DILLON CONSULTING

CITY OF BELLEVILLE

Loyalist West Secondary Plan Update

Natural Heritage Report

February, 2023 – 21-2538

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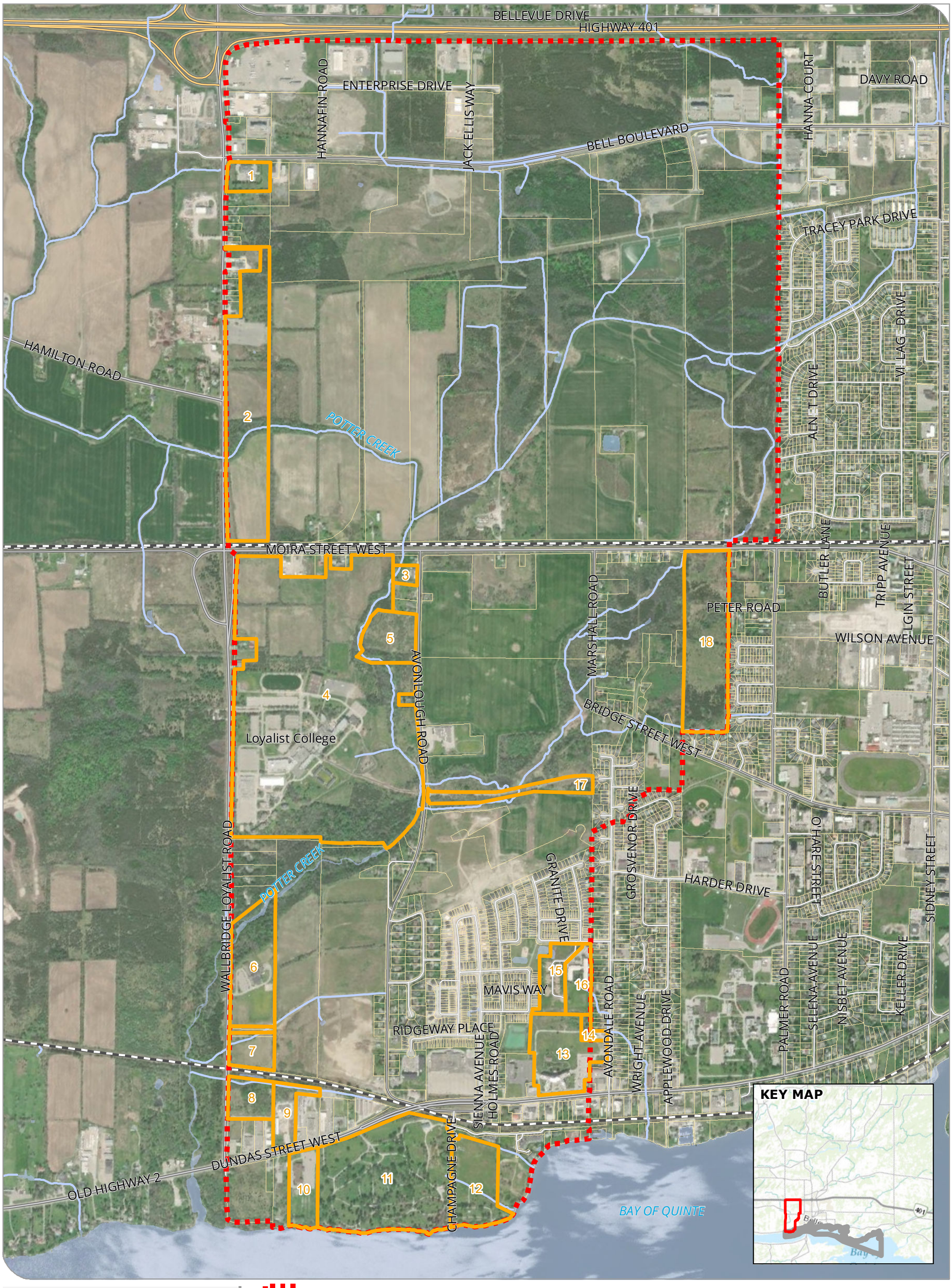
1.0 Introduction

Dillon Consulting Limited (Dillon) was retained by the City of Belleville to undertake natural environment studies as part of updating the Loyalist Secondary Plan (herein referred to as the Loyalist West Secondary Plan, or LWSP) Update for the LWSP area (herein referred to as the "Study Area"). The Study Area is generally bound by Wallbridge-Loyalist Road to the west, Avondale Road and Palmer Road to the east, the Bay of Quinte to the south, and Highway 401 to the north, within the City (**Figure 1**). In November, 2021, the City of Belleville adopted its new Official Plan (OP) while carrying forward the existing Loyalist Secondary Plan (2010) with an understanding that the LWSP would be updated. In order to support and inform the LWSP Update with regard to potential impacts to natural heritage features within the Study Area, this Natural Heritage Report (NHR) has been prepared.

The natural environment areas of the Study Area are generally aligned with Potter Creek, which meanders and bisects the center of Study Area. The woodlands and wetlands adjacent to the alignment of Potter Creek largely form the foundation of the natural environment areas within the Study Area, with the exception to a large mosaic of unevaluated wetland and woodland areas that occur within the northeast portion of the Study Area and the natural areas associated with Potter Creek Tributary Non-Provincially Significant Evaluated Wetland that occurs east of Loyalist College and Avonlough Road. The remaining natural areas occur as meadow or agricultural fields used for perennial and annual row crops.

The purpose of the NHR is to summarize the results of the background review and natural environment field program, which will ultimately be incorporated into the Loyalist West Secondary Plan Update. It may also benefit future requirements needed to fulfill the Municipal Class Environmental Assessment (EA) process. The NHR will document existing conditions of the natural environment; determine the potential limits of development; evaluate the potential for environmental impacts associated with future development proposals; and recommend mitigation, restoration, and enhancement measures to preserve and/or restore natural features in the Study Area.

The NHR has been prepared in accordance with the Terms of Reference (ToR) established in consultation with the Quinte Conservation (QC) and the City of Belleville, agreed to through correspondence between Dillon, QC and the City of Belleville on January 11, 2022 (**Appendix A**). This NHR has been completed in accordance with both the guiding principles of the City of Belleville OP, as well as the general policies of Quinte Conservation (QC).



CITY OF BELLEVILLE

Loyalist Secondary Plan Update
Natural Heritage Report

STUDY AREA

FIGURE 1

Subject to limitations; please refer to Section 10.0 of this report.

- Study Area
- Participating Landowner Property Boundary
- Property Parcels
- Expressway
- Arterial Road
- Collector Road
- Local Road
- Rail Line

MNRF (2022)

- Watercourse
- Waterbody

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, CITY OF BELLEVILLE

MAP CREATED BY: -ZJB
MAP CHECKED BY: -CE
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

SCALE 1:15,000

0 137.5 275 550 m

PROJECT: 21-2538 STATUS: DRAFT DATE: 2022-10-13

FILE LOCATION: K:\2021\212538 - Loyalist Secondary Plan Update\Product\Client\Natural Environment\F1_StudyArea.mxd

2.0 Policy Framework

The following sections have been prepared to identify the applicable land use planning policies related to the natural environment. Various regulatory agencies and legislative authorities have established a number of policies with the purpose of protecting ecological features and functions. **Table 1** lists the relevant policies and legislation that apply to the protection of natural heritage features within the City of Belleville, as well as supporting guidance documents and resources consulted respective to each policy. This table also includes additional background information sources used to help identify and define natural heritage features within the province of Ontario, and Eco-region 6E specifically. This section is not intended to constitute a complete land use planning assessment, as it focuses on the relevant environmental policies and regulations. The documents referenced below can be read in their entirety for a more detailed understanding of the land use policy framework applicable to the Study Area.

Table 1: Policies, Legislation and Background Resources Reviewed

Policy	Guidelines and Supporting Documents
Planning Act, 1990; Provincial Policy Statement (PPS), 2020 (Province of Ontario)	Policies within Section 2.1 and 2.2 related to natural heritage features

Planning Act, 1990; PPS, 2020 (Province of Ontario)	Natural Heritage Information Centre (NHIC) (Ministry of Northern Development, Mines, Natural Resources and Forestry [NDMNRF] 2022)
	• GIS database of occurrence records for natural heritage features. Uses 1-kilometre squares based on the military grid reference system. Reviewed to determine historical occurrence records of:
	  ○ Species of Conservation Concern (SCC) and Species at Risk (SAR);
	  ○ Rare and exemplary plant communities;
	  ○ Wildlife concentration areas; and
	  ○ Natural areas.
	• NHIC 1- kilometre squares reviewed: 18UP0589, 18UP0689, 18UP0590, 18UP0690, 18UP0790, 18UP0791, 18UP0691, 18UP0591, 18UP0592, 18UP0692, 18UP0792, 18UP0492, 18UP0493, 18UP0593, 18UP0693, 18UP0793, 18UP0494, 18UP0594, 18UP0694, 18UP0794, 18UP0595, 18UP0695

Planning Act, 1990; PPS, 2020 (Province of Ontario)	Ecological Land Classification (ELC) for Southern Ontario, Second Approximation, 2008
Planning Act, 1990; PPS, 2020 (Province of Ontario)	Natural Heritage Reference Manual, Second Edition, 2010
Planning Act, 1990; PPS, 2020 (Province of Ontario)	Ontario Wetland Evaluation System, Southern Manual, Third Edition, 2013
Planning Act, 1990; PPS, 2020 (Province of Ontario)	Ministry of Natural Resources and Forestry (MNRF) Significant Wildlife Habitat Technical Guide, 2000 • Significant Wildlife Habitat Eco-region 6E Criterion Schedules, 2015

Policy	Guidelines and Supporting Documents
Planning Act, 1990; PPS, 2020 (Province of Ontario)	Federal Species at Risk Public Registry (Government of Canada 2022a) • Schedule 1 of the *Species at Risk Act, 2002* (SARA) reviewed to confirm status of SAR/SCC.
Planning Act, 1990; PPS, 2020 (Province of Ontario)	Fisheries and Oceans Canada (DFO) Aquatic SAR Map, accessed October 2022
Planning Act, 1990; PPS, 2020 (Province of Ontario)	Ontario Breeding Birds Atlas (OBBA) • Breeding bird historical occurrence records for the 10-kilometre grid squares overlapping the Study Area: 18TP98, 18TP99, 18UP08, 18UP09, 18UP98
Planning Act, 1990; PPS, 2020 (Province of Ontario)	Christmas Bird Count (Birds Canada, 2022a) • Christmas Bird Count (CBC) records from 2018 for the (Belleville Region) ONBV program that overlaps the Study Area
Planning Act, 1990; PPS, 2020 (Province of Ontario)	Ontario Reptile and Amphibian Atlas (Ontario Nature, 2022) • List of reptile and amphibian species occurrences for the 10-kilometre grid squares overlapping the Study Area: 18TP98, 18TP99, 18UP08, 18UP09, 18UP98
Planning Act, 1990; PPS, 2020 (Province of Ontario)	Ontario Butterfly Atlas (Toronto Entomologists' Association, 2022) • Lepidoptera historical occurrence records for the 10-kilometre grid squares overlapping the Study Area: 18TP98, 18TP99, 18UP08, 18UP09, 18UP98
Planning Act, 1990; PPS, 2020 (Province of Ontario)	Atlas of the Mammals of Ontario (Dobbyn, 1994) and Mammals of the Western Hemisphere (NatureServe, 2007) • Distribution data for mammals overlapping the Study Area
Endangered Species Act, 2007 (Province of Ontario)	Ministry of Environment Conservation and Parks Species at Risk in Ontario (SARO) List (O. Reg. 230/08), 2022
Endangered Species Act, 2007 (Province of Ontario)	• NHIC 1-kilometre squares reviewed: 18UP0589, 18UP0689, 18UP0590, 18UP0690, 18UP0790, 18UP0791, 18UP0691, 18UP0591, 18UP0592, 18UP0692, 18UP0792, 18UP0492, 18UP0493, 18UP0593, 18UP0693, 18UP0793, 18UP0494, 18UP0594, 18UP0694, 18UP0794, 18UP0595, 18UP0695
Endangered Species Act, 2007 (Province of Ontario)	OBBA • Breeding bird historical occurrence records for the 10-kilometre grid squares overlapping the Study Area: 18TP98, 18TP99, 18UP08, 18UP09, 18UP98
Endangered Species Act, 2007 (Province of Ontario)	Ontario Reptile and Amphibian Atlas (Ontario Nature, 2022) • List of reptile and amphibian species occurrences for the 10-kilometre grid squares overlapping the Study Area: 18TP98, 18TP99, 18UP08, 18UP09, 18UP98
Endangered Species Act, 2007 (Province of Ontario)	Atlas of the Mammals of Ontario (Dobbyn, 1994) and Mammals of the Western Hemisphere (NatureServe, 2007) • Distribution data for mammals overlapping the Study Area

Policy	Guidelines and Supporting Documents
City of Belleville Official Plan, 2021, pending Ministry approval	Schedules C, F, G
Loyalist Secondary Plan, 2010 (City of Belleville)	Schedule A
Quinte Conservation (QC) Conservation Authorities Act, 1990: Ontario Regulation 319/09	Resources and reports available from QC • Online Regulated Area and Floodplain mapping • Source Protection Plan (2019) • Quinte Conservation Watershed Report Card (2018)
AECOM Canada Ltd. (supplementary background resource/document)	City of Belleville – Avonlough Road Sewage Pumping Station: Natural Environment Inventory Report (2021)
Greer Galloway Consulting Engineers (supplementary background resource/document)	Environmental Impact Study Report – Loyalist College Multi-Use Path and Bridge 376 Wallbridge Loyalist Road, Belleville (2020)
Ainley Group (supplementary background resource/document)	Environmental Impact Study for Bridge Street West Path to Loyalist College – City of Belleville (2017)
Ainley Group (supplementary background resource/document)	Environmental Impact Study for Proposed Village of Avonlea – City of Belleville (2021)

Policies and information within each document and resources that relate to the natural environment and apply to the Study Area are outlined in subsequent sections.

2.1 Provincial Policy Statement, 2020

The Provincial Policy Statement (PPS), 2020 provides overall policy direction on matters of provincial interest related to land use planning and development in Ontario. The PPS sets forth a vision for Ontario's land use planning system by managing and directing land use to achieve efficient development and land use patterns, wise use and management of resources, and protecting public health and safety. This report deals specifically with Policy 2.1 (Natural Heritage) and Policy 2.2 (Water), which provide for the protection and management of natural heritage and water resources. These policies include the following:

- significant wetlands;
- significant coastal wetlands;
- significant woodlands;
- significant valleylands;
- significant wildlife habitat;
- significant areas of natural and scientific interest (ANSIs);

- fish habitat;
- sensitive surface water features; and
- sensitive ground water features.

The PPS defines "significant" to mean:

- "in regard to wetlands, coastal wetlands and areas of natural and scientific interest, an area identified as provincially significant by the Ontario Ministry of Natural Resources using evaluation procedures established by the Province, as amended from time to time;
- in regard to woodlands, an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history. These are to be identified using criteria established by the Ontario Ministry of Natural Resources; and
- in regard to other features and areas in policy in 2.1, ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system.".

The PPS defines "sensitive" to mean:

- "in regard to surface water features and ground water features, means areas that are particularly susceptible to impacts from activities or events, including, but not limited to, water withdrawals, and additions of pollutants."

Potential significance of natural heritage features may be evaluated based on size, age, presence of rare or sensitive species, species diversity, and linkage functions, taking into consideration factors such as adjacent land use and degree of disturbance. Criteria for determining significance follow guidance outlined in the Natural Heritage Reference Manual (NHRM) (MNRF, 2010) and the Significant Wildlife Habitat Technical Guide Eco-Region 6E Criterion Schedules (MNRF, 2015), where applicable.

Significance of natural features identified within the Study Area is further discussed in **Section 5.0** of this report.

2.2 Endangered Species Act, 2007

In June 2008, the *Endangered Species Act, 2007* (ESA) came into effect in Ontario. The purpose of the ESA is to identify Species at Risk (SAR) based on the best available scientific information; to protect SAR and their habitats, to promote the recovery of SAR; and to promote stewardship activities to assist in the protection and recovery of SAR in Ontario. There are three applicable regulations under the ESA: *Ontario Regulation 230/08* (the SARO List), *Ontario Regulation 242/08* (General), and *Ontario Regulation 830/21* (Exemptions). These regulations serve to identify which species and habitat receive protection and provide direction on the current implementation of the ESA by the Ministry of Environment Conservation and Parks (MECP).

The potential for SAR and SAR habitat to be impacted as a result of the future development is discussed further in **Sections 3.3.6** and **5.2.6** of this report.

2.3 City of Belleville Official Plan, 2021

The current City of Belleville Official Plan (OP) was adopted by the City Council on June 18, 2001 by By-law 2001-98 and was approved by the Ministry of Municipal Affairs and Housing on January 7, 2002 under the *Planning Act, 1990*. Since that time the Official Plan has been amended, however to respond to new Provincial planning policies and legislation, the City of Belleville embarked on an Official Plan update.

Based on the new OP (adopted by Council in 2021, pending Ministry approval), lands within the Study Area fall within the Loyalist Secondary Plan (2010), and are designated as a mix of Residential, Employment Area, Community Facility, Open Space and Environmental Protection (Schedule A to the 2010 Loyalist Secondary Plan). In accordance with Appendix C and Schedule F to the OP, the Study Area contains features identified as Proposed Significant Wetland, Other Wetlands, Proposed Natural Heritage System, and Floodplain. Refer to **Appendix B** for OP mapping.

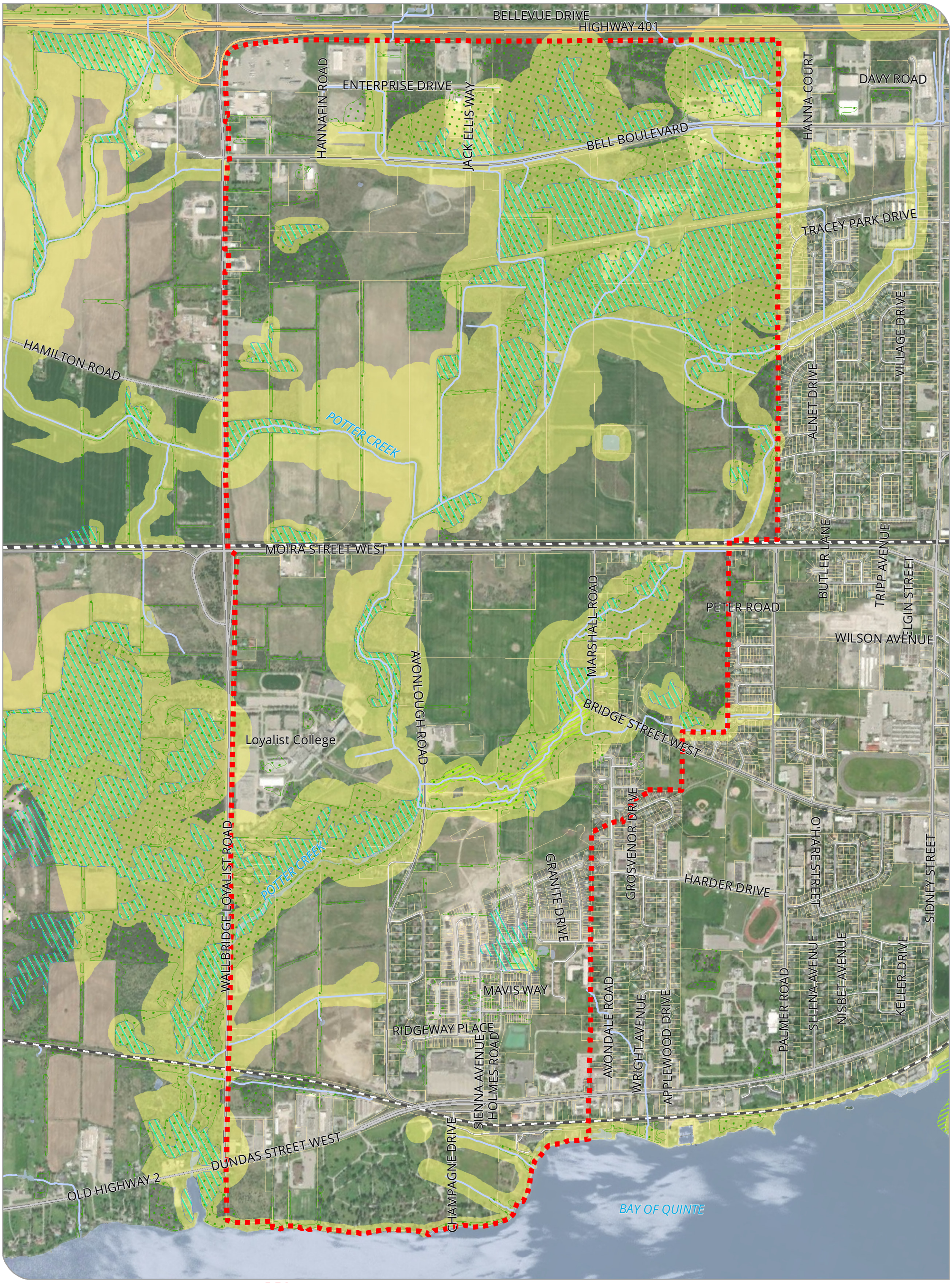
Policies related to Environmental Protection and Natural Heritage Features are outlined in Section 3.5 of the OP. Section 4.4 of the OP outlines policy with respect to the Specific Policy Area #4 – Loyalist West Secondary Plan and Section 3.5 of the 2010 Loyalist Secondary Plan addresses policy regarding Environmental Protection areas.

2.4 Quinte Conservation Authority (Ontario Regulation 319/09)

In accordance with Section 28 of the *Conservation Authorities Act, 1990*, QC is authorized to implement and enforce the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulation 319/09). Section 2(1) of this Regulation lists areas within QC's jurisdiction where development is prohibited without proper permissions from the QC. Such areas include, but are not limited to, river or stream valleys, floodplains, hazardous lands, and wetlands.

In participating in the review of applications under the *Planning Act and Environmental Assessment Act(s)*, QC ensures that applicants and approval authorities are aware of any Section 28 Regulation requirements under the Conservation Authorities Act, where applicable. Further, QC assists in the coordination of these applications to avoid ambiguity, conflict and unnecessary delay or duplication in the process.

The Study Area contains several areas located within QC's Regulated Area (**Figure 2**).



CITY OF BELLEVILLE

Loyalist Secondary Plan Update
Natural Heritage Report

DESIGNATED NATURAL HERITAGE FEATURES

FIGURE 2

Subject to limitations; please refer to Section 10.0 of this report.

Study Area
Property Parcels
Expressway
Arterial Road
Collector Road
Local Road
Rail Line

MNRF (2022)
Watercourse
Waterbody
Non-Provincially Significant Evaluated Wetland
Unevaluated Wetland
Wooded Area

Quinte Conservation (2021)
Conceptual Regulated Area

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, CITY OF BELLEVILLE

MAP CREATED BY: -ZJB
MAP CHECKED BY: -CE
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

SCALE 1:15,000

0 137.5 275 550 m

N W E S

PROJECT: 21-2538 STATUS: DRAFT DATE: 2023-02-09

FILE LOCATION: K:\2021\212538 - Loyalist Secondary Plan Update\Product\Client\Natural Environment\F2_Designated_Natural_Heritage_Features.mxd

3.0 Results of Background Review

The following sections provide a brief summary of the existing environmental conditions within the Study Area. This information provides the background information upon which the report was based.

As mentioned in **Section 2.1**, several natural heritage features as defined under the PPS require consideration within this report and are discussed in subsequent sections.

3.1 Landforms, Soils and Geology

A desktop review indicates that the Study Area is primarily comprised of agricultural lands with a large woodland/wetland within the northeast quadrant and a woodland associated within Potter Creek that is oriented in a general east-west alignment within the Study Area. Potter's Creek Conservation Area and QC occurs west of the Study Area with frontage along Wallbridge Loyalist Road. The Study Area also contains several rural residential properties as well as a few large developed areas including Loyalist College along the western boundary, an existing and under construction residential subdivision in the southeast quadrant and a rest stop/gas station area in the northwest corner nearby Highway 401. The Study Area is bounded by two major roadways, Highway 401 and Wallbridge-Loyalist Road to the north and west, respectively, and smaller residential/collector roads to the east, with the Bay of Quinte to the south. Lands within the Study Area contain areas of gently rolling hills across terrain that slopes south towards the Bay of Quinte.

The Study Area lies within the Bay of Quinte area and consists of Middle Ordovician bedrock including limestone, dolostone, shale, arkose, and sandstone (OGS, 1991). According to Chapman and Putnam, 1984, the physiography of the Study Area includes areas of Bevelled Till Plain, Limestone Plain, and Clay Plain. According to Schedule G to the OP (**Appendix B**), the Study Area falls contains all three bedrock types identified within the City of Belleville:

- Paleozoic bedrock outcrop; areas of exposed bedrock partially covered by a thin veneer of drift. Drift thickness is generally less than 1 metre;
- Paleozoic bedrock covered by drift; drift thickness is generally 1 to 8 metres. Bedrock outcrops may occur; and
- Paleozoic bedrock covered by drift; drift thickness is generally 8 to 15 metres. Isolated outcrops may occur.

3.2 Aquatic Environment

The Study Area is located within the jurisdiction of QC which manages the watersheds of all streams draining into the Moira, Napanee, and Salmon rivers. A total of four subwatersheds are located within the QC watershed, encompassing a total area of 5,921 square kilometres. The Study Area lies within the catchment area for Potter Creek within the Moira River Watershed. Potter Creek and associated tributaries within this subwatershed flow southward and eventually discharge directly into the Bay of

Quinte. According to the Quinte Conservation Watershed Report Card (2018), the Moira Watershed received a grade of "A-Excellent" with respect to surface water quality, forest conditions and wetland cover. The report also describes the Moira River Watershed as containing lands that are approximately 54% of forested, 17% is forest interior and 52% is considered a forested riparian zone while approximately 13% of the Moira River Watershed is covered by wetlands (QC, 2018). Comparatively, habitat guidelines established by Environment Canada's Canadian Wildlife Service for maintaining healthy ecosystems recommends a minimum of 30% forest cover, 10% interior and 50% riparian forest; and suggests that a healthy watershed should contain at least 10% wetland cover (2013).

