), common buttercup (*Ranunculus repens*), Canada thistle (*Cirsium arvense*), chicory (*Cichorium inybus*), white sweet-clover (*Melilotus alba*), common strawberry, bouncing-bet (*Saponaria officinalis*), Canada blue grass (*Poa compressa*), timothy (*Phleum pratense*) and rough-fruited cinquefoil (*Potentilla recta*).

**Wetland Vegetation Communities**

The South Parcel is bordered on all sides by part of the provincially significant Bell Creek Swamp Complex. The North Parcel is bordered on the south and east sides by the PSW. The boundary of the PSW at its

interface with the South Parcel and North Parcel was flagged and surveyed (GPSd) with Quinte Conservation staff on July 25, 2008 and September 13, 2017 (**Figure 6**). The subsections below provide qualitative descriptions and representative photographs are the wetland features that border the South Parcel and North Parcel, and are all contained in the adjacent provincially significant Bell Creek Swamp Wetland, but are not individually mapped on **Figure 6**.

**Green Ash Mineral Deciduous Swamp (SWDM2-2):** **Photograph 9** shows an inside view of the typical green ash mineral deciduous swamp (SWDM2-2) that borders the southern edge of the South Parcel. Dominant trees in the canopy include green ash, black ash (*Fraxinus nigra*), white elm, large-toothed aspen, and balsam poplar. Understorey and shrub stratum woody species include slender willow (*Salix petiolaris*), nannyberry (*Viburnum lentago*), red-osier dogwood, gray dogwood, red-berried elder, common elderberry (*Sambucus canadensis*), Bebb’s willow (*Salix bebbiana*), pussy willow (*Salix discolor*), winterberry (*Ilex verticillata*) and red currant (*Ribes sativum*).

<i>Epilobium hirsutum</i>	hairy willow-herb
<i>Galium triflorum</i>	fragrant bedstraw
<i>Typha angustifolia</i>	narrow-leaved cattail
<i>Typha latifolia</i>	common cattail
<i>Nastursium officinale</i>	watercress
<i>Lythrum salicaria</i>	purple loosestrife
<i>Mentha arvensis</i>	wild mint
<i>Eutrochium maculatum</i>	spotted Joe pye-weed
<i>Lysimachia ciliata</i>	fringed loosestrife
<i>Eupatorium perfoliatum</i>	boneset
<i>Phalaris arundinacea</i>	reed canary grass
<i>Impatiens capensis</i>	spotted jewelweed
<i>Caltha palustris</i>	marsh marigold
<i>Lysimachia terrestris</i>	swamp candles
<i>Iris versicolor</i>	blue flag
<i>Vitis riparia</i>	wild grape
<i>Equisetum fluviatile</i>	water horsetail
<i>Symphotrichum puniceum</i>	purple-stemmed aster
<i>Lemna minor</i>	common duckweed
<i>Parthenocissus inserta</i>	Virginia creeper
<i>Myosotis laxa</i>	forget-me-not
<i>Barbarea vulgaris</i>	wintercress
<i>Lycopus americanus</i>	water horehound
<i>Solanum dulcamara</i>	deadly nightshade
<i>Alisma plantago-aquatica</i>	water plantain
<i>Scutellaria galericulata</i>	marsh skullcap
<i>Leersia oryzoides</i>	rice cut grass
<i>Glyceria striata</i>	fowl manna grass



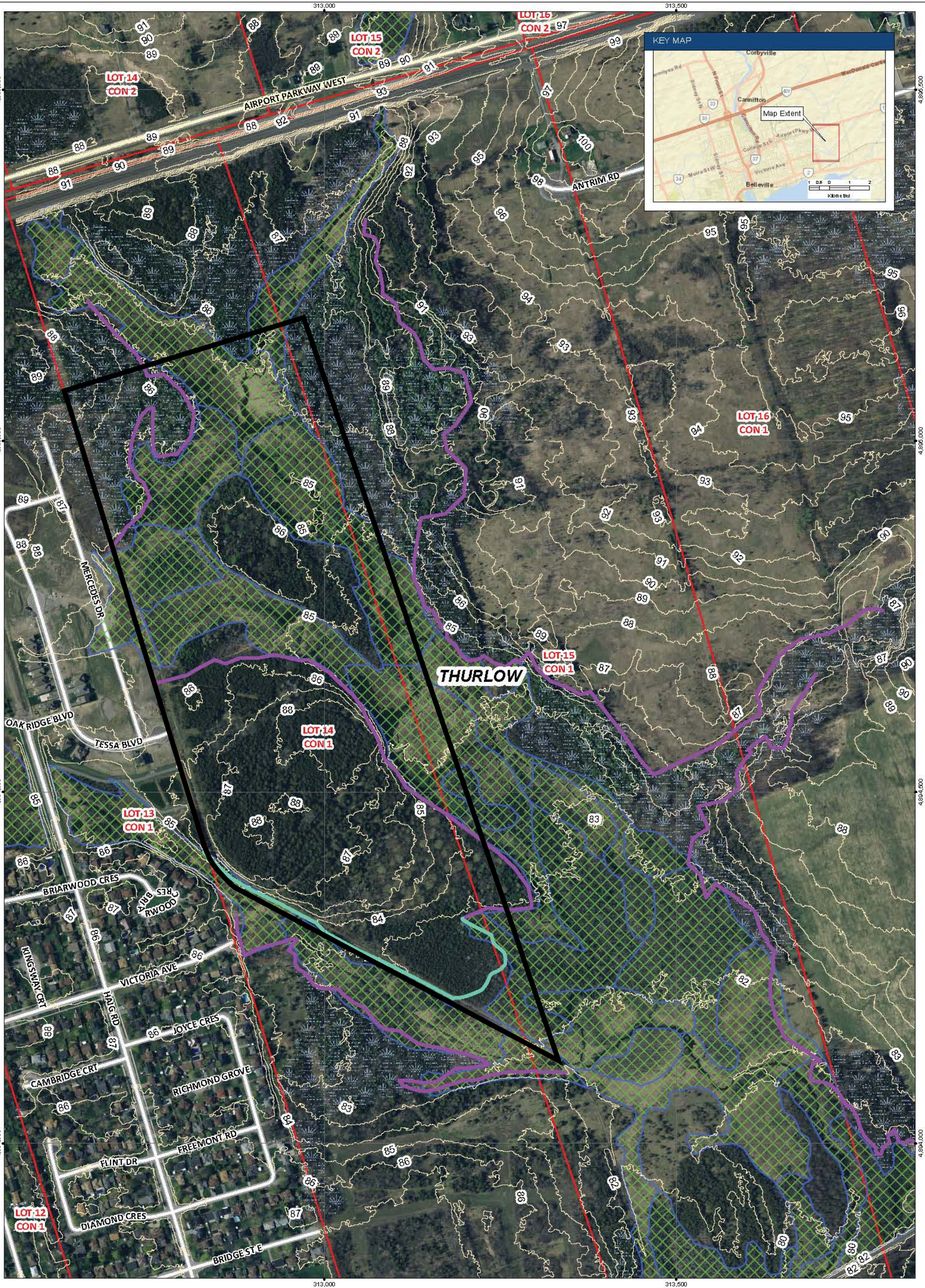




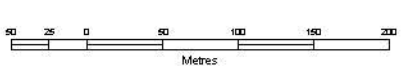
Figure 6. QC & CEA Wetland Boundary

 subject property boundary (approx.)



DEPARTMENT:	Planning and Regulations	
TITLE:	Bell Creek Wetland Boundary Delineation Update, 2017 True Colour Image	
SCALE:	1:5,000	
SHEET:	1 of 2	
DRAWING:	C.V.	
CHECK:	T.T.	

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01	Draft for comment / review	12/10/17
No.	REVISION	DD/MM/YY

LEGEND / NOTES		
	Contour - 1 metre interval	
<b>Bell Creek Wetland Boundary (Per QC, CEA) <sup>1</sup></b>		
	Survey date: 2017-09-13	
	Survey dates: 2004-2012	
<b>Wetland Boundary (Per MNRFF)</b>		
	Evaluated-Provincial	
	Evaluated-Other	
	Not evaluated per OWES <sup>2</sup>	
<sup>1</sup> T. Trustham and D. Cunningham		
<sup>2</sup> Ontario Wetland Evaluation System Grid Spacing: 500 metres		





**Photograph 9.** View inside of Green Ash Mineral Deciduous Swamp (SWDM2-2) at south end of subject property, part of the Bell Creek Swamp Complex (PSW)



**Photograph 10.** View of Cattail Mineral Shallow Marsh (MASM1-1), with a canopy of Green Ash Mineral Deciduous Swamp (SWDM2-2), part of the PSW



**Photograph 11.** View of Gray Dogwood Mineral Deciduous Thicket Swamp (SWTM2-3), intermixed with white elm, green ash, willow shrubs and dead hardwoods part of the PSW



**Photograph 12.** View of Cattail Mineral Shallow Marsh (MASM1-1), part of the Bell Creek Swamp Complex PSW, with water fluctuations due to beaver activity



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<i>Calamagrostis canadensis</i>	Canada bluejoint grass
<i>Carex stipata</i>	awl-fruited sedge
<i>Carex gracillima</i>	graceful sedge
<i>Carex bebbii</i>	Bebb's sedge
<i>Carex stricta</i>	tussock sedge
<i>Carex granularis</i>	meadow sedge

**Cattail Mineral Shallow Marsh (MASM1-1)/Green Ash Mineral Deciduous Swamp (SWDM2-2):** This part of the provincially significant Bell Creek Swamp Complex is dominated by cattail mineral meadow marsh with a canopy of green ash mineral deciduous swamp (**Photograph 10**). The groundflora is dominated by narrow-leaved cattails, common cattail, hybrid cattail (*Typha x glauca*), along with species found in the groundcover stratum of SWDM2-2. Scattered woody vegetation includes green ash, white elm, gray dogwood, red-osier dogwood, elderberries and willow shrubs.

**Gray Dogwood Mineral Deciduous Thicket Swamp (SWTM2-3):** Gray dogwood shrubs dominate that thicket swamp feature found in certain sections of the PSW, namely along its outer edges (**Photograph 11**). Associate woody vegetation includes pussy willow, slender willow, Bebb's willow, black ash, green ash, white elm, dead hardwoods (dh), and red-osier dogwood.

Typical species in the groundcover stratum include marsh horsetail (*Equisetum pretense*), purple loosestrife, fringed sedge (*Carex crinita*), tussock sedge, awl-fruited sedge, bristly sedge (*Carex comosa*), hop sedge (*Carex lupulina*), common duckweed, spotted Joe pye-weed, boneset, sensitive fern, marsh fern (*Thelypteris palustris*), ostrich fern (*Matteuccia struthiopteris*), water plantain, reed canary grass, bulb-bearing water hemlock (*Cicuta bulbifera*), water dock (*Rumex orbiculatus*), fringed loosestrife, purple-stemmed aster, tall goldenrod, fowl manna grass, Canada bluejoint grass, rice cut grass, and swamp candles.

**Cattail Mineral Shallow Marsh (MASM1-1):** This wetland unit is similar in form and inherent plant species as those found in MASM1-1/SWDM2-2, but lacking in the green ash mineral deciduous swamp canopy. Most of the tree species in this particular wetland feature are dead or dying due to the higher water levels as a result of past and present beaver activity (**Photograph 12**).

**Reed Canary Grass Shallow Marsh (MASM1-14):** **Photograph 13** shows a typical view of a reed canary grass mineral shallow marsh feature, part of the PSW and typically found along the edges of the many diffuse and defined tributaries of Bell Creek. Dense swards of reed canary grass are dominant, and interspersed with meadowsweet (*Spiraea alba*), willow and dogwood shrubs.





**Photograph 13.** View of Reed Canary Grass Mineral Shallow Marsh (MASM1-14), with pure patches, as well as a shrub stratum of willows and dogwoods



**Photograph 14.** Northward view of “finger intrusion of PSW” into the North Parcel, dominated by Jewelweed Forb Mineral Shallow Marsh (MAMM2-1), part of the PSW



**Photograph 15.** View of Forb Mineral Shallow Marsh (MASM2-1), part of the PSW on the subject property, situated between the South Parcel and North Parcel



**Photograph 16.** View of Cattail-Graminoid Mineral Meadow Marsh (MAMM1-2) on the subject property, part of the PSW to the east of FOMM4-2



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Commonly noted groundflora includes spotted jewelweed (*Impatiens capensis*), sensitive fern, purple loosestrife, narrow-leaved cattail, common cattail, elecampane (*Inula helenium*), hog peanut (*Amphicarpa bracteata*), boneset, spotted Joe pye-weed, purple-stemmed aster, water horehound (*Lycopus americanus*), meadow sedge, foxtail sedge (*Carex vulpinoidea*), tussock sedge, fragrant bedstraw, cleavers (*Galium aparine*), and tall goldenrod.

**Jewelweed Forb Mineral Shallow Marsh (MAMM2-1):** **Photograph 14** shows a view of a finger-like wetland feature projection on the North Parcel, which is dominated by spotted jewelweed. Other groundflora includes boneset, forget-me-not, sensitive fern, fringed loosestrife, water horehound, sedges and grasses.

**Forb Mineral Shallow Marsh (MASM2-1):** The large block of PSW between the north edge of the South Parcel and the south edge of the North Parcel is dominated by forb mineral shallow marsh, which contains a diverse and lush groundcover (**Photograph 15**). Typical forbs include spotted Joe pye-weed, boneset, blue flag, purple-stemmed aster, purple loosestrife, fringed loosestrife, blue vervain (*Verbena hastata*), broad-leaved arrowhead (*Sagittaria latifolia*), water plantain, common burreed (*Sparganium eurycarpum*), marsh cinquefoil (*Comarum palustre*), rushes (*Juncus spp.*), spikerush (*Eleocharis spp.*), beggar-ticks (*Bidens frondosa*), Jack-in-the-pulpit (*Arisaema triphyllum*), ostrich fern, sedges (*Carex spp.*) and typical shallow marsh grasses.

**Cattail-Graminoid Mineral Meadow Marsh (MAMM1-2):** **Photograph 16** shows a view of a cattail-graminoid mineral meadow marsh feature, part of PSW that borders the eastern edge of the South Parcel. Typical woody vegetation is similar to that contained in SWTM2-3 and a groundcover similar to that contained in MASM1-14, MASM2-1 and MASM1-1.

## 4.2 Wildlife Species

**Table 2** is a list of bird species observed on the Hanley Park North property (South Parcel and North Parcel) during the 2018 site inventories. **Figure 4** shows the locations of the four (4) point count stations for dawn breeding birds utilized during the 2018 surveys. The data were supplemented with sightings observed during the July 25, 2008 and September 13, 2017 wetland boundary flagging with QC staff. The **Ontario Breeding Bird Atlas (OBBA)** data from the Ontario 2001-2005 surveys (Square Summary 18UP19) and MNAL (2005) were also reviewed to garner an understanding of the local bird species in and around the



**Table 2. Bird Species List for Subject Property (South Parcel and North Parcel) - Hanley Park North Property (2018), City of Belleville, County of Hastings.**

FAMILY	SCIENTIFIC NAME	COMMON NAME	Point Count Station				Breeding Evidence <sup>1</sup>	Relative Location	Conservation Rank Information <sup>2</sup>			
			1	2	3	4			S RANK	G RANK	SARO STATUS	COSEWIC Status
Accipitridae	<i>Circus cyaneus</i>	Northern Harrier **	X,H				Possible	PSW	S4B	G5		
Accipitridae	<i>Buteo jamaicensis</i>	Red-tailed Hawk		FO, H	,H		Possible	On-site	S5	G5		
Alcedinidae	<i>Megaceryle alcyon</i>	Belted Kingfisher **	C,H			,C	Possible	PSW	S4B	G5		
Anatidae	<i>Branta canadensis</i>	Canada Goose*		FO	FO	FY	Confirmed	PSW	S5	G5		
Anatidae	<i>Anas platythynos</i>	Mallard **	FO			FY	Confirmed	PSW	S5	G5		
Anatidae	<i>Anas discors</i>	Blue-winged Teal **				H	Possible	PSW	S4	G5		
Ardeidae	<i>Ixobrychus exilis</i>	Least Bittern **				X	Observed	Reported in PSW	SB4	G5	THR	THR
Phasianidae	<i>Bonasa umbellus</i>	Ruffed Grouse		X	,X		Possible	On-site	S4	G5		
Cathartidae	<i>Carthartes aura</i>	Turkey Vulture *	FO		FO	,FO	None	Flying Overhead	SB5	G5		
Falconidae	<i>Falco sparverius</i>	American Kestrel				X	Observed	On-site	S4	G5		
Scolopacidae	<i>Actitis macularia</i>	Spotted Sandpiper*	,H			H	Possible	PSW	S5	G5		
Ardeidae	<i>Ardea herodias</i>	Great Blue Heron *	X			FO	None	PSW	S4	G5		
Bombycillidae	<i>Bombycilla cedrorum</i>	Cedar Waxwing	H	H,C	H,S		Possible	On-site	S5B	G5		
Cardinalidae	<i>Cardinalis cardinalis</i>	Northern Cardinal	S,S <sup>3</sup>	P	S,S	S	Probable	On-site	S5	G5		
Cardinalidae	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak		C	C		Possible	On-site	S4B	G5		
Charadriidae	<i>Charadrius vociferus</i>	Killdeer				C,C	Possible	On-site	S5B,S5N	G5		
Icteridae	<i>Icterus galbula</i>	Baltimore Oriole	S		S,S		Probable	On-site	S4B	G5		
Columbidae	<i>Zenaida macroura</i>	Mourning Dove	C,C	C,C	V		Probable	On-site	S5	G5		
Corvidae	<i>Corvus brachyrhynchos</i>	American Crow	X,H	C	C	C	Probable	On-site	S5B	G5		
Corvidae	<i>Cyanocitta cristata</i>	Blue Jay	C	C,C	C	C	Probable	On-site	S5	G5		
Emberizidae	<i>Melospiza melodia</i>	Song Sparrow			C	X	Observed	On-site	S5B	G5		
Emberizidae	<i>Spizella passerina</i>	Chipping Sparrow		C,C	,C		Probable	On-site	S5B	G5		
Emberizidae	<i>Melospiza georgiana</i>	Swamp Sparrow **				X	Observed	Reported in PSW	S5B	G5		
Fringillidae	<i>Carduelis tristis</i>	American Goldfinch	H,C	H,C	C,C		Probable	On-site	S5B	G5		
Hirundinidae	<i>Tachycineta bicolor</i>	Tree Swallow	X			C,C	Probable	PSW	S4B	G5		
Hirundinidae	<i>Steigodopteryx serripennis</i>	Northern Rough-winged Swallow **				H,C	Possible	PSW	S4B	G5		
Icteridae	<i>Agelaius phoeniceus</i>	Red-winged Blackbird	H,C			C,C	Probable	PSW	S4	G5		
Icteridae	<i>Molothrus ater</i>	Brown-headed Cowbird		H	H		Possible	On-site	S4B	G5		
Icteridae	<i>Quiscalus quiscula</i>	Common Grackle	C,C	H	H		Probable	On-site	S5B	G5		
Laridae	<i>Larus delawarensis</i>	Ring-billed Gull **	FO			FO,FO	None	PSW	S5B,S4N	G5		
Laridae	<i>Larus argentatus</i>	Herring Gull **		FO		FO,FO	None	PSW	S5B, S5N	G5		
Paridae	<i>Poecile atricapillus</i>	Black-capped Chickadee	C,C	C,C	C	C	Probable	On-site	S5	G5		
Trochilidae	<i>Archilochus colubris</i>	Ruby-throated Hummingbird			H		Possible	On-site	S5B	G5		
Mimidae	<i>Dumetella carolinensis</i>	Gray Catbird	C			C,C	Probable	PSW	S4B	G5		
Parulidae	<i>Mniotilta varia</i>	Black-and-white Warbler			H		Possible	On-site	S5B	G5		
Parulidae	<i>Setophaga ruticilla</i>	Yellow Warbler	C	C			Possible	On-site	S5B	G5		
Parulidae	<i>Geothlypis trichas</i>	Common Yellowthroat*				C,S	Probable	PSW	S5B	G5		

