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Natural Heritage Evaluation – Existing Conditions (Phase 1)
Farewell Heights Secondary Plan, Courtice

Municipality of Clarington

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Farewell Heights Secondary Plan, Courtice

Municipality of Clarington

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Distribution List

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0	Yes	Yes	Municipality of Clarington
0	Yes	Yes	Central Lake Ontario Conservation Authority

Record of Revisions

Revision	Date	Description
0	January 30, 2024	Initial Submission to Municipality of Clarington and Farewell Heights Landowners Group
1	November 25, 2024	Final Phase 1 Submission to Municipality of Clarington and Farewell Heights Landowners Group

R.J. Burnside & Associates Limited

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Table of Contents

Tables

Figures

Graphs

Appendices

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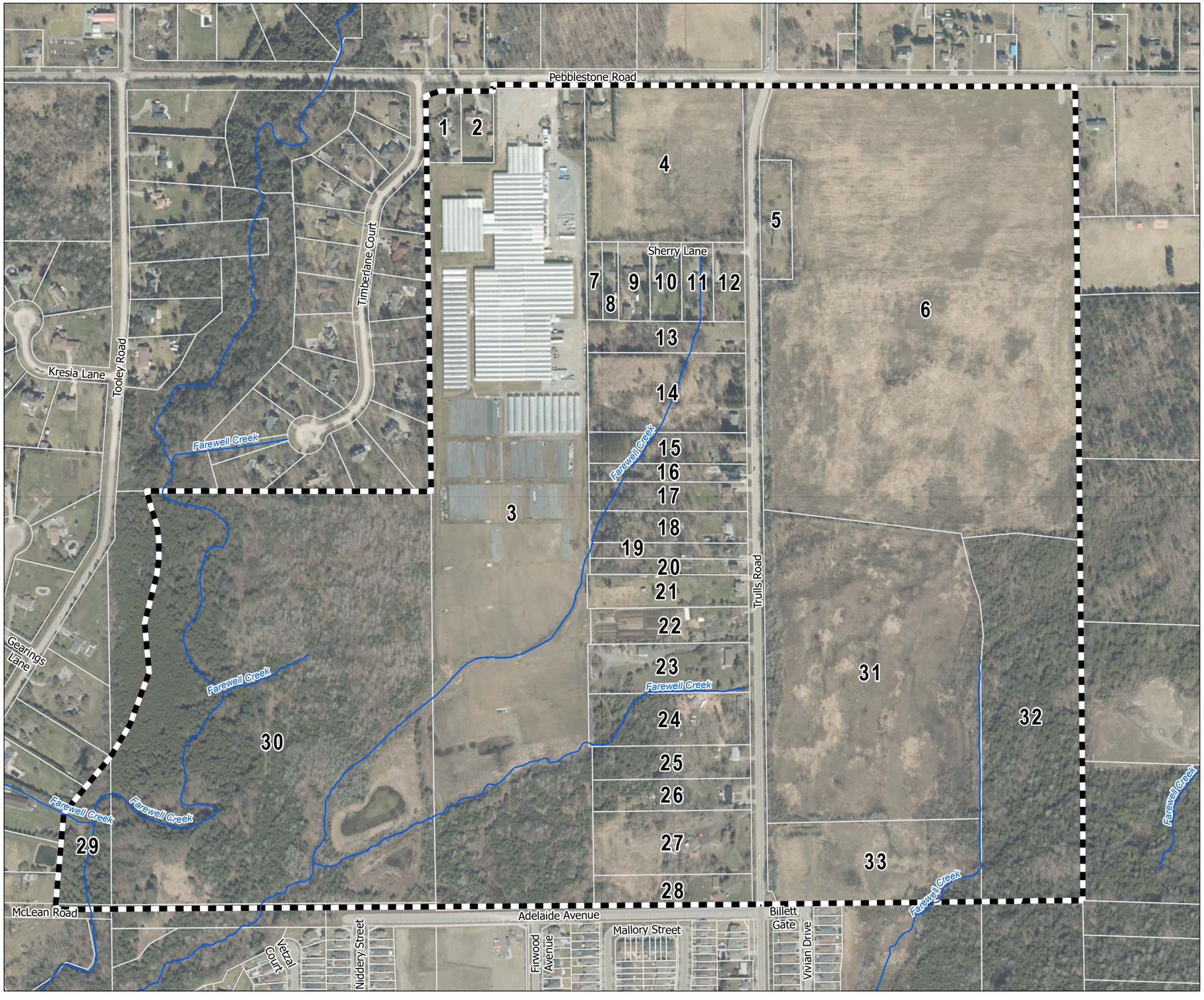
1.0 Introduction

1.1 Background and Purpose

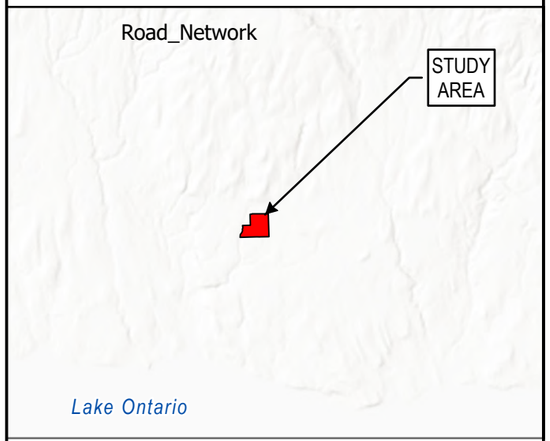
R.J. Burnside & Associates Limited (Burnside) has been retained by the Farewell Heights Landowners Group on behalf of the Municipality of Clarington, to prepare a Natural Heritage Evaluation (NHE) in support of the Farewell Heights Secondary Plan being led by Clarington. The Secondary Plan Area (herein referred to as the "subject lands") is generally located east of Tooley Road, south of Pebblestone Road, west of Courtice Road, and north of the Adelaide Avenue extension in North Courtice in the Municipality of Clarington, Region of Durham (Region). The subject lands are bound by rural residential properties and / or farmland to the north, west, and east and a subdivision to the south.

The Secondary Plan Area is approximately 107 ha in size. The subject lands are within the jurisdiction of Central Lake Ontario Conservation Authority (CLOCA) and Ministry of Environment, Conservation and Parks (MECP) York-Durham District. Any area within 120 m of the subject lands is defined as the "adjacent lands." The location and limits of the Secondary Plan Area are shown in Figure 1.



Secondary Plan Boundary

Watercourse (MNR ARA)



Sources:

1. Ministry of Natural Resources and Forestry,© King's Printer for Ontario.
2. Natural Resources Canada,© His Majesty the King in Right of Canada.

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This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

Datum: North American 1983	
Coord. System: NAD 1983 UTM Zone 17N	
Projection: Transverse Mercator	
Central Meridian: 81°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
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Grid North

0 100 200 300 400

Metres

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TRUSTEE: FAREWELL HEIGHTS LANDOWNERS GROUP
FOR: MUNICIPALITY OF CLARINGTON

Figure Title

FAREWELL HEIGHTS SECONDARY PLAN NATURAL HERITAGE EVALUATION

SUBJECT LANDS

Drawn	Checked	Date	Figure No.
HN	HM	2024/11/18	1
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At the time of Burnside's field investigations in 2023, the Secondary Plan ownership was comprised of three main groups:

- Participating Landowners: Parcels 4, 6, 32, and 33.
- Supportive Landowners: Parcels 3, 30, and 31.
- Non-participating Landowners: Parcels 1, 2, 5, and 7 to 29.

Broadly speaking, the purpose of the Secondary Plan will be to provide more detailed directions for the subject lands regarding land uses, transportation, infrastructure, natural heritage, phasing, and urban design. The area is expected to support residential units with an internal road network, stormwater features, and open space features resulting from retained natural features and their buffers.

The Secondary Plan Area is comprised of a mix of land uses, including large agricultural parcels, smaller residential properties, and a large commercial property (Witzke's Greenhouses Ltd.). The lands also contain natural heritage features, including woodlands and portions of the Harmony-Farewell Creek Iroquois Beach Provincially Significant Wetland (PSW) Complex, three branches of Farewell Creek and associated floodplain that comprise the Environmental Protection Area (EPA). The subject lands were further characterized through the scope of work described below, in support of the Secondary Plan process.

1.2 Scope of Work

This report was prepared in accordance with the approved NHE Terms of Reference (TOR) with Clarington, dated May 3, 2023 (revised March 5, 2024) (Appendix A), Section 4.1 (Natural Heritage) of the Provincial Policy Statement (PPS; MMAH, 2024), the Natural Heritage Reference Manual (NHRM) for Natural Heritage Policies of the PPS, 2005 (MNR, 2010) and the Significant Wildlife Habitat Technical Guide (SWHTG; MNR, 2000).

As outlined in Clarington's Work Plan (issued November 1, 2023), Phase 1 of the Secondary Plan process will focus on initiating the technical analysis and background reports. These background reports include the NHE, as well as other environmental and landscape reports such as Floodplain Analysis, Hydrogeological Assessment, and Landscape Analysis, prepared by Burnside under separate covers. For the environmental component, the focus of Phase 1 is to describe baseline conditions that identify opportunities and constraints to development. Ongoing work will continue in Phase 2 to finalize the NHE in support of the development of land use options, analysis, and refinement of key directions.

As such, the first draft of the NHE includes:

- Planning and environmental policy considerations in the context of the Secondary Plan Area.

- A review of existing secondary source data to identify any known natural features.
- Pre-submission consultation with various agencies to identify additional features and confirm field study methodologies.
- A summary of detailed field assessments that were completed in support of the NHE.
- Identification of Provincially Significant Features.
- Identification and refinement of the Natural Heritage System (NHS), including a preliminary assessment of wildlife linkages and corridors and enhancement and restoration opportunities.
- Opportunities and challenges for development in the context of the natural environment.
- Guidelines for future environmental studies in support of site level development proposals.

The NHE is organized according to this approach. Each of the report sections corresponds with the above objectives.

2.0 Planning and Environmental Policy Considerations

The following policies, *Acts*, and regulations apply to features present on the subject lands.

2.1 *Federal Species at Risk Act*, 2002

The *Species at Risk Act, 2002* (SARA), provides protection for Species at Risk (SAR) and their habitats. Schedule 1 of SARA is considered the official list of wildlife SAR that receive legal protection under the *Act* and includes species that have been assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Extirpated, Endangered, Threatened or Special Concern (Government of Canada, 2023).

To ensure the protection of SAR, Section 32(1) and (2) of the SARA states:

> *(1) No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species, or a threatened species*
>
> *(2) No person shall possess, collect, buy, sell or trade an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species, or any part or derivative of such an individual*

And Section 33 of the SARA states:

> *No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered or threatened species, or that is listed as an extirpated species if a recovery strategy has recommended reintroduction of the species into the wild in Canada*

SARA prohibitions pertaining to private lands include:

- Aquatic species listed on Schedule 1 as Endangered, Threatened, or Extirpated.
- Migratory birds listed under the *Migratory Birds Convention Act* (MBCA) and listed on Schedule 1 as Endangered, Threatened, or Extirpated.
- May apply through an order, to other species listed on Schedule 1 (i.e., not an aquatic or migratory bird species) as Endangered, Threatened, or Extirpated, if provincial / territorial legislation or voluntary measures do not adequately protect the species and its habitat.

Although Environment and Climate Change Canada (ECCC) is the overall administrator of SARA, responsibility for implementation of the *Act* is shared by ECCC and the Canadian Wildlife Service, Parks Canada and Department of Fisheries and Oceans (DFO). On private lands, ECCC oversees matters related to migratory birds, while DFO oversees matters related to aquatic species. In most cases pertaining to non-aquatic species on private lands, provincial laws (e.g., the *Endangered Species Act, 2007*) provide protection for critical habitat (i.e., habitat that is necessary for the survival or recovery of a listed endangered, threatened, or extirpated species). Alternatively, SARA prohibitions can be applied by an order, as described above, or through federal legislation (including SARA).

2.2 *Federal Fisheries Act*, 1985

Construction activities that have the potential to impact fish or fish habitat must be constructed and operated in compliance with the federal *Fisheries Act*. If the "*death of a fish by means other than fishing*", or the "*harmful alteration, disruption or destruction of fish habitat*" will likely result from a project, the proponent responsible for the activities is required to obtain an *Authorization* from DFO as per Paragraph 34.4(2) and 35(2)(b) of the *Fisheries Act.*

The federal *Fisheries Act* prohibits causing the "*death of fish by means other than fishing*", and the "*harmful alteration, disruption or destruction (HADD) of fish habitat*". If construction activities have the potential to cause the death of fish, or HADD of fish habitat, then the project must be submitted to the Department of Fisheries and Oceans (DFO) as a Request for Review. The proponent responsible for the activities is required to obtain an *Authorization* from DFO as per Paragraph 34.4(2) and 35(2)(b) of the *Fisheries Act.*

2.3 *Federal Migratory Birds Convention Act*, 1994 and Migratory Birds Regulations, 2022

The MBCA and Migratory Birds Regulations (MBR) are federal legislative requirement that are binding on members of the public and all levels of government, including federal and provincial governments. The legislation protects certain species[1], controls the harvest of others and prohibits the commercial sale of all species.

The MBCA has recently updated and modernized the MBR. The new MBR came into force on July 30, 2022. Further regulatory amendments are planned.

The previous regulations protected the nests of all migratory birds, at all times, for as long as they existed, which meant that many nests were protected when they no longer benefited migratory birds. The new MBR provides protection to migratory bird nests when they are considered to have a high conservation value for migratory birds.

The nests of all migratory bird species are protected when they contain a live bird or a viable egg. The nests of 18 species (listed in Schedule 1 of the regulations), whose nests are reused by migratory birds, continue to have year-round nest protection, unless they have been shown to be abandoned. To be considered abandoned:

- Minister must be notified, via an online registration system (Notice: Abandoned Nest Registry – Canada.ca) that the nest does not contain a live bird or viable egg.
- Nest is to remain unused by migratory birds during the designated wait time for that species.
- Of the 18 species, three are known to commonly breed in Southern Ontario: Great Blue Heron, Green Heron, and Pileated Woodpecker.

Permits are available under limited circumstances and mostly relate to egg or nest destruction, or relocation "*for the purpose of reducing the danger that they are causing or are likely to cause to human health or public safety or the damage they are causing or are likely to cause to agricultural, environmental or other interests.*" Environment Canada and the Canadian Wildlife Service have compiled nesting calendars that show the variation in nesting intensity, by habitat type and nesting zone, within broad geographical areas distributed across Canada. While this does not mean nesting birds will not nest outside of these periods, the calendars can be used to greatly reduce the risk of encountering a nest. Environment Canada advises avoidance as the best approach.

[1] *Bird species not regulated under the Act include Rock dove, American crow, Brown-headed cowbird, Common grackle, House sparrow, Red-winged blackbird, and European starling. In addition, raptors are not regulated under the MBCA. However, they are protected under provincial legislation which restricts and regulates the taking or possession of eggs and nests. Furthermore, if the species identified is protected under Ontario's ESA or the federal SARA, additional restrictions may apply.*

2.4 *Provincial Planning Act*, 1990

Section 2 of the *Planning Act* contains matters of provincial interest that approval authorities must have regard to in carrying out the responsibilities under the *Act*. The matters of provincial interest include the protection of ecological systems, including natural areas, features, and functions.

2.4.1 Provincial Planning Statement, 2024

The Provincial Planning Statement (PPS; MMAH, 2024) provides general policies on land use patterns, resources, and public health and safety that guide development across Ontario. All planning decisions are required to be consistent with the applicable provisions of the PPS.

Eight types of natural heritage features are identified in Section 4.1, Policies 4.1.4 and 4.1.5 of the PPS, where development and site alteration are not permitted unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. The NHRM (MNR, 2010) provides criteria for identifying provincially significant features; these are listed below and described in more detail in Section 6.0 of this report:

1. Significant Wetlands in Ecoregions 5E, 6E, and 7E.
2. Significant Coastal Wetlands.
3. Significant Wetlands in the Canadian Shield, north of Ecoregions 5E, 6E, and 7E.
4. Significant Woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River).
5. Significant Valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and St. Marys River).
6. Significant Wildlife Habitat (SWH).
7. Significant Areas of Natural and Scientific Interest (ANSIs).
8. Coastal wetlands in Ecoregions 5E, 6E, and 7E that are not subject to Policy 2.1.4(b).

Section 4.1, Policies 4.1.6, 4.1.7, and 4.1.8 identifies three additional development and site alteration prohibitions and exemptions, as follows:

1. Fish habitat, except in accordance with provincial and federal requirements.

2. Habitat of Endangered and Threatened species, except in accordance with provincial and federal requirements.

3. On adjacent lands to the natural heritage features and areas identified in Policies 4.1.4, 4.1.5, and 4.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

The presence, or potential presence, of these features as well as the policy and planning implications of these features for development, are discussed in detail in this report.

2.5 *Provincial Endangered Species Act*, 2007

The *Endangered Species Act, 2007* (ESA) provides protection for SAR and their habitat. The ESA is now administered by MMECP and provides policies for the protection of Extirpated, Endangered, and Threatened species, as well as species of Special Concern. These four categories of species form the Species at Risk in Ontario (SARO) List, which are classified by the Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is also responsible for maintaining criteria for assessing and classifying SAR.

The ESA helps protect species (Section 9) and their habitat (Section 10). Section 9(1)(a) of the ESA states:

> *No person shall kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species.*

Section 10(1)(a) of the ESA states:

> *No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario List as an endangered or threatened species.*

The ESA includes general habitat regulations, as well as species-specific habitat regulations. Species up listed to Endangered, or Threatened, automatically receive general habitat protection under the ESA. The province is then required to prepare a species recovery strategy and establish a habitat regulation according to requirements of the ESA.

Regulatory amendments under the ESA were issued by the province in 2022, which streamlines ESA Authorizations for activities that have “predictable effects and common and routine mitigation actions with well understood requirements to minimize adverse impacts”. Proponents are still required to avoid and minimize impacts on SAR and their habitats.

The use of a SAR Conservation Fund has been enabled for five designated conservation fund species when they seek permits and agreements related to these species (Eastern Whip-poor-will (*Antrostomus vociferus)*, Blanding's turtle (*Emydoidea blandingii*)), or register for conditional exemptions (Eastern meadowlark (*Sturnella magna)*, Bobolink (*Dolichonyx oryzivorus)*, and Butternut (*Juglans cinerea*)).

The SARO List is updated from time to time; therefore, it is the proponent's responsibility to practice due diligence to ensure that the ESA and its regulations are not violated.

2.6 Provincial Greenbelt Plan, 2017

The Greenbelt Plan (Government of Ontario, 2017) establishes the Protected Countryside designation to enhance the extent of protected lands covered by the Niagara Escarpment Plan (NEP) and the Oak Ridges Moraine Conservation Plan (ORMCP), while also improving linkages between these areas and the surrounding major lake systems and watersheds. The Greenbelt Plan sets out three geographically specific policies that apply within the Protected Countryside designation: the Agricultural System, the Natural System, and Settlement Areas, as well as general policies that apply throughout the Protected Countryside.

The Natural System of the Protected Countryside is made up of an NHS and a Water Resource System that together protect ecologically and hydrologically significant features, areas, and functions.

The NHS is an overlay that applies to the prime agricultural area and rural lands designations contained in official plans. As such, permitted uses are those set out within the prime agricultural area and rural lands policies and designations of official plans, subject to the Natural System policies of the Greenbelt Plan. The Greenbelt Plan also identifies Towns / Villages and Hamlets of varying sizes and urban river valleys, which support the achievement of healthier and safer communities that are more resilient to climate change.

The subject lands are just outside the Greenbelt boundary; however, Farewell Creek and surrounding valley land fall within the Greenbelt Urban River Valley Area designation.

2.7 Central Lake Ontario Conservation Authority

2.7.1 *Conservation Authorities Act*, 1990

On April 1, 2024, amendments to the *Conservation Authorities Act* (*CA Act*) governing the permitting process were proclaimed including a new section, "Part VI – Regulation of Areas Under Which Authorities Have Jurisdiction". A new Minister's regulation for all Conservation Authorities was approved on February 16, 2024, Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits, and also came into effect on April 1,

2024. This new, single regulation replaces all existing individual CA permit regulations including CLOCA's Ontario Regulation 42/06.

Part V of the *CA Act* sets out the Regulatory Powers of conservation authorities. Specifically, the *CA Act* prohibits, in the absence of a permit "activities to straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or to change or interfere in any way with a wetland." Development activities are also prohibited in hazardous lands, wetlands, river or stream valleys, and shorelines in the absence of a permit.

2.7.2 Ontario Regulation 41/24

To implement, in part, the provisions of Part VI of the *CA Act*, Ontario Regulation 41/24 has been made by MNR, which has application to all CAs in the province, including CLOCA. The principal mandate of CLOCA is to prevent the loss of life and property due to flooding and erosion and to conserve and enhance natural resources. Ontario Regulation 41/24 is a key tool in fulfilling this mandate because it prevents or restricts development activity in areas where the control of flooding, erosion, dynamic beaches, unstable soil, or bedrock may be affected by development. Further development activity is prohibited if an activity is likely to create conditions or circumstances that, in the event of a natural hazard, might jeopardize the health or safety of people or result in damage or destruction of property.

CLOCA will assess any future permit applications to determine if the proposed works will affect regulated features, in accordance with their programs and policies.

Lands regulated by CLOCA on the subject lands include:

- Wetlands (unevaluated).
- Harmony-Farewell Iroquois Beach evaluated PSW Complex.
- Farewell Creek (mainstem) and tributaries.
- Floodplain / Hazard lands.
- Headwater Drainage Features (HDFs).

2.7.3 CLOCA Guidelines and Policies

2.7.3.1 Watershed Policies, Guidelines, and Plans

- Policy and Procedural Document for Land Use Planning and Regulation was revised and approved by CLOCA's Board to implement Ontario Regulation 41/24 and became effective on April 1, 2024.
- Wildlife Corridor Protection Enhancement Plan, Second Edition (2022)
- Riparian Corridors Restoration Plan (2017)
- Instream Barrier Action Plan (2017)
- Black / Harmony / Farewell Creek Watershed Existing Conditions Report (2011)

- Black / Harmony / Farewell Creek Watershed Plan (2013) and Update (2020)

2.8 Official Plans

2.8.1 Envision Durham Official Plan, 2024

On September 3, 2024, the Region of Durham received notice from the Ministry of Municipal Affairs and Housing (MMAH) that Envision Durham – the new Regional Official Plan (OP) – has been approved in part, with modifications, and is now in effect. Work on a consolidated version of the new OP is underway.

Map 1 Regional Structure – Urban and Rural Systems – shows the subject lands within the Urban Area Boundary; Greenlands System – Major Open Space Areas, Community Areas and Delineated Built Boundaries designations are also present as part of the Urban System. Map 2a shows portions of the subject lands as Regional Natural Heritage System and Future Enhancement Opportunity Areas; Map 2c shows Key Natural Hydrologic Features on the subject lands including Provincially Significant Wetlands, Permanent and Intermittent Streams, and Greenbelt Plan – Urban River Valleys.

Applicable land use planning and natural heritage policies include:

- Urban System.
- Protected Greenlands System (Greenbelt Urban River Valleys, Regional NHS).
- Key Natural Hydrologic Features.

2.8.2 Municipality of Clarington Official Plan, 2018

The Clarington OP (2018) establishes a long-term vision for the Municipality, manages growth and development, and guides capital investment decisions now and into the future. The subject lands are within the Urban Boundary (Map A2) and are designated as EPA and Urban Residential. The NHS (Map D1) coincides with the watercourse and tributaries, forest, and wetland features on-site.

Applicable land use planning and natural heritage policies:

- NHS.
- Watershed and Subwatershed Plans.
- Secondary Plans.
- Hazards
- EPA.
- Special Study Area.

Generally, development and site alteration within a natural heritage feature and / or a hydrologically sensitive feature, or within its Vegetation Protection Zone (VPZ), is prohibited (with some exceptions).

The subject lands are also within the Lake Iroquois Beach physiographic landform. Clarington's OP provides guidance on development in this landform. Specifically, Section 3.4.32 states "*The extensive wetlands, forested areas, and wildlife habitat of the Lake Iroquois Beach provides an east-west natural corridor across the Municipality. This landform is also valued for its groundwater recharge and discharge functions, its landscape features, and its aggregate resources.*"

And Section 3.4.33 states "*…the Municipality shall endeavor to maintain the form, character and variety of landscapes within the Lake Iroquois Beach by encouraging only minimal modification to the natural contours of the land and the retention of natural landscape features, including woodlands and wetlands.*"

2.8.2.1 Woodlot Preservation By-law 97-35 (Consolidation date November 22, 2021)

Applies to:

- All lands defined as "woodlots" by Section 2 of the By-law.
- Any tree within lands designated EPA on Map A of the Official Plan.
- Any tree within 120 m of a wetland as identified on Map C of the Official Plan.

"Woodlots" are defined as an area 0.2 ha in area or greater having not less than:

- 200 trees of any size in a 0.2 ha area.
- 150 trees measuring more than 5 cm dbh in a 0.2 ha area.
- 100 trees measuring more than 12 cm dbh in a 0.2 ha area.
- 50 trees measuring more than 20 cm dbh in a 0.2 ha area.

3.0 Background Records Review and Agency Consultation

A comprehensive desktop assessment was completed for existing natural heritage information available for the subject lands. All areas within 120 m of the subject lands were reviewed as part of the high-level assessment to identify significant natural heritage features located within, or directly adjacent to the subject lands, which may be impacted by future development.

Information reviewed included, but was not limited to, the following sources:

- Aerial photographic imaging and 1:10,000 Ontario Base Mapping (OBM).
- DFO Aquatic SAR mapping.
- Ministry of Natural Resources (MNR) Make a Map: Natural heritage Areas to identify natural heritage features and Natural Heritage Information Centre (NHIC) data of rare wildlife species on, and in the vicinity of, the subject lands: 1 x 1 km^2 Squares: 17PJ7666, 17PJ7766, 17PJ7665, 17PJ7765.
- MNR Land Information Ontario (LIO) database.

- MNR Aquatic Resource Area (ARA) summary data.
- MNR Online GeoHub Search (Nesting Sites, White-tailed Deer Wintering Areas).
- MNR Harmony-Farewell Iroquois Beach PSW Complex Evaluation (2005), and Addendum (2006).
- Ontario Hydrology Network (OHN) mapping.
- The Ontario Breeding Bird Atlas (OBBA) 2001-2005 – 10x10 km^2 Square 17PJ76.
- Ontario Reptile and Amphibian Atlas (ORAA) – 10x10 km^2 Square 17PJ76.
- iNaturalist records.
- eBird records.
- CLOCA Regulated Areas and features mapping.
- CLOCA Management Plans, Subwatershed Studies, etc.
- CLOCA Guidelines, Policies and Strategies (various documents).
- CLOCA Regional and Local Rarity Flora and Fauna list
  - Varga et al. 2000 for Durham Region and Site District 6E-7.
  - Varga, Leadbeater, D., Webber, J., Kaiser, J., Crins, B., Kamstra, J., Banville, D., Ashley, E., Miller, G., Kingsley, C., Jacobsen, C., Mewa, K., Tebby, L., Mosley, E., and Zajc, E. 2000. Distribution and Status of the Vascular Plants of the Greater Toronto Area. Ontario Ministry of Natural Resources Aurora District. 103 pp.
  - Riley et al. 1989 for Durham (Pickering-Uxbridge-Brock-Oshawa-Whitby-Ajax-Scugog-Clarington).
  - Riley, J. et al. 1989. The Distribution and Status of the Vascular Plants of Central Region. Ontario Ministry of Natural Resources, Central Region, Richmond Hill, ON.
- Envision Durham Official Plan (2024).
- Municipality of Clarington Official Plan (2018).

The subject lands are in the jurisdiction of CLOCA and MECP York-Durham District. Species protected under the ESA are administered by MECP, Species at Risk Branch.

As stated in Section 2.7, online CLOCA Regulation mapping shows portions of the subject lands are regulated by CLOCA. These areas are associated with:

- Wetlands (unevaluated).
- Harmony-Farewell Iroquois Beach PSW Complex.
- Farewell Creek (mainstem) and tributaries.
- Floodplain / Hazard lands.
- HDFs.

3.1 Terrestrial Habitat

3.1.1 Wildlife

The following is a summary of potential wildlife habitat identified on the subject lands, based on a review of background aerial imagery, databases, reports:

- Wetlands that may support amphibian breeding habitat, including salamander habitat.
- Breeding bird habitat (e.g., grassland, wetland, forest).
- Mixed Wader Nesting Colony.
- Colonial Waterbird Nesting Area.
- Raptor nesting habitat.
- Bat maternity roosting habitat.
- Wildlife linkages and corridors.
- SWH.
- SAR and Species of Conservation Concern (SCC).

SWH and SAR confirmed during Burnside's field investigations are summarized further in Section 6.5 and Section 6.6. SWH and SAR screening tables are provided in Appendix B.

3.1.2 Vegetation Communities and Species

NHIC mapping, CLOCA ELC mapping as well as MNR's Harmony-Farewell Iroquois Beach PSW Complex Evaluation (2005) and Addendum (2006) were reviewed. Based on this review, portions of the subject lands are identified as wetlands with units of the Harmony-Farewell Iroquois Beach Wetland Complex, located in the southeast and scattered across the NHS in the southwest portions of the subject lands.

The following is a summary of potential vegetation communities identified on the subject lands, based on a review of background aerial imagery, databases, and reports:

- Wetland communities (meadow marsh, graminoid meadow, swamp).
- Cultural habitats (constructed pond, hedgerow, meadow, woodland, thicket).
- Deciduous, coniferous, and mixed forest.
- Agricultural, commercial, and rural residential land.
- Locally rare flora.
- SAR and SCC.

3.2 Aquatic Habitat

Three branches of Farewell Creek (the watercourse) flow through the subject lands, generally in a north to south direction. The MNR Aquatic Resources Area (ARA)

mapping indicates that all watercourses within the subject lands have a coldwater thermal regime.

The westernmost branch is the mainstem of Farewell Creek and it flows through Pebblestone Road to the north and continues through the subject lands and the NHS. This report refers to the mainstem of Farewell Creek as FC-1.

Intersecting the subject lands, west of Trulls Road, two tributaries of Farewell Creek flow from east to west through agricultural lands. These two tributaries form a confluence approximately 70 m north of the west end of Adelaide Avenue and discharge to FC-1 approximately 2,030 m downstream of Pebblestone Road. The north and south reaches of this feature are referred to as FC-2A and FC-2B. Downstream of the confluence of reaches 2-A and 2-B, the watercourse is referred to as FC-2.

West of Trulls Road there is a feature that flows from north to south. It eventually discharges to FC-1 south of the subject lands. This reach is referred to as FC-4.

MNR ARA mapping does not include records of fish sampling within the mainstem of Farewell Creek, or its tributaries. There is a list of fish that have been observed within Farewell Creek, although the mapping does not provide records of location or date of species observance. A summary of documented fish species in Farewell Creek is outlined in Table 1, below.

Table 1: Fish Species Historically Observed in Farewell Creek

Species Name	Scientific Name	Thermal Regime
American brook lamprey	*Lethenteron appendix*	Cold
Blacknose dace	*Rhinichthys spp.*	Cool
Bluegill	*Lepomis macrochirus*	Warm
Bluntnose minnow	*Pimephales notatus*	Warm
Brook stickleback	*Culaea inconstans*	Cool
Brown bullhead	*Ameiurus nebulosus*	Warm
Brown trout	*Salmo trutta*	Cold
Common shiner	*Luxilus cornutus*	Cool
Creek chub	*Semotilus atromaculatus*	Cool
Fantail darter	*Etheostoma flabellare*	Cool
Fathead minnow	*Pimephales promelas*	Warm
Golden shiner	*Notemigonus crysoleucas*	Cool
Green sunfish	*Lepomis cyanellus*	Warm
Johnny darter	*Etheostoma nigrum*	Cool
Logperch	*Percina caprodes*	Warm
Longnose dace	*Rhinichthys cataractae*	Cool
Mottled sculpin	*Cottus bairdii*	Cold

Species Name	Scientific Name	Thermal Regime
Northern brook lamprey	*Ichthyomyzon fossor*	Cool
Northern redbelly dace	*Chrosomus eos*	Cool
Pumpkinseed	*Lepomis gibbosus*	Warm
Rainbow darter	*Etheostoma caeruleum*	Cool
Rainbow trout	*Oncorhynchus mykiss*	Cold
Rock bass	*Ambloplites rupestris*	Cool
Sea lamprey	*Petromyzon marinus*	Cool
Slimy sculpin	*Cottus cognatus*	Cold
Spottail shiner	*Hudsonius hudsonius*	Cool
White sucker	*Catostomus commersonii*	Cool
Yellow perch	*Perca flavescens*	Cool

A review of ARA data for spawning habitat does not identify any occurrences or documentation in the immediate vicinity of the subject lands, although that does not preclude spawning potential. Aquatic SAR habitat and occurrences were not identified on the subject lands, based on a review of the DFO aquatic SAR screen tool and NHIC mapping.

CLOCA's Black / Harmony / Farewell Creek Watershed Plan Update (2020) indicates the subject lands and vicinity contain ecologically significant groundwater recharge areas, as well as high vulnerability aquifers. CLOCA's Instream Barrier Action Plan (2017) highlighted the management plan for the 18instream barriers in the watershed. There are no instream barriers on the subject lands, or vicinity.

4.0 Field Methodology

Field investigations were completed in accordance with the approved NHE TOR with Clarington dated May 3, 2023 (revised March 5, 2024), which included documentation of any confirmed or candidate SAR and / or SAR habitat and are included in the detailed SAR Screening Table in Appendix B. Field methodologies and findings are detailed below. Provincially significant features, including SWH and SAR, are discussed further in Section 6.5 and Section 6.6.

Burnside ecologists were granted permission to enter parcels associated with the Participating and Supportive Landowners. No permission was granted to enter parcels of Non-participating Landowners; therefore, these were surveyed from adjacent lands or roadside, where feasible.

4.1 Vegetation Communities and Species

Detailed surveys to characterize vegetation communities and species were conducted by Burnside for the entirety of the subject lands, plus 50 m into the adjacent lands,

where possible. Where access to properties was not permitted, CLOCA ELC was verified through aerial imagery and roadside observation. All species herein are described according to nomenclature and S-ranks provided by the NHIC, current to February 17, 2022. Where nomenclature differs between databases or rarity lists, the Database of Vascular Plants of Canada (VASCAN) (Canadensys, 2024) was used as a reference for synonyms of plant names to current taxonomic standards.