Potter Creek flows west-east and then north-south for the portion of the alignment that occurs north of Moira Street West and then continues in a north-south orientation generally aligned with Avonlough Road until passing Loyalist College. Potter Creek then travels east-west for the portion of the watercourse alignment that occurs south of Loyalist College. Potter Creek represents the largest surface water feature within the Study Area and serves as the primary mode of surface water transport in the LWSP area to the Bay of Quinte. Based on background review Potter Creek is known to contain fish and fish habitat. In addition, based on background mapping there is the potential for several tributaries of Potter Creek and headwater drainage features to be present throughout the Study Area that contain habitat for fish and other aquatic life. While no SAR or Special Concern fish species were identified through a search of background records within the Study Area, River Redhorse *(Moxostoma carinatum)*, Northern Sunfish *(Lepomis peltastes)*, and Grass Pickerel *(Esox americanus vermiculatus)* (all considered Special Concern, both provincially and federally) have been identified as potentially occurring within the Bay of Quinte.

Of particular note was a large constructed waterbody feature within the northeast portion of the Study Area approximately 200 metres south of the current southern extent of Jenland Way South. The feature appears to be a stormwater management pond. The feature also contains adjacent access roads and based on aerial photography is believed to have been constructed within the last few years.

3.3 Terrestrial Environment

3.3.1 Wetlands

Wetlands within the Study Area are considered southern wetlands based on their location south of the northern limit of Ecoregions 5E, 6E, and 7E as shown on Figure 1 of the PPS, 2020. Based on a desktop review of available agency mapping Potter Creek Tributary Non-Provincially Significant Evaluated Wetland was identified as occurring with the central portion of the Study Area located east of Avonlough Road and Potter Creek (**Figure 2**). Several other areas of unevaluated wetlands were also identified as occurring within the Study Area some of which occur in association with Potter Creek and a separate concentration being associated with the woodlands in the northeast quadrant of the Study Area.

3.3.2 Woodlands

Based on a desktop review of available agency mapping several areas of woodland were identified within the Study Area during background review. The largest woodland areas occur within the northeast quadrant of the Study Area, as well as the Potter Creek corridor. City of Belleville has indicated areas where proposed significant woodlands should be designated within the Study Area, these areas are identified on Appendix C to the City of Belleville OP and generally align with the areas identified previously.

Significance of woodlands is discussed further in **Sections 4.2.4** and **5.2.4**.

3.3.3 Valleylands

No significant valleylands were specifically identified within or adjacent to the Study Area during background review. Based on the landscape and known topography of the Study Area that generally contains gently rolling hills, significant valleylands are not anticipated to occur within the Study Area.

3.3.4 Areas of Natural and Scientific Interest

No ANSIs were identified within or adjacent to the Study Area during background review.

3.3.5 Significant Wildlife Habitat

Wildlife habitat is defined as an area where plants, animals and other organisms live, including areas where species concentrate at a vulnerable point in their life cycle, and areas that are important to migratory and non-migratory species (MNR, 2000). To assist planning authorities, the NDMNRF developed the Significant Wildlife Habitat (SWH) Technical Guide (MNR, 2000) that provides information on the identification, description, and prioritization of SWH in Ontario.

To account for the ecological diversity across the province, NDMNRF developed the SWH Ecoregional Criteria Schedules to support the SWH Technical Guide. These schedules are specific to each geographic area of each ecoregion. The Study Area is located in Ecoregion 6E (Lake Simcoe-Rideau); under the Criteria Schedule for Ecoregion 6E (MNRF, 2015), SWH is divided into four broad categories consisting of:

- Seasonal concentration areas;
- Rare vegetation communities or specialized habitats for wildlife;
- Animal movement corridors; and
- Habitats of species of conservation concern excluding the habitats of endangered and threatened species.

The Significant Wildlife Habitat Technical Guide (MNRF, 2000) defines SCC as globally, nationally, provincially, regionally, or locally rare (S-Rank of S1, S2 or S3) as well as species listed as Endangered or Threatened federally; but does not include provincial SAR (species listed as Threatened or Endangered under the ESA). SCC include:

- Species that are assigned a conservation rank of S1-S3 by the NHIC;

- Species that are listed as Special Concern on the SARO list;
- Species that are listed as Special Concern, Threatened, or Endangered on Schedule 1 of SARA; and/or,
- Species that are classified as Special Concern, Threatened, or Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) but have not yet been added to Schedule 1 of SARA.

Based on the results of the background review, a total of 18 SCC listed in **Table 2** were identified as having the potential to occur within the general vicinity of the Study Area and have been considered in determining the potential for SWH within the Study Area.

Table 2: Species of Conservation Concern with Potential to Occur Within the Vicinity of the Study Area

Scientific Name	Common Name	SARA[1]	ESA[2]	S-RANK[3]	Info Source[4]
BIRDS					
Ammodramus savannarum	Grasshopper Sparrow	SC	SC	S4B	OBBA
Cardellina canadensis	Canada Warbler	THR	SC	S4B	NHIC, OBBA
Chordeiles minor	Common Nighthawk	THR	SC	S4B	OBBA
Contopus virens	Eastern Wood-pewee	---	SC	S4B	OBBA
Falco peregrinus	Peregrine Falcon	SC	SC	S3B	CBC, OBBA
Haliaeetus leucocephalus	Bald Eagle	---	SC	S2N,S4B	CBC, OBBA
Hylocichla mustelina	Wood Thrush	THR	SC	S4B	OBBA
Melanerpes erythrocephalus	Red-headed Woodpecker	THR	SC	S4B	OBBA
HERPTILES					
Chelydra serpentina	Snapping Turtle	SC	SC	S3	NHIC, ON
Chrysemys picta marginata	Midland Painted Turtle	SC	---	S4	NHIC
Graptemys geographica	Northern Map Turtle	SC	SC	S3	NHIC, ON
Pseudacris triseriata pop. 1	Western Chorus Frog (Great Lakes/ St. Lawrence- Canadian Shield Population)	THR	SC	S3	ON
Sternotherus odoratus	Eastern Musk Turtle	SC	SC	S3	ON
FISH					
Esox americanus vermiculatus	Grass Pickerel	SC	SC	S3	DFO
Moxostoma carinatum	River Redhorse	SC	SC	S2	DFO
Percina copelandi	Channel Darter	END	SC	S2	NHIC
Lepomis peltastes	Northern Sunfish (Great Lakes – Upper St. Lawrence population)	---	SC	S3	DFO
LEPIDOPTERA					
Danaus plexippus	Monarch	SC	SC	S2N, S4B	OBA

Notes:

[1] Federal SARA Registry Status: THR = Threatened, END = Endangered, SC = Special Concern

[2] Provincial ESA Species at Risk in Ontario List Status: SC = Special Concern

[3] Provincial Conservation Rank (Srank): S4 = apparently secure; S3 = vulnerable; S2 = imperilled; S1 = extremely rare in Ontario; ? = inexact or uncertain; B = breeding status; N = non-breeding status

[4] Information sources include: CBC = Christmas Bird Count; DFO = Fisheries and Oceans Canada; MECP = Ministry of the Environment, Conservation and Parks; NHIC= Natural Heritage Information Centre; OBA = Ontario Butterfly Atlas; OBBA = Ontario Breeding Bird Atlas; ON = Ontario Nature: Ontario Reptile and Amphibian Atlas

A review of the background data and satellite imagery suggests that the following SWH types may occur within the Study Area:

- Waterfowl Stopover and Staging Areas (terrestrial);
- Bat Maternity Colonies;
- Turtle Wintering Areas;
- Landbird Migratory Stopover Area;
- Area-Sensitive Bird Breeding Habitat;
- Amphibian Breeding Habitat (Woodland);
- Amphibian Breeding Habitat (Wetland); and
- Habitat for Special Concern and Rare Wildlife Species.

A discussion on SWH has been included in **Section 5.2.5**.

3.3.6 Species at Risk

Based on the background review, a total of 15 SAR listed as Endangered and Threatened under the ESA have been identified with the potential to occur within the vicinity of the Study Area (**Table 3**).

Table 3: Species at Risk with Potential to Occur Within the Study Area

Scientific Name	Common Name	SARA[1]	ESA[2]	S-RANK[3]	Info Source[4]
BIRDS					
Chaetura pelagica	Chimney Swift	THR	THR	S4B, S4N	OBBA
Dolichonyx oryzivorus	Bobolink	THR	THR	S4B	OBBA
Hirundo rustica	Barn Swallow	THR	THR	S4B	OBBA
Ixobrychus exilis	Least Bittern	THR	THR	S4B	OBBA
Lanius ludovicianus migrans	Loggerhead Shrike	END	END	S2B	OBBA
Riparia riparia	Bank Swallow	THR	THR	S4B	OBBA
Sturnella magna	Eastern Meadowlark	THR	THR	S4B	OBBA
MAMMALS					
Myotis lucifugus	Little Brown Myotis	END	END	S4	MWH
Myotis septentrionalis	Northern Myotis	END	END	S3	MWH
Perimyotis subflavus	Tricolored Bat	END	END	S3	MWH
Myotis leibii	Eastern Small-footed Myotis	---	END	S2S3	MWH
HERPTILES					
Emydoidea blandingii	Blanding's Turtle	THR	THR	S3	ON
VACLUAR PLANTS					
Asclepias quadrifolia	Four-leaved Milkweed	---	END	S1	MECP
Fraxinus nigra	Black Ash	---	END	S4	TOC
Juglans cinerea	Butternut	END	END	S3?	TOC

Notes:

[1] Federal SARA Registry Status: THR = Threatened, END = Endangered

[2] Provincial ESA Species at Risk in Ontario List Status: THR = Threatened, END = Endangered, SC = Special Concern

[3] Provincial Conservation Rank (Srank): S4 = apparently secure; S3 = vulnerable; S2 = imperilled; S1 = extremely rare in Ontario; ? = inexact or uncertain; B = breeding status; N = non-breeding status

[4] Information sources include: DFO = Fisheries and Oceans Canada; IBA = Important Bird and Biodiversity Area; MECP = Ministry of the Environment, Conservation and Parks; MWH = Mammals of the Western Hemisphere; NHIC= Natural Heritage Information Centre; OBBA = Ontario Breeding Bird Atlas; ON = Ontario Nature: Ontario Reptile and Amphibian Atlas; TOC = Trees of Canada

3.3.6.1 Species at Risk Habitat

Based on background review as part of this NHR, the following SAR and/or SAR habitat may be found within the Study Area and warrant further consideration as part of the NHR:

- Black Ash;
- Butternut;
- Bobolink;
- Barn Swallow;
- Blanding's Turtle;
- Eastern Meadowlark;
- Eastern Small-footed Myotis;
- Loggerhead Shrike;
- Little Brown Myotis;
- Northern Myotis; and
- Tri-coloured bat.

These species are discussed further in **Section 5.2.6**.

3.3.7 Incidental Wildlife

A review of aerial photos and local knowledge suggests that there are several common wildlife species found within the general area with potential to occur in the Study Area.

Incidental wildlife occurrences are discussed further in **Section 5.2.7**.

4.0 Field Work Methodology

The results of the review of background materials and resources, were used to assist in scoping the 2022 field program.

In accordance with the TOR, the 2022 field program included the following:

- Headwater Drainage Feature (HDF) Assessment;
- ELC of vegetation communities;
- Single-season botanical survey (summer);
- Breeding bird surveys;
- Amphibian breeding surveys; and
- Aquatic assessments.

Fieldwork conducted for the NHR occurred in 2022 between the months of April and August when weather conditions and timing were deemed suitable based on the survey protocols being implemented (**Table 4**)**.** Incidental wildlife observations made during the surveys were also documented and used to assist in the identification of potential SWH. These studies were undertaken to identify baseline conditions within the Study Area, confirm the results of the background review, and help to identify potential impacts and/or mitigation measures.

Access for the fieldwork program was limited to 18 property parcels (refer to **Figure 1**) within the Study Area, therefore survey stations, inventories, and assessments were limited to these accessible properties only. The remainder of the Study Area was assessed via background mapping and aerial interpretation. Aerial interpretation on inaccessible properties was supplemented by additional surveys and observations from properties where access was granted as well as publically accessible areas and vantage points such as roadside shoulders and public pedestrian pathways. Features identified by background mapping on inaccessible properties were assumed to be present for the purpose of this NHR. The inaccessible properties within the Study Area will need to be reassessed for future development proposals.

Table 4: Field Survey Dates and Weather Conditions

Date	Weather Conditions	Air Temp (°C)	Purpose of Visit
April 7, 2022	100% cloud cover, light air[1], rain	5	• HDF Assessment #1 – Day 1 • Preliminary Investigations for Aquatic Habitat Assessment Locations – Day 1
April 8, 2022	100% cloud cover, light breeze[2], drizzle	8	• HDF Assessment #1 – Day 2 • Preliminary Investigations for Aquatic Habitat Assessment Locations – Day 2

Date	Weather Conditions	Air Temp (°C)	Purpose of Visit
April 21, 2022	10% cloud cover, light air[1], no precipitation	12	• Amphibian Survey #1
May 17, 2022	10% cloud cover, light breeze[2], no precipitation	13	• Amphibian Survey #2
June 16, 2022	10% cloud cover, light air[1], no precipitation	21	• Breeding Bird Survey #1
June 29, 2022	40% cloud cover, light air[1], no precipitation	20	• Amphibian Survey #3
July 14, 2022	20% cloud cover, light breeze[2], no precipitation	25	• Breeding Bird Survey #2
August 10, 2022	10% cloud cover, moderate breeze[4], no precipitation	26	• ELC/Botanical Survey • Aquatic Assessments – Day 1
August 11, 2022	10% cloud cover, light breeze[2], no precipitation	22	• ELC/Botanical Survey • Aquatic Assessments – Day 2

Notes
[1]Light air = Beaufort Scale 1
[2]Light breeze = Beaufort Scale 2
[3]Gentle breeze = Beaufort Scale 3
[4]Moderate breeze = Beaufort Scale 4

The following sub-sections outline the survey methodologies used for the NHR.

4.1 Aquatic Assessments

4.1.1 Headwater Drainage Feature Assessment

To confirm the presence/absence of headwater features associated with the Study Area and identify potential opportunities for refining or eliminating the headwater feature from regulation mapping, a Headwater Drainage Feature Assessment as per the *"Evaluation, Classification and Management of headwater Drainage Features Guidelines"* as developed by Credit Valley Conservation (CVC) and the Toronto and Region Conservation Authority (TRCA) is typically undertaken. Dillon conducted one HDF assessment in April 2022; however, due to the lack of property access across the Study Area, it was not possible to complete a fulsome assessment, and the two follow up assessments (as per the protocol) could not be completed.

Potential impacts and recommendations associated with surface water features within the Study Area are discussed in **Section 7.1.1**.

4.1.2 Aquatic Habitat Assessment

A combination of desktop review of available agency resources and a preliminary field investigations were conducted to identify the location of existing surface water features with the potential for fish habitat within the Study Area. As part of the HDF Assessment #1, preliminary field investigations for aquatic habitat assessments were completed to confirm the location of surface water features within the Study Area. Aquatic habitat assessments were later completed on August 10 and 11, 2022 to confirm preliminary findings and further capture detailed information on fish habitat such as vegetative cover, relative feature span and depth and presence of water and substrate type.

Results of the aquatic habitat survey are included in **Section 5.1.1**.

4.2 Terrestrial Assessments

4.2.1 Ecological Land Classification

Vegetation communities were assessed using ELC as a first step to identify and assess potential natural heritage features within the Study Area. During the field investigations, vegetation was characterized using the ELC System for Southern Ontario, and second approximation classifications (Lee et al., 1998; Lee, 2008). The ecological community boundaries were first determined through the review of aerial photography and then further refined through on-site vegetation and tree surveys where property access had been granted. For those communities where property access was restricted, if possible observations regarding vegetation present and community structure were noted from properties where access was granted and publically accessible areas and vantage points such as roadside shoulders and public pedestrian pathway areas. In addition, natural environment reports provided by the City of Belleville detailed in **Table 1** were used to assist in identification of ELC communities via desktop review.

The ELC protocol recommends that a vegetation community be a minimum of 0.5 hectares in size before it is defined. Based on the composition of vegetation communities within the Study Area, patches of vegetation less than 0.5 hectares or disturbed/planted vegetation were described, provided they clearly fit within an ELC vegetation type.

Results of the ELC survey are included in **Section 5.2.1**.

4.2.2 Botanical Survey

A single-season (summer) botanical survey was conducted during the appropriate seasonal blooming period. The survey consisted of wandering transects and/or area searches to determine the presence, richness and abundance of floral species within the Study Area as well as presence/absence of botanical SAR. The botanical survey was restricted to those properties where access had been granted. Additional effort was exercised to collect observations of communities without access from publicly accessible vantage points (i.e., roadside and pedestrian pathway areas). Species nomenclature recorded is based on the Ontario Plant List (Newmaster et al., 1998).

Results of the botanical surveys are discussed in **Section 5.2.2**.

4.2.3 Wetlands

The boundaries of wetland units within the Study Area were delineated in conjunction with ELC surveys within properties where access was permitted. Where property access was restricted aerial interpretation and the use of available background resources was used to identify the potential for wetlands within the Study Area. To supplement the aerial interpretation additional observations from publically accessible areas (i.e., roadside and pedestrian pathways) was completed where possible.

Further details on wetlands within the Study Area are discussed in **Section 5.2.3**.

4.2.4 Woodlands

As previously mentioned, City of Belleville has indicated areas where proposed significant woodlands occur within the Study Area, these areas are identified on Appendix C of the City of Belleville OP. Based on Section 3.5.6 of the City of Belleville OP identification of proposed significant woodlands followed significance criteria as defined by the PPS and was undertaken by Lower Trent Conservation using a GIS landscape overlay modelling approach as described in the Proposed Natural Heritage Strategy (2015).

Woodlands within the Study Area were investigated within properties where access was permitted as part of the ELC and botanical surveys. Where property access was restricted aerial interpretation and the use of available background resources was used to identify the potential for woodlands within the Study Area. To supplement the aerial interpretation additional observations from publically accessible areas (i.e., roadside and pedestrian pathways) was completed where possible. The results of the ELC will be used to validate proposed significant woodland areas and boundaries identified in **Appendix C** to the OP. The results will also be used to confirm significance following woodland significance criteria established by the NHRM for Policy 2.1 of the PPS (MNRF, 2010).

Results of field studies relating to woodlands and assigned significance are discussed in **Section 5.2.4**.

4.2.5 Significant Wildlife Habitat

In order to determine whether SWH for birds and amphibians exists within the Study Area, breeding bird surveys and amphibian breeding surveys were completed during the 2022 field program. Surveys were only completed within properties where access had been granted. Due to lack of fulsome property access across the Study Area additional roadside surveys were completed in proximity to areas with prospective habitat based on roadside assessments and aerial interpretation. See **Sections 4.2.5.1** and **4.2.5.2** for details regarding the surveys.

As for the other potential SWH types identified, survey observations were paired with incidental wildlife observations throughout the field program, as well as vegetation community results to determine potential for all other potential SWH and habitat use within the Study Area.

4.2.5.1 Breeding Bird Survey

Diurnal breeding bird surveys conducted within the Study Area followed the methods outlined in the Ontario Breeding Bird Atlas Guide for Participants (Cadman et al., 2007).

Specifically, surveys consisted of point counts generally conducted between dawn and five hours after sunrise to establish quantitative estimates of bird abundance in suitable habitat types within the Study Area. During the surveys evidence of breeding behaviour was recorded which generally includes, but is not limited to, males singing, nest building, egg incubation, territorial defence, carrying food, and feeding their young. Breeding evidence for each bird species was documented using Breeding Bird Atlas Evidence Codes.

15 point count stations were surveyed within and directly adjacent to the Study Area where property access permitted. Point count locations are displayed on **Figure 3**.

Results of breeding bird studies within the Study Area are included in **Section 5.2.5.1**.

4.2.5.2 Amphibian Survey

Amphibian monitoring followed the Marsh Monitoring Program protocol (Bird Studies Canada, 2009). In accordance with the protocol, three different surveys were conducted between April 1 and June 30, with at least two-weeks between each survey. Surveys were completed between one half hour after sunset and midnight during evenings with a minimum night temperature of 5 ^{o}C, 10 ^{o}C, and 17 ^{o}C for each of the three respective surveys.

The calling activity of individuals estimated to be within 100 metres of the observation point were documented. All individuals beyond 100 metres were recorded as outside the count circle and calling activity was not recorded. Calling activity was then ranked using one of the three abundance code categories:

- Code 1: Calls not simultaneous, number of individual can be accurately counted.
- Code 2: Some calls simultaneous, number of individuals can be reliably estimated.
- Code 3: Calls continuous and overlapping, number of individuals cannot be estimated.

19 amphibian monitoring stations were surveyed within and directly adjacent to the Study Area where property access permitted. Survey locations are displayed on **Figure 3**.

Results of amphibian breeding studies within the Study Area are included in **Section 5.2.5.2**.

4.2.6 Species at Risk

The results of the ELC and botanical surveys were used as a baseline for determining the potential for potential SAR and SAR habitat based on vegetation community types and features observed during the field program. To supplement aerial interpretation where property access was restricted additional field observations from publically accessible areas (i.e., roadside and pedestrian pathways) was completed where possible. A search for Black Ash and Butternut was conducted during ELC and botanical surveys where property access had been granted was conducted. With respect to SAR bats, suitable bat maternal roosting habitat such as snags and trees containing cracks, crevices, peeling bark and clusters of leaves was noted where present within woodlands. The potential for SAR birds and SAR bird habitat was further investigated via breeding bird surveys.

Barns are used by Barn Swallow for nesting during the breeding season and by SAR bats during the active season for maternity roosting and also during the winter for hibernation roosts. With respect to barns and potential habitat for SAR bats and Barn Swallow, based on roadside observations and a review of aerial imagery several barns are present within the Study Area, however there was no access to the properties in order to investigate further. In addition, Barn Swallow may use bridge structures for nesting. Bridge structures (where possible) were investigated for presence of Barn Swallow nests during the field program. Surveys of buildings such as barns and bridge structures are recommended prior to future development proposals to confirm the absence or presence of SAR bats and Barn Swallow habitat.

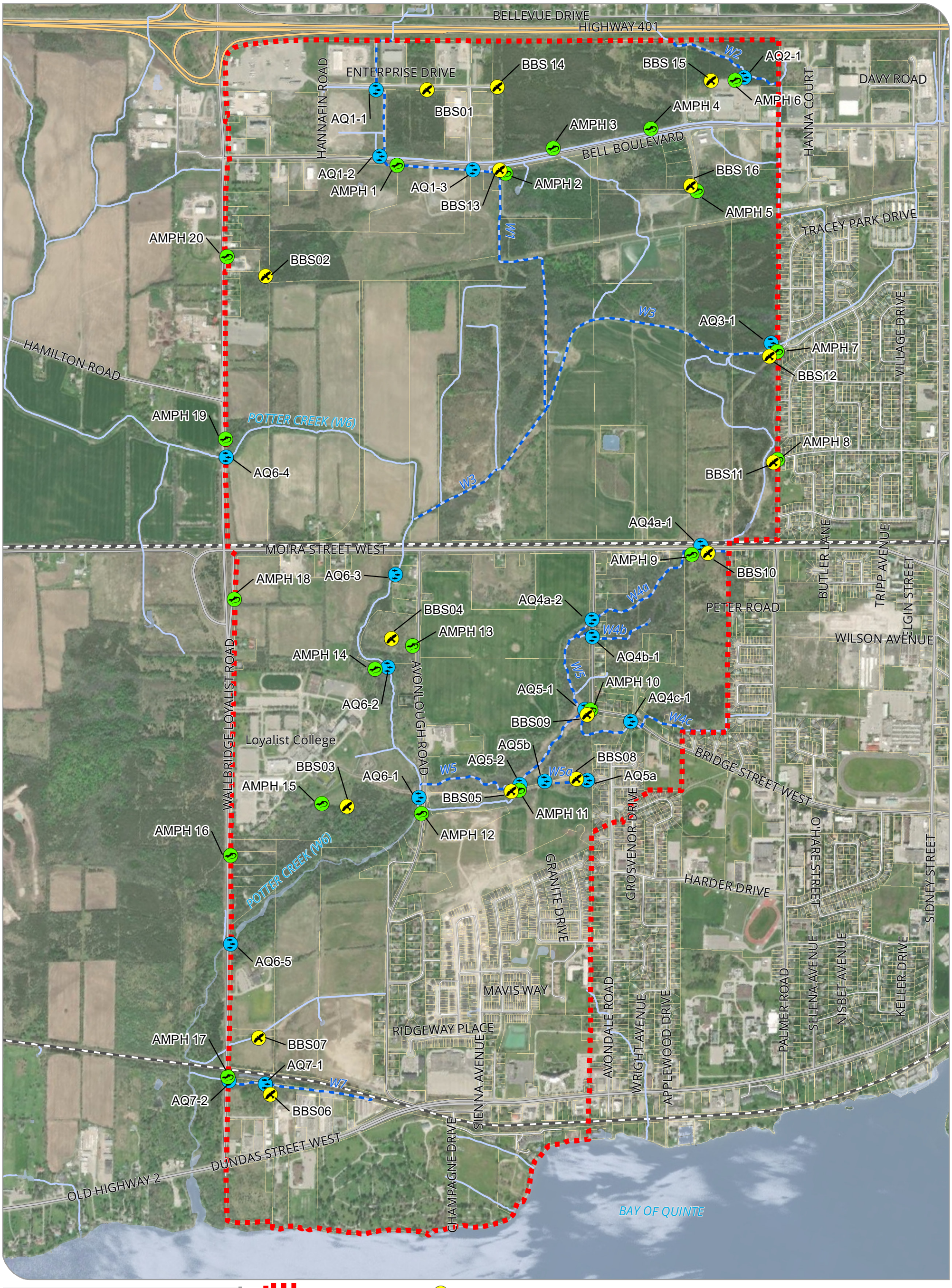
Blanding's Turtle require habitats with free (unfrozen) shallow water for overwintering, such as permanent marshes, or ponds. Marsh and open water communities within the Study Area may provide suitable overwintering habitat for Blanding's Turtle. Although Blanding's Turtles nest close to water, they often travel considerable distances from their habitat of origin during nesting migrations. Therefore there is the potential for this species to occur throughout the Study Area. The Blanding's Turtle presence and potential habitat surveys are recommended prior to future development proposals to confirm the absence or presence of this species.