Parulidae	<i>Setophaga ruticilla</i>	American Redstart			H		Possible	On-site	S5B	G5		
Passeridae	<i>Passer domesticus</i>	House Sparrow	X,X				Observed	On-site	SNA	G5		
Picidae	<i>Picoides villosus</i>	Hairy Woodpecker		H	H		Possible	On-site	S5	G5		
Picidae	<i>Picoides pubescens</i>	Downy Woodpecker		H			Possible	On-site	S5	G5		
Picidae	<i>Colaptes auratus</i>	Northern Flicker **				C,C	Probable	PSW	S4B	G5		
Picidae	<i>Dyocopus pileatus</i>	Pileated Woodpecker			X		Observed	On-site	S5	G5		
Sittidae	<i>Sitta canadensis</i>	Red-breasted Nuthatch		C	,C		Possible	On-site	S5	G5		
Sturnidae	<i>Sturnus vulgaris</i>	European Starling	X,X				Observed	On-site	SNA	G5		
Troglodytidae	<i>Troglodytes aedon</i>	House Wren			C,C		Probable	On-site	S5B	G5		
Turdidae	<i>Turdus migratorius</i>	American Robin	X,H	C,C	C		Probable	On-site	S5B	G5		
Tyrannidae	<i>Contopus virens</i>	Eastern Wood-pewee		H	H,C		Possible	On-site	S4B	G5	SC	SC
Turdidae	<i>Hylocichla mustelina</i>	Wood Thrush		C		C	Possible	On-site	S4B	G4	SC	THR
Tyrannidae	<i>Epidonax minimus</i>	Least Flycatcher		C			Possible	On-site	S4B	G5		
Tyrannidae	<i>Myiarchus crinitus</i>	Great Crested Flycatcher			C		Possible	On-site	S4B	G5		
Tyrannidae	<i>Tyrannus tyrannus</i>	Eastern Kingbird		H			Possible	On-site	S4B	G5		
Vireonidae	<i>Vireo gilvus</i>	Warbling Vireo			C,C		Probable	On-site	S5B	G5		
Vireonidae	<i>Vireo olivaceus</i>	Red-eyed Vireo		C,C	C		Probable	On-site	S5B	G5		

\* overhead, on-site and/or off-site

\*\* off-site in the PSW

#### Surveys Conditions:

June 11, 2018; Start Time 0600hr/ End Time 0830hr; Start Temperature +10°C/ End Temperature 16°C; Start Wind B2/End Wind B3; Cloud Cover Start 10%, End 10%; Precipitation Nil; Observer David G. Cunningham (CEA)

June 28, 2018; Start Time 0630hr/ End Time 0830hr; Start Temperature +18°C/ End Temperature +19°C; Start Wind B2/End Wind B2; Start Cloud Cover 100% foggy/ End Cloud Cover 20% foggy; Precipitation Nil; David G. Cunningham (CEA)

Point Count Survey Duration - 10 minutes/station; includes calls/observations during travel between point count stations

<sup>1</sup>Highest level of breeding evidence detected based on Ontario Breeding Bird Atlas (OBBA) criteria and Breeding Evidence Codes

<sup>2</sup>Conservation Rank - from Ontario Ministry of Natural Resources & Forestry, Natural Heritage Information Centre, Species at Risk in Ontario Lists and Environment Canada/COSEWIC Lists

S-rank - S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common NAR - Not at Risk

G-Rank - G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 - Secure

<sup>3</sup>Breeding Evidence Codes: Entry examples **S,S** - Singing Male detected during first survey and second survey; **S** Singing male detected during first survey only ,**S** Singing male detected during second survey only

*Breeding Evidence Breeding Evidence Codes*

None FO - Species observed Flying Over showing no signs of use of subject or adjacent lands

Observed X - Species observed, no evidence of breeding

Possible H - Species observed in its breeding season in suitable nesting habitat

*Note* S or C - Singing male(s) present (S), or breeding calls heard (C), in suitable nesting habitat in breeding season

Probable P - Pair observed in suitable nesting habitat in nesting season

Probable D - Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.

Probable V - Visiting probable nest site

Probable A - Agitated behaviour or anxiety calls of an adult

Probable B - Brood Patch on adult female or cloacal protuberance on adult male

Probable N - Nest-building or excavation of nest hole.

Confirmed DD - Distraction display or injury feigning.

Confirmed NU - Used nest or egg shells found (occupied or laid within the period of the survey)

Confirmed FY - Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight

Confirmed AE - Adult leaving or entering nest sites in circumstances indicating occupied nest

Confirmed FS - Adult carrying fecal sac.

Confirmed CF - Adult carrying food for young.

Confirmed NE - Nest containing eggs.

Confirmed NY - Nest with young seen or heard

*Note* : Possible if only one observation of S or C, Probable if evidence of S or C in same place on two or more dates a week or more apart

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subject property (**Bird Studies Canada** *et al.* 2006). **Figure 4** also shows the locations of the two (2) nocturnal wildlife (eastern whip-poor-will and chimney swift) survey stations.

A total of fifty-four (54) bird species, eleven (11) mammal species and seven (7) herpetofauna (amphibians and reptiles) species were directly sighted or evidence of presence noted through tracks, calls, nests, burrows, browse, and scats. All of the bird species observed are considered year-round residents and/or summer breeders, either utilizing parts of the South Parcel and North Parcel habitats or were seen flying overhead. Some of the bird species observed on or flying overhead are species that would utilize the PSW for all or parts of their life cycle.

Typical wildlife species observed, heard of evidence of presence noted on-site include: downy woodpecker (*Picoides pubescens*), mourning dove (*Zenaidura macroura*), American robin (*Turdus migratorius*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), black-capped chickadee (*Parus atricapillus*), red-eyed vireo (*Vireo olivaceus*), cedar waxwing (*Bombycilla cedrorum*), northern oriole (*Icterus galbula*), American goldfinch (*Carduelis tristis*), European starling (*Sturnus vulgaris*), common grackle (*Quiscalus quiscula*), northern cardinal (*Cardinalis cardinalis*), rose-breasted grosbeak (*Pheucticus ludovicianus*), black-and-white warbler (*Mniotilta varia*), downy woodpecker (*Picoides pubescens*), red-breasted nuthatch (*Sitta canadensis*), and great-crested flycatcher (*Myiarchus crinitus*). No eastern whip-poor-will or common nighthawks were heard during the nocturnal wildlife surveys. Mammals and herpetofauna noted on-site include coyote (*Canis latrans*), eastern chipmunk (*Tamias striatus*), eastern cottontail (*Sylvilagus floridanus*), eastern gray squirrel (*Sciurus carolinensis*), groundhog (*Marmota monax*), northern raccoon (*Procyon lotor*), red squirrel (*Tamiasciurus hudsonicus*), white tailed deer (*Odocoileus virginianus*) and eastern garter snake (*Thamnophis s. sirtalis*).

Birds, mammals and amphibians observed, heard or reports in the PSW include: great blue heron (*Ardea herodias*), northern harrier (*Circus hudsonicus*), tree swallow (*Tachycineta bicolor*), ring-billed gull (*Larus delawarensis*), herring gull (*Larus argentatus*), mallard (*Anas platyrhynchos*), red-winged blackbird (*Agelaius phoeniceus*), common yellowthroat (*Geothlypis trichas*), gray catbird (*Dumetella carolinensis*), swamp sparrow (*Melospiza georgiana*), spotted sandpiper (*Actitis macularius*), belted kingfisher (*Megaceryle alcyon*), northern flicker (*Colaptes auratus*), northern rough-winged swallow (*Steigidopteryx serripennis*), beaver (*Castor canadensis*), American toad (*Bufo americanus*), gray tree frog (*Hyla versicolor*), green frog (*Lithobates clamitans*), northern leopard frog (*Rana pipiens*), spring peeper (*Pseudacris crucifer*), and wood frog (*Rana sylvaticus*).



**Table 3. Amphibian Species List for Subject Property - Hanley Park North Property (2018), City of Belleville, County of Hastings**

Common Name	Scientific Name	April 12, 2018						May 21, 2017						June 29, 2017						Conservation Rank		
		On-site #1	On-site #2	On-site #3	On-site #4	On-site #5	Control Site <sup>2</sup>	On-site #1	On-site #2	On-site #3	On-site #4	On-site #5	Control Site	On-site #1	On-site #2	On-site #3	On-site #4	On-site #5	Control Site	S Rank	SARO Status	COSEWIC Status
Spring Peeper	<i>Pseudacris crucifer</i>	1-3	2-4	2-6	1-1	2-5	1-4	1-4	3	3	1-3	3	1-5	1.3	2-4	2-6	1-2	3	3	S5		
American Toad	<i>Anaxyrus americanus</i>						0	1-2		1-2	1-4	2-4	2-5	2-5	1-2	1-1	1-4	3	2-4	S5		
Wood Frog*	<i>Rana sylvaticus</i>	1-4	2-4	3	1-2	2-3	1-3		1-2	1-3									1-1	S5		THR
Western Chorus Frog	<i>Pseudacris triseriata</i>							1-3	3	3	1-2	3	3	1-1	1-2	2-4		1-3	1-3	S5		
Northern Leopard Frog**	<i>Rana pipiens</i>							1-2	2-3	2-4	1-2	2-3	1-2						1-2	S5		
Green Frog***	<i>Lithobates clamitans</i>								1-2	2-4	1-1	2-4	1-1						1-1	S5		
Gray Tree Frog	<i>Hyla versicolor</i>								1-2	1-3	1-2	1-2	1-2	1-3	1-3	2-3	1-2	1-3	1-2	S5		

Observation Conditions:

April 12 - Start Time: 1915hr, Air Temp. +8°C, Wind B1 Southwest, Cloud 80%, Precipitation Nil, Observer David G. Cunningham (CEA)

May 21 - Start Time: 2130hr, Air Temp. +15°C, Wind B2 Northwest, Cloud 50%, Precipitation Nil, Observer David G. Cunningham (CEA)

June 29 - Start Time: 2145hr, Air Temp. +23°C, Wind B1 South, Cloud 25%, Precipitation Nil, Observer David G. Cunningham (CEA)

<sup>1</sup>Call Code: 3 - Full Chorus; 2-# - Overlapping Calls number of individuals calling total; 1-# - Non-overlapping Calls number of individuals calling total

<sup>2</sup>Control Site: Stanley Park on west side of Haig Road (NAD83 18T 312506.13m E 489506.03m N)

\* wood frog also observed in all habitats during other wildlife surveys and during botanical surveys in May and June, not calling

\*\* northern leopard frog observed in all habitats during other wildlife surveys and during botanical surveys in June, not calling

\*\*\* green frog observed in open water habitats during other wildlife surveys and during botanical surveys in May and June, not calling

**Table 4. List of Mammal and Herpetofauna Species Observed or Heard on or Adjacent to the Hanley Park North Property (South Parcel and North Parcel).**

Common Name	Scientific Name
<b>Mammals</b>	
beaver*	<i>Castor canadensis</i>
coyote	<i>Canis latrans</i>
eastern chipmunk	<i>Tamias striatus</i>
eastern cottontail	<i>Sylvilagus floridanus</i>
eastern gray squirrel	<i>Sciurus carolinensis</i>
groundhog	<i>Marmota monax</i>
muskrat*	<i>Ondatra zibethicus</i>
northern raccoon*	<i>Procyon lotor</i>
red squirrel	<i>Tamiasciurus hudsonicus</i>
red fox**	<i>Vulpes vulpes</i>
white-tailed deer	<i>Odocoileus virginianus</i>
<b>Amphibians and Reptiles</b>	
American toad	<i>Anaxyrus crucifer</i>
eastern garter snake	<i>Thamnophis sirtalis sirtalis</i>
gray tree frog	<i>Hyla versicolor</i>
green frog	<i>Lithobates clamitans</i>
northern leopard frog	<i>Rana pipiens</i>
spring peeper	<i>Pseudacris crucifer</i>
wood frog	<i>Rana sylvaticus</i>

\* observed on-site and reported in the provincially significant Bell Creek Swamp Complex wetland data record (Muldal and Boxall 1993)

\*\* reported in the provincially significant Bell Creek Swamp Complex wetland data record (Muldal and Boxall 1993)





**Photograph 17.** Downgradient view of a reach of Bell Creek, to the west of the hydro easement, lies within part of the PSW (green ash swamp)



**Photograph 18.** Upgradient view of a reach of Bell Creek on west side of hydro easement, opposite FOMM4-2 and opposite the end of Victoria Avenue, within green ash swamp, part of the PSW



**Photograph 19.** Down-gradient view of a reach of Bell Creek, west of hydro easement, opposite FOCM4-1, lies within green ash swamp, part of the PSW



**Photograph 20.** View of remnant beaver dam just off-site from the south end of the subject property, part of the PSW, bordered by MAMM1-2



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also lists a variety of sportfish and forage fish known to inhabit Bell Creek, albeit in other reaches and near its mouth with the Bay of Quinte.

Fish species listed on the PSW wetland evaluation (Muldal and Boxall 1993) are as follows: northern pike (*Esox lucius*), small-mouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), yellow perch (*Perca flavescens*), pumpkinseed (*Lepomis gibbosus*), rock bass (*Ambloplites rupestris*), brook stickleback (*Culaea inconstans*), northern redbelly dace (*Phoxinus eos*), banded killifish (*Fundulus diaphanus*) and central mudminnow (*Umbra limi*).

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## **5 RESOURCE SIGNIFICANCE**

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## 5.1 Vegetation Communities and Floristics

The determination of rarity or significance for the vegetation communities and floristics (i.e., plant species) on the subject property was derived from standard status lists, published literature and the NHIC dataquery web-site (NHIC 2020). Source for community rarity included Bakowsky (1997) and NHIC (2020). Plant species rarity was derived from Environment Canada (2020), Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (2020), Province of Ontario (2007), Natural Heritage Information Centre (2020), Oldham and Brinker (2009), Ministry of Natural Resources and Forestry (2020), and Mulal and Boxall (1993). The determination of plant species rarity consisted of a straightforward comparison of the subject property's floral species list with those listed in the source references.

NHIC (2020) 1 x 1 kilometre (km) tracking squares that overlap all or parts of the subject property (North Parcel and South Parcel) and surrounding lands include 18UP1295, 18UP1294 and 18UP1394 (**Appendix B**). The North Parcel is encompassed by NHIC tracking squares 18UP1295 and 18UP1294; the South Parcel is encompassed by NHIC tracking squares 18UP1294 and 18UP1394.

A review of the natural environmental data collected for the subject property and surrounding lands indicated that the most significant natural feature is the PSW, as delineated and evaluated by the MNRF (Mulal and Boxall 1993). The wetland boundaries of this PSW germane to the upland edges of the two Parcels were flagged and GPS'd on July 25, 2008, with completion on September 13, 2017 with QC staff. Details regarding the attributes (i.e., wetland units), inherent species and functions of this wetland resource are detailed in **Section 4.1.2**, in conjunction with **Figure 5** and **Photographs 7 to 16** and **20**. As we understand, the wetland boundary and evaluation/data record has been revised since 1993; we have requested copies from the MNRF Peterborough Regional and the Kingston District Offices. None of the upland terrestrial features (e.g., FOCM4-1, FOMM4-2, FOMM7-2, FOMM5-2 and THMM1-1/MEMM3) are considered or have been designated as rare or significant on either a national or provincial level. As indicated in **Section 2.2**, the PSW is designated as EP on Schedule "B" – Land Use Plan – Urban Serviced Area, City of Belleville Official Plan (**Figure 3**).

A review of the vascular plant species listed in **Table 1**, and contained in the master plant species list (**Appendix A**), and listed in NHIC tracking squares 18UP1295, 18UP1294 and 18UP1394 indicates that none are considered Endangered or Threatened on a federal or provincial level. Some plant species are listed as SRank S1 and S2 (i.e., provincially rare) and S3 (i.e., rare to uncommon), include the following as



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contained in NHIC tracking squares and listed in the following manner, where applicable: NHIC Tracking Square; common name; scientific name; GRank (Global Rank); SRank; SARO Status; COSEWIC Status; Last Observed Date; and EO\_ID:

- NHIC Tracking Square 18UP1295; Natural Area Bell Creek Swamp Complex; 7050
- NHIC Tracking Square 18UP1295: Hybrid Pondweed; *Potamogeton hillii* x *Potamogeton zosteriformis*; SNA; SARO END, END, 1873-07-15; 93486
- NHIC Tracking Square 18UP1295; Blistered Jellyskin; *Leptogium corticola*; S2; 1868-09-27; 116186
- NHIC Tracking Square 18UP1295; Fan Moss; *Forsstroemia trichomitria*; S1; No Date; 116320
- NHIC Tracking Square 18UP1294; Natural Area Bell Creek Swamp Complex; 7050
- NHIC Tracking Square 18UP1294; Macoun's Shining Moss; *Neomacounia mitida*; SX; EXT; EXT; 1864; 22847
- NHIC Tracking Square 18UP1294; Hybrid Pondweed; *Potamogeton hillii* x *Potamogeton zosteriformis*; SNA; SARO END, END, 1873-07-15; 93486
- NHIC Tracking Square 18UP1295; Blistered Jellyskin; *Leptogium corticola*; S2; 1868-09-27; 116186;
- NHIC Tracking Square 18UP1295; Fan Moss; *Forsstroemia trichomitria*; S1; No Date; 116320
- NHIC Tracking Square 18UP1294; Natural Area Bell Creek Swamp Complex; 7050
- NHIC Tracking Square 18UP1294; Macoun's Shining Moss; *Neomacounia mitida*; SX; EXT; EXT; 1864; 22847
- NHIC Tracking Square 18UP1294; Hybrid Pondweed; *Potamogeton hillii* x *Potamogeton zosteriformis*; SNA; SARO END, END, 1873-07-15; 93486
- NHIC Tracking Square 18UP1295; Fan Moss; *Forsstroemia trichomitria*; S1; No Date; 116320

An S1 and/or S2 ranked species is defined as “Very rare in Ontario; usually between 1 and 5 occurrences and 5 and 20 occurrences respectively in the province or with many individuals in fewer occurrences; often susceptible to extirpation (NHIC 2020). As the NHIC glossary states, “*These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation, needs can be ascertained.*”

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An S3 rank is defined as, “**Rare to uncommon** in Ontario; usually between 20 and 100 occurrences in the province; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances. Most species with an S3 rank are assigned to the watch list, unless they have a relatively high global rank.”

Of all of these NHIC records, the only one that exists on or abutting the subject property (South Parcel and North Parcel) are parts of the PSW. As indicated earlier, the boundary of this wetland resource at its interface with the upland portions of the South Parcel and North Parcel were flagged and GPSd with QC staff on July 25, 2008, with completion on September 13, 2017. The Draft Plan of Subdivision is cognizant of and reflects the wetland boundary and QC mandated buffers and floodline setbacks. The plant species records for Macoun’s shining moss, fan most, hybrid pondweed, and blistered jellyfish as listed above, are out-of-date (i.e., greater than 25 years or are extirpated). There is no known flora listed as provincially or regionally significant in the PSW data record/wetland evaluation (Mulal and Boxall 1993).

## **5.2 Wildlife and Wildlife Habitat**

Standard lists and published literature used to derive the status of fauna included Environment Canada (2020), Committee on the Status of Endangered Wildlife in Canada (2020), Province of Ontario (2007), Natural Heritage Information Centre (2020), **Bird Studies Canada** *et al.* (2006), Cadman *et al.* (2007), Austen *et al.* (1994) and Dobbyn (1994).

A comparison of the wildlife species listed in **Section 4.2. 1** and **Tables 2** and **3** with the status references, indicates that none are considered Endangered (END) or Threatened (THR) on either a federal or provincial level, with the exception of western chorus frog (*Pseudacris triseriata*), wood thrush (*Hylocichla mustelina*) and least bittern (*Ixobrychus exilis*). Other species of note reported or observed in the area include eastern meadowlark (*Sturnella magna*), eastern wood-pewee (*Contopus virens*), and snapping turtle (*Chelydra serpentina*). All of the birds, mammals and amphibians found on the upland portions of the South Parcel and North Parcel are ubiquitous to the types of woodland/field habitats and conditions. The North Parcel does not contain any interior forest breeding habitat for birds (i.e., interior areas greater than at least 100 m from outer edges of the wooded area), given its shape. Only a very small area (i.e., narrow band) of interior forest bird breeding habitat exists on the South Parcel. The lack of interior forest bird breeding habitat is reflective of the list of breeding bird species as contained on **Table 2**.

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The upland woodlands in combination with wetland habitats of the PSW provide breeding, feeding, resting and roosting habitat for a variety of common wildlife. Past clearing, cutting and abandoned agricultural uses on adjacent lands, along with urban development has contributed to the presence of open expanses of old field meadow habitat for birds with old field affinities, as well as urban tolerant bird species.