4.1.1 Ecological Land Classification and Botanical Inventory

Surveys for ELC and botanical inventory were undertaken on May 12, August 23, and November 3, 2023. Previously reported vegetation communities and species surveyed by CLOCA and listed in the MNR PSW evaluation (2005, 2006) were verified and modified, as required, to describe the current conditions on the subject lands. Vegetation communities were assessed and described using the updated Second Approximation 2008 codes (Lee, 2008), utilizing Ecological Land Classification System for Southern Ontario (Lee et al., 1998) as required. Species nomenclature is described according to the NHIC database (2024). All plant species observed on the subject lands and adjacent lands have been analyzed for species rarity based on:

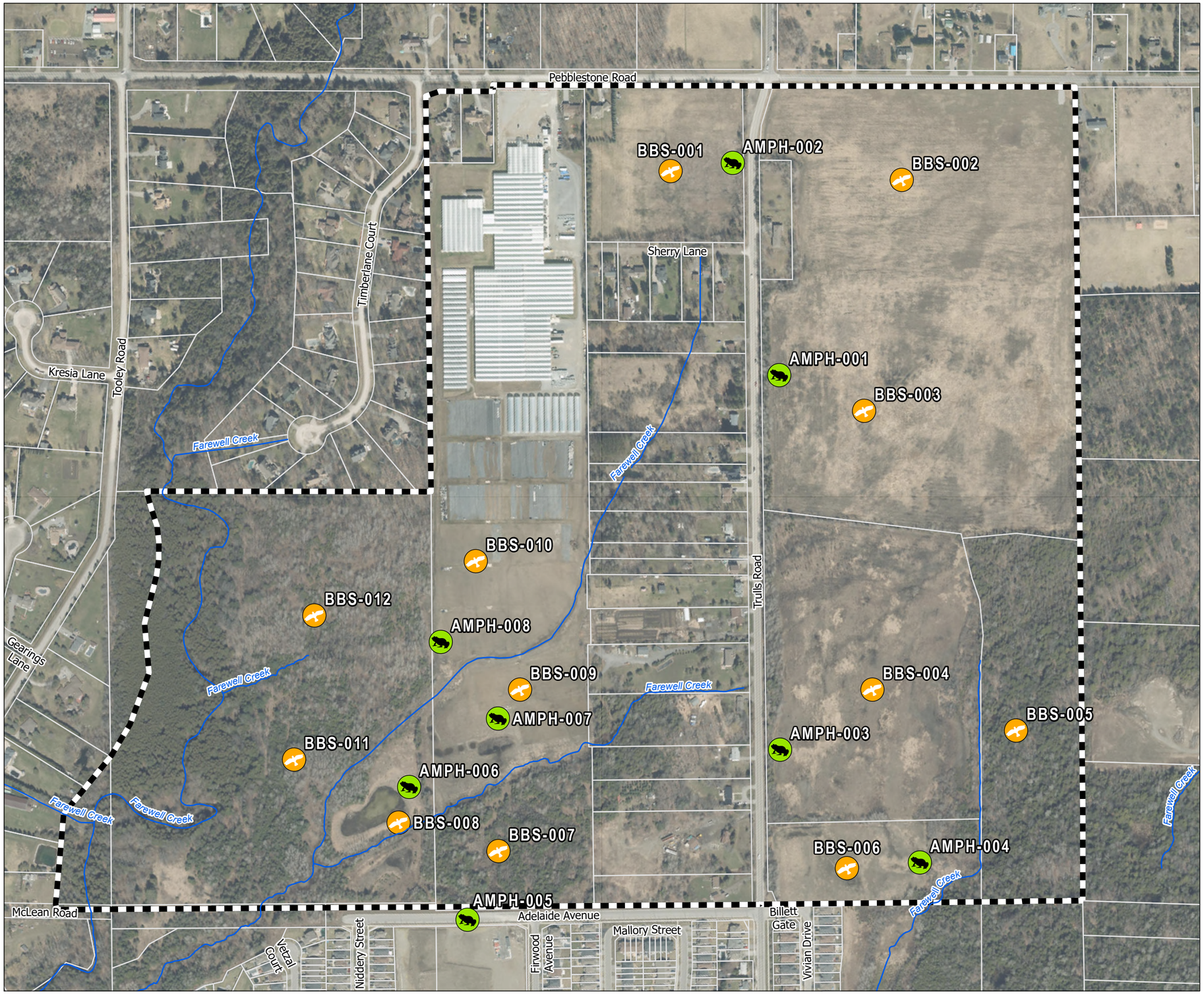
- Species' status under the ESA (2007) and SARA (2002).
- Species' S-rank as provided in the NHIC database.
- Rarity for Durham Region and Site District 6E-7, as listed in "Varga, Leadbeater, D., Webber, J., Kaiser, J., Crins, B., Kamstra, J., Banville, D., Ashley, E., Miller, G., Kingsley, C., Jacobsen, C., Mewa, K., Tebby, L., Mosley, E., and Zajc, E. 2000. Distribution and Status of the Vascular Plants of the Greater Toronto Area. Ontario Ministry of Natural Resources Aurora District. 103 pp."
- Rarity for Durham, as listed in "Riley, J. et al. 1989. The Distribution and Status of the Vascular Plants of Central Region. Ontario Ministry of Natural Resources, Central Region, Richmond Hill, ON."

There are PSWs and other wetlands on the subject lands. Wetland communities were classified using ELC. Wetland significance was assessed in accordance with provincial criteria. Clarington's OP (2018) states that wetlands are considered a natural heritage feature in the Municipality's NHS. Where refinement of the boundary or extent of a wetland feature is proposed for a PSW, or its related minimum VPZ, formal confirmation of said refinement is required from the Province, prior to any development or site alteration. Wetlands included in the NHS are at least 0.5 ha in size. For Parcels 4 and 6 specifically, wetland communities and their limits were confirmed in 2023, based on site-level evaluation of wetland boundaries as per the Ontario Wetland Evaluation System (OWES) guidelines by a certified wetland evaluator. Soil auger samples were obtained for the fields in Parcels 4 and 6 to determine Moisture Regime.

4.2 Amphibian Breeding Call Surveys

Burnside staff conducted amphibian breeding call surveys, following the *Marsh Monitoring Program Participant's Handbook for Surveying Amphibians* (BSC, 2009), during the 2023 season. Surveys were conducted between April and June by qualified ecologists, to detect potential early, mid and late-season amphibian breeding activity in Central Ontario.

Eight survey stations were chosen to provide information on potential amphibian breeding sites within representative wetland communities, located throughout the subject lands. See Figure 2.



Secondary Plan Boundary

Watercourse (MNR ARA)

Amphibian Breeding Call Survey Station

Breeding Bird Survey Station

Sources:

1. Ministry of Natural Resources and Forestry,© King's Printer for Ontario.
2. Natural Resources Canada,© His Majesty the King in Right of Canada.

Disclaimer:

R.J. Burnside & Associates Limited and the above mentioned sources and agencies are not responsible for the accuracy of the spatial, temporal, or other aspects of the data represented on this map. It is recommended that users confirm the accuracy of the information represented.

This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

Datum: North American 1983	
Coord. System: NAD 1983 UTM Zone 17N	
Projection: Transverse Mercator	
Central Meridian: 81°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Page Orientation: -19.5°	Scale Factor: 0.99960

Grid North

0 100 200 300 400

Metres

BURNSIDE

TRUSTEE: FAREWELL HEIGHTS LANDOWNERS GROUP
FOR: MUNICIPALITY OF CLARINGTON

Figure Title

FAREWELL HEIGHTS SECONDARY PLAN NATURAL HERITAGE EVALUATION

FAUNA SURVEYS

Drawn	Checked	Date	Figure No.
HN	HM	2024/11/18	2
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The Marsh Monitoring Program guidelines state that three call surveys should be completed a minimum of 15 days apart when nighttime air temperatures are greater than 5°C, 10°C, and 17°C, respectively and when wind strength is less than 19 km/h (<3 on the Beaufort Scale). Weather conditions during the surveys are outlined in Table 2.

Amphibian calls are used to identify species presence and are quantified by assigning a Call Level Code and an Abundance Count. The purpose of the breeding amphibian surveys was to identify wildlife habitat, as well as any potential SWH on the subject lands.

Table 2: Amphibian Breeding Call Survey Weather Conditions

Survey Date	Observer(s)	Time of Day (Start/End) (24 hours)	Weather Conditions (Air Temp °C/Beaufort Sky Code[1] /Wind Scale[2])
April 21, 2023	Hannah Maciver Matthew Moote	20:35 to 22:00	Start: 12°C; End: 9°C Sky: 1 Wind: 2
May 12, 2023	Hannah Maciver Ariana Burgener	20:52 to 21:59	Start: 22°C; End: 19°C Sky: 2 Wind: 2
June 29, 2023	Hannah Maciver Matthew Moote	21:11 to 22:47	Start: 21°C; End: 18°C Sky: 4 Wind: 0

[1]NAAMP/ Beaufort Sky Codes

0 = clear (no cloud cover)
1 = partly cloudy (scattered or broken) or variable
2 = cloudy or overcast
3 = sandstorm, dust storm or blowing snow
4 = fog, smoke, thick dust, or haze
5 = drizzle or light rain
6 = rain
7 = snow or snow/rain mix
8 = showers
9 = thunderstorms

[2]Beaufort Wind Scale

0 = calm, smoke rises vertically (0-2km/hr)
1 = Light air movement, smoke drifts (3-5)
2 = Slight breeze, wind felt on face; leaves rustle (6-11)
3= Gentle breeze, leaves & twigs in constant motion (12-19)
4= Moderate breeze, small branches moving, raises dust & loose paper (20-30)
5= Fresh breeze, small trees begin to sway (31-39)
6= Strong breeze, large branches in motion (40-50)

4.3 Salamander Habitat Assessment

Two preliminary salamander habitat assessments were undertaken to investigate potentially suitable breeding sites for salamanders. The purpose of these surveys was also to provide a high-level assessment of whether vernal pools are present on the subject lands and to determine if further detailed studies will need to be completed at an Environmental Impact Study (EIS) site level (i.e., egg mass / minnow trap surveys).

A vernal pool (or seasonal forest pool) is defined as:

> *A natural, temporary to semi-permanent body of water occurring in a shallow depression that typically fills during the spring or fall and may dry during the summer. Vernal pools have no permanent inlet or outlet and no viable populations of predatory fish. A vernal pool may provide the primary breeding habitat for Blue-spotted salamander (Ambystoma laterale), Spotted salamander (Ambystoma maculatum), Wood frog (Lithobates sylvatica) and Fairy shrimp (Anostraca spp.) as well as valuable habitat for other plants and wildlife (Maine Association of Wetland Scientists Vernal Pool Technical Committee, 2014).*

Prior to the initial survey, Google Earth aerial imagery was reviewed and identified potential pools of water on the west side of Trulls Road, in the NHS (Parcels 3 and 30). CLOCA ELC layers also indicated the presence of forested lowland wetlands, such as deciduous swamp (SWD) and deciduous thicket (SWT) communities, in these parcels. The presence of ATV trails and heavy disturbance throughout this portion of the subject lands made accessibility to these pools easier. While no potential pools of water were identified from aerial imagery in the forested communities located in the NHS on the east side of Trulls Road (Parcels 32 and 33), this area was also visually inspected during the initial site visit on April 19, 2023. However, access into these portions of the subject lands was difficult due to the density of the vegetation and absence of trails. The initial site visit revealed potential salamander habitat in Parcels 3 and 30 and low potential in Parcels 32 and 33 within the study area limits. Therefore, Parcels 32 and 33 were not assessed on the second visit on May 8, 2023.

Surveys were completed during the early spring amphibian breeding season. See Table 3 below. According to the Vernal Pool Survey Protocol (Maine Association of Wetland Scientists Vernal Pool Technical Committee, 2014), the optimal identification period shortly follows the peak amphibian breeding period for the three vernal pool indicator species (i.e., late March to late May).

A careful scan of the pool perimeter with binoculars was completed to look for species presence. The pool was then approached slowly and the area within 25 ft of the pool edge was observed. Once at the pool, data and photo-documentation of the pool's physical characteristics (i.e., vegetation, pool substrate, biological indicators) and position in the landscape was collected, documenting evidence of vernal pool indicator species within the vernal pool habitat, including anuran and salamander egg masses. Polarized sunglasses were worn to assist with visual inspections of the water to reduce glare.

These pools were also generally surveyed during other field investigations in the spring and summer months (ELC, breeding birds, amphibian breeding call surveys, etc.) to check for any further evidence of breeding activity.

Table 3: Summary of Salamander Habitat Assessment Weather Conditions

Survey Date	Observer(s)	Time of Day (Start/End) (24 hours)	Weather Conditions (Air Temp °C/Beaufort Sky Code[1] /Wind Scale[2])
April 19, 2023	Hannah Maciver Ariana Burgener	09:30 to 16:30	Start: 4°C; End: 6°C Sky: 1 Wind: 3
May 8, 2023	Hannah Maciver	09:30 to 13:45	Start: 14°C; End: 19°C Sky: 1 Wind: 2

[1]NAAMP/ Beaufort Sky Codes

0 = clear (no cloud cover)
1 = partly cloudy (scattered or broken) or variable
2 = cloudy or overcast
3 = sandstorm, dust storm or blowing snow
4 = fog, smoke, thick dust, or haze
5 = drizzle or light rain
6 = rain
7 = snow or snow/rain mix
8 = showers
9 = thunderstorms

[2]Beaufort Wind Scale

0 = calm, smoke rises vertically (0-2km/hr)
1 = Light air movement, smoke drifts (3-5)
2 = Slight breeze, wind felt on face; leaves rustle (6-11)
3= Gentle breeze, leaves & twigs in constant motion (12-19)
4= Moderate breeze, small branches moving, raises dust & loose paper (20-30)
5= Fresh breeze, small trees begin to sway (31-39)
6= Strong breeze, large branches in motion (40-50)

4.4 Avifauna

Eastern Meadowlark (EAME) and Bobolink (BOBO) are listed as Threatened under the ESA. These species were identified as having potential to be on the subject lands, based on a background database review and the presence of grassland / cultural meadow habitat on the subject lands. Both species have similar habitat requirements and were surveyed concurrently.

Standard breeding bird surveys were completed by Burnside staff, in combination with targeted surveys for Eastern Meadowlark and Bobolink and were conducted according to the Ontario Breeding Bird Atlas (OBBA) *Instructions for General Atlassing and Appendices* (April 2021) and MNR's *Survey Protocol for Eastern Meadowlark in Ontario* (August 2013), tailored to the needs of this project. The methodology for both types of surveys is summarized below, in Table 4.

- Surveys were conducted between May 21 and July 3, which is the recommended date range for surveying EAME and BOBO (MNRF, 2013).
- Surveys for EAME and BOBO were conducted three times and were evenly spaced throughout the survey period. Surveys were completed on May 29, June 19, and June 29. The third survey was completed at the EAME and BOBO stations only.
- Surveys were completed at 12-point count locations per survey period, including five targeted EAME and BOBO stations. Note: BBS-002 and BBS-003 were combined into one single station. See Figure 2.

- Surveys were conducted under the following weather conditions: counts were not completed if it was raining, if there was thick fog, or if winds were greater than 19 km per hour (i.e., >3 on the Beaufort Scale). Generally, weather conditions were conducive to auditory and visual surveys, with winds less than 19 km per hour, and no precipitation.
- Targeted EAME and BOBO point count locations were chosen based on good visibility of the surrounding fields / open areas (BB1, BB2 / BB3, BB6, BB9, and BB10). Per the protocol, the surveyor completed ten minutes of passive observation and recorded all species observed or heard.
- All birds recorded, including level of breeding evidence, are summarized in Appendix C.
- Field data was collected using a mobile data collection app (Fulcrum) on an iOS device.

Table 4: Summary of Breeding Bird Survey Weather Conditions

Survey Date	Observer(s)	Time of Day (Start/End) (24 hours)	Weather Conditions (Air Temp °C/Beaufort Sky Code[1] /Wind Scale[2])
May 29, 2023	Hannah Maciver	05:54 to 10:07	Start: 15°C; End: 22°C Sky: 0 Wind: 2
June 19, 2023	Hannah Maciver	06:03 to 11:11	Start: 13°C; End: 21°C Sky: 0 Wind: 1
June 29, 2023 (EAME/BOBO point counts only)	Hannah Maciver	06:17 to 9:00	Start: 14°C; End: 17°C Sky: 4 Wind: 0

[1]NAAMP/ Beaufort Sky Codes

0 = clear (no cloud cover)
1 = partly cloudy (scattered or broken) or variable
2 = cloudy or overcast
3 = sandstorm, dust storm or blowing snow
4 = fog, smoke, thick dust, or haze
5 = drizzle or light rain
6 = rain
7 = snow or snow/rain mix
8 = showers
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[2]Beaufort Wind Scale

0 = calm, smoke rises vertically (0-2km/hr)
1 = Light air movement, smoke drifts (3-5)
2 = Slight breeze, wind felt on face; leaves rustle (6-11)
3= Gentle breeze, leaves & twigs in constant motion (12-19)
4= Moderate breeze, small branches moving, raises dust & loose paper (20-30)
5= Fresh breeze, small trees begin to sway (31-39)
6= Strong breeze, large branches in motion (40-50)

4.5 Aquatic Ecology

Burnside completed a variety of aquatic assessments in 2023, summarized below in Table 5.

Table 5: Dates of Aquatic Field Studies

Studies	Dates	Staff
Aquatic Habitat Assessment	August 22, 2023	M. Moote
HDF Assessment – Freshet	April 19, 2023	M. Moote
HDF Assessment – Spring	May 11, 2023	M. Moote
HDF Assessment – Summer	August 22, 2023	M. Moote
Fish Community Inventory	August 29, 2023	M. Moote, T. Exton, E. Hind-Smith
Thermal Classification	May through November 2023	T. Exton
Benthic Invertebrate Assessment (Spring)	May 11 and May 18, 2023	M. Moote, T. Exton, S. Yoshida
Benthic Invertebrate Assessment (Fall)	October 12, 2023	M. Moote, T. Exton, E. Hind-Smith
Salmonid Spawning Assessment (Spring)	April 19, 2023	M. Moote
Salmonid Spawning Assessment (Fall)	September 28, 2023	M. Moote

4.5.1 Aquatic Habitat Assessment and In-Stream Barrier Assessment

Burnside's Standard Operating Procedures (SOP's) were used to complete general aquatic habitat assessment investigations, based on the Ministry of Transportation (MTO) Environmental Guide for Fish and Fish Habitat (2009) ("The Guide"). Burnside staff traversed the entire length of Farewell Creek, and its tributaries located on the subject lands and assessed stream health, form, function, and potential barriers to fish movement.

4.5.2 Salmonid Spawning Survey

Fish spawning surveys occurred in both the spring and fall to observe if spring spawning (i.e., Rainbow trout) and / or fall spawning (i.e., Chinook salmon) inhabit the watercourses. Visual assessments of spawning behaviour and redd constructions (trout spawning beds) were completed following the Trout Unlimited Redd Survey Handbook (protocol to be confirmed by CLOCA).

4.5.3 Headwater Drainage Features (HDF) Assessments

Since HDF's can vary significantly on a seasonal basis, multiple site visits are needed to correctly assess their hydrology and riparian conditions. Headwater drainage features were evaluated through a series of three site visits which were timed to coincide with late winter / early spring, late spring, and summer conditions, as outlined in the HDF Guide (TRCA & CVC, 2014). Table 5 above provides a summary of field investigation dates and recommended sampling periods.

Following field investigations, findings of the HDF evaluations were then translated into a classification of the HDF, with respect to the hydrology and the riparian vegetation conditions of the features.

4.5.4 Fish Community Inventory

A general fish inventory was completed in Farewell Creek in August 2023. Four sites were sampled over various substrates and morphological units using an electrofishing backpack unit and dipnets. The fish community inventory was completed upon obtaining a License to Collect Fish (LCF) from MNR.

4.5.5 Benthic Invertebrate Assessment

Samples were collected within reaches FC-1, FC-2B, and FC-3 in May 2023, and in FC-1 during the October 2023 site visit. Three replicate samples were taken at each respective sampling station and were collected following the Ontario Benthos Biomonitoring Network Protocol (Jones, C. *et. al.* 2007). Sampling was performed with the use of a travelling kick-and-sweep method, collected with a D-net, and transferred to laboratory-provided collection jars. The samples were preserved with 10% buffered formalin. The benthic invertebrate samples were delivered to ZEAS Incorporated (ZEAS) following each site visit, and ZEAS sorted and identified the benthic invertebrates to a species level and provided 100 count data.

The benthic invertebrate results were analyzed for a variety of community and density indices, including EPT richness (% EPT), and the Shannon Diversity Index. The Shannon Diversity Index indicates the diversity of benthic invertebrates in each sample, and it can be used to compare diversity between sites. Values for the Shannon Diversity Index typically range from 1.5 to 4.5, and the higher the value, the more diverse the sample is. From the Shannon Diversity index, evenness can be calculated. The evenness calculation provides a value that can be interpreted to determine relative abundance of species in a sample. Evenness values will fall between 0 and 1. An evenness value calculated as 1 would mean complete evenness between the taxonomic groups.

The formula for the Shannon Diversity Index is $H = -\sum(pi*\ln(pi))$ (Beals *et. al.* 2000). Pi is the number of an individual species relative to the total number of species in a sample. The sum of pi abundance multiplied by the natural logarithm of pi is the final value of the Shannon Diversity Index. Evenness is calculated as the $E = H/H_{max}$ where H_{max} is the natural logarithm of the number of species groups in the samples.

The % EPT calculation is chosen as it is a general indicator of water quality. A higher % EPT indicates better biological health in a watercourse or waterbody than a smaller value (Jones, C. *et. al.* 2007). The % EPT value is calculated by dividing the sum of all

Ephemeroptera (Mayflies), *Plecoptera* (Stoneflies) and *Trichoptera* (Caddisflies) in a sample against the total number of organisms in a sample and multiplying by 100.

4.5.6 Thermal Classification

Burnside installed four continuous data loggers in perforated pipes within the watercourse on the subject lands to determine both flow permanency and thermal regime. Data from the loggers was downloaded monthly. The thermal regime for each of the three tributaries was classified using the protocols outlined in Stoneman et al.,1996.

4.6 Incidental Wildlife Observations

General wildlife surveys were conducted concurrently with all field investigations. All observations and signs of species were recorded (e.g., tracks / trails, scat, burrows, dens, browse, vocalizations). The results are summarized in Section 5.10.

4.7 Anthropogenic Features

Aside from structures that may be habitat for SAR birds and bats (as discussed above), anthropogenic features may be present on the subject lands that could provide suitable habitat for other wildlife, such as snakes. Additional searches for man-made features (e.g., rock piles or rock fences extending into the ground) were conducted during all site investigations and inspected for evidence of wildlife use.

Anthropogenic features, as they relate to other wildlife, are discussed in Section 5.11.

5.0 Existing Conditions

5.1 Subwatershed Conditions

The subject lands fall within the Farewell Creek subwatershed, which drains an area of approximately 3,773 ha. This subwatershed stretches from its headwaters in the Oak Ridges Moraine, through the Oshawa Second Marsh, and outlets into Lake Ontario. Agriculture is the primary land use throughout the watershed, with pockets of urbanized residential areas and natural spaces. Notably, over half (54%) of the watershed is within the greenbelt and an additional portion (20%) is within the Oak Ridges Moraine (CLOCA, 2011).

5.2 Geology

The subject lands are located on the Blue Mountain Formation, which consists of shale with minor limestone. The surficial geology of Farewell Creek (mainstem) is comprised of coarse-textured glaciolacustrine deposits made up of sand, gravel, minor silt, and clay with some recent alluvial deposits along the beds and banks of the existing channel.

The remainder of the subject lands is comprised of foreshore deposits (Iroquois Beach sands) and reworked materials from older till cover (CLOCA, 2011).

5.3 Physiography and Topography

The subject lands are located within the Iroquois Beach physiographic region. This region lies between the South Slope and Iroquois Plain and is marked by low-lying shoreline bluffs and gravel bars that overlay a till material. The topography of Iroquois Beach is due to remnant glacial shoreline deposits and can vary across the region, but typically has moderate slopes. Additionally, the landscape north and south of the subject lands is drumlinized (Chapman & Putnam, 1984 and 2007; CLOCA, 2011).

The subject lands are generally flat with a gentle westerly slope. The highest elevation is 147 masl, in the northeast corner, and the lowest area is 135 masl along the Farewell Creek boundary (CLOCA, 2011).

5.4 Soils and Infiltration Conditions

The majority of the subject lands is silt loam which tends towards moderate infiltration potential, while a small portion along the northern and southeastern boundary is sandy loam, which tends towards high infiltration / low runoff potential. Overall, the soils on the subject lands are highly permeable and promote infiltration (CLOCA, 2011).

5.5 Vegetation Communities and Species

5.5.1 Ecological Land Classification

The subject lands consist of numerous separately owned units of land. Parcel 32, in the southeast corner, contains a mix of swamp units which are contiguous with larger swamp woodlands extending offsite and are mapped almost entirely as PSW. Parcels 29 and 30 in the southwest portion of the subject lands is primarily swamps and mixed forests dominated by Eastern white cedar (*Thuja occidentalis*) and Trembling aspen (*Populus tremuloides*). To the east of these is Parcel 3, a large tract of land running through the center of the subject lands, owned by Witzke's Greenhouses Ltd. This land is a mix of agricultural buildings and stock fields where plant material is stored. The stock fields are kept free of vegetation and are actively used by the owners. The forest and swamp west of Parcel 3 extend into the southern portion of the property. The adjacent properties, Parcels 1, 2, 5, and 7 to 28 are residential properties with a mosaic of cultural vegetation, deciduous forest, and lawn. The remainder of the subject lands, Parcels 4, 6, 31, and 33, are a mix of active and old agricultural fields, ranging from dry to wet Moisture Regimes. These units are discussed in more detail below. Vegetation communities are described in Table 6 below and depicted in Figure 3.

Table 6: Ecological Classification Table

ELC Vegetation Type	Layer (% Cover)	Main Species	Plant Species of Conservation Concern	Additional Descriptions and Comments
CUM1-1 Dry-Moist Old Field Meadow	Access to land not permitted, ELC determined through aerial photography interpretation.			
CUP3 Coniferous Plantation	Access to land not permitted, ELC determined through aerial photography interpretation.			
CUT1 Mineral Cultural Thicket Ecosite	Access to land not permitted, ELC determined through aerial photography interpretation.			
CUW1 Mineral Cultural Thicket Ecosite	Canopy (25 to 60%)	Scots pine (*Pinus sylvestris*), White pine (*Picea gluaca*), Trembling aspen (*Populus tremuloides*), White willow (*Salix alba*)	N/A	N/A
CUW1 Mineral Cultural Thicket Ecosite	Sub Canopy (25 to 60%)	Trembling aspen, Eastern white cedar	N/A	N/A
CUW1 Mineral Cultural Thicket Ecosite	Understory (25 to 60%)	Pussy willow (*Salix discolor*)	N/A	N/A
CUW1 Mineral Cultural Thicket Ecosite	Ground Layer (>60%)	Kentucky bluegrass (*Poa pratensis*), Wild carrot (*Ducus carota*), Canada goldenrod (*Solidago canadensis*), Common dandelion (*Taraxacum officinale*)	N/A	N/A
CVR_4 Rural Property	Canopy (0%)	N/A	This unit contains the following local rare species: • Sphinx Ladies'-tresses (*Spiranthes incurva*) • Narrow-leaved Blue-eyed-grass (*Sisyrinchium angustifolium*)	N/A
CVR_4 Rural Property	Sub Canopy (0%)	N/A	This unit contains the following local rare species:	N/A
CVR_4 Rural Property	Understory (1 to 10%)	Staghorn sumac (*Rhus typhina*)	Sphinx Ladies'-tresses (*Spiranthes incurva*)	N/A
CVR_4 Rural Property	Ground Layer (>60%)	Kentucky bluegrass, European swallowwort, Red clover (*Trifolium pratense*), Canada goldenrod	Narrow-leaved Blue-eyed-grass (*Sisyrinchium angustifolium*)	N/A
IAGM1 Agricultural Buildings	Access to land not permitted, ELC determined through aerial photography interpretation.			
SAGM5 Nursery	Nursery grounds are kept free of vegetation.			

ELC Vegetation Type	Layer (% Cover)	Main Species	Plant Species of Conservation Concern	Additional Descriptions and Comments
TAGM5 Fencerow	Canopy (>60%)	Trembling aspen, Eastern white cedar, Yellow birch (*Betula alleghaniensis*), Freeman maple (*Acer x freemanii*)	This unit contains the following local rare species: • Long-headed anemone (*Anemone cylindrica*) • Great blue lobelia • Narrow-leaved blue-eyed-grass • Purple false foxglove • Smooth serviceberry (*Amelanchier laevis*) • Eastern cottonwood (*Populus deltoides*)	N/A
FOCM4-1 Fresh-moist White Cedar Coniferous Forest	Canopy (>60%)	Eastern white cedar, Trembling aspen	This unit contains the following local rare species: • Yellow clintonia (*Clintonia borealis*)	N/A
FOCM4-1 Fresh-moist White Cedar Coniferous Forest	Sub Canopy (25 to 60%)	Eastern white cedar	This unit contains the following local rare species: Yellow clintonia (*Clintonia borealis*)	N/A
FOCM4-1 Fresh-moist White Cedar Coniferous Forest	Understory (25 to 60%)	European buckthorn	This unit contains the following local rare species: Yellow clintonia (*Clintonia borealis*)	N/A
FOCM4-1 Fresh-moist White Cedar Coniferous Forest	Ground Layer (25 to 60%)	Canada mayflower, Spinulose wood fern (*Dryopteris carthusiana*), Eastern poison ivy, Broad-leaved helleborine (*Epipactis helleborine*)	This unit contains the following local rare species: Yellow clintonia (*Clintonia borealis*)	N/A
FOD Deciduous Forest	Access to land not permitted, ELC determined through aerial photography interpretation.			
FODM6 Fresh-Moist White Cedar Coniferous Forest	Access to land not permitted, ELC determined through aerial photography interpretation.			
FOMM4-2 Dry-Fresh White Cedar - poplar Mixed Forest	Canopy (>60%)	Eastern white cedar, Trembling aspen, Scots pine, Yellow birch	This unit contains the following local rare species: • Great blue lobelia • Black walnut • Early goldenrod (*Solidago juncea*) • Royal fern (*Osmunda regalis*) • Purple false foxglove • Canada Tick-trefoil (*Desmodium canadense*) • Indian-pipe (Monotropa uniflora)	N/A

ELC Vegetation Type	Layer (% Cover)	Main Species	Plant Species of Conservation Concern	Additional Descriptions and Comments
FOMM4-2 Dry-Fresh White Cedar - poplar Mixed Forest	Sub Canopy (25 to 60%)	Eastern white cedar, Riverbank Grape, Virginia creeper (*Parthenocissus quinquefolia*)	This unit contains the following local rare species: • Great blue lobelia • Black walnut • Early goldenrod (*Solidago juncea*) • Royal fern (*Osmunda regalis*) • Purple false foxglove • Canada Tick-trefoil (*Desmodium canadense*) Indian-pipe (Monotropa uniflora)	N/A
FOMM4-2 Dry-Fresh White Cedar - poplar Mixed Forest	Understory (25 to 60%)	Red Osier dogwood, Eastern poison Ivy, Chokecherry (*Prunus virginiana*), Honeysuckle (*Lonicera sp.*)	This unit contains the following local rare species: • Great blue lobelia • Black walnut • Early goldenrod (*Solidago juncea*) • Royal fern (*Osmunda regalis*) • Purple false foxglove • Canada Tick-trefoil (*Desmodium canadense*) Indian-pipe (Monotropa uniflora)	N/A
FOMM4-2 Dry-Fresh White Cedar - poplar Mixed Forest	Ground Layer (25 to 60%)	Spinulose wood fern, Canada mayflower, Goldenrod (*Solidago sp.*)	This unit contains the following local rare species: • Great blue lobelia • Black walnut • Early goldenrod (*Solidago juncea*) • Royal fern (*Osmunda regalis*) • Purple false foxglove • Canada Tick-trefoil (*Desmodium canadense*) Indian-pipe (Monotropa uniflora)	N/A
MAMM1-12/MAMM1-3 Common reed Graminoid Mineral Meadow Marsh / Reed-canary Grass Graminoid Mineral Meadow Marsh	Canopy (0%)	N/A	N/A	N/A
MAMM1-12/MAMM1-3 Common reed Graminoid Mineral Meadow Marsh / Reed-canary Grass Graminoid Mineral Meadow Marsh	Sub Canopy (1 to 10%)	Black locust (*Robinia pseudoacacia*), Silver birch (*Betula pendula*)	N/A	N/A
MAMM1-12/MAMM1-3 Common reed Graminoid Mineral Meadow Marsh / Reed-canary Grass Graminoid Mineral Meadow Marsh	Understory (1 to 10%)	Pussy willow, Heart-leaved willow (*Salix eriocephala*), Red Osier dogwood, Bebb's willow (*Salix bebbiana*)	N/A	N/A

ELC Vegetation Type	Layer (% Cover)	Main Species	Plant Species of Conservation Concern	Additional Descriptions and Comments
MAMM1-12/MAMM1-3 Common reed Graminoid Mineral Meadow Marsh / Reed-canary Grass Graminoid Mineral Meadow Marsh	Ground Layer (>60%)	European reed (*Phragmities australis*), Reed canary grass, Goldenrod (*Solidago sp.*)	N/A	N/A
MAMM2-4 / SWTM3-5 Mixed Forb Mineral Meadow Marsh / Pussy willow Mineral Deciduous Thicket Swamp	Canopy (0%)	N/A	This unit contains the following local rare species: • Sphinx Ladies'-tresses • Great blue lobelia • Narrow-leaved blue-eyed-grass • Purple false foxglove	N/A
MAMM2-4 / SWTM3-5 Mixed Forb Mineral Meadow Marsh / Pussy willow Mineral Deciduous Thicket Swamp	Sub Canopy (0%)	N/A	This unit contains the following local rare species: • Sphinx Ladies'-tresses • Great blue lobelia • Narrow-leaved blue-eyed-grass Purple false foxglove	N/A
MAMM2-4 / SWTM3-5 Mixed Forb Mineral Meadow Marsh / Pussy willow Mineral Deciduous Thicket Swamp	Understory (25 to 60%)	Pussy willow, Heart-leaved willow, Cranberry Viburnum, Trembling aspen	This unit contains the following local rare species: • Sphinx Ladies'-tresses • Great blue lobelia • Narrow-leaved blue-eyed-grass Purple false foxglove	N/A
MAMM2-4 / SWTM3-5 Mixed Forb Mineral Meadow Marsh / Pussy willow Mineral Deciduous Thicket Swamp	Ground Layer (>60%)	Sensitive fern (*Onoclea sensibilis*), Reed canary grass (*Phalaris arundinacea*), Canada anemone (*Anemonastrum canadense*), European swallowwort (*Vincetoxicum rossicum*)	This unit contains the following local rare species: • Sphinx Ladies'-tresses • Great blue lobelia • Narrow-leaved blue-eyed-grass Purple false foxglove	N/A
MASM1-1 Cattail Mineral Shallow Marsh	Canopy (0%)	N/A	This unit contains the following local rare species: • Purple-veined willowherb (*Epilobium coloratum*) • Leafy muhly (*Muhlenbergia frondose*) • Royal fern	Species taken from PSW report, Wetland #64
MAMM2-4 / SWTM3-5 Mixed Forb Mineral Meadow Marsh / Pussy willow Mineral Deciduous Thicket Swamp	Sub Canopy (0%)	N/A	This unit contains the following local rare species: • Purple-veined willowherb (*Epilobium coloratum*) • Leafy muhly (*Muhlenbergia frondose*) Royal fern	Species taken from PSW report, Wetland #64
MAMM2-4 / SWTM3-5 Mixed Forb Mineral Meadow Marsh / Pussy willow Mineral Deciduous Thicket Swamp	Understory (0%)	N/A	This unit contains the following local rare species: • Purple-veined willowherb (*Epilobium coloratum*) • Leafy muhly (*Muhlenbergia frondose*) Royal fern	Species taken from PSW report, Wetland #64