Results of SAR surveys conducted to date have been included in **Section 5.2.6**.

4.2.7 Incidental Wildlife

During site visits incidental observations of wildlife were noted, as well as other wildlife evidence such as dens, tracks, and scat. For each observation, notes, and when possible, photos were taken. These observations assisted in the identification of potential habitat as well as ecological functions, linkages, etc. within the Study Area.

Results related to incidental wildlife are included in **Section 5.2.7**.



CITY OF BELLEVILLE

Loyalist Secondary Plan Update
Natural Heritage Report

SURVEY LOCATIONS

FIGURE 3

Subject to limitations; please refer to Section 10.0 of this report.

Study Area
Property Parcels
Watercourse Labels
Breeding Bird Survey Location
Amphibian Breeding Survey Location
Aquatic Assessment Survey Location
Expressway
Arterial Road
Collector Road
Local Road
Rail Line

MNRF (2022)
Watercourse
Waterbody

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, CITY OF BELLEVILLE

MAP CREATED BY: -ZJB
MAP CHECKED BY: -CE
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

SCALE 1:15,000

0 137.5 275 550 m

N W E S

PROJECT: 21-2538 STATUS: DRAFT DATE: 2023-02-15

FILE LOCATION: K:\2021\212538 - Loyalist Secondary Plan Update\Product\Client\Natural Environment\F3_SurveyLocations.mxd

5.0 Results of Field Work

A biophysical inventory of natural features within the Study Area was completed in accordance with the methods detailed in **Section 4.0**. The analysis of data collected from secondary source information and during field surveys in 2022 was used to evaluate the potential significance of natural heritage features within the Study Area.

5.1 Aquatic Environment

As previously mentioned, Potter Creek represents the largest surface water feature within the Study Area and serves as the primary mode of conveying surface water across the Study Area to the Bay of Quinte. Multiple tributaries to Potter Creek were identified during background review and further investigated during aquatic habitat assessments and are described below.

5.1.1 Aquatic Habitat Assessments

The locations of previously mapped surface water features, aquatic assessment locations and labels for surface water features assessed are shown on **Figure 3**.

A summary of the surface water features and the results of the aquatic habitat assessments including location descriptors are provided below:

- **Watercourse 1** – Occurs within the north central portion of the Study Area and originates north of Highway 401 and flows south where it crosses Enterprise Drive via corrugated steel pipe (CSP) and Bell Boulevard via CSP. The feature then flows east along the south side of Bell Boulevard and then south through a combination of wooded and wetland areas for approximately 1.1 kilometres until discharging Watercourse 3, which flows another approximate 750 metres until discharging into Potter Creek. Minimal flow was observed only for the portions of the feature north of Bell Boulevard and the feature is believed to convey intermittent flow throughout the year primarily during high precipitation events and freshet. Where assessed the average wetted width and wetted depth of the feature measured approximately 0.6 metres and 0.06 metres, respectively, and occurred as a defined channel. Potential fish habitat observed on-site included abundant emergent in-stream graminoids. The dominant substrate was observed as a clayey. The portion of the feature along Bell Boulevard occurred as a dry roadside ditch with a sandy and fragmented rocky substrate. The assessed portion of this feature has potential to provide seasonal fish habitat during high flow periods.
    - Nearby Assessments – Mapped surface water features in the vicinity were also investigated during this assessment and included the feature north and parallel to Bell Boulevard and the feature that crosses Jenland Way South and mapped as continuing southeast of the intersection of Belle Boulevard and Jenland Way South. The first feature was observed as a dry ephemeral roadside ditch and the other feature no longer occurs as mapped and likely

was displaced or removed during construction of the gas station and convenience store. Neither features were identified as containing suitable fish habitat.

- **Watercourse 2** – Occurs within the northeast corner of the Study Area and originates north of Highway 401 and flows approximately 500 metres in a west-southeast direction until leaving the Study Area. Beyond the Study Area the feature travels north-south through developed areas until discharging into the upstream limits of Watercourse 3. At the time of the assessment the feature was observed as dry and is only believed to convey intermittent flow as the result of high precipitation events and freshet. Where assessed the estimated wetted width and wetted depth of the feature measured approximately 1.5 metres and 0.05 metres, respectively. Potential fish habitat observed on-site included abundant riparian shade from the forest canopy containing mature Eastern Red Cedar (*Juniperus virginiana*). The dominant substrate was observed as a fractured bedrock. The assessed portion of this feature has potential to provide seasonal fish habitat during high flow periods.
    - Nearby Assessments – Mapped surface water features in the vicinity were also investigated during this assessment and included the feature north and parallel to Bell Boulevard which was observed as a continuation of the roadside ditch described above.
- **Watercourse 3** – Occurs within the northeast quadrant of the Study Area and originates as a large defined channel that runs parallel to Cascade Boulevard. The feature flows approximately 2 kilometres from the large Tracey Park Drive CSP outlet in east-southwest direction through woodland and wetland areas until discharging into Potter Creek. An approximate third of the alignment has southern frontage to large agricultural fields. At the time of the assessment the feature was observed to contain minimal to moderate flow and believed to contain permanent flow throughout the year. Where assessed the estimated wetted width and wetted depth of the feature measured approximately 8 metres and 0.26 metres, respectively. Potential fish habitat observed on-site included abundant riparian shade from the adjacent forest canopy, rare to occasional large in-stream logs, occasional emergent graminoids along the banks. In addition, abundant submergent vegetation and algae was noted which may impede fish. The dominant substrate was observed as a mucky clay. The assessed portion of this feature likely provides fish habitat throughout the year.
- **Watercourse 4 (Tributaries to Potter Creek Tributary Non-Provincially Significant Evaluated Wetland)** – Three features were grouped together based on similarity of alignment and direction of flow. All four features originate east of Marshall Road, flow in an east-southwest direction and discharge into Watercourse 5 located within the Potter Creek Tributary Non-Provincially Significant Evaluated Wetland. The features are detailed below.
    - **Watercourse 4a** – Occurs within the central eastern portion of the Study Area and originates as a roadside ditch on the south side of Moira Street West. No connectivity north of Moira Street West was observed. The feature flows approximately 530 metres from Moira Street West in east-southwest direction through woodland and wetland areas then crosses Marshall Road via CSP culvert and travels another approximate 85 metres via poorly defined natural channel until discharging into Watercourse 5. At the time of the assessment the

feature was observed as dry at the Marshall Road crossing with minor standing water (0.05-metre wetted depth) at Moira Street West and is only believed to convey intermittent flow as the result of high precipitation events and freshet. Potential fish habitat observed on-site included abundant riparian shade from the forest canopy and abundant emergent graminoids. The dominant substrate was silty clay for both assessment locations. The assessed portion of this feature has potential to provide seasonal fish habitat during high flow periods.

- **Watercourse 4b** – Occurs approximately 80 metres south of Watercourse 4a. The feature originates approximately 240 metres east of Marshall Road within a wooded area and crosses Marshall Road via CSP culvert where it travels another approximate 75 metres until discharging into Watercourse 5. At the time of the assessment the feature was observed as dry and is only believed to convey ephemeral flow as the result of high precipitation events and freshet. Potential fish habitat observed on-site included abundant riparian shade from the forest canopy and abundant emergent graminoids. The dominant substrate was silty clay. Upstream the feature occurred as a vegetated manicured lawn swale, however, no apparent stream morphology occurred south of Marshall Road. The assessed portion of this feature has potential to provide limited seasonal fish habitat during high flow periods, if any.
- Nearby Assessment – Mapped surface water features in the vicinity were also investigated during this assessment and included the mapped feature approximately 170 metres south of aquatic assessment survey location 4b-1. No feature was observed at the time of the assessment.
  - **Watercourse 4c** – Occurs approximately 420 metres southeast of Watercourse 4b. The feature originates at the intersection of Benson Court and Palmer Road and travels in an east-west direction through a wooded and wetland areas until reaching Bridge Street West where it discharges into a flat sewer inlet grate. The sewer acts as a barrier to fish migration and this feature likely does not contain fish habitat.

- **Watercourse 5** (**Potter Creek Tributary Non-Provincially Significant Evaluated Wetland)** – Occurs within the central eastern portion of the Study Area and originates approximately 180 metres north of Potter Creek Tributary Non-Provincially Significant Evaluated Wetland and flows approximately

  1 kilometre through the wetland in an east-southwest direction until crossing Avonlough Road via culvert and discharging into Potter Creek. At the time of the assessment the feature was observed to contain minimal to moderate flow and the feature likely provides permanent flow throughout the year. No specific channel was observed at the aquatic assessment locations however a wetted depth of 0.06 metres was observed at aquatic assessment survey location 4e-2. Potential fish habitat observed on-site included abundant emergent graminoids. The dominant substrate was observed as combination organics and silty clay. The feature likely provides fish habitat throughout the year within the wetter areas of the wetland.
  - Nearby Assessment – A search for mapped and unmapped surface water features in the vicinity were also undertaken during this assessment and included the unmapped feature

that originates as a sewer outlet approximately 30 metres west of Meagher Place. The feature travels approximately 260 metres west as a vegetated defined channel where it crosses the pedestrian pathway via CSP culvert and discharges into Potter Creek Tributary Non-Provincially Significant Evaluated Wetland. Where assessed the average estimated wetted width and wetted depth of the feature measured approximately 0.85 metres and 0.08 metres, respectively. The features was densely vegetated with graminoids and contained a high abundance of algae. Further, the pedestrian pathway culvert outlet occurred as perched and likely serves as a barrier to fish movement within the feature. The assessed portion of this feature likely seasonal fish habitat. The dominant substrate was observed as organics/muck/clay nearby the wetland and muck/gravel/clay nearby the sewer outlet.

- **Watercourse 6 (Potter Creek)** – Potter Creek represents the largest surface water feature within the Study Area and serves as the primary mode of conveying surface water across the Study Area to the Bay of Quinte. Potter Creek generally meanders and bisects the center of Study Area. Potter Creek flows east-west and then north-south for the portion of the alignment that occurs north of Moira Street West then continues in a north-south orientation generally aligned with Avonlough Road until passing Loyalist College. Potter Creek then travels east-west for the portion of the Creek alignment that occurs south of Loyalist College. The total distance Potter Creek travels through the Study area is approximately 3.5 kilometres. The creek travels through a variety of landscapes with the most frequent being agricultural and woodland. The average wetted width and wetted depth of Potter Creek measured approximately 4.4 metres and 0.2 metres, respectively. Potter Creek is known to provide permanent flow throughout the year. During the aquatic assessments schools of small fish were incidentally observed. Furthermore, the Creek provides a variety of fish habitat throughout the year including small to medium sized rock and cobble, small and large boulders, undercut banks, pools and riffles, emergent in-stream graminoids, and large and small diameter woody debris. The substrate within the creek varied at aquatic habitat assessment locations and occurred as follows:
  - AQ6-1: Silt = Sand < Clay with abundant cobble present.
  - AQ6-2: Silt < Clay no cobble present.
  - AQ6-3: Silt < Clay with occasional cobble present.
  - AQ6-4: Muck < Clay with no cobble present.
  - AQ6-5: Sand < Clay with occasional cobble/boulders present by bridge and silty clay dominates the area 40 metres upstream from bridge.
- **Watercourse 7** – Occurs within the southwest quadrant of the Study Area and occurs as a large defined channel that runs parallel to the Canadian Pacific railway from Wallbridge Loyalist Road to nearby the railway underpass of Dundas Street West. The feature is approximately 600 metres in length within the Study Area and flows in an east-west direction. The feature crosses Wallbridge Loyalist Road via CSP culvert. At the time of the assessment the feature was observed to contain minimal flow. Where assessed the average estimated wetted width and wetted depth of the feature measured approximately 2.5 metres and 0.14 metres, respectively. The west

quarter of the alignment of the feature narrows considerably and abundant emergent graminoids occur. It appears that at one point flow west near Wallbridge Loyalist Road was restricted by a soil berm, however, over time the berm has eroded and a narrow channel has development that discharges toward the CSP culvert inlet at Wallbridge Loyalist Road. Potential fish habitat observed on-site included abundant riparian shade from the adjacent forest canopy, abundant in-stream woody debris and emergent graminoids in the western quarter of the alignment. The dominant substrate was observed as a mucky clay. The assessed portion of this feature may provide seasonal fish habitat however the narrow channel associated with the soil berm likely acts as a barrier to fish access to the upstream portions of the feature.

- Nearby Assessment – Mapped surface water features in the vicinity were also investigated during this assessment and included the mapped feature approximately 150 metres north of aquatic assessment survey location 7-1. This feature was observed as a vegetated swale and at the time of the assessment was observed as dry with no flow. This feature crosses Wallbridge Loyalist Road via a perched CSP culvert which acts a barrier to fish access to the upstream portion of the feature within the Study Area. This feature is believed to only convey flow as the result of high precipitation events and freshet. The assessed portion of this feature is not believed to contain fish habitat.

The inaccessible portions of surface water features described above and other mapped surface water features within the Study Area where property access was restricted will need to be reassessed for future development proposals.

Potential impacts to surface water features are discussed further in **Section 7.1.1**.

5.2 Terrestrial Environment

5.2.1 Ecological Land Classification

A total of 62 ecological communities were identified within the Study Area during ELC, 44 of which are considered natural vegetation communities and 18 of which are considered cultural (**Table 5**). The location, type, and boundaries of these communities are delineated in **Figure 4**. Each of the vegetation communities identified within the Study Area are considered common in Ontario. **Table 5** outlines the communities documented during ELC surveys and summarizes the dominant vegetation cover. Representative photos for vegetation communities where access was permitted can be found in **Appendix C**.

Over half of the Study Area was identified as containing cultural communities including but not limited to, residential and business sector properties, disturbed meadow and agricultural lands such as annual row crops and hayfield. The natural environment communities within the Study Area are generally aligned with Potter Creek, which meanders and bisects the center of Study Area. The woodlands and wetlands adjacent to the alignment of Potter Creek largely form the foundation of the natural environment areas within the Study Area with the exception to a large mosaic of unevaluated wetland and woodland areas that occur within the northeast portion of the Study Area and the natural areas

associated with Potter Creek Tributary Non-Provincially Significant Evaluated Wetland that occurs east of Loyalist College and Avonlough Road. For those properties accessible or partially observable from adjacent properties or publicly accessible areas, natural communities within the Study Area appear to have been disturbed due to adjacent or historical anthropogenic uses (i.e., agriculture, adjacent development, disturbed meadow, etc.) and contained higher a abundances of invasive species, particularly Common Buckthorn (*Rhamnus cathartica*), which in some cases dominated the entire understory layer of communities. It should be noted that access permission to the entire Study Area was not available and many communities were assessed via a combination of observation from adjacent accessible properties, publically accessible areas (roadside or pedestrian pathway) or desktop review using aerial interpretation only, as noted in **Table 5**.

The shallow marsh area known as Creek Tributary Non-Provincially Significant Evaluated Wetland was surrounded by wooded communities primarily ones that contained high concentrations of Green Ash in the past and now have succumbed to the influence of EAB which has caused a large amount of Green Ash decline in health and in many cases death. Associate tree species such as Eastern Black Walnut, Manitoba Maple and Eastern Red Cedar have begun to re-establish canopy cover where Green Ash die-off has occurred.

Potter Creek contains a well-established woodland corridor community south of Loyalist College and based on a review of aerial imagery from University of Toronto Map and Data Library's 1954 Air Photos of Southern Ontario and the distinct mature Eastern White Cedar specimens observed while on-site, much of the natural area has remained untouched since the mid-1950s. The natural areas south of Loyalist College contain abundant Eastern White Cedar which over time has been complimented by other coniferous and deciduous trees including but not limited to Eastern Red Cedar, Eastern Black Walnut, Northern Red Oak, Crack Willow and Manitoba Maple. However, the understory of this area has succumbed to eventual invasion by Common Buckthorn. Other natural areas of Potter Creek such as east of Loyalist College contains a thinner width of communities with a more mixed composition of coniferous and deciduous trees. Similar to areas adjacent to Creek Tributary Non-Provincially Significant Evaluated Wetland, this area has also succumb to the influence of EAB which has caused a large amount of Green Ash decline in health and death. The remaining areas along Potter Creek are agricultural in nature with the exception to the Willow swamp that occurs north of Moira Street West along Wallbridge Loyalist Road where Green Ash die-off is also apparent, however the Willow and other associates canopy trees have retained canopy cover.

The large mosaic of unevaluated wetland and woodland areas that occur within the northeast portion were observed to be a mixture of deciduous, coniferous and mixed forests and swamps with pockets of thicket and meadow areas and small marsh areas. The woodlands in the area were observed to be composed of varying combinations of Eastern Red Cedar, Eastern White Cedar, White Spruce, Sugar Maple, Trembling Aspen and Eastern Cottonwood. Based on roadside observations and a review of aerial imagery from University of Toronto Map and Data Library's 1954 Air Photos of Southern Ontario, the Mixed Forest (FOM) community, the SWCM1 and the adjacent SWM communities that occur south

of Bell Boulevard and east and west of Jenland Way South could contain ecosystems and tree specimens dating approximately 70 years or age or older that could be of high ecosystem or natural heritage value.

Potential impacts to vegetation communities are discussed further in **Section 7.1.3**.

Table 5: Ecological Land Classification

ELC Code	Classification	Total Within Study Area (hectares)	Vegetation	Photo Reference (Appendix C)
NATURAL ELC COMMUNITIES				
Terrestrial				
ME	Meadow	31.91	Contained little or no woody vegetation cover and contained a mixture of graminoids and forbs. ELC community identification is based on desktop (aerial) interpretation only.	---
MEF	Forb Meadow	18.70	Contained little or no woody vegetation cover and contained primarily forbs such as Goldenrods species (*Solidago sp.*) and Asters (*Symphyotrichum sp.*). ELC community identification is based on a combination of roadside (if available) and desktop (aerial) interpretation only.	1
MEG	Graminoid Meadow	23.72	Contained little or no woody vegetation cover and contained primarily graminoids. Not all communities or full portions of communities classified as this vegetation type were accessible. ELC community identification is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	2, 3
MEM	Mixed Meadow	30.99	Contained little or no woody vegetation cover and contained a mixture of graminoids and forbs. Not all communities classified as this vegetation type were accessible. ELC community identification is based on a combination of roadside (if available) and desktop (aerial) interpretation only.	4, 5
TAGM5	Fencerow	12.91	There areas consisted of tree rows that were planted or naturally developed along the edges of agricultural fields and other properties boundaries. Not all communities classified as this vegetation type were accessible. ELC community identification is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	6, 7
THC	Coniferous Thicket	3.56	Smaller shrub sized diameter Eastern Red Cedar dominated this community. For the community east and adjacent to Loyalist College the community was dominated by Eastern White Pine (*Pinus strobus*) and had been planted in recent years. Most of the communities classified as this vegetation type were accessible or visible from roadside. ELC community identification is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	8
THCM1-1	Red Cedar Coniferous Thicket	0.33	Smaller shrub sized diameter Eastern Red Cedar dominated this community. ELC community identification is primarily based on a combination of roadside and desktop (aerial) interpretation only.	---
THD	Deciduous Thicket	22.94	Community typically contained abundant Gray Dogwood (*Cornus racemosa*) and occasional Common Buckthorn (*Rhamnus cathartica*). In some cases sapling deciduous trees also occurred such as Trembling Aspen (*Populus tremuloides*) and Large-tooth Aspen (*Populus grandidentata*). Some communities contained Ash species (*Fraxinus sp.*) snags, likely the result of Emerald Ash Borer (EAB) (*Agrilus planipennis*). Not all communities classified as this vegetation type were accessible. ELC community identification is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	9
THDM2-6	Buckthorn Deciduous Shrub Thicket	3.35	Understory was dominated by Common Buckthorn with occasional occurrence of Gray Dogwood and Eastern Red Cedar.	10
THM	Mixed Thicket	20.92	Eastern Red Cedar, Gray Dogwood, Common Buckthorn and Staghorn Sumac were typical species observed for this community. ELC community identification is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	11
THMM1	Mixed Regeneration Thicket	1.12	Understory contained abundant Gray Dogwood and occasional to abundant Eastern Red Cedar and sapling Green Ash. A combination of forbs occurred in the ground layer such as Goldenrods species and Asters. Many Ash species snags were observed. The full portion of this community was not entirely accessible. Remain areas community identification is primarily based on a combination of pedestrian pathway and desktop (aerial) interpretation only.	---
WOCM1-1	Red Cedar Coniferous Woodland	2.44	Canopy layer was dominated by Eastern Red Cedar and contained some open canopy areas. Many Ash species snags were observed for the community located north of Enterprise Drive. ELC community identification is primarily based on a combination of roadside and desktop (aerial) interpretation only.	---

ELC Code	Classification	Total Within Study Area (hectares)	Vegetation	Photo Reference (Appendix C)
WOD	Deciduous Woodland	1.29	Canopy layer contained an abundance of Eastern Cottonwood (*Populus deltoides*) with rare occurrences to occasional occurrences of Sugar Maple (*Acer saccharum*), Manitoba Maple (*Acer negundo*) and American Basswood (*Tilia americana*), and contained many open canopy areas. ELC community identification is primarily based on a combination of roadside and desktop (aerial) interpretation only.	12
WODM5-1	Poplar Deciduous Woodland	5.09	Canopy layer contained an abundance of Eastern Cottonwood with occasional Red Cedar, Willow species (*Salix sp.*) with a ground layer dominated by Reed Canary Grass (*Phalaris arundinacea*) and contained many open canopy areas. Community was observed to by young and developing. ELC community identification is primarily based on a combination of adjacent property access and roadside and desktop (aerial) interpretation only.	---
WODM5-3	Manitoba Maple Deciduous Woodland	0.95	Canopy was dominated by Manitoba Maple and contained many open canopy areas. ELC community identification is primarily based on a combination of adjacent property access and roadside and desktop (aerial) interpretation only.	13
WOM	Mixed Woodland	4.29	Canopy contained Eastern Black Walnut (*Juglans nigra*), Eastern Red Cedar, dead Ash species snags and other deciduous and coniferous tree species. ELC community identification is primarily based on a combination roadside and desktop (aerial) interpretation only.	14
FOC	Coniferous Forest	4.68	Canopy is likely dominated by a combination of coniferous tree species such as Eastern Red Cedar, Eastern White Cedar (*Thuja occidentalis*) and White Spruce (*Picea glauca*). ELC community identification is based on a combination roadside and desktop (aerial) interpretation only.	15
FOCM2-1	Red Cedar Coniferous Forest	48.12	Canopy is dominated Eastern Red Cedar, with varying concentrations of Eastern Red Cedar, Eastern White Cedar (*Thuja occidentalis*) and White Spruce. ELC community identification is based on a combination roadside and desktop (aerial) interpretation only.	16, 17
FOCM4-1	White Cedar Coniferous Forest	6.90	Canopy was dominated by mid-age to mature Eastern White Cedar, but was also included occasional to rare Eastern White Pine, Green Ash (*Fraxinus pensylvanica*) with rare occurrences of False Solomon's-seal (*Maianthemum racemosum*), and Bittersweet Nightshade (*Solanum dulcamara*) within the ground layer.	18, 19
FOCM6-3	Scotch Pine Naturalized Coniferous Plantation	0.42	Canopy was dominated by Scotch Pine (*Pinus sylvestris*). ELC community identification is based on a combination roadside and desktop (aerial) interpretation only	20
FOD	Deciduous Forest	10.16	Canopy was dominated by deciduous trees. ELC community identification is based on a combination roadside and desktop (aerial) interpretation only	---
FODM4-5	Manitoba Maple Deciduous Forest	0.57	Canopy was dominated by Manitoba Maple with occasional Green Ash. The Understory contained abundant Common Buckthorn and the ground later was dominated by forbs. ELC community identification is based on a combination roadside and desktop (aerial) interpretation only	21
FODM5	Sugar Maple Deciduous Forest	3.90	Canopy is dominated by Sugar Maple. ELC community identification is based on a community knowledge and a combination of roadside (if available) and desktop (aerial) interpretation only.	---
FODM7	Lowland Deciduous Forest	3.33	Canopy for the community with frontage to Wallbridge Loyalist Road within the southwest quadrant of the Study Area had a peculiar combination of tree species within the canopy including American Elm (*Ulmus americana*), Willow species, Wild Black Cherry (*Prunus serotina*) and Trembling Aspen. Some Ash and American Elm snags were observed. The understory contained occasional to abundant Common Buckthorn. Based on a review of aerial imagery, the majority of this forest had been removed within the last couple of years to accommodate development of the property. The canopy of the community associated with Potter Creek Tributary Non-Provincially Significant Evaluated Wetland contained Eastern Black Walnut, Green Ash, Manitoba Maple, American Elm and Eastern Red Cedar. The understory contained Common Buckthorn and Gray Dogwood. ELC community identification is primarily based on a combination of adjacent property access and pedestrian pathway observation and desktop (aerial) interpretation only.	22
FODM7-2	Green Ash – Hardwood Lowland Deciduous Forest	4.15	Green Ash dominated the canopy with occasional Manitoba Maple and Eastern Red Cedar associates; however many of the trees are in decline or occur as snags likely due to the influence of EAB. The understory contained similar species composition as the canopy layer with the exception to occasional to abundant Common Buckthorn. ELC community identification is primarily based on a combination of adjacent property access and roadside/pedestrian pathway observation and desktop (aerial) interpretation only.	---