A review of the wildlife species listed in **Section 4.2.1**, on **Tables 2** and **3**, and in NHIC tracking squares 18UP1295, 18UP1294 and 18UP1934 indicates that none are considered Endangered or Threatened on a federal or provincial level, again, with the exception of eastern meadowlark, western chorus frog, least bittern, and wood thrush. Some are listed as a “Special Concern” species (e.g, snapping turtle and eastern wood-pewee). Other wildlife species are listed as SRank S1, S2 (i.e., provincially rare) and S3 (rare to uncommon) and include the following as contained in NHIC tracking squares and listed in the following manner, where applicable: NHIC Tracking Square; common name; scientific name; GRank (Global Rank); SRank; SARO Status; COSEWIC Status; Last Observed Date; and EO\_ID:

- NHIC Tracking Square 18UP1295: Snapping Turtle; *Chelydra serpentina*; S3; SC, SC, 2009-07-03; 95897
- NHIC Tracking Square 18UP1295; Eastern Meadowlark; *Sturnella magna*; S4B; THR; THR; 2002-06-19; 109558
- NHIC Tracking Square 18UP1294: Snapping Turtle; *Chelydra serpentina*; S3; SC, SC, 2009-07-03; 95897
- NHIC Tracking Square 18UP1394: Snapping Turtle; *Chelydra serpentina*; S3; SC, SC, 2009-07-03; 95897
- NHIC Tracking Square 18UP1394: Eastern Wood-pewee; *Contopus virens*; S4B; SC; SC; 180539
- NHIC Tracking Square 18UP1394; Wood Thrush; *Hylocichla mustelina*; S4B; SC; THR; 180359

An S1 and/or S2 SRank species is defined as, “**Very rare** in Ontario, usually between 1 and 5 occurrences and 5 and 20 occurrences respectively in the province or with many individuals in fewer occurrences, often susceptible to extirpation” (NHIC 2020). As the NHIC glossary states, “These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be ascertained.”



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An S3 rank is defined as, “**Rare to Uncommon** in Ontario; usually between 20 and 100 occurrences in the province: may have fewer occurrences, but with a larger number of individuals in some populations; may be susceptible to large-scale disturbances. Most species with an S3 rank are assigned to the watch list, unless they have a relatively high global rank.”

Western chorus frog, western meadowlark, wood thrush and least bittern are listed on Schedule 1 of the Federal **Species At Risk Act, 2002** as Threatened - THR (Environment Canada 2020). Eastern meadowlark and least bittern are also listed as Threatened -THR by both COSEWIC (2020) and the Province of Ontario Species At Risk Ontario (SARO) program (MNRF 2020). Western chorus frog, wood thrush, eastern wood-pewee and snapping turtle are listed Special Concern (SC) species in Ontario (MNRF 2020).

Based on review of the tableland habitats for both the South Parcel and North Parcel, it is concluded that there is no foraging or breeding habitat for eastern meadowlark on-site and none were observed or heard during the dawn breeding bird surveys. Least bittern was reported in the PSW data record, but there is no life cycle habitats on the tablelands. Life cycle habitat does exist for eastern wood-pewee and wood thrush, both of which were heard during the dawn breeding bird surveys conducted in June 2018. Habitat for these species is ubiquitous in the area, and habitat will be retained on site in the wetland buffers. No evidence of snapping turtle use on the upland features of the subject property was found; life cycle habitats are abundant in the abutting PSW and possibly in the hydro easement. Life cycle habitats for western chorus frog also exist in the abutting PSW, as confirmed during the evening amphibian call counts conducted in May and June, 2018; none was found on the upland woodlands. No breeding habitat exists for this species on the North and South Parcels. Finally, there are no known fauna listed as provincially or regionally significant in the PSW data record/wetland evaluation (Mulal and Boxall 1993).

### **5.3 Bell Creek Swamp Complex Provincially Significant Wetland**

The determination of whether a wetland is provincially significant is based on an evaluation. In Ontario, there are two evaluation manuals, one for the area generally south of the southern edge of the Precambrian Shield, and one for the area north of this line. Both manuals provide direction for gathering data on an assortment of features, functions and values which are divided into four categories (biological, social, hydrological and special features). The functions and values are assigned numerical scores which cannot exceed 250 points in any category, or 1,000 points overall.

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The manual for southern Ontario is a revision that has been in use since 1984. Revisions were necessary for a variety of reasons, but among the most important, was the inability of the 1984 manual to adequately value rare wetland types, and assess the importance of the wetlands in relation to hydrological regimes. As well, the 1984 manual established seven classes of wetlands based on scoring, with Classes 1 through 3 being provincially significant in the 1992 **Wetland Policy Statement** (now superseded by the 2014 **PPS**). Because of the revisions, the scores required for a wetland to become provincially significant were also amended, such that the protocol of seven classes was dropped. Accordingly, a PSW is any wetland that either achieves a score of 600 points or more, or achieves a score of 200 or more points in either the biological component or the special features component.

The subject PSW was determined to be provincially significant, with a total score of 718 points (Mulal and Boxall 1993).

Scores for the four components are as follows:

- biological – 132;
- social – 122;
- hydrological – 170; and
- special features – 216.

It is not our intent to question or challenge the evaluation; rather, it is accepted at face value, and is included herein as **Appendix C**. As we understand it, the boundaries and evaluation of the PSW have been revised since 1993 (T. Trustham – Quinte Conservation pers. comm. November 2018). Inquiries with the MNRF District Office have been made for the update; but to-date none has been received.

The subject PSW consists of four individual wetlands that cover approximately 88.1 ha. Prominent Biological Component attributes palustrine and riverine wetland site types; and an abundance of vegetation communities comprised of many forms (e.g., open water marsh, submergent marsh, tall shrub thicket swamp, narrow-leaved emergent marsh, hardwood treed swamp). Social Component economically valuable products include wood products in approximately 25% of the wetland; commercial bait fish; bullfrogs, snapping turtles; and furbearers such as red fox (*Vulpes vulpes*), muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*) and raccoon (*Procyon lotor*). High intensity recreational uses include nature enjoyment and fishing, as well as outdoor educational uses by schools. Under the Special Features Component, the wetland scores high for colonial waterbirds (known great blue heron nesting within last 5

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years) and for fish habitat physical characteristics and the presence of fish such as northern pike (*Esox lucius*), small-mouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), yellow perch (*Perca flavescens*), pumpkinseed (*Lepomis gibbosus*), rock bass (*Ambloplites rupestris*), brook stickleback (*Culaea inconstans*), northern redbelly dace (*Phoxinus eos*), banded killifish (*Fundulus diaphanus*) and central mudminnow (*Umbra limi*).



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**6 PROPOSED DEVELOPMENT PLAN, IMPACT  
EVALUATION AND MITIGATION**

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## **6.1            Development Opportunities and Constraints**

Based on a review of the background data and planning documents, site inventories, and discussions with staff of QC, only a small part of the subject property has development capabilities (i.e., 10.4 ha out of 35.2 ha), including detached and townhouse units, parklands, roads, stormwater treatment facilities, walkways and open space. The upland ELC units FOCM4-1, FOMM4-2, FOMM7-2 and FOMM5-2 are on tableland with all providing development opportunities. The PSW which virtually surrounds both the North Parcel and the South Parcel is an unambiguous constraint to residential development (**Figures 5 and 6**).

## **6.2            Development Proposal (Draft Plan of Subdivision)**

Details of the proposed residential plan are shown in **Figure 2 – Draft Plan of Subdivision, Hanley Park North**. It reflects an iterative process, involving revisions at the request of and through discussions with staff of the City of Belleville and QC. To summarize, the November 8, 2019 version of the Draft Plan of Subdivision entails a total of 156 units, 60 of which are detached with 15.24 m frontages, 39 are detached with 9.75 m frontages, and 57 are townhouses with 19.7 m frontages. The roads cover 2.5 ha, parklands 0.54 ha, a stormwater management facility 0.52 ha and walkways of 0.06 ha. The lotting fabric for the South Parcel is based on a series of four internal roads (i.e., Streets A, B, C and D), with Street A being an extension of Tessa Boulevard. An emergency exit is proposed for the South Parcel, south of an existing stormwater management pond which is located on the adjacent property to the west. Lots associated with the North Parcel are accessible via a cul-de-sac connection to Spruce Gardens eastwards. A 30 m wide buffer is recommended between the rear lot lines of all residences and the boundary of the PSW; the only exception is that the proposed buffer width for the stormwater treatment facility is 25 m. Further details in this regard are provided in **Sections 6.3.1 and 6.3.3**.

The following sections summarize the identification and assessment of impacts to the natural environmental features and functions on site. Measures and recommendations are proposed to mitigate potential negative impacts, particularly to the PSW's attributes and functions. Inherent in our recommendations is the notion that mechanisms are in place whereby specific mitigation measures can be implemented.

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## 6.3 Development Issues and Concerns

The environmental implications of implementing the proposed 156 unit Draft Plan of Subdivision, including a stormwater management facility are identified below. Most of the issues are interrelated to varying degrees and are inclusive of the following.

- Partial loss of ELC units FOCM4-1, FOMM7-2, FOMM4-2 and FOMM5-2; parts of these vegetation units will remain untouched in the 25 m and 30 m buffers that protects the PSW.
- Short-term displacement of some local wildlife species and diminishment of concomitant breeding, feeding and roosting habitat due to diminishment of the above woodland ELC units.
- Short term construction impacts (i.e., noise, dust and lighting) on wildlife species composition, populations and their habitats, primarily in the remaining woodland ELC units and contiguous PSW.
- Effects of treated stormwater on surface water quality in downstream receiving waterbodies (i.e., Bell Creek and Bay of Quinte).

### 6.3.1 Lot Layout

The Draft Plan of Subdivision for the Hanley Park North Development shows proposed land use changes within four woodland stands (i.e., ELC units FOCM4-1, FOMM7-2, FOMM4-2 and FOMM5-2). No special mitigation is proposed or warranted to address the reduction of these woodlands. This will be partially offset through typical lot landscape plantings, potentially along streetscapes and walkways, and around the perimeter of the stormwater management pond. As indicated in **Figure 2**, there will be no direct impact (i.e., site alteration or development) on the PSW from the proposed lot layout. All of the PSW attributes and functions that exist within the subject property will be adequately protected. To ensure that the ecological integrity of the PSW is maintained in the long term, it is recommended that:

- **a 30 metre natural buffer be implemented and enforced between the back lot lines of the North Hanley Park Subdivision and the confirmed boundary of the Bell Creek Swamp Provincially Significant Wetland;**
- **the 30 metre buffer should not be altered or disturbed, and trees should not be cut or cleared within it, except for safety (i.e., dead trees or trees of poor health) and the possible location of a passive recreational pathway on the outer edge of the buffer;**  
**and**



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- **a 25 metre buffer between the stormwater management facility and the boundary of the Bell Creek Swamp Provincially Significant Wetland be implemented, as shown in Block F of the Draft Plan of Subdivision – Hanley Park (Figure 2).**

Impacts to wildlife attributes and functions associated with the four ELC units will be direct, resulting mainly from the removal of vegetation cover to create the residential units, internal roads and stormwater treatment facility. Nesting, feeding, and resting locations for woodland birds, mammals and herpetofauna within the tableland features will be diminished. Also, development may result in the mortality of some wetland fauna such as frog species that could potentially disperse from the PSW during the late spring and summer. Mortality would be attributable mainly to road traffic; but, it will also be due in part to predation by domestic pets from adjacent residences. In effect, buildings and roads represent barriers to wildlife migration and dispersal that are not present under the current land use fabric. Such impacts might similarly occur even if the proposed development was theoretically set further back from the PSW, say 120 m from the wetland boundary. Given this potential implication, development adjacent to the PSW might not be in complete compliance with the PPS, particularly with respect to a strict interpretation of the no negative impacts on PSW features or functions. However, we are of the view that it is not possible to construct and utilize the proposed development, while at the same time have no impacts on some features and functions of the PSW (e.g., migration routes that exist under present conditions). In short, impacts on the PSW and its functions in an absolute sense (i.e., to the smallest degree possible) will be unavoidable. As a result, approval of the residential subdivision will necessitate some accommodation or discretion on the matter of negative impacts on wetland features. While very small impacts may occur, they would only result in a reduction in attributes, which in our opinion is acceptable. The primary mitigation measure embodied in the Draft Plan of Subdivision is the protection of the PSW in its entirety within the subject property, as well as part of its contiguous upland forest cover (i.e., parts of the four tableland ELC woodland units that are within the above recommended 25 m and 30 m buffers).

Besides the reduction of wildlife habitat and local populations on the tablelands (i.e., adjacent lands to the PSW), there will be a shift from early successional woodland dependent to edge dependent species, as well as an increase in species tolerant of an urbanized setting. Landscape treatment within individual lots, along streetscapes, and around the perimeter of the stormwater pond will assist in offsetting this reduction in wildlife habitat. Urban tolerant wildlife, particularly bird species (e.g., black-capped chickadee, American robin, mourning dove, chipping sparrow, European starling, house sparrow, northern cardinal, American sparrow, downy woodpecker, red-winged blackbird, etc.) will remain after the development has been constructed and occupied.

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Construction impacts that may affect the remaining upland vegetation cover (i.e., primarily the 25 m and 30 m buffers) usually results from heavy equipment damaging tree trunks and branches, soil compaction, erosion, and siltation, dust and noise. These short duration impacts can be mitigated through the use of silt and construction fencing and chemical or natural (i.e., water) dust suppressants. In this regard, it is recommended that:

- **a silt/sediment fence supplemented with a heavy duty construction fence be installed and maintained along the back lot lines of the North Hanley Park Subdivision and the stormwater treatment facility;**
- **the fencing be removed only when the backyards of lots adjacent to the 25 metre and 30 metre natural buffers have been “greened up” and stabilized; and**
- **landscape planting along streetscapes, and around the perimeter of the stormwater management pond should be in vegetation combinations that are consistent with the community types found on the property (i.e., in the natural buffers and park blocks), and in adjacent natural areas, and native to the Great Lakes – St. Lawrence Forest Region.**

Human intrusion into the PSW presently exists, as evidenced by the many man-made paths and crossings of Bell Creek. To assist in reducing these influences, the earlier mentioned silt/sediment and heavy duty construction fences should be replaced with a minimum 1.5 m high chain link fence, which will diminish physical encroachment by landowners and household pets. At the same time, other attributes and functions of the PSW offer meaningful social and educational benefits (e.g., bird watching, nature appreciation and photography, fishing, etc.) that should not be discouraged through prohibiting access.

Given the above, it is recommended that:

- **for long term protection of the buffers and contiguous PSW, the earlier mentioned silt/sediment and heavy duty construction fencing along the back lot lines of the North Hanley Park Subdivision be replaced with a permanent minimum 1.5 metre high chain link fence, or other design/type satisfactory to the City of Belleville; and**
- **given that the Bell Creek Swamp Complex is of Provincial interest, the applicant be required to prepare a “Stewardship/Homeowner’s Manual” for inclusion as a schedule in the subdivision agreement in offers of purchase and sale, and registered on title, for prospective purchasers of the 156 units within the Draft Plan of Subdivision, that will provide educational material regarding the significance and sensitivity of the feature and its functions to disturbances from residential development, as well as information on the conservation role/actions that individual landowners can take. Examples of inclusions are:**
  - i. **refuse/yard waste composting;**

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- ii. **use of French drains or soakaway pits to reduce pollutants in stormwater runoff;**
  - iii. **fertilizer and pesticide use (i.e., inclusive of herbicides, insecticides and fungicides);**
  - iv. **natural area re-vegetation, including preparation and implementation of landscape plans focusing on the planting of native trees, shrubs and ground cover species within front and back yards of properties;**
  - v. **impacts of noise and lighting;**
  - vi. **trail use;**
  - vii. **domestic pet impacts and controls;**
  - viii. **control of invasive plants; and**
  - ix. **discharge of swimming pool water.**

As noted in **Section 3.5.6** of the **City of Belleville Official Plan**, “. . . The lands designated Environmental Protection in the Bell Creek area may be used for passive open space and recreational activities that result in minimal disturbance to the existing natural vegetation and topography of this area. Uses such as recreational trails, interpretive centres and similar uses may be permitted.” The parkway blocks shown in **Figure 2** are intended to facilitate pedestrian connections that recognize existing informal paths and provide new walkways along the western edge of the development. Opportunities for low impact (e.g., wood chip) paths at the outer edge of the 30 m buffers can also be explored and may provide opportunities to connect to the development to the south (i.e., Hanley Park Phase 1), which is also anticipated to have walkways through its park and open space areas. Also, it is our opinion that a passive recreational trail would minimize impacts of uncontrolled human/pet incursions into the PSW. Accordingly, it is recommended that:

- **the City of Belleville in consultation with Quinte Conservation consider the design and implementation of a low impact footpath/walkway to be located on the outer edge of the 30 metre natural buffer, which would have the potential to be linked into the City’s outdoor recreational program northwards and southwards. Such a pathway would obviously contribute to educational and passive recreational opportunities, which are not otherwise available to the public.**

### **6.3.2 Roads and Servicing**

All of the residential units within the Draft Plan of Subdivision will be serviced through municipal water and sewer systems. The internal streets and linear buried servicing will result in similar impacts to wildlife



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that currently utilize the tableland woodland features as noted earlier. The internal roads will connect either directly or indirectly to Tessa Boulevard in the South Parcel and Spruce Gardens in the North Parcel. The partial removal of tableland woodland due to the internal roads and servicing will result in a reduction of breeding, nesting, feeding and resting habitats for a variety of wildlife species that currently utilize these habitats. There will be a concomitant reduction in local wildlife populations and/or displacement of species to the upland woodlands of the 25 m and 30 m buffers, and to off-site habitats to the north and east.

Typical construction impacts that may affect wildlife and wildlife habitat during tree removal, overburden clearing and road and servicing usually results from equipment damage to tree trunks and branches, soil compaction, erosion and siltation, dust and noise. As noted earlier, such short duration impacts can be mitigated through the use of silt and construction fencing and chemical or natural (e.g., water) dust suppressants. Potential construction impacts to wildlife, particularly breeding birds during tree removal can be offset by undertaking this activity outside of the breeding season. In this regard, it is recommended that:

- **any tree cutting and removal be undertaken between October 15 and April 15<sup>th</sup>.**

This timing window not only accommodates the tree removal period for breeding birds under provision of the federal *Migratory Birds Convention Act*, it covers the hibernacula life cycle of species of bats that are listed as Endangered in the Province's SARO listing and potentially could be using parts of the subject property.

### **6.3.3 Stormwater Management**

Given the proximity of the downgradient Bell Creek and the Bay of Quinte to the proposed development site, implementation of an appropriate stormwater management facility is required. As the property is within the Quinte Conservation Region, the stormwater treatment requirements are subject to the Quinte Conservation Regional Event (i.e., 100 year design storm). Quality control is subject to a "Level 1" treatment, and quantity control measures are generally required to ensure post-development discharge rates do not exceed pre-development rates. "Level 1" control is the MECP's highest degree of protection, meaning a long term average removal of 80% suspended solids.

As summarized in **Servicing Report – Hanley Park North Residential Subdivision**, prepared by Ainley Graham & Associates (2019a), "A preliminary **Stormwater Management Report** has been prepared to

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accompany the application for Draft Plan Application. The report outlines that based on review of the **Stanley Park Stormwater Management Report**, it is our understanding that the Stanley Park facility was designed to overcontrol discharge rates allowing for proposed developments to the east (i.e., Mercedes Meadows, Hanley Park North) to convey stormwater directly to the Bell Creek System uncontrolled. As such, quantity control measures are not required.” Quality for the South Parcel will be provided in a wet pond in the 5,175 m<sup>2</sup> SWM block at the southeastern portion of the subject property. Storm sewers will convey stormwater towards the proposed SWM facility. As mentioned earlier, the proposed stormwater treatment facility will have a 25 m setback or buffer from the boundary of the PSW; it will also be outside of the floodline, thereby meeting requirements of QC. Quality control for the North Parcel will be either through an Oil-Grit-Separator or a level spreader berm; both alternatives are suitable for catchment areas under 2.0 ha, and can be implemented within the proposed parkland block immediately southeast of the North Parcel (Ainley Graham & Associates 2019b).

Further to the stormwater treatment pond at the southern end of the South Parcel, it is recommended that:

- **the outwalls of the stormwater pond be landscaped with tree, shrub and groundcover species native to the local area .**

Of substantial interest to quality control aspects of the proposed stormwater facility are the findings of the then MoE and the Toronto Region Conservation Authority at the Heritage Estates stormwater management pond in the Town of Richmond Hill (1996). This facility was not designed to achieve MoE Level 1 protection criteria; however, it met and exceeded its original design objectives, which required management of post- to pre-development peak flow rates. Based on two and one-half years of monitoring, the average removal efficiencies for total suspended solids, *E. Coli*, total phosphorus, and BOD<sub>5</sub> during the summer and autumn were 85%, 79%, 80% and 48% respectively. Surprisingly, the average removal efficiencies during the winter/spring season were also quite high: total suspended solids – 86%; *E. Coli* – 75%; total phosphorus – 65%; and BOD<sub>5</sub> – 50%. Based on the design recommended by Ainley Graham & Associates (2019b), similarly high removal efficiencies can be anticipated from the proposed stormwater treatment facility for the South Parcel of the Hanley Park subdivision.

In our opinion, once the stormwater treatment facilities are fully built out and appropriately landscaped with tree, shrub and groundcover species native to the area, discharge concentrations of suspended solids, turbidity and other parameters will approximate ambient levels.

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**7 POLICY COMPLIANCE, CONCLUSIONS  
AND RECOMMENDATIONS**

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## **7.1 Compliance with Environmental Policies/Regulations**

The results of our field investigations and analyses of natural features on and adjacent to the subject property indicate that the landholding can sustain 156 residential units, parklands, walkways, roads and two stormwater treatment facilities, one for the North Parcel and the second for the South Parcel. The following commentary summarizes how the proposed Draft Plan of Subdivision complies with various provincial and local policies and regulations.