ELC Vegetation Type	Layer (% Cover)	Main Species	Plant Species of Conservation Concern	Additional Descriptions and Comments
MAMM2-4 / SWTM3-5 Mixed Forb Mineral Meadow Marsh / Pussy willow Mineral Deciduous Thicket Swamp	Ground Layer (>60%)	Green-fruited burreed (*Sparganium emersum*), European water-plantain (*Alisma plantago-aquatica*), Broad-leaved cattail (*Typha latifolia*), Small duckweed (*Lemna minor*)	This unit contains the following local rare species: • Purple-veined willowherb (*Epilobium coloratum*) • Leafy muhly (*Muhlenbergia frondose*) Royal fern	Species taken from PSW report, Wetland #64
MASM1-1/SWTM3 Cattail Mineral Shallow Marsh / willow Mineral Deciduous Thicket Swamp	Canopy (10 to 25%)	Trembling aspen	N/A	Species taken from PSW report, Wetland #64
MASM1-1/SWTM3 Cattail Mineral Shallow Marsh / willow Mineral Deciduous Thicket Swamp	Sub Canopy (0%)	N/A	N/A	Species taken from PSW report, Wetland #64
MASM1-1/SWTM3 Cattail Mineral Shallow Marsh / willow Mineral Deciduous Thicket Swamp	Understory (25 to 60%)	Bebb's willow, Heart-leaved willow	N/A	Species taken from PSW report, Wetland #64
MASM1-1/SWTM3 Cattail Mineral Shallow Marsh / willow Mineral Deciduous Thicket Swamp	Ground Layer (>60%)	Spotted jewelweed, Sensitive fern, Creeping bentgrass (*Agrostis stolonifera*), Broad-leaved cattail	N/A	Species taken from PSW report, Wetland #64
MEGM1-2 Dry Big Bluestem Graminoid Tallgrass Prairie	Canopy (1 to 10%)	Balsam poplar (*Populus balsamifera*), Eastern cottonwood (*Populus deltoides*), Scots pine, Red ash (*Fraxinus pennsylvanica*)	This unit contains the following local rare species: • Great blue lobelia • Black walnut (*Juglans nigra*) • Early goldenrod • Long-headed anemone • Eastern cottonwood • Canada rush • Big bluestem (*Andropogon gerardi*)	N/A
MEGM1-2 Dry Big Bluestem Graminoid Tallgrass Prairie	Sub Canopy (1 to 10%)	N/A	This unit contains the following local rare species: • Great blue lobelia • Black walnut (*Juglans nigra*) • Early goldenrod • Long-headed anemone • Eastern cottonwood • Canada rush Big bluestem (*Andropogon gerardi*)	N/A

ELC Vegetation Type	Layer (% Cover)	Main Species	Plant Species of Conservation Concern	Additional Descriptions and Comments
MEGM1-2 Dry Big Bluestem Graminoid Tallgrass Prairie	Understory (1 to 10%)	Poison Ivy, Riverbank grape, Red raspberry, Pussy willow	This unit contains the following local rare species: • Great blue lobelia • Black walnut (*Juglans nigra*) • Early goldenrod • Long-headed anemone • Eastern cottonwood • Canada rush Big bluestem (*Andropogon gerardi*)	N/A
MEGM1-2 Dry Big Bluestem Graminoid Tallgrass Prairie	Ground Layer (>60%)	Big bluestem (*Andropogon gerardi*), Canada goldenrod, Wild carrot (*Dacus carota*), Wild bergamot (*Monarda fistulosa*)	This unit contains the following local rare species: • Great blue lobelia • Black walnut (*Juglans nigra*) • Early goldenrod • Long-headed anemone • Eastern cottonwood • Canada rush Big bluestem (*Andropogon gerardi*)	N/A
MEGM4 Fresh Moist Graminoid Meadow	Canopy (0%)	N/A	N/A	N/A
MEGM4 Fresh Moist Graminoid Meadow	Sub Canopy (0%)	N/A	N/A	N/A
MEGM4 Fresh Moist Graminoid Meadow	Understory (0%)	N/A	N/A	N/A
MEGM4 Fresh Moist Graminoid Meadow	Ground Layer (>60%)	Bluegrass, Wild carrot, Virginia strawberry (*Fragaria virginiana*), Goldenrod	N/A	N/A
MEMM3 Dry-Fresh Mixed Meadow	Canopy (0%)	N/A	N/A	N/A
MEMM3 Dry-Fresh Mixed Meadow	Sub Canopy (0%)	N/A	N/A	N/A
MEMM3 Dry-Fresh Mixed Meadow	Understory (1 to 10%)	Trembling aspen, Heart-leaved willow	N/A	N/A
MEMM3 Dry-Fresh Mixed Meadow	Ground Layer (>60%)	Smooth brome (*Bromus inermis*), Goldenrod, Bluegrass, Wild carrot	N/A	N/A
MEMM4 Fresh-Moist Mixed Meadow	Canopy (0%)	N/A	This unit contains the following local rare species: • Great blue Lobelia • Sphinx Ladies'-tresses • Purple false foxglove • Downy willowherb (*Epilobium strictum*)	N/A

ELC Vegetation Type	Layer (% Cover)	Main Species	Plant Species of Conservation Concern	Additional Descriptions and Comments
MEMM4 Fresh-Moist Mixed Meadow	Sub Canopy (0%)	N/A	This unit contains the following local rare species: • Great blue Lobelia • Sphinx Ladies'-tresses • Purple false foxglove Downy willowherb (*Epilobium strictum*)	N/A
MEMM4 Fresh-Moist Mixed Meadow	Understory (1 to 10%)	Pussy willow, Heart-leaved willow	This unit contains the following local rare species: • Great blue Lobelia • Sphinx Ladies'-tresses • Purple false foxglove Downy willowherb (*Epilobium strictum*)	N/A
MEMM4 Fresh-Moist Mixed Meadow	Ground Layer (>60%)	Canada thistle (*Cirsium arvense*), Reed canary grass, White panicled aster (*Symphyotrichum lanceolatum*), Downy willowherb (*Epilobium densum*)	This unit contains the following local rare species: • Great blue Lobelia • Sphinx Ladies'-tresses • Purple false foxglove Downy willowherb (*Epilobium strictum*)	N/A
MEMM4/MAMM3-1 Fresh-Moist Mixed Meadow / Mixed Mineral Meadow Marsh	Canopy (0%)	N/A	N/A	N/A
MEMM4/MAMM3-1 Fresh-Moist Mixed Meadow / Mixed Mineral Meadow Marsh	Sub Canopy (0%)	N/A	N/A	N/A
MEMM4/MAMM3-1 Fresh-Moist Mixed Meadow / Mixed Mineral Meadow Marsh	Understory (1 to 10%)	Pussy willow, Heart-leaved willow	N/A	N/A
MEMM4/MAMM3-1 Fresh-Moist Mixed Meadow / Mixed Mineral Meadow Marsh	Ground Layer (>60%)	Reed canary grass, European reed, Poverty rush (*Juncus tenuis*), Sensitive fern	N/A	N/A
SWMM3-2 Poplar-Conifer Mineral Mixed Swamp	Canopy (25 to 60%)	Trembling aspen, Eastern white cedar, White willow, Balsam poplar	This unit contains the following local rare species: • Great blue lobelia	N/A
SWMM3-2 Poplar-Conifer Mineral Mixed Swamp	Sub Canopy (10 to 25%)	Trembling aspen, White birch	This unit contains the following local rare species: Great blue lobelia	N/A
SWMM3-2 Poplar-Conifer Mineral Mixed Swamp	Understory (10 to 25%)	Pussy willow, Riverbank grape, Red Oiser dogwood	This unit contains the following local rare species: Great blue lobelia	N/A
SWMM3-2 Poplar-Conifer Mineral Mixed Swamp	Ground Layer (25 to 60%)	Sensitive fern, Water Horsetail (*Equisetum fluviatile*), Broad-leaved cattail, Coltsfoot	This unit contains the following local rare species: Great blue lobelia	N/A

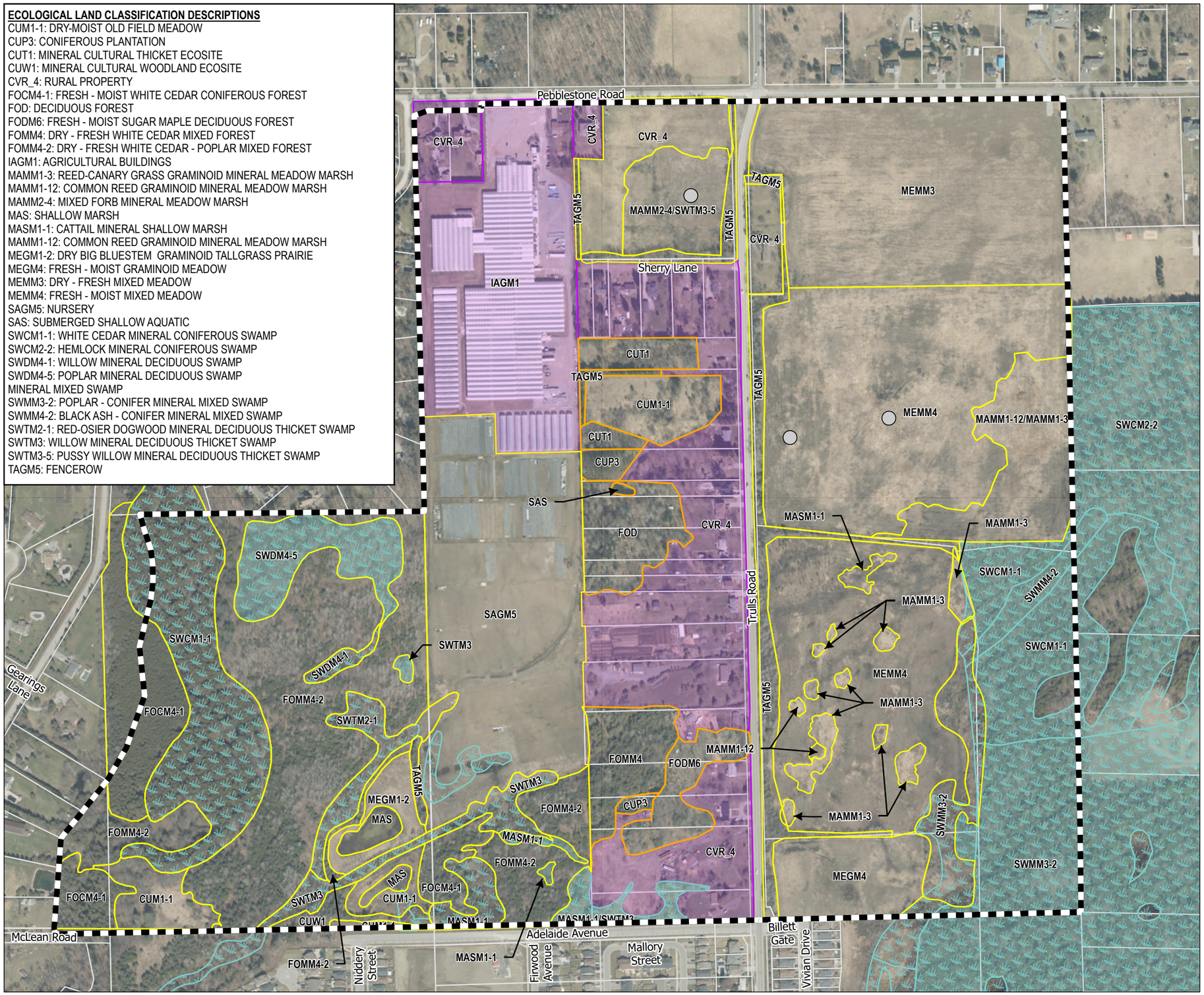
ELC Vegetation Type	Layer (% Cover)	Main Species	Plant Species of Conservation Concern	Additional Descriptions and Comments
SWCM1-1 White Cedar Mineral Coniferous Swamp	Canopy (>60%)	Eastern white cedar, Yellow birch, Black walnut (*Juglans nigra*), Eastern hemlock (*Tsuga canadensis*)	This unit contains the following local rare species: • Black maple (*Acer nigrum*) • Dwarf scouring-rush (*Equisetum scirpoides*) • Great blue lobelia • Black walnut • Pale jewelweed (*Impatiens pallida*)	N/A
SWCM1-1 White Cedar Mineral Coniferous Swamp	Sub Canopy (10 to 25%)	White Cedar, European buckthorn	This unit contains the following local rare species: • Black maple (*Acer nigrum*) • Dwarf scouring-rush (*Equisetum scirpoides*) • Great blue lobelia • Black walnut Pale jewelweed (*Impatiens pallida*)	N/A
SWCM1-1 White Cedar Mineral Coniferous Swamp	Understory (1 to 10%)	European buckthorn	This unit contains the following local rare species: • Black maple (*Acer nigrum*) • Dwarf scouring-rush (*Equisetum scirpoides*) • Great blue lobelia • Black walnut Pale jewelweed (*Impatiens pallida*)	N/A
SWCM1-1 White Cedar Mineral Coniferous Swamp	Ground Layer (10 to 25%)	Ostrich fern (*Matteuccia struthiopteris*), Bulblet bladder fern (*Cystopteris bulbifera*), Jack-in-the-pulpit (*Arisaema triphyllum*), Wild sarsaparilla (*Aralia nudicaulis*)	This unit contains the following local rare species: • Black maple (*Acer nigrum*) • Dwarf scouring-rush (*Equisetum scirpoides*) • Great blue lobelia • Black walnut Pale jewelweed (*Impatiens pallida*)	N/A
SWDM4-1 Willow Mineral Deciduous Swamp	Canopy (25 to 60%)	White willow, Eastern cottonwood, Trembling aspen, Freeman maple	This unit contains the following local rare species: • Eastern cottonwood	N/A
SWCM1-1 White Cedar Mineral Coniferous Swamp	Sub Canopy (10 to 25%)	Eastern cottonwood, Trembling aspen	This unit contains the following local rare species: • Eastern cottonwood	N/A
SWCM1-1 White Cedar Mineral Coniferous Swamp	Understory (1 to 10%)	Red Osier dogwood, Riverbank grape	This unit contains the following local rare species: • Eastern cottonwood	N/A
SWCM1-1 White Cedar Mineral Coniferous Swamp	Ground Layer (25 to 60%)	Sensitive fern, Reed canarygrass, Common woolly Bulrush (*Scirpus cyperinus*), Canada wood nettle (*Laportea canadensis*)	This unit contains the following local rare species: • Eastern cottonwood	N/A
SWTM2-1 Red-osier dogwood Mineral Deciduous Thicket Swamp	Canopy (1 to 10%)	White willow, Balsam poplar, Silver birch, Red ash	N/A	N/A

ELC Vegetation Type	Layer (% Cover)	Main Species	Plant Species of Conservation Concern	Additional Descriptions and Comments
SWTM2-1 Red-osier dogwood Mineral Deciduous Thicket Swamp	Sub Canopy (10 to 25%)	Silver birch, Balsam poplar	N/A	N/A
SWTM2-1 Red-osier dogwood Mineral Deciduous Thicket Swamp	Understory (25 to 60%)	Red-Osier dogwood, Bebb's willow, Riverbank grape	N/A	N/A
SWTM2-1 Red-osier dogwood Mineral Deciduous Thicket Swamp	Ground Layer (25 to 60%)	Sensitive fern, Spotted jewelweed (*Impatiens capensis*), Canada goldenrod, Narrow-leaved cattail (*Typha angustifolia*)	N/A	N/A
SWDM4-5 Poplar Mineral Deciduous Swamp	Canopy (25 to 60%)	Trembling aspen	N/A	Species taken from PSW report, Wetland #54
SWDM4-5 Poplar Mineral Deciduous Swamp	Sub Canopy (1 to 10%)	Trembling aspen	N/A	Species taken from PSW report, Wetland #54
SWDM4-5 Poplar Mineral Deciduous Swamp	Understory (1 to 10%)	Meadow willow (*Salix petiolaris*), Heart-leaved willow, Red Osier dogwood	N/A	Species taken from PSW report, Wetland #54
SWDM4-5 Poplar Mineral Deciduous Swamp	Ground Layer (25 to 60%)	Sensitive fern, Spotted jewelweed	N/A	Species taken from PSW report, Wetland #54
SWTM3 Willow Mineral Deciduous Thicket Swamp	Canopy (1 to 10%)	Trembling aspen	N/A	Species taken from PSW report, Wetland #56
SWTM3 Willow Mineral Deciduous Thicket Swamp	Sub Canopy (0%)	N/A	N/A	Species taken from PSW report, Wetland #56
SWTM3 Willow Mineral Deciduous Thicket Swamp	Understory (25 to 60%)	Bebb's willow, Heart-leaved willow	N/A	Species taken from PSW report, Wetland #56
SWTM3 Willow Mineral Deciduous Thicket Swamp	Ground Layer (10 to 25%)	Sensitive fern, Spotted jewelweed, Creeping bentgrass, Broadleaved cattail	N/A	Species taken from PSW report, Wetland #56
SWMM4-2 Black ash-Conifer Mineral Mixed Swamp	Canopy (>60%)	Eastern white cedar, Black ash (*Fraxinus nigra*)	This unit contains the following locally and provincially rare species: • Black ash	Species taken from PSW report, Wetland #1
SWMM4-2 Black ash-Conifer Mineral Mixed Swamp	Sub Canopy (1 to 10%)	Eastern white cedar	This unit contains the following locally and provincially rare species: • Black ash	Species taken from PSW report, Wetland #1

ELC Vegetation Type	Layer (% Cover)	Main Species	Plant Species of Conservation Concern	Additional Descriptions and Comments
SWMM4-2 Black ash-Conifer Mineral Mixed Swamp	Understory (1 to 10%)	Eastern white cedar, Red Osier dogwood	This unit contains the following locally and provincially rare species: • Black ash	Species taken from PSW report, Wetland #1
SWMM4-2 Black ash-Conifer Mineral Mixed Swamp	Ground Layer (10 to 25%)	Spotted jewelweed	This unit contains the following locally and provincially rare species: • Black ash	Species taken from PSW report, Wetland #1
SWCM2-2 Hemlock Mineral Coniferous Swamp	Canopy (>60%)	Eastern hemlock (*Tsuga canadensis*), Yellow birch	N/A	Species taken from PSW report, Wetland #1
SWCM2-2 Hemlock Mineral Coniferous Swamp	Sub Canopy (10 to 25%)	Mountain maple (*Acer spicatum*)	N/A	Species taken from PSW report, Wetland #1
SWCM2-2 Hemlock Mineral Coniferous Swamp	Understory (1 to 10%)	N/A	N/A	Species taken from PSW report, Wetland #1
SWCM2-2 Hemlock Mineral Coniferous Swamp	Ground Layer (10 to 25%)	Sensitive fern	N/A	Species taken from PSW report, Wetland #1

ECOLOGICAL LAND CLASSIFICATION DESCRIPTIONS

CUM1-1: DRY-MOIST OLD FIELD MEADOW
CUP3: CONIFEROUS PLANTATION
CUT1: MINERAL CULTURAL THICKET ECOSITE
CUW1: MINERAL CULTURAL WOODLAND ECOSITE
CVR_4: RURAL PROPERTY
FOCM4-1: FRESH - MOIST WHITE CEDAR CONIFEROUS FOREST
FOD: DECIDUOUS FOREST
FODM6: FRESH - MOIST SUGAR MAPLE DECIDUOUS FOREST
FOMM4: DRY - FRESH WHITE CEDAR MIXED FOREST
FOMM4-2: DRY - FRESH WHITE CEDAR - POPLAR MIXED FOREST
IAGM1: AGRICULTURAL BUILDINGS
MAMM1-3: REED-CANARY GRASS GRAMINOID MINERAL MEADOW MARSH
MAMM1-12: COMMON REED GRAMINOID MINERAL MEADOW MARSH
MAMM2-4: MIXED FORB MINERAL MEADOW MARSH
MAS: SHALLOW MARSH
MASM1-1: CATTAIL MINERAL SHALLOW MARSH
MAMM1-12: COMMON REED GRAMINOID MINERAL MEADOW MARSH
MEGM1-2: DRY BIG BLUESTEM GRAMINOID TALLGRASS PRAIRIE
MEGM4: FRESH - MOIST GRAMINOID MEADOW
MEMM3: DRY - FRESH MIXED MEADOW
MEMM4: FRESH - MOIST MIXED MEADOW
SAGM5: NURSERY
SAS: SUBMERGED SHALLOW AQUATIC
SWCM1-1: WHITE CEDAR MINERAL CONIFEROUS SWAMP
SWCM2-2: HEMLOCK MINERAL CONIFEROUS SWAMP
SWDM4-1: WILLOW MINERAL DECIDUOUS SWAMP
SWDM4-5: POPLAR MINERAL DECIDUOUS SWAMP
MINERAL MIXED SWAMP
SWMM3-2: POPLAR - CONIFER MINERAL MIXED SWAMP
SWMM4-2: BLACK ASH - CONIFER MINERAL MIXED SWAMP
SWTM2-1: RED-OSIER DOGWOOD MINERAL DECIDUOUS THICKET SWAMP
SWTM3: WILLOW MINERAL DECIDUOUS THICKET SWAMP
SWTM3-5: PUSSY WILLOW MINERAL DECIDUOUS THICKET SWAMP
TAGM5: FENCEROW



Secondary Plan Area

Soil Sample Location

Ecological Land Classification (RJB Field Verified)

Ecological Land Classification (MNRF Field Verified)

Ecological Land Classification (RJB Aerial Photography Interpretation)

Ecological Land Classification (RJB Field Verified - From Road)

Harmony-Farewell Iroquois Beach Provincially Significant Wetland (MNRF)

Sources:

1. Ministry of Natural Resources and Forestry,© King's Printer for Ontario.
2. Natural Resources Canada,© His Majesty the King in Right of Canada.

Disclaimer:

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This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

Datum: North American 1983	
Coord. System: NAD 1983 UTM Zone 17N	
Projection: Transverse Mercator	
Central Meridian: 81°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Page Orientation: -18.78°	Scale Factor: 0.99960

N
Grid North

0 100 200 300 400
Metres

BURNSIDE

TRUSTEE: FAREWELL HEIGHTS LANDOWNERS GROUP
FOR: MUNICIPALITY OF CLARINGTON

Figure Title

FAREWELL HEIGHTS SECONDARY PLAN NATURAL HERITAGE EVALUATION

ECOLOGICAL LAND CLASSIFICATION

Drawn	Checked	Date	Figure No.
HN	LA/AB	2024/11/18	3
Scale		Project No.	
H 1:5,000		300056758	

File Path: X:\056758 (Farewell Heights)\08_GIS\056758 Farewell Heights.aprx Print Date: 2024/11/18 Time: 06:38 PM

5.5.2 Botanical Inventory

A detailed list of plants identified on the subject lands can be found in Appendix D. The following summarizes the flora observed on the subject lands by Burnside in 2023:

- 177 plant taxa were observed. Of those, 176 were identified to a species, or subspecies level.
- Of those species, 133 (75%) were native and 40 (25%) were non-native to Ontario.
- All native species are considered 'apparently secure' (uncommon but not rare) (S4) or 'secure' (common, widespread, and abundant) (S5) in Ontario.
- 19 species were observed that are considered rare (R) or uncommon (U) to Durham Region (Varga et al., 2000):
  - Pale jewelweed (*Impatiens pallida*) R
  - Canada rush (*Juncus canadensis*) R
  - Leafy muhly (*Muhlenbergia frondosa*) R
  - Big bluestem (*Andropogon gerardi*) R2
  - Black maple (*Acer nigrum*) R4
  - Purple-veined willowherb (*Epilobium coloratum*) R5
  - Downy willowherb (*Epilobium strictum*) R5
  - Smooth serviceberry (*Amelanchier laevis*) U
  - Long-headed anemone (*Anemone cylindrica*) U
  - Yellow clintonia (*Clintonia borealis*) U
  - Canada tick-trefoil (*Desmodium canadense*) U
  - Dwarf scouring-rush (*Equisetum scirpoides*) U
  - Black walnut (*Juglans nigra*) U
  - Great blue lobelia (*Lobelia siphilitica*) U
  - Indian-pipe (*Monotropa uniflora*) U
  - Eastern cottonwood (*Populus deltoides*) U
  - Early goldenrod (*Solidago juncea*) U
  - Sphinx ladies'-tresses (*Spiranthes incurva*) (Formerly *S. cernua*) U
  - Royal fern (*Osmunda regalis*) U
- No species listed as Rare (R) in Durham (Riley et al., 1989) were recorded.
- Two species did not have rarity ratings in the reference plant lists for Durham but are likely rare for the region as they have been documented as rare in adjacent municipalities / ecodistricts:
  - Purple false foxglove (*Agalinis purpurea*)
  - Narrow-leaved blue-eyed-grass (*Sisyrinchium angustifolium*)

Black walnut, Eastern cottonwood, and Smooth serviceberry are commonly-planted landscaping trees, which are known to escape from manicured gardens in suburban and rural areas. Black walnut was found commonly in forests, cultural woodlands, and

hedgerows throughout the Site. These are not naturally occurring mature populations and as such should not be considered rare in a modified agricultural landscape.

Big bluestem was present in areas where restoration has occurred. This population is present due to native seed mix used in the restoration project.

5.5.3 Human Impact

Many of the vegetation communities on the subject lands have been heavily disturbed by past and current land use practices (i.e., agricultural, commercial and residential) and land development south of the subject lands.

Based on Google Earth imagery, natural features were removed in Parcel 30 and replaced with created wetlands as compensation for wetland removal south of the study limits, circa 2013. There is also a wetland restoration near the south end of Parcel 3 that was overseen by CLOCA for compensation of vegetation removal carried out by the landowner.

The northern portion of Parcel 6 has consistently been actively farmed for the past 30 years or more. The other fields in Parcel 4, 31, 33, and the south portion of Parcel 6 appear to have been farmed or maintained at irregular intervals (based on aerial imagery and deep ruts noted in the fields) and are currently zoned for Agriculture. Despite these parcels having been left fallow in recent years, it is possible these lands may be cleared and planted in active rotation again in future years.

Some of the human impacts observed are noted below:

- Extensive ATV trails noted throughout Parcels 3 and 30.
- Littering and dumping in the hedgerows east of Trulls Road.
- Expansion of greenhouse activities in Parcel 3 into PSW.

Parcel 31

Photo 1: Site Conditions May 12, 2023

Photo 2: Site Conditions August 23, 2023

Parcel 31 is an agricultural field that has been irregularly maintained. Aerial imagery from 1985 shows extensive tree cover that was cleared sometime between 1985 and 2005, likely coniferous swamp similar to the adjacent PSW. Gaps in historical imagery mean a more precise date could not be determined.

During the spring site visit on May 12, 2023, the Site appeared to have been left fallow for several years and displayed vegetation characteristic of a Native Deciduous Regeneration Thicket (THDM4-1). During the summer ELC / vegetation visit on August 23, vegetation had been removed in preparation for future cultivation of the field in 2024. The vegetation that had regrown appeared to be a mosaic of Fresh-Moist Mixed Meadow (MEMM4) and Mixed Mineral Meadow Marsh (MAMM3-1). However, the regrowth was fresh and too minimal to properly characterize the Site. The deciduous hedgerows on the northern and southern limit of the parcel had also been removed; the hedgerow on the western limit of the parcel (parallel to Trulls Road) had been thinned.

CLOCA had not classified the vegetation community type for this Parcel, as is the protocol under the ELC First Approximation (Lee et al., 1998) for anthropogenic communities. However, the ELC update protocols (Lee 2008, 2013) – under which this Site was assessed – provides for the classification of all land uses. It is anticipated that the active land management currently underway on this parcel will create a vegetation composition on the Site which is anthropogenic in nature (i.e., active row or forage crop). Because Burnside was unable to confidently classify the vegetation in 2023, Burnside ecologists will re-visit this Parcel during the growing season (i.e., June 2024) to classify it appropriately. An addendum to this report will be provided once we have confirmed the vegetation communities and delineated any wetland units, if present.

5.5.4 Future Wetland Compensation

Parcel 4

Parcel 4 consists primarily of a wet field that has been irregularly maintained. The northwest corner of the property is residential land, and the north and west borders of the field are drier and have been regularly mowed to create a lawn. However, a large portion of the southeast corner has been left to naturalize with only occasional maintenance. This is likely due to the wet soil conditions. During Burnside's spring site visit, this portion of the Parcel was characterized as Pussy Willow Mineral Deciduous Thicket Swamp (SWTM3-5) vegetation. During our summer visit on August 23, the woody vegetation was bushhogged. The resultant vegetation regrowth was classified as Mixed Forb Mineral Meadow Marsh Type (MAMM2-4), with patches of SWTM3-5. Wetland boundaries were determined as per the OWES guidelines for wetland delineation by a Ministry trained wetland evaluator (e.g., 50% wetland vegetation and hydric soils).

Photo 3: Site Conditions May 12, 2023

Photo 4: Site Conditions August 23, 2023

Summer vegetation was dominated by Sensitive fern, an OWES Wetland Indicator. Reed canary grass, Canada anemone, and Common buttercup (*Ranunculus acris*), all OWES Wetland Plant species, were also pervasive within the ecosite. Regrowth from Pussy willow and Heart-leaved willow was also evident across the Site.

A soil sample was taken in the MAMM2-4 / SWTM3-5 ecosite, shown in Figure 4B. The dark brown A horizon (surface horizon) extended down 30 cm and consisted of loamy fine sand. The light tan brown B horizon (subsurface horizon) consisted of fine sand and extended from 30 cm to the depth of the sample taken (100 cm). Mottles (g) were present at 30 cm and gley (G) was present at 95 cm. The sample returned a Moisture Regime of 5, Moist and has an Imperfect / Poor drainage class. According to the OWES manual, wetlands have soils that are classified as “hydric (e.g., substrates of Moisture Regime 6 or greater) and “nearly hydric” (e.g., Moisture Regime 5).

This meadow marsh is isolated from other wetlands or natural vegetation communities and has a history of disturbance. No amphibians were heard calling at this Parcel, no birds of significance or SAR were recorded using the meadow marsh as habitat. Due to these reasons, it is recommended the meadow marsh be considered for removal, which should be compensated for with an offsetting plan. During the site level EIS stage, it is also recommended that the vegetation be re-assessed in the event site conditions change or portions of the parcel are used for intensive agricultural use.

Parcel 6

Parcel 6 is divided into two distinct fields. The northern field has been consistently cultivated for agricultural uses. The southern field has seen occasional management but has predominately been left fallow. Wetland species were documented in the Fresh Moist Mixed Meadow (MEMM4), with small patches of wetland vegetation concentrations. However, the concentrations were confined to small dips in microtopography, and the site had less than 50% wetland vegetation coverage. According to the OWES manual, 50% wetland vegetation and a Moisture Regime of 5 or above is required to meet the conditions of a wetland.

Two soil samples were taken in the MEMM4 ecosite. The first sample was taken roughly 40 m from Trulls road, near the centerline of the ecosite. No mottles were observed, though gley was present at 55 cm. The dark brown A horizon extended 15 cm and consisted of fine sandy loam. The B horizon was reddish brown, fading to light tan. It consisted of fine sand and was determined to be the effective texture. It extended from 15 cm to the depth of the sample taken (100 cm). The soil sample was determined to be a Moisture Regime of 1, Moderately Fresh.

The second sample was taken near the center of the MEMM4 ecosite, near a willow thicket inclusion. The dark brown A horizon extended to a depth of 90 cm and consisted of silty clay loam. This layer was determined to be an effective texture. The medium

brown B horizon was fine sand and extended from 90 cm to 100 cm. Mottles were observed at 40 cm, but no gley was found. The soil sample was determined to have a Moisture Regime of 4, Moderately Moist.

Photo 5: Site Conditions November 3, 2023

Photo 6: Site Conditions November 3, 2023

The southeast corner of the Parcel is dominated by European common reed (*Phragmites australis* subsp. *australis*), with some Canary reed grass and sparse Torrey's rush towards the outer edges of the ecosite. Due to the dominance of the noxious, invasive European common reed, this area has been flagged for invasive species removal and remediation. European common reed is a seed dispersed, rhizomatic, and stoloniferous spreading species. Its aggressive growth outcompetes native species for water and nutrients, as well as for space and light. It creates monocultures that hinder wildlife use and can also trap and kill wildlife (OPWG, 2024). During future EIS site-level studies for this Parcel, an invasive species management plan should be developed for the removal of all European common reed to prevent its spread into the protected PSW. Opportunities for offsetting removal of wetlands should be explored in conjunction with restoration plans.

5.6 Salamander Habitat Assessment

Portions of the Harmony-Farewell Iroquois Beach PSW Complex are present on the subject lands. These wetlands are situated on poorly drained substrates. A high-water table exists because of the flat terrain, the perching of the groundwater in the sands over less permeable underlying glacial tills and the low ridges and swales. Therefore, many of the marsh and thicket swamp wetlands are typically flooded in spring. While water tables rise close to the surface in spring in the mixed and conifer swamps (as noted on the east side of Trulls Road in Parcel 32), areas of permanent water are rare in the wetland complex (MNR, 2005).

During the site visit on April 19, the high-water table and flooding was apparent while traversing the subject lands in search of vernal pools that may be suitable salamander breeding habitat. One vernal pool was identified in the study area as “high potential”. This pool is located in the SWDM4-1 (willow mineral deciduous swamp) community, shown in Figure 4A. There is a defined channel on the west side that drains southwest, towards Farewell Creek. This feature was dry in August (see Section 0 for more details). Despite a thorough search, no salamander or anuran egg masses were observed anywhere in the vernal pool during both assessments. Fairy shrimp and Wood Frog tadpoles were confirmed during the second visit, on May 8. Overhanging branches of shrubs, fallen trees, and tree branches are abundant in this pool. Adult Green frogs were also observed basking along the wetland edges and on woody debris and vegetation. One adult Wood frog was incidentally observed on May 8, on the edge of the woodland heading in an easterly direction towards the channel in the open field. Standing water in this pool was still present on June 19 (observed during a breeding bird survey). Amphibian breeding call surveys, completed on April 21, May 12, and June 29, recorded two individual Gray treefrogs calling along the forest edge on the second survey. No other anurans were recorded in this location. It is possible that the first scheduled survey missed the very short window for Wood Frog breeding calls (6 to 14 days). They move to their breeding sites during the first warm days of early spring (late March to early April), often when patches of ice are still on portions of the ponds and return to their summer habitat shortly thereafter. Tadpoles transform quickly in as little as six weeks (Harding, 1997).

No standing water was observed in this pool during other field investigations in late summer. Additional surveys at this vernal pool should be completed at the EIS site level (i.e., egg mass / minnow trap surveys) to confirm breeding habitat for Blue-spotted and spotted salamanders.

5.7 Amphibian Breeding Call Surveys

In total, five anuran species were identified on the subject lands during targeted amphibian breeding call surveys: Spring peeper (*Pseudacris crucifer*), Northern leopard frog (*Lithobates pipiens*), American toad (*Anaxyrus americanus*), Gray treefrog

(*Dryophytes versicolor*) and Green frog (*Lithobates clamitans*). All these species are ranked as S5 (Secure) in Ontario and considered common and widespread in the province. Results are summarized in Table 7 below.