ELC Code	Classification	Total Within Study Area (hectares)	Vegetation	Photo Reference (Appendix C)
FODM8-1	Poplar Deciduous Forest	1.72	Canopy was dominated by Poplar species (*Populus sp.*). ELC community identification is based on a combination of roadside and desktop (aerial) interpretation only.	23
FODM9	Oak – Maple – Hickory Deciduous Forest	2.42	Canopy was dominated by Freeman's Maple (*Acer × freemanii*) with an understory containing occasional to abundant Common Buckthorn. ELC community identification is based on a combination roadside and desktop (aerial) interpretation only	24
FOM	Mixed Forest	31.50	Canopy contained a combination of deciduous and coniferous trees. From accessible areas canopy consisted of varying combinations of Eastern Black Walnut, Manitoba Maple, Sugar Maple, Eastern Cottonwood, Trembling Aspen, Large-tooth Aspen, American Elm, Eastern Red Cedar, Eastern White Cedar, White Spruce and Eastern White Pine. ELC community identification is based on a combination of roadside (if available) and desktop (aerial) interpretation only.	25
FOMM7-2	White Cedar – Hardwood Mixed Forest	7.44	Canopy consisted of abundant Eastern White Cedar, with Sugar Maple, Northern Red Oak (*Quercus rubra*), Eastern Black Walnut and Eastern White Pine associates. The understory consisted of occasional Common Buckthorn and Gray Dogwood.	26, 27
Wetland				
MAM	Meadow Marsh	6.53	Consisted primarily of ground layers dominated by Reed Canary Grass with occasional Narrow-leaved Cattail and rare Purple Loosestrife (*Lythrum salicaria*). ELC community identification is primarily based on a combination of adjacent property access and roadside/pedestrian pathway observation and desktop (aerial) interpretation only.	28
MAS	Shallow Marsh	0.54	Consisted primarily of ground layers dominated by Reed Canary Grass and Narrow-leaved Cattail with shallow water areas. Community is believed to have originated from the construction of the railway and the soil berm along Wallbridge Loyalist Road described in **Section 5.1.1** for Watercourse 7 and due to flooding.	---
MASM1-1	Cattail Mineral Shallow Marsh	3.18	Community was dominated by Narrow-leaved Cattail (*Typha angustifolia*) with occasional Reed Canary Grass and rare Spotted Jewelweed and Purple Loosestrife. Based on aerial imagery a few shallow ponding areas occur within the internal areas of the community.	29
MASM1-14	Reed Canary Grass Mineral Shallow Marsh	0.19	Rare Manitoba Maple and Willow tree species occurred within the canopy. Understory layer was dominated by Reed Canary Grass with abundant European Common Reed (*Phragmites australis ssp. australis*) and Narrow-leaved Cattail with occasional to rare Purple Loosestrife and Spotted Jewelweed. ELC community identification is primarily based on a combination of adjacent property access and roadside/pedestrian pathway observation and desktop (aerial) interpretation only.	30
SWT	Thicket Swamp	1.96	Believed to be areas dominated by shrubs with wetland. ELC community identification is primarily based desktop (aerial) interpretation only.	31
SWTM5-8	Non-native Mineral Deciduous Thicket Swamp	1.63	Canopy is dead Ash species and Common Buckthorn understory has filled in. Ground layer was dominated by Reed Canary Grass. ELC community identification is primarily based on a combination of roadside observation and desktop (aerial) interpretation only.	32
SWC	Coniferous Swamp	29.57	Canopy is believed to be dominated by coniferous tree species. ELC community identification is primarily based desktop (aerial) interpretation only.	---
SWCM1	White Cedar Mineral Coniferous Swamp	2.36	Canopy is dominated by mature Eastern White Cedar and White Spruce. ELC community identification is primarily based on a combination of roadside observation and desktop (aerial) interpretation only.	33
SWD	Deciduous Swamp	25.17	Canopy is believed to be dominated by deciduous tree species. ELC community identification is primarily based desktop (aerial) interpretation only.	---
SWDM2	Ash Mineral Deciduous Swamp	0.19	Canopy is a combination of Red Maple (*Acer rubrum*) and Black Ash. Black Ash occurs as snags or trees in heavy decline, likely due to the influence of EAB.	34
SWDM2-2	Green Ash Mineral Deciduous Swamp	2.42	For the community south of the pedestrian pathway along Potter Creek Tributary Non-Provincially Significant Evaluated Wetland the canopy was dominated by Green Ash, the majority of which occur as snags or are in heavy decline in health likely due to EAB. The understory contained occasional Common Buckthorn, Gray Dogwood, Manitoba Maple and sapling Green Ash. The ground layer was dominated by Reed Canary Grass with rare Spotted Jewelweed. The community north of the pedestrian pathway along Potter Creek Tributary Non-Provincially Significant Evaluated Wetland was inaccessible, however, based on ELC completed by AECOM for the Avonlough Road Sewage Pumping Station: Natural Environment Inventory Report in 2021 the canopy is anticipated to contain primarily Green Ash with Black Ash and Manitoba	35, 36

ELC Code	Classification	Total Within Study Area (hectares)	Vegetation	Photo Reference (Appendix C)
			Maple associates and an understory containing Common Buckthorn, Gray Dogwood, and Red-osier Dogwood (*Cornus sericea ssp sericea*). ELC community identification is primarily based on a combination of adjacent property access and roadside/pedestrian pathway observation and desktop (aerial) interpretation only.	
SWDM3-1	Red Maple Mineral Deciduous Swamp	1.38	Canopy dominated by Red Maple with occasional Eastern Red Cedar along the boundary of the community. ELC Community identification is primarily based on a combination of adjacent roadside observation and desktop (aerial) interpretation only.	37
SWDM4-1	Willow Mineral Deciduous Swamp	3.11	Canopy contain abundant Black Willow (*Salix nigra*) and Crack Willow (*Salix × fragilis*) with Freeman's Maple, Manitoba Maple and dead Ash species snag associates.	38
SWM	Mixed Swamp	21.74	Canopy is believed to be a combination of deciduous and coniferous tree species. ELC community identification is primarily based desktop (aerial) interpretation only.	39
Aquatic				
OA	Open Water	3.41	This community represent aquatic areas, such as ponds, wide watercourse areas and large pools within wetlands. Not all communities classified as this vegetation type were accessible. ELC community identification is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	40
CULTURAL ELC COMMUNITIES				
CGL	Green Lands	35.63	Areas dominated by manicured lawns, landscaped features including but not limited to the Belleville Cemetery. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	41
CGL_2	Parkland	2.45	Community playscapes and park grounds. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	---
CVC	Commercial and Institutional	23.74	Buildings and manicured property owned by municipal, non-profit or religious organizations. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	---
CVC_1	Business Sector	53.01	Buildings and manicured property owned by businesses. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	---
CVI_1	Transportation and Utilities	27.63	Asphalt and gravel roads. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	---
CVI_1 (Railway)	Railway	5.13	Railway ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	42
CVI_4	Power Generation	0.10	Transformer stations and other related hydro-electric infrastructure. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	---
CVR	Residential	89.65	Detached and semi-detached residential areas building and associated areas with manicured lawns and landscaped gardens and trees. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	---
CVR_2	High Density Residential	5.05	Low and high rise residential buildings and associated areas with manicured lawns and landscaped gardens and trees. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	---
CVS_1	Education	38.46	Properties that contain education buildings and associated landscapes such as manicured lawns such as post-secondary education, high school and elementary schools. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	---
Disturbed Meadow	Disturbed Meadow	56.76	Areas that show evidence of previous grading which have been left to re-naturalize. Bare ground areas occurred throughout these communities with opportunistic forbs and graminoids. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	43, 44, 45
Graded/Construction	Graded/Construction	18.37	Areas that have been graded or are staged for construction and development. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	46

ELC Code	Classification	Total Within Study Area (hectares)	Vegetation	Photo Reference (Appendix C)
IAG	Agricultural Infrastructure	4.74	Agricultural structures such as but not limited to silos, barns and equipment storage. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	---
Stormwater Management Pond	Stormwater Management Pond	8.24	Areas containing stormwater ponds with manicured lawn areas. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	47
OAGM1	Annual Row Crops	128.37	Agricultural fields planted for Corn (*Zea mays*) or Soybean (*Glycine max*).ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	---
OAGM2	Perennial Cover Crops	47.91	Agricultural fields hay. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	48, 49
OAGM4	Open Pasture	0.17	Agricultural field for cattle or other grazing animals. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	---
TAGM3	Deciduous Plantation	1.54	Artifact of an area of property that was previously used as a tree nursery. ELC community is primarily based on a combination of roadside (if available) and desktop (aerial) interpretation only.	---

CITY OF BELLEVILLE

Loyalist Secondary
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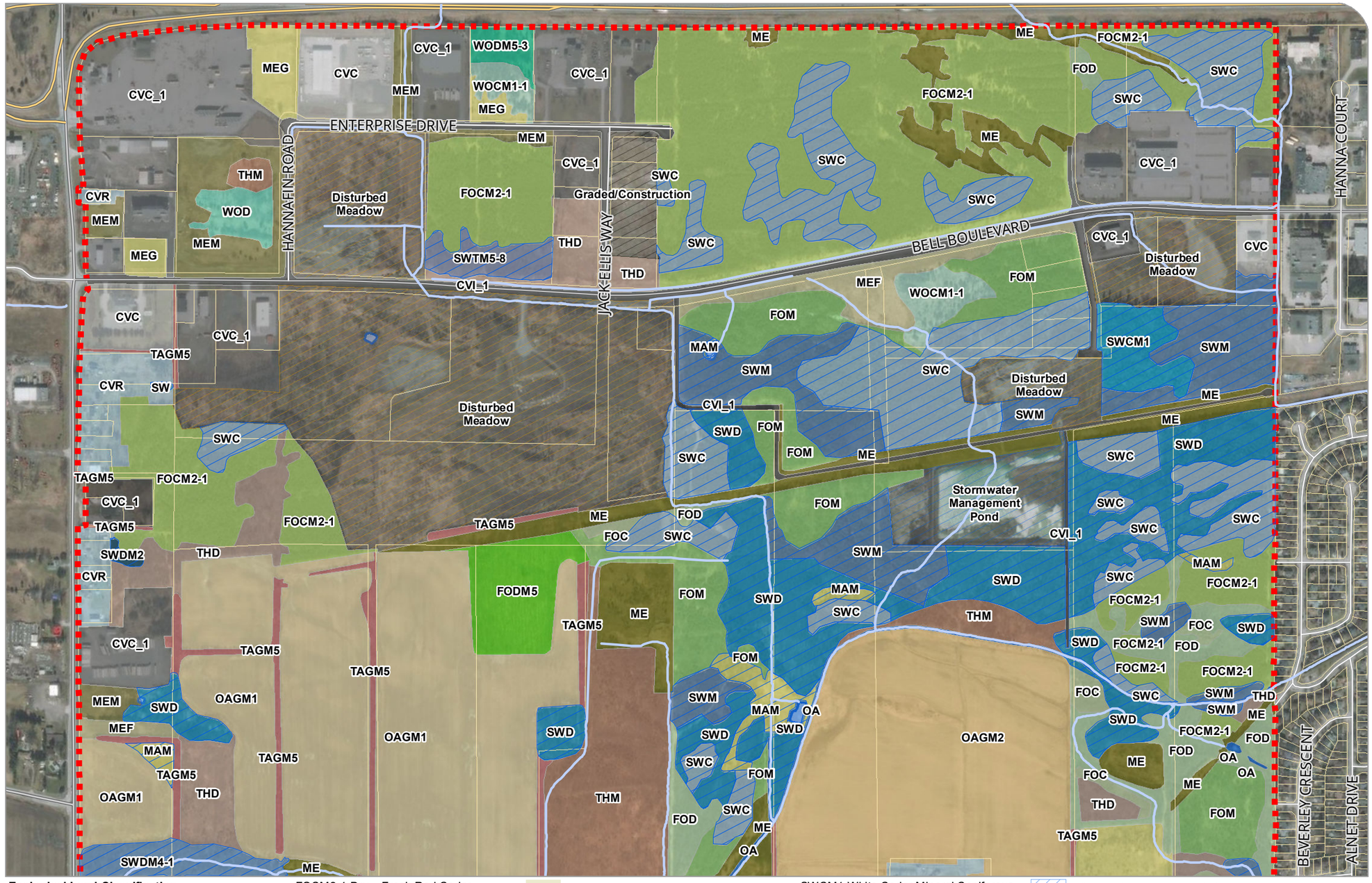
VEGETATION COMMUNITIES
FIGURE 4.1

Subject to limitations; please refer to Section 10.0 of this report.



- Study Area
- Property Parcels
- Wetland Community
- Expressway
- Arterial Road
- Collector Road
- Local Road
- Watercourse
- Waterbody

SCALE 1:8,000

0 100 200 400 m

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: -ZJB
MAP CHECKED BY: -CE
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

Ecological Land Classification

- CVC-Commercial and Institutional
- CVC_1-Business Sector
- CVI_1-Transportation and Utilities
- CVR-Residential
- Disturbed Meadow
- FOC-Coniferous Forest
- FOCM2-1-Dry – Fresh Red Cedar Coniferous Forest
- FOD-Deciduous Forest
- FODM5-Sugar Maple Deciduous Forest
- FOM-Mixed Forest
- Graded/Construction
- MAM-Meadow Marsh
- ME-Meadow
- MEF-Forb Meadow
- MEG-Graminoid Meadow
- MEM-Mixed Meadow
- OA-Open Water
- OAGM1-Annual Row Crops
- OAGM2-Perennial Cover Crops
- SW-Swamp
- SWC-Coniferous Swamp
- SWCM1-White Cedar Mineral Coniferous Swamp
- SWD-Deciduous Swamp
- SWDM2-Ash Mineral Deciduous Swamp Ecosite
- SWDM4-1 - Willow Mineral Deciduous Swamp
- SWM-Mixed Swamp
- SWTM5-8-Non-native Mineral Deciduous Thicket Swamp
- Stormwater Management Pond
- TAGM5-Fencerow
- THD-Deciduous Thicket
- THM-Mixed Thicket
- WOCM1-1-Dry - Fresh Red Cedar Coniferous Woodland
- WOD-Deciduous Woodland
- WODM5-3-Manitoba Maple Deciduous Woodland

DILLON CONSULTING

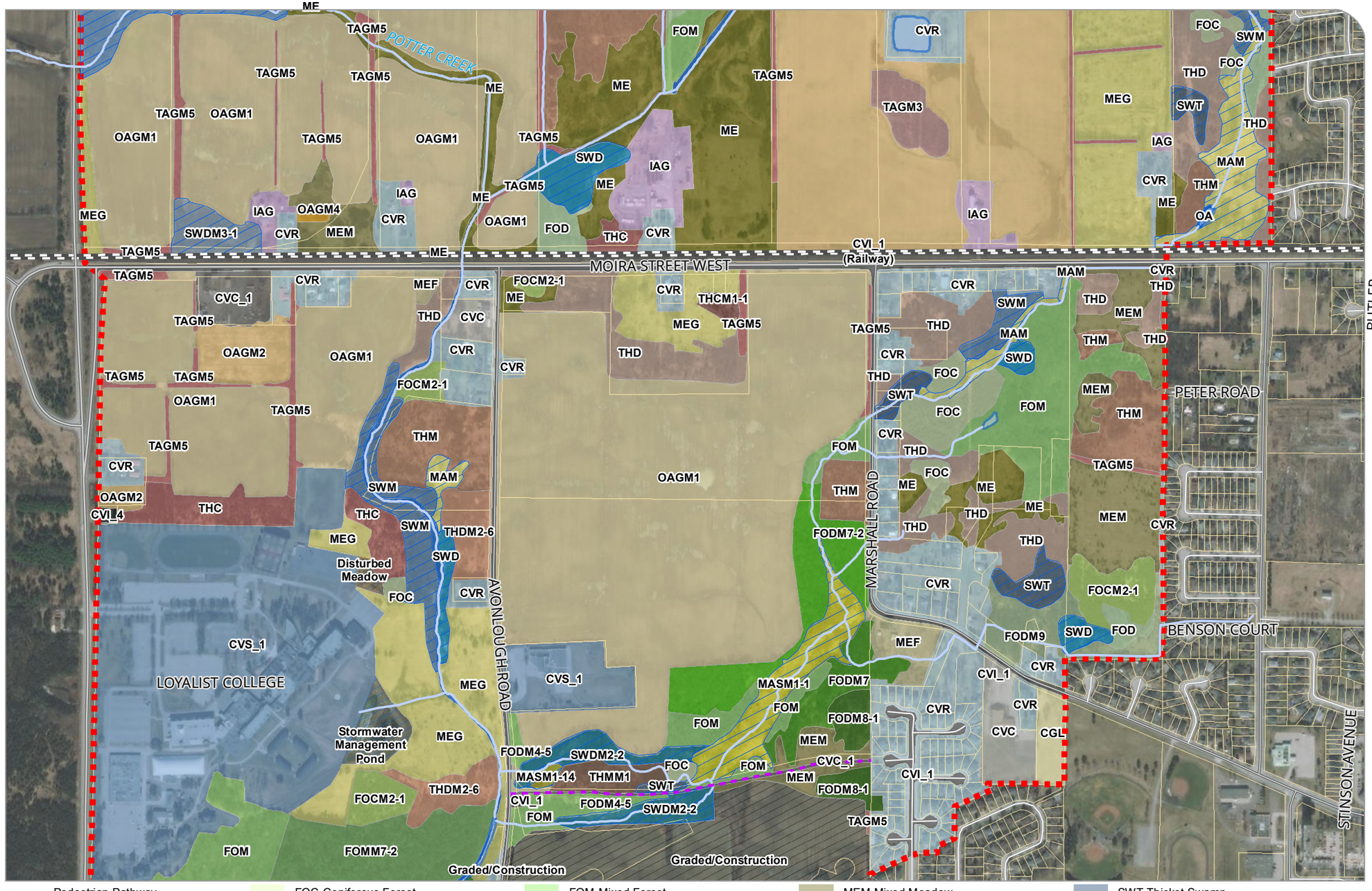
PROJECT: 21-2538
STATUS: DRAFT
DATE: 2022-10-17

CITY OF BELLEVILLE

Loyalist Secondary
Plan Update
Natural Heritage Report

VEGETATION COMMUNITIES
FIGURE 4.2

Subject to limitations; please refer to Section 10.0 of this report.



- Study Area
- Property Parcels
- Wetland Community
- Pedestrian Pathway
- Arterial Road
- Collector Road
- Local Road
- Watercourse
- Rail Line
- Waterbody

SCALE 1:8,000

0 100 200 400 m

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: -ZJB
MAP CHECKED BY: -CE
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

DILLON CONSULTING

PROJECT: 21-2538
STATUS: DRAFT
DATE: 2022-10-17

Pedestrian Pathway

Ecological Land Classification

- CGL-Green Lands
- CVC-Commercial and Institutional
- CVC_1-Business Sector
- CVI_1 - Railway
- CVI_1-Transportation and Utilities
- CVI_4-Power Generation
- CVR-Residential
- CVS_1-Education
- Disturbed Meadow
- FOC-Coniferous Forest
- FOCM2-1-Dry – Fresh Red Cedar Coniferous Forest
- FOCM4-1-White Cedar Coniferous Forest
- FOD-Deciduous Forest
- FODM4-5-Manitoba Maple Deciduous Forest
- FODM7-2-Green Ash - Hardwood Lowland Deciduous Forest
- FODM7-Fresh – Moist Lowland Deciduous Forest Ecosite
- FODM8-1-Poplar Deciduous Forest
- FODM9-Oak – Maple – Hickory Deciduous Forest
- FOM-Mixed Forest
- FOMM7-2-White Cedar – Hardwood Mixed Forest
- Graded/Construction
- IAG-Agricultural Infrastructure
- MAM-Meadow Marsh
- MASM1-1-Cattail Mineral Shallow Marsh
- MASM1-14-Reed Canary Grass Mineral Shallow Marsh
- ME-Meadow
- MEF-Forb Meadow
- MEG-Graminoid Meadow
- MEM-Mixed Meadow
- OA-Open Water
- OAGM1-Annual Row Crops
- OAGM2-Perennial Cover Crops
- OAGM4-Open Pasture
- SWD-Deciduous Swamp
- SWDM2-2-Green Ash Mineral Deciduous Swamp
- SWDM3-1-Red Maple Mineral Deciduous Swamp
- SWDM4-1 - Willow Mineral Deciduous Swamp
- SWM-Mixed Swamp
- SWT-Thicket Swamp
- Stormwater Management Pond
- TAGM3-Deciduous Plantation
- TAGM5-Fencerow
- THC-Coniferous Thicket
- THCM1-1-Red Cedar Coniferous Thicket
- THD-Deciduous Thicket
- THDM2-6-Buckthorn Deciduous Shrub Thicket
- THM-Mixed Thicket
- THMM1-Mixed Regeneration Thicket

Ecological Land Classification

- CGL-Green Lands
- CGL_2-Parkland
- CVC-Commercial and Institutional
- CVC_1 (Railway)
- CVC_1-Business Sector
- CVI_1 - Railway
- CVI_1-Transportation and Utilities
- CVR-Residential
- CVR_2-High Density Residential
- CVS_1-Education
- Disturbed Meadow
- FOCM4-1-White Cedar Coniferous Forest
- FOCM6-3-Scotch Pine Naturalized Coniferous Plantation
- FODM7-Fresh – Moist Lowland Deciduous Forest Ecosite
- FODM8-1-Poplar Deciduous Forest
- FOM-Mixed Forest
- FOMM7-2-White Cedar – Hardwood Mixed Forest
- Graded/Construction
- IAG-Agricultural Infrastructure
- MAS-Shallow Marsh
- ME-Meadow
- MEF-Forb Meadow
- MEG-Graminoid Meadow
- MEM-Mixed Meadow
- OA-Open Water
- SWM-Mixed Swamp
- Stormwater Management Pond
- TAGM5-Fencerow
- THDM2-6-Buckthorn Deciduous Shrub Thicket
- WODM5-1-Poplar Deciduous Woodland
- WOM-Mixed Woodland

CITY OF BELLEVILLE

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VEGETATION COMMUNITIES
FIGURE 4.3

Subject to limitations; please refer to Section 10.0 of this report.

- Study Area
- Property Parcels
- Wetland Community
- Arterial Road
- Collector Road
- Local Road
- Watercourse
- Rail Line
- Waterbody

SCALE 1:8,000

0 100 200 400 m

N W E S

MAP DRAWING INFORMATION:
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MAP CREATED BY: -ZJB
MAP CHECKED BY: -CE
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N

DILLON CONSULTING

PROJECT: 21-2538
STATUS: DRAFT
DATE: 2022-10-17

5.2.2 Botanical Survey

A total of 122 plant species were documented during the 2022 field program. With the exception to Butternut (*Juglans cinerea*) which is listed as Endangered under the ESA and considered rare to uncommon in Ontario (S3) and Black Ash (*Fraxinus nigra*) which is listed as Endangered under the ESA and three species which could not be identified to species level or did not contain a SRank, all of the plant species identified are considered to be common (S4) to very common (S5) in the province of Ontario or are listed as introduced species; therefore, a status ranking is not applicable as the species is not a suitable target for conservation activities (SRank of SE or SNA).

The Co-efficient of Conservatism (CC) provides additional information on the nature of the vegetation communities within the Study Area. The CC values range from 0 to 10 and represent an estimated probability that a plant is likely to occur in a landscape that is relatively unaltered or is in a pre-settlement condition. For example, a CC of 0 is given to plants such as Manitoba Maple (*Acer negundo*) that demonstrate little fidelity to any remnant natural community, i.e., may be found almost anywhere. Similarly, a CC of 10 is applied to plants like Shrubby Cinquefoil (*Potentilla fructicosa*) that are almost always restricted to a pre-settlement remnant, i.e., a high quality natural area. Introduced plants were not part of the pre-settlement flora, so no CC values have been applied to these species.

Of the 122 species identified within the Study Area, the average CC value recorded is 2.0, which is typical of an altered landscape. This is typical of agricultural lands or previously disturbed areas which accounts for a large proportion of the Study Area as compared to naturally occurring environments. A full list of the botanical species observed within the Study Area has been included in **Appendix D**.

Potential impacts related to vegetation within the Study Area are included in **Section 7.1.3**.

5.2.3 Wetlands

As mentioned in **Section 3.3.3**, Potter Creek Tributary Non-Provincially Significant Evaluated Wetland and several areas of unevaluated wetland occur within the Study Area (**Figure 2**). Within the Study Area, the Potter Creek Tributary Non-Provincially Significant Evaluated Wetland and the unevaluated wetlands provide ecological and hydrological functions, providing habitat to a number of native plants, wildlife, and fish species.

The boundaries of wetland units within the Study Area were delineated in conjunction with ELC surveys on lands where access was permitted and desktop review and roadside observations for those where access was restricted. Based on vegetation communities identified, a variety of wetland types occur within the Study Area such as swamps, marshes and swamp thickets (**Figure 4**). The most common wetland community type was swamp and occurred in mixed concentrations of coniferous and deciduous woodlands within the large mosaic of unevaluated wetlands within the northeast quadrant of the Study Area. Swamp communities were also observed in association with Potter Creek however to a lesser extent.

Several relatively small unevaluated wetlands not originally identified on background mapping were added and mainly consist of meadow marsh and a couple swamp communities. These new wetland

communities primarily occur adjacent to those wetland areas already identified through background review and were identified via ELC where property access was granted or via desktop review. (**Figure 2**).