### **7.1.1 2014 Provincial Policy Statement and *Endangered Species Act 2007***

Provincial policies that apply to the subject application include assurances that no development and site alteration will occur in the PSW, or within significant habitat of Endangered and Threatened species, and fish habitat. As indicated in **Figure 2**, the proposed residential development and related infrastructure including stormwater treatment facilities are well-removed from the PSW and fish habitat. The **PPS** states that development and site alteration may be permitted on adjacent lands to the PSW and fish habitat, provided that the ecological functions of these features are evaluated and it is demonstrated that there will be no negative impacts of the features or their functions. As indicated in **Section 6.3.1**, upland wooded buffers of 30 m for the residential development and 25 m for the stormwater treatment pond at the southern end of the South Parcel are recommended to protect the PSW and related fish habitat. As well, on-site mitigation measures (i.e., silt/sediment curtains coupled with heavy duty construction fencing) are recommended along the back lot lines of the proposed subdivision in the short term, that is during the construction and “green up” period. In the long term, that is when the proposed development is built out and fully occupied, it is recommended that the silt/sediment and heavy construction fencing be replaced with a permanent minimum 1.5 m high chain link fence, or other design/type satisfactory to the City of Belleville. This will assist in diminishing the encroachment by landowners and household pets into areas of Provincial interest. A key recommendation that will also contribute to protecting the ecological integrity of the PSW and fish habitat is the preparation of a “Stewardship/Homeowner’s Manual” and provision of same to purchasers of the 156 residential units. Finally, the installation of a low impact footpath/walkway is recommended on the outer edges of the 25 m and 30 m buffers; this would not only contribute to educational and natural heritage interpretation benefits, which are not otherwise available to the public; but, it would reduce uncontrolled human/pet incursions into the PSW. It is our opinion that by implementing this suite of recommendations, the constituent habitats and respective attributes of the PSW will be maintained over the long term, thereby complying with the relevant sections of the **PPS**.

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With respect to water quality aspects of Bell Creek and its tributaries, no development or site alteration is proposed that would negatively impact these features. Urban stormwater runoff will be treated by an Oil-Grit-Separator for the North Parcel and a “Level 1” quality control pond for the South Parcel. These will be designed to ensure that water quality will not be degraded in the long-term, thereby benefiting the fish habitat functions of the downgradient Bell Creek and the Bay of Quinte, complying with Section 2.2.1 h) of the PPS.

### **7.1.2 City of Belleville Official Plan**

No part of the proposed Draft Plan of Subdivision is within the PSW. The entire development is on adjacent lands to the PSW and fish habitat, separated by upland woodland buffers of 25 m for the stormwater treatment pond on the South Parcel and 30 m buffers from all residential units, internal roads and related infrastructure. As well, a number of mitigation measures to offset potential impacts are recommended to ensure the long-term integrity of the PSW and related Bell Creek fish habitat. In keeping with Section 3.5.6 of the City of Belleville Official Plan, a passive recreational trail is recommended at the outer edge of the buffers which would contribute to educational and interpretive aspects as the PSW/Bell Creek Complex, which is not otherwise available to the public. Accordingly, we are convinced that the proposed Draft Plan of Subdivision is in compliance with relevant sections of the **City of Belleville Official Plan**.

### **7.1.3 Ontario Regulation 319/09 – Quinte Conservation Authority: Regulation of Development, Interference with Wetlands and Alteration to Shorelines and Watercourses**

As indicated in Section 2.3, development is not permitted in wetlands and in areas within 120 m of all PSWs; development and site alteration within 120 m is permitted, subject to the completion of an acceptable EIS. This EIS demonstrates that subject to the implementation of a number of recommendations including 25 m and 30 m buffers of upland woodland, there will be no negative impacts on the features and functions of the PSW and its related Bell Creek tributaries.

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**7.1.4 Quinte Conservation Development and Interference with Wetlands and Watercourses Regulation – Policies and Procedures Manual** (Revised, January 2017)

Quinte Conservation sets out direction for development applications where the proximity to wetlands are an issue. In this regard, comments on those policies and procedures that are relevant to the subject Draft Plan of Subdivision are provided in **Table 5**. It is our opinion that the contemplated residential development as shown on **Figure 2** conforms to select policies in QC’s **Policies and Procedures Manual** (Revised, January 2017).

**7.2 Conclusions and Recommendations**

1. This **EIS** was undertaken in support of a Draft Plan of Subdivision consisting of 156 residential units, parks, walkways, roads and two stormwater treatment facilities, one for a North Parcel and a second for a South Parcel.
2. The subject property is approximately 35.2 ha in area; however, only about 10.4 ha are developable.
3. The site’s legal description is part of Lots 14 and 15, Concession 1, former Township of Thurlow, now City of Belleville, Hastings County. It is east of Haig Road and North of Victoria Avenue. The largest block, the South Parcel, will be accessed from a dead-end off Tessa Boulevard, while a smaller parcel in the northwestern corner of the property, the North Parcel, will be access from a dead-end off Spruce Gardens.
4. Parts of the North and South Parcels are developable. However, these are virtually surrounded by the PSW which is of provincial interest.
5. The PSW is designated EP on Schedule “B” – Land Use Plan – Urban Serviced Area in the City of Belleville Official Plan. The upland parts of North and South Parcels are designated as Residential Land Use.
6. Extensive field inventories and evaluations of natural features have been undertaken over the years, with the following results.



**Table 5.** Quinte Conservation policies and procedures that are relevant to the subject Draft Plan of Subdivision.

Policy	Commentary
2)	<p>A ‘site plan’ (prepared by an Ontario Land Surveyor, at the expense of the proponent), which indicates hazard land area, and the appropriate setbacks applied to the development (both by Quinte Conservation or Municipal setbacks) may be required prior to approval of the planning application.</p> <p><i>Comment: Figure 2 is a Draft Plan of Subdivision Hanley Park North showing the locations of residential development units, parks, walkways, roads, a stormwater treatment pond for the South Parcel and appropriate buffers to protect the Provincially Significant Bell Creek Swamp Wetland.</i></p>
4)	<p>Draft plans of subdivision shall illustrate the limits of hazardous land and the appropriate setback to the satisfaction of Quinte Conservation prior to draft plan approval. These areas may be delineated in the field in consultation with the Authority staff (at the expense of the proponent), and be incorporated in the lot layout shown on the draft plan of subdivision. The lot lines of any proposed lot within the development should be outside of the appropriate setback area.</p> <p><i>Comment: The boundary of the Provincially Significant Bell Creek Swamp Wetland Complex was confirmed with staff of Quinte Conservation in attendance on two dates (i.e., July 25, 2008 and September 13, 2017). A buffer width of 25 m from the boundary of the PSW to the stormwater management facility on the South Parcel was confirmed with Tim Trustham on December 6, 2019 (personal communication with Michael Michalski). The 30 m buffer width between all residential units and the boundary of the PSW was confirmed on September 13, 2007 (personal communication with David Cunningham).</i></p>
5)	<p>For any development application which is greater than 1 hectare in size, Quinte Conservation shall require the proponent to submit a storm water management report (prepared by a qualified professional engineer at the expense of the proponent). Any new development on the subject land must demonstrate that post-development flows do not exceed pre-development levels for design storms from the 5-year to 100-year events.</p> <p><i>Comment: A Stormwater Management Report for the Hanley Park Residential Subdivision has been prepared by Ainley Graham &amp; Associates. Quality control will be provided for both the North and South Parcels. Quantity control is not required due to the proximity of Bell Creek; however, conveyance of quantity events will be provided.</i></p>
6)	<p>Applications for Site Plan approval should illustrate the extent of hazardous lands, any appropriate setback requirements (applied by Quinte Conservation and/or the Municipality), stormwater control facilities and sedimentation &amp; erosion control measures on the submitted drawings.</p> <p><i>Comment: All of the above are shown on Figure 2 which is a Draft Plan of Subdivision for Hanley Park North.</i></p>

**Table 5 (Cont'd.)**

Policy	Commentary
9)	<p>Quinte Conservation may require an environmental impact study (prepared by a qualified professional with expertise in biology, ecology, landscape ecology or any other relevant fields of study and at the expense of the proponent) prior to approval of any planning act application within 120 metres of a Provincially evaluated wetland and wetlands greater than 2 hectares in size, or an Provincially evaluated Area of Natural Scientific Interest. An environmental impact study should:</p> <ul style="list-style-type: none"> <li>- For areas on and adjacent to the site, include descriptions and clearly legible scaled maps of the existing land uses, and the proposed development and site alteration, including all proposed buildings, structures, driveways and parking areas, and sources of human intrusion;</li> </ul> <p><i>Comment: Existing land use is shown on Figures 5 and 6 herein. The proposed residential plan of subdivision is Figure 2.</i></p> <ul style="list-style-type: none"> <li>- Provide a thorough inventory of flora and fauna and related habitat features (field data collected during at least 3 field visits at varying times of the year), as well as relevant information on soils and geology, slope, hydrology and hydrogeology;</li> </ul> <p><i>Comment: Descriptions of floral and faunal communities are provided in Section 4 herein. Relevant information of soils, geology, slope and hydrology is presented in Hanley Park North Residential Subdivision – Stormwater Management Report (Ainley graham + Associates 2019).</i></p> <ul style="list-style-type: none"> <li>- Review the ecological functions of the natural features identified above, including the habitat needs of species that utilize adjacent lands;</li> </ul> <p><i>Comment: Description of ecological functions including habitat requirements are set out in Section 5 herein.</i></p> <ul style="list-style-type: none"> <li>- Predict the impacts of the proposed development and site alteration on the various attributes of the environment on and adjacent to the site, such as habitat, vegetation, soil, surface and ground water, air, and any other relevant attributes;</li> </ul> <p><i>Comment: Impacts on site vegetation, including the subject PSW, wildlife and wildlife habitat, downgradient water quality, and fish and fish habitat are identified in Section 6.3 and further elaborated on in Sections 6.3.1 through 6.3.3.</i></p>

**Table 5 (Cont'd.)**

Policy	Commentary
	<ul style="list-style-type: none"> <li data-bbox="352 318 1478 347">- Evaluate the significance of all predicted positive and negative impacts on the environment;</li> </ul> <p data-bbox="352 363 1913 428"><i>Comment: Evaluation of significance of environmental impacts (i.e., vegetation including the subject PSW, wildlife and wildlife habitat, downgradient water quality and fish and fish habitat are set out in Sections 6.3.1, 6.3.2 and 6.3.3.</i></p> <ul style="list-style-type: none"> <li data-bbox="352 500 1913 565">- Recommend extents of land where: disturbance must be avoided, or where disturbance must be limited in order to maintain the natural features and ecological functions of the area, supported by a detailed rationale;</li> </ul> <p data-bbox="352 581 1913 646"><i>Comment: Figure 2 shows extent of land (i.e., subject PSW and related Bell Creek) where disturbances must be avoided. Detailed rationale for environmental protection is summarized in Sections 7.1 through 7.3.</i></p> <ul style="list-style-type: none"> <li data-bbox="352 717 1913 782">- Review alternative development options and recommend measures that could be implemented to avoid or mitigate the predicted negative impacts;</li> </ul> <p data-bbox="352 799 1913 896"><i>Comment: The proposed Draft Plan of Subdivision reflects an iterative process, involving revisions/changes recommended by staff of the City of Belleville, Quinte Conservation and consultants of the landowner. A number of mitigation measures to protect the Provincially Significant Bell Creek Wetland Complex are set out in Sections 6.3.1 and 6.3.3 herein.</i></p> <ul style="list-style-type: none"> <li data-bbox="352 967 1913 1032">- Identify any measures needed to monitor the mitigation measures and to assess the long-term impacts associated with the proposal;</li> </ul> <p data-bbox="352 1049 1913 1114"><i>Comment: No specific monitoring to evaluate long term impacts of the proposed development on natural heritage features is recommended.</i></p> <ul style="list-style-type: none"> <li data-bbox="352 1185 1913 1250">- Conclude with an independent professional opinion as to whether or not the development and site alteration is appropriate, and consistent with the intent of the Provincial Policy Statement.</li> </ul> <p data-bbox="352 1266 1913 1429"><i>Comment: The primary measure embodied in the proposed development plan is the protection of that part of the Provincially Significant Bell Creek Swamp Complex and its contiguous upland forest cover (i.e., the 25 m and 30 m buffers). It is our professional opinion that given implementation of the recommendations set out in Section 6, there will be no negative impacts on the constituent vegetation and related fauna of the PSW and its contiguous buffers, thereby complying with the intent of the 2014 PPS.</i></p>



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- a) The boundary of the PSW was confirmed from two site visits, with staff of QC attending on both occasions (July 25, 2008 and September 13, 2017).
  - b) Five woodland ELC units were identified and mapped, all of which are ubiquitous within the local area. All are in upland parts of Parcel 1 and Parcel 2. None are considered or have been designated as rare or otherwise significant on either national or provincial levels. Similarly, none of the individual plant species on the tablelands are considered Threatened or Endangered on a federal or provincial level. There are no known floral species listed as provincially or regionally significant in the PSW data record/wetland evaluation prepared by Mulal and Boxall (1993), nor were any observed in our field investigations.
  - c) Forty-two bird species were identified during two dawn breeding bird surveys, eleven mammals were observed, heard or evidence of presence noted either on the subject property and on adjacent lands. Four amphibian species were observed on-site through amphibian call count surveys conducted over three evenings; an additional three species were observed during other surveys. Three species associated with the subject property are Threatened, the western chorus frog, wood thrush and eastern meadowlark; two species are Special Concern (eastern wood-pewee and snapping turtle) otherwise, all of the birds, mammals and amphibians found on the upland parts of the North and South Parcels are ubiquitous to the area. The North Parcel does not contain any interior forest breeding habitat for birds (i.e., interior areas greater than at least 100 m from the outer edges of the wooded area), given its area and shape. Only a very small area (i.e., a narrow band) of interior forest bird breeding habitat exists on the South Parcel. The lack of interior forest breeding bird habitat is reflective of the breeding birds observed.
  - d) Based on a review of the tableland habitats for both Parcels, it is concluded that there is no foraging or breeding habitat for eastern meadowlark on site. Life cycle habitat does exist for wood thrush and eastern wood-pewee, both of which were heard during the dawn breeding bird surveys; habitat for these species is ubiquitous in the area, and habitat will be retained on site in the wetland buffers. No evidence of snapping turtle use on upland features of the subject property was found; life cycle habitats are abundant in the abutting PSW. Life cycle habitats for the western chorus frog also exist in the PSW, as confirmed during the evening amphibian call counts; no individual sightings occurred on the upland woodland parts of the North and South Parcels.

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7. The proposed Draft Plan of Subdivision (**Figure 2**) consists of 156 residential units, roads, parklands, walkways and two stormwater treatment facilities, one for the North Parcel and the second for the South Parcel. Of importance is that there will be no direct impact (i.e., site alteration or development) on the PSW from the proposed development; all of the feature's attributes and functions that exist within the subject property will be adequately protected. The environmental implications of Hanley Park North are as follows.

- Partial loss of upland woodland plant communities.
- Short-term displacement of some local wildlife species and diminishment of concomitant breeding, feeding and roosting habitat due to diminishment of upland woodland ELC units.
- Short-term construction impacts (i.e., noise, dust and lighting) on wildlife species composition, populations and their habitats, primarily in the remaining woodland ELC units and contiguous PSW.
- Effects of treated stormwater on surface water quality in downstream receiving waterbodies (i.e., Bell Creek and the Bay of Quinte).

8. A suite of measures to mitigate potential negative impacts are recommended, with particular emphasis on protecting attributes and functions of the PSW. These are as follows.

- **A 30 metre natural buffer be implemented and enforced between the back lot lines of the North Hanley Park Subdivision and the confirmed boundary of the Bell Creek Swamp Provincially Significant Wetland.**
- **The 30 metre buffer should not be altered or disturbed, and trees should not be cut or cleared within it, except for safety (i.e., dead trees or trees of poor health) and the possible location of a passive recreational pathway on the outer edge of the buffer.**
- **A 25 metre buffer between the stormwater management facility and the boundary of the Bell Creek Swamp Provincially Significant Wetland be implemented, as shown in Block F of the Draft Plan of Subdivision – Hanley Park (Figure 2).**
- **A silt/sediment fence supplemented with a heavy duty construction fence be installed and maintained along the back lot lines of the North Hanley Park Subdivision and the stormwater treatment facility.**
- **That the fencing be removed only when the backyards of lots adjacent to the 25 metre and 30 metre natural buffers have been “greened up” and stabilized.**

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- Landscape planting along streetscapes, and around the perimeter of the stormwater management pond should be in vegetation combinations that are consistent with the community types found on the property (i.e., in the natural buffers and park blocks), and in adjacent natural areas, and native to the Great Lakes – St. Lawrence Forest Region.
  - For long term protection of the buffers and contiguous PSW, the earlier mentioned silt/sediment and heavy duty construction fencing along the back lot lines of the North Hanley Park Subdivision be replaced with a permanent minimum 1.5 metre high chain link fence, or other design/type satisfactory to the City of Belleville.
  - Given that the Bell Creek Swamp Complex is of Provincial interest, the applicant be required to prepare a “Stewardship/Homeowner’s Manual” for inclusion as a schedule in the subdivision agreement in offers of purchase and sale, and registered on title, for prospective purchasers of the 156 units within the Draft Plan of Subdivision, that will provide educational material regarding the significance and sensitivity of the feature and its functions to disturbances from residential development, as well as information on the conservation role/actions that individual landowners can take. Examples of inclusions are:
    - x. refuse/yard waste composting;
    - xi. use of French drains or soakaway pits to reduce pollutants in stormwater runoff;
    - xii. fertilizer and pesticide use (i.e., inclusive of herbicides, insecticides and fungicides);
    - xiii. natural area re-vegetation, including preparation and implementation of landscape plans focusing on the planting of native trees, shrubs and ground cover species within front and back yards of properties;
    - xiv. impacts of noise and lighting;
    - xv. trail use;
    - xvi. domestic pet impacts and controls;
    - xvii. control of invasive plants; and
    - xviii. discharge of swimming pool water.
  - The City of Belleville in consultation with Quinte Conservation consider the design and implementation of a low impact footpath/walkway to be located on the outer edge of the 30 metre natural buffer, which would have the potential to be linked into the City’s outdoor recreational program northwards and southwards. Such a pathway would obviously contribute to educational and passive recreational opportunities, which are not otherwise available to the public.
  - Any tree cutting and removal be undertaken between October 15 and April 15<sup>th</sup>.

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- **The outwalls of the stormwater pond be landscaped with tree, shrub and groundcover species native to the local area .**

It is our opinion that with implementation of the above recommendations, there will be no negative impacts on the flora and fauna of the PSW and its contiguous upland woodlands (i.e., the 25 m buffer for the stormwater treatment facility in the southern part of the South Parcel and 30 m buffers elsewhere on both Parcels).