Table 7: Amphibian Breeding Call Survey Results

Survey Date	Station ID	Species Observed	No. of Individuals
April 21, 2023	AMPH-001	N/A	0
April 21, 2023	AMPH-002	N/A	0
April 21, 2023	AMPH-003	Spring peeper	Chorus
April 21, 2023	AMPH-004	N/A	0
April 21, 2023	AMPH-005	Spring peeper	Chorus
April 21, 2023	AMPH-006	Spring peeper	Chorus
April 21, 2023	AMPH-006	Northern leopard frog	2
April 21, 2023	AMPH-007	Spring peeper	Chorus
April 21, 2023	AMPH-007	Northern leopard frog	2
April 21, 2023	AMPH-007	American toad	3
April 21, 2023	AMPH-008	N/A	0
May 12, 2023	AMPH-001	N/A	0
May 12, 2023	AMPH-002	N/A	0
May 12, 2023	AMPH-003	Spring peeper	6
May 12, 2023	AMPH-004	N/A	0
May 12, 2023	AMPH-005	Gray treefrog	2
May 12, 2023	AMPH-005	Spring peeper	Chorus
May 12, 2023	AMPH-006	Spring peeper	Chorus
May 12, 2023	AMPH-006	Gray treefrog	Chorus
May 12, 2023	AMPH-006	Green frog	6
May 12, 2023	AMPH-007	Spring peeper	Chorus
May 12, 2023	AMPH-007	American toad	Chorus
May 12, 2023	AMPH-007	Gray treefrog	Chorus
May 12, 2023	AMPH-008	Gray treefrog	2
June 29, 2023	AMPH-001	N/A	0
June 29, 2023	AMPH-002	N/A	0
June 29, 2023	AMPH-003	Gray treefrog	3
June 29, 2023	AMPH-004	N/A	0
June 29, 2023	AMPH-005	Green frog	2
June 29, 2023	AMPH-006	Green frog	5
June 29, 2023	AMPH-006	Gray treefrog	1
June 29, 2023	AMPH-007	Gray treefrog	2
June 29, 2023	AMPH-007	Green frog	1
June 29, 2023	AMPH-008	N/A	0

Three of the eight stations did not have any calls recorded: AMPH-001, AMPH-002, and AMPH-004. Therefore, these areas of the subject lands are not considered amphibian breeding habitat. Two Gray treefrogs were calling from AMPH-008 during the May 12 survey indicating that the ponds and swamps in this wooded location support a very small population of reproducing treefrogs; the marsh wetland stations at AMPH-006, and AMPH-007 support the highest density of reproducing treefrogs with full chorus recorded during the May 12 survey. Similarly, AMPH-005, AMPH-006, and AMPH-007 support the highest density of reproducing Spring peepers, with full chorus on both April 21 and May 12. The shrub thicket wetlands on the east side of Trulls Road (AMPH-003) also appear to support a higher density of reproducing Spring peepers. There is a shallow water marsh (SAS) surrounded by forest (FOD), located on Parcel 16, that is on a non-participating Parcel within the Secondary Plan Area (permission to enter was not granted) that supports a high density of reproducing Spring peepers, with full chorus incidentally recorded on April 21 and May 12. As noted above in Section 5.6, Wood frog tadpoles were confirmed in the vernal pond located close to AMPH-008 on May 8, during a salamander habitat assessment. Therefore, wooded ponds on the subject lands may also support Wood frog breeding habitat. Additional breeding call surveys specifically targeting Wood frog should be completed at the EIS site level.

It appears that the two constructed wetlands at AMPH-006 were created as compensation for removal of wetland and forested habitat in support of the residential subdivision south of Adelaide Avenue. Based on a review of Google Earth imagery, this occurred between 2010 to 2013. Amphibians exhibit high site fidelity to breeding ponds; therefore, it is not surprising that the northernmost wetland cell near a former shallow marsh wetland seems to support one of the highest densities of Spring peepers and Gray treefrogs on the subject lands, as well as Northern leopard frog and Green frog. The southernmost wetland cell was dry during all field investigations, including the first visit on April 19. Similarly, the shallow marsh (AMPH-007) located in the middle of the field on Parcel 3 has been heavily altered over the years due to agricultural practices (this can be viewed on Google Earth imagery). In recent years, it appears that some restoration activities surrounding the pond have occurred (i.e., tree and shrub plantings, “no mow” zones). Prior to 2020, this wetland was closely surrounded by forested habitat on the south and west sides. European common reed (*Phragmites australis* subsp. *australis*) has taken over the west end of this wetland, but it still supports a breeding population of a variety of amphibian species (Spring peeper, American toad, Gray treefrog, Northern leopard frog, Green frog).

Except for AMPH-003, all of the wetlands with confirmed amphibian breeding habitat are located in the NHS.

SWH is discussed further in Section 6.5 and Appendix B.

5.8 Avifauna

49 resident bird species, exhibiting some level of breeding evidence (possible, probable, or confirmed), were observed on the subject lands during targeted breeding bird surveys in 2023 (see Appendix C).

Four species were observed on the subject lands during the breeding bird window, but no breeding evidence (i.e., suitable breeding habitat or breeding behavior) was recorded. Blackpoll warbler (*Setophaga striata*) and Tennessee warbler (*Lieothylpis peregrina*) were presumed late migrants; Great blue heron (*Ardea herodias*), Rock pigeon (*Columba livia*), and Turkey vulture (*Cathartes aura*) were flyover observations.

According to MNR's SWH Technical Guide (2000), "area-sensitive" species are defined as species that require large areas of suitable habitat for long term population survival. Fragmentation of essential habitats can result in overall declines in populations. Eight "area-sensitive" bird species, as defined by MNR, were observed exhibiting breeding evidence on the subject lands during the breeding bird surveys. Three of these species were recorded in the developable limits on the subject lands: Bobolink, Eastern meadowlark, and Savannah sparrow (*Passerculus sandwichensis*). Four additional species were recorded in the NHS on the subject lands: Hairy woodpecker (*Dryobates villosus*), Pileated woodpecker (*Dryocopus pileatus*), Red-breasted nuthatch (*Sitta canadensis*), Veery (*Catharus fuscescens*), and Ovenbird (*Seiurus aurocapilla*).

Four bird species, listed as both provincially and federally significant, were observed on the subject lands during breeding bird surveys. Three of these species were recorded in the developable limits on the subject lands: Barn swallow (*Hirundo rustica*) (SC), Bobolink (THR), and Eastern meadowlark (THR). One species was recorded in the NHS of the subject lands: Wood thrush (Hylocichla mustelina) (SC). SAR and SWH Screening Tables for the subject lands are included in Appendix B. The significance of these species is discussed in more detail in Section 6.5 and 6.6.

Habitat for raptors may be present in the woodlands contained within the NHS and in the mature hedgerows. No confirmed breeding evidence was recorded during breeding bird surveys or any field investigations on the subject lands, including early spring salamander habitat assessments, aquatic surveys, and amphibian breeding call surveys. Incidental observations of raptors during other surveys included sightings of unidentified Accipiter species (Sharp-shinned or Cooper's hawk), Barred owl (feather), and empty stick nests. Future early spring raptor surveys should be completed at the EIS site level, if encroachments into candidate breeding habitat are proposed, to ensure that any confirmed raptor nesting habitat is protected. Potential breeding habitat is present on the subject lands in the NHS given the mosaic of treed wetland and forested ecosites associated with the Harmony-Farewell Iroquois Beach PSW Complex and Farewell Creek valleyland.

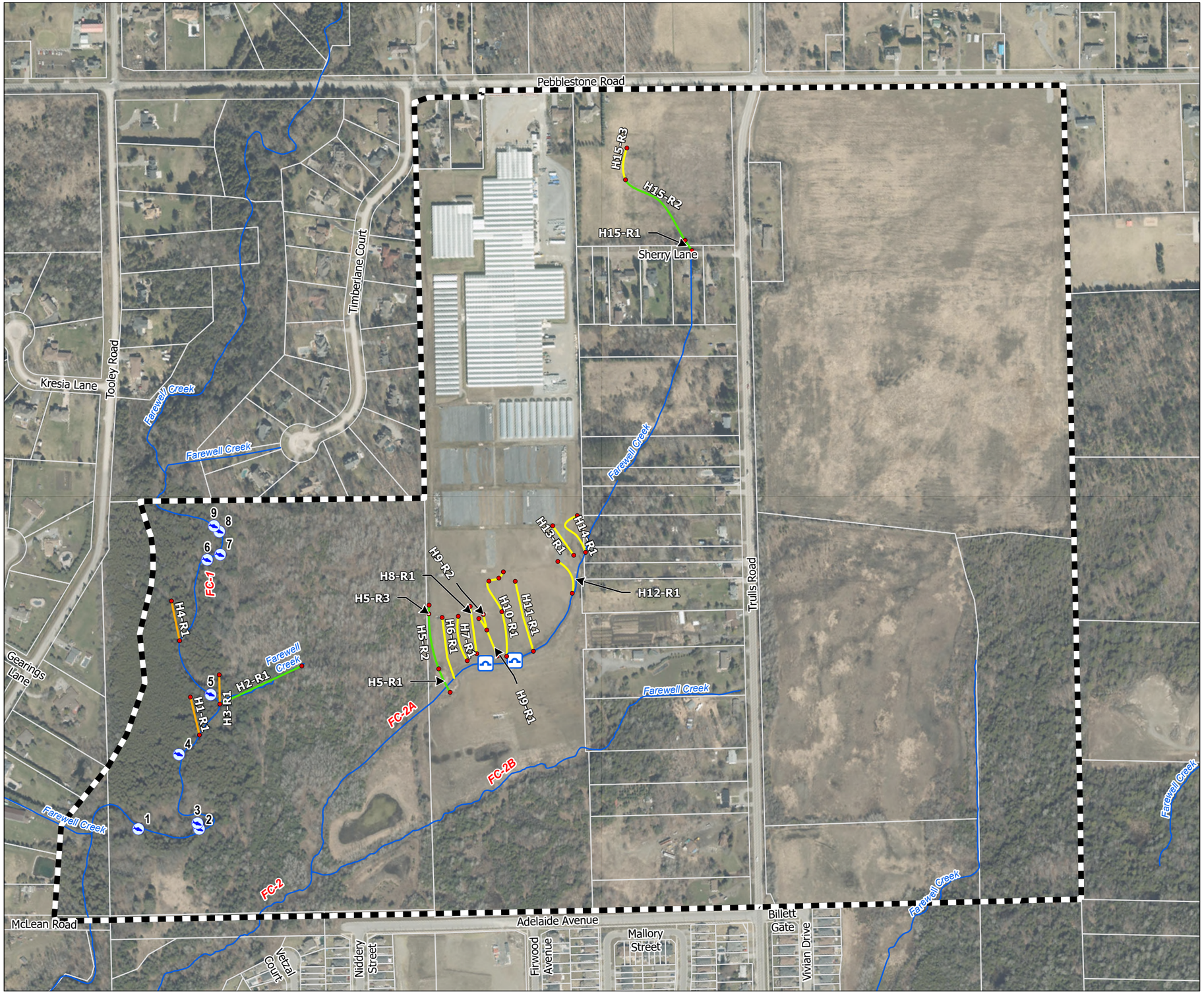
Pileated woodpecker was confirmed to be breeding on the subject lands in the NHS in the wetland and forested ecosites. The majority of observations were west of Trulls Road in Parcels 3 and 30. Adult birds were first observed and heard drumming / calling incidentally on April 19 during a salamander habitat assessment. This species begins defending their territory and breeding in mid-March to early May. Individuals were observed during targeted breeding bird surveys and subsequent field investigations. There is a tall dead tree snag located immediately north of Adelaide Avenue, in Parcel 3 on the east side of an ATV trail (BBS-007). There are two southwest-facing cavities approximately 1 m apart that were excavated by Pileated woodpecker in early spring (personal communication and video reviewed from local resident). On July 27, five individuals (presumed family) were incidentally observed at the tree snag and vocalizing in the general area. This tree snag is a presumed nesting site.

As discussed in Section 2.3, the MBCA (1994) recently updated the Migratory Bird Regulations. The nesting cavities of Pileated woodpecker are protected year-round, including when they are not occupied by a migratory bird or viable eggs. If an unoccupied nest is destroyed, a notification must first be submitted through the Abandoned Nest Registry, and if the nest remains unoccupied by Pileated woodpecker and other migratory bird species for 36 months, it may at that point be destroyed by cutting down the tree (note, other rules may apply for SAR bats under the ESA). Nests are usually excavated in large diameter declining or dead trees. Additional tree cavity searches should be completed at the EIS site level effort to document and confirm presence of nesting sites once development impacts are better understood.

5.9 Aquatic Ecology

5.9.1 Fish Habitat and In-Stream Barrier Assessment

All watercourse reaches are depicted in Figure 4A.



Secondary Plan Boundary

Watercourse - Thermal Regime: Cold (MNR ARA)

FC-# Reach Number

Culvert

Spawning Redds

Headwater Drainage Feature Reach Break

Headwater Drainage Feature Reach Classification:

Conservation

Maintain/Replicate Terrestrial Linkage

No Management Concern

Sources:

1. Ministry of Natural Resources and Forestry,© King's Printer for Ontario.
2. Natural Resources Canada,© His Majesty the King in Right of Canada.

Disclaimer:

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This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

Datum: North American 1983	
Coord. System: NAD 1983 UTM Zone 17N	
Projection: Transverse Mercator	
Central Meridian: 81°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Page Orientation: -18.78°	Scale Factor: 0.99960

N
Grid North

0 100 200 300 400
Metres

BURNSIDE

TRUSTEE: FAREWELL HEIGHTS LANDOWNERS GROUP
FOR: MUNICIPALITY OF CLARINGTON

Figure Title

FAREWELL HEIGHTS SECONDARY PLAN NATURAL HERITAGE EVALUATION

AQUATIC HABITAT

Drawn	Checked	Date	Figure No.
HN	MM	2024/11/18	4A
Scale		Project No.	
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File Path: X:\056758 (Farewell Heights)\08_GIS\056758 Farewell Heights\056758 Farewell Heights.aprx Print Date: 2024/11/18 Time: 06:34 PM

5.9.1.1 FC-1

FC-1 is the mainstem of Farewell Creek, which bisects the subject lands on the west side of Trulls Road, flowing in a north to south direction. It flows through forested lands, mostly vegetated with cedars and coniferous trees. A residential subdivision is present east of the watercourse, near the upstream limit of the subject lands. Most of the residential properties west of FC-1 are setback from the watercourse with a dense layer of forested lands situated between them and the watercourse. It was noted that one property near the downstream limit has mown lawn to the bank of the watercourse.

Generally, the watercourse flows in sections of riffles, runs, and pools with flats observed as well. In August 2023, wetted width and depth measurements were taken at representative morphological units throughout FC-1, and these are present in Table 8 below. The substrate is primarily comprised of gravel, cobble, and sand with trace amounts of boulders present throughout the watercourse.

The watercourse is located within forested lands that provide a high degree of shading, as well as overhead cover and shading for aquatic life. There are deposits of overhanging and woody debris found throughout FC-1, which provides additional habitat and cover for aquatic life. Other than watercress, which was observed throughout the channel, indicating the potential of groundwater upwelling within it, aquatic macrophytes were not observed in any substantial abundance.

Most of the banks are minorly eroded with minimal scalloping observed, although two large, exposed slopes with fallen trees were observed on the east bank near the upstream and downstream limits of the subject lands. There are small sections of undercut banks through the watercourse, which provide cover and habitat for aquatic life. A single, large island was observed approximately 90 m upstream of the downstream limit of the subject lands. Flowing water was observed in each of the channels that surround the island.

There are signs of human influence in FC-1, as there are several areas where all-terrain vehicles (ATV) have been crossing it, resulting in eroded banks and stream bed disturbances. Additionally, a stormwater outfall is present on the west bank, near the downstream reach of the watercourse.

Permanent barriers to fish movement (i.e., dam, weirs, perched culverts) were not observed along FC-1. Fish were observed within the watercourse during each site visit, and thus it is determined that FC-1 provides permanent fish habitat. As noted in Section 5.9.4 below, coldwater, sensitive fish species were captured within the watercourse in the summer of 2023.

Table 8: Channel Measurements – FC-1

Morphology	Mean Wetted Width (m)	Mean Wetted Width (d)	Substrate
Runs	5.4	0.25	Gravel, cobble, sand, and trace boulders.
Flats	5.4	0.20	Gravel, cobble, sand, and trace boulders.
Riffle	4.8	0.15	Gravel and cobble.
Pools	5.2	0.45	Sand, silt, gravel, and trace cobble.

5.9.1.2 FC-2A

FC2-A was dry, other than the April and May site visits. The channel is located on Parcel 3, with no trees or shrubs on either side of the channel as it flows through the property. Stagnant water was observed during the April and May site visits.

The channel through Parcel 3, and immediately downstream, is completely vegetated with cattails. The substrate is comprised of muck and organic material, with no granular or fine sediment observed. There are sections downstream of the property where vehicles have driven through the feature, disrupting flow, and removing any definition of a channel.

There are two culverts on Parcel 3, although they are neither perched nor embedded. They do not pose a barrier to fish movement as fish are unlikely to inhabit the tributary given the dense in-stream vegetation, intermittent nature of the flow and lack of a defined channel downstream.

Downstream of the greenhouse operations in Parcel 30, the channel continues to flow through extremely dense vegetation in an undefined channel (i.e., no bed and bank). During the April site visit, the water depth through these lands was 0.1 m or less, while the wetted width was over 2 m. FC-2A continues to flow in similar conditions until it forms a confluence with FC-2B, near the southern limit of the subject lands.

Based on the interpretation of aerial imagery, the watercourse flows through residential properties and forested areas upstream of the greenhouse operations beyond the subject lands. Aerial imagery displays that FC-2A originates north of Sherry Lane, although it was observed that a channel with a defined bed and bank is not present upstream or downstream of this road. A culvert is present to convey flows from north to south through the road.

Given the lack of a defined channel and flowing water and the dense in-stream vegetation, it was determined that FC-2A is not direct fish habitat, as defined by the *Fisheries Act*, but it does provide indirect fish habitat through the conveyance of flow, nutrients, sediment, and water quality.

5.9.1.3 FC-2B

Reach FC-B flows from east to west through the subject lands, originating on the west side of Trulls Road. If flows through residential properties, upstream of the subject lands.

FC-2B flows through the subject lands parallel to a field on Parcel 3, south of reach FC-2A. It flows in a poorly defined channel for approximately 105 m from east to west before forming a smaller channel until it flows into forested lands 30 m downstream on Parcel 30. During the April 2023 site visit, two large wetland cells were observed on Parcel 30.

Within the forested lands on Parcel 30, the channel is poorly defined, and FC2-B continues to flow in this manner until it forms the confluence with reach FC-2A. Through this section, dense in-stream emergent vegetation, and woody material grow within and adjacent to the watercourse. Reach FC-2B was dry during all site visits, following the May 11 site visit.

The substrate of FC-2B is comprised of muck and organic material. Within Parcel 3, small islands have formed, and the channel can be braided at times. Trees, grasses, and wetland plants (i.e., cattails) were observed in the water in the portion of FC-2B that flows through Parcel 3 during spring site visits. Through Parcel 3, forested lands are present south of reach FC-2B.

Given the lack of a defined channel, flowing water, and the dense in-stream vegetation, it was determined that FC-2B is not direct fish habitat, as defined by the *Fisheries Act*, but it does provide indirect fish habitat through the conveyance of flow, nutrients, sediment, and water quality.

5.9.1.4 FC-2

FC-2 flows through the subject lands for approximately 110 m from northeast to southwest. This reach is surrounded by forested lands, which shade the watercourse. The channel is undefined, similar to reach FC-2A. Flowing water was observed in FC-2 only during the April and May site visits. A channel with a defined bed and bank was not observed through the subject lands. Emergent plants and shrubby vegetation grow within and adjacent to the watercourse. The substrate of reach FC-2 is comprised of muck and organic material. Water depths were measured to be 0.1 m or less during the April site visit, when flowing water was observed.

Given the lack of a defined channel and flowing water and the dense in-stream vegetation, it was determined that FC-2B is not direct fish habitat, as defined by the *Fisheries Act*, but it does provide indirect fish habitat through the conveyance of flow, nutrients, sediment, and water quality.

5.9.1.5 FC-3

FC-3 originates within forested lands vegetated with cedar trees, just south of the southern limit of the agricultural field on Parcel 33, east of Trulls Road. It flows in a linear channel from north to south for approximately 350 m after which it flows in a meandering, poorly defined channel through the remainder of the subject lands. Flowing water was observed only in April and May of 2023.

Over 80% of the surface area of the channel is shaded and the banks are stable, where the channel is defined in the linear section described above. In April and May, when water was observed, it was either stagnant or minorly flowing and the wetted depth was measured to be 0.1 m or less. Granular substrate is not present, as the streambed is comprised of muck and organic material.

A review of aerial imagery and MNR ARA mapping indicates that the watercourse flows into online ponds downstream of the subject lands, which may be a permanent barrier to fish movement from reaches of FC-3 into the subject lands. Fish were not observed within the channel during any site visit in 2023.

Given the lack of flowing water and the on-line ponds downstream of the subject lands, it was determined that FC-3 is not direct fish habitat, as defined by the *Fisheries Act*, but it does provide indirect fish habitat through the conveyance of flow, nutrients, sediment, and water quality.

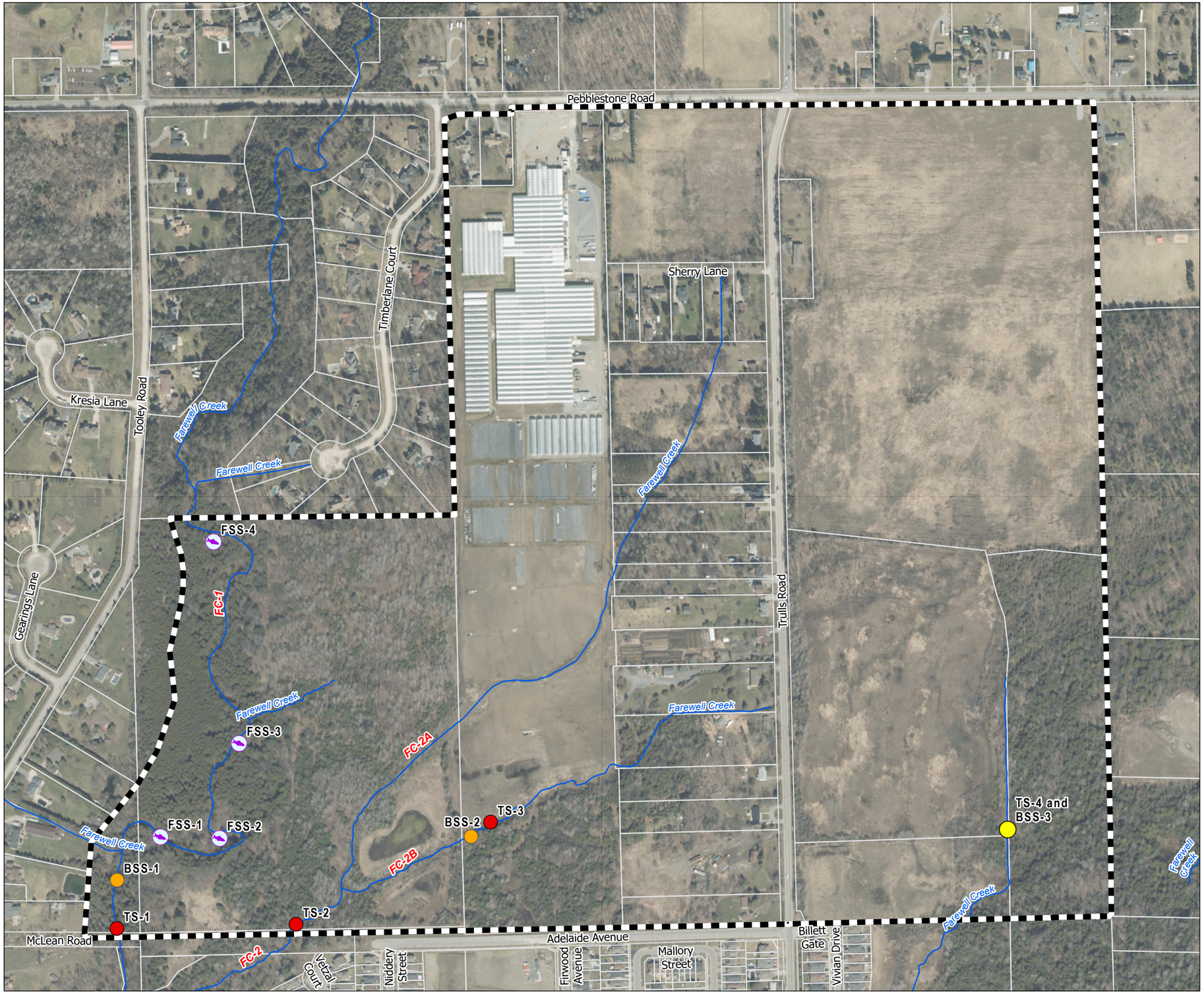
5.9.2 Fish Spawning Surveys

All watercourses within the subject lands were traversed in the spring and fall of 2023 to observe potential salmonid spawning within FC-1 and its tributaries. No fall spawning species (i.e., Brown trout, Chinook salmon, Brook trout) were observed in FC-1, and the tributaries were dry in the fall.

Numerous adult Rainbow trout were observed migrating upstream in FC-1 during the April 2023 site visit. No fish were observed in FC-2, FC-2A / 2B, or FC-3 during in April, or any subsequent site visits. In April, the watercourse was clear, with the substrate of the stream visible through the reach bisecting the subject lands. Rainbow trout were observed in runs, flats, pools and riffles, with fish actively moving upstream and others seeking refuge habitat in pools. Fish were not observed on redds, but several cleared off, depressional areas within the substrate were observed. Nine potential spawning redds were observed throughout the reach of FC-1 that bisects the subject lands. Conditions of the nine redds are presented below, in Table 9. The locations of the redds are shown in Figure 4B.

Table 9: April 2023 Spawning Redd Conditions

Redd	Morphology	Substrate	Depth (m)
1	Run	Gravel, sand, and cobble	0.35
2	Run	Gravel, sand, and cobble	0.30
3	Flat	Gravel, sand, and cobble	0.40
4	Run	Gravel	0.30
5	Run	Gravel and cobble	0.25
6	Flat	Gravel, sand, and cobble	0.30
7	Flat	Sand and gravel	0.40
8	Run	Gravel, sand, and cobble	0.45
9	Flat	Gravel and cobble	0.25



- Secondary Plan Boundary
- Watercourse - Thermal Regime: Cold (MNR ARA)
- Fisheries Sampling Station
- Spawning Redds
- Thermal Station
- Thermal Station and Benthic Sampling Station
- Benthic Station

Sources:

1. Ministry of Natural Resources and Forestry,© King's Printer for Ontario.
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False Easting: 500,000m	False Northing: 0m
Page Orientation: -18.78°	Scale Factor: 0.99960

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Grid North

0 100 200 300 400
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BURNSIDE

TRUSTEE: FAREWELL HEIGHTS LANDOWNERS GROUP
FOR: MUNICIPALITY OF CLARINGTON

Figure Title

FAREWELL HEIGHTS SECONDARY PLAN NATURAL HERITAGE EVALUATION

AQUATIC SAMPLING

Drawn	Checked	Date	Figure No.
HN	MM	2024/11/18	4B
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5.9.3 Headwater Drainage Features

Headwater Drainage Features are depicted in Figure 4. Features H1 through H4 are all located within the NHS in the corridor surrounding FC-1. H1, H3, and H4 are swales that had standing water in them in during the first and second site visits but were drying during the final site visit in August. Due to the lack of flowing water, and forested corridor, the management recommendation for H1, H3, and H4 is Maintain / Replicate Terrestrial Function, although they are located within the NHS, and it is unlikely that they will be altered / removed by any future development.

Feature H2 functions as a natural channel; although fish do not inhabit it, a defined bed and substrate sorting was observed. Flowing water was observed in April and May of 2023, but the feature was dry in August. Flows are conveyed from a wetland at its upstream, east end to Farewell Creek. Given its channel form, flow, and riparian vegetation conditions, the management recommendation for H2 is Conservation. As Feature H2 is located within the NHS, it is unlikely that it will be altered / removed by any future development.

Features H5 through H14 are all located within Parcel 3, on the north side of FC-2A. Aside from Feature H5, these were all removed from the landscape between the May 11 site visit and the August 22 site visit. Features H6 through H14 were dry during the April and May site visits and non-existent during the August site visit. The HDFs are covered as part of the greenhouse operations in the summer / fall months. These features appear to convey runoff outside the growing season to reach FC-2A during snowmelt or storm events, but this is likely in short-duration due to the lack of flow or moist soil during Burnside's April site visit. Given the lack of flow, no contributing, or valued riparian habitat, and the fact that the features are removed from the landscape in the summer, the management recommendation for Features H6 trough H14 is No Management Concern.

Feature H5 is a multi-thread feature on the far west side of Parcel 3, adjacent to forested lands, losing definition in the downstream reach near FC-2A. Standing water and / or minimal flow was visible throughout the feature during the April site visit, and the feature remained on the landscape in the summer. Standing water was observed in isolated pockets through H5, during the May site visit. Due to the feature type, flow, and adjacent riparian vegetation, the management recommendation for H5 is Conservation.

Feature H15 is located in the northwest potion of the subject lands, on Parcel 4. Standing water was observed throughout during the April and May site visits but was dry in August 2023. It is not a defined channel, but wetland plants are found through Reach 2, and forested / scrubland in Reach 1. The wetland plants in Reach 2 consist largely of Sensitive fern and Pussy willow. The far upstream reach is not as densely vegetated with wetland plants. Given the standing water, feature type and riparian vegetation surrounding Reach 2, the management recommendation Conservation for

Reaches 1 and 2 (downstream) was applied per the TRCA-CVC HDF Guidelines (2014). Reach 3 is a depressional, vegetated flow route in which standing water was observed in April and May, although wetland plants are not present as they are downstream in Reaches 1 and 2. Therefore, the management recommendation for Reach 3 is No Management Concern. Overall, it is recommended that future studies occur in this parcel for the wetland and the HDF. As noted in Section 5.5.4, land management of this wetland has led to periodic vegetation removals and changes over the years. Due to the disruption to the wetland, it will be important for future studies to observe wetland conditions, and the flow regime through the parcel.

Table 10 below summarizes the HDF Reached Based classification recommendations for the Secondary Plan Area.

Table 10: Farewell Heights Reach Based HDF Classification

Drainage	Reach	Hydrology	Modifiers	Riparian Classification	Fish and Fish Habitat	Terrestrial Habitat	Management Recommendation
H1	R1	Limited Function	N/A	Important Function	Contributing Function	Contributing Function	Maintain/Replicate Terrestrial Linkage
H2	R1	Valued Function	N/A	Important Function	Contributing Function	Valued Function	Conservation
H3	R1	Limited Function	N/A	Important Function	Contributing Function	Contributing Function	Maintain/Replicate Terrestrial Linkage
H4	R1	Limited Function	N/A	Important Function	Contributing Function	Contributing Function	Maintain/Replicate Terrestrial Linkage
H5	R1	Limited Function	N/A	Important Function	Contributing Function	Limited Function	Conservation
H5	R2	Valued Function	N/A	Important Function	Contributing Function	Limited Function	Conservation
H5	R3	Valued Function	N/A	Important Function	Contributing Function	Limited Function	Conservation
H6	R1	Limited Function	Agricultural Practices	Limited Function	Contributing Function	Limited Function	No Management Concern
H7	R1	Limited Function	Agricultural Practices	Limited Function	Contributing Function	Limited Function	No Management Concern
H8	R2	Limited Function	Agricultural Practices	Limited Function	Contributing Function	Limited Function	No Management Concern
H9	R1	Limited Function	Agricultural Practices	Limited Function	Contributing Function	Limited Function	No Management Concern
H9	R2	Limited Function	Agricultural Practices	Limited Function	Contributing Function	Limited Function	No Management Concern

Drainage	Reach	Hydrology	Modifiers	Riparian Classification	Fish and Fish Habitat	Terrestrial Habitat	Management Recommendation
H10	R1	Limited Function	Agricultural Practices	Limited Function	Contributing Function	Limited Function	No Management Concern
H11	R2	Limited Function	Agricultural Practices	Limited Function	Contributing Function	Limited Function	No Management Concern
H12	R1	Limited Function	Agricultural Practices	Limited Function	Contributing Function	Limited Function	No Management Concern
H13	R1	Limited Function	Agricultural Practices	Limited Function	Contributing Function	Limited Function	No Management Concern
H14	R1	Limited Function	Agricultural Practices	Limited Function	Contributing Function	Limited Function	No Management Concern
H15	R1	Valued Function	Culvert	Important Function	Contributing Function	Limited Function	Conservation
H15	R2	Valued Function	N/A	Important Function	Contributing Function	Limited Function	Conservation
H15	R3	Valued Function	N/A	Valued Function	Contributing Function	Limited Function	No Management Concern

5.9.4 Fish Community Inventory

Burnside completed a fish community inventory at four stations along FC-1. Reaches FC-2A / 2B, FC-2, and FC-3 were dry during the site visit and thus sampling did not occur. Sampling locations along FC-1 are depicted in Figure 4A.

Fisheries Sampling Site 1 was the furthest downstream and consisted of a riffle at the far downstream limit and runs and flats upstream of it. The substrate was comprised of cobble, gravel and sand, with trace boulders as well. Watercress was present, as well overhanging and in-stream woody debris.

Fisheries Sampling Site 2 featured a pool at the downstream limit, that was up to 0.5 m deep. Watercress was present within the Site, as well as woody debris and overhanging grasses. The substrate was comprised of fine material within the pool and some cobble interspersed and on the margins of it.

Fisheries Sampling Site 3 featured a pool and a riffle at the downstream and upstream limits, respectively. Overhanging woody debris was present and the banks were not undercut. A minor amount of watercress was observed. The substrate was comprised of cobble, gravel, and sand.

Fisheries Sampling Site 4 was located near the upstream limit of FC-1 in the subject lands and downstream of the residential homes on the east bank of Farewell Creek. The Site was well shaded, as were Sites 1 through 3, and the morphology was comprised of flats. The substrate was comprised mostly of sand and silt with minor amounts of cobble observed. See Table 11 below.

Table 11: Fisheries Sampling Data – Farewell Creek – August 29, 2023

Species	Scientific Name	Thermal Regime	# of Fish Collected at Sampling Site 1	# of Fish Collected at Sampling Site 2	# of Fish Collected at Sampling Site 3	# of Fish Collected at Sampling Site 4
Blacknose dace	*Rhinichthys spp.*	Cool	2	16	2	3
Bluegill	*Lepomis macrochirus*	Warm	1	0	0	0
Creek chub	*Semotilus atromaculatus*	Cool	0	1	4	0
Johnny darter	*Etheostoma nigrum*	Cool	14	1	0	0
Longnose dace	*Rhinichthys cataractae*	Cool	4	0	0	0

Species	Scientific Name	Thermal Regime	# of Fish Collected at Sampling Site 1	# of Fish Collected at Sampling Site 2	# of Fish Collected at Sampling Site 3	# of Fish Collected at Sampling Site 4
Mottled sculpin	*Cottus bairdii*	Cold	14	1	6	2
Pumpkinseed	*Lepomis gibbosus*	Warm	0	0	1	0
Rainbow trout	*Oncorhynchus mykiss*	Cold	36	6	11	10

The fish community inventory indicates that the watercourse can provide habitat to coldwater sensitive fish species, including Rainbow trout and Mottled sculpin. These species were captured at each site, throughout the reach of FC-1 that flows through the subject lands.

5.9.5 Benthic Monitoring

Benthic invertebrate monitoring was conducted in the spring and early fall of 2023, as recommended in the OBBN Manual. During the spring site visit flowing water was present in FC-1, FC-2B, and FC-3. FC-2A was dry through the agricultural fields, and very dense vegetation prevented sampling downstream of the fields. FC-2B and FC-3 were dry in October. Sampling was conducted at the downstream limit of FC-1, at the downstream limit adjacent to the field in FC-2B and through the forested section of FC-3 within the subject lands.

Table 12: Benthic Invertebrate Sampling Results – May 11 and 18, 2023

Index	FC-1	FC-2B	FC-3
Mean No. of Taxonomic Groups Found	32	15	15.33
Total Number of Individuals	382	336	348
% EPT	24.08	0.60	1.44
Shannon Diversity Index	3.03	1.94	1.91
Evenness	0.88	0.72	0.70

Table 13: Benthic Invertebrate Sampling Results – October 12, 2023

Index	FC-1
Mean No. of Taxonomic Groups Found	34.67
Total Number of Individuals	374
% EPT	45.72
Shannon Diversity Index	2.94
Evenness	0.83

The benthic invertebrate sampling results follow several patterns. Water quality as indicated by the Shannon Diversity Index and the % EPT index decreases in the tributaries of Farewell Creek as opposed to the mainstem (FC-1). In addition, a relatively higher number of taxonomic groups were identified in the FC-1 site than in the tributaries, indicating a more diverse population of benthic invertebrates is present.

Although there is no reference site for this project it is noted that the FC-1 sampling station is less influenced by anthropogenic interferences, such as the agriculture directly adjacent to FC-2B and FC-3, and the residential properties directly adjacent to FC-2B. The results from the benthic surveys from 2023 can be used a baseline moving forward to monitor impacts to the watercourses adjacent to the subject lands.