As mentioned in **Section 4.0**, wetlands identified by desktop review on inaccessible lands were assumed to be present for the purpose of this NHR. The inaccessible wetlands within the Study Area will need to be reassessed for future development proposals.

5.2.4 Woodlands

The results of ELC was used to confirm and adjust woodland areas identified within the Study Area during background review with minor revisions. Differences in woodland boundaries and extents between background review and ELC were mainly the result of new development or where boundaries required refinement due to meadow or thicket areas occurring versus actual woodland. Of particular note, many woodlands throughout the Study Area appear to be recovering from Emerald Ash Borer (EAB) (*Agrilus planipennis*) evidenced by the occasional to abundant Ash species (*Fraxinus sp.*) snags with EAB bores and galleries. This has left some woodlands with a reduced canopy, in some cases to the extent where the effective vegetation layer either defaults to the shrub layer or the feature composition has resulted to the transitioning of deciduous or mixed woodland to coniferous. Of particular note are select areas near Marshall Road, however, additional field investigations with property access would be required to confirm the extent of this community transitioning within the Study Area.

The largest woodland areas occur within the northeast quadrant of the Study Area, as well as the Potter Creek corridor. Woodlands throughout the Study Area contained abundant Eastern Red Cedar and many of the understories were observed to be dominated by or contain abundant Common Buckthorn. The City of Belleville has indicated areas where proposed significant woodlands and proposed natural heritage system should be designated within the Study Area, these areas are identified on Appendix C to the City of Belleville OP (**Appendix B**) and generally align with the woodland areas identified during ELC.

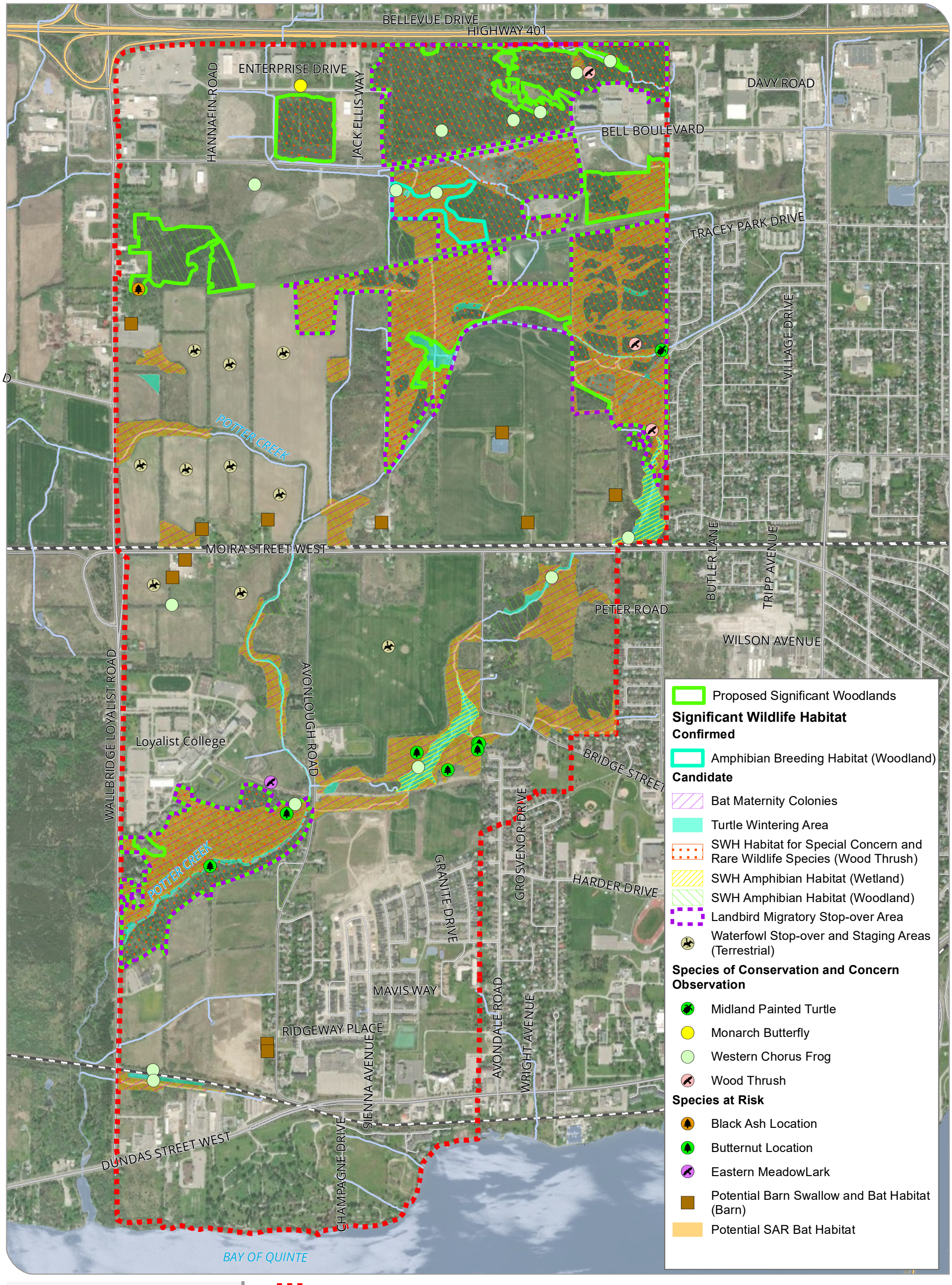
As per woodland significance criteria established by the NHRM for Policy 2.1 of the PPS (MNRF, 2010) woodlands within the Study Area were identified as Significant Woodland if they satisfied at least one of the following NHRM significance criteria:

- Woodland size in relation to the planning area
  - Where woodland cover is 30-60% (54% cover for the Moira River Watershed of QC which the Study Area is located), woodlands 50 hectares in size or larger are considered significant. In accordance with the NHRM, a bisecting opening 20 metres or less in width between crown edges is not considered to divide a woodland into two separate woodlands. Two woodlands within the Study Area are comprised of an area equal to or greater than 50 hectares, therefore this criterion is met. Specifically, woodlands north of Bell Boulevard and woodlands south of the hydro-electric corridor in the northeast quadrant of the Study Area.
- Presence of interior habitat
  - 8 or more hectares of interior habitat where woodland cover is 30-60% is considered significant. None of the woodlands within the Study Area contain interior habitat equal to or greater than 8 hectares.

- Proximity to other woodlands or other habitats
  - Where a woodland is located within proximity to another significant natural feature receiving ecological benefit from the woodland; i.e., fish habitat, SAR habitat, etc. Many of the woodlands within the Study Area contain watercourses, wetland units, and/or potential SAR habitat, therefore several woodland areas meet this criterion.
- Water protection
  - Woodlands are located in relation to a groundwater or surface water feature. Many of these woodlands contain wetlands and watercourses particularly those where Potter Creek and associated tributaries occur, therefore this criterion is met.
- Woodland diversity
  - Woodlands contain high diversity of native forest species or diversity through a combination of composition and terrain. Due to the limited access to properties within the Study Area, further studies would be required to investigate this criterion.

The inaccessible woodlands and portions of partially accessible woodlands within the Study Area will need to be reassessed for significance for future development proposals. See **Figure 5** for proposed significant woodlands based on Dillon ELC and application of NHRM significance criteria.

Potential impacts related to woodlands and significant woodlands within the Study Area are included in **Section 7.1.3**.



CITY OF BELLEVILLE

Loyalist Secondary Plan Update
Natural Heritage Report

NATURAL HERITAGE FEATURES

FIGURE 5

Subject to limitations; please refer to Section 10.0 of this report.

Study Area
Expressway
Arterial Road
Collector Road
Local Road
Rail Line

MNRF (2022)
Watercourse
Waterbody

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, CITY OF BELLEVILLE
MAP CREATED BY:
MAP CHECKED BY: -CE
MAP PROJECTION: NAD 1983 CSRS UTM Zone 18N -ZJB

SCALE 1:15,000
0 137.5 275 550 m

PROJECT: 21-2538 STATUS: DRAFT DATE: 2023-02-15

FILE LOCATION: K:\2021\212538 - Loyalist Secondary Plan Update\Product\Client\Natural Environment\F5_NaturalHeritageFeatures.mxd

5.2.5 Significant Wildlife Habitat

Based on the results of the 2022 field program, a portion of woodland located south of Bell Boulevard was the only area identified as confirmed SWH, specifically SWH for Amphibian Breeding Habitat (Woodland) as detailed in **Section 5.2.5.2**. The following SWH types have been brought forward for candidacy within Study Area and include:

- Waterfowl Stopover and Staging Areas (terrestrial) – agricultural fields where abundant flooding during spring freshet occurred based on historical aerial imagery and observations made during the first round of HDF surveys in April;
- Bat Maternity Colonies – woodlands with the potential to contain trees with maternal roosting habitat such as snags and trees with cracks, crevices or cavities;
- Turtle Wintering Areas – large wetland or open water areas that were observed or likely contain water deep enough not to freeze and contain substrate composted of soft mud;
- Landbird Migratory Stopover Area;
- Amphibian Breeding Habitat (Woodland);
- Amphibian Breeding Habitat (Wetland); and
- Habitat for Special Concern and Rare Wildlife Species:
    - Wood Thrush (Special Concern) – woodlands within the northeast quadrant of the Study Area based on the Wood Thrush observations during breeding bird surveys.

The inaccessible properties within the Study Area will need to be reassessed for SWH for future development proposals.

See **Figure 5** for the locations of confirmed and candidate SWH.

5.2.5.1 Breeding Bird Survey

A total of 44 bird species were observed during breeding bird surveys (**Table 6**). Of the 44 species observed, one SAR, Eastern Meadowlark listed provincially as Threatened, was observed. In addition, one SCC, Wood Thrush listed provincially as Special Concern was observed. With the exception to European Starling (*Sturnus vulgaris*) which is listed as listed as an introduced species; therefore, a status ranking is not applicable as the species is not a suitable target for conservation activities (SNA), all species observed during the breeding bird surveys are considered common and secure (S4) to very common (S5) in the province of Ontario based on the provincial conservation rankings assigned by the NHIC.

Table 6: Breeding Bird Survey Results

Scientific Name	Common Name	SARA[1]	ESA[2]	Srank[3]	Breeding Evidence
Accipiter cooperii	Cooper's Hawk	---	---	S4	CF
Actitis macularius	Spotted Sandpiper	---	---	S5	Flyover
Agelaius phoeniceus	Red-winged Blackbird	---	---	S4	S, X, H, A, Flyover
Ardea Herodias	Great Blue Heron	---	---	S4	Flyover
Bombycilla cedrorum	Cedar Waxwing	---	---	S5B	S
Buteo jamaicensis	Red-tailed Hawk	---	---	S5	H, FY, Flyover
Cardinalis cardinalis	Northern Cardinal	---	---	S5	S, A, H, X
Carduelis tristis	American Goldfinch	---	---	S5B	S, H, X
Charadrius vociferus	Killdeer	---	---	S5B, S5N	S, X
Colaptes auratus	Northern Flicker	---	---	S4B	S, X, H
Columba livia	Rock Pigeon	---	---	SNA	X, H, Flyover
Corvus brachyrhynchos	American Crow	---	---	S5B	S, X, H, A
Cyanocitta cristata	Blue Jay	---	---	S5	S, X, H, A, FY, Flyover
Dumetella carolinensis	Gray Catbird	---	---	S4B	S
Empidonax traillii	Willow Flycatcher	---	---	S5B	S
Geothlypis trichas	Common Yellowthroat	---	---	S5B	S
Hylocichla mustelina	Wood Thrush	THR	SC	S4B	S
Icterus galbula	Baltimore Oriole	---	---	S4B	S, Flyover
Icterus spurius	Orchard Oriole	---	---	S4B	S
Larus delawarensis	Ring-billed Gull	---	---	S5B,S4N	S, X, Flyover
Melospiza georgiana	Swamp Sparrow	---	---	S5B	S
Melospiza melodia	Song Sparrow	---	---	S5B	S, A, H, X, CF
Molothrus ater	Brown-headed Cowbird	---	---	S4B	S
Myiarchus crinitus	Great Crested Flycatcher	---	---	S4B	S
Passerina cyanea	Indigo Bunting	---	---	S4B	S
Picoides pubescens	Downy Woodpecker	---	---	S5	S, H, A
Pipilo erythrophthalmus	Eastern Towhee	---	---	S4B	S
Poecile atricapillus	Black-capped Chickadee	---	---	S5	S, FY
Quiscalus quiscula	Common Grackle	---	---	S5B	FY, S, X, P, H Flyover
Sayornis phoebe	Eastern Phoebe	---	---	S5B	FY
Setophaga petechia	Yellow Warbler	---	---	S5B	S
Sitta carolinensis	White-breasted Nuthatch	---	---	S5	S
Spizella passerina	Chipping Sparrow	---	---	S4B	S
Spizella pusilla	Field Sparrow	---	---	S4B	S
Sturnella magna	Eastern Meadowlark	THR	THR	S4B	S

Scientific Name	Common Name	SARA[1]	ESA[2]	Srank[3]	Breeding Evidence
Sturnus vulgaris	European Starling	---	---	SNA	FY, S, CF, X, H Flyover
Tachycineta bicolor	Tree Swallow	---	---	S4B	Flyover
Troglodytes aedon	House Wren	---	---	S5B	S, T
Turdus migratorius	American Robin	---	---	S5B	S, A, X, H, FY, CF, Flyover
Tyrannus tyrannus	Eastern Kingbird	---	---	S4B	S
Vireo gilvus	Warbling Vireo	---	---	S5B	S
Vireo olivaceus	Red-eyed Vireo	---	---	S5B	S
Zenaida macroura	Mourning Dove	---	---	S5	S, NB, X, H, Flyover
Zonotrichia albicollis	White-throated Sparrow	---	---	S5B	S

Notes:

[1] Federal SARA Registry Status: THR = Threatened

[2] Provincial ESA Species at Risk in Ontario List Status: THR = Threatened, SC = Special Concern

[3] Provincial Conservation Rank (Srank): S5 = secure; S4 = apparently secure; ? = inexact or uncertain; B = breeding status; N = non-breeding status; SNA = Not Applicable – a conservation status rank is not applicable because the species is not a suitable target for conservation activities

"---" denotes no information or not applicable

Breeding Bird Codes from Breeding Bird Atlas of Ontario (Cadman et al., 2007)

Observed

X Species observed in its breeding season (no breeding evidence)

Possible

H Species observed in its breeding season in suitable nesting habitat

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

Probable

P Pair observed in suitable nesting habitat in nesting season

T Permanent territory presumed through registration of territorial song, or the occurrence of an adult bird, at the same place, in breeding habitat, on at least two days a week or more apart, during its breeding season.

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

V Visiting probable nest site

A Agitated behaviour or anxiety calls of an adult

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

N Nest-building or excavation of nest hole, except by a wren or a woodpecker

Confirmed

NB Nest-building or excavation of nest hole by a species other than a wren or a woodpecker

DD Distraction display or injury feigning

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

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

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

FS Adult carrying fecal sac

CF Adult carrying food for young

NE Nest containing eggs

NY Nest with young seen or heard

Wood Thrush was observed at survey locations BBS 11, BBS 12 and BBS 15 all within suitable mixed (conifer-deciduous) forests habitat located within the northeast quadrant of the Study Area.

A pair of Eastern Meadowlark was observed incidentally while traveling between survey locations nearby survey location BBS 3. The hayfields north of Moira Street West and meadows east of Loyalist College and the meadows with frontage to Avonlough Road south of Potter Creek provide potential breeding habitat.

SCC are discussed in detail in **Section 5.2.5**, and SAR are discussed in detail in **Section 5.2.6**. Impacts to general wildlife including breeding birds are discussed further in **Section 7.1.4**.

5.2.5.2 Amphibian Survey

In accordance with the SWH Criteria Schedules for Ecoregion 6E (MNRF, 2015), the Study Area was considered for amphibian breeding habitat given the potential in association with the woodlands and wetlands present. Consistent with the criteria schedule, in order for amphibian breeding habitats to be significant, they must contain one or more of the listed newt/salamander species; at least two or more of the listed frog/toad species with at least 20 individuals (adults or egg masses) of each species; or at least two of the listed frog/toad species with Call Code 3.

The highest amphibian activity was recorded at amphibian survey stations AMPH 2, AMPH 3, AMPH 4 and AMPH 6. At all four amphibian survey stations, Western Chorus Frog was heard in full chorus (assumed to be > 20 individuals). At three of the amphibian survey stations (AMPH 3, AMPH 4 and AMPH 6) Western Chorus Frog was heard throughout the wetland and woodland areas north of Bell Boulevard; however, no other significant calls or amphibian significance features as per the Criteria Schedules were observed. In addition, Spring Peeper (*Pseudacris crucifer*) was heard in full chorus at amphibian survey station AMPH 2 within the woodland and wetland communities south of Bell Boulevard. Given that both Western Chorus Frog and Spring Peeper are species listed under Amphibian Breeding (Woodland) within the SWH Criterion Schedules for Ecoregion 6E (MNRF 2015), a call code of 3 was observed for both species at amphibian survey station AMPH 2 and the woodland is adjacent to unevaluated wetlands, the woodland is considered SWH for Amphibian Breeding (Woodlands) (**Figure 5**).

No egg masses or additional other evidence of amphibian breeding were observed within the Study Area in 2022.

SCC and SWH are further discussed in detail **in Section 5.2.5**. Impacts to general wildlife are discussed further in **Section 7.1.4**.

5.2.6 Species at Risk

As noted in **Section 5.2.5.1**, Eastern Meadowlark was incidentally observed within the Study Area during breeding bird surveys nearby survey location BBS 3. The agricultural fields and meadows described in **Section 5.2.5** were considered as potentially suitable breeding habitat for Eastern Meadowlark as well as Bobolink; however, due to the higher forb concentration observed within the meadows south of Potter Creek this habitat would only be considered suitable for Eastern Meadowlark who tolerate

disturbed areas and forb meadows. The location of the Eastern Meadowlark observation is shown on **Figure 5**.

No Barn Swallow were observed incidentally or during the breeding birds survey, however several barns occur in the Study Area that may provide suitable nesting habitat for Barn Swallow. The barn may also provide potential habitat for SAR bats for maternal roosting and/or for winter hibernation. The barns could not be investigated for suitability or presence for these species due to lack of access on those properties. The locations of these prospective barns are shown on **Figure 5**.

Several live Butternut were identified as occurring within the Study Area based on a review of the supplemental background resources/documents identified in **Table 1**. Live Butternut were noted as occurring south and east of Loyalist College in relation to Potter Creek and Potter Creek Tributary Non-Provincially Significant Evaluated Wetland, respectively. Two of the seven Butternut identified during background review were confirmed in the field during ELC, one north of the pedestrian pathway near Potter Creek Tributary Non-Provincially Significant Evaluated Wetland and one along the forest boundary south of the pedestrian pathway by Loyalist College. For the five remaining previously reported live Butternut, due to lack of property access, these Butternut were assumed to be live and present specimens for the purpose of this NHR. Due to known occurrences of Butternut in these locations, a search for Butternut and Butternut Health Assessments for any Butternut identified should be completed by a Butternut Health Expert prior to future development proposals in accordance with the ESA. In addition, several Black Ash were observed within the northwest portion of the Study Area within the Ash Mineral Deciduous Swamp (SWDM2) community. It should be noted that the MECP has temporarily suspended protections for Black Ash for a period of two years from the time the species was added to the SARO list and during this time, proponents will not need to seek authorizations for activities that impact Black Ash and its habitat.

Deciduous and mixed woodlands including swamps and forests that occur throughout the Study Area have the potential to provide maternal roosting habitat for SAR bats based on the potential occurrence of trees that could contain bat maternity roosting habitat such as snags and trees with cavities, cracks, crevices, peeling bark and dense clumping of leaves. Due to observation of abundant Ash tree (*Fraxnius sp.*) snags throughout the Study Area, there is an increased likelihood for this habitat to occur. Bats (*Chiroptera sp.*) were observed hunting during the June 29 amphibian survey at amphibian survey station AMPH 11, however species could not be determined at the time of the observation. To accurately determine if bats occupying this portion or other portions of the Study Area are considered SAR species, bat acoustic survey should be undertaken during the active season for bats.

No other SAR or SAR habitat was identified within the Study Area.

5.2.7 Incidental Wildlife

41 incidental wildlife species observed within the Study Area are listed below in **Table 7**. Three SCC (Western Chorus Frog, Midland Painted Turtle [*Chrysemys picta marginata*] and Monarch [*Danaus plexippus*]) were incidentally observed during the 2022 field program. In addition, bats (*Chiroptera sp.*)

were observed hunting during the June 29 amphibian survey at amphibian survey station AMPH 11. The location of SCC observations is show on **Figure 5**.

Table 7: Incidental Wildlife Observations

Scientific Name	Common Name	SARA[1]	ESA[2]	SRank[3]
BIRDS				
Agelaius phoeniceus	Red-winged Blackbird	---	---	S4
Anas platyrhynchos	Mallard	---	---	S5
Ardea herodias	Great Blue Heron	---	---	S4
Bombycilla cedrorum	Cedar Waxwing	---	---	S5B
Branta canadensis	Canada Goose	---	---	S5
Buteo jamaicensis	Red-tailed Hawk	---	---	S5
Cardinalis cardinalis	Northern Cardinal	---	---	S5
Cardinalis cardinalis	Northern Cardinal	---	---	S5
Carduelis tristis	American Goldfinch	---	---	S5B
Cathartes aura	Turkey Vulture	---	---	S5B
Charadrius vociferus	Killdeer	---	---	S5B,S5N
Corvus brachyrhynchos	American Crow	---	---	S5B
Corvus corax	Common Raven	---	---	S5
Cyanocitta cristata	Blue Jay	---	---	S5
Larus delawarensis	Ring-billed Gull	---	---	S5B,S4N
Meleagris gallopavo	Wild Turkey	---	---	S5
Melospiza melodia	Song Sparrow	---	---	S5B
Myiarchus crinitus	Great Crested Flycatcher	---	---	S4B
Poecile atricapillus	Black-capped Chickadee	---	---	S5
Quiscalus quiscula	Common Grackle	---	---	S5B
Scolopax minor	American Woodcock	---	---	S4B
Sitta carolinensis	White-breasted Nuthatch	---	---	S5
Sturnus vulgaris	European Starling	---	---	SNA
Turdus migratorius	American Robin	---	---	S5B
Tyrannus tyrannus	Eastern Kingbird	---	---	S4B
Zenaida macroura	Mourning Dove	---	---	S5
Zenaida macroura	Mourning Dove	---	---	S5
HERPTILES				
Anaxyrus americanus	American Toad	---	---	S5
Chrysemys picta marginata	Midland Painted Turtle	---	---	S4
Lithobates clamitans	Green Frog	---	---	S5

Scientific Name	Common Name	SARA[1]	ESA[2]	SRank[3]
Pseudacris triseriata pop. 1	Western Chorus Frog (Great Lakes/St. Lawrence – Canadian Shield Population)	THR	---	S3
MAMMALS				
Odocoileus virginianus	White-tailed Deer	---	---	S5
Procyon lotor	Northern Raccoon	---	---	S5
Sciurus carolinensis	Eastern Gray Squirrel	---	---	S5
Sylvilagus floridanus	Eastern Cottontail	---	---	S5
Tamias striatus	Eastern Chipmunk	---	---	S5
Tamiasciurus hudsonicus	Red Squirrel	---	---	S5
LEPIDOPTERA				
Danaus plexippus	Monarch	SC	SC	S2N,S4B
Pieris rapae	Cabbage White	---	---	SNA

Notes:

[1] Federal SARA Registry Status: THR = Threatened, SC = Special Concern

[2] Ontario ESA Species at Risk in Ontario List Status: SC = Special Concern

[3] Provincial Conservation Rank (Srank): S5 = secure; S4 = apparently secure; S3 = vulnerable; S2 = imperiled; S1 = extremely rare in Ontario; ? = inexact or uncertain; B = breeding status; N = non-breeding status; SNA = Not Applicable – a conservation status rank is not applicable because the species is not a suitable target for conservation activities

"---" denotes no information or not applicable

Potential impacts related to wildlife and SAR within the Study Area are included in **Section 7.1.4**.

6.0 Ecological Function

Natural features within the Study Area were analyzed to determine their ecological function. At the larger landscape scale, the majority of the central part of the Study Area and areas adjacent to the northwest boundary of the Study Area are agricultural lands. The natural environment features within the Study Area are generally aligned with Potter Creek, which meanders and bisects the center of Study Area. The woodlands and wetlands adjacent to the alignment of Potter Creek and Potter Creek Tributary Non-Provincially Significant Evaluated Wetland and the large mosaic of unevaluated wetlands and woodland within the northeast quadrant of the Study Area largely form the foundation of the natural environment areas within the Study Area.

Potter Creek and associated tributaries including Potter Creek and Potter Creek Tributary Non-Provincially Significant Evaluated Wetland provide ecological and hydrological function, through the landscape and provides habitat to a number of native plant and wildlife species.

General ecological functions of natural features within the Study Area include prevention of erosion and runoff, facilitates hydrological and nutrient cycling, and improves localized soil, water and air quality. Within the Study Area, treed fencerows within the large expansive agricultural fields provide limited cover, foraging, refuge, and nesting habitat for common terrestrial wildlife.

7.0 Impact Assessment

Future development within the LWSP area may include, but is not limited to, construction of a wide variety of residential buildings, schools, parks, commercial and retail space, stormwater management areas, roads, etc.

Construction activities would include the removal of select trees and vegetation from the development area, construction of dwellings, placement of hardscape (driveways, sidewalks) and underground servicing for stormwater and sanitary water. Landscaping may include, but is not limited to, the installation of patios, fencing, sod, and tree plantings.

Currently, specific impacts of future developments are unknown. As a result we have provided a high-level analysis of potential impacts and mitigation measures in subsequent subsections and **Section 8.0**.