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**APPENDIX A – MASTER PLANT LIST**

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**Appendix A. List of Vascular Plants Observed on the Hanley Park North Property (North and South Parcels) and Abutting PSW**

SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	SARA, 2002	ESA, 2007
<i>Acer negundo</i>	Manitoba maple	G5	S5		
<i>Acer rubrum</i> **	red maple	G5	S5		
<i>Acer saccharum</i>	sugar maple	G5	S5		
<i>Acer saccharinum</i> *	silver maple	G5	S5		
<i>Achillea millefolium</i>	common yarrow	G5	SNA		
<i>Actaea rubra</i>	red baneberry	G5	S5		
<i>Agrimony gryposepala</i>	hooked agrimony	G5	S5		
<i>Agrostis gigantea</i> *	redtop	G5	S5		
<i>Agrostis stolonifera</i> *	creeping bent grass	G5	SNA		
<i>Alisma plantago-aquatica</i> *	water plantain	G5	S5		
<i>Alliaria petiolata</i>	garlic mustard	GNR	SNA		
<i>Alnus rugosa</i> **	speckled alder	G5	S5		
<i>Ambrosia artemisiifolia</i>	annual ragweed	G5	S5		
<i>Amphicarpa bracteata</i> *	hog-peanut	G5	S5		
<i>Amelanchier arborea</i>	downy serviceberry	G5	S5		
<i>Anaphalis margaritacea</i>	pearly everlasting	G5	S5		
<i>Anemone canadensis</i>	Canada anemone	G5	S5		
<i>Apocynum androsaemifolium</i>	spreading dogbane	G5	S5		
<i>Aralia nudicaulis</i>	wild sarsaparilla	G5	S5		
<i>Arctium minus</i>	common burdock	GNR	SNA		
<i>Argentina anserina</i>	silverweed	GNR	S5		
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	G5	S5		
<i>Asclepias incarnata</i> *	swamp milkweed	G5	S5		
<i>Asclepias syriaca</i>	common milkweed	G5	S5		
<i>Athyrium filix-femina</i> **	northeastern lady fern	G5T5	S5		
<i>Barbarea vulgaris</i> **	yellow rocket	GNR	SNA		
<i>Betula alleghaniensis</i>	yellow birch	G5	S5		
<i>Betula papyrifera</i>	white birch	G5	S5		

**Appendix A. List of Vascular Plants Observed on the Hanley Park North Property (North and South Parcels) and Abutting PSW**

SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	SARA, 2002	ESA, 2007
<i>Bidens frondosa</i> *	beggar-ticks	G5	S5		
<i>Boehmeria cylindrica</i>	false wood-nettle	G5	S5		
<i>Brassica kaber</i>	field mustard	GNR	SNA		
<i>Bromus inermis</i>	awnless brome brass	G5TNR	SNA		
<i>Calamagrostis canadensis</i>	Canada bluejoint grass	G5	S5		
<i>Caltha palustris</i> *	marsh marigold	G5	S5		
<i>Capsella bursa-pastoris</i>	common shepherd's purse	GNR	SNA		
<i>Carex bebbii</i> *	Bebb's sedge	G5	S5		
<i>Carex comosa</i> *	bristly sedge	G5	S5		
<i>Carex deweyana</i>	Dewey's sedge	G5	S5		
<i>Carex gracillima</i>	graceful sedge	G5	S5		
<i>Carex granularis</i> *	meadow sedge	G5	S5		
<i>Carex lupulina</i> *	hop sedge	G5	S5		
<i>Carex stipata</i> *	awl-fruited sedge	G5	S5		
<i>Carex stricta</i> *	tussock sedge	G5	S5		
<i>Carex vulpinoidea</i> *	foxtail sedge	G5	S5		
<i>Carpinus caroliniana</i>	blue-beech	G5	S5		
<i>Caulophyllum thalictroides</i>	blue cohosh	G4G5	S5		
<i>Cerastium vulgare</i>	mouse-eared chickweed	GNR	SNA		
<i>Chenopodium album</i>	lamb's quarters	G5	SNA		
<i>Chrysanthemum leucanthemum</i>	ox-eye daisy	GNR	SNA		
<i>Cichorium intybus</i>	chicory	GNR	SNA		
<i>Cicuta bulbifera</i> *	water hemlock	G5	S5		
<i>Circaea lutetiana</i> *	enchanters' nightshade	G5T5	S5		
<i>Cirsium arvense</i>	Canada thistle	GNR	SNA		
<i>Cirsium vulgare</i>	bull thistle	GNR	SNA		
<i>Clematis virginiana</i>	virgin's-bower	G5	S5		
<i>Clinopodium vulgare</i>	wild basil	G5	S5		
<i>Comarum palustre</i> *	marsh cinquefoil	G5	S5		
<i>Convolvulus arvensis</i>	field bindweed	GNR	SNA		



**Appendix A. List of Vascular Plants Observed on the Hanley Park North Property (North and South Parcels) and Abutting PSW**

SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	SARA, 2002	ESA, 2007
<i>Cornus alternifolia</i>	alternate-leaved dogwood	G5	S5		
<i>Cornus racemosa</i> **	gray dogwood	G5	S5		
<i>Cornus stolonifera</i> **	red-osier dogwood	G5	S5		
<i>Corylus cornuta</i>	beaked hazel	G5	S5		
<i>Crataegus spp.</i>	hawthorn	GNRTNR	SU		
<i>Cynanchum rossicum</i>	black swallowwort	GNR	SNA		
<i>Cypripedium parviflorum</i>	yellow lady slipper				
<i>Cystopteris bulbifera</i>	bulblet fern	G5	S5		
<i>Cystopteris tenuis</i>	fragile fern	G5	S5		
<i>Dactylis glomerata</i>	orchard grass	GNR	SNA		
<i>Daucus carota</i>	wild carrot	GNR	SNA		
<i>Dryopteris carthusiana</i>	spinulose wood-fern	G5	S5		
<i>Echinocystis lobata</i> **	wild cucumber	G5	S5		
<i>Echium vulgare</i>	common viper's-bugloss	GNR	SNA		
<i>Eleocharis erythropoda</i> *	red-stemmed spike-rush	G5	S5		
<i>Elymus repens</i>	quackgrass	GNR	SNA		
<i>Epilobium hirsutum</i> *	hairy willowherb	GNR	SNA		
<i>Epilobium parviflorum</i> *	small-flowered willowherb	GNR	SNA		
<i>Epipactis helleborine</i>	helleborine	GNR	SNA		
<i>Equisetum arvense</i>	field horsetail	G5	S5		
<i>Equisetum fluviatile</i> *	water horsetail	G5	S5		
<i>Equisetum hymale</i> **	common scouring-rush	G5	S5		
<i>Equisetum pratense</i> *	meadow horsetail	G5	S5		
<i>Erigeron canadensis</i>	Canada horseweed	G5	S5		
<i>Erigeron hyssopifolius</i>	daisy fleabane	G5	S5		
<i>Erigeron philadelphicus</i>	Philadelphia fleabane	G5	S5		
<i>Erysimum cheiranthoides</i>	wormseed mustard	G5	SNA		
<i>Erythronium americanum</i>	yellow trout-lily	G5	S5		
<i>Eupatorium perfoliatum</i> *	common boneset	G5	S5		
<i>Eurybia macrophylla</i>	large-leaved aster	G5	S5		

**Appendix A. List of Vascular Plants Observed on the Hanley Park North Property (North and South Parcels) and Abutting PSW**

SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	SARA, 2002	ESA, 2007
<i>Euthamia graminifolia</i> **	grass-leaved goldenrod	G5	S5		
<i>Eutrochium maculatum</i> *	spotted Joe-pye weed	G5T5	S5		
<i>Fagus grandifolia</i>	beech	G5	S5		
<i>Fragaria vesca</i>	woodland strawberry	G5	S5		
<i>Fragaria virginiana</i>	common strawberry	G5	S5		
<i>Fraxinus americana</i>	white ash	G5	S4		
<i>Fraxinus nigra</i> *	black ash	G5	S4		
<i>Fraxinus pennsylvanica</i> **	green ash	G5	S4		
<i>Galium aparine</i> *	cleavers	G5	S5		
<i>Galium triflorum</i> **	fragrant bedstraw	G5	S5		
<i>Geranium robertianum</i>	herb-robert	G5	S5		
<i>Geum aleppicum</i>	yellow avens	G5	S5		
<i>Geum canadense</i>	white avens	G5	S5		
<i>Glyceria striata</i> *	fowl mannagrass	G5	S5		
<i>Hesperis matronalis</i>	dame's rocket	G4G5	SNA		
<i>Hieracium lachenalii</i>	common hawkweed	GNR	SNA		
<i>Hypericum perforatum</i>	common St. John's-wort	GNR	SNA		
<i>Ilex verticillata</i> *	winterberry	G5	S5		
<i>Impatiens capensis</i> **	spotted jewelweed	G5	S5		
<i>Inula helenium</i> *	elecampane	GNR	SNA		
<i>Iris versicolor</i> *	blue flag	G5	S5		
<i>Juncus effusus</i> *	soft rush	G5	S5		
<i>Juncus tenuis</i>	path rush	G5	S5		
<i>Juniperus communis</i>	ground juniper	G5	S5		
<i>Juniperus virginiana</i>	eastern red cedar	G5	S5		
<i>Lactuca serriola</i>	prickly lettuce	GNR	SNA		
<i>Leersia oryzoides</i> *	rice cut grass	G5	S5		
<i>Lemna minor</i> *	common duckweed	G5	S5		
<i>Leonurus cardiaca</i>	motherwort	GNR	SNA		
<i>Lepidium campestre</i>	field peppergrass	GNR	SNA		

**Appendix A. List of Vascular Plants Observed on the Hanley Park North Property (North and South Parcels) and Abutting PSW**

SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	SARA, 2002	ESA, 2007
<i>Lithospermum officinale</i>	European gromwell	GNR	SNA		
<i>Lonicera morrowii</i>	Morrow's honeysuckle	GNR	SNA		
<i>Lonicera tatarica</i>	tartarian honeysuckle	GNR	SNA		
<i>Lotus corniculatus</i>	bird's-foot trefoil	GNR	SNA		
<i>Lycopus americanus</i> *	water horehound	G5	S5		
<i>Lysimachia ciliata</i>	fringed loosestrife	G5	S5		
<i>Lysimachia nummularia</i>	moneywort	GNR	SNR		
<i>Lysimachia terrestris</i> *	swamp candles	G5	S5		
<i>Lythrum salicaria</i> *	purple loosestrife	G5	SNA		
<i>Maianthemum canadense</i>	wild lily-of-the-valley	G5	S5		
<i>Maianthemum racemosum</i>	false Solomon's-seal	G5	S5		
<i>Maianthemum stellatum</i>	starry false Solomon's-seal	G5	S5		
<i>Malus coronaria</i>	sweet crabapple	G5	SNA		
<i>Malus pumila</i>	common apple	G5	SNA		
<i>Malva neglecta</i>	cheeses	GNR	SNA		
<i>Matricaria matricarioides</i>	pineapple-weed	G5	SNA		
<i>Matteuccia struthiopteris</i> *	ostrich fern	G5	S5		
<i>Melilotus albus</i>	white sweet-clover	G5	SNA		
<i>Mentha arvensis</i>	field mint	G5	S5		
<i>Myosotis laxa</i>	small forget-me-not	G5	S5		
<i>Nastursium officinale</i> *	watecress	GNR	SNA		
<i>Nepeta cataria</i>	catnip	GNR	SNA		
<i>Oenothera biennis</i>	common evening primrose	G5	S5		
<i>Onoclea sensibilis</i> **	sensitive fern	G5	S5		
<i>Osmunda regalis</i> *	royal fern	G5	S5		
<i>Ostrya virginiana</i>	hop hornbeam	G5	S5		
<i>Oxalis montana</i>	common wood-sorrel	G5	S5		
<i>Panicum capillare</i>	common panic grass	G5	S5		
<i>Parthenocissus inserta</i>	Virginia creeper	G5	S4?		
<i>Persicaria maculosa</i>	lady's-thumb	G3G5	SNA		

**Appendix A. List of Vascular Plants Observed on the Hanley Park North Property (North and South Parcels) and Abutting PSW**

SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	SARA, 2002	ESA, 2007
<i>Phalaris arundinacea</i>	reed canary grass	G5	S5		
<i>Phleum pratense</i>	timothy	GNR	SNA		
<i>Picea glauca</i>	white spruce	G5	S5		
<i>Pinus strobus</i>	white pine	G5	S5		
<i>Pinus sylvestris</i>	Scotch pine	GNR	SNA		
<i>Plantago lanceolata</i>	English plantain	G5	SNA		
<i>Plantago major</i>	common plantain	G5	S5		
<i>Poa annua</i>	annual bluegrass	GNR	SNA		
<i>Poa compressa</i>	Canada bluegrass	GNR	SNA		
<i>Poa palustris</i> *	fowl bluegrass	G5	S5		
<i>Poa pratensis</i>	Kentucky bluegrass	G5T5	S5		
<i>Podophyllum peltatum</i>	may-apple	G5	S5		
<i>Populus balsamifera</i> **	balsam poplar	G5	S5		
<i>Populus grandidentata</i>	large-tooth aspen	G5	S5		
<i>Populus tremuloides</i> **	trembling aspen	G5	S5		
<i>Potentilla recta</i>	common cinquefoil	GNR	SNA		
<i>Prunella vulgaris</i>	self-heal	G5TU	SNA		
<i>Prunus serotina</i>	black cherry	G5	S5		
<i>Prunus virginiana</i>	choke cherry	G5	S5		
<i>Pteridium aquilinum</i>	eastern bracken fern	G5	S5		
<i>Quercus rubra</i>	red oak	G5	S5		
<i>Ranunculus acris</i>	common buttercup	G5	SNA		
<i>Ranunculus repens</i> **	creeping buttercup	GNR	SNA		
<i>Rhamnus alnifolia</i> *	alder-leaved buckthorn	G5	S5		
<i>Rhamnus cathartica</i>	common buckthorn	GNR	SNA		
<i>Rhus radicans</i>	poison ivy	G5	S5		
<i>Rhus typhina</i>	staghorn sumac	G5	S5		
<i>Ribes cynosbati</i>	pasture gooseberry	G5	S5		
<i>Ribes sativum</i>	red currant	G4G5	SNA		



**Appendix A. List of Vascular Plants Observed on the Hanley Park North Property (North and South Parcels) and Abutting PSW**

SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	SARA, 2002	ESA, 2007
<i>Rosa canina</i>	dog rose	G5	S5		
<i>Rosa multiflora</i>	multiflora rose	GNR	SNA		
<i>Rubus idaeus</i>	wild red raspberry	G5T5	SNA		
<i>Rubus alleghaniensis</i>	common blackberry	G5	S5		
<i>Rumex crispus</i>	curly dock	GNR	SNA		
<i>Rumex orbiculatus</i> *	water dock	G5	S4S5		
<i>Sagittaria latifolia</i> *	broad-leaved arrowhead	G5	S5		
<i>Salix bebbiana</i> *	Bebb's willow	G5	S5		
<i>Salix discolor</i> *	pussy willow	G5	S5		
<i>Salix eriocephala</i> *	Missouri river willow	G5	S5		
<i>Salix fragilis</i> *	crack willow	GNR	SNA		
<i>Salix petiolaris</i> *	slender willow	G5	S5		
<i>Sambucus canadensis</i> **	common elderberry	G5T5	S5		
<i>Sambucus pubens</i> **	red-berried elder	G5	S5		
<i>Saponaria officinalis</i>	bouncing bet	GNR	SNR		
<i>Scirpus atrovirens</i> *	dark-green bulrush	G5?	S5		
<i>Scutellaria galericulata</i> *	marsh skullcap	G5	S5		
<i>Setaria viridis</i>	green foxtail	GNR	SNA		
<i>Silene cucubalus</i>	baldder campion	GNR	SNA		
<i>Silene noctiflora</i>	night-flowering catchfly	GNR	SNA		
<i>Sisyrinchium montanum</i>	blue-eyed grass	G5T4T5	S5		
<i>Solanum dulcamara</i> **	deadly nightshade	GNR	SNA		
<i>Solidago altissima</i>	tall goldenrod	GNR	S5		
<i>Solidago canadensis</i>	Canada goldenrod	G5T5	S5		
<i>Solidago flexicaulis</i>	zig-zag goldenrod	G5	S5		
<i>Sonchus oleraceus</i>	common sow-thistle	GNR	SNA		
<i>Sparganium eurycarpum</i> *	broad-leaved burreed	G5	S5		
<i>Spiraea alba</i> **	meadowsweet	G5	S5		
<i>Stellaria graminifolia</i>	grass-leaved stitchwort	GNR	SNA		
<i>Symphyotrichum cordifolium</i>	heart-leaved aster	G5	S5		

**Appendix A. List of Vascular Plants Observed on the Hanley Park North Property (North and South Parcels) and Abutting PSW**

SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	SARA, 2002	ESA, 2007
<i>Symphyotrichum lateriflorum</i>	calico aster	G5	S5		
<i>Symphyotrichum novae-angliae</i>	New England aster	G5	S5		
<i>Symphyotrichum puniceum</i> *	purple-stemmed aster	G5	S5		
<i>Syringa vulgaris</i>	common lilac	GNR	SNA		
<i>Taraxacum officinale</i>	common dandelion	G5	SNA		
<i>Thalictrum dioicum</i>	early meadow-rue	G5	S5		
<i>Thalictrum pubescens</i>	tall meadow-rue	G5	S5		
<i>Thelypteris palustris</i> *	marsh fern	G5	S5		
<i>Thlaspi arvense</i>	field penny-cress	GNR	SNA		
<i>Thuja occidentalis</i>	eastern white cedar	G5	S5		
<i>Tiarella cordifolia</i> *	foam flower	G5	S5		
<i>Tilia americana</i>	basswood	G5	S5		
<i>Tragopogon pratensis</i>	goat's-beard	GNR	SNA		
<i>Trientalis borealis</i>	starflower	G5	S5		
<i>Trifolium campestre</i>	low hop clover	GNR	SNA		
<i>Trifolium pratense</i>	red clover	GNR	SNA		
<i>Trifolium repens</i>	white clover	GNR	SNA		
<i>Tussilago farfara</i> **	coltsfoot	GNR	SNA		
<i>Typha angustifolia</i> *	narrow-leaved cattail	GNR	SNA		
<i>Typha latifolia</i> *	broad-leaved cattail	GNR	SNA		
<i>Typha x glauca</i> *	hybrid cattail	GNA	SNA		
<i>Ulmus americana</i> **	white elm	G5?	S5		
<i>Urtica dioica</i>	European stinging nettle	G5T5?	SNA		
<i>Verbascum thapsus</i>	common mullein	GNR	SNA		
<i>Verbena hastata</i> *	blue vervain	G5	S5		
<i>Veronica officinalis</i>	common speedwell	G5	SNA		
<i>Viburnum acerifolium</i> **	maple-leaved viburnum	G5	S5		
<i>Viburnum trilobum</i> **	high-bush viburnum	G5	S5		
<i>Viburnum lentago</i>	nannyberry	G5	S5		
<i>Vicia cracca</i>	cow vetch	GNR	SNA		

**Appendix A. List of Vascular Plants Observed on the Hanley Park North Property (North and South Parcels) and Abutting PSW**

<b>SCIENTIFIC NAME</b>	<b>COMMON NAME</b>	<b>G-RANK</b>	<b>S-RANK</b>	<b>SARA, 2002</b>	<b>ESA, 2007</b>
<i>Viola cucullata</i> *	marsh blue violet	G4G5	S5		
<i>Viola pubescens</i>	downy yellow violet	G5T5	S5		
<i>Viola sororia</i>	woolly blue violet	G5	S5		
<i>Vitis riparia</i> **	riverbank grape	G5	S5		
<i>Zanthoxylum americanum</i>	prickly-ash	G5	S5		

**Legend**

**Provincial Rank (SRANK)**

*S1 - Critically Imperiled*

*S2 - Imperiled*

*S3 - Vulnerable*

*S4 - Apparently Secure*

*S5 - Secure*

*SNA - Non Applicable or equivalent to non-native*

**SARA, 2002**

*NAR - Not at Risk*

*SC - Special Concern*

*T - Threatened*

*E - Endangered*

**ESA, 2007**

*NAR - Not at Risk*

*SC - Special Concern*

*THR - Threatened*

*END - Endangered*

\* plant species observed in the PSW, \*\* plant species observed on the tableland and in the PSW

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**APPENDIX B – HANLEY PARK NORTH PROPERTY  
OVERLAPPING NHIC SQUARES 18UP1295,  
18UP1294 AND 18UP1394**

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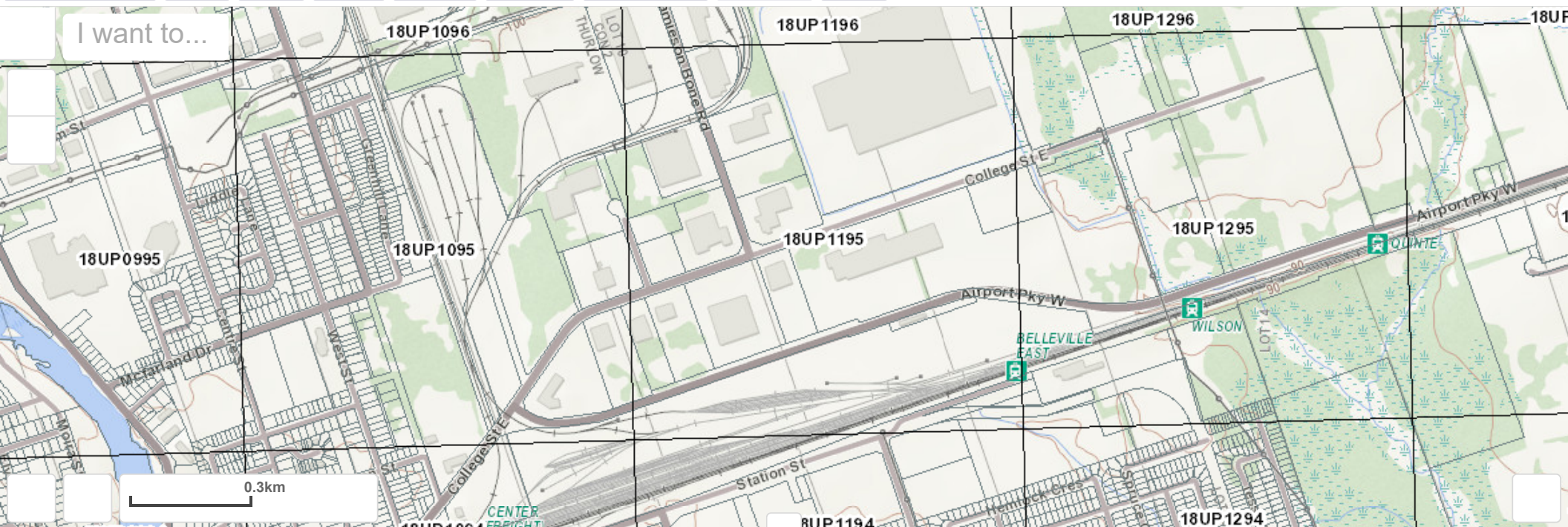
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# Make A Map: Natural Heritage Areas