5.9.6 Thermal Monitoring

Tributaries FC-2, FC-2B, and FC-3 are intermittent steams. Based on visual observation, and through stream flow monitoring with continuous data loggers, the channels were consistently dry. Maximum air temperature during the period recommended to be analyzed by Chu et.al. (2009) occurred on July 5 and 6, when the temperature at 16:30 was 30.1 ºC. The water temperature in the watercourses during this time is provided in Table 14 below.

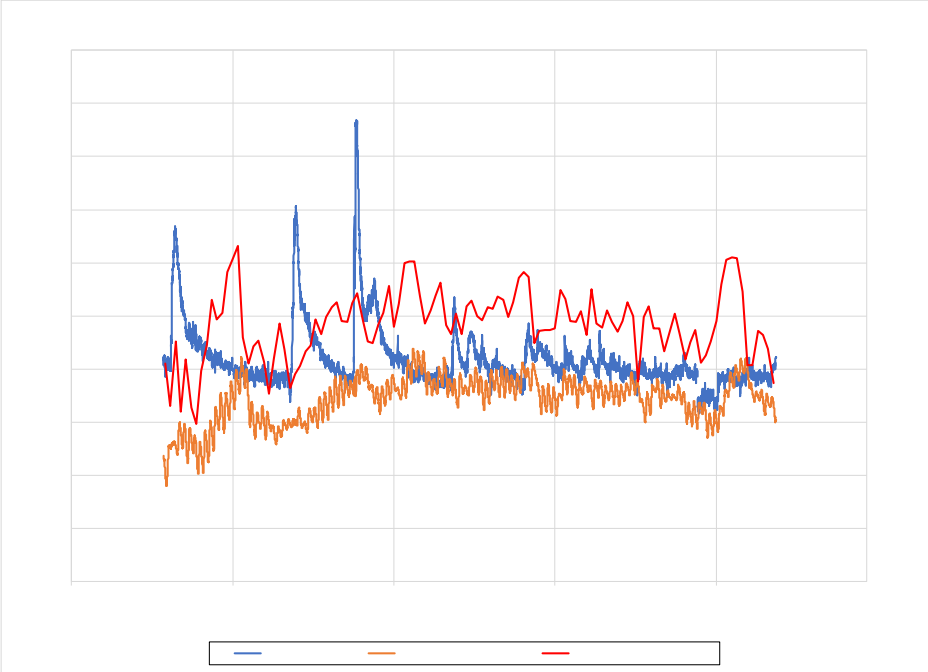
Table 14: Stream Temperature – 16:30 June 2, 2023

Reach Number	Thermal Monitoring Station	Temperature (ºC)
FC-1	TS-1	21.89
FC-2	TS-2	25.2 (dry)
FC-2B	TS-3	26.2 (dry)
FC-3	TS-4	24.4 (dry)

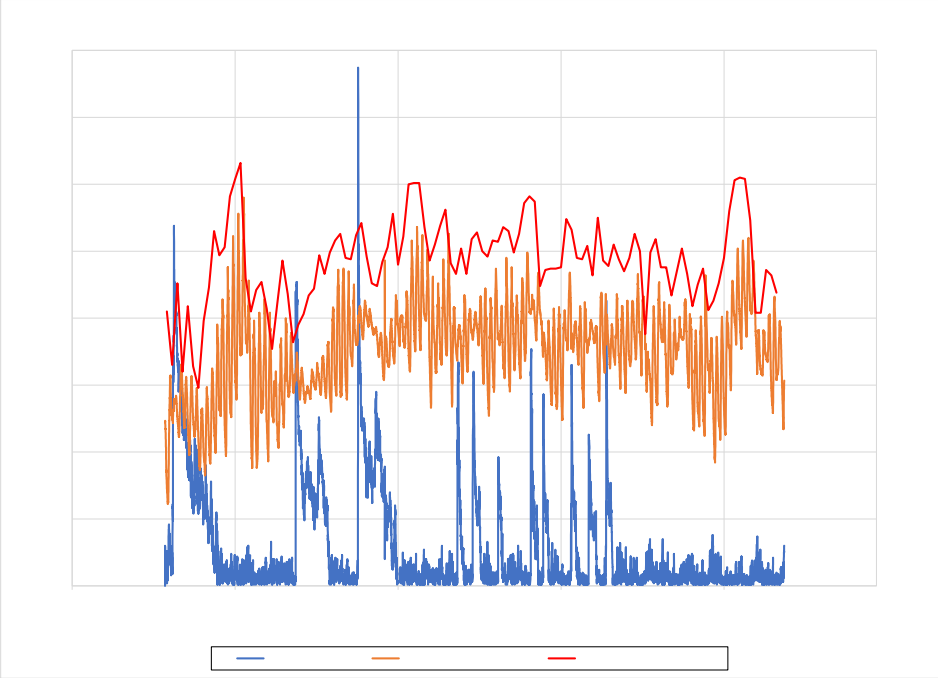
The thermal data is presented in Graphs 1 to 4, below.

Based on the nomogram produced by Stoneman et. al. (1996), Reach FC-1 is classified as a cool-water thermal regime, while Reaches FC-2, FC-2B, and FC-3 are classified as a warmwater thermal regime.

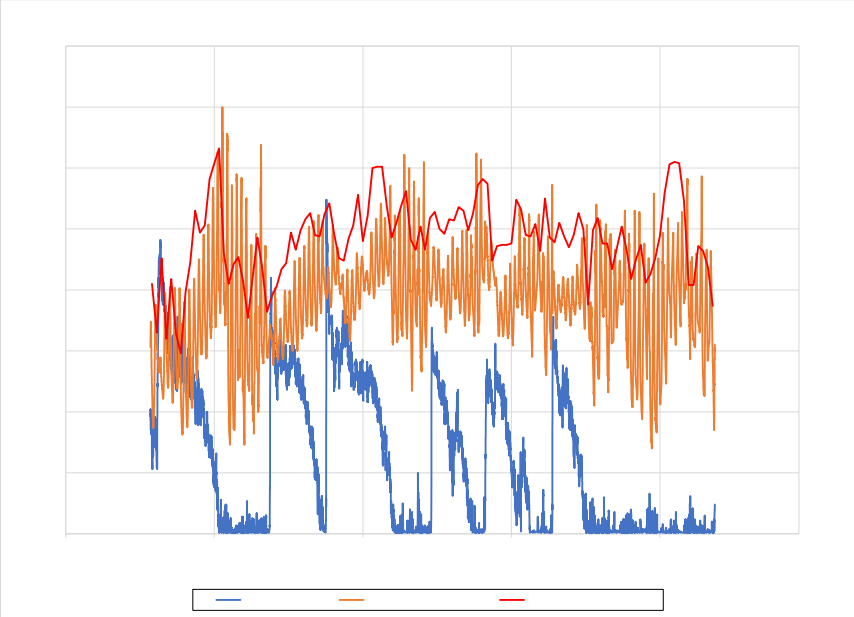
Graph 1: FC-1 Thermal Data



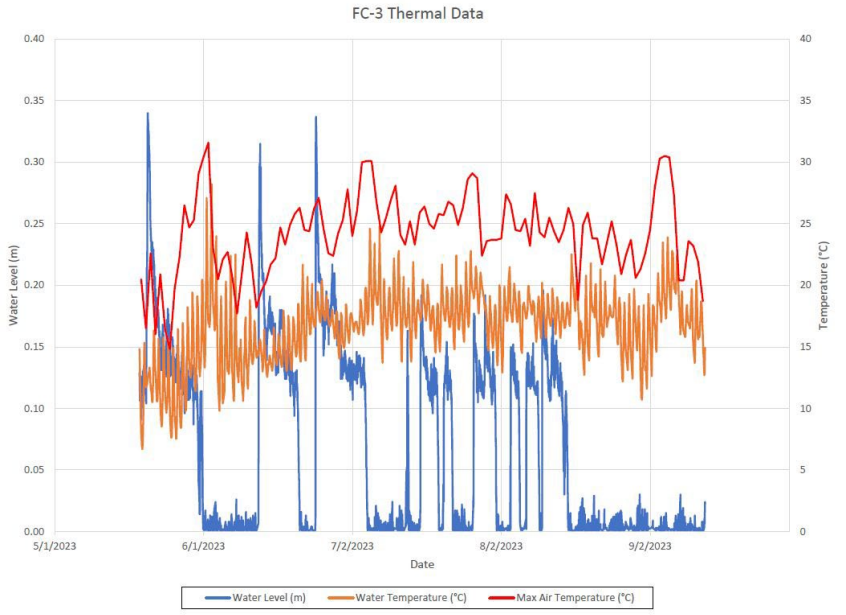
Graph 2: FC-2 Thermal Data



Graph 3: FC-2B Thermal Data



Graph 4: FC-3 Thermal Data



5.10 Incidental Wildlife Observations

Incidental wildlife observations recorded by Burnside during field investigations are listed in Table 15 below.

MNRs provincial ranks (i.e., S1 to S5) are used to set protection priorities for rare species and natural communities. Except for Monarch (*Danaus plexippus*), the

remaining species observed are not listed as provincially and / or federally significant and are listed as secure, or apparently secure in Southern Ontario (in other words, they are ranked as S4 or S5, which is defined by MNR as species that are common, widespread, and abundant in the province or uncommon but not rare).

Table 15: Summary of Incidental Wildlife Observations by Burnside Staff on the Subject Lands

Common Name	Scientific Name	Number Observed	S-Rank	Location/Comments
Bat spp	*Myotis spp.*	2	-	Parcel 30/3 (forest edge and open field); Parcel 3 (forest edge and Adelaide Avenue). Both observed foraging; incidentally observed June 29, 2023, during amphibian survey #3.
Eastern cottontail	*Sylvilagus floridanus*	2	S5	Parcel 3. Multiple dates.
Coyote	*Canis latrans*	-	S5	Scat and tracks. Multiple dates.
Eastern chipmunk	*Tamias striatus*	1	S5	Parcel 3. Multiple dates.
Red squirrel	*Tamiasciurus hudsonicus*	1	S5	Parcel 29. Multiple dates.
White-tailed deer	*Odocoileus virginianus*	-	S5	Entire site. Tracks, browsing along tribs / watercourses, wetland edges, and fields.
American toad	*Anaxyrus americanus*	1	S5	Parcel 30 (SWD). Recorded on May 12.
Gray treefrog	*Dryophytes veriscolor*	1	S5	Parcel 30 (FOM). Recorded on May 12 and August 23.
Green frog	*Lithobates clamitans*	5+	S5	Parcel 30. Observed in SWDM4-1 on May 8; not recorded in this location during amphibian breeding call surveys.
Wood frog	*Lithobates sylvaticus*	1	S5	On the border of Parcel 3 and 30. Individual recorded on May 8.
Spring peeper		1	S5	Parcel 31. Individual recorded on May 12.
Eastern garter snake	*Thamnophis sirtalis sirtalis*	2	S5	Parcel 33. One recorded incidentally in April 19 and June 19, respectively.
Barred owl	*Strix varia*	-	S5	Feather. Parcel 30. Along ATV trail on June 19.
Black-and-white warbler	*Mniotilta varia*	1	S5B	Migrant. Recorded on May 8.

Common Name	Scientific Name	Number Observed	S-Rank	Location/Comments
Black-throated green warbler	*Setophaga virens*	2	S5B	Migrant. Recorded on May 8.
Indigo bunting	*Passerina cyanea*	1	S5B	Migrant. Recorded on May 8.
Magnolia warbler	*Setophaga magnolia*	1	S5B	Migrant. Recorded on May 8.
Nashville warbler	*Leiothlypis ruficapilla*	2	S5B	Migrant. Recorded on May 8.
Ruby-crowned kinglet	*Corthylio calendula*	1	S5B,S3N	Migrant. Recorded on May 8.
Ruffed grouse	*Bonasa umbellus*	1	S5	Parcel 30.
White-throated sparrow	*Zonotrichia albicollis*	2	S5	Migrant. Recorded on May 8.
European honeybee	*Apis mellifera*	5+	SNA	Parcel 31 (TAGM5). Recorded on August 23.
Praying mantis	*Mantis religiosa*	1	SNA	Parcel 30 (MEGM1-2). Recorded on August 23.
Monarch	*Danaus plexippus*	2	S2N, S4B	Special Concern. Adults noted; Milkweed in CUM ecosites (i.e., Parcel 30, 4, 6, 33). Recorded on August 23.
Fairy shrimp	*Eubranchipus spp.*	3+	SNR	Parcel 30 (AMPH-008) – vernal pool. Recorded on May 8.

5.11 Anthropogenic Features

As stated in Section 4.7, searches for other anthropogenic features were conducted during field studies to determine evidence of wildlife use. While no wildlife use of anthropogenic features was confirmed, wildlife habitat is present on the subject lands that may provide potential reptile hibernaculum and refuge for other wildlife. The subject lands feature rural residential farm properties (non-participating landowners), with barns and foundations and other structures. Burnside ecologists did not have permission to enter these properties as part of this study; these structures will need to be investigated as part of future studies. Eastern milksnake (*Lampropeltis triangulum*) is the most likely species to be found in this type of habitat, particularly in rural Southern Ontario. As per the background records review, there are records for this species in the vicinity of the subject lands, according to the ORAA (Refer to the SAR Screening Table in Appendix B). While Eastern milksnake is no longer ranked as "at risk" under the provincial ESA, it is ranked as Special Concern under the federal SARA. Species, or habitat protection for Special Concern species, are not afforded protection under either legislation, but confirmed habitat is considered SWH.

As discussed in Section 2.4, the PPS requires that it must be demonstrated that there will be no negative impacts on natural features or their ecological functions, if development or site alteration is proposed. SWH is discussed further in Section 6.5 of this report.

6.0 Identification of Provincially Significant Features

6.1 Provincially Significant Wetlands

Section 8.0 of the PPS (MMAH, 2024) defines significant wetlands as:

> *An area identified as provincially significant using evaluation criteria and procedures established by the Province, as amended from time to time.*

Portions of the Harmony-Farewell Iroquois Beach PSW Complex are located on the subject lands. Specifically, Wetlands #1, 52, 54, 55, 56, 57, 62, and 64 (MNR, 2005).

6.2 Significant Valleylands

The NHRM (MNR, 2010) provides criteria for identifying Significant Valleylands, including a variety of landform related functions and attributes as well as ecological features and functions. According to the NHRM a Significant Valleyland is defined as:

> *A natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year. Large,*

> *well-defined valleylands are often significant landscape features essential to the character of an area.*

Additionally, Section 8.0 of the PPS (2020) defines Significant Valleylands as:

> *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 Farewell Creek valleyland system, on the far west side of the subject lands (Parcel 30), is designated under the Greenbelt Plan (2017) as part of an Urban River Valley system. According to the Plan, only publicly-owned lands are subject to the policies of the Urban River Valley designation. The subject lands are comprised entirely of private land. However, this Significant Valleyland feature is contained entirely within the Municipality's NHS designation. As per Clarington's OP (2018), Section 3.4, Significant Valleylands are a natural heritage feature included in the NHS and are subject to policies of the OP.

6.3 Significant Woodlands

The NHRM (MNR, 2010) states that "woodlands" include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional, and provincial levels."

According to Section 8.0 of the PPS (MMAH, 2024), significant woodland is defined as:

> *An area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history.*

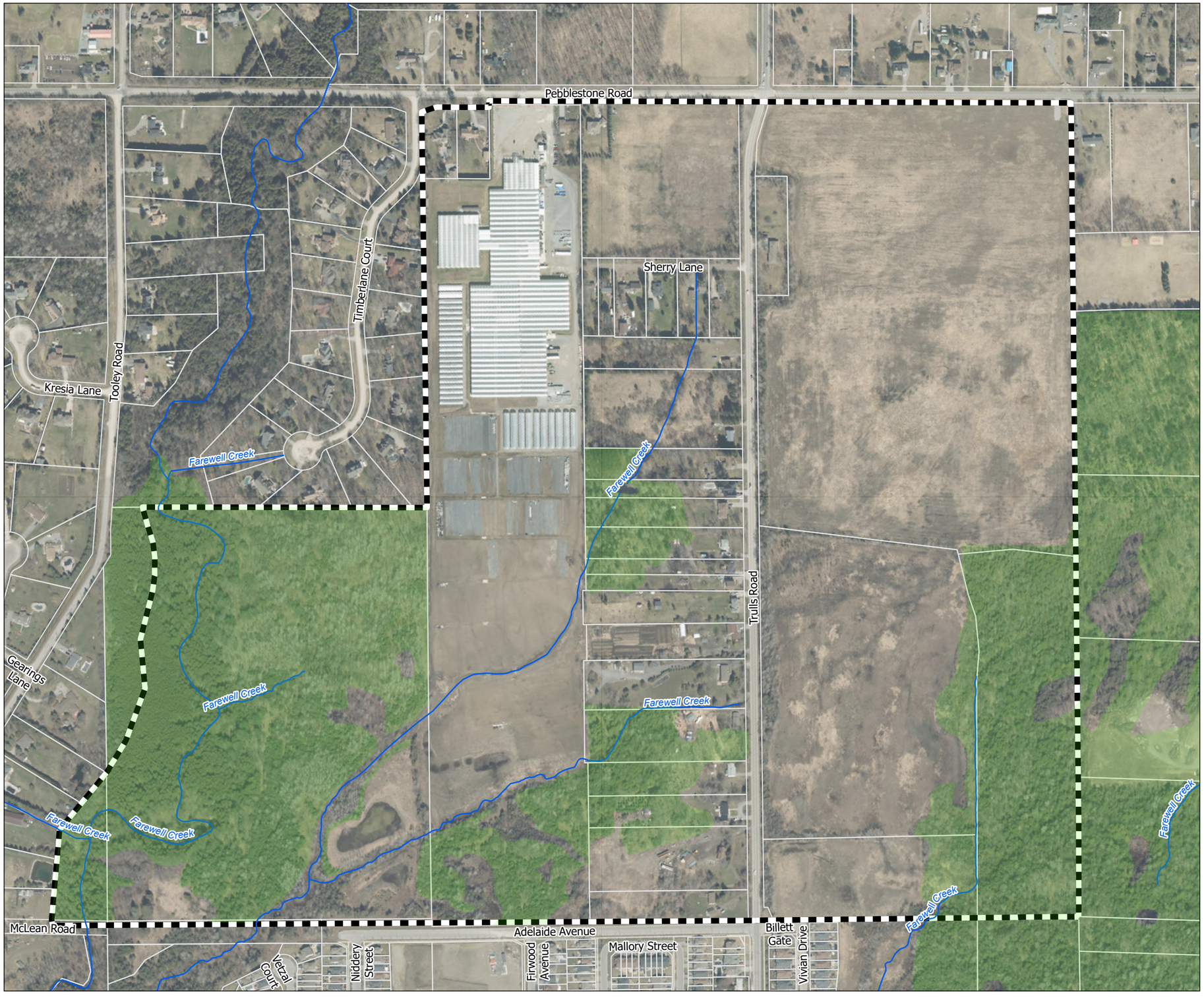
The PPS indicates that significant woodland criteria is to be identified using criteria established by MNR; however, it is Burnside's understanding that these criteria have not yet been provided.

Significant Woodlands are typically identified by the local municipality. Clarington's OP (2018) defines Significant Woodlands as:

> *An old growth woodland, or a woodland, greater than 4 ha located outside of settlement areas, or greater than 1 ha in settlement areas. Significance of woodlands within the Oak Ridges Moraine is determined by the MNRF using evaluation procedures established by that Ministry, or*

> *by a study conducted in accordance with this Plan. 'Significant Woodland' may also include plantations.*

All woodlands in the Secondary Plan Area meet the criteria of 'significant' per Clarington's OP. See Figure 5.



Secondary Plan Boundary

Significant Woodland

Watercourse (MNR ARA)

Sources:

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Grid North

0 100 200 300 400

Metres

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Figure Title

FAREWELL HEIGHTS SECONDARY PLAN NATURAL HERITAGE EVALUATION

SIGNIFICANT WOODLANDS

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6.4 Significant Areas of Natural and Scientific Interest

According to the PPS (MMAH, 2024), ANSIs are defined as:

> *Areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study, or education.*

According to the NHRM (MNR, 2010), provincially significant ANSIs include some of the most significant and best examples of these features in the province, and only include ANSIs identified as provincially significant.

A Candidate Provincially Significant Life Science ANSI is present on the subject lands (Parcels 31, 32, and 33): West Clarington Iroquois Beach. This feature is coincident with portions of the Harmony-Farewell Iroquois Beach PSW Complex that extends east of the study limits. This feature is contained entirely within the Municipality's NHS designation. Candidate ANSIs are areas that have been identified and recommended for protection by MNR, or other sources, but have not been formally confirmed through the confirmation procedure. It is MNR that confirms whether the ANSI is provincially, regionally, or locally significant.

6.5 Significant Wildlife Habitat

Determination of SWH is broadly categorized and described in the NHRM (MNR, 2010). Additionally, MNR's SWHTG (2000) and SWH Criteria Schedule for Ecoregion 6E (2015) are further supplemental documents intended to assist in identifying SWH. The four main categories of SWH are identified as:

1. Habitats of seasonal concentrations of animals.

2. Rare vegetation communities, or specialized habitat for wildlife.

3. Habitat of species of conservation concern.

4. Animal movement corridors.

Appendix B includes a screening of the various categories of SWH for the subject lands and adjacent lands, based on background records review, agency records, and aerial photo interpretation as well as Burnside's field investigations for the subject lands, completed in 2023.

Table 16 below summarizes Candidate and Confirmed SWH on the subject lands.

Table 16: Candidate and Confirmed SWH on the Subject Lands

Seasonal Concentration Areas of Animals
Candidate – Raptor Wintering Area (east of Trulls Road – Parcels 6, 31, 32, 33)
Candidate – Bat Maternity Colonies (NHS only)
Candidate – Turtle Wintering Areas [NHS only]
Candidate – Reptile Hibernaculum
Candidate – Colonially-nesting Bird Breeding Habitat (Tree/Shrubs) – Green heron (NHS only)
Specialized Habitats for Wildlife Considered Significant Wildlife Habitat
Candidate – Woodland Raptor Nesting Habitat (NHS only)
Candidate – Turtle Nesting Areas (NHS only)
Confirmed – Seeps and Springs (NHS only)
Confirmed – Amphibian Breeding Habitat (Woodland) (NHS only)
Candidate – Woodland Area-Sensitive Bird Breeding Habitat (NHS only)
Habitat for Species of Conservation Concern Considered Significant Wildlife Habitat
Candidate – Marsh Breeding Bird Habitat (NHS only)
Confirmed Special Concern and Rare Plant and Wildlife Species
Monarch (SC) – larvae and adult butterflies
Barn swallow (SC)
Wood thrush (SC) (NHS only)
American brook lamprey (S3) (NHS only)
Animal Movement Corridors
Confirmed – Amphibian Movement Corridors (NHS only)

The majority of Candidate / Confirmed habitat on the subject lands is associated with the NHS (i.e., PSW, Significant Woodlands) and will not be directly impacted by development. Exceptions to this are:

- Candidate Raptor Wintering Area (both the NHS and limit of development).
- Candidate Reptile Hibernaculum (both the NHS and limit of development).
- Special Concern and Rare Wildlife Species for Monarch and Barn swallow.

According to Burnside's background review, the Harmony-Farewell Iroquois Beach PSW Complex Evaluation reported two Great blue heron rookeries in the PSW Complex (MNR, 2005). CLOCA confirmed that these rookeries are located approximately 1 km northeast and east of the subject lands (email correspondence, July 4, 2023; 1998). Based on Burnside's sightings of Great blue heron flying over the Site in an easterly direction during breeding bird surveys in 2023, these heronries may still be present in that general location. However, they are located well outside the Secondary Plan Area.

6.6 Habitat of Endangered and Threatened Species

Burnside's background database review, consultation with agencies, and field investigations in 2023 revealed the potential for species listed as Endangered or

6.6 Habitat of Endangered and Threatened Species

Burnside's background database review, consultation with agencies, and field investigations in 2023 revealed the potential for species listed as Endangered or Threatened under the ESA on the subject lands and adjacent lands (Appendix B). Table 17 below summarizes Confirmed and Candidate habitat for Endangered and Threatened species.

Table 17: Candidate and Confirmed Habitat for Endangered and Threatened Species on the Subject Lands

Habitat	Subject Lands
Confirmed Habitat Present	Eastern meadowlark (THR) Bobolink (THR)
Candidate Habitat Present	Little brown myotis (END) Northern myotis (END) Tri-colored bat (END)

Each of the Confirmed SAR species on the subject lands are described below, including implications under the ESA.

6.6.1 Eastern Meadowlark / Bobolink

The General Habitat Description for Eastern meadowlark and Bobolink is as follows:

General Habitat	Eastern Meadowlark	Bobolink
Category 1	Nest and the area within 10 m of the nest.	Nest and the area within 10 m of the nest.
Category 2	The area between 10 m and 100 m of the nest or centre of approximated defended territory.	The area between 10 m and 60 m of the nest or centre of approximated defended territory.
Category 3	The area of continuous suitable habitat between 100 m and 300 m of the nest or approximated centre of defended territory	The area of continuous suitable habitat between 60 m and 300 m of the nest or approximated centre of defended territory

Parcel 6 (participating owner), on the east side of Trulls Road, is confirmed breeding habitat for both Eastern Meadowlark and Bobolink (point count station BBS-002 / 003 shown in Figure 2). This Parcel is within the developable area of the subject lands. Both species were recorded with "probable" breeding evidence (permanent territory presumed through registration of territorial behaviour on at least two days, a week or more apart, at the same place). The vegetation community in this location is characterized as MEMM4 Fresh-Moist Mixed Meadow.

Under the ESA, removal of confirmed breeding habitat for these species falls under either O. Reg. 242/08, Section 23.2 or O. Reg. 830/21 Part IV (species subject to conservation charges) for habitat removal that is equal to or less than 30 ha. The field that is confirmed habitat for Eastern meadowlark and Bobolink is approximately 20 ha.

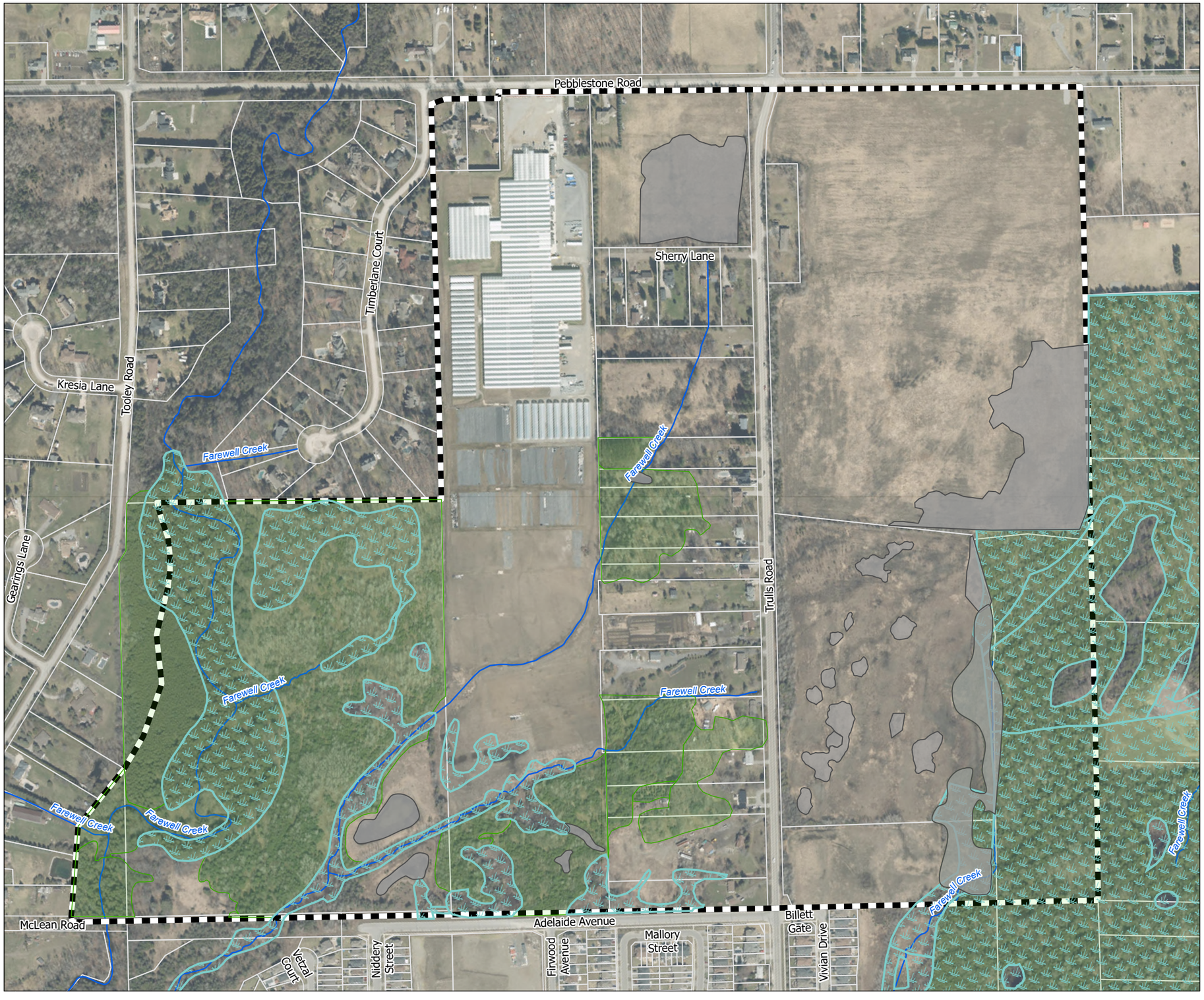
Determining which of the two Regulations apply depends on a variety of factors. Additional surveys should be completed to confirm presence on the subject lands during the EIS phase, given the agricultural setting and acknowledging that site conditions change over time.

7.0 Natural Heritage System

Both CLOCA and Clarington have mapped the NHS for the subject lands. According to CLOCA (email correspondence dated June 8, 2023), the criteria used to map these systems was largely similar, but there are some discreet differences in the mapping. Based on Burnside's site-level investigations in 2023, some minor changes were made to the limits of the NHS, based on the updated ELC. These updates pertain to the limits of wetlands and woodlands, as they have changed over time.

Figure 6 depicts the preliminary natural environment features as refined during Burnside's site investigations in 2023 and 2024.

Individual Environmental Impact Studies undertaken for any future development applications will further refine the work completed during this Secondary Plan process.



- Secondary Plan Boundary
- Watercourse - Thermal Regime: Cold (MNR ARA)
- Harmony-Farewell Iroquois Beach Provincially Significant Wetland (MNRF)
- Wetland (final limits to be determined through future studies)
- Significant Woodland

Sources:

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Disclaimer:

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This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

Datum: North American 1983	
Coord. System: NAD 1983 UTM Zone 17N	
Projection: Transverse Mercator	
Central Meridian: 81°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Page Orientation: -18.78°	Scale Factor: 0.99960

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BURNSIDE

TRUSTEE: FAREWELL HEIGHTS LANDOWNERS GROUP
FOR: MUNICIPALITY OF CLARINGTON

Figure Title

FAREWELL HEIGHTS SECONDARY PLAN

NATURAL ENVIRONMENT

Drawn	Checked	Date	Figure No.
HN	HM	2024/11/18	6
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7.1 Natural Heritage System Linkages and Corridors

CLOCA's Wildlife Corridor Protection and Enhancement Plan (2022) indicates the subject lands are comprised of one main wildlife habitat network within a broader Regional Corridor identified as Core Habitat. This feature is coincident with those contained within the EPA on Parcels 3, 23 to 29, 30 to 33 (excluding the tributary of Farewell Creek taversing west-east across Parcel 3 and other non-particating landowners). The vernal pool (SWMD4-1) identified during field investigations in 2023 is in this Core Habitat.

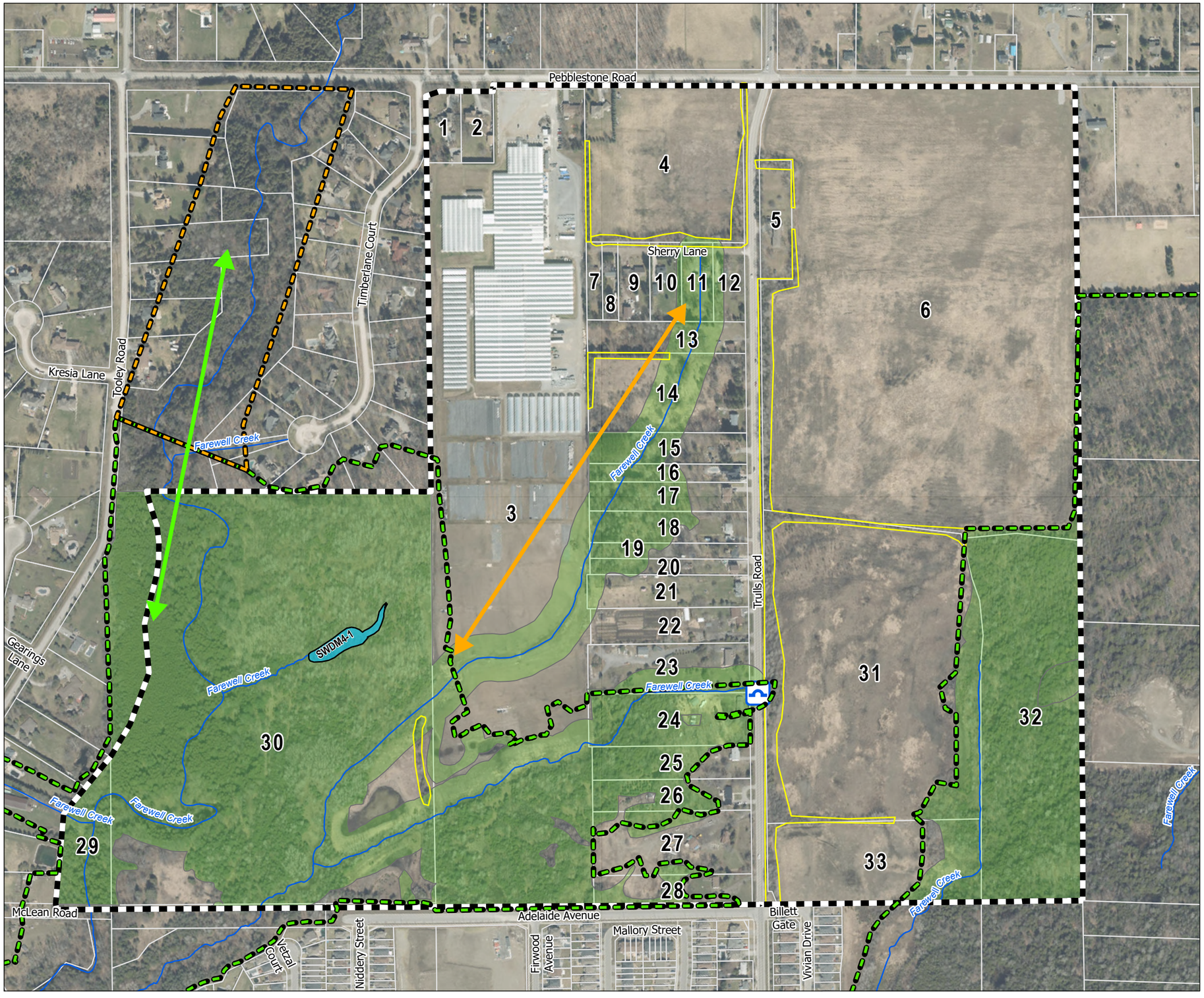
On adjacent lands, a Landscape Corridor is present and is coincident with the mainstem of Farewell Creek immediately north of the subject lands, extending north of Pebblestone Road.