7.1 Potential Direct Impacts

Direct impacts are those that are immediately evident as a result of a development. Typically, the adverse effects of direct impacts are most evident during the site preparation and construction phase of a development. Potential direct impacts of the future development proposals within the LWSP area include, but are not limited to, the following:

- Diversion of surface water flows;
- Erosion and sedimentation into natural features (woodlands, wetlands, watercourses);
- Tree and vegetation removal; and
- Loss of/ disturbance to wildlife and wildlife habitat (including SAR and SWH).

Each of these potential impacts are discussed in sections below.

7.1.1 Diversion of Surface Water Flows

The potential impacts of changes to land use and land cover on the health of a watershed have been well documented and can include changes to groundwater infiltration, run off, stream flow regime, water quality, stream channel erosion, and wildlife habitat (TRCA, 2008). More specifically, changes may include:

- Direct “footprint” effects such as the loss of natural land cover or destruction of built heritage features;
- Indirect “flow-related” effects such as increased frequency of high stream flows, accelerated stream channel erosion and deterioration of water quality; and
- Cumulative effects such as changes in aquatic community composition that may arise from a combination of changes affecting upstream areas (North-South Environmental, 2009).

Refer to **Section 8.1** for mitigation measures related to surface flows.

7.1.2 Erosion and Sedimentation of Natural Features

Due to the anticipated reduction in infiltration rate post-development with creation of more impermeable surfaces, there is the potential for natural features within the area to be impacted as a result of development if construction best management practices are not implemented.

Potential impacts to these features may include, but are not limited to:

- Reduced water quality and degradation of aquatic habitat in Potter Creek; and
- Disturbance to or loss of vegetation due to the deposition of dust and/or overland mobilization of soil.

Refer to **Section 8.3** for mitigation measures related to erosion and sedimentation within the Study Area.

7.1.3 Tree and Vegetation Removal

Future development within the LWSP area will include tree removals, although the location and extent is currently unknown.

In general, tree removal can result in a reduction of tree cover, marginal wildlife habitat loss, and alteration of soil conditions. On a site level, the impacts of tree and vegetation removal may include:

- Direct loss of trees;
- Decreased floral species richness and abundance;
- Negative edge effects, include altered soil conditions and water availability;
- Alteration of microclimate;
- Loss of native seed banks; and
- Physical injury, root damage, and compaction of trees not intended for removal that may result from construction operations.

Refer to **Section 8.1.1** for mitigation and enhancement opportunities.

7.1.4 Loss of and/or Disturbance to Wildlife and Wildlife Habitat

As stated in **Section 4.2.5**, candidate SWH present within the Study Area include:

- Waterfowl Stopover and Staging Areas (terrestrial);
- Bat Maternity Colonies;
- Turtle Wintering Areas;
- Landbird Migratory Stopover Area;
- Area-Sensitive Bird Breeding Habitat;
- Amphibian Breeding Habitat (Woodland);
- Amphibian Breeding Habitat (Wetland); and
- Habitat for Special Concern and Rare Wildlife Species:
  - Wood Thrush (Special Concern) – woodlands within the northeast quadrant of the Study Area.

- SWH confirmed within the Study Area include one woodland/wetland tract for Amphibian Breeding Habitat (Woodland).

There is potential for flora and fauna to be impacted due to vegetation clearing for future development within the LWSP area. Habitat for flora and fauna may be impacted by construction in the following ways:

- Displacement, injury, or death resulting from contact with heavy equipment during clearing and grading activities;
- Disturbance to wildlife as a result of noise associated with construction activities, particularly during breeding periods; and
- Loss of wildlife habitat.

Accordingly, wildlife impact mitigation measures have been recommended for the development area and are included in **Section 8.2**.

7.2 Potential Indirect Impacts

Indirect impacts are those that do not always manifest in the core development area, but in the lands adjacent to the development. Indirect impacts can begin in the construction phase, however they can continue post-construction. Potential indirect impacts of the development include anthropogenic disturbance and colonization of non-native and/or invasive species.

7.2.1 Anthropogenic disturbance

Disturbance to local wildlife communities due to indirect impacts on the lands adjacent to the proposed development could result if left unmitigated. Noise, light, vibration and human presence are indirect impacts that can adversely influence the population size and breeding success of local wildlife. These effects are more pronounced when new development is introduced in non-urban areas.

Mitigation measures related to anthropogenic disturbance are addressed in **Section 8.2**.

7.2.2 Colonization of Non-native and/or Invasive Species

Physical site disturbance may increase the likelihood that non-native and/or invasive flora species will be introduced to the surrounding vegetation communities. Invasive flora can establish in disturbed sites more efficiently than native flora and can then encroach into adjacent undisturbed areas.

Mitigation measures related to control of invasive species are addressed in **Section 8.1.1**.

8.0 Mitigation and Opportunities for Enhancement

Mitigation involves the avoidance or minimization of developmental impacts through good design, construction practices and/or restoration and enhancement activities. The feasibility of mitigation options has been evaluated based on the natural features within and adjacent to the Study Area. The impact assessment highlighted four potential direct impacts which include, diversion of surface water flows, erosion and sedimentation of natural features, tree and vegetation removal, and loss of/ disturbance to wildlife and wildlife habitat.

A variety of mitigation techniques can be used to minimize or eliminate the above-mentioned impacts. These measures include establishment and enhancement of buffers area through a Landscaping and Planting Plan, a Functional Servicing and Stormwater Management Plan, Erosion and Sediment Control Plan and an Environmental Monitoring Plan. Each mitigation measure is introduced below. Detailed mitigation measures will be refined and finalized in consultation with the City of Belleville and QC through future development applications.

8.1 Functional Servicing and Stormwater Management Plan

The development plan for the LWSP area is currently being drafted and engineering plans are presently at a high-level planning stage, therefore no specific functional servicing or Stormwater Management Plans have been developed. It is recommended that all future developments within the LWSP contain an effective Stormwater Management Plan.

8.1.1 Landscaping and Planting Plan

As a result of the potential vegetation removal, Landscaping and Planting Plans are recommended for future development applications off-set any vegetation removal, as well as to protect and enhance significant natural features. Vegetation protective zone plantings should be similar to the vegetation communities they are buffering.

The planting plan may include, but is not limited to:

- A mix of native deciduous and coniferous trees and shrubs throughout the parks, open spaces and boulevards within the LWSP;
- A mix of native tree and wetland species within and adjacent to each of the storm water ponds;
- A native wetlands seed mix for wetland community vegetation protection zones; and
- A mix of native deciduous and coniferous trees and shrubs for woodland community vegetation protection zones.

The following monitoring and maintenance measures may also be recommended for within the vegetation protection zones and enhancement areas:

- Removal of invasive tree and shrubs, where applicable;
- Watering and weeding of newly planted areas as required for proper establishment of plantings; and
- Replacement of dead material from previous year's planting.

8.2 Wildlife Impact Mitigation Plan

Strategies to mitigate impacts to general wildlife prior to and during construction are proposed. These may include (but are not limited to) the following:

- Clearing trees and vegetation outside the breeding bird season (April 1 to August 31). Should any clearing be required during the breeding bird season, nest searches conducted by a qualified person must be completed 48 hours prior to clearing activities. If nests are found, work within 10 metres of the nest should cease until the nest has fledged. If no nests are present, clearing may occur. This is in accordance with the federal *Migratory Birds Convention Act*, 1994;
- Clearing trees outside of the active bat window (May through September);
- Schedule vegetation clearing and grading activities to avoid disturbance to breeding amphibians and other sensitive wildlife species where possible;
- Visual monitoring for wildlife species and avoidance where encountered if possible;
- If necessary, have a qualified biologist monitor construction in the areas of potential wildlife habitat. If wildlife are found within the construction area they should be re-located to an area outside of the development into an area of appropriate habitat, as necessary;
- Construction crews working on site should be educated on local wildlife and take appropriate measures for avoiding wildlife; and
- Should an animal be injured or found injured during construction they should be transported to an appropriate wildlife rehabilitation center.

In addition, strategies to mitigate impacts of anthropogenic disturbance following construction associated with new occupation of lands adjacent general wildlife habitat are proposed. These may include (but are not limited to) the following:

- Specific to Residential Developments:
  - Provide Owner Awareness Package to all new residents. This information could include:
    - Impacts of cat predation on bird populations and the importance of keeping household cats indoors;
    - Legal restrictions of uncontrolled pets; and
    - The risks of feeding wildlife.
- For all developments:
  - Integrate mitigation options for reducing the potential bird strikes with windows (i.e., falcon silhouette stickers for windows);

- Limit the use of lighting, where possible. Avoid light effects entering adjacent woodlands (if present) to eliminate or reduce light trespass, where possible; and,
- Reduce light pollution by:
  - Installing external decorative lightings that projects light downwards; and
  - Modifying building operations or lighting schedules to reduce the use of lighting after hours of primary use.

8.3 Erosion and Sediment Control Plan

Construction activity, especially operations involving the handling of earthen material, dramatically increases the availability of sediment for erosion and transport by surface drainage. In order to mitigate the adverse environmental impacts caused by the release of sediment-laden runoff into receiving watercourses, measures for erosion and sediment control are required for construction sites. This is an extremely important component of land development that plays a large role in the protection of downstream watercourses and aquatic habitat.

Control measures must be selected that are appropriate for the erosion potential of the site and it is important that they be implemented and modified on a staged basis to reflect the site activities. Furthermore, their effectiveness decreases with sediment loading and therefore, inspection and maintenance is required.

The plan may include, but is not limited to measure such as installation of geotextile silt fences, rock check dams, ditch checks, temporary sediment ponds, designated topsoil stockpile areas, and cut-off swales and ditches to divert surface flows to the appropriate sediment control area. More specifically, the plan may include the following measures:

- Standard duty silt fencing (OPSD 219.110) and/ or other equivalent erosion and sediment controls should be installed around the perimeter of the work area to clearly demarcate the development area and prevent erosion and sedimentation into adjacent habitats. Erosion and sediment control measures should be monitored regularly to ensure they are functioning properly and if issues are identified should be dealt with promptly;
- Stockpiling of excavated material should not occur outside the delineated work area. If stockpiling is to occur outside of this area, silt fencing should be used to contain any spoil piles to prevent sedimentation into adjacent areas. Further, stockpiling of excavated materials will not occur within 30 metres of watercourses;
- A spill response plan should be developed and implemented as required; and
- The use of silt socks, dewatering ponds, etc. should be implemented to avoid sedimentation and erosion in adjacent areas as required. If dewatering requires more than 50,000 L of water to be pumped per day, appropriate permits must be obtained from the MECP prior to the dewatering.

8.4 Environmental Monitoring Plan

The Environmental Monitoring Plan (EMP) should be carried out through the duration of construction activities on-site to ensure that the erosion and sediment control measures operate effectively and to monitor the potential impact, if any, upon the natural environment. The duration of construction is defined as the period of time from the beginning of earthworks until the site is stabilized. Site stabilization is defined as the point in time when the roads have been paved, buildings have been built, lawns have been sodded and restoration plantings have been completed.

The EMP would consist of monitoring the erosion and sediment measures and the vegetation protection zone plantings. Erosion and sediment control measures would be regularly monitored and they will require periodic cleaning (i.e., removal of accumulated silt), maintenance and/or re-construction. Inspections of all of the erosion and sediment controls on the construction site should be undertaken by a certified sediment and erosion control monitor. If damaged control measures are found they should be repaired and/or replaced promptly.

The EMP will be implemented during active construction periods in the development area with the following frequency:

- On a bi-weekly basis; and
- After every 10 millimetres or greater rainfall event.

Restoration planting and protected vegetation areas will require periodic monitoring to ensure that they are not impacted by adjacent development. Should any impacts be observed, necessary steps will be taken to ensure that the impacted vegetation is either restored or replaced.

9.0 Summary

The purpose of the NHR is to summarize the results of the background review and natural environment field program, which will ultimately be incorporated into the Loyalist West Secondary Plan Update. It may also benefit future requirements needed to fulfill the Municipal Class Environmental Assessment (EA) process. The findings of the biophysical inventory which consisted of secondary source reviews supported by a 2022 field studies program are presented in this NHR.

The main natural environment areas of the Study Area were found in association with Potter Creek, the large mosaic of unevaluated wetlands and woodland areas that occur within the northeast quadrant of the Study Area, the Potter Creek Tributary Non-Provincially Significant Evaluated Wetland and an isolated woodland area in the northwest quadrant. The remaining natural areas occur as agricultural fields, used for perennial and annual row crops or field that have been left for fallow and have transitioned to meadow. The significant woodlands, confirmed and candidate SWH, confirmed (Butternut) and potential SAR habitat, wetlands are recommended as targets for conservation and should be generally be protected from development.

Potential ecological impacts of development may include tree and vegetation removal, vegetation protection zone encroachment, diversion of surface water flows, sedimentation of wetland and forest areas, and loss of potential wildlife habitat. These impacts will be avoided or minimized by implementing the mitigation, restoration, and management measures described in this report.

Additional studies such an Environmental Impact Study and/or SAR specific surveys/assessments like a Butternut Health Assessment will be required for future development proposals for the lands within the Study Area, in particular, for those lands where access was not granted for this NHR.

Based on the information available to date and presented in this report, the proposed Secondary Plan generally confers with the intent of the applicable policies outlined in **Section 2.0** of this report.

10.0 Closure and Limitations

This NHR was prepared exclusively for the purposes, project, and Study Area outlined in the ToR for the NHR. The NHR is based on information provided to or obtained by Dillon, as indicated in the NHR ToR. It applies solely to site conditions existing at the time of the site investigation(s) as part of the 2022 field program. Access for areas within the Study Area for the fieldwork program was limited to the 18 property parcels identified in this NHR in which Dillon was granted access to by the landowner(s) at the time that the fieldwork program was conducted. In addition, to inform on the inaccessible portions of the Study Area observations and surveys from publically accessible areas and vantage points such as roadside shoulders and public pedestrian pathways were used. Dillon's investigation was by no means exhaustive, and it cannot be construed as a certification of the absence of any species, including Species at Risk, from the Study Area. Rather, Dillon's NHR represents a review of available information within an agreed-upon scope of work, schedule, and budget. Further review and updating of the NHR may be required, as local/site conditions and the regulatory and planning frameworks change over time.

Additional studies such an Environmental Impact Study and/or SAR specific assessments like a Butternut Health Assessment will be required for future development proposals for the lands within the Study Area, in particular, for those lands where access was not granted for this NHR.

Dillon prepared this NHR for the sole benefit of our Client, the City of Belleville. The material in it reflects Dillon's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this NHR, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Accordingly, Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this NHR.

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Appendix A

Terms of Reference

DILLON CONSULTING

Memo

TO:	Desta McAdam, City of Belleville Paul McCoy, Quinte Conservation David Eastcott, Quinte Conservation
FROM:	Connor Edington, Dillon Consulting Limited
cc:	Whitney Moore, Dillon Consulting Limited Rory Baksh, Dillon Consulting Limited Amy Greenberg, Dillon Consulting Limited
DATE:	January 11, 2022
SUBJECT:	Terms of Reference for the Loyalist Secondary Plan Update – Natural Heritage Report, City of Belleville
OUR FILE:	21-2538

Introduction

The City of Belleville has retained Dillon Consulting Limited (Dillon) to undertake environmental studies that are required as part of the Loyalist Secondary Plan (the Plan) Update for the Plan area (referred to herein as the "Study Area"). Wallbridge Loyalist Road generally bounds the Study Area to the west, Avondale Road and Palmer Road to the east, the Bay of Quinte to the south and Highway 401 to the north within the City of Belleville (the "City"), (see **Figure 1**, attached). The field work component of this project is to be completed over the course of an appropriate baseline field studies program (field program) to commence in February 2022 and conclude in the fall of 2022, followed by the preparation of a Natural Heritage Report (NHR). The NHR will summarize the results of the field program, which will ultimately be incorporated into the Draft Secondary Plan Background Study for the Loyalist Secondary Plan Update's Official Plan Amendment and Urban Design Guideline Assessment as part of requirements needed to fulfill the Municipal Class Environmental Assessment (EA) process.

Background

In November 2021, the City adopted its new Official Plan while carrying forward the existing Loyalist Secondary Plan (LSP) with an understanding that the LSP would be updated. The area-specific LSP policies for the Plan will be reviewed, and public consultation will be required to determine the specific needs and opportunities of those who live and work in the area.

The purpose of the Plan update is to conduct an appropriate analysis of the Study Area to review and integrate planning, engineering due diligence (water, sewer, storm), ecological due diligence, and transportation needs. As this update will help to identify a future vision for the area and shape it in a way that meets the needs and interests of the local community, it will help Belleville make well-informed decisions related to the development of the Study Area. This work will also complement ongoing work on the planning framework and infrastructure phasing to assist staff with decision-making

regarding the efficient use of land and infrastructure and the phasing of future development in the area. It will offer clarity on infrastructure so that there is also appropriate cost-recovery (e.g., development charges) for the build-out of the Study Area.

Approach

Dillon understands that the update to the Plan must include an appropriate ecological due diligence approach that captures and assesses the variety of natural heritage features that may occur within the Study Area. Therefore, the City and Dillon are taking a pro-active approach to environmental-first planning and undertaking the appropriate environmental studies that are required in preparation of a NHR, in support of the Plan update and towards the successful preparation for the Municipal Class EA process. The NHR will be completed in accordance with both the guiding principles of the City's OP, as well as the general policies of Quinte Conservation (QC).

The purpose of the NHR is to document the existing conditions of the natural environment, and specifically, the presence of significant natural features as outlined in Section 2 of the Provincial Policy Statement, which includes:

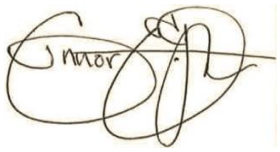
- Significant wetlands;
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat;
- Significant areas of natural and scientific interest (ANSIs);
- Fish habitat;
- Habitat of Endangered or Threatened species (species listed provincially under the *Endangered Species Act* (2007) as identified on the Species at Risk in Ontario list);
- Sensitive surface water features; and
- Sensitive ground water features.

A review of the City's current OP reveals the Study Area is primarily designated as Residential with Employment Areas concentrated along the north and south extents of the Study Area associated with being in proximity to Highway 401 and Dundas Street West. Furthermore, Environmental Protection areas occur in association with Potter Creek, which meanders through the Study Area, and Community Facility zoned areas such as Loyalist College occur as a few large blocks within the central south half of the Study Area. Based on our initial review of aerial photography and secondary sources, the natural environment areas of the Study Area are aligned with Potter Creek, which meanders and trisects the center of Study Area. The woodlands and wetlands adjacent to the alignment of Potter Creek largely form the foundation of the natural environment areas within the Study Area with the exception to a mosaic of unevaluated wetlands and coniferous plantation that occurs within the northeast portion of the Study Area. The remaining natural areas occur as agricultural fields, likely used for perennial and annual row crops. Based on the presence of meadows, woodlands and wetlands, there is potential for Species at Risk (SAR), listed as Endangered or Threatened under the Endangered Species Act, 2007, and

SAR habitat to be present within the vicinity of the Study Area; including, but not limited to, Bobolink (*Dolichonyx oryzivorus*), Eastern Meadowlark (*Sturnella magna*), Barn Swallow (*Hirundo rustica*), Butternut (*Juglans cinerea*), Blanding's Turtle (*Emydoidea blandingii*) and SAR bats. The potential for SAR and SAR habitat within the Study Area will be examined through the field program proposed for 2022. Please note, however, that no species-specific surveys for SAR have been included in this scope of work. Should species-specific surveys be required, Dillon has qualified staff (e.g., qualified Butternut Health Assessors) that can provide these services, as required. The City will be informed of consultation with the Ministry of Environment, Conservation and Parks, and approvals that are required, as necessary. Wetlands and watercourse and waterbodies occur within the Study Area, many of which fall with the QC Regulation Limit.

Based on Dillon's experience with environmental field programs for other NHRs coordinated as part of secondary plan updates and Municipal Class EAs we have prepared the following Terms of Reference (TOR). Below, we present the TOR in a check-list format to ensure that the required work and/or studies are known and agreed to prior to the commencement of work to facilitate a stream-lined and timely review process. Should additional requirements be identified through agency review of the TOR, these tasks will be outlined in a scope change to be included in the 2022 field program prior to commencement. Based on the above, we are recommending the work plan outlined below.

Please note: Due to access restrictions associated with private property, only those publicly-owned properties will be accessed as part of the field program. Where areas are inaccessible additional roadside field surveys will be completed to supplement surveys.



Connor Edington, B.A.
Biologist

Terms of Reference

General Policies

☒ The NHR must be undertaken by a qualified professional in environmental or related sciences to the satisfaction of the City.

[N/A] The staking of significant natural features (i.e., woodlands, etc.) by the City or by QC may be required. Staking will generally occur between the end of May and the end of October. Any staking that occurs outside of this time may require a confirmatory visit between May and October.*

**Note: As no development is proposed at this time, and separate Environmental Impact Studies will be required for any further development plans within the Study Area, staking of natural features is not anticipated at this time.*

Existing Conditions

☒ The existing conditions of the Study Area must be clearly described and clearly mapped on aerial photographs.

☒ The NHR will include basic information about the Study Area, including ownership, and location. The description will include the current zoning and all OP and LSP designations on the Study Area. Land use designations will be clearly described and the limits identified in the mapping, as applicable.

☒ The NHR shall identify the components of the City's Natural Heritage System. The boundaries of the City's Natural Heritage System shall be confirmed in the field by the proponent, mapped on a figure in the report and approved by the City.

☒ All designated environmental features must be identified in the mapping and described in the report. These features include provincial or regional Areas of Natural and Scientific Interest (ANSIs), unevaluated wetlands, provincially and Locally Significant Wetlands (PSWs and LSWs, respectively), Environmentally Significant Areas (ESAs), Geological or Landform Features, etc. The descriptions must discuss the value(s) assigned to the features and clearly identify aspects of the features that contribute to its significance, and assess the sensitivity of the feature to the potential development.

☒ A description of the landforms, soil and surficial geology based on a review of available mapping and literature must be described in the NHR. Any staking done to date as well as the calculated hazard limits will be provided on constraints mapping. If available, topographical information will be provided on constraints mapping.

☒ Hydrological and hydrogeological resources and issues, including surface water features, recharge/discharge zones, groundwater quality and quantity, area specific infiltration

groundwater elevations and flow directions, and connections between groundwater and surface water features will be identified based on the information available from the consulting team (i.e. stormwater management report, hydrogeological report, etc.) and potential impacts and mitigation measures related to the natural environment will be incorporated in the NHR

☒ A Headwater Drainage Features (HDF) Assessment will be completed for potential HDF within the Study Area, as per the *Evaluation, Classification, and Management of Headwater Drainage Features Guidelines* (TRCA & CVC, 2014).

☒ The vegetation communities must be identified using the Ecological Land Classification (ELC) system to vegetation type, where possible. Dominant species of trees, shrubs, and or ground cover for each community on the Study Area and in the affected surrounding area will be included in the report. The communities must be identified in the mapping, using the appropriate ELC codes, as well as described in the text. As a component of the ELC, a plant list (see below) must be included in the report. The list must include the presence of federal and provincial threatened or endangered species.

☒ A single-season (summer) botanical survey is required and must be included in the NHR As mentioned above, the list must include the presence of federal and provincial threatened or endangered species.

☒ The NHR requires a breeding bird survey. The survey must be conducted during the breeding bird season at an appropriate time of day in appropriate weather conditions and by a qualified professional. A minimum of two surveys are required and they must follow generally accepted scientific protocols, not necessarily atlasing methods. A list of the breeding birds is required as an appendix. The list must include the presence of federal and provincial threatened or endangered species.

☒ The NHR requires a breeding amphibian survey. The survey must be conducted during the breeding amphibian season and by a qualified professional. For calling amphibians a minimum of three surveys are required. These surveys must span the full amphibian breeding season to ensure that the peak periods of activity for early and late breeding species are accounted for. For non-calling amphibians, appropriate methodology must be used. Incidental observations of individual amphibians on Study Area will also be included in the resulting data set. A list of the breeding amphibians is required as an appendix. The list must include an analysis for the presence of federal, provincial, threatened or endangered species.

☒ Aquatic assessments shall be provided due to the presence of potential suitable fish habitat. Existing data regarding fish species shall be obtained from the Ministry of Natural Resources and Forestry (MNRF) and used as part of the aquatic assessment. The assessment shall include a description of watercourses or other fish habitat on and/or adjacent to the Study Area (where site access is permitted).

[N/A] The aquatic assessments will include community sampling through electrofishing and/or netting during the appropriate season, under a collection permit issued by the MNRF*

Note: Fish community sampling is not proposed at this time.

☒ A functional assessment of the Study Area describing the ecology of the natural heritage features and functions (including components of the natural heritage system) within and adjacent to the Study Area should be provided. The functional assessment may include ecological function, wetland functions, natural heritage features and landscapes, benefits of importance to humans, and corridors and linkages, as required. As part of this assessment the identification of linkages between natural heritage features and areas including (where applicable) surface water features and ground water features will be undertaken.

Evaluation of the Ecological Impacts

☒ Mapping showing natural heritage existing conditions (at a minimum) shall consist of the following:

a) All mapping must have a title, figure number, north arrow, legend and scale or scale bar.
b) A key map to show the Study Area's location in relation to the surrounding major roads and other landmarks.
c) A site location map that provides the regional or watershed context of the Study Area.
d) The extent of the City's current Natural Heritage System and its components; including significant natural areas.
e) Topographic information such as general slope trends and specific features such as valleys or gullies, cliffs or escarpments, hills, drumlins, eskers, kettles, etc., as available.
f) The locations of all watercourses and waterbodies, if applicable.
g) The location of any rare, threatened or endangered species and/or populations shall be identified, if appropriate.
h) The location of significant wildlife habitat features, as defined by the MNRF (2015) (i.e., hibernacula, den, stick nest, etc.) shall be identified.
i) A conceptual development plan.

☒ The potential impacts to the features and functions of natural areas shall be identified and discussed, including an assessment of cumulative impacts at the landscape scale.