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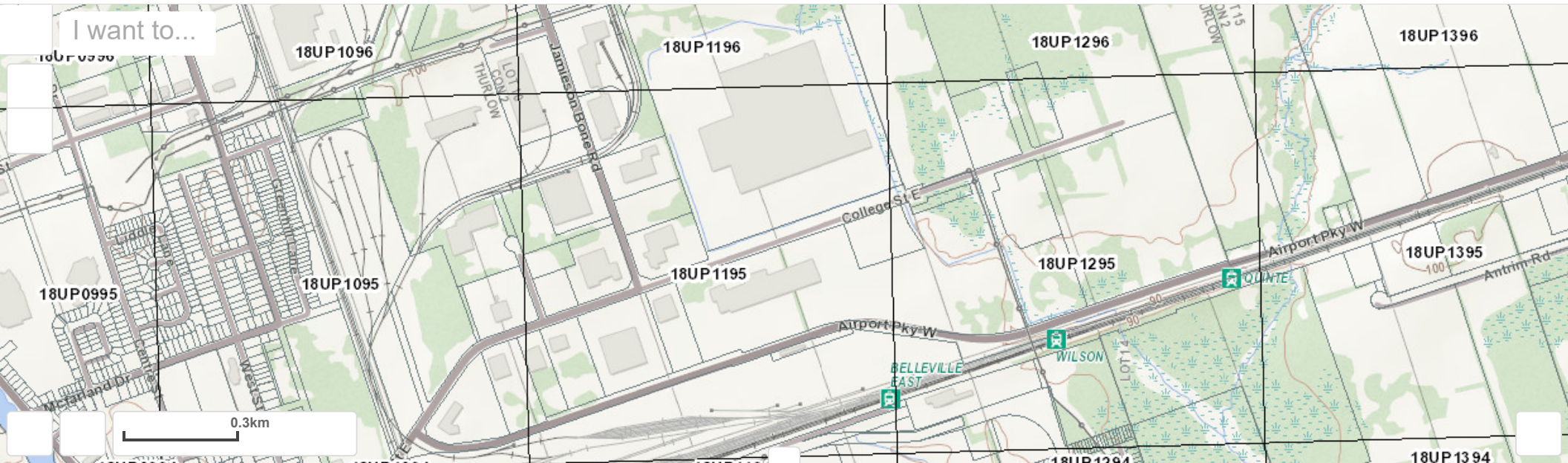
Identify Results (1)

NHIC Data					
Ogf ID	UTM Zone	Easting Lower Left Corner	Northing Low Left Corner	MGRS NAD83 IDent	Atlas NAD83 Ident
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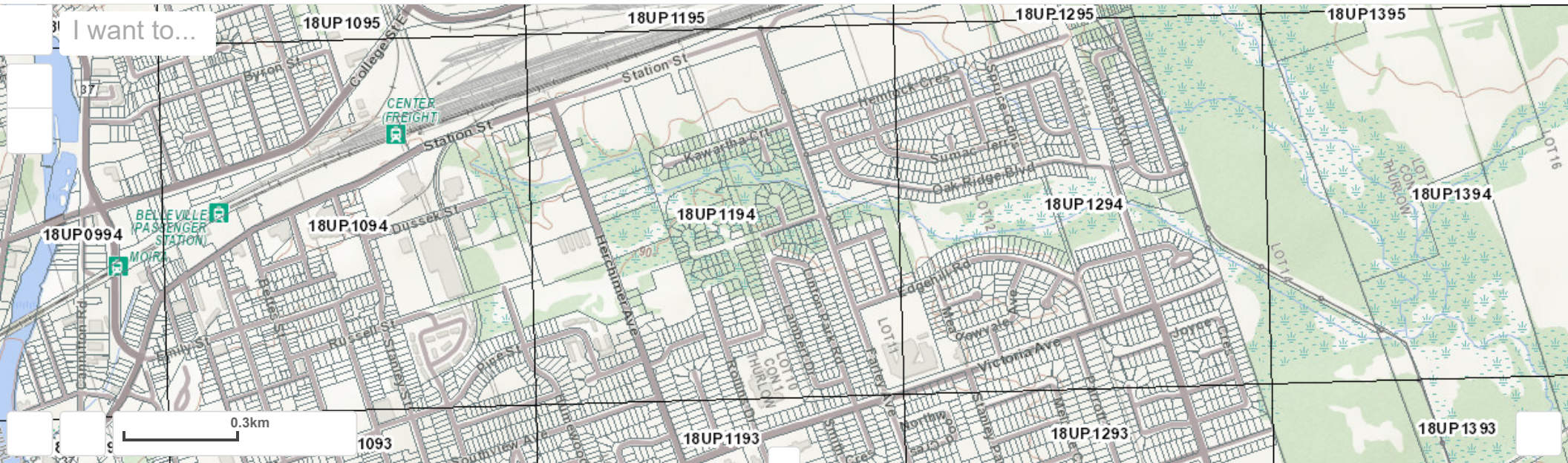
NHIC Data -- Grid ID = 1080891

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
NATURAL AREA	Bell Creek Swamp Complex						7050	<a href="http://nhic.mnr.gov.on.ca/">http://nhic.mnr.gov.on.ca/</a>
SPECIES	(Potamogeton hillii X Potamogeton zosteriformis)	Potamogeton x ogdenii	SNA	END	END	1873-07-15	93486	<a href="http://nhic.mnr.gov.on.ca/">http://nhic.mnr.gov.on.ca/</a>
SPECIES	Snapping Turtle	Chelydra serpentina	S3	SC	SC	2009-07-31	95897	<a href="http://nhic.mnr.gov.on.ca/">http://nhic.mnr.gov.on.ca/</a>
SPECIES	Eastern Meadowlark	Sturnella magna	S4B	THR	THR	2002-06-19	109558	<a href="http://nhic.mnr.gov.on.ca/">http://nhic.mnr.gov.on.ca/</a>
SPECIES	Blistered Jellyskin	Leptogium corticola	S2			1868-09-27	116186	<a href="http://nhic.mnr.gov.on.ca/">http://nhic.mnr.gov.on.ca/</a>
SPECIES	Fan Moss	Forsstroemia trichomitria	S1			No Date	116320	<a href="http://nhic.mnr.gov.on.ca/">http://nhic.mnr.gov.on.ca/</a>



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Identify Results (1)

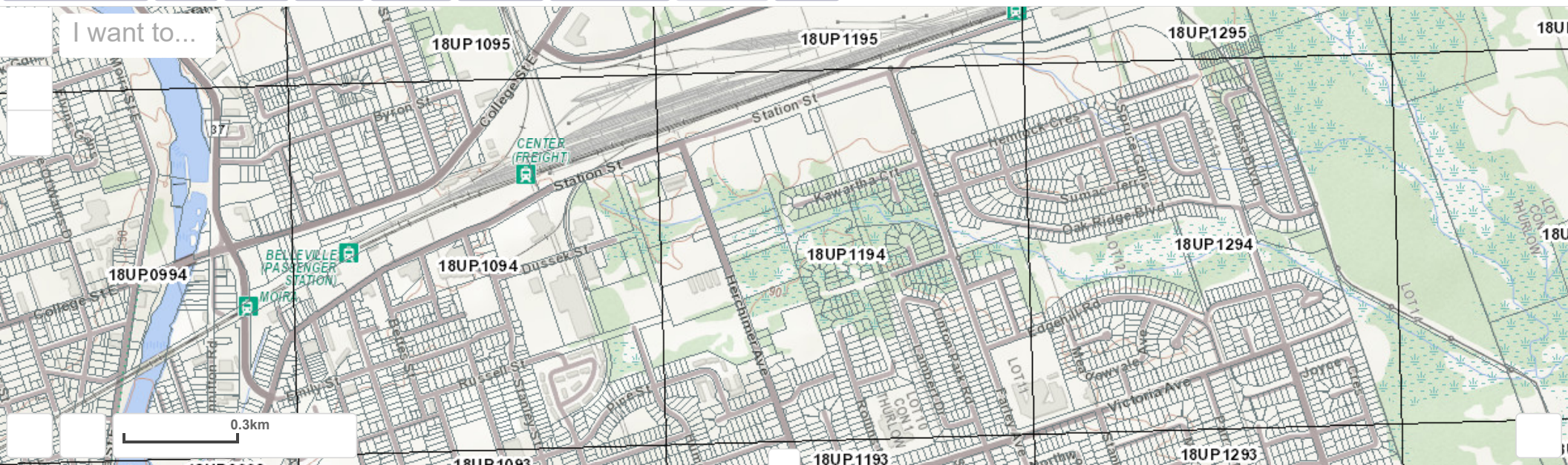
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NHIC Data -- Grid ID = 1080890

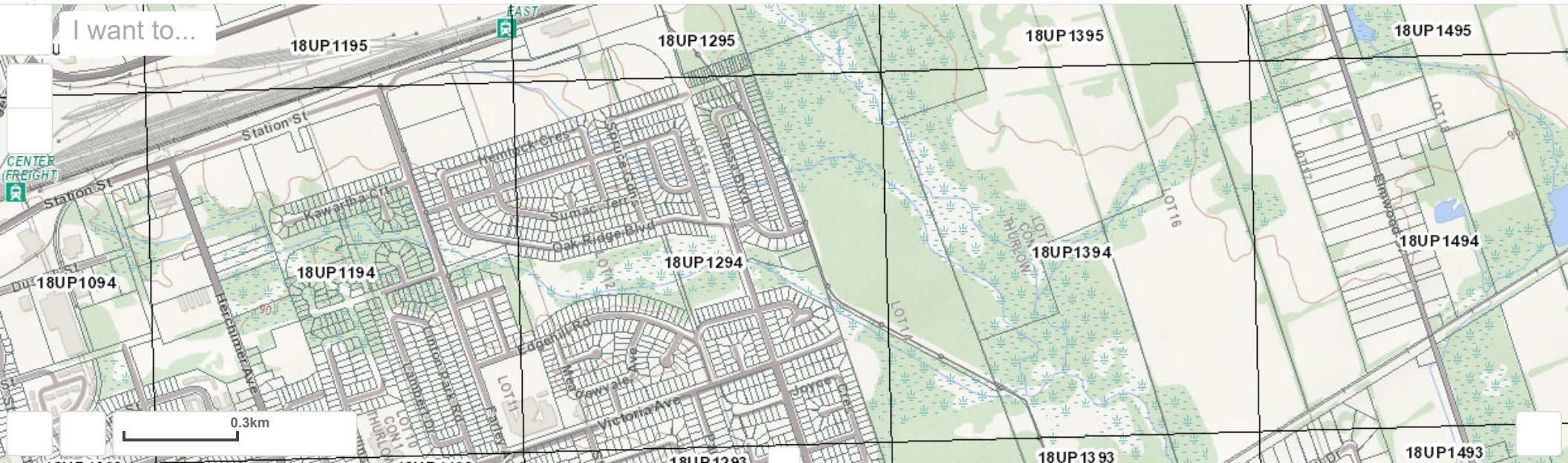
Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
NATURAL AREA	Bell Creek Swamp Complex						7050	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>
SPECIES	Macoun's Shining Moss	Neomacounia nitida	SX	EXT	EXT	1864	22487	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>
SPECIES	(Potamogeton hillii X Potamogeton zosteriformis)	Potamogeton x ogdenii	SNA	END	END	1873-07-15	93486	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>
SPECIES	Snapping Turtle	Chelydra serpentina	S3	SC	SC	2009-07-31	95897	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>
SPECIES	Blistered Jellyskin	Leptogium corticola	S2			1868-09-27	116186	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>
SPECIES	Fan Moss	Forsstroemia trichomitria	S1			No Date	116320	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>



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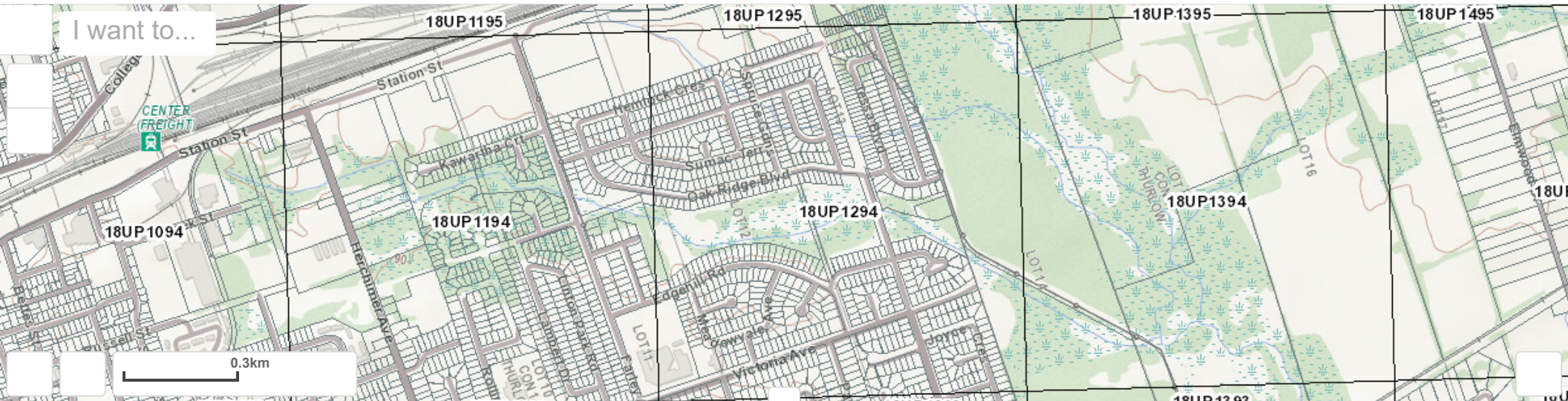
Identify Results (1)

NHIC Data					
Ogf ID	UTM Zone	Easting Lower Left Corner	Northing Low Left Corner	MGRS NAD83 Ident	Atlas NAD83 Ident
1080900	18	313000	4894000	18TUP1394	18UP1394

# Make A Map: Natural Heritage Areas



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NHIC Data -- Grid ID = 1080900

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
NATURAL AREA	Bell Creek Swamp Complex						7050	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>
SPECIES	Macoun's Shining Moss	Neomacounia nitida	SX	EXT	EXT	1864	22487	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>
SPECIES	(Potamogeton hillii X Potamogeton zosteriformis)	Potamogeton x ogdenii	SNA	END	END	1873-07-15	93486	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>
SPECIES	Snapping Turtle	Chelydra serpentina	S3	SC	SC	2009-07-31	95897	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>
SPECIES	Fan Moss	Forsstroemia trichomitria	S1			No Date	116320	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>
SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC		180294	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>
SPECIES	Wood Thrush	Hylocichla mustelina	S4B	SC	THR		180359	<a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a>

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**APPENDIX C – WETLAND EVALUATION – BELL  
CREEK SWAMP COMPLEX**

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Jan 20/13  
KIB.

WETLAND DATA RECORD

- i) WETLAND NAME AND OR NUMBER: Bell Creek Swamp Comp
  - ii) MNR ADMINISTRATIVE REGION: Eastern DISTRICT: Napanee  
MANAGEMENT AREA: Quinte
  - iii) CONSERVATION AUTHORITY JURISDICTION: Moira Region Conservati  
Authority  
(If not within a designated CA, check here:     )
  - iv) COUNTY OR REGIONAL MUNICIPALITY: Hastings
  - v) TOWNSHIP: Sidney
  - vi) LOTS & CONCESSIONS: Con I Lots 14-15, Con II Lots 11-16  
(attach separate sheet if necessary)
  - vii) MAP AND AIR PHOTO REFERENCES
    - a) Latitude 77° 20' Longitude: 44° 0'
    - b) U.T.M. grid ref.:     Zone: 18     Block: J  
                                  Grid: E 135 N 440
    - c) National Topographic Series:
      - map name Belleville
      - map number(s) 31 C/3     edition 6
      - Scale 1:50,000
    - d) Air photos: Date photo taken: 1978     Scale: 1:10,000
- Flight & plate numbers: 4412-63 4413-202,  
4415-235+237, 4414-205, 207, 209
- 
- (attach separate sheet if necessary)



Southern Ontario Wetland Evaluation System August 1992 Draft

e) Ontario Base Map numbers & scale 10 18 3100  
1:10000

2  
48900

attach separate sheets if necessary

viii) WETLAND SIZE AND BOUNDARIES

a) Single contiguous wetland area: \_\_\_\_\_ hectares

b) Wetland complex comprised of 4 individual wetlands:

Wetland Unit Number (for reference)	Size of each wetland unit
Wetland Unit No. 1	<u>50.2</u> ha
Wetland Unit No. 2	<u>3.9</u> ha
Wetland Unit No. 3	<u>17.3</u> ha
Wetland Unit No. 4	<u>16.7</u> ha
Wetland Unit No. 5	_____ ha
Wetland Unit No. 6	_____ ha
Wetland Unit No. 7	_____ ha
Wetland Unit No. 8	_____ ha
Wetland Unit No. 9	_____ ha
Wetland Unit No. 10	_____ ha
TOTAL WETLAND SIZE	<u>88.1</u> ha

Attach rationale for including wetland units.

c) Rationale for wetlands bordering on deep water lakes and rivers (see p. 15)

N/A

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d) Brief documentation of reasons for including any areas less than 0.5 ha in size:

N/A

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attach separate sheets if necessary.

e) Rationale for any distances greater than 0.75 km (p. 23)

N/A

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attach separate sheets if necessary

**1.0 BIOLOGICAL COMPONENT**

**1.1 PRODUCTIVITY**

**1.1.1 GROWING DEGREE-DAYS/SOILS**

**GROWING DEGREE DAYS**

(check one)

- <2800
- 2800 - 3200
- 3200 - 3600
- 3600 - 4000
- >4000

**SOILS**

- 79.8 Estimated % of Area clay/loam
- silt/marl
- limestone
- sand
- 20.2 humic/mesic
- fibric
- granite
- fibric

*20.2% mesic (organic)*

SCORING:

	Clay-Loam	Silt-Marl	Lime-stone	Sand	Humic-Mesic	Fibric	Granite
<2800	9	7	6	4	4	3	2
2800-3200	10	9	8	6	5	3	3
3200-3600	12	11	9	7	6	4	3
3600-4000	14	13	10	8	7	4	4
>4000	16	15	12	9	8	5	4

$$12 \times .798 = 9.6$$

$$6 \times .202 = 1.2$$


---

**10.8**

Steps required for evaluation: (maximum score 16 points)

1. Select GDD line in evaluation table applicable to your wetland;
2. Determine % of area of the wetland for each soil type;
3. Multiply fractional area of each soil type by score;
3. Sum individual soil type scores (round to nearest whole number).

In wetland complexes the evaluator should aim at determining the percentage of area occupied by the categories for the complex as a whole.

FINAL SCORE (GROWING DEGREE-DAYS/SOILS) **10.8**

1.1.2 WETLAND CLASS

Estimated % of Area		Scoring	
bog	_____	x 5	_____
fen	_____	x 8	_____
swamp	<u>.58</u>	x 11	<u>6.38</u>
marsh	<u>.42</u>	x 14	<u>5.88</u>
			<u>12.26</u>
WETLAND CLASS SCORE (Maximum 14)			<u>12.3</u>

1.1.4 SITE TYPE

Estimated % of Area		Score	
isolated	_____	x 1	_____
palustrine (permanent or intermittent flow)	<u>.43</u>	x 2	<u>.86</u>
riverine	<u>.56</u>	x 4	<u>2.24</u>
riverine (at rivermouth)	_____	x 5	_____
lacustrine (at rivermouth)	<u>.01</u>	x 5	<u>.05</u>
lacustrine (on enclosed bay, with barrier beach)	_____	x 3	_____
lacustrine (exposed to lake)	_____	x 2	_____
SITE TYPE SCORE (Maximum 5)			<u>3.15</u>

1.2 BIODIVERSITY

1.2.1 NUMBER OF WETLAND CLASSES

(Check one)	Score (Choose one only)
<input type="checkbox"/> one	9
<input checked="" type="checkbox"/> two	13
<input type="checkbox"/> three	20
<input type="checkbox"/> four	30
NUMBER OF WETLAND CLASSES SCORE (Maximum 30) <u>13</u>	



1.2.2 VEGETATION COMMUNITIES

Attach a separate sheet listing community (map) codes, vegetation forms and dominant species. Communities should be grouped by number of forms. For example, 2 form communities might appear as follows:

2 forms

<u>Code</u>	<u>Forms</u>	<u>Dominant Species</u>
M6	re, ff	Typha latifolia; Lemna minor, Wolffia
S1	ts, gc	Salix discolor; Impatiens capensis, Thelypteris palustris

Note that the dominant species for each form are separated by a semicolon. The dominant species (max. of 2) within a form are separated by commas.