Burnside has assessed the mainstem of Farewell Creek (Core Habitat and Landscape Corridor) as the "primary" NHS wildlife linkage and corridor on the subject lands and adjacent lands. A "secondary" linkage and restoration / enhancement opportunity is present along the tributary of Farewell Creek, traversing west-east across Parcel 3, as noted above. While currently very degraded along this reach of the tributary, it is a potential wildlife corridor between the forests and wetlands in Parcels 29, 30, and the south end of Parcel 3 and the forests and wetlands that traverse through the non-participating landowner parcels.

"Tertiary" wildlife linkages are also present on the subject lands and include:

- Hedgerows – Represent an NHS west-east wildlife pathway between habitats on either side of Trulls Road (i.e., amphibians); potential link with core habitats (i.e., PSW Complex).
- Existing CSP culvert on Trulls Road – Represents an NHS west-east wildlife pathway between habitat on either side of Trulls Road; this is a weaker linkage than the hedgerows because there is currently no vegetation cover on the east side.

Figure 7 depicts potential NHS linkages and corridors on the subject lands and adjacent lands.



- Secondary Plan Boundary
- Watercourse (MNRF)
- Vernal Pool
- Primary NHS Corridor
- Secondary Ecological Linkage and Enhancement Opportunity
- Hedgerow - Tertiary Ecological Linkage
- Culvert - Potential Ecological Linkage
- Natural Heritage System

CLOCA Wildlife Habitat Network:

- Core Habitat
- Landscape Corridor

Sources:

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Grid North

0 100 200 300 400

Metres

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TRUSTEE: FAREWELL HEIGHTS LANDOWNERS GROUP
FOR: MUNICIPALITY OF CLARINGTON

Figure Title

FAREWELL HEIGHTS SECONDARY PLAN NATURAL HERITAGE EVALUATION

NHS CORRIDORS AND ECOLOGICAL LINKAGES

Drawn	Checked	Date	Figure No.
HN	HM	2024/11/18	7
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7.2 Enhancement and Restoration Opportunities

Given the degraded conditions in portions of the NHS, enhancement and restoration opportunities are present throughout the subject lands, particularly in the proposed setbacks to the NHS. In many cases, restoration may occur 'in situ'. Currently, the proposed setbacks are comprised of agricultural land and recently disturbed vegetation communities. The subject lands have been heavily altered from human impacts (feature removals and disturbance particularly in PSWs, ATV trails, garbage, invasive species, etc.). For future development proposals, specific enhancement and restoration opportunities should be explored in detail and in consultation with the municipality and CLOCA.

Examples may include:

- Targeted removal of invasive species (i.e., European buckthorn, European reed) and re-planting with native species. As discussed in Section 5.5, the European reed in the MAMM1-12 / MAMM1-3 ecosite in Parcel 6 is of particular concern. Restoration plans should be developed in consultation with CLOCA.
- Restore ATV trails to natural vegetation to improve wildlife linkages.
- Restore any recent feature removals (wetlands, woodlands, hedgerows) either 'in-situ', or in a suitable location in the Secondary Plan Area.
- Enhance the two built wetland cells in Parcel 30, the wetlands on Parcel 3 and Parcel 6 so that they function as healthy ecosystems on the landscape. Phragmites have spread to these areas and should be aggressively removed.
- Riparian and other native, self-sustaining vegetation in the 30 m setback to the tributaries to Farewell Creek on Parcel 3 and other parcels, where applicable (with consideration to plants that help to cool water temperature).
- Setbacks to be established as non-mowing areas, with native self-sustaining vegetation. Grading encroachments into NHS setbacks to be enhanced with a native seed mix and conveyed into public use and restored to existing, or better conditions.
- Table 6 details what rare flora are present and in which ELC units. Some rare flora are present in many units, such as Great blue lobelia, while others are found only in a few select locations. In instances where only a few occurrences are known, these communities will likely be removed for development. Of particular note, are Sphinx ladies'-tresses, Narrow-leaved blue-eyed-grass, and Downy willowherb. These species are likely to be the most impacted by vegetation removal and have few to no populations preserved in the NHS. It is recommended that up to 100 specimens of each of these species is transplanted to an appropriate habitat within the protected NHS during their flowering period (late May to early July).

8.0 Opportunities and Challenges

The following summarizes opportunities and challenges in the Secondary Plan Area related to the natural environment.

Opportunities:

- To increase woodland and riparian cover through the application of buffers from natural heritage features.
- Restore and enhance wetland / woodland habitat (i.e., removal of invasive species) and wildlife habitat.
- Remove current barriers to wildlife movement and maintain and enhance wildlife linkages and corridors.
- Improve the quality / quantity of urban runoff to watercourses and wetlands.
- To set the limits of development in a manner that protects significant natural features.

Challenges:

- High water table – maintaining pre-development water balance to features (woodlands, wetlands).
- Protecting watercourses from development impacts such as urban pollution, sedimentation, channel / bank erosion, and thermal impacts.
- Invasive species control.
- Minimizing crossings of natural heritage features and retaining wildlife linkages and corridors.
- Minimizing the negative impacts of human activities on natural heritage features and functions.

9.0 Future Phases of the Secondary Plan

Clarington's Work Plan (issued November 1, 2023) identifies three additional phases of the planning process; natural heritage milestones in the context of the Work Plan are outlined below.

Phase 2: Alternative Land Use Plans

To support the evaluation of the three land use alternatives developed under Phase 2, the alternatives will be reviewed and the advantages and disadvantages of each will be identified from a natural heritage perspective. A final NHE report will be submitted that will assess the final Secondary Plan land use.

Phase 3: Preferred Land Use Plan

Once a preferred land use plan has been prepared, a detailed impact assessment and management plan will be completed. The impact assessment will identify what impacts are anticipated from the development of the Secondary Plan Area, as it relates to the aquatic and terrestrial environment and the NHS. Mitigation measures and recommendations to improve these environments will be provided, including refinements to the NHS, if required (i.e., setbacks, linkages, enhancement areas).

Phase 4: Final Draft Secondary Plan, Zoning By-law, and Urban Design Guidelines and Sustainability Principles

The recommendations of the impact assessment and management plan will establish the framework for future monitoring programs and future study requirements to support the next stages of planning and design within the Secondary Plan Area. The monitoring plan will identify key components of future monitoring programs to establish and refine baseline conditions, verify performance of protective measures during construction and implementation, and verify the performance of the proposed management plan post-development to inform possible adaptive management actions. Requirements for future studies to support subsequent stages of planning and design will also be provided, to serve as a basis for development detailed TOR at subsequent stages.

The following provides a general framework for the monitoring plan that may be required for the Farewell Heights Secondary Plan. Future consultation with CLOCA will occur to refine monitoring programs specific to the subject lands.

- Water quality and quantity, including stormwater system performance, as well as any best management practice measures and / or designs used.
- Fisheries and aquatic resources.
- Hydrology and hydraulics.
- Groundwater quality and quantity.
- Stream morphology and slope stability.
- Terrestrial resources – woodlots, wetlands, flora and fauna, terrestrial linkages, buffer areas, invasive species, natural system encroachments, natural system edge management.
- Water balance and the effectiveness of groundwater recharge enhancement measures.

The Phase 4 report will be submitted and updated at the end of the study process to address outstanding comments.

10.0 Guidelines for Environmental Studies in Support of Site-specific Development Proposals

The following provides guidelines for carrying out future site-specific Environmental Impact Studies, to be prepared by individual applicants in support of development applications on the subject lands "*to determine the potential for development to adversely impact environmentally significant and sensitive areas, and natural heritage features*" (Clarington, 2018). These site-specific studies will assess the merits of the application and will apply findings, recommendations and strategies contained in the NHE. Establishing guidelines for the preparation of site-specific studies will assist future applicants in determining the scope and content of such studies.

10.1 Environmental Impact Studies

The Clarington OP, Appendix A (2018) outlines the key components of an EIS report. These should be referenced prior to any future studies that are completed. An EIS must:

- Examine the functions of the natural heritage features.
- Identify the location and extent of natural heritage features.
- Identify the potential impacts of development on the natural heritage features and their ecological functions.
- Identify any lands to be preserved in their natural state.
- Identify mitigating measures to address the adverse effects of development on the natural heritage features and their ecological functions, including setbacks for development.
- Identify the potential for restoration and / or creation of wildlife habitat.
- Examine the cumulative impact of the existing, proposed, and potential development, including the impact on groundwater function and quality.

10.2 Site-specific Field Studies

Individual studies will further refine the work completed in the Secondary Plan. Site-specific environmental studies that may be required as part of future work include, but are not limited to:

- **Bats:** Except for hedgerows (which represent lower quality habitat), higher quality SAR bat habitat is contained entirely in the NHS where woodlands and treed wetland communities are present. Scoped leaf-on, leaf-off and / or acoustic surveys may be required for intrusions into the NHS (i.e., grading, LIDs, outfalls), once specific impacts are better understood. Consultation with MECP is required. Acoustic surveys can only be completed in June and early July.
- **Pileated woodpecker:** Per Section 5.8, additional tree cavity searches may be required to document and confirm presence of nesting sites once development impacts are better understood.

- **Eastern meadowlark / Bobolink:** Additional surveys should be completed to confirm presence on the subject lands (i.e., Parcel 6) during the EIS phase, given the agricultural setting and acknowledging that site conditions change over time.
- **Butternut and Black ash:** Surveys should be completed for trees that are proposed for removal, including intrusions into the NHS (i.e., grading, LIDs, outfalls), once specific impacts are better understood.
- **Significant Wildlife Habitat:** Additional consultation with CLOCA may be required to discuss the need to complete surveys for any Candidate or Confirmed SWH identified on the subject lands for site-specific development proposals once impacts are better understood (see Section 6.5 and Appendix B). Detailed amphibian studies at the vernal pool (SWMD4-1) in Parcel 30 should be completed (i.e., egg mass / minnow trap surveys) to confirm breeding habitat for Blue-spotted and spotted salamander.
- **Non-participating Landowners:** A full suite of ecological surveys should be completed on these parcels once permission to enter has been obtained (i.e., ELC, breeding birds, amphibians, aquatic habitat, search for SWH, etc.).
- **Feature Stakings:** Confirmation of feature boundaries will be completed with Municipal and / or CLOCA staff (Top-of-Bank, wetlands, woodlands) at the EIS stage.
- **ELC Confirmation:** With active land management for agriculture taking place, vegetation classification may change. Site-specific environmental studies should confirm or adjust the NHE ELC, depending on future conditions.
- **Aquatic Studies:** As land management practices may change over time, it is recommended that HDF assessments take place to confirm the management recommendations included in this report. If any in-water projects are proposed in the future (i.e., crossings of the NHS / watercourses), then it is recommended that detailed aquatic habitat assessments take place. While Burnside did not observe or capture any fall-spawning species in FC-1, future studies should be completed to determine if they inhabit it. If fall spawning habitat was confirmed, it would impact if in-water works could continue past September 15 or 30 of any given year.

11.0 Summary

The Farewell Heights Secondary Plan Area is in north Courtice and features a variety of land uses including rural residential, greenhouse retail and operations, agricultural, unevaluated wetlands, fallow mixed meadow fields and EPA. The EPA is comprised of a mosaic of unevaluated and evaluated PSWs, Significant Woodlands, and the mainstem of Farewell Creek coldwater watercourse and associated tributaries.

In support of the Secondary Plan process, field investigations were completed in 2023 to further characterize existing natural heritage conditions. These surveys broadly included vegetation classification, amphibian breeding habitat assessments, breeding bird surveys and a suite of aquatic and HDF assessments.

As part of Phase 1, this initial draft of the NHE provides a summary of existing conditions, including a preliminary assessment of opportunities and challenges associated with future development of the area. In Phase 2, ongoing work will continue to finalize the NHE in support of the development of land use options, analysis, and refinement of key directions for the new community proposed in Courtice. The findings of the NHE will be the basis for developing land use alternatives and Secondary Plan policies, as they relate to natural heritage protection in the Farewell Heights Secondary Plan Area.

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Appendix A

Terms of Reference

R.J. Burnside & Associates Limited 1465 Pickering Parkway Suite 200 Pickering ON L1V 7G7 CANADA
telephone (905) 420-5777 **fax** (519) 941-8120 **web** www.rjburnside.com

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[THE DIFFERENCE IS OUR PEOPLE]

May 3, 2023 (revised March 5, 2024)

Via: Email

Lisa Backus
Manager of Community Planning
Municipality of Clarington
40 Temperance Street
Bowmanville ON

Dear Ms. Backus:

Re: Natural Heritage Evaluation Terms of Reference
Farewell Heights Secondary Plan, Clarington
Project No.: 300056758.0000

1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) has been retained by the Farewell Heights Landowners Group, to conduct a Natural Heritage Evaluation (NHE) in support of the Farewell Heights Secondary Plan Area. The Secondary Plan area (herein referred to as the "subject lands") is generally located east of Tooley Road, south of Pebblestone Road, west of Courtice Road, and north of the Adelaide Avenue extension in north Courtice in the Municipality of Clarington, Regional Municipality of Durham (Region). The subject lands are within the jurisdiction of Central Lake Ontario Conservation Authority (CLOCA) and Ministry of Environment, Conservation and Parks (MECP) York-Durham District. This letter provides the proposed Terms of Reference (TOR) for the NHE fieldwork and reporting plan. A version of this TOR was submitted to CLOCA on May 3, 2023, and approval of the proposed fieldwork was received on May 30, 2023.

Based on Clarington's Land Use Plan Map (dated December 10, 2021), the Farewell Heights Secondary Plan area is approximately 107 ha; 40.69 ha is designated as Environmental Protection and 66.25 ha as Urban Residential. Please see Figure 1.

2.0 Project Understanding

Broadly speaking, the purpose of the Secondary Plan will be to provide more detailed directions for the subject lands regarding land uses, transportation, infrastructure, natural heritage, phasing, and urban design. The area is expected to support approximately 1,400 residential units with an internal road network, stormwater features, and open space features resulting from retained natural features and their buffers. Currently, the subject lands are comprised of a mix of parcel sizes and existing land uses, including large agricultural parcels, smaller residential properties, and a large commercial property (Witzke's Greenhouses Ltd.). The lands also contain several natural heritage features, including woodlands and portions of the Harmony-Farewell Iroquois Beach Provincially Significant Wetland (PSW) Complex, Farewell Creek and floodplain. Many of these features are contained within the Natural Heritage System

(NHS). All wetlands, watercourses, and floodplains are regulated by CLOCA under Ontario Regulation 42/06 and will require a permit from the Conservation Authority to develop in those areas.

Per Clarington's Official Plan (OP) (2018), the subject lands are within the Urban Boundary (Map 2A) and are designated as Environmental Protection Area and Urban Residential. The NHS (Map D1) is generally coincident with the forest and wetland features on-site. The subject lands are bound by rural residential properties and / or farmland to the north, west, and east, and a subdivision to the south.

The TOR are organized as follows:

- Part I: Summary of Background Secondary Source Information.
- Part II: Proposed NHE Methodology, including:
  - Fieldwork Methodology.
  - Criteria for Determining the Significance, Sensitivity, and Rarity of Features Found On-site.
  - Natural Heritage System and Minimum Vegetation Protection Zones (VPZ).
  - Preliminary Identification of Linkages.
  - Analysis, Reporting, and Recommendations.
- Part III: Information Requests.

3.0 Environmental Field Study Framework

Three documents have been reviewed to understand the scope of the field studies required:

- Draft Terms of Reference (TOR) by GHD, dated September 24, 2021.
- TOR by Municipality of Clarington Planning and Development Services Department, dated August 2022; Addendums 1, 2 and 3, dated August-September 2022.
- Farewell Heights Secondary Plan and Integrated MCEA Technical Proposal prepared by The Planning Partnership Team (TPP), dated September 23, 2022. It is our understanding that this proposal was submitted in response to Clarington's Request for Proposal (RFP) and was approved by Clarington. Clarington's expectation is that the Secondary Plan's natural environment studies be equivalent to a scoped subwatershed characterization study (for our TOR, this is limited to the subject lands).
- Farewell Heights Secondary Plan – Work Plan, Municipality of Clarington, dated November 1, 2023.

According to Clarington's TOR (2022), the purpose of the NHE is to determine the extent of natural heritage features and their buffers and the potential for development to adversely impact the features. The Evaluation is to be completed in keeping with all relevant policies of Clarington's Official Plan, the Black / Harmony / Farewell Creek Watershed Plan, and in accordance with CLOCAs guidelines. The NHE will be completed in four interrelated phases that will include an identification, determination and examination of the natural heritage features and their functions. In Phase 1: Initial Public Input and Technical Analysis, the report will examine the functions of the natural heritage features as follows:

- Identify the location and extent of natural heritage features.
- Identify the potential impacts of the proposed Plan on the natural heritage features and their ecological functions. Identify any lands to be preserved in their natural state.

- Identify and delineate high-level environmental constraints and development opportunities in the Secondary Plan area to help guide appropriate and compatible development.

The results of Phase 1 will inform the preparation of the future phases of the planning process as follows:

- **Phase 2: Alternative Land Use Plans**
- **Phase 3: Preferred Land Use Plan for the Farewell Heights Secondary Plan Area**
- **Phase 4: Final Draft Secondary Plan, Zoning By-Law, and Urban Design Guidelines and Sustainability Principles**

A final NHE report will be needed that will assess the final Secondary Plan land use.

Part I: Background Secondary Source Information

The first step is to conduct a comprehensive desktop assessment. The desktop assessment will involve a review of current land use policy, background reports, natural heritage information, as well as applicable policies and plans. This includes all areas within 120 m of the subject lands to identify significant natural heritage features, located within or directly adjacent to the land parcels, that may be impacted by the Plan. Information acquired through this screening process will be used to help guide future field efforts and evaluate the significance of on-site observations. Consultation with MNRF (obtain PSW Wetland Evaluation) and MECP will occur at this stage to obtain relevant background information on aquatic and terrestrial resources and determine the potential presence of SAR, as well as any associated fieldwork requirements that may be required in the future. Consultation with Clarington and CLOCA will include the submission of an information request.

Burnside has reviewed the following existing data sources prior to the start of the 2023 field investigations:

- Aerial photographic imaging and 1:10,000 Ontario Base Mapping (OBM).
- MNRF Make a Map: Natural heritage Areas to identify natural heritage features and Natural Heritage Information Centre (NHIC) data of rare wildlife species on, and in the vicinity of, the subject lands.
- MNRF Land Information Ontario (LIO) database, including but not limited to: ANSIs, drainage, woodlands, NHS, Greenbelt, waterbodies, wetlands, soil surveys, etc.
- MECP Species at Risk (SAR) summary.
- Ontario Hydrology Network (OHN) mapping.
- Ontario Breeding Bird Atlas (OBBA) (2001-2005).
- Ontario Reptile and Amphibian Atlas (ORAA).
- Vetted citizen science databases such as iNaturalist and eBird.
- Department of Fisheries and Oceans (DFO) Aquatic SAR mapping.
- Aquatic Resource Area (ARA) Summary Data.
- CLOCA regulated areas and features mapping.
- CLOCA Open Data including but not limited to: ELC, NHS, drainage, etc.
- Clarington Official Plan (2018).
- Durham Region Official Plan (2020).

Based on this review, the following applicable environmental policies and legislative framework is summarized in Table 1.

Table 1: Applicable Environmental Policies and Legislative Framework

Legislation, Policy, or Guidance Document	Applicable Natural Heritage Policies and Legislative Framework
Fisheries Act, 1985	Construction activities that have the potential to impact fish, or fish habitat, must be built and operated in compliance with the federal Fisheries Act.
Fisheries and Oceans Canada (DFO)	If the "death of a fish by means other than fishing", or the "harmful alteration, disruption, or destruction of fish habitat" is likely to occur as a result of the project, the proponent responsible for the activities is required to obtain an Authorization from DFO, as per Paragraphs 34.4(2) and 35(2)(b) of the Fisheries Act.
Migratory Birds Convention Act, 1994	The MBCA has recently updated and modernized the MBR. The new MBR came into force on July 30, 2022. Further regulatory amendments are planned. The previous regulations protected the nests of all migratory birds, at all times, for as long as they existed, which meant that many nests were protected when they no longer benefited migratory birds. The new MBR provides protection to migratory bird nests when they are considered to have a high conservation value for migratory birds. The nests of all migratory bird species are protected when they contain a live bird or a viable egg. The nests of 18 species (listed in Schedule 1 of the regulations), whose nests are reused by migratory birds, continue to have year-round nest protection, unless they have been shown to be abandoned.
Species at Risk Act, 2002	The Act provides protection for federally listed SSAR and their habitat. SARA prohibitions may pertain to private lands for certain aquatic species, birds, and other species if provincial / territorial legislation or voluntary measures do not adequately protect the species and its habitat.

Legislation, Policy, or Guidance Document	Applicable Natural Heritage Policies and Legislative Framework
Endangered Species Act, 2007	The Act provides protection for SAR and their habitat. The ESA is now administered by MECP and provides policies for the protection of Extirpated, Endangered, and Threatened species, as well as species of Special Concern. Regulatory amendments under the ESA were issued by the Province in 2022, which streamlines ESA Authorizations for activities that have "predictable effects and common and routine mitigation actions with well understood requirements to minimize adverse impacts". Proponents are still required to avoid and minimize impacts on SAR and their habitats. The use of a SAR Conservation Fund has been enabled for five designated conservation fund species when they seek permits and agreements related to these species (Eastern Whip-poor-will, Blanding's Turtle), or register for conditional exemptions (Eastern Meadowlark, Bobolink, Butternut). Background records indicate the potential for SAR, on or adjacent to the subject lands, including but not limited to: Monarch, Barn Swallow, Bank Swallow, Eastern Wood-pewee, Bobolink, Eastern Meadowlark, Chimney Swift, Wood Thrush, Red-headed Woodpecker, Butternut, Snapping Turtle, Blanding's Turtle, Western Chorus Frog, and SAR Bats (Little Brown Myotis, Northern Myotis, and Tri-colored Bat).
Provincial Policy Statement, 2020* under the Planning Act,1990 *Currently under provincial review	All planning decisions are required to be consistent with the applicable provisions of the PPS. The Planning Act has not been changed to remove the Conservation Authority (CA) as a prescribed agency; therefore, staff will continue to circulate Planning Act applications to the CA as they did prior to January 1, 2023, so that they may review and comment on natural hazard including flood plains and source water protection matters. The CA staff will now scope their review to include wetlands, valleylands, watercourses, and stormwater management amongst others, as these are integral components of natural hazard management in addition to their source water protection mandate. **Note:** *The Province is currently seeking input on a proposed PPS that would replace the existing PPS and A Place to Grow. Should the government adopt the proposed PPS, the government would consequentially revoke the PPS, 2020 and A Place to Grow, as well as amend regulations.*

Legislation, Policy, or Guidance Document	Applicable Natural Heritage Policies and Legislative Framework
A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020* *Currently under provincial review	Building upon the policy foundation in the PPS, the Plan provides growth management policy direction for the GGH, which includes Durham Region. It provides additional and more specific land use planning policies for this geographic area. **Note:** *Please see notes under PPS.*
Greenbelt Plan, 2017	Applicable policies: • Lands Within the Urban River Valley Area.
Bill 23 More Homes Built Faster Act, 2022	One of the goals of Bill 23 is to "further focus Conservation Authorities on their core mandate, support faster and less costly approvals, streamline Conservation Authority processes, and help make land suitable for housing available for development." When reviewing and commenting on development and land use planning, the Conservation Authorities' comments must be limited to only Category 1 Programs (Natural Hazards). Category 1 Programs include stormwater management, floodplain, steep slopes, erosion prone areas, and wetlands. Under this Regulation, Conservation Authorities are no longer able to comment on Category 2 (Municipal programs and services they provide at the request of the Municipality) or Category 3 (other programs and services the CA determines to be advisable) programs under certain prescribed Acts, including (but not limited to): • The Endangered Species Act. • The Planning Act. Category 2 Programs include land use planning and development related to Natural Heritage, Municipal led Subwatershed Studies, and Tree planting. Category 3 Programs include surface water quality monitoring and land acquisition.

Legislation, Policy, or Guidance Document	Applicable Natural Heritage Policies and Legislative Framework
Bill 23 More Homes Built Faster Act, 2022	**Ontario Wetland Evaluation System (OWES)** On October 25, 2022, the proposed changes to OWES were posted on the Environmental Registry of Ontario. This new version changes how wetlands are scored and re-evaluated. The following is a summary of key updates (not comprehensive): • The definition of a wetland remains unchanged under the new OWES guidelines. • Wetlands will retain their current status (i.e., significant or not) until a re-evaluation occurs. • When re-evaluating a PSW, the entire complex does not need to be re-evaluated. Single wetland units that are part of a previously evaluated wetland complex can be re-evaluated (re-scored and re-mapped) without requiring a complete re-evaluation of all units in the existing wetland complex. • A mapping update of the wetland boundaries can be undertaken without undertaking a re-evaluation. In these instances, the original designation will be maintained. • A wetland evaluation, re-evaluation, or mapping update will be considered complete and final once a trained Wetland Evaluator attests that they have undertaken an evaluation in accordance with OWES. • In general, wetlands smaller than 2 ha (5 acres) are not evaluated. However, they are generally still considered to be wetlands and require protection. • Under the previous system, complexing allowed many small pockets of wetlands to be grouped with larger PSWs. Under the new protocols, complexing is no longer permitted.
Durham Region Official Plan, 2020	Applicable policies: • Urban Area. • Key Natural Heritage and Hydrologic Features.
Municipality of Clarington Official Plan, 2018	Applicable policies that are key to the Secondary Plan planning process: • Natural Heritage System. • Watershed and Subwatershed Plans. • Secondary Plans. • Hazards. • Environmental Protection Areas. • Special Study Area.

Legislation, Policy, or Guidance Document	Applicable Natural Heritage Policies and Legislative Framework
Municipality of Clarington's Woodlot Preservation By-Law 97-35 (Consolidation date November 22, 2021)	Applies to: (i) all lands defined as "woodlots" by Section 2 of the By-law. (ii) any tree within lands designated "Environmental Protection Area" on Map A of the Official Plan. (iii) any tree within 120 m of a wetland as identified on Map C of the Official Plan. "Woodlots" are defined as an area 0.2 ha in area or greater having not less than: (iv) 200 trees of any size in a 0.2 ha area. (v) 150 trees measuring more than 5 cms dbh in a 0.2 ha area. (vi) 100 trees measuring more than 12 cms dbh in a 0.2 ha area. (vii) 50 trees measuring more than 20 cms dbh in a 0.2 ha area.
CLOCA Regulated Areas (Ontario Regulation 42/06) under Section 28 of the Conservation Authorities Act	Lands regulated by CLOCA on the subject lands include: • Wetlands (unevaluated). • Harmony-Farewell Iroquois Beach Provincially Significant Wetland (PSW) Complex. • Farewell Creek and tributaries. • Floodplain / Hazard lands. • Headwater Drainage Features.
CLOCA Policies, Guidelines, and Plans	• Policy and Procedural Document for Regulation and Planning Review (2014). • Wildlife Corridor Protection Enhancement Plan (2022). • Riparian Corridors Restoration Plan (2017). • Instream Barrier Action Plan (2017). • Black / Harmony / Farewell Creek 2020 Watershed Plan Update.

Part II: Proposed Natural Heritage Evaluation Methodology

To start, detailed field studies will be required to complete the NHE. On-site verification of Clarington's NHS limits and provincially significant features, such as valleylands, woodlands, and wetlands will be characterized and delineated. Data will be collected and the findings from baseline conditions will determine what further studies are required in the future. Field investigations, in combination with background information obtained from the natural heritage databases and consultation with Agencies (i.e., MNRF, MECP, CLOCA), will be used to undertake a screening for candidate or confirmed SAR habitat and Significant Wildlife Habitat (SWH).

Features identified will appear on the constraints and opportunities mapping and be used to determine buffers and a suitable limit of development. Based on Addendum 2 of Clarington's TOR, CLOCA and municipal staff will confirm the boundaries in the field after the initial work has been completed. Features include:

- Toe of slope and / or top of bank and associated valley vegetation.
- Woodland limit.
- Wetland limit.
- Verification of Clarington's NHS.

Fieldwork Methodology

Burnside's proposed methodology is summarized in Table 2 below.

Table 2: Baseline Conditions – Field Investigations Completed by Burnside in 2023

Study Component	Existing Data	Fieldwork Requirements	Features / Areas to be Assessed Based on Secondary Plan Limits	Survey Timing Window
Headwater Drainage Features Assessments	None.	Field investigations following CVC and TRCA Headwater Drainage Feature Guidelines (Finalized January 2014) and supporting OSAP Section 4: Module 10 (S4:M10) and Section 4: Module 11 (OSAP, 2017).	Subject lands.	Up to three site visits between late March and mid-September.
Site Reconnaissance	Background databases, aerial imagery.	Site visit to characterize natural heritage features and identify preliminary constraints including: Visual assessment of existing structures; provide preliminary comment on habitat suitability for species such as Barn Swallow, Chimney Swift, and SAR bats. Visual assessment of wildlife habitats and incidental wildlife observations, including features that may be considered Candidate or Confirmed Significant Wildlife Habitat (SWH) such as: tracks / signs, dens, reptile hibernacula, structures, uncapped chimneys, foundations heronries, raptor nests, terrestrial crayfish burrows, seeps, springs, etc. General survey of natural heritage features present (i.e., watercourse, valleyland, wetlands, spring ephemerals, other vegetation communities).	All farm / industrial-related structures, and any chimneys located on the subject lands.	Early spring.

Study Component	Existing Data	Fieldwork Requirements	Features / Areas to be Assessed Based on Secondary Plan Limits	Survey Timing Window
Salamander Habitat Assessment	Background Databases – Ontario Reptile and Amphibian Atlas records for Square 17PJ76. Species may include: Spotted Salamander, Red-spotted Newt, Eastern Red-backed Salamander.	General assessment to identify potential habitat for breeding salamanders (woodland vernal pools, wetlands); visual surveys to look for confirmation of species presence in breeding ponds (i.e., individuals, egg masses).	Woodland vernal pools and wetlands on the subject lands.	Two surveys in early spring and late spring.
Amphibian Breeding Call Surveys	Background Databases – Ontario Reptile and Amphibian Atlas records for Square 17PJ76, iNaturalist. Species may include: Wood Frog, Western Chorus Frog, Spring Peeper, American Toad, Northern Leopard Frog, Green Frog, Gray Treefrog.	Three surveys, following Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Bird Studies Canada).	All ponds and wetlands present on the subject lands (stations to be verified during HDF / Site Reconnaissance survey).	Three surveys from April to June, as detailed in the Marsh Monitoring protocol; based on weather conditions.

Study Component	Existing Data	Fieldwork Requirements	Features / Areas to be Assessed Based on Secondary Plan Limits	Survey Timing Window
Aquatic Habitat Assessment and Fish Spawning Surveys	According to TPP proposal, Addendum 2, Rainbow Trout, Chinook, Coho Salmon, and Brown Trout have all been documented to utilize the habitat in and around the study area.	One aquatic habitat assessment of Farewell Creek, tributaries, and ponds. Fish spawning surveys will occur once in spring and fall, respectively, to observe if spring spawning (i.e., Rainbow Trout) and / or fall spawning (i.e., Chinook Salmon) inhabit the watercourses. Visual assessments of spawning behaviour and redd constructions (trout spawning beds). Trout Unlimited Redd Survey Handbook (protocol to be confirmed by CLOCA).	Watercourses and ponds on the subject lands.	Aquatic Habitat Assessment: May.
Fish Habitat and In-Stream Barrier Assessment	According to TPP proposal, Addendum 2, Rainbow Trout, Chinook, Coho Salmon, and Brown Trout have all been documented to utilize the habitat in and around the study area.	Detailed observations with respect to channel form, function, and fish habitat will be recorded. Observations will be made of the riparian vegetation, substrate, wetted width and depths, erosion, morphology, etc. Instream barriers to fish movement will be identified and characterized to assist in the determining of fish passage for jumping and non-jumping fish. Following industry standard protocols (i.e., Ontario Stream Assessment Protocol, MTO Environmental Guide for Fish and Fish Habitat).	Watercourses on the subject lands.	One visit in Spring / Summer.

Study Component	Existing Data	Fieldwork Requirements	Features / Areas to be Assessed Based on Secondary Plan Limits	Survey Timing Window
Fish Community Inventory	MNRF ARA data provides a substantial list of species that inhabit the watercourses on the subject lands. The list is not specific about date or location of species observations and may be data from upstream or downstream of the subject lands.	Backpack electrofishing and dipnets will be used in tandem to complete the fish sampling. If any of the ponds within the Site are determined to be connected to the watercourses (i.e., online ponds) then minnow traps may be used to assess the fish community within them. A License to Collect Fish for a Scientific Purpose (LCFSP) will be acquired from the MNRF prior to this sampling being completed. Burnside owns the necessary equipment to complete this sampling, and regularly completes sampling for public and private sector clients. Following industry standard protocols (i.e., Ontario Stream Assessment Protocol, MTO Environmental Guide for Fish and Fish Habitat).	Watercourses on the subject lands.	One visit during low flow conditions in the summer.
Thermal Regime of the Watercourses	MNRF Aquatic Resource Area (ARA) mapping describes the watercourses on the subject lands as cold-water systems.	Determined through the installation of continuous temperature data loggers. Data from these loggers will be analyzed to determine the thermal regime of the watercourse.	Watercourses on the subject lands – completed at four Stations.	Monthly between April-November to download data from the loggers to ensure it is not lost throughout the monitoring period.

Study Component	Existing Data	Fieldwork Requirements	Features / Areas to be Assessed Based on Secondary Plan Limits	Survey Timing Window
Benthic Invertebrate Assessment	None.	Samples will be collected from the watercourses and preserved and delivered to a laboratory that specializes in identifying and enumerating benthic invertebrates. Following Ontario Benthos Biomonitoring Network (OBBN) Stream Protocol (Jones et al. 2005).	Watercourses on the subject lands – completed at three Stations.	Two visits in both Spring and Fall.
Ecological Land Classification (ELC) community mapping, preliminary flora inventory and identification of regionally and provincially rare species (i.e., Butternut).	Preliminary ELC communities have been identified by CLOCA's open data and will be site-confirmed in 2023.	ELC undertaken on subject lands to classify and map vegetation communities. Standard ELC system for southern Ontario will be applied (Lee et al., 1998). Two-season preliminary flora inventory and analysis of flora rarity (provincial, regional, and CLOCA ranking). Verify location and extent of natural heritage (wetlands, woodlands, Clarington's NHS).	Subject lands and 50 m adjacent lands.	ELC and Flora Inventory: Spring (May) (combine with 2nd amphibian survey). Summer (July to mid-August).

Study Component	Existing Data	Fieldwork Requirements	Features / Areas to be Assessed Based on Secondary Plan Limits	Survey Timing Window
Breeding Bird and SAR Bird Surveys (Bobolink and Eastern Meadowlark)	Potential habitat suitability identified for SAR birds based on review of aerial photography (open fields). Background Databases – Ontario Breeding Bird Atlas records for Square 17PJ76, iNaturalist, eBird. SAR species may include: Red-headed Woodpecker, Chimney Swift, Eastern Meadowlark, Bobolink, Barn Swallow, Eastern Wood-pewee, Wood Thrush.	Assume three surveys to be completed, following the MNRF Survey Protocol for Eastern Meadowlark (2013) and Ontario Breeding Bird Atlas protocol (2021). Breeding bird surveys would incorporate observations of all SAR birds.	Subject lands.	Between May 21 and July 3 (to meet MNRF protocols), spaced at least 10 days apart.

Criteria for Determining the Significance, Sensitivity and Rarity of Features Found On-Site

In accordance with the Natural Heritage Reference Manual (NHRM) (MNR, 2010), habitats of Endangered and Threatened species are identified and evaluated based on provincial criteria. Burnside will consult with MECP to ensure that the appropriate criteria are utilized, including species-specific habitat regulations and guidance material.