☒ An assessment of the potential impact on wildlife at a local, watershed and provincial (if applicable) level shall be provided.

☒ In the case of significant natural features (as confirmed through the field program), the NHR must demonstrate that the prevailing approach would be to encourage that no development or site alteration within the features) with the exception of uses as specified in the OP and/or prior approvals. The NHR must recommend appropriate buffers from significant natural features.

☒ The NHR will include a high-level impact and mitigation analysis for environmental features identified during the background review and field program such as significant natural features and general wildlife habitat areas. The impact and mitigation analysis will integrate the results of the functional assessment (i.e. ecological function, wetland functions, natural heritage features and landscapes, benefits of importance to humans, and corridors and linkages, as required) in

order to identify appropriate ecological due diligence measures that align with the Plan update objectives.

Conclusions

The NHR will address the following:

☒ Conformity with the policies and requirements of the City's OP / LSP

☒ Conformity with the policies and requirements of other applicable planning documents (i.e., PPS, Natural Heritage Reference Manual, etc.)

BELLEVILLE
on the Bay of Quinte

CITY OF BELLEVILLE
LOYALIST SECONDARY PLAN UPDATE

STUDY AREA
FIGURE 1

Legend

Study Area

0 250 500 1,000 Metres

N
W E
S

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: ZJB
MAP CHECKED BY: CE
MAP PROJECTION: NAD 1983 UTM Zone 17N

DILLON CONSULTING

PROJECT: 21-2538
STATUS: FINAL
DATE: 2022-01-11

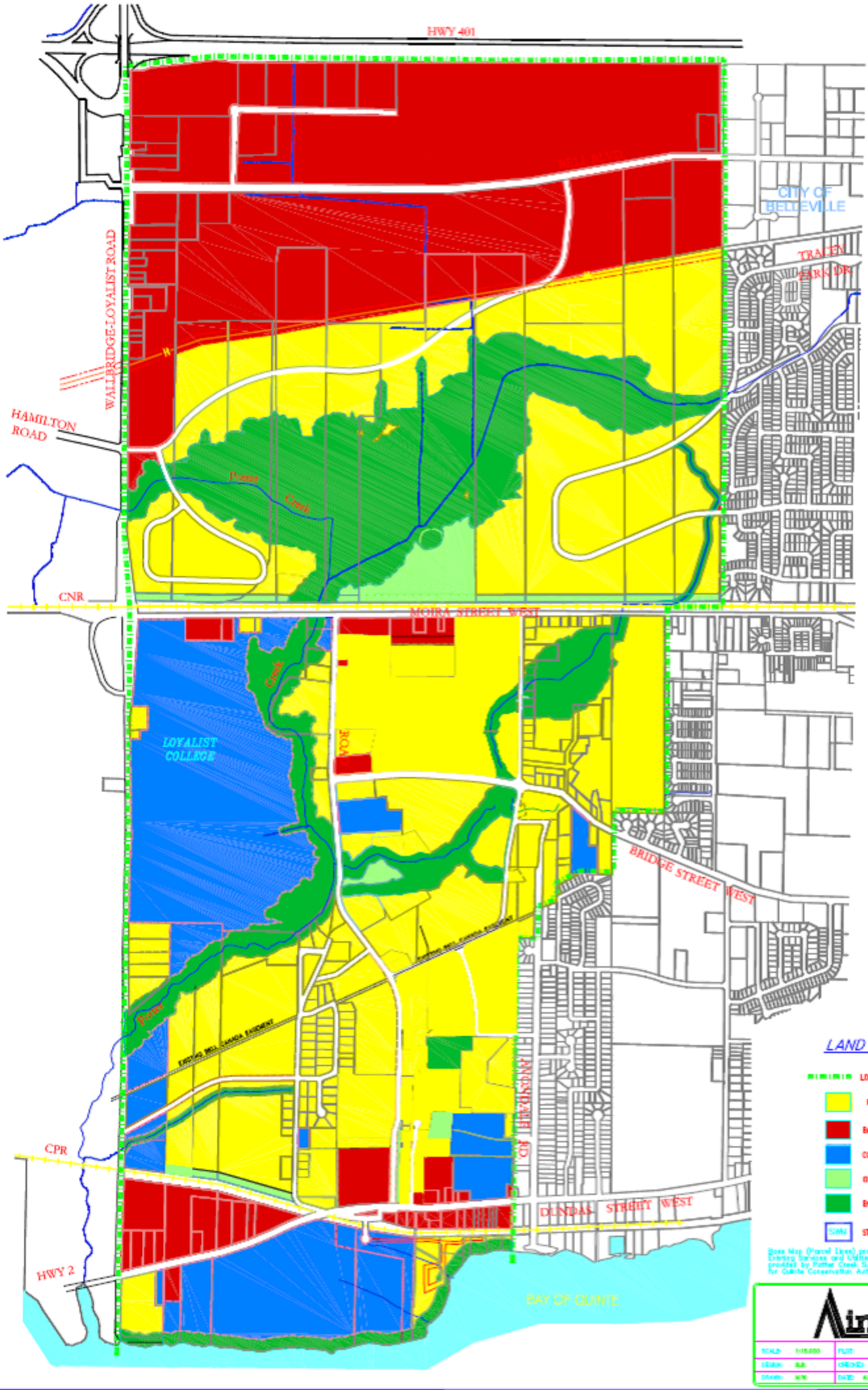
Appendix B

Background Mapping

DILLON CONSULTING

LOYALIST SECONDARY PLAN

SCHEDULE A - LAND USE



Base Map (Parcel Lines) provided by City of Belleville 2004.
Existing Services and Utilities, Environmental Protection Areas provided by Potter Creek Subwatershed Plan, which was prepared for Quinte Conservation Authority in November of 1994.

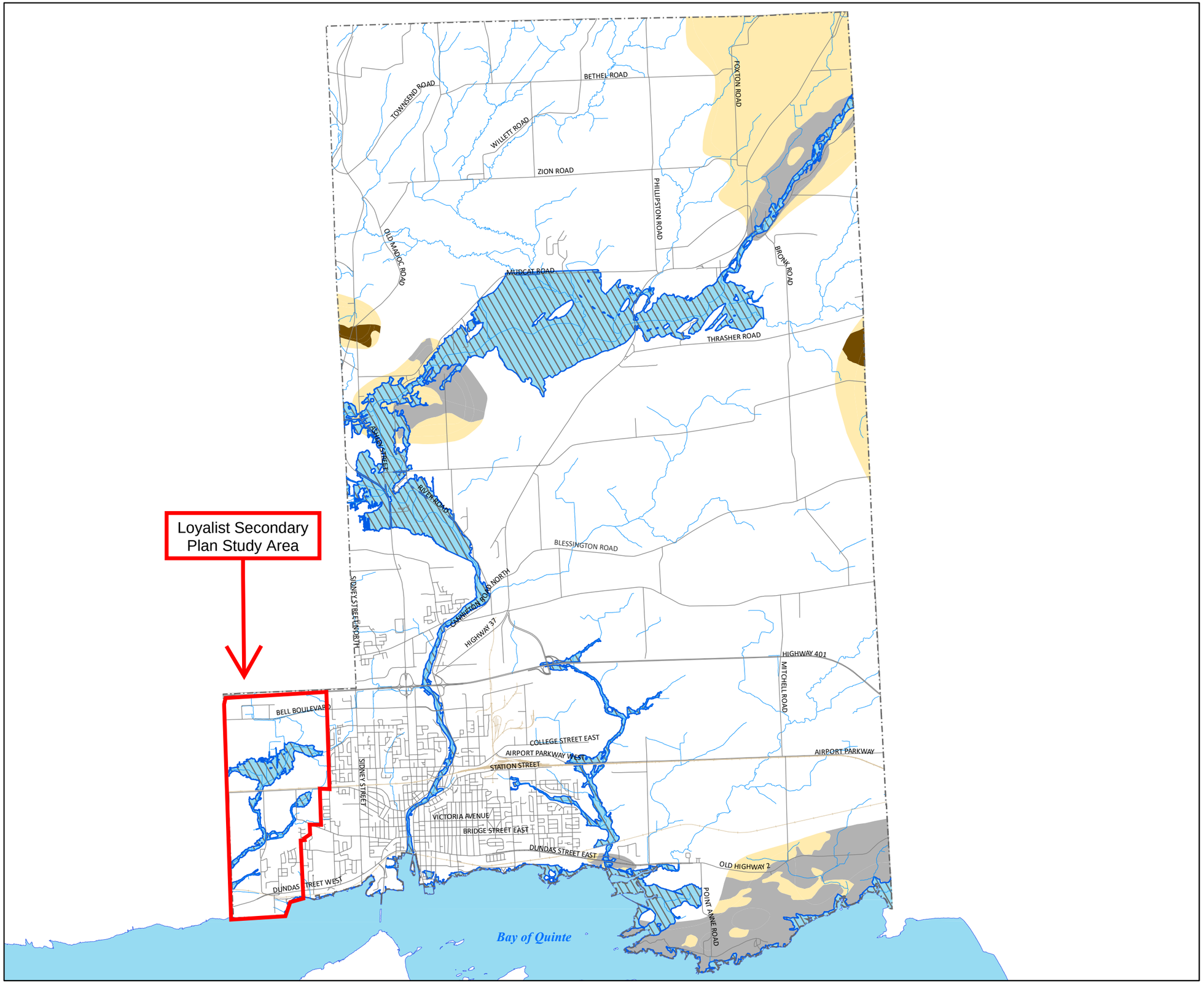
Ainley CONSULTING ENGINEERS PLANNERS

SCALE: 1:15,000	PLOT: 1=1:5	JOB NO. 24519-1	
DESIGN: BLR	CHECKED: BB	DWG. 24519-1	
DRAWN: MCM	DATE: AUG. 22, 2007		

DRAFT

CITY OF BELLEVILLE
OFFICIAL PLAN

Schedule F
Natural Hazard Features



Legend

- Municipal Boundary
- Roads
- Railways
- Watercourses
- Bay of Quinte

Natural Hazard Features

- Floodplain

Karst

- Known
- Inferred
- Potential

Meters
0 500 1,000 2,000 3,000 4,000

SCALE 1:82,500

MAP DRAWING INFORMATION:
ESRI Basemaps, City of Belleville, MNRF (2019), Canvec (2018)

MAP PROJECTION: NAD 1983 UTM Zone 18N , ROTATED 15°

PROJECT: 199902

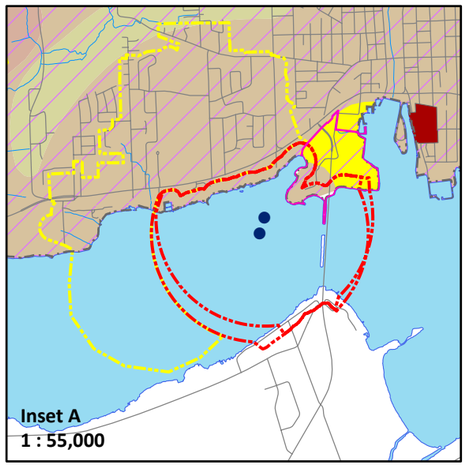
STATUS: DRAFT

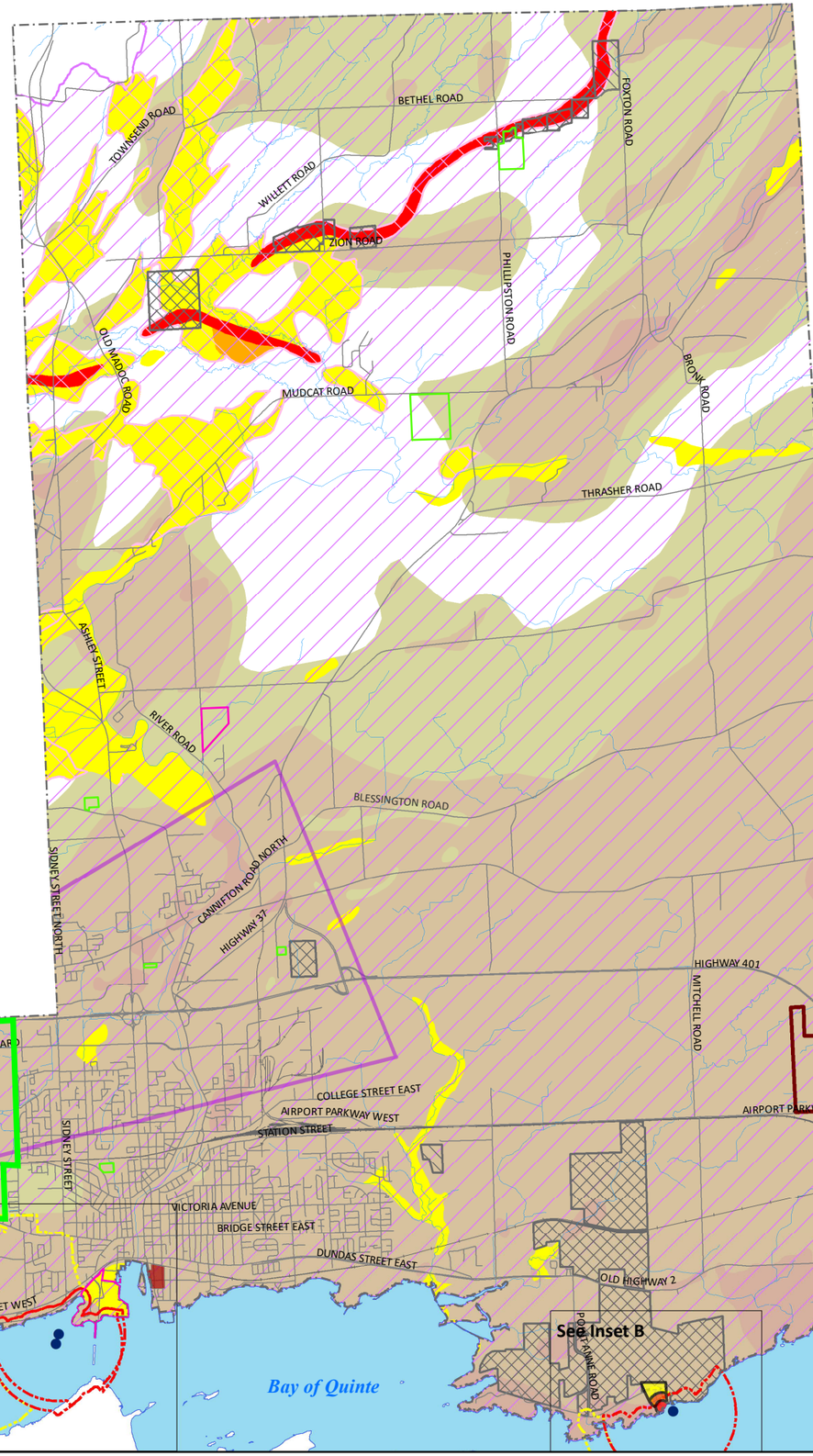
DATE: 2021-10-19

DRAFT

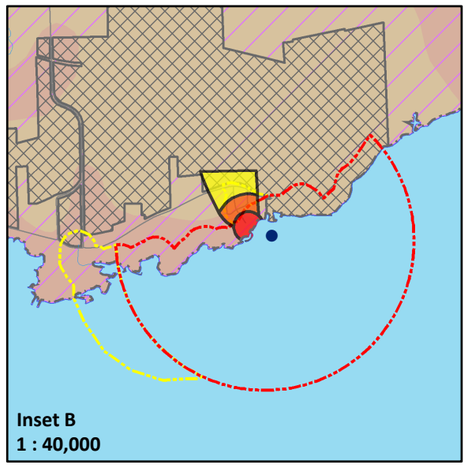
CITY OF BELLEVILLE OFFICIAL PLAN

Schedule G
Constraint Areas





Loyalist Secondary Plan Study Area



- Operating Waste Management Site
- Closed Waste Management Site
- Crown Land (Official Plan policies not applicable)
- Mineral Aggregate
- Mineral Aggregate Licenced
- Significant Groundwater Recharge Areas
- Highly Vulnerable Aquifers
- Wellhead Protection Area A
- Wellhead Protection Area B
- Wellhead Protection Area C
- Intake Protection Zone 1
- Intake Protection Zone 2
- Regulated Bird Hazard and Surface Approach Area for the Trenton Air Force Base

Gravel Deposits

- Sand and Gravel Resource Area (Primary)
- Sand and Gravel Resource Area (Secondary)
- Sand and Gravel Resource Area (Tertiary)

Bedrock

- Paleozoic bedrock outcrop; areas of exposed bedrock partially covered by a thin veneer of drift. Drift thickness is generally less than 1 metre.
- Paleozoic bedrock covered by drift; drift thickness is generally 1 to 8 metres. Bedrock outcrops may occur.
- Paleozoic bedrock covered by drift; drift thickness is generally 8 to 15 metres. Isolated bedrock outcrops may occur.

Other Features

- Drinking Water Intakes
- Municipal Boundary
- Former Industrial Lands
- Roads
- Railways
- Watercourses
- Bay of Quinte

Meters
0 500 1,000 2,000 3,000 4,000

SCALE 1:82,500
MAP DRAWING INFORMATION:
ESRI Basemaps, City of Belleville, MNRF (2019), Canvec (2018), Ministry of Energy, Northern Development and Mines & Quinte Conservation

MAP PROJECTION: NAD 1983 UTM Zone 18N , ROTATED 15°

PROJECT: 199902

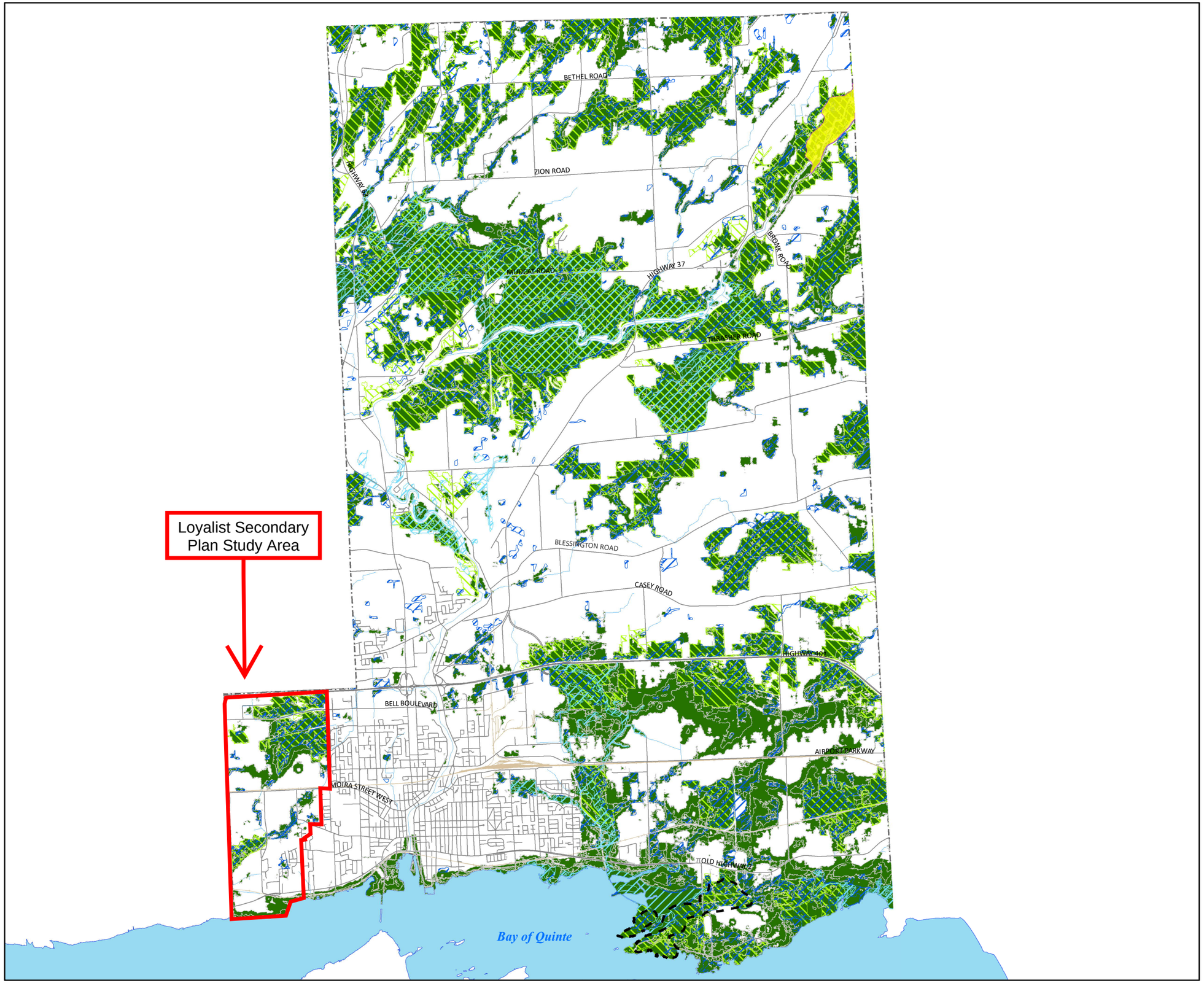
STATUS: DRAFT

DATE: 2021-10-19

DRAFT

CITY OF BELLEVILLE
OFFICIAL PLAN

Appendix C
Natural Heritage Features



Legend

- Areas of Natural Scientific Interest - Earth Science
- Candidate Area of Natural Scientific Interest - Life Science
- Provincially Significant Wetland
- Other Wetlands
- Proposed Significant Wetland
- Proposed Natural Heritage System
- Municipal Boundary
- Roads
- Railways
- Watercourses
- Bay of Quinte

Meters
0 500 1,000 2,000 3,000 4,000

SCALE 1:82,500

MAP DRAWING INFORMATION:
ESRI Basemaps, City of Belleville, MNRF (2019), Canvec (2018), Land Information Ontario

MAP PROJECTION: NAD 1983 UTM Zone 18N , ROTATED 15°

PROJECT: 199902

STATUS: DRAFT

DATE: 2021-10-19

Appendix C

Site Photos

Appendix C – Table 1: Site Photo Log

Photograph 1 **MEF** **Forb Meadow** August 10, 2022 Facing south at the MEF Forb Meadow Ecological Land Classification vegetation community (“community”), from the south side of Bell Boulevard.	

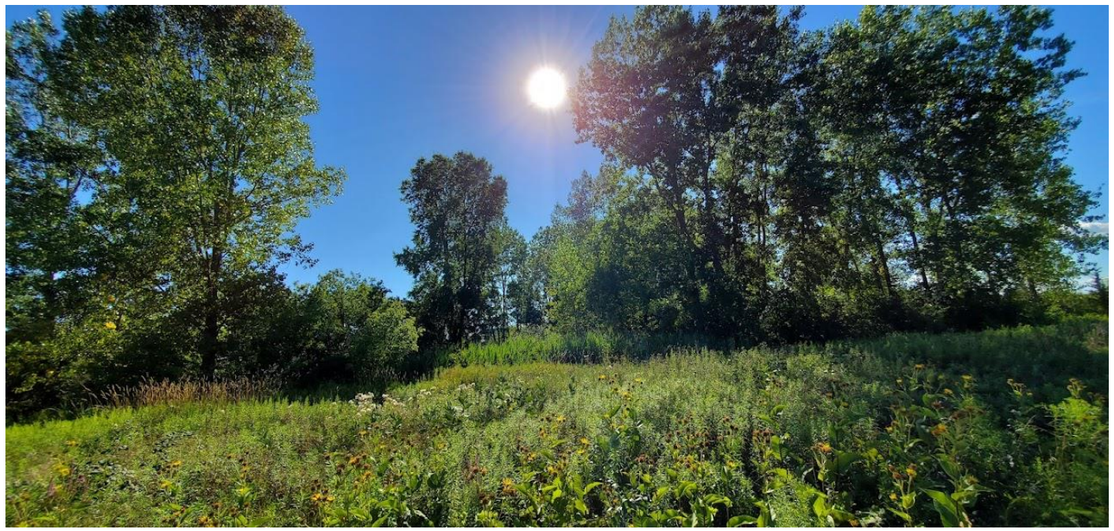
Photograph 2 **MEG** **Graminoid Meadow** August 10, 2022 Facing north from the intersection of Hannafin Road and Enterprise Drive.	
Photograph 3 **MEG** **Graminoid Meadow** August 10, 2022 Facing west from the west side of Avonlough Road, near Susanna Moodie Elementary School.	

Photograph 4 **MEM** **Mixed Meadow** August 11, 2021 Facing south from the interior of the MEM Mixed Meadow community, north of the pedestrian pathway, and east of Avonlough Road.	
Photograph 5 **MEM** **Mixed Meadow** August 11, 2021 Facing south from the interior of the MEM Mixed Meadow community, south of Moira Street West, and near the eastern extent of Loyalist West Secondary Plan Area (“Study Area”) boundary.	

Photograph 6 **TAGM5** **Fencerow** April 7, 2022 Facing west along the fencerow within the Ontario Provincial Police property in the northwest quadrant of the Study Area.	
Photograph 7 **TAGM5** **Fencerow** April 7, 2022 Facing west at the fencerow along an agricultural field that is south of Moira Street West.	

Photograph 8 **THC** **Coniferous Thicket** August 11, 2022 Facing northeast at the disturbed meadow and the western boundary of the THC Coniferous Thicket community from Loyalist College parking lot.	
Photograph 9 **THD** **Deciduous Thicket** August 11, 2022 Facing south at the northern portion of the THD Deciduous Thicket community, south of Moira Street West, and east of Marshall Road near the eastern extent of Study Area boundary.	