Scoring:

<u># of communities with 1-3 forms</u>	<u># of communities with 4-5 forms</u>	<u># of communities with 6 or more forms</u>
1 = 1.5 points	1 = 2 points	1 = 3 points
2 = 2.5	2 = 3.5	2 = 5
3 = 3.5	3 = 5	3 = 7
4 = 4.5	4 = 6.5	4 = 9
5 = 5	5 = 7.5	5 = 10.5
6 = 5.5	6 = 8.5	6 = 12
7 = 6	7 = 9.5	7 = 13.5
8 = 6.5	8 = 10.5	8 = 15
9 = 7	9 = 11.5	9 = 16.5
10 = 7.5	10 = 12.5	10 = 18
11 = 8	11 = 13	11 = 19

28 +5 each additional community = 8.5      +5 each additional community = \_\_\_\_\_      +1 each additional community = \_\_\_\_\_

(e.g.) a wetland with 3 one form communities, 4 two form communities, 12 four form communities and 8 six form communities would score:

$$3.5 + 4.5 + 13.5 + 15 = 36.5 = 37 \text{ points}$$

VEGETATION COMMUNITIES SCORE (maximum 45) 25

$$8 + 17(.5) + 8.5 = 8 + 8.5 + 8.5 = 25$$



**1.2.3 DIVERSITY OF SURROUNDING HABITAT**

(Check all appropriate items)

- row crop
- pasture
- abandoned agricultural land
- deciduous forest
- coniferous forest
- abandoned pits & quarries
- open lake or deep river
- fence rows with cover, or shelterbelts
- terrain appreciably undulating, hilly, or with ravines
- creek flood plain

DIVERSITY OF SURROUNDING HABITAT SCORE (1 each, maximum 6) 6

**1.2.4 PROXIMITY TO OTHER WETLANDS**

(Check first appropriate category only)

Scoring

- 1)  hydrologically connected by surface water to other wetlands (different dominant class), or open lake or deep river within 1.5 km 8 points
- 2)  hydrologically connected by surface water to other wetlands (same dominant class) within 0.5 km 8
- 3)  hydrologically connected by surface water to other wetlands (different dominant class), or open lake or deep river from 1.5 to 4 km away 5
- 4)  hydrologically connected by surface water to other wetlands (same dominant class) from 0.5 to 1.5 km away 5
- 5)  within 0.75 km of other wetlands (different dominant class) or open water body, but not hydrologically connected by surface water 5
- 6)  within 1 km of other wetlands, but not hydrologically connected by surface water 2
- 7)  no wetland within 1 km 0

PROXIMITY TO OTHER WETLANDS SCORE (chose one only, max. 8 points) 8

Table 2: SIZE - BIOLOGICAL COMPONENT - EVALUATION TABLE  
 Total Biodiversity Scores (see Section 1.4)

wetland size(ha)	<36	37-48	48-60	61-72	73-84	85-96	97-108	109 - 120	121- 132	>132
<20 ha	1	5	7	9	11	12	20	26	32	40
21-40	2	6	8	10	12	14	22	28	34	40
41-60	3	7	9	11	13	16	24	30	36	40
61-80	4	8	10	12	14	18	28	32	38	40
81-100	5	9	11	13	15	20	28	34	40	40
101-120	6	10	12	14	16	22	30	36	40	40
121-140	7	11	13	15	17	24	32	38	40	40
141-160	8	12	14	16	18	26	34	40	40	40
161-180	9	13	15	17	19	28	36	40	40	40
181-200	10	15	16	18	20	30	38	40	40	40
201-400	12	17	18	20	22	32	40	40	40	40
401-600	14	19	20	22	24	34	40	40	40	40
601-800	16	21	22	24	26	36	40	40	40	40
801-1000	18	23	24	26	28	38	40	40	40	40
1001-1200	20	25	26	28	30	40	40	40	40	40
1201-1400	22	27	28	30	32	40	40	40	40	40
1401-1600	24	29	30	32	34	40	40	40	40	40
1601-1800	26	31	32	34	36	40	40	40	40	40
1801-2000	28	32	34	36	38	40	40	40	40	40
>2000	30	35	38	40	40	40	40	40	40	40





1.3 ECOSYSTEM AGE

Age related attributes of wetland classes

Scoring

bog	_____ % area	x 25	_____
fen, treed to open on deeper soils,			
floating mats or marl	_____ % area	x 20	_____
fen, on limestone rock	_____ % area	x 5	_____
swamp	<u>.58</u> % area	x 3	<u>1.74</u>
marsh	<u>.42</u> % area	x 0	<u>0</u>

ECOLOGICAL AGE SCORE (Maximum 25) 1.7

1.4 SIZE (See size table -- Biological Component)

88.1 hectares

SIZE SCORE (BIOLOGICAL COMPONENT) (Maximum 20) 20

Biodiversity Scores

1.2.1	13
1.2.2	26.5
1.2.3	6
1.2.4	8
1.2.5	18
1.2.6	14
	<u>85.5</u>



Table for size - biological component



2.0 SOCIAL COMPONENT

2.1 ECONOMICALLY VALUABLE PRODUCTS

2.1.1 WOOD PRODUCTS

Area of wetland forested (ha), i.e. dominant form is h, c, dh or dc. Note that this is not wetland size. (Check one only)

- |   |              |          |
|---|--------------|----------|
|   |              | Score    |
| 1) _____  | <5 ha        | 0 points |
| 2) _____  | 5 - 25 ha    | 3        |
| 28.4 ha. 3) <input checked="" type="checkbox"/> | 26 - 50 ha   | 6        |
| 4) _____  | 51 - 100 ha  | 9        |
| 5) _____  | 101 - 200 ha | 12       |
| 6) _____  | >200 ha      | 18       |

Source of information: wetland map

WOOD PRODUCTS SCORE (score one only, Max. 18) 6

2.1.2 WILD RICE

(Check one)

Score (Choose one)

- |                               |  |          |
|-------------------------------|--|----------|
| present (minimum size 0.5 ha) | 1) _____                               | 6 points |
| absent                        | 2) <input checked="" type="checkbox"/> | 0        |

Source of information: Field observation

WILD RICE SCORE (Maximum 6) 0

2.1.3 COMMERCIAL FISH (BAIT FISH AND/OR COARSE FISH)

Score (Choose one)

- |                               |  |           |
|-------------------------------|--|-----------|
| present                       | 1) <input checked="" type="checkbox"/> | 12 points |
| habitat not suitable for fish | 2) _____                               | 0         |

Source of information: \_\_\_\_\_

COMMERCIAL BAITFISH SCORE (Maximum 12) 12

**2.1.4 BULLFROGS**

present  
absent

1) ✓  
2)       

Score (Choose one)  
1 point  
0

Source of information: Field Observation

BULLFROG SCORE (Maximum 1) 1

**2.1.5 SNAPPING TURTLES**

present  
absent

1) ✓  
2)       

Score (Choose one)  
1 point  
0

Source of information: Field Observation

SNAPPING TURTLE SCORE (Maximum 1) 1

**2.1.6 FURBEARERS**

(Consult Appendix 9)

Name of furbearer

Source of information

- 1) red fox
- 2) muskrat
- 3) beaver
- 4) raccoon
- 5)

Neil Keene, local trapper  
and  
Field observations

Scoring: 3 points for each species, maximum 12

FURBEARER SCORE (Maximum 12) 12

2.2 RECREATIONAL ACTIVITIES

Intensity of Use	Type of Wetland-associated Use		
	hunting	nature enjoyment ecosystem study	fishing
High	40	40	40
Moderate	20	20	20
Low	8	8	8
Not Possible	0	0	0

(score one level for each of the three wetland uses; scores are cumulative; maximum score 75 points)

Sources of information:

hunting:  
nature:  
fishing:

field observations

Public Input component of Br. Creek Sec. Plan Background Study

Chris Marshall

RECREATIONAL ACTIVITIES SCORE (Maximum 75) 75

vol. 3.  
Stanley Park  
Plan, Quinte  
Field natural  
Moira Sec. School

2.3 LANDSCAPE AESTHETICS

2.3.1 DISTINCTNESS

(Check one)

clearly distinct 1)            
indistinct 2)          

Score (Choose one)

3 points  
0

LANDSCAPE DISTINCTNESS SCORE (Maximum 3) 3

**2.3.2 ABSENCE OF HUMAN DISTURBANCE**

- |  |  |                    |
|--|--|--------------------|
| (check one)  |  | Score (Choose one) |
| Human disturbances absent or nearly so                                   | 1) _____                               | 7 points           |
| One or several localized disturbances                                    | 2) _____                               | 4                  |
| Moderate disturbance; localized water pollution                          | 3) _____                               | 2                  |
| Wetland intact but impairment of ecosystem quality intense in some areas | 4) <input checked="" type="checkbox"/> | 1                  |
| Extreme ecological degradation, or water pollution severe and widespread | 5) _____                               | 0                  |

Source of information: no source noted in 1991/90 evaluations

ABSENCE OF HUMAN DISTURBANCE SCORE (Maximum 7) 1

**2.4 EDUCATION AND PUBLIC AWARENESS**

**2.4.1 EDUCATIONAL USES**

- |            |  |                    |
|------------|--|--------------------|
|            |  | Score (Choose one) |
| frequent   | 1) <input checked="" type="checkbox"/> | 20 points          |
| infrequent | 2) _____                               | 12                 |
| not known  | 3) _____                               | 0                  |

Source of information: Keum Tribble letter Dec 24/92, Moira Sec. School, Bell Creek! Plumbecker report

EDUCATIONAL USES SCORE (Maximum 20) 20

**2.4.2 FACILITIES AND PROGRAMS**

- |   |  |                    |
|---|--|--------------------|
| (check one)   |  | Score (Choose one) |
| Staffed interpretation centre   | 1) _____                               | 8 points           |
| No interpretation centre or staff, but a system of self-guiding trails or brochures available | 2) <input checked="" type="checkbox"/> | 4                  |
| no facilities or programs   | 3) <input checked="" type="checkbox"/> | 0                  |

Source of information: \_\_\_\_\_

FACILITIES AND PROGRAMS SCORE (Maximum 8) 0



**2.4.3 RESEARCH AND STUDIES**

(check appropriate spaces)

Score all appropriate categories

- 1) Long term research has been done \_\_\_\_\_ 12 points
- 2) Research papers published in refereed scientific journal or as a thesis \_\_\_\_\_ 10
- 3) One or more (non-research) reports have been written on some aspect of the wetland's flora, fauna, hydrology, etc.  5
- 4) No research or reports \_\_\_\_\_ 0

Attach list of known reports by above categories

RESEARCH AND STUDIES SCORE (Maximum 12) 5

**2.5 PROXIMITY TO AREAS OF HUMAN SETTLEMENT**

Circle the highest scoring category applicable

Distance of wetland from settlement	population > 10,000	population 2,500 - 10,000	population < 2,500 or cottage community
within or adjoining settlement	40 points	26	16
0.5 to 10 km from settlement	26	16	10
10 to 60 km from settlement	12	8	4
> 60 km from settlement	5	2	0

(maximum score 40 points)

Name of settlement: City of Belleville

PROXIMITY TO HUMAN SETTLEMENT SCORE (Maximum 40) 40

# Research and Studies

- Bell Creek and Blessington Creek: A study of Water Quality and Quantity. Nancy Wierda and Carol Cambell, M.R.C.A. (1982).
- "Flood Plain Mapping, Master Drainage Plan, Bell Creek" Ecos Garatech Associates Ltd. November (1989)
- Bell Creek Secondary Plan Background Report. Ainley and Associates (1991)
- ✓ North East Environs Report. Heartland Environmental Design (1992)
- Bell Creek Resource and Development Capability Analysis. Michael Michalski Associates (March 1992) (enclosed)
- Storm Water Management Study for the Bell Creek Secondary Plan. Paul Wisner and Associates Inc. (1990) (enclosed)
- Bell Creek and Stanley Park Tributary Pike Spawning Survey. Totten Sims Hubicki Associates (1992) (enclosed)
- The North East Environs study Heartland Environmental design (1992) outlines some aspect of the wetlands natural resources.

**2.6 OWNERSHIP**

	Score
1) % of wetland in public or private ownership, held under contract or in trust for wetland protection	_____ % x 10 = _____
2) % of wetland area in public ownership, not as above <i>City of Belleville</i>	<u>6</u> % x 8 = <u>.48</u>
3) % of wetland area in private ownership, not as above	<u>94</u> % x 4 = <u>3.76</u>

Source of information: City of Belleville, Chris Schaefer

OWNERSHIP SCORE (Maximum 10) 4.24

**2.7 SIZE (See size table - Social Component)**

88.1 hectares

SIZE SCORE (SOCIAL COMPONENT) (Maximum 20) 20

- 2.1 32
- 2.2 75
- 2.5 40

147 Size dependent % of values

Size table - social component



Table 3: Size		Total	Size	Depend.	Score					
ha	<30	31-45	46-60	61-75	76-90	91-105	106-119	121-135	136-150	>150
<2	1	2	4	8	10	12	14	14	14	15
2-4	1	2	4	8	12	13	14	14	15	16
5-8	2	2	5	9	13	14	15	15	16	16
9-12	3	3	6	10	14	15	15	16	17	17
13-17	3	4	7	10	14	15	16	16	17	17
18-28	4	5	8	11	15	16	16	17	17	18
29-37	5	7	10	13	16	17	18	18	19	19
38-49	5	7	10	13	16	17	18	18	19	20
50-62	5	8	11	14	17	17	18	19	20	20
63-81	5	8	11	15	17	18	19	20	20	20
82-105	6	9	11	15	18	18	19	20	20	20
106-137	6	9	12	16	18	19	20	20	20	20
138-178	6	9	13	16	18	19	20	20	20	20
179-233	6	9	13	16	18	20	20	20	20	20
234-302	7	9	13	16	18	20	20	20	20	20
303-393	7	9	14	17	18	20	20	20	20	20
394-511	7	10	14	17	18	20	20	20	20	20
512-665	7	10	14	17	18	20	20	20	20	20
666-863	7	10	14	17	19	20	20	20	20	20
864-1123	8	12	15	17	19	20	20	20	20	20
1124-1460	8	12	15	17	19	20	20	20	20	20
1461-1898	8	13	15	18	19	20	20	20	20	20
1899-2467	8	14	16	18	20	20	20	20	20	20
>2467	8	14	16	18	20	20	20	20	20	20

**2.8 ABORIGINAL AND CULTURAL HERITAGE VALUES**

**2.8.1 ABORIGINAL VALUES**

Full documentation of sources must be attached to the data record.

_____	Significant	=	30 points
_____	Not Significant	=	0

**2.8.2 CULTURAL HERITAGE**

_____	Significant	=	30 points
_____	Not Significant	=	0

ABORIGINAL VALUES/CULTURAL HERITAGE SCORE (Maximum 30) \_\_\_\_\_

3.0 HYDROLOGICAL COMPONENT

3.1 FLOOD ATTENUATION (MAXIMUM 100 POINTS)

Step 1: Determination of Maximum Score

- Wetland is located one of Ontario's 5 large lakes or 5 major rivers (Go to Step 4a)
- All other wetland types (Go through Steps 2, 3 and 4b)

Step 2: Determination of Upstream Detention Factor (DF)

- (a) Wetland area (ha)
- (b) Total area (ha) of upstream detention areas (include the wetland itself) = 40.0 + 88.1
- (c) Ratio of a:b
- (d) Upstream detention factor: (c) x 2 = (Maximum allowable factor = 1)

88.1  
 128.1  
 .69  
 1.375

max = 1

Step 3: Determination of Wetland Attenuation Factor (AF)

- (a) Wetland area (ha)
- (b) Size of catchment basin (ha) upstream of wetland (include wetland itself in catchment area)
- (c) Ratio of a:b
- (d) Wetland attenuation factor: (c) x 10 = (Maximum allowable factor = 1)

88.1  
 2532.9  
 .035  
 .35

catchment  
 area including  
 wetland = 2621 ha.  
 - 88.1  
 -----  
 2532.9

Step 4: Calculation of final score

- (a) Wetlands on large lakes or major rivers
- (b) All other wetlands -- calculate as follows:  
 Initial score  
 Upstream detention factor (DF) (Step 2)  
 Wetland attenuation factor (AF) (Step 3)  
 Final score:  $[(DF + AF)/2] \times \text{Initial score} =$   
 $1.35/2 \times 100 = 67.5$

0  
 100  
 .35  
 -----  
 67.5

**FINAL SCORE FOR FLOOD ATTENUATION**

**3.2 WATER QUALITY IMPROVEMENT**

Note: the score for water quality improvement is based on three separate components.

**3.2.1 SHORT TERM WATER QUALITY IMPROVEMENT (MAXIMUM 60 POINTS)**

**Step 1:** Determination of maximum initial score

- Wetland on one of Ontario's 5 large lakes or 5 major rivers (Go to Step 5a)
- All other wetlands (Go through Steps 2,3,4, and 5b)

**Step 2:** Determination of watershed improvement factor (WIF)

Calculation of WIF is based on the fractional area (FA) of each site type that makes up the total area of the wetland.

(FA = area of site type/total area of wetland)

<u>.56</u>	FA of isolated wetland	x 0.5	
<u>.43</u>	FA of riverine wetland	x 1.0	<u>.56</u>
<u>.01</u>	FA of palustrine wetland with no inflow	x 0.7	
	FA of palustrine wetland with inflows	x 1.0	<u>.43</u>
	FA of lacustrine on lake shoreline	x 0.2	
	FA of lacustrine at lake inflow or outflow	x 1.0	<u>.01</u>
	Sum (WIF cannot exceed 1.0)		<u>1.0</u>

**Step 3:** Determination of catchment land use factor (LUF)

Choose only one of the following

<input checked="" type="checkbox"/>	Over 50% agricultural and/or urban	1.0
<input type="checkbox"/>	Between 30 and 50% agricultural and/or urban	0.8
<input type="checkbox"/>	Over 50% forested	0.6
	Land Use Factor	<u>.8</u>



**Step 4: Determination of pollutant uptake factor (PUT)**

Calculation of PUT is based on the fractional area (FA) of each vegetation type that makes up the total area of the wetland. (FA = area of vegetation type/total area of wetland)

28.4 ha	.32	FA of wetland with trees	x 0.75	.24
21.4 ha	.24	FA of wetland with shrubs	x 0.75	.18
1.7	.02	FA of wetland with herbs or mosses	x 0.75	.01
36.0	.41	FA of wetland with emergent vegetation	x 1.0	.41
0.7	.01	FA of wetland with submergent vegetation	x 1.0	.01
		FA of wetland with little or no vegetation	x 0.5	
<hr/>				
88.2		Sum (PUT cannot exceed 1.0)		<u>.85</u>

**Step 5: Calculation of final score**

(a)	Wetland on large lakes or major rivers	0
(b)	All other wetlands - calculate as follows	
	Initial score	60
	Water <sup>quality</sup> improvement factor <del>(WQF)</del> <sup>WIF</sup>	<u>1.0</u>
	Land use factor (LUF)	<u>.80</u>
	Pollutant uptake factor (PUT)	<u>.85</u>

Final score:  $60 \times WQF \times LUF \times PUT =$   
 $60 \times 1.0 \times .8 \times .85 = 40.8$

**FINAL SCORE FOR SHORT TERM WATER QUALITY IMPROVEMENT**

40.8

**3.2.2 LONG TERM NUTRIENT TRAP (MAXIMUM 10 POINTS)**

**Step 1: Determination of maximum score**

- Wetland on large lakes or 5 major rivers (Go to Step 3a)
- All other wetlands (Go through Steps 2 and 3b)

Step 2: Determination of long term water quality improvement factor (LQF)

Choose only one of the following settings that best describes the wetland being evaluated.

- Wetland located in a river mouth 1.0
- Wetland is a bog, fen, or ~~swamp~~ with more than 50% of the wetland being covered with organic soil 1.0
- Wetland is a bog, fen, ~~swamp~~ with less than 50% of the wetland being covered with organic soil 0.3
- Wetland is a marsh or swamp with more than 50% of the wetland covered with organic soil 0.3
- None of the above 0

Step 3: Calculation of final score

- (a) Wetland on Great Lakes or major rivers 0
- (b) Final score calculated as follows
  - Initial score 10
  - Long term water quality factor (LQF) \_\_\_\_\_
  - Final score: 10 x LQF \_\_\_\_\_

FINAL SCORE FOR LONG TERM WATER QUALITY IMPROVEMENT

0

3.2.3 GROUNDWATER DISCHARGE (MAXIMUM 30 POINTS)

Circle the characteristics that best describe the wetland being evaluated and then sum the scores. If the sum exceeds 30 points assign the maximum score of 30.