By contrast, the identification and evaluation of Significant Woodlands and Significant Wildlife Habitats are undertaken at the local and / or regional planning level, using landscape level data and criteria from the NHRM as well as supporting policy documents, such as Official Plans and CLOCA's Policy and Procedural Document for Regulation and Planning Review (2014). Preliminary ELC communities have been identified by CLOCA's open data and will be site-confirmed in 2023.

Significant Wildlife Habitat will be evaluated based on the criteria for Ecoregion 6-E (MNRF, 2015). Species rarity will be based on the following, unless otherwise directed:

- Species' status under the Endangered Species Act, 2007 and Species at Risk Act, 2002.
- Species' S-rank as provided on the NHIC database.
- Varga et al. 2000 for Durham Region and Site District 6E-7 (if applicable to the Site).
- Varga, Leadbeater, D., Webber, J., Kaiser, J., Crins, B., Kamstra, J., Banville, D., Ashley, E., Miller, G., Kingsley, C., Jacobsen, C., Mewa, K., Tebby, L., Mosley, E., and Zajc, E. 2000. Distribution and Status of the Vascular Plants of the Greater Toronto Area. Ontario Ministry of Natural Resources Aurora District. 103 pp.
- Riley et al. 1989 for Durham (Pickering-Uxbridge-Brock-Oshawa-Whitby-Ajax-Scugog-Clarington).
- Riley, J. et al. 1989. The Distribution and Status of the Vascular Plants of Central Region. Ontario Ministry of Natural Resources, Central Region, Richmond Hill, ON.

There are PSWs and other wetlands on the subject lands. Wetland communities will be classified using ELC. Wetland significance will be assessed in accordance with provincial criteria and Clarington's OP (2018).

Natural Heritage System and Minimum Vegetation Protection Zones (VPZ)

The limits of Clarington's NHS will be confirmed during field investigations as part of the site characterization (i.e., watercourses, woodlands, wetlands, valleylands, etc). Per Subsection 3.5.6 of Clarington's OP (2018), it states that through the preparation of a subwatershed plan as part of the Secondary Planning Process, the limits of the NHS as depicted on Map D may be refined. The NHE will provide recommendations for VPZs, as well as areas for potential enhancement.

Table 3-1 of Clarington's OP (2018) provides required minimum VPZs for NHS features within urban and rural settlement areas as follows:

- Wetlands – 30 m.
- Fish Habitat and Riparian Corridors – 15 m.
- Valleylands – 15 m.

- Significant Woodlands – 15 m.
- Watercourses – 15 m.
- Seepage Areas and Springs – 15 m.

Preliminary Identification of Linkages

Per CLOCA's Wildlife Corridor Enhancement and Protection Plan, the subject lands are within three wildlife habitat networks: Core Habitat, Landscape Corridor, and Regional Corridor.

Under Section 3.5 Watershed and Subwatershed Plans of Clarington's OP (2018), Subsections 3.5.8 to 3.5.13 provide policies as it relates to linkages. The importance of sustaining linkages is recognized and that linkages should be identified in subwatershed plans and other studies. Linkages should also be evaluated, identified, and protected through the preparation of Secondary Plans. During and after fieldwork is completed, a preliminary assessment of existing wildlife linkages will be completed and reviewed alongside CLOCA's Wildlife Corridor Plan including the wildlife habitat network, corridor gaps, and infrastructure barriers for Black / Harmony / Farewell Creek watershed.

Analysis, Reporting, and Recommendations

In summary, the NHE report will be prepared in two stages. A draft existing conditions report will be submitted in Phase 1; a final NHE report will be submitted that will assess the final Secondary Plan land use.

The final NHE will include the following:

- A general description of the proposed development.
- Summary of all applicable heritage land use policies, including the Region and Municipality Official Plans and the PPS.
- Identification of the significance of natural features at a Provincial and Regional level, with reference to standard information sources from the Province and CLOCA.
- Identification of the environmental features potentially impacted by development and any lands to be preserved.
- Summary of findings from the HDF evaluations. Using hydrological characteristics, riparian vegetation, potential fish habitat, and terrestrial linkage habitat classification of each HDF feature will be completed based on the management decision matrix provided in the HDF Guideline (i.e., Protection, Conservation, No Management) (TRCA and CVC, 2014).
- A constraints map that depicts the recommended dimensions of a minimum vegetation protection zone (VPZ) for the NHS and its features (i.e., wetlands, woodlands, watercourse) as specified in Table 3-1 of the OP (2018) and determine if they are sufficient; if not sufficient, specify the dimensions of the required minimum VPZ.
- A preliminary assessment of how and where the proposed development can proceed, without a negative impact on the NHS and its features and their ecological functions.
- Summary of next steps in the Secondary Plan process and recommend additional ecological surveys that may be required in the future.

All findings will be summarized in a report, complete with figures. The locations of all provincially significant species, and / or habitat encountered, will be recorded using GPS and included on the figures (excepting those classified by MNRF / MECP as Restricted Species). Locally rare species will also be recorded in the ELC unit in which they are found.

Part III: Information Requests

As part of the background review, Burnside will be submitting information requests to provincial agencies, including MECP and MNRF, as well as accessing Land Information Ontario, CLOCA's open data and Clarington's geospatial data.

If you have any questions or comments regarding these Terms of Reference, please feel free to contact me at 519-820-2562 (Hannah.Maciver@rjburnside.com).

Yours truly,

R.J. Burnside & Associates Limited

Hannah Maciver
Project Coordinator / Senior Ecologist
HM:tm

cc: Mustafa Ghassan, Delta Urban Inc. (enc.) (Via: Email)
Marcus Marrano, Delta Urban Inc. (enc.) (Via: Email)
Stacey McCulloch, The Planning Partnership (TPP) (enc.) (Via: Email)

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Appendix B

SAR and SWH Screening Tables

Background Review of Potential Species at Risk and Species of Conservation Concern on the Subject Lands and/or Adjacent Lands

COMMON NAME **(Source)	SCIENTIFIC NAME	Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description[5]	Habitat Present on the Subject Lands and/or Adjacent Lands?
Birds								
Bank Swallow (Source: OBBA)	*Riparia riparia*	S4B	THR	THR	THR	1	Prefers open habitats including, farmland, lake/river shorelines, grasslands, and wetlands. Nests in exposed earthen banks along shorelines and in artificial sites such as gravel pits.[6, 7, 8]	None observed during breeding bird surveys (foraging or breeding) or any other surveys on the subject lands. No breeding habitat present on subject lands or adjacent lands.
Barn Swallow (Source: Burnside, OBBA, iNaturalist, eBird)	*Hirundo rustica*	S4B	SC	SC	THR	1	Prefers farmland, lake/river shorelines, wooded clearings, urban populated areas, rocky cliffs, and wetlands. Nests inside or on exterior of buildings; under bridges and in road culverts; on rock faces, and in caves, etc.[6, 7, 8]	Confirmed foraging habitat present on the subject lands over open areas; breeding habitat may be present on Parcel 3 (supporting landowner) - iNaturalist record for Witzke's greenhouses given presence of adults birds over open areas of subject lands. Otherwise, no other structures present on subject lands. High potential on adjacent lands (i.e., non-participating landowners and rural farm properties). Records from eBird (2017).
Bobolink (Source: Burnside, OBBA, eBird)	*Dolichonyx oryzivorus*	S4B	THR	SC	THR	1	Generally, prefers open grasslands and hay fields for nesting, typically featuring relatively tall vegetation. Sometimes uses large fields of winter wheat and rye in southwestern Ontario. Sensitive to vegetation structure and composition. Positively associated with high grass-to-forb ratios; moderate litter depth; tolerate wetter portions of fields compared to Eastern Meadowlark (EAME) and more likely to nest closer to field centres rather than field margins. Lower tolerance to presence of patches of bare ground. Appear to prefer larger fields than EAME.[6, 7, 8, 9]	Confirmed breeding habitat present on Parcel 6 (participating landowner). Potential habitat on adjacent lands given the rural nature of the study area. Two records from eBird in proximity to the subject lands (2017).
Chimney Swift (Source: OBBA)	*Chaetura pelagica*	S3B	THR	THR	THR	1	Historically nested in large hollow trees, other tree cavities and cracks in cliffs. Currently, most are found in developed areas in large, uncapped chimneys. May also nest in barns, silos, old wells, etc. Proximity to lakes is also a preferred habitat feature as they will forage for flying insects close to water.[6, 7, 8]	None observed during breeding bird surveys or any other surveys on the subject lands. Foraging habitat present over open areas; breeding habitat such as chimneys are not present on the subject lands. Potential breeding habitat may be present on adjacent lands given the presence of various structures.

COMMON NAME **(Source)	SCIENTIFIC NAME	Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description[5]	Habitat Present on the Subject Lands and/or Adjacent Lands?
Common Nighthawk (Source: OBBA)	*Chordeiles minor*	S4B	SC	SC	SC	1	Nests in open habitats, in forests and in urban areas. It prefers rock outcrops, alvars, sand barrens, bogs, fens, and in forests, openings created by clearcuts and burns. In southern Ontario, grasslands, agricultural fields, gravel pits, prairies, and alvars and at airports. In cities, it nests mostly on flat, graveled roofs but occasionally on railways and footpaths. [6, 7, 8]	None observed during breeding bird surveys or any other surveys on the subject lands.
Eastern Meadowlark (Source: Burnside, OBBA, eBird)	*Sturnella magna*	S4B, S3N	THR	THR	THR	1	Generally, prefers grassy pastures, meadows and hay fields. Prefers moderately tall grass with abundant litter cover, a high proportion of grass cover, moderate forb density, low proportions of shrub and woody vegetation cover, and low percent of bare ground. Prefers to nest in drier sites and frequently nests around field margins. [6, 7, 8, 9]	Confirmed breeding habitat present on Parcel 6 (participating landowner). Potential habitat on adjacent lands given the rural nature of the study area. Potential on adjacent lands given the rural nature of the study area. Record from eBird in proximity to the subject lands.
Eastern Wood-Pewee (Source: OBBA, eBird)	*Contopus virens*	S4B	SC	SC	SC	1	Prefers open space near the nest in the form of forest edges, clearings, roadways, and water. Does not require large areas of woods but occurs less frequently in woodlots surrounded by development than in those without. [6, 7, 8]	None observed during breeding bird surveys or any other surveys on the subject lands. Potential habitat north of Pebblestone Road (north of the subject lands) where upland deciduous forest is present.
Red-headed Woodpecker (Source: OBBA, eBird)	*Melanerpes erythrocephalus*	S3	END	END	END	1	Prefers open woodland and woodland edges and often found in parks, golf courses and cemeteries because these areas typically have many dead trees which the woodpecker uses for nesting and perching. [6, 7, 8]	None observed during breeding bird surveys or any other surveys on the subject lands. One non-breeding record from eBird on adjacent lands (October 2022).
Wood Thrush (Source: Burnside, OBBA)	*Hylocichla mustelina*	S4B	SC	THR	THR	1	Inhabits and breeds in woodlands ranging from small (3 ha) and isolated to large and contiguous. The presence of tall trees and a thick understorey are usually prerequisites for site occupancy. [6, 7, 8]	Confirmed breeding habitat present on Parcel 32 (participating landowner). Potential habitat north of Pebblestone Road (north of the subject lands) where upland deciduous forest is present.
Fish								
American Brook Lamprey (Source: Burnside; MNRF PSW Evaluation; CLOCA)	*Lampetra lamottei*	S3	-	-	-	-	Adults inhabit gravel/sand riffles and runs of creeks and small- to medium-sized rivers with strong flow and clear waters; spawn in sandy or silty pools; preferred water temperature range 9-12°C.[12]	Confirmed on the subject lands in the western branch of Farewell Creek located in Parcel 30 during aquatic investigations. Potential on adjacent lands where habitat is present.
Northern Brook Lamprey (Source: MNRF PSW Evaluation) *Great Lakes - Upper St. Lawrence Population*	*Ichthyomyzon fossor*	S3	SC	SC	SC	1	Generally, inhabits small rivers and clear streams of varying sizes. Adults spawn in gravelly riffles.[13, 14]	None recorded during aquatic investigations but assumed present based on background records for Farewell Creek. Potential on adjacent lands where habitat is present.

COMMON NAME **(Source)	SCIENTIFIC NAME	Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description[5]	Habitat Present on the Subject Lands and/or Adjacent Lands?
Insects								
Monarch (Source: Burnside, Butterfly Atlas)	*Danaus plexippus*	S2N, S4B	SC	END	END	1	Throughout their life cycle, Monarchs use three different types of habitats. Only the caterpillars (larvae) feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers. Monarchs spend the winter in Oyamel Fir forests found in central Mexico. The largest threat to Ontario Monarchs is habitat loss and fragmentation at overwintering sites in central Mexico where forests are being logged and converted into agricultural fields and pastures. Widespread pesticide and herbicide use throughout the Monarch's range may also limit recovery.[7, 8]	Confirmed on the subject lands; adults noted on Parcel 4 (participating landowner); milkweed present in meadow ecosites (i.e., Parcels 30, 4, 6, 33). High potential on adjacent lands given the rural nature of the study area.
Mammals								
Little Brown Myotis (Source: Burnside)	*Myotis lucifugus*	S3	END	END	END	1	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).[11]	No overwintering habitat present on the subject lands. High potential for maternity roost habitat on the subject lands and adjacent lands. Snags and cavities abundant in woodlands and hedgerows.
Northern Myotis (Source: Burnside)	*Myotis septentrionalis*	S3	END	END	END	1	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius. Maternal Roosts: Often associated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.)[11]	No overwintering habitat present on the subject lands. High potential for maternity roost habitat on the subject lands and adjacent lands. Snags and cavities abundant in woodlands and hedgerows.
Tri-colored Bat (Source: Burnside)	*Perimyotis subflavus*	S3?	END	END	END	1	Overwintering habitat: Deepest parts of caves and mines where temperature is the least variable. Maternal Roosts: Less is known about roosts of Tri-colored Bats. Most roost sites found within forested habitats. May roost in clumps of dead foliage and lichens. In more anthropogenically modified landscapes, maternity roosts may be barns or similar human-made structures.[11]	No overwintering habitat present on the subject lands. High potential for maternity roost habitat on the subject lands and adjacent lands.

COMMON NAME **(Source)	SCIENTIFIC NAME	Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description[5]	Habitat Present on the Subject Lands and/or Adjacent Lands?
Plants								
Butternut (Source: Burnside)	*Juglans cinerea*	S2?	END	END	END	1	Butternut grows best in rich, moist and well-drained soils or limestone gravel sites. They are less commonly found in dry, rocky and sterile soils. They generally grow alone or in small groups in deciduous forests that are commonly comprised of Basswood, Black Cherry, Beed, Black Walnut, Elm, Hemlock, Hickory, Oak, Red Maple, Sugar Maple, Poplar, White Ash and Yellow Birch. In Ontario, they can be found throughout southern Ontario, south of the Canadian Shield.[7, 8]	None recorded on the subject lands during field investigations. Potential on adjacent lands.
Reptiles and Amphibians								
Blanding's Turtle (Source: ORAA)	*Emydoidea blandingii*	S3	THR	END	END	1	Inhabits shallow water, usually in large wetlands and shallow lakes with lots of water plants. Can also be found hundreds of meters away from nearest waterbody when searching for a mate or travelling to a nesting site. [7, 8, 10]	No potential overwintering and breeding habitat on the subject lands; movement corridors present (i.e., Farewell Creek). Potential on adjacent lands where wetland habitat / marsh ponds are present.
Midland Painted Turtle (Source: ORAA)	*Chrysemys picta marginata*	S4	No Status	SC	SC	1	Generally, prefers waterbodies such as ponds, marshes, lakes and slow-moving creeks that have a soft bottom and provide abundant basking sites and aquatic vegetation. [7, 8, 10]	Low potential overwintering and breeding habitat present on Parcels 30 and 3 (supporting) and 33 (participating) although none were observed during any field surveys. Potential on adjacent lands where wetland habitat / ponds are present.
Eastern Milksnake (Source: ORAA)	*Lampropeltis triangulum*	S4	No status	SC	SC	1	Habitat generalist. Found in wide variety of habitats, from open woodlands, bogs, swamps, woodland edges, marshes, lakeshores, old fields, pastures, farmyards, parks, gardens. Often in or near farm outbuildings, barns, and sheds, and are attracted to piles of rocks, logs, firewood, or building materials, or any place that offers shelter to snakes and their prey (rodents). [7, 8, 10]	High potential on the subject lands and adjacent generally given the rural nature of the study area. None observed during any field surveys, but targeted searches were not completed.
Snapping Turtle (Source: ORAA)	*Chelydra serpentina*	S4	SC	SC	SC	1	Generally, inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits. [7, 8, 10]	Low potential overwintering and breeding habitat present on Parcels 30 and 3 (supporting) and 33 (participating) although none were observed during any field surveys. Potential on adjacent lands where wetland habitat / ponds are present.

COMMON NAME **(Source)	SCIENTIFIC NAME	Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description[5]	Habitat Present on the Subject Lands and/or Adjacent Lands?
Western Chorus Frog (Source: ORAA) *Great Lakes - St Lawrence population*	*Pseudacris maculata*	S4	No status	THR	THR	1	The Western Chorus Frog is primarily a lowland terrestrial species. In marshes or wooded wetland areas, it is found on the ground or in low shrubs and grass. Like all other frogs, the Western Chorus Frog requires both terrestrial and aquatic habitats in close proximity. For breeding and tadpole development, it requires seasonally dry temporary ponds devoid of predators, particularly fish. It is very rarely found in permanent ponds. In southern Ontario, its range is bounded by the United States border in the south, Georgian Bay in the northwest, and south of Algonquin Park and up the Ottawa River valley to the vicinity of Eganville in the east. [7, 8, 10]	None recorded during amphibian breeding call surveys or during any other surveys. Potential on adjacent lands.

** Sources: Natural Heritage Information Centre (NHIC) database of records searched on April 11, 2023 (1x1 km^2 Squares: 17PJ7666, 17PJ7766, 17PJ7665, 17PJ7765); Ontario Breeding Bird Atlas (2001-2005) searched on April 11, 2023 (Square 17PJ76); Ontario Reptile and Amphibian Atlas (ORAA) searched on April 11, 2023 (Square 17PJ76); iNaturalist, eButterfly and eBird records searched on April 11, 2023; Black/Harmony/Farewell Creek Watershed Existing Conditions Report – Chapter 16 – Fisheries and Aquatic Habitat (CLOCA, 2011); Harmony-Farewell Iroquois Beach Wetland Complex Evaluation (MNRF, 2005); R.J. Burnside & Associates (Burnside) observations during ecological field surveys in 2023.

[1]**S-Ranks (provincial)**
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario (Please refer to: http://explorer.natureserve.org/nsranks.htm)

SX — Presumed Extirpated - Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH — Possibly Extirpated (Historical) - Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20–40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
S1 — Critically Imperiled - Critically imperiled in the province or state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.
S2 — Imperiled - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.
S3 — Vulnerable - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 — Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 — Secure - Common, widespread, and abundant in the province.
SNR — Unranked - Province conservation status not yet assessed.
SU — Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA — Not Applicable - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S# — Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
S#? – Inexact or Uncertain - Denotes inexact or uncertain numeric rank.

Breeding Status Qualifiers
B – Breeding Conservation status refers to the breeding population of the species in the nation or state/province.
N – Nonbreeding Conservation status refers to the non-breeding population of the species in the province.
M – Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.

[2]**SARO *Endangered Species Act, 2007***
(provincial status from http://www.ontario.ca/environment-and-energy/how-species-risk-are-listed#section-3)
The provincial review process is implemented by the MNRF's Committee on the Status of Species at Risk in Ontario (COSSARO).

Extinct - A species that no longer exists anywhere.
Extirpated (EXT) - Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.
Endangered (END) - Lives in the wild in Ontario but is facing imminent extinction or extirpation.
Threatened (THR) - Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.
Special concern (SC) - Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.
Not at Risk (NAR) - A species that has been evaluated and found to be not at risk.
Data Deficient (DD) - A species for which there is insufficient information for a provincial status recommendation.

[3]**SARA (Federal *Species at Risk Act*) Status and Schedule (includes COSEWIC Status)**
The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

Appendix B – SAR Screening Table
300056758 Farewell Heights Secondary Plan Natural Heritage Evaluation

Extinct - A wildlife species that no longer exists.
Extirpated (EXT) - A wildlife species that no longer exists in the wild in Canada but exists elsewhere.
Endangered (END) - A wildlife species facing imminent extirpation or extinction.
Threatened (THR) - A wildlife species that is likely to become an endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
Data Deficient (DD) - A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.
Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

[4]**SARA Schedule**
Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as special concern and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

[5]**Sources:**
[6]Cadman, M.D., et al. (eds). 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp
[7]Species at Risk Public Registry https://species-registry.canada.ca/
[8] SARO List Species Descriptions (Species at risk in Ontario | ontario.ca)
[9] McCracken, J.D. et al. 2013. Recovery Strategy for the Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario, viii + 88 pp.
[10]Ontario Nature Reptile and Amphibian Atlas (ON Reptile & Amphibian Atlas (ontarioinsects.org))
[11]Environment Canada. 2015. Recovery Strategy for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. Ix + 110 pp.
[12]American Brook Lamprey (www.ontariofishes.ca)
[13]Department of Fisheries and Oceans (DFO) Aquatic Species at Risk found online at: http://www.dfo-mpo.gc.ca/species-especes/sara-lep/identify-eng.html.
[14]Fisheries and Oceans Canada (DFO). 2018. Management Plan for the Northern Brook Lamprey (*Ichthyomyzon fossor*), Great Lakes – Upper St. Lawrence populations, in Canada. *Species at Risk Act* Management Plan Series. Fisheries and Oceans Canada, Ottawa. vi + 33 pp.

Significant Wildlife Habitat Screening – Ecoregion 6E Criteria (2015)

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Table 1.1: Seasonal Concentration Areas of Animals					
Waterfowl Stopover & Staging Areas (Terrestrial) **Rationale:** Habitat important to migrating waterfowl.	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these ecosites.	Fields with sheet water during Spring (mid-March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects. • Any mixed species aggregations of 100 or more individuals required. • The flooded field ecosite habitat plus a 100-300 m radius area, dependent on local site conditions and adjacent land use is the SWH. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • **SWHMiST Index #7** provides development effects and mitigation measures.	No potential on the subject lands. The criteria for Significant Wildlife Habitat is not present. No large aggregations of waterfowl were observed during any of the field investigations that occurred in early spring. Candidate habitat on adjacent lands but not within 120 m. The Harmony-Farewell Iroquois Beach Provincially Significant Wetland (PSW) Complex Evaluation identified waterfowl staging areas as “known to occur” in this Complex (MNR, 2005).
Waterfowl Stopover & Staging Areas (Aquatic) **Rationale**: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and SWM ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water).	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback Ruddy Duck	**Studies carried out & verified presence of:** • Aggregations of 100 or more of listed species for 7 days, results in >700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH. • The combined area of the Ecological Land Classification (ELC) ecosites and a 100 m radius area is the SWH. • Wetland area and shorelines associated with sites identified within the SWHTG Appendix K are SWH. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • **SWHMiST Index #7** provides development effects and mitigation measures.	No potential on the subject lands. The criteria for Significant Wildlife Habitat is not present. No large aggregations of waterfowl were observed during any of the field investigations that occurred in early spring. Candidate habitat on adjacent lands but not within 120 m. The Harmony-Farewell Iroquois Beach PSW Complex Evaluation identified waterfowl staging areas as “known to occur” in this Complex (MNR, 2005).

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Shorebird Migratory Stopover Area **Rationale**: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	• Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. • Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. • Sewage treatment ponds and storm water ponds do not qualify as a SWH.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	**Studies confirming:** • Presence of 3 or more of listed species and >1000 shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period). • Whimbrel stop briefly (<24 hrs.) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100 m radius area. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • **SWHMiST Index #8** provides development effects and mitigation measures.	No potential on the subject lands. The criteria for Significant Wildlife Habitat is not present. None of these species were observed utilizing the ecosites listed during any of the field investigations. No potential on adjacent lands. The Harmony-Farewell Iroquois Beach PSW Complex Evaluation identified shorebird stopover areas as "not significant" in this Complex (MNR, 2005).
Raptor Wintering Area **Rationale**: Sites used by multiple species, a high number of individuals and used annually are most significant.	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW Bald Eagle: Forest community Series: FOD, FOM, FOC, SWD, SWM, or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	• The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. • Raptor wintering sites (hawk/owl) need to be **>** 20 ha, with a combination of forest and upland. • Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands. • Field area of the habitat is to be wind swept with limited snow depth or accumulation. • Eagle sites have open water, large trees and snags available for roosting.	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl **Special Concern:** Short-eared Owl Bald Eagle	**Studies confirm the use of these habitats by:** • One or more Short-eared Owls or; One or more Bald Eagle or; At least 10 individuals and two of the listed hawk/owl species. • To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects." • **SWHMiST Index #10 and #11** provides development effects and mitigation measures.	Candidate habitat present on the subject lands east of Trulls Road. The mosaic of forest and upland ecosites are present; the fields have been disturbed in the past but have been left fallow in recent years. No potential on adjacent lands within 120 m. Intensive agriculture and residential development are present adjacent to forests. Large rivers and lakes with open water are absent on the subject lands and adjacent lands for Bald Eagle.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Bat Hibernacula **Rationale:** Bat hibernacula are rare habitats in all Ontario landscapes.	**Bat Hibernacula may be found in these ecosites:** CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH. • The locations of bat hibernacula are relatively poorly known.	Big Brown Bat Tri-coloured Bat	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200 m radius around the entrance of the hibernaculum for most development types and 1000 m for wind farms. • Studies are to be conducted during the peak swarming period (August to September). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects". • **SWHMiST Index #1** provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.
Bat Maternity Colonies **Rationale:** Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Maternity colonies considered SWH are found in forested ecosites. **All ELC ecosites in ELC Community Series:** FOD FOM SWD SWM	• Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario. • Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25 cm dbh) wildlife trees. • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.	Big Brown Bat Silver-haired Bat	• Maternity Colonies with confirmed use by: – >10 Big Brown Bats – >5 Adult Female Silver- haired Bats • The area of the habitat includes the entire woodland, or a forest stand ELC ecosite or an ecoelement containing the maternity colonies. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #12 provides development effects and mitigation measures.	No potential in the developable limits of the subject lands. The ecosites are not present and the habitat criteria for Significant Wildlife Habitat is not present. Candidate habitat present in the NHS of the subject lands and forested tracts on adjacent lands. These ecosites are part of a larger wooded/wetland system associated with Harmony-Farewell Iroquois Beach PSW Complex that meets the minimum to be considered SWH. The woodlands are part of the protected NHS.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Turtle Wintering Areas **Rationale:** Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Snapping and Midland Painted Turtles. **ELC Community Classes:** SW, MA, OA and SA **ELC Community Series:** FEO and BOO For Northern Map Turtle: Open water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	• For most turtles, wintering areas are in the same general area as their core habitat. Water must be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH.	Midland Painted Turtle **Special Concern:** Northern Map Turtle Snapping Turtle	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (September–October) or spring (March–May). • Congregation of turtles is more common where wintering areas are limited and therefore significant. • **SWHMiST Index #28** provides development effects and mitigation measures for turtle wintering habitat.	No potential in the developable limits of the subject lands. The habitat criteria for Significant Wildlife Habitat is not present. No turtles were observed during any field investigations conducted on the subject lands (early spring, summer, fall). Candidate habitat present in the NHS of the subject lands in the open water wetland communities (i.e., SWD, SWT, MAS). However, no turtles were observed during any field investigations conducted on the subject lands (early spring, summer, fall). An open water wetland (SAS) on a non-participating parcel in the NHS may be suitable overwintering habitat for turtles; however, this wetland could not surveyed (permission to enter was not granted). Candidate habitat present on adjacent lands within 120 m where small open water wetlands are present south and southeast of the subject lands associated with the Harmony-Farewell Iroquois Beach PSW Complex.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Reptile Hibernaculum **Rationale**: Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and ecosites: FOC1 and FOC3.	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line. • Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock groundcover. • Five-lined Skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures.	**Snakes**: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake **Special Concern**: Milksnake Eastern Ribbonsnake **Lizard: Special Concern:** (Southern Shield population): Five-lined Skink	**Studies confirming:** • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (e.g., foundation or rocky slope) on sunny warm days in Spring (April/May) and Fall (September/October). • **Note**: If there are Special Concern Species present, then site is SWH. • **Note:** Sites for hibernation possess specific habitat parameters (e.g., temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e., strong hibernation site fidelity). Other critical life processes (e.g., mating) often take place near hibernacula. The feature in which the hibernacula is located plus a 30 m radius area is the SWH. • **SWHMiST Index #13** provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for Skink is significant. • SWHMiST Index #37 provides development effects and mitigation measures for five-lined Skink wintering habitat.	Candidate potential on the subject lands and adjacent lands given the variety of suitable overwintering habitat present and availability of shelter materials (barns, outbuildings, wood piles, wetlands, etc.). One snake species, Eastern Gartersnake, was observed on the subject lands during surveys in 2023. Two individuals were recorded on Parcel 33 – MEGM4 graminoid meadow community in April and June. The Farewell Creek valleyland system and the Harmony-Farewell Iroquois Beach PSW Complex features a mosaic of ecosite communities.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Colonially - Nesting Bird Breeding Habitat (Bank & Cliff) **Rationale:** Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles. Cliff faces, bridge abutments, silos, barns. **Habitat found in the following ecosites:** CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	**Studies confirming:** • Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50 m radius habitat area from the peripheral nests. • Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • **SWHMiST Index #4** provides development effects and mitigation measures.	No potential on the subject lands. The criteria for Significant Wildlife Habitat is not present. Neither species recorded during breeding bird surveys or any other field investigations. No potential breeding habitat on adjacent lands. No obvious features such as exposed earthen banks or shorelines.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) **Rationale:** Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	**Studies confirming:** • Presence of 2 or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300 m radius or extent of the Forest ecosite containing the colony or any island <15.0 ha with a colony is the SWH. • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells. • **SWHMiST Index #5** provides development effects and mitigation measures.	No potential on the subject lands in the developable limits. Candidate habitat present on the subject lands in the NHS associated with the Harmony-Farewell Iroquois Beach PSW Complex; however, none of the wildlife species listed were recorded with breeding evidence on the subject lands during breeding bird surveys or other field investigations. The only species recorded as a flyover was Great Blue Heron (see below). According to Burnside's background review, the Harmony-Farewell Iroquois Beach PSW Complex Evaluation reported two Great Blue Heron rookeries in the PSW Complex (MNR, 2005). CLOCA confirmed that these rookeries are located approximately 1 km northeast and east of the subject lands (email correspondence with Doris Cheng, July 4, 2023; 1998). Based on Burnside's sightings of Great Blue Heron flying over the site in an easterly direction during breeding bird surveys in 2023, these heronries may still be present in that general location. However, they are located well outside the Secondary Plan area. The Evaluation also identifies Green Heron as a confirmed breeder in this Complex.
Colonially - Nesting Bird Breeding Habitat (Ground) **Rationale;** Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird). MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in low bushes in close proximity to streams and irrigation ditches within farmlands.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	**Studies confirming:** • Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150 m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0 ha with a colony is the SWH. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • **SWHMiST Index #6** provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The criteria for Significant Wildlife Habitat is not present (i.e., no gull or tern colonies are known from the area). Breeding records for Brewer's Blackbird are mainly restricted to the north shore of Lake Huron and Georgian Bay, as well as Sudbury/Manitoulin Island and NW Ontario; no breeding records currently exist for Southern and Eastern Ontario.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Migratory Butterfly Stopover Areas **Rationale:** Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Combination of ELC Community Series; need to have present one Community Series from each land class. <u>Field</u>: CUM, CUT, CUS <u>Forest</u>: FOC, FOD, FOM, CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	• A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present and will be located within 5 km of Lake Erie or Ontario. • The habitat is typically a combination of field and forest and provides the butterflies with a location to rest prior to their long migration south. • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes.	Painted Lady Red Admiral <u>Special Concern</u> Monarch	**Studies confirm:** • The presence of Monarch Use Days (MUD) during fall migration (August/October). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. • MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. • **SWHMiST Index #16** provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The criteria for Significant Wildlife Habitat is not present. The subject lands are greater than 5 km from Lake Ontario.
Landbird Migratory Stopover Areas **Rationale:** Sites with a high diversity of species as well as high numbers are most significant.	**All ecosites associated with these ELC Community Series:** FOC, FOM, FOD, SWC, SWM, SWD	• Woodlots >10 ha in size and within 5 km of Lake Ontario. • If woodlands are rare in an area of shoreline, woodland fragments 2-5 ha can be considered for this habitat. • If multiple woodlands are located along the shoreline those Woodlands <2 km from Lake Ontario are more significant. • Sites have a variety of habitats; forest, grassland and wetland complexes. • The largest sites are more significant. • Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5 km of Lake Ontario are Candidate SWH.	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1 All migrant raptors species: *Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997.* Schedule 7: Specially Protected Birds (Raptors)	**Studies confirm:** • Use of the habitat by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (April/May) and fall (August/October) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • **SWHMiST Index #9** provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The criteria for Significant Wildlife Habitat is not present. The subject lands are greater than 5 km from Lake Ontario. The Harmony-Farewell Iroquois Beach PSW Complex Evaluation identified landbird stopover areas as "not significant" in this Complex (MNR, 2005).