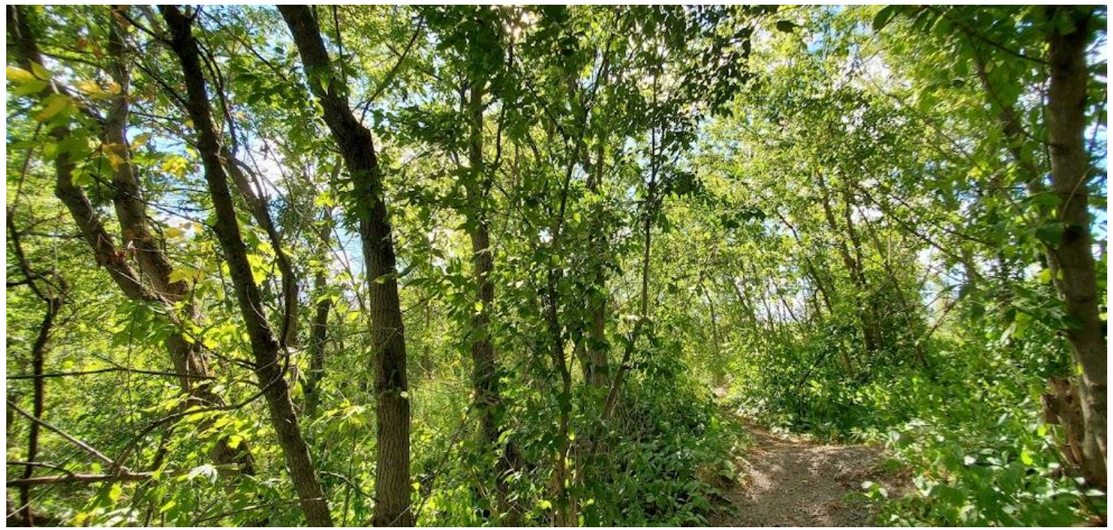
Photograph 10 **THDM2-6** **Buckthorn** **Deciduous Shrub** **Thicket** August 11, 2022 Facing west at the THDM2-6 Buckthorn Deciduous Shrub Thicket community from the west side of Avonlough Road and north of Susanna Moodie Elementary School.	
Photograph 11 **THM** **Mixed Thicket** August 11, 2022 Facing west at the THM Mixed Thicket community from the west side of Marshall Road, at the property entrance.	

Photograph 12 **WOD Deciduous Woodland** August 10, 2022 Facing west at the WOD Deciduous Woodland community, from the west side of Hannafin Road.	
Photograph 13 **WODM5-3 Manitoba Maple Deciduous Woodland** August 10, 2022 Facing west at the WODM5-3 Manitoba Maple Deciduous Woodland community, from the business property access road north off Enterprise Drive	

Photograph 14 **WOM** **Mixed Woodland** August 11, 2022 Facing south at the WOM Mixed Woodland community, from the south side of Dundas Street West.	
Photograph 15 **FOC** **Coniferous Forest** August 11, 2022 Facing northeast at the FOC Coniferous Forest community in the distance, from the Loyalist College parking lot.	

Photograph 16 **FOCM2-1** **Red Cedar** **Coniferous Forest** August 11, 2022 Facing northeast at the boundary of the FOCM2-1 Red Cedar Coniferous Forest community, from the east side of the Enterprise Drive cul-de-sac and northeast of Jack Ellis Way.	
Photograph 17 **FOCM2-1** **Red Cedar** **Coniferous Forest** August 11, 2022 Facing south at the FOCM2-1 Red Cedar Coniferous Forest community, from the south side of Enterprise Drive.	

Photograph 18 **FOCM4-1** **White Cedar** **Coniferous Forest** August 11, 2022 Facing southeast at the interior of the FOCM4-1 White Cedar Coniferous Forest community, from the south side of Potter Creek near Avonlough Road.	
Photograph 19 **FOCM4-1** **White Cedar** **Coniferous Forest** August 11, 2022 Facing south at the interior of the FOCM4-1 White Cedar Coniferous Forest community, from south side of Potter Creek.	

Photograph 20 **FOCM6-3** **Scotch Pine** **Naturalized** **Coniferous** **Plantation** August 11, 2022 Facing west at the FOCM6-3 Scotch Pine Naturalized Coniferous Plantation community, from the west side of Avonlough Road.	
Photograph 21 **FODM4-5** **Manitoba Maple** **Deciduous Forest** August 11, 2022 Facing west from the interior of the FODM4-5 Manitoba Maple Deciduous Forest community, south of the pedestrian pathway, and east of Avonlough Road.	

Photograph 22 **FODM7** **Lowland Deciduous Forest** August 11, 2022 Facing north from the interior of the FODM7 Lowland Deciduous Forest community, north of the pedestrian pathway, and east of Avonlough Road.	
Photograph 23 **FODM8-1** **Poplar Deciduous Forest** August 11, 2022 Facing north from the interior of the FODM8-1 Poplar Deciduous Forest community, north of and adjacent to the pedestrian pathway, and east of Avonlough Road.	

Photograph 24 **FODM9** **Oak – Maple – Hickory Deciduous Forest** August 11, 2022 Facing north at the interior of the FODM9 Oak – Maple – Hickory Deciduous Forest community, from the north side of Bridge Street West.	
Photograph 25 **FOM** **Mixed Forest** August 11, 2022 Facing south at the northern boundary of the FOM Mixed Forest community, from the south side of Bell Boulevard and near the intersection of Bell Boulevard and Jenland South Way.	

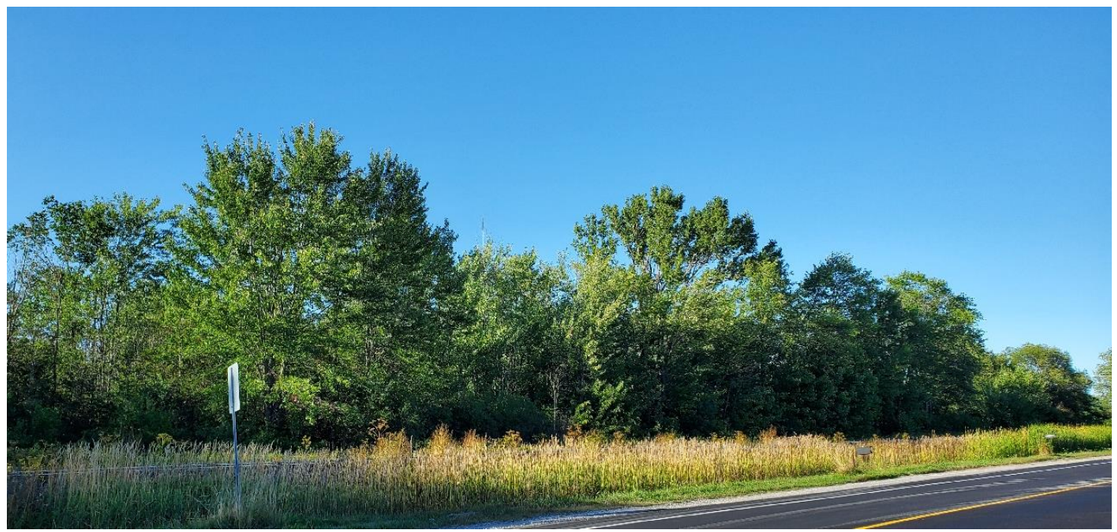
Photograph 26 **FOMM7-2** **White Cedar – Hardwood Mixed Forest** April 7, 2022 Facing south from the interior of the FOMM7-2 White Cedar – Hardwood Mixed Forest community.	
Photograph 27 **FOMM7-2** **White Cedar – Hardwood Mixed Forest** April 7, 2022 Facing east from the interior of the FOMM7-2 White Cedar – Hardwood Mixed Forest community.	

Photograph 28 **MAM** **Meadow Marsh** April 7, 2022 Facing east from the interior of the MAM Meadow Marsh community, located west and near Avonlough Road.	
Photograph 29 **MASM1-1** **Cattail Mineral** **Shallow Marsh** August 11, 2022 Facing north at the MASM1-1 Cattail Mineral Shallow Marsh community within the Potter Creek Tributary Non-Provincially Significant Evaluated Wetland, from the pedestrian pathway that is east of Avonlough Road.	

Photograph 30 **MASM1-14** **Reed Canary Grass Mineral Shallow Marsh** August 11, 2022 Facing east from Avonlough Road at the MASM1-14 Reed Canary Grass Mineral Shallow Marsh community ground layer.	
Photograph 31 **SWT** **Thicket Swamp** August 11, 2022 Facing east at the western boundary of the SWT Thicket Swamp community from Marshall Road.	

Photograph 32 **SWTM5-8** **Non-native Mineral Deciduous Thicket Swamp** August 10, 2022 Facing north at the SWTM5-8 Non-native Mineral Deciduous Thicket Swamp community from the north side of Bell Boulevard.	
Photograph 33 **SWCM1** **White Cedar Mineral Coniferous Swamp** August 10, 2022 Facing east at the SWCM1 White Cedar Mineral Coniferous Swamp community from Jenland South Way.	

Photograph 34 **SWDM2** **Ash Mineral** **Deciduous Swamp** April 7, 2022 Facing west at the interior of the SWDM2 Ash Mineral Deciduous Swamp community from the eastern extent.	
Photograph 35 **SWDM2-2** **Green Ash Mineral** **Deciduous Swamp** August 11, 2022 Facing southwest from corrugated steel pipe outlet, south of pedestrian pathway that is east of Avonlough Road.	

Photograph 36 **SWDM2-2** **Green Ash Mineral Deciduous Swamp** August 11, 2022 Facing south from the pedestrian pathway that is east of Avonlough Road.	
Photograph 37 **SWDM3-1** **Red Maple Mineral Deciduous Swamp** August 11, 2022 Facing northeast at the SWDM3-1 Red Maple Mineral Deciduous Swamp community, from the south side of Moira Street West.	

Photograph 38 **SWDM4-1** **Willow Mineral** **Deciduous Swamp** April 7, 2022 Facing east from within the interior of the SWDM4-1 Willow Mineral Deciduous Swamp community near Wallbridge-Loyalist Road.	
Photograph 39 **SWM** **Mixed Swamp** April 7, 2022 Facing east from the west side of Potter Creek and east of Loyalist College.	

Photograph 40 **OA** **Open Water** April 7, 2022 Facing upstream at Potter Creek from the northern bank, east of and near Wallbridge-Loyalist Road.	
Photograph 41 **CGL** **Green Lands** Facing south at the cemetery from the south of Gracefield Lane.	

Photograph 42 **CVI_1 (Railway) Railway** August 11, 2022 Facing east at the railway alignment, from the north side of Moira Street West and near the eastern boundary of the Study Area.	
Photograph 43 **Disturbed Meadow** August 10, 2022 Facing northeast at the Disturbed Meadow community, from a property entrance along Hannafin Road.	

Photograph 44 **Disturbed Meadow** August 10, 2022 Facing southeast at the Disturbed Meadow community, from the south side of Bell Boulevard, near Shorelines Casino Belleville.	
Photograph 45 **Disturbed Meadow** August 10, 2022 Facing south at the Disturbed Meadow community, from the south side of Bell Boulevard and near the intersection of Jack Ellis Way and Bell Boulevard.	

Photograph 46 **Graded/Construction** April 7, 2022 Facing east at a graded/construction area from the entrance east off Avonlough Road.	
Photograph 47 **Stormwater Management Pond** April 7, 2022 Facing north at a stormwater management pond from the Loyalist College Pathway.	

Photograph 48 **OAGM1** **Annual Row Crops** August 11, 2022 Facing east at the OAGM1 Annual Row Crops community, from the east side of Avonlough Road.	
Photograph 49 **OAGM1** **Annual Row Crops** August 11, 2022 Facing south at the OAGM1 Annual Row Crops community, from the south side of Moira Street West and west of Potter Creek.	

Photograph 50 **Watercourse 1** August 11, 2022 Facing downstream (south) from a culvert crossing on Enterprise Drive. Photo taken from assessment location AQ1-1.	
Photograph 51 **Watercourse 1** April 7, 2022 Facing northeast at watercourse from a culvert crossing that is north of Bell Boulevard. Photo taken from assessment location AQ1-2.	

Photograph 52 **Watercourse 2** August 11, 2022 Facing south at the centre of a watercourse channel from the Shorelines Casino Belleville parking lot nearby. Photo taken from assessment location AQ2-1.	
Photograph 53 **Watercourse 3** August 11, 2022 Facing upstream (east) at the Tracey Park Drive culvert, from the south side of the watercourse. Photo taken from assessment location AQ3-1.	

Photograph 54 **Watercourse 3** August 11, 2022 Facing downstream (west) from the south side of the watercourse near Tracey Park Drive. Photo taken from assessment location AQ3-1.	
Photograph 55 **Watercourse 4a** August 11, 2022 Photo taken from assessment location AQ4a-1. Facing west, parallel to Moira Street West.	

Photograph 56 **Watercourse 4a** August 11, 2022 Facing northeast from the culvert outlet that is west of Marshall Road. Photo taken from assessment location AQ4a-2.	
Photograph 57 **Watercourse 4b** August 11, 2022 Facing east from Marshall Road. Photo taken from assessment location AQ4a-2.	

Photograph 58 **Watercourse 4b** August 11, 2022 Facing west from Marshall Road. Photo taken from assessment location AQ4a-2.	
Photograph 59 **Watercourse 4c** August 11, 2022 Facing south at feature from the north side of Bridge Street. Photo taken from assessment location AQ4c-1.	

Photograph 60 **Watercourse 5** August 11, 2022 Facing southwest at a feature that occurs within Potter Creek Tributary Non-Provincially Significant Evaluated Wetland. Photo taken from assessment location AQ5-1.	
Photograph 61 **Watercourse 5a** August 11, 2022 Facing east at feature origin (outlet) directly west of the Meagher Place cul-de-sac. Photo taken from assessment location AQ5a.	

Photograph 62 **Watercourse 5a** August 11, 2022 Facing north at the outlet of a culvert that crosses a pedestrian path. Photo taken from assessment location AQ5b.	
Photograph 63 **Watercourse 6 – Potter Creek** April 7, 2022 Facing downstream (northeast) from the north alignment of Potter Creek, east of and near Wallbridge-Loyalist Road. Photo taken from assessment location AQ6-4.	

Photograph 64 **Watercourse 6 – Potter Creek** April 7, 2022 Facing upstream (north) from the east side of Potter Creek, near Moira Street West bridge. Photo taken from assessment location AQ6-3.	
Photograph 65 **Watercourse 6 – Potter Creek** April 7, 2022 Facing downstream (south) from the east side of Potter Creek, near Moira Street West bridge. Photo taken from assessment location AQ6-3.	

Photograph 66 **Watercourse 6 – Potter Creek** April 7, 2022 Facing downstream (southwest) from the central alignment of Potter Creek, west of and parallel with Avonlough Road, and northwest of Susanna Moodie Elementary School. Photo taken from assessment location AQ6-2.	
Photograph 67 **Watercourse 6 – Potter Creek** August 11, 2022 Facing downstream (south) from the southern alignment of Potter Creek, west of Avonlough Road at the Loyalist College pedestrian bridge. Photo taken from assessment location AQ6-1.	

Photograph 68 **Watercourse 6 – Potter Creek** August 11, 2022 Facing upstream (north) from the southern alignment of Potter Creek, west of Avonlough Road at Loyalist College pedestrian bridge. Photo taken from assessment location AQ6-1.	
Photograph 69 **Watercourse 6 – Potter Creek** August 11, 2022 Facing upstream (north) from the southern alignment of Potter Creek, west of Avonlough Road and south of Loyalist College pedestrian bridge. Photo taken from south of assessment location AQ6-1.	

Photograph 70 **Watercourse 6 – Potter Creek** August 11, 2022 Facing downstream (south) from the southern alignment of Potter Creek, west of Avonlough Road and south of Loyalist College pedestrian bridge. Photo taken from south of assessment location AQ6-1.	
Photograph 71 **Watercourse 7** April 7, 2022 Facing upstream (east) from the south side of a watercourse within the central portion of the feature alignment. Photo taken from assessment location AQ7-1.	

Photograph 72 **Watercourse 7** April 7, 2022 Facing downstream (west) from the south side of a watercourse within the central portion of the feature alignment. Photo taken from assessment location AQ7-1.	
Photograph 73 **Watercourse 7** April 7, 2022 Facing upstream (east) from the south side of a watercourse within the western portion of the feature alignment.	

Photograph 74 **Pedestrian Pathway** August 11, 2022 Facing west at the eastern entrance of a pedestrian pathway from the Meagher Place cul-de-sac.	

Appendix D

Botanical List

DILLON CONSULTING

Appendix D: Botanical Survey List

Scientific Name	Common Name	SARA[1]	ESA[2]	SRank[3]	CC[4]
Acer negundo	Manitoba Maple	---	---	S5	0
Acer rubrum	Red Maple	---	---	S5	4
Acer saccharinum	Silver Maple	---	---	S5	5
Acer saccharum	Sugar Maple	---	---	S5	4
Acer x freemanii	Freeman's Maple	---	---	SNA	---
Achillea millefolium	Common Yarrow	---	---	SE	---
Alisma triviale	Northern Water-plantain	---	---	S5	---
Ambrosia artemisiifolia	Annual Ragweed	---	---	S5	0
Amphicarpaea bracteata	American Hog-peanut	---	---	S5	4
Anthemis cotula	Stinking Chamomile	---	---	SNA	---
Apocynum androsaemifolium	Spreading Dogbane	---	---	S5	3
Apocynum cannabinum	Hemp Dogbane	---	---	S5	3
Arctium lappa	Greater Burdock	---	---	SNA	---
Arctium minus	Common Burdock	---	---	SNA	---
Asclepias syriaca	Common Milkweed	---	---	S5	0
Barbarea vulgaris	Bitter Wintercress	---	---	SNA	---
Bidens frondosa	Devil's Beggarticks	---	---	S5	3
Bromus inermis	Awnless Brome	---	---	SNA	---
Campanula americana	Tall Bellflower	---	---	S4	8
Carduus acanthoides	Spiny Plumeless Thistle	---	---	SNA	---
Carex cristatella	Crested Sedge	---	---	S5	3
Carex echinata	Little Prickly Sedge	---	---	S5	7
Carex lacustris	Lake-bank Sedge	---	---	S5	5
Carex stipata	Awl-fruited Sedge	---	---	S5	3
Carex vesicaria	Inflated Sedge	---	---	S5	7

Scientific Name	Common Name	SARA[1]	ESA[2]	SRank[3]	CC[4]
Celtis occidentalis	Common Hackberry	---	---	S4	8
Centaurea jacea	Brown Knapweed	---	---	SNA	---
Cichorium intybus	Chicory	---	---	SNA	---
Cicuta bulbifera	Bulb-bearing Water-hemlock	---	---	S5	5
Circaea canadensis	Broad-leaved Enchanter's Nightshade	---	---	S5	3
Cirsium arvense	Canada Thistle	---	---	SNA	---
Cirsium palustre	Marsh Thistle	---	---	SNA	---
Cirsium vulgare	Bull Thistle	---	---	SNA	---
Cornus racemosa	Gray Dogwood	---	---	S5	2
Cornus sericea ssp sericea	Red-osier Dogwood	---	---	S5	2
Cuscuta gronovii var. *gronovii*	Swamp Dodder	---	---	S5?	4
Cynanchum rossicum	European Swallow-wort	---	---	SNA	---
Echinocystis lobata	Wild Mock-cucumber	---	---	S5	3
Echium vulgare	Common Viper's-bugloss	---	---	SNA	---
Epilobium ciliatum ssp. *ciliatum*	Hairy Willowherb or Sticky Willowherb	---	---	S5	3
Erigeron philadelphicus	Philadelphia Fleabane	---	---	S5	1
Eupatorium perfoliatum	Common Boneset	---	---	S5	2
Eutrochium maculatum var. *maculatum*	Spotted Joe Pye Weed	---	---	S5	3
Fraxinus nigra	Black Ash	---	END	S4	7
Fraxinus pennsylvanica	Green Ash	---	---	S4	3
Geum laciniatum	Rough Avens	---	---	S4	4
Glyceria striata	Fowl Mannagrass	---	---	S5	3
Helianthus tuberosus	Jerusalem Artichoke	---	---	SU	---
Hypericum perforatum	Common St. John's-wort	---	---	SNA	---

Scientific Name	Common Name	SARA[1]	ESA[2]	SRank[3]	CC[4]
Impatiens capensis	Spotted Jewelweed	---	---	S5	4
Juglans cinerea	Butternut	END	END	S3?	6
Juglans nigra	Black Walnut	---	---	S4	5
Juniperus virginiana	Eastern Red Cedar	---	---	S5	4
Lactuca serriola	Prickly Lettuce	---	---	SNA	---
Lemna minor	Lesser Duckweed	---	---	S5	2
Lonicera sp.	Honeysuckle species (invasives)	---	---	---	---
Lonicera tatarica	Tartarian Honeysuckle	---	---	SNA	---
Lotus corniculatus	Garden Bird's-foot Trefoil	---	---	SNA	---
Lycopus americanus	American Water-horehound	---	---	S5	4
Lythrum salicaria	Purple Loosestrife	---	---	SNA	---
Maianthemum racemosum	False Solomon's-seal	---	---	S5	4
Malus spp.	Apple species	---	---	---	---
Medicago lupulina	Black Medic	---	---	SNA	---
Melilotus albus	White Sweet-clover	---	---	SNA	---
Mentha arvensis	Wild Mint	---	---	S5	3
Nepeta cataria	Catnip	---	---	SNA	---
Oenothera biennis	Common Evening Primrose	---	---	S5	0
Ostrya virginiana	Eastern Hop-hornbeam	---	---	S5	4
Panicum capillare	Common Panicgrass	---	---	S5	0
Parthenocissus inserta	Thicket Creeper	---	---	S5	3
Parthenocissus quinquefolia	Virginia Creeper	---	---	S4?	6
Pastinaca sativa	Wild Parsnip	---	---	SNA	---
Phalaris arundinacea	Reed Canary Grass	---	---	S5	0
Phleum pratense	Common Timothy	---	---	SNA	---

Scientific Name	Common Name	SARA[1]	ESA[2]	SRank[3]	CC[4]
Phragmites australis ssp. *australis*	European Common Reed	---	---	SNA	---
Picea glauca	White Spruce	---	---	S5	6
Pilea pumila	Canada Clearweed	---	---	S5	5
Pinus strobus	Eastern White Pine	---	---	S5	4
Poa pratensis ssp. *pratensis*	Kentucky Bluegrass	---	---	S5	0
Podophyllum peltatum	May-apple	---	---	S5	5
Populus alba	White Poplar	---	---	SNA	---
Populus deltoides ssp. *deltoides*	Eastern Cottonwood	---	---	S5	4
Populus grandidentata	Large-tooth Aspen	---	---	S5	5
Populus tremuloides	Trembling Aspen	---	---	S5	2
Prunella vulgaris ssp. vulgaris	Self-heal	---	---	SNA	---
Prunus serotina	Wild Black Cherry	---	---	S5	3
Purpletop vervain	Verbena bonariensis	---	---	---	---
Quercus macrocarpa	Bur Oak	---	---	S5	5
Quercus rubra	Northern Red Oak	---	---	S5	6
Ranunculus acris	Tall Buttercup	---	---	SNA	---
Rhamnus cathartica	Common Buckthorn	---	---	SNA	---
Rhus hirta	Staghorn Sumac	---	---	S5	1
Robinia pseudoacacia	Black Locust	---	---	SNA	---
Rubus occidentalis	Black Raspberry	---	---	S5	2
Rubus sachalinensis var. sachalinensis	Wild Red Raspberry	---	---	S5	0
Rumex crispus	Curly Dock	---	---	SNA	---
Sagittaria latifolia	Broad-leaved Arrowhead	---	---	S5	4
Salix alba	White Willow	---	---	SNA	---

Scientific Name	Common Name	SARA[1]	ESA[2]	SRank[3]	CC[4]
Salix bebbiana	Bebb's Willow	---	---	S5	4
Salix fragilis	Crack Willow	---	---	S4?	---
Saponaria officinalis	Bouncing-bet	---	---	SNA	---
Schoenoplectus tabernaemontani	Soft-stemmed Bulrush	---	---	S5	5
Scirpus atrovirens	Dark-green Bulrush	---	---	S5	3
Securigera varia	Common Crown-vetch	---	---	SNA	---
Setaria viridis	Green Foxtail	---	---	SNA	---
Silene vulgaris	Maiden's Tears	---	---	SNA	---
Solanum dulcamara	Climbing Nightshade or Bittersweet Nightshade	---	---	SNA	---
Solidago canadensis var. canadensis	Canada Goldenrod	---	---	S5	1
Spiraea alba	White Meadowsweet	---	---	S5	3
Thlaspi arvense	Field Penny-cress	---	---	SNA	---
Thuja occidentalis	Eastern White Cedar	---	---	S5	4
Tilia americana	American Basswood	---	---	S5	4
Toxicodendron rydbergii	Rydberg's Poison Ivy	---	---	S5	0
Trifolium pratense	Red Clover	---	---	SNA	---
Tussilago farfara	Colt's-foot	---	---	SNA	---
Typha angustifolia	Narrow-leaved Cattail	---	---	SNA	3
Ulmus americana	American Elm	---	---	S5	3
Verbascum thapsus	Common Mullein	---	---	SNA	---
Verbena hastata	Blue Vervain	---	---	S5	4
Vicia cracca	Tufted Vetch	---	---	SNA	---
Vitis riparia	Riverbank Grape	---	---	S5	0
Zanthoxylum americanum	Northern Prickley Ash	---	---	S5	3

Notes:

1 Federal SARA Registry Status: END = Endangered, THR = Threatened, SC = Special Concern
2 Provincial ESA Species at Risk in Ontario List Status: END = Endangered, THR = Threatened, SC = Special Concern
3 Provincial Conservation Rank (SRank): S5= widespread in Ontario (Secure); S4 = apparently secure; S3 = vulnerable; S2 = imperilled; S1 = extremely rare in Ontario; ? = inexact or uncertain; SNA = not applicable/non-native.
4 Coefficient of Conservatism as determined by the NHIC's Floristic Quality Assessment System for Southern Ontario (1995)

"---" denotes no information or not applicable