Wetland Characteristic	Amount of Discharge		
	None to little	Some	High
Topography	FLAT = 0	HILLY = 5 pts	STEEP = 10 pts
Wetland type	BOG = 0	SWAMP/MARSH = 5 pts	FEN = 10 pts
Seeps	NONE = 0	= or < 3 = 10 pts	> 3 = 15 pts
Surface marl deposits	NONE = 0	= or > 3 = 5 pts	> 3 = 10 pts
Iron precipitates	NONE = 0	= or < 3 = 2 pts	> 3 = 5 pts
Located near a major aquifer	N/A NO	N/A	YES = 10 pts

(scores are cumulative; maximum score 30 points)

FINAL SCORE FOR GROUNDWATER INFLUENCE ON WATER QUALITY 20

3.3 CARBON SINK (MAXIMUM 5 POINTS)

Step 1: Determination of maximum initial score

- Wetland has less than 40 cm depth of peat or organic soil (Go to Step 3a)
- Wetland has more than 40 cm depth of peat or organic soil (Go through Steps 2 and 3b)

**Step 2:** Determination of carbon sink factor (CSF)

Choose only one of the following

- |                          |   |     |
|--------------------------|---|-----|
| <input type="checkbox"/> | Bog, fen or swamp with more than 50% coverage by organic soil     | 1.0 |
| <input type="checkbox"/> | Bog, fen or swamp with between 10 to 49% coverage by organic soil | 0.4 |
| <input type="checkbox"/> | Marsh with more than 50% coverage by organic soil                 | 0.6 |
| <input type="checkbox"/> | Wetlands not in one of the above categories                       | 0   |

**Step 3:** Calculation of final score

- |   |                                    |       |
|---|------------------------------------|-------|
| <input checked="" type="checkbox"/> (a) | Little organic soil accumulation   | 0     |
| (b)                                     | Final score calculated as follows  |       |
|   | Initial score                      | 5     |
|   | Carbon sink factor (CSF)           | _____ |
|   | Final score: Initial score x CSF = | _____ |

FINAL SCORE FOR CARBON SINK FACTOR

0

**3.4 SHORELINE EROSION CONTROL (MAXIMUM 15 POINTS)**

**Step 1:** Determination of maximum score

- |                                     |   |
|-------------------------------------|---|
| <input type="checkbox"/>            | Isolated wetland (Go to 3a)                                     |
| <input checked="" type="checkbox"/> | Palustrine, riverine, or lacustrine (Go through Steps 2 and 3b) |



**Step 2:** Determination of wetland erosion factor (EF)

Choose the one characteristic that best describes the vegetation between the shoreline and the high water mark of the wetland being evaluated.

	Erosion Control Factor (EF)
<input checked="" type="checkbox"/> Trees and shrubs	1.0
<input type="checkbox"/> Emergent vegetation	0.5
<input type="checkbox"/> Submergent vegetation	0.4
<input type="checkbox"/> Other shoreline vegetation	0.2
<input type="checkbox"/> No vegetation	0

**Step 3:** Calculation of final score

(a) Wetlands with no river banks or shoreline 0

(b) Calculate final score as follows:

Initial score 15

Erosion control factor (EF)           

Final score:  $15 \times EF =$  7.5

*15, 5*

**FINAL SCORE FOR SHORELINE EROSION CONTROL**

7.5

**3.5 GROUND WATER RECHARGE**

Note: The groundwater recharge function is based on the evaluation of 2 separate components.

**3.5.1 WETLAND SITE TYPE (MAXIMUM 50 POINTS)**

(a) Lacustrine wetlands or located on one of the five major rivers 0

(b) Final score is based on the fractional area (FA) of each site type that makes up the total area of the wetland.

(FA = area of site type/total area of wetland)

<u>143</u>	FA of isolated wetland	x 50 =
<u>56</u>	FA of palustrine wetland	x 50 = <u>21.5</u>
	FA of riverine wetland	x 20 = <u>11.2</u>
		Sum <u>32.7</u>
	FINAL SCORE FOR GROUND WATER SITE TYPE	<u>32.7</u>

3.5.2 WETLAND SOIL RECHARGE POTENTIAL (MAXIMUM 10)

Circle only one chose that best describes the hydrologic soil class of the wetland being evaluated.

Dominant Wetland Type	Soil Class A - B - C	Soil Class D <i>clay</i>
Lacustrine or on one of 5 major rivers	0	0
Isolated	10	5
Palustrine	7	4
Riverine	5	<u>2</u>

FINAL SCORE FOR WETLAND SOIL RECHARGE POTENTIAL 2

**4.0 SPECIAL FEATURES COMPONENT**

**4.1 RARITY**

**4.1.1 WETLANDS**

Name of physiographic unit: Prince Edward Plain  
 Unit number: 11

Wetland class (check one or more)

- 1)  bog
- 2)  fen
- 3)  swamp
- 4)  marsh

(score all wetland classes present; scores are cumulative; maximum score 80 points)

Unit #	Physiographic Unit	Scarcity	Marsh	Swamp	Fen	Bog
1	Essex Plain	35	0	10	20	20
2	Lake Erie Plain	35	0	10	20	20
3	Stratford Plain	35	20	0	20	20
4	Niagara Peninsula	35	10	0	20	20
5	Guelph Moraine	20	20	0	20	20
6	Grey-Bruce Uplands	20	29	0	20	20
7	Bruce Peninsula	5	20	0	10	20
8	Simcoe Lowlands	20	10	0	20	20
9	Lake Ontario Slope	20	10	0	20	20
10	Peterborough Moraine	5	10	0	20	20
11	Prince Edward Plain	20	0	10	20	20
12	Frontenac Axis	5	10	0	20	10
13	Lanark Plain	5	20	0	20	20
14	Eastern Moraines	20	20	0	20	20
15	Great Lakes/St. Lawrence	35	0	10	20	20

RARITY OF WETLAND CLASS SCORE (max. 80 points) 30

4.1.2 SPECIES

4.1.2.1 BREEDING HABITAT FOR AN ENDANGERED SPECIES *none known*

Name of species	Source of information
1) _____	_____
2) _____	_____
3) _____	_____

Attach documentation

Scoring  
 For one species 250 points  
 For each additional species 250

(score is cumulative; no maximum score)

BREEDING HABITAT FOR ENDANGERED SPECIES SCORE \_\_\_\_\_

4.1.2.2 TRADITIONAL MIGRATION OR FEEDING HABITAT FOR AN ENDANGERED SPECIES *none known*

Name of species	Source of information
1) _____	_____
2) _____	_____
3) _____	_____

Attach documentation

Scoring  
 For one species 150 points  
 For each additional species 75

(score is cumulative; no maximum score)

TRADITIONAL FEEDING HABITAT FOR ENDANGERED SPECIES SCORE \_\_\_\_\_



4.1.2.3 PROVINCIALY SIGNIFICANT SPECIES OF FAUNA none known

Name of species	Source of information
1) _____	_____
2) _____	_____
3) _____	_____
4) _____	_____
5) _____	_____
6) _____	_____
7) _____	_____
8) _____	_____
9) _____	_____
10) _____	_____

Attach separate list if necessary; Attach documentation

Scoring

Number of provincially  
significant species of  
fauna in wetland:      Score

---

One species	=	50
2 species	=	80
3 species	=	95
4 species	=	103
5 species	=	111
6 species	=	116
7 species	=	121
8 species	=	126
9 species	=	131
10 species	=	134

11 species	=	137
12 species	=	140
13 species	=	143
14 species	=	146
15 species	=	149
16 species	=	151
17 species	=	153
18 species	=	155
19 species	=	157
20 species	=	159
21 species	=	161
22 species	=	163
23 species	=	165
24 species	=	167
25 species	=	169

Add one point for every species past 25 (for example, 26 species = 170 pts, 27 species = 171 pts etc...) (no maximum score)

SCORE FOR PROVINCIALLY SIGNIFICANT FAUNA \_\_\_\_\_

4.1.2.4 PROVINCIALLY SIGNIFICANT SPECIES OF FLORA *none known*

Name of species	Source of information
1) _____	_____
2) _____	_____
3) _____	_____
4) _____	_____
5) _____	_____
6) _____	_____
7) _____	_____
8) _____	_____
9) _____	_____

10) \_\_\_\_\_

Attach separate list if necessary; Attach documentation

Scoring

Number of provincially  
significant species of  
fauna in wetland:      Score

---

One species	=	50
2 species	=	80
3 species	=	95
4 species	=	103
5 species	=	111
6 species	=	116
7 species	=	121
8 species	=	126
9 species	=	131
10 species	=	134
11 species	=	137
12 species	=	140
13 species	=	143
14 species	=	146
15 species	=	149
16 species	=	151
17 species	=	153
18 species	=	155
19 species	=	157
20 species	=	159
21 species	=	161
22 species	=	163
23 species	=	165
24 species	=	167
25 species	=	169

Add one point for every species past 25 (for example, 26 species = 170 pts, 27 species = 171 pts etc...) (No maximum score)

SCORE FOR PROVINCIALY SIGNIFICANT FLORA \_\_\_\_\_

4.1.2.5 REGIONALLY SIGNIFICANT SPECIES *none known*

SIGNIFICANT IN SITE REGION:

Name of species	Source of information
1) _____	_____
2) _____	_____
3) _____	_____
4) _____	_____
5) _____	_____
6) _____	_____
7) _____	_____
8) _____	_____
9) _____	_____
10) _____	_____

Attach separate list if necessary; Attach documentation

Scoring

Number of significant  
species at Site Region  
level in wetland:      Score

---

One species	=	20
2 species	=	30
3 species	=	40
4 species	=	50
5 species	=	60
6 species	=	65
7 species	=	70



8 species = 75  
9 species = 80  
10 species = 85

Add one point for every species past 10. (No maximum score)

SCORE FOR SIGNIFICANT SPECIES (SITE REGION) \_\_\_\_\_

4.2.1.6 SIGNIFICANT IN SITE DISTRICT *none known*

Name of species	Source of information
1) _____	_____
2) _____	_____
3) _____	_____
4) _____	_____
5) _____	_____
6) _____	_____
7) _____	_____
8) _____	_____
9) _____	_____
10) _____	_____

Attach separate list if necessary; Attach documentation

Scoring

Number of significant species at Site District level in wetland      Score

One species =	10
2 species =	17
3 species =	24
4 species =	31
5 species =	38
6 species =	41
7 species =	44
8 species =	47
9 species =	50
10 species =	53

For each significant species over 10 in the wetland, add 1 point.  
(No maximum score)

SCORE FOR SIGNIFICANT SPECIES (SITE DISTRICT) \_\_\_\_\_

4.2 SIGNIFICANT FEATURES AND/OR FISH & WILDLIFE HABITAT

4.2.1 NESTING OF COLONIAL WATERBIRDS

(Check one)  
species      Score (one only)

Names of

1) \_\_\_\_\_ currently nesting

50 points

name of species: \_\_\_\_\_

source of information: \_\_\_\_\_

2)  known to have nested within past 5 years

25 points

name of species: Great Blue Heron

source of information: field observations

3) \_\_\_\_\_ active feeding area (great blue heron excluded) 15 points

name of species: \_\_\_\_\_  
source of information: \_\_\_\_\_

4) \_\_\_\_\_ none known 0

SCORE FOR COLONIAL WATERBIRDS 25

**4.2.2. WINTER COVER FOR WILDLIFE**

- |  |                  |
|--|------------------|
| (Check only highest level of significance)                 | Score (one only) |
| 1) _____ provincially significant                          | 100              |
| 2) _____ regionally significant (Site Region)              | 50               |
| 3) _____ regionally significant (Site District)            | 25               |
| 3) <input checked="" type="checkbox"/> locally significant | 15               |
| 4) _____ little or poor winter cover present               | 0                |

Source of information: K Bellamy MNR

SCORE FOR WINTER COVER FOR WILDLIFE (max. 100 points) 15

**4.2.3 WATERFOWL STAGING AND/OR MOULTING**

(Check only highest level of significance for both staging and moulting)

	<u>Staging</u> Score (one only)	<u>Moulting</u> Score (one only)
1) national significance	_____ 150	_____ 150
2) provincial significance	_____ 100	_____ 100
3) regional significance	_____ 50	_____ 50
4) habitat suitable	_____ 15	_____ <input checked="" type="checkbox"/> 15
5) habitat not suitable	_____ <input checked="" type="checkbox"/> 0	_____ 0
6) unknown	_____ 0	_____ 0

Source of information: K Bellamy

SCORE FOR WATERFOWL MOULTING AND STAGING (Maximum 300) 15

**4.2.4 WATERFOWL BREEDING**

- (Check only highest level of significance)      Score
- 1)  Provincial significance      100
  - 2)  Regional significance      50
  - 3)  Habitat suitable      15
  - 4)  Habitat not suitable      0
  - 5)  Unknown      0

Source of information: K Bellamy

SCORE FOR WATERFOWL BREEDING (Maximum 100) 15

**4.2.5 MIGRATORY PASSERINE, SHOREBIRD OR RAPTOR STOPOVER AREA**

(check highest applicable category)

- 1)  Provincial significance      100
- 2)  Regional significance (Site Region)      50
- 3)  Generalized significance      0

Source of information: Field Observation

SCORE FOR PASSERINE, SHOREBIRD OR RAPTOR STOPOVER (Max.100) 0

**4.2.6 FISH HABITAT**

1) Average Water Depth (Use your judgement here as to how many measurements should be taken - may vary with wetland type):

Measurement

- a)  metres
- b)  metres
- c)  metres

Average  metres

Score for average depth (m):

- < 0.2 metres = 0 points
- 0.2-0.6 = 4
- 0.61-1.00 = 6
- 1.01-1.4 = 8
- >1.4 m = 10

*Call  
unconfirmed  
by Jim 4/93*

SCORE FOR AVERAGE WATER DEPTH (max. 10 points) = 4

ii) Bottom Type (Portion of the fish habitat area of the wetland only)  
(estimate % of bottom consisting of sand, gravel, and/or rubble):

\_\_\_\_\_ percent

Scoring:

Portion of bottom consisting of sand, gravel and/or rubble:

- >60% = 10 points
- 51-60 = 8
- 41-50 = 6
- 31-40 = 4
- <31 = 0

SCORE FOR BOTTOM TYPE (max. 10 points) = 0

iii) Presence of Key Vegetation Groups:

check all vegetation groups below that are represented in the vegetation community descriptions (ie up to two dominant species for each vegetation form) for those areas of the wetland that contain fisheries habitat:

Group Number	Group Name	Group Represented by a Dominant Species
1	Tallgrass	_____
2	Shortgrass-Sedge	<input checked="" type="checkbox"/>
3	Cattail-Burreed	<input checked="" type="checkbox"/>
4	Arrowhead-Pickerelweed	_____
5	Duckweed	_____
6	Smartweed-Waterwillow	_____

*Andy Smith  
RAP stuff*



7	Waterlily-Lotus	✓
8	Waterweed-Watercress	—
9	Ribbongrass	—
10	Coontail-Naiad-Watermilfoil	✓
11	Narrowleaf Pondweed	✓
12	Broadleaf Pondweed	—

Scoring:

1.	tallgrass	7 points	} 52
2.	shortgrass-sedge	14	
3.	cattail-burreed	5	
4.	arrowhead-pickereelweed	6	
5.	duckweed	1	
6.	smartweed-waterwillow	4	
7.	waterlily-lotus	12	
8.	waterweed-watercress	8	
9.	ribbongrass	12	
10.	coontail-naiad-watermilfoil	16	
11.	narrowleaf pondweed	5	
12.	broadleaf pondweed	10	

(score all appropriate categories; scores are cumulative; max. score 100 points)

SCORE FOR PRESENCE OF KEY VEGETATION GROUPS (max. 100 pts) = 52

4.3.2 PRESENCE OF FISH

- Walleye \_\_\_\_\_
- Muskellunge \_\_\_\_\_
- Northern Pike
- Bass - SM
- LM
- Yellow Perch
- Bluegill, Pumpkinseed
- Black Crappie or Rockbass
- Salmonids \_\_\_\_\_
- Forage Fish
- Any other fish (list below) \_\_\_\_\_

Andy Smith  
RAP stuff

6 x 10 = 60

each category above scores 10 points

(score all appropriate categories; scores are cumulative; max. score 90 points)

SCORE FOR PRESENCE OF FISH SPECIES (max. 90 pts) = 60

Attach sources (by species)

SMB - Bass Creek Resource + Development Capability Analysis, Michael Michalski Assoc.

Forage Fish - "

LMB - RAP Fish Habitat Inventory, Andy Smith

Pump. - "

Rockbass - "

Perch - "

N Pike - "

Forage Fish - cup unids, brook stickleback, northern redbelly dace, banded killifish, central mudminnow



BIOLOGICAL COMPONENT

1.1 Productivity

- 1.1.1 Growing Degree Days/Soils
- 1.1.2 Wetland Classes
- 1.1.3 Site Type

10.8  
12.3  
3.15

Total 1.1 26.25

1.2 Biodiversity

- 1.2.1 Number of Wetland classes
- 1.2.2 Vegetation Communities
- 1.2.3 Diversity of surrounding habitat
- 1.2.4 Interspersion Proximity to other wetlands
- 1.2.5 Open-water Interspersion
- 1.2.6 Open water

13  
25  
6  
7  
18  
14

Total 1.2 84.0

1.3 Ecosystem Age

1.7

1.4 Size

20.0

TOTAL BIOLOGICAL COMPONENT (maximum score 250 points) 132.0

## SOCIAL COMPONENT

## 2.1 Resource Products with Cash Value

2.1.1	Wood Product	<u>6</u>
2.1.2	Wild Rice	<u>0</u>
2.1.3	Commerical Baitfish and/or Coarse fish	<u>12</u>
2.1.4	Bullfrogs	<u>1</u>
2.1.5	Snapping Turtles	<u>1</u>
2.1.6	Furbearers	<u>12</u>

Total 2.1 322.2 Recreational Activities 75

## 2.3 Landscape Aesthetics

2.3.1	Distinctness	<u>3</u>
2.3.2	Absence of Human Disturbance	<u>1</u>

Total 2.3 4

## 2.4 Education and Public Awareness

2.4.1	Educational Uses	<u>20</u>
2.4.2	Facilities and Programs	<u>0</u>
2.4.3	Research and Studies	<u>5</u>

Total 2.4 252.5 Proximity to Areas of Human Settlement 402.6 Ownership 4.22.7 ~~Aboriginal Values~~ *Size* 202.8.1 ~~Cultural Values~~ *Aboriginal Values*     2.8.2 *Cultural Values*     TOTAL FOR SOCIAL COMPONENT (maximum score 250 points) 200.2



**HYDROLOGICAL COMPONENT**

3.1	Flood attenuation score	<u>67.5</u>
3.2	Water Quality improvement	
3.2.1	Short term improvement	<u>40.8</u>
3.2.2	Long term nutrient trap	<u>0</u>
3.2.3	Groundwater discharge	<u>20.0</u>
3.3	Carbon sink	<u>0</u>
3.4	Shoreline erosion control	<u>7.5</u>
3.5	Groundwater recharge	
3.5.1	Site Type	<u>32.7</u>
3.5.2	Soils	<u>2</u>
<b>TOTAL SCORE FOR HYDROLOGICAL COMPONENT (Sum)</b> (Assign 250 or total score which ever is less)		<u>170.5</u>

## SPECIAL FEATURES COMPONENT

## 4.1 Rarity

4.1.1	Wetlands	<u>30</u>
4.1.2	Species	
4.1.2.1	Endangered Species - Breeding	_____
4.1.2.2	Endangered Species - Feeding/Migration	_____
4.1.2.3	Provincially Significant Fauna	_____
4.1.2.4	Provincially Significant Flora	_____
4.1.2.5	Regionally Significant - Site Region	_____
	- Site District	_____
	Total 4.1	<u>30</u>

## 4.2 Significant Features and/or Wildlife Habitat

4.2.1	Colonial Waterbirds	<u>25</u>
4.2.2	Winter Cover for Wildlife	<u>15</u>
4.2.3	Waterfowl staging and/or moulting	<u>15</u>
4.2.4	Waterfowl breeding	<u>15</u>
4.2.5	Migratory passerine, shorebird, raptor..	<u>0</u>
4.2.6	Fish habitat	
4.2.6.1	Physical habitat characteristics	<u>56</u>
4.2.6.2	Presence of fish	<u>60</u>
	Total 4.2	<u>186</u>

TOTAL SPECIAL FEATURES COMPONENT (maximum 250 points) 216

SCORING SUMMARY

BIOLOGICAL COMPONENT	<u>132</u>
SOCIAL COMPONENT	<u>200.2</u>
HYDROLOGICAL COMPONENT	<u>170.5</u>
SPECIAL FEATURES COMPONENT	<u>216</u>
TOTAL SCORE	<u>718.7</u>