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Deer Yarding Areas **<u>Rationale:</u>** Winter habitat for deer is considered to be the main limiting factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	**Note:** MNRF to determine this habitat. **ELC Community Series** providing a thermal cover component for a deer yard would include: FOM, FOC, SWM, SWC **Or these ELC ecosites:** CUP2, CUP3, FOD3, CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%. • MNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual". • Woodlots with high densities of deer due to artificial feeding are not significant.	White-tailed Deer	**No Studies Required:** • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40 cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH. • Deer Yards are mapped by MNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by MNRF will be available at local MNRF offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area, then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST Index #2 provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present. No deer yarding areas were identified by MNRF. See notes below.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Deer Winter Congregation Areas **Rationale:** Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions.	**All Forested ecosites with these ELC Community Series:** FOC, FOM, FOD, SWC, SWM, SWD Conifer plantations much smaller than 50 ha may also be used.	• Woodlots will typically be >100 ha in size. Woodlots <100 ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100 ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha. • Woodlots with high densities of deer due to artificial feeding are not significant.	White-tailed Deer	**Studies confirm:** • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF. • Use of the woodlot by white- tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF. • Studies should be completed during winter (January/February) when >20 cm of snow is on the ground using aerial survey techniques, ground or road surveys. or a pellet count deer density survey. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area, then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • **SWHMiST Index #2** provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present. No deer yarding areas were identified by MNRF. The 282 ha of mixed/conifer swamp associated with the Harmony-Farewell Iroquois Beach PSW Complex is considered locally significant for wintering deer (MNR, 2005).
Table 1.2.1: Rare Vegetation Communities					
Cliffs and Talus Slopes **Rationale:** Cliffs and Talus Slopes are extremely rare habitats in Ontario.	**Any ELC ecosite within Community Series:** TAO, CLO, TAS, CLS, TAT, CLT	• A Cliff is vertical to near vertical bedrock >3 m in height. • A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.		• Most cliff and talus slopes occur along the Niagara Escarpment. • Confirm any ELC Vegetation Type for Cliffs or Talus Slopes. • **SWHMiST Index #21** provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present. The Niagara Escarpment is not present in the area.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Sand Barren **Rationale;** Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	**ELC ecosites:** SBO1, SBS1, SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	• Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered, but less than 60%.		• A sand barren area >0.5 ha in size. • Confirm any ELC Vegetation Type for Sand Barrens. • Site must not be dominated by exotic or introduced species (<50% vegetative cover is exotic sp.). • **SWHMiST Index #20** provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.
Alvar **Rationale;** Alvars are extremely rare habitats in Ecoregion 6E.	ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2 **Five Alvar Indicator Species:** *Carex crawei* *Panicum philadelphicum* *Eleocharis compressa* *Scutellaria parvula* *Trichostema brachiatum* These indicator species are very specific to Alvars within Ecoregion 6E.	• An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover. • Alvar is particularly rare in Ecoregion 6E where the only known sites are found in the western islands of Lake Erie.		**Field studies that identify:** • An Alvar site > 0.5 ha in size. • Four of the five Alvar Indicator Species at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover is exotic sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses. • **SWHMiST Index #17** provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.
Old Growth Forest **Rationale:** Due to historic logging practices and land clearance for agriculture, old growth forest is rare in the Ecoregion 6E.	**Forest Community Series:** FOD, FOC, FOM, SWD, SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.		**Field Studies will determine:** • If dominant trees species are >140 years old, then the area containing these trees is SWH. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present). • The area of forest ecosites combined or an eco-element within an ecosite that contains the old growth characteristics is the SWH. • Determine ELC vegetation types for the forest area containing the old growth characteristics. • **SWHMiST Index #23** provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present. MNRF did not identify Old Growth forest in the study area.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Savannah **Rationale:** Savannahs are extremely rare habitats in Ontario.	TPS1, TPS2, TPW1, TPW2, CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25–60%.		**Field studies confirm:** • No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. • One or more of the Savannah indicator species listed in Appendix N should be present. **Note**: Savannah plant spp. list from Ecoregion 6E should be used. • Area of the ELC ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover is exotic sp.). • **SWHMiST Index #18** provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.
Tallgrass Prairie **Rationale:** Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1, TPO2	• No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway Right of Ways (ROW) are not considered to be SWH. • A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.		**Field studies confirm:** • One or more of the Prairie indicator species listed in Appendix N should be present. **Note:** Prairie plant spp. list from Ecoregion 6E should be used. • Area of the ELC ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover is exotic sp.). • **SWHMiST Index #19** provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.
Other Rare Vegetation Communities **Rationale:** Plant communities that often contain rare species which depend on the habitat for survival.	• Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG. • Any ELC ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.		• ELC ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M. • The MNRF/Natural Heritage Information Centre (NHIC) will have up to date listing for rare vegetation communities. **Field studies should confirm:** • If an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG. • Area of the ELC Vegetation Type polygon is the SWH. • **SWHMiST Index #37** provides development effects and mitigation measures.	No potential on the subject lands. No rare vegetation communities were identified during ELC field surveys or other field investigations completed in 2023. Candidate habitat on adjacent lands but none have been identified during desktop assessment and background review.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Table 1.2.2: Specialized Habitats for Wildlife considered Significant Wildlife Habitat					
Waterfowl Nesting Area **Rationale:** Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	**All upland habitats located adjacent to these wetland ELC ecosites are Candidate SWH:** MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands (PSW).	• A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120 m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. • Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40 cm dbh) in woodlands for cavity nest sites.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	**Studies confirmed:** • Presence of 3 or more nesting pairs for listed species excluding Mallards, or; • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest. • **SWHMiST Index #25** provides development effects and mitigation measures.	No potential on the subject lands. Of the wildlife species listed, one pair of Wood Duck and 3 Mallard (including 1 pair) exhibiting breeding behaviour were recorded during field observations in 2023. Candidate habitat present on adjacent lands. Waterfowl breeding records confirmed in the Harmony-Farewell Iroquois Beach PSW Complex Evaluation (MNR, 2005) for Wood Duck and Mallard.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Bald Eagle & Osprey Nesting, Foraging & Perching Habitat **Rationale:** Nest sites are fairly uncommon in Eco-region 6E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	**ELC Forest Community Series:** FOD, FOM, FOC, SWD, SWM, and SWC (directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.)	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top of a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g., telephone poles and constructed nesting platforms).	Osprey **Special Concern** Bald Eagle	**Studies confirm the use of these nests by**: • One or more active Osprey or Bald Eagle nests in an area. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is important. • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800 m is dependent on-site lines from the nest to the development and inclusion of perching and foraging habitat. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid-March to mid-August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • **SWHMiST Index #26** provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present. Bald Eagle or Osprey were not recorded during breeding bird surveys or any other field investigations. There are no breeding records for either species in OBBA Square 17PJ76 (2001-2005); additionally, supplemental data from LIO does not have any nesting records for Osprey or Bald Eagle in the study area.
Woodland Raptor Nesting Habitat **Rationale:** Nests sites for these species are rarely identified; these are area sensitive habitats and are often used annually by these species.	May be found in all forested ELC ecosites. **May also be found in:** SWC, SWM, SWD, and CUP3	• All natural or conifer plantation woodland/forest stands >30 ha with >10ha of interior habitat. Interior habitat determined with a 200 m buffer. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers Hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	**Studies confirm:** • Presence of 1 or more active nests from species list is considered significant. • Red-shouldered Hawk and Northern Goshawk – A 400 m radius around the nest or 28 ha area of habitat is the SWH (the 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest). • Barred Owl – A 200 m radius around the nest is the SWH. • Broad-winged Hawk and Coopers Hawk– A 100 m radius around the nest is the SWH. • Sharp-Shinned Hawk – A 50 m radius around the nest is the SWH. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • **SWHMiST Index #27** provides development effects and mitigation measures.	No potential in the developable limits of the subject lands. The habitat criteria for Significant Wildlife Habitat is not present. Candidate habitat present in the forested communities of the NHS on the subject lands for Red-tailed Hawk, Cooper's Hawk, Sharp-shinned Hawk and Barred Owl. While incidental observations of raptors included *Accipiter* species, Barred Owl (feather) and empty stick nests, none were confirmed breeding during any field investigations or breeding bird surveys completed in 2023. Potential habitat present given the size of the forest/wetland ecosites extending beyond the subject lands. Candidate habitat on adjacent lands based on the mosaic of treed wetland and forested ecosites associated with the Harmony-Farewell Iroquois Beach PSW Complex and Farewell Creek valleyland.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Turtle Nesting Areas **Rationale:** These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	**Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC ecosites:** MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, BOO1, FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.	Midland Painted Turtle <u>Special Concern Species:</u> Northern Map Turtle Snapping Turtle	**Studies confirm:** • Presence of 5 or more nesting Midland Painted Turtles. • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100 m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH. • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100 m area of habitat. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • **SWHMiST Index #28** provides development effects and mitigation measures for turtle nesting habitat.	No potential in the developable limits of the subject lands. The habitat criteria for Significant Wildlife Habitat is not present. No turtles were observed during any field investigations conducted on the subject lands (early spring, summer, fall). Candidate habitat present in the NHS of the subject lands in the open water wetland communities (i.e., SWD, SWT, MAS). However, no turtles were observed during any field investigations conducted on the subject lands (early spring, summer, fall). An open water wetland (SAS) on a non-participating parcel in the NHS may be suitable overwintering habitat for turtles; however, this wetland could not surveyed (permission to enter was not granted). Candidate habitat present on adjacent lands within 120 m where small open water wetlands are present south and southeast of the subject lands associated with the Harmony-Farewell Iroquois Beach PSW Complex.
Seeps and Springs **Rationale:** Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Seeps/Springs are areas where ground water comes to the surface. Often, they are found within headwater areas within forested habitats. Any forested ecosite within the headwater areas of a stream could have seeps/springs.	• Any forested area (with <25% meadow/field/ pasture) within the headwaters of a stream or river system. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	**Field Studies confirm:** • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat. • **SWHMiST Index #30** provides development effects and mitigation measures.	No potential in the developable limits of the subject lands. **Confirmed** on the subject lands in the forest/wetland ecosites of the NHS. Two of the species listed were recorded during field surveys: Ruffed Grouse and White-tailed Deer. Some of the wetlands in the NHS are seep-based and groundwater fed based on the vegetation present and the shape/size. Candidate habitat on adjacent lands based on the mosaic of treed wetland and forested ecosites associated with the Harmony-Farewell Iroquois Beach PSW Complex and Farewell Creek valleyland.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Amphibian Breeding Habitat (Woodland) **Rationale:** These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	All ecosites associated with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500 m^2 (about 25 m diameter) within or adjacent (within 120 m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	**Studies confirm:** • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230 m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • **SWHMiST Index #14** provides development effects and mitigation measures.	No potential in the developable limits of the subject lands. **Confirmed** on the subject lands in the NHS at station AMPH-006 (man-made compensation wetland) and AMPH-007 – Spring Peeper and Gray Treefrog were recorded with Call Level Codes of 3. Significant site alteration has occurred on the subject lands over the years; there appears to be site fidelity to these breeding sites adjacent to woodland habitat. Vernal pool habitat assessments did not identify any salamander or newt species in the woodland ponds. Candidate habitat on adjacent lands based on the mosaic of treed wetland and forested ecosites associated with the Harmony-Farewell Iroquois Beach PSW Complex and Farewell Creek valleyland.
Amphibian Breeding Habitat (Wetlands) **Rationale;** Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	**ELC Community Classes:** SW, MA, FE, BO, OA, and SA. Typically, these wetland ecosites will be isolated (>120 m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g., Bull Frog) may be adjacent to woodlands.	• Wetlands >500 m^2 (about 25 m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	**Studies confirm:** • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3 or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • **SWHMiST Index #15** provides development effects and mitigation measures.	No potential on the subject lands. The habitat criteria for Significant Wildlife Habitat is not present. Candidate habitat on adjacent lands associated with the Harmony-Farewell Iroquois Beach PSW Complex.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Woodland Area-Sensitive Bird Breeding Habitat **Rationale:** Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	**All ecosites associated with these ELC Community Series:** FOC, FOM, FOD, SWC, SWM, SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs. old) forest stands or woodlots >30 ha. • Interior forest habitat is at least 200 m from forest edge habitat.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren **Special Concern:** Cerulean Warbler Canada Warbler	**Studies confirm:** • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • **Note**: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • **SWHMiST Index #34** provides development effects and mitigation measures.	No potential in the developable limits of the subject lands. The ecosites and the habitat criteria for Significant Wildlife Habitat are not present. Candidate habitat present in the NHS of the subject lands and forested tracts on adjacent lands. Single observations of Red-breasted Nuthatch, Veery, and Ovenbird were recorded during breeding bird surveys in 2023 in the forested ecosites of the NHS located west of Trulls Rd and north of Adelaide Ave. None were confirmed pairs. The Harmony-Farewell Iroquois Beach PSW Complex extends well beyond the limits of the study area (and is >30 ha). It is likely that additional species from the wildlife list may be present.
Table 1.3: Habitat for Species of Conservation Concern considered Significant Wildlife Habitat					
Marsh Breeding Bird Habitat **Rationale:** Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, FEO1, BOO1 **For Green Heron:** All SW, MA and CUM1 sites	• Nesting occurs in wetlands. • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water.	American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan **Special Concern:** Black Tern Yellow Rail	**Studies confirm:** • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes breeding by any combination of 5 or more of the listed species. • **Note**: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. • Area of the ELC ecosite is the SWH. • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • **SWHMiST Index #35** provides development effects and mitigation measures.	No potential in the developable limits of the subject lands. The ecosites and the habitat criteria for Significant Wildlife Habitat are not present. Candidate habitat present in the NHS of the subject lands and adjacent lands. None of these species were recorded during breeding bird surveys in 2023 or during any other field investigations on the subject lands. Candidate habitat on adjacent lands. The Harmony-Farewell Iroquois Beach PSW Complex extends well beyond the limits of the study area. It is likely that species from the wildlife list may be present.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Open Country Bird Breeding Habitat **Rationale:** This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	CUM1, CUM2	• Large grassland areas (includes natural and cultural fields and meadows) >30 ha. • Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e., no row cropping or intensive hay or livestock pasturing in the last 5 years). • Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. • The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow **Special Concern** Short-eared Owl	**Field Studies confirm:** • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owls is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • **SWHMiST Index #32** provides development effects and mitigation measures.	No potential on the subject lands. Only Savannah Sparrow was recorded during breeding bird surveys. No potential on adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.
Shrub/Early Successional Bird Breeding Habitat **Rationale:** This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	CUT1, CUT2, CUS1, CUS2, CUW1, CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	• Large field areas succeeding to shrub and thicket habitats >10 ha in size. • Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e., no row-cropping, haying or live-stock pasturing in the last 5 years). • Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. • Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands.	**Indicator Spp:** Brown Thrasher Clay-coloured Sparrow **Common Spp.** Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher **Special Concern:** Yellow-breasted Chat Golden-winged Warbler	**Field Studies confirm:** • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species. • A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as SWH. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • **SWHMiST cxlix Index #33** provides development effects and mitigation measures.	No potential on the subject lands. Only Willow Flycatcher was recorded during breeding bird surveys. No potential on adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Terrestrial Crayfish **Rationale:** Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SWD, SWT, SWM CUM1 with inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.	• Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for Terrestrial Crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed.	Chimney or Digger Crayfish (*Fallicambarus fodiens*) Devil Crayfish or Meadow Crayfish (*Cambarus diogenes*)	**Studies Confirm:** • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites. • Area of ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH. • Surveys should be done April to August in temporary or permanent water. **Note** the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult. • **SWHMiST Index #36** provides development effects and mitigation measures.	No potential on the subject lands. None were observed during any of the field investigations in 2023. Candidate habitat on adjacent lands associated with the Harmony-Farewell Iroquois Beach PSW Complex.
Special Concern and Rare Wildlife Species **Rationale:** These species are quite rare or have experienced significant population declines in Ontario.	All plant and animal Element Occurrences (EO) within a 1 or 10 km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC ecosites.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the NHIC.	**Studies Confirm:** • Assessment/inventory of the site for the identified Special Concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g., specific nesting habitat or foraging habitat. • **SWHMiST Index #37** provides development effects and mitigation measures.	The following species were **Confirmed** on the subject lands: • Monarch (SC) • Wood Thrush (SC) • Barn Swallow (SC) • American Brook Lamprey (S3) Candidate habitat for SC and Rare wildlife species on adjacent lands.
Table 1.4.1: Animal Movement Corridors					
Amphibian Movement Corridors **Rationale:** Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	• Movement corridors between breeding habitat and summer habitat. • Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat–Wetland) of this Schedule.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. • Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant. • Corridors should have at least 15 m of vegetation on both sides of waterway or be up to 200 m wide of woodland habitat and with gaps <20 m. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat. • **SWHMiST Index #40** provides development effects and mitigation measures.	No potential in the developable limits of the subject lands. **Confirmed** on the subject lands in the NHS and adjacent lands. The Farewell Creek valleyland system and its tributaries have been identified as Core Habitat in the Wildlife Corridor Enhancement and Protection Plan (CLOCA, 2022). Candidate habitat on adjacent lands.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
Deer Movement Corridors **Rationale:** Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule. • A deer wintering habitat identified by the MNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges).	White-tailed Deer	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering habitat should be unbroken by roads and residential areas. • Corridors should be at least 200 m wide with gaps <20 m and if following riparian area with at least 15 m of vegetation on both sides of waterway. • Shorter corridors are more significant than longer corridors, SWHMiST Index #39 provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present. Deer wintering habitat was not identified by MNRF.
Table 1.5.1: Significant Wildlife Habitat Exceptions for Ecodistricts within EcoRegion 6E					
6E-14 **Mast Producing Areas** **Rationale:** The Bruce Peninsula has an isolated and distinct population of black bears. Maintenance of large woodland tracts with mast-producing tree species is important for bear.	**All Forested habitat represented by ELC Community Series**: FOM, FOD	• Woodland ecosites >30 ha with mast-producing tree species, either soft (cherry) or hard (oak and beech). • Black bears require forested habitat that provides cover, winter hibernation sites, and mast- producing tree species. Forested habitats need to be large enough to provide cover and protection for black bears.	Black Bear	**All woodlands >30 ha with a 50% composition of these ELC Vegetation Types are considered significant:** FOM1-1; FOM2-1; FOM3-1; FOD1-1; FOD1-2; FOD2-1; FOD2-2; FOD2-3; FOD2-4; FOD4-1; FOD5-2; FOD5-3; FOD5-7; FOD6-5. SWHMiST Index #3 provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.

Habitat	CANDIDATE - Significant Wildlife Habitat		CONFIRMED - Significant Wildlife Habitat		
	Ecological Land Classification Ecosite Codes	**Habitat Criteria**	**Wildlife Species**	**Defining Criteria**	**Presence of Candidate or Confirmed Habitat on the Subject Lands and/or Adjacent Lands?**
6E- 17 **Lek** **Rationale:** Sharp-tailed grouse only occur on Manitoulin Island in Ecoregion 6E, Leks are an important habitat to maintain their /*population.	CUM, CUS, CUT	• The Lek or dancing ground consists of bare, grassy or sparse shrubland. There is often a hill or rise in topography. • Leks are typically a grassy field/meadow >15 ha with adjacent shrublands and >30 ha with adjacent deciduous woodland. Conifer trees within 500 m are not tolerated. • Grasslands (field/meadow) are to be >15 ha when adjacent to shrubland and >30 ha when adjacent to deciduous woodland. • Grasslands are to be undisturbed with low intensities of agriculture (light grazing or late haying). • Leks will be used annually if not destroyed by cultivation or invasion by woody plants or tree planting.	Sharp-tailed Grouse	• Studies confirming Lek habitat are to be completed from late March to June. • Any site confirmed with sharp-tailed grouse courtship activities is considered significant. • The field/meadow ELC ecosites plus a 200 m radius area with shrub or deciduous woodland is the Lek habitat. • SWHMiST cxlix Index #32 provides development effects and mitigation measures.	No potential on the subject lands or adjacent lands. The habitat criteria for Significant Wildlife Habitat is not present.

BURNSIDE

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Appendix C

Breeding Bird Survey Summary Table

Breeding Bird Survey Summary Table

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species at Risk Act)[3]	Federal SARA Schedule[4]	Provincial MNRF Area Sensitive Species[5]	Highest Number Recorded Per Unit Green = units entirely within NHS Blue = part of developable lands, some portions within NHS										Highest Number Recorded (All Habitat Units Combined)	Highest Recorded Breeding Evidence[6]	Comments
								BB1	BB2 & BB3	BB4	BB5	BB6	BB7	BB8	BB9	BB10	BB11	BB12		
Alder Flycatcher	*Empidonax alnorum*	S5B						1		3				1					5	PROB, T	
American Crow	*Corvus brachyrhynchos*	S5						3			2					1	2		8	POSS, S	Likely nesting on north side of Pebblestone Road in upland forest (adjacent lands).
American Goldfinch	*Spinus tristis*	S5						6	2	7		4	2	2	1			2	26	PROB, D	
American Robin	*Turdus migratorius*	S5						1		1		2	3	2	2	20	4		35	PROB, A	
American Woodcock	*Scolopax minor*	S4B												3	1	1			5	PROB, D	Display calls heard during amphibian survey on May 12, 2023 in Parcel 3; individuals observed during breeding bird surveys in Parcel 3.
Baltimore Oriole	*Icterus galbula*	S4B								1		2	1	1		1			6	PROB, T	
Barn Swallow	*Hirundo rustica*	S4B	SC	SC	THR	1		3	8					1		5			17	POSS, H	Likely nesting on or in greenhouses in Parcel 3 (iNaturalist record for this location in 2022). Assume some of these records are the same individuals. No other structures present on the subject lands.
Black-capped Chickadee	*Poecile atricapillus*	S5						2				3	2	4			3	3	17	PROB, T	
Blackpoll Warbler	*Setophaga striata*	S5B											1						1	OBS, X	Presumed late migrant.
Blue Jay	*Cyanocitta cristata*	S5						1			2	6	2					1	12	CONF, NB	
Bobolink	*Dolichonyx oryzivorus*	S4B	THR	SC	THR	1	Yes		2										2	PROB, T	Parcel 6 only.
Brown-headed Cowbird	*Molothrus ater*	S5						2					1						3	PROB, T	
Cedar Waxwing	*Bombycilla cedrorum*	S5						2		1		1							4	POSS, S	
Chestnut-sided Warbler	*Setophaga pensylvanica*	S5B										1							1	POSS, S	
Chipping Sparrow	*Spizella passerina*	S5B, S3N						1		1									2	PROB, A	
Common Grackle	*Quiscalus quiscula*	S5						2	5	1		15	5	3					31	CONF, CF	
Common Yellowthroat	*Geothlypis trichas*	S5B, S3N						1	1	1		1		2	2	1		1	10	PROB, T	
Downy Woodpecker	*Dryobates pubescens*	S5										1					1	1	3	POSS, S	First observed during site reconnaissance on April 19, 2023 in Parcel 30; this species begins nesting in April.
Eastern Kingbird	*Tyrannus tyrannus*	S4B						1											1	POSS, H	
Eastern Meadowlark	*Sturnella magna*	S4B, S3N	THR	THR	THR	1	Yes		2										2	PROB, T	Parcel 6 only.
Eastern Phoebe	*Sayornis phoebe*	S5B							1										1	POSS, S	
European Starling	*Sturnus vulgaris*	SNA						12	15			4				2			33	CONF, CF	
Gray Catbird	*Dumetella carolinensis*	S5B, S3N								2		1	1	3					7	PROB, T	
Great Blue Heron	*Ardea herodias*	S4							1	1				1	1				4	OBS, X	Flyover; mostly observed heading east over site; once heading west.

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species at Risk Act)[3]	Federal SARA Schedule[4]	Provincial MNRF Area Sensitive Species[5]	Highest Number Recorded Per Unit Green = units entirely within NHS Blue = part of developable lands, some portions within NHS											Highest Number Recorded (All Habitat Units Combined)	Highest Recorded Breeding Evidence[6]	Comments
								BB1	BB2 & BB3	BB4	BB5	BB6	BB7	BB8	BB9	BB10	BB11	BB12			
																					CLOCA reported two heronries from the PSW Complex approximately 1 km northeast and east of the subject lands (1998).
Great Crested Flycatcher	*Myiarchus crinitus*	S5B									1								1	PROB, T	
Hairy Woodpecker	*Dryobates villosus*	S5					Yes							1					1	POSS, H	Observed during salamander habitat assessment on May 8, 2023 in Parcel 30; this species begins nesting in April.
House Finch	*Haemorhous mexicanus*	SNA						1	1										2	PROB, T	
House Wren	*Troglodytes aedon*	S5B						1											1	PROB, T	
Killdeer	*Charadrius vociferus*	S4B													1	2			3	PROB, A	
Mallard	*Anas platyrhynchos*	S5											1		2				3	PROB, P	
Mourning Dove	*Zenaida macroura*	S5						1		1		3	1						6	PROB, T	
Mourning Warbler	*Geothlypis philadelphia*	S5B															1		1	PROB, T	
Northern Cardinal	*Cardinalis cardinalis*	S5						1		1		1	1				2	1	7	PROB, T	
Northern Flicker	*Colaptes auratus*	S5									1	1		2					4	PROB, P	
Ovenbird	*Seiurus aurocapilla*	S5B					Yes						1					1	2	POSS, S	
Pileated Woodpecker	*Dryocopus pileatus*	S5					Yes	1		2	1		1				1		6	PROB, P	First observed during site reconnaissance on April 19, 2023 in Parcel 30 drumming/calling; this species begins defending territory/breeding in mid-March to early May. Dead snag strongly suspected to be site of PIWO roosting or nesting cavity in Parcel 3 (incidental / resident observations).
Red-bellied Woodpecker	*Melanerpes carolinus*	S5								1									1	POSS, S	
Red-breasted Nuthatch	*Sitta canadensis*	S5					Yes										1		1	POSS, S	Observed during site reconnaissance on April 19, 2023 in Parcel 30; this species begins nesting in March / early April.
Red-eyed Vireo	*Vireo olivaceus*	S5B															1		1	POSS, S	
Red-winged Blackbird	*Agelaius phoeniceus*	S5						1	12	3		6	2	6	12	5			47	CONF, CF	
Rock Pigeon	*Columba livia*	SNA						22	10										33	OBS, X	Flyover only.
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S5B									1								1	PROB, T	
Ruby-throated Hummingbird	*Archilochus colubris*	S5B								1		1		1					3	PROB, T	
Savannah Sparrow	*Passerculus sandwichensis*	S5B, S3N					Yes	2	3							1			5	PROB, A	
Song Sparrow	*Melospiza melodia*	S5						4	2	4		3	2	1	3	1			20	PROB, A	
Swamp Sparrow	*Melospiza georgiana*	S5B, S4N										1	1						2	POSS, S	
Tennessee Warbler	*Leiothlypis peregrina*	S5B																1	1	OBS, X	Presumed late migrant.
Turkey Vulture	*Cathartes aura*	S5B, S3N						1						1					2	OBS, X	Flyover only.
Veery	*Catharus fuscescens*	S5B					Yes										1	1	2	PROB, T	

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species at Risk Act)[3]	Federal SARA Schedule[4]	Provincial MNRF Area Sensitive Species[5]	Highest Number Recorded Per Unit Green = units entirely within NHS Blue = part of developable lands, some portions within NHS										Highest Number Recorded (All Habitat Units Combined)	Highest Recorded Breeding Evidence[6]	Comments
								BB1	BB2 & BB3	BB4	BB5	BB6	BB7	BB8	BB9	BB10	BB11	BB12		
Warbling Vireo	*Vireo gilvus*	S5B						1	1					1	1				4	PROB, T	
Wood Duck	*Aix sponsa*	S5B,S3N															2		2	PROB, P	Observed during site reconnaissance on April 19, 2023 in Parcel 30, pair flushed from treed swamp; this species begins nesting in late March/early April.
Wood Thrush	*Hylocichla mustelina*	S4B	SC	THR	THR	1					1								1	POSS, S	Parcel 32.
Yellow Warbler	*Setophaga petechia*	S5B								3		1		1					5	PROB, T	
TOTAL	**53**																				

Appendix C - Breeding Bird Survey Summary Table
300056758 Farewell Heights Secondary Plan Natural Heritage Evaluation

[1]S-Ranks (provincial)
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario (Please refer to: http://explorer.natureserve.org/nsranks.htm)

SX — Presumed Extirpated - Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH — Possibly Extirpated (Historical) - Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20–40 years. A species or community could become SH without such a 20–40-year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
S1 — Critically Imperiled - Critically imperiled in the province or state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.
S2 — Imperiled - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.
S3 — Vulnerable - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 — Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 — Secure - Common, widespread, and abundant in the province.
SNR — Unranked - Province conservation status not yet assessed.
SU — Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA — Not Applicable - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S# — Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
S#? – Inexact or Uncertain - Denotes inexact or uncertain numeric rank.

Breeding Status Qualifiers
B – Breeding Conservation status refers to the breeding population of the species in the nation or state/province.
N – Nonbreeding Conservation status refers to the non-breeding population of the species in the province.
M – Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.

[2]SARO *Endangered Species Act, 2007*
(provincial status from http://www.ontario.ca/environment-and-energy/how-species-risk-are-listed#section-3)
The provincial review process is implemented by the MNRF's Committee on the Status of Species at Risk in Ontario (COSSARO).

Extinct - A species that no longer exists anywhere.
Extirpated (EXT) - Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.
Endangered (END) - Lives in the wild in Ontario but is facing imminent extinction or extirpation.
Threatened (THR) - Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.
Special concern (SC) - Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.
Not at Risk (NAR) - A species that has been evaluated and found to be not at risk.
Data Deficient (DD) - A species for which there is insufficient information for a provincial status recommendation.

[3]SARA (Federal *Species at Risk Act*) Status and Schedule (includes COSEWIC Status)
The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

Extinct - A wildlife species that no longer exists.
Extirpated (EXT) - A wildlife species that no longer exists in the wild in Canada but exists elsewhere.
Endangered (END) - A wildlife species facing imminent extirpation or extinction.
Threatened (THR) - A wildlife species that is likely to become an endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
Data Deficient (DD) - A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.
Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

[4]SARA Schedule
Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as special concern and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

[5]Source: Ontario Ministry of Natural Resources. 2000. *Significant Wildlife Habitat Technical Guide* & Appendices.

Appendix C - Breeding Bird Survey Summary Table
300056758 Farewell Heights Secondary Plan Natural Heritage Evaluation

[6]Ontario Breeding Bird Atlas - Breeding Evidence Codes

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 behaviour (song, etc.) on at least two days, a week or more apart, at the same place.
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.

Confirmed	
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.

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix D

Plant List

Botanical Inventory Plant List

Scientific Name	Common Name	ESA	COSEWIC	SARA	G-Rank	S-Rank	Native/ Introduced	Durham Region (Varga et al. 2000)[1]	Peterborough - Durham - Victoria-Northumberland (Riley et al. 1989)[2]
Acer negundo	Manitoba Maple				G5	S5	N	X	X
Acer nigrum	Black Maple				G5	S4?	N	R4	X
Acer rubrum	Red Maple				G5	S5	N	X	X
Acer saccharum	Sugar Maple				G5	S5	N	X	SR
Acer x freemanii	Freeman Maple				GNA	SNA	N	X	SR
Achillea millefolium	Common Yarrow				G5	SNA	I	X	SR
Actaea pachypoda	White Baneberry				G5	S5	N	X	X
Actaea rubra	Red Baneberry				G5	S5	N	X	SR
Agalinis purpurea	Purple False Foxglove				GNR	S4S5	N		X
Ageratina altissima	White Snakeroot				G5	S5	N	X	X
Alliaria petiolata	Garlic Mustard				GNR	SNA	I	X	
Ambrosia artemisiifolia	Common Ragweed				G5	S5	N	X	SR
Amelanchier laevis	Smooth Serviceberry				G5	S5	N	U	X
Amphicarpaea bracteata	American Hog-peanut				G5	S5	N	X	X
Andropogon gerardi	Big Bluestem				G5	S4	N	R2	SR
Anemonastrum canadense	Canada Anemone				G5	S5	N	X	X
Anemone cylindrica	Long-headed Anemone				G5	S4	N	U	X
Antennaria neglecta	Field Pussytoes				G5	S5	N	X	X
Apocynum androsaemifolium	Spreading Dogbane				G5	S5	N	X	X
Apocynum cannabinum	Hemp Dogbane				GNR	S5	N	X	
Aralia nudicaulis	Wild Sarsaparilla				G5	S5	N	X	X
Arisaema triphyllum	Jack-in-the-pulpit				G5	S5	N	X	X
Asclepias incarnata	Swamp Milkweed				G5	S5	N	X	X
Asclepias syriaca	Common Milkweed				G5	S5	N	X	X
Asparagus officinalis	Garden Asparagus				G5?	SNA	I	X	SR
Athyrium filix-femina	Common Lady Fern				G5	S5	N		
Barbarea vulgaris	Bitter Wintercress				GNR	SNA	I	X	X
Betula alleghaniensis	Yellow Birch				G5	S5	N	X	SR
Betula papyrifera	Paper Birch				G5	S5	N	X	X
Bidens frondosa	Devil's Beggarticks				G5	S5	N	X	X
Calamagrostis canadensis	Bluejoint Reedgrass				G5	S5	N	X	
Caltha palustris	Yellow Marsh Marigold				G5	S5	N	X	X
Cardamine diphylla	Two-leaved Toothwort				G5	S5	N	X	X
Carex gracillima	Graceful Sedge				G5	S5	N	X	X
Carex interior	Inland Sedge				G5	S5	N	X	X

Appendix D - Botanical Inventory Plant List
300056758 Farewell Heights Secondary Plan Natural Heritage Evaluation

Scientific Name	Common Name	ESA	COSEWIC	SARA	G-Rank	S-Rank	Native/ Introduced	Durham Region (Varga et al. 2000)[1]	Peterborough - Durham - Victoria-Northumberland (Riley et al. 1989)[2]
Carex lupulina	Hop Sedge				G5	S5	N	X	X
Carex pensylvanica	Pennsylvania Sedge				G5	S5	N	X	X
Carex retrorsa	Retrorse Sedge				G5	S5	N	X	X
Carex sp.	Sedge Species								
Carex stipata	Awl-fruited Sedge				G5	S5	N	X	X
Caulophyllum thalictroides	Blue Cohosh				G5	S5	N	X	X
Circaea canadensis	Broad-leaved Enchanter's Nightshade				G5	S5	N	X	X
Cirsium arvense	Canada Thistle				G5	SNA	I	X	X
Clematis virginiana	Virginia Clematis				G5	S5	N	X	X
Clintonia borealis	Yellow Clintonia				G5	S5	N	U	X
Coptis trifolia	Goldthread				G5	S5	N	X	X
Cornus sericea	Red-osier Dogwood				G5	S5	N	X	X
Cypripedium parviflorum	Yellow Lady's-Slipper				G5	S5	N	X	
Cystopteris bulbifera	Bulblet Bladder Fern				G5	S5	N	X	X
Daucus carota	Wild Carrot				GNR	SNA	I	X	X
Desmodium canadense	Canada Tick-trefoil				G5	S4	N	U	X
Dryopteris carthusiana	Spinulose Wood Fern				G5	S5	N	X	X
Epilobium coloratum	Purple-veined Willowherb				G5	S5	N	R5	
Epilobium strictum	Downy Willowherb				G5	S4	N	R5	X
Epipactis helleborine	Broad-leaved Helleborine				GNR	SNA	I	X	X
Equisetum arvense	Field Horsetail				G5	S5	N	X	X
Equisetum scirpoides	Dwarf Scouring-rush				G5	S5	N	U	X
Erigeron annuus	Annual Fleabane				G5	S5	N	X	SR
Eupatorium perfoliatum	Common Boneset				G5	S5	N	X	X
Euphrasia stricta	Stiff Eyebright				GNR	SNA	I	X	
Euthamia graminifolia	Grass-leaved Goldenrod				G5	S5	N	X	X
Eutrochium maculatum	Spotted Joe Pye Weed				G5	S5	N	X	
Fagus grandifolia	American Beech				G5	S4	N	X	X
Fragaria vesca	Woodland Strawberry				G5	S5	N	X	X
Fragaria virginiana	Wild Strawberry				G5	S5	N	X	X
Fraxinus americana	White Ash				G4	S4	N	X	SR
Fraxinus pennsylvanica	Red Ash				G4	S4	N	X	SR
Galium mollugo	Smooth Bedstraw				GNR	SNA	I	X	X
Geum canadense	Canada Avens				G5	S5	N	X	X
Glechoma hederacea	Ground-ivy				GNR	SNA	I	X	X
Gymnocarpium dryopteris	Common Oak Fern				G5	S5	N	X	X

Scientific Name	Common Name	ESA	COSEWIC	SARA	G-Rank	S-Rank	Native/ Introduced	Durham Region (Varga et al. 2000)[1]	Peterborough - Durham - Victoria-Northumberland (Riley et al. 1989)[2]
Hypericum perforatum	Common St. John's-wort				GNR	SNA	I	X	X
Impatiens capensis	Spotted Jewelweed				G5	S5	N	X	X
Impatiens pallida	Pale Jewelweed				G5	S4	N	R	X
Juglans nigra	Black Walnut				G5	S4?	N	U	SR Nat
Juncus canadensis	Canada Rush				G5	S5	N	R	
Juncus tenuis	Path Rush				GNR	S5	N	X	X
Juniperus communis	Common Juniper				G5	S5	N		X
Lactuca sp.	Lettuce Species								
Laportea canadensis	Canada Wood Nettle				G5	S5	N	X	X
Leersia oryzoides	Rice Cutgrass				G5	S5	N	X	X
Lobelia inflata	Indian-tobacco				G5	S5	N	X	X
Lobelia siphilitica	Great Blue Lobelia				G5	S5	N	U	X
Lonicera sp.	Honeysuckle Species								
Lycopus americanus	American Water-horehound				G5	S5	N	X	X
Lycopus uniflorus	Northern Water-horehound				G5	S5	N	X	X
Lythrum salicaria	Purple Loosestrife				G5	SNA	I	X	X
Maianthemum canadense	Wild Lily-of-the-valley				G5	S5	N	X	X
Matteuccia struthiopteris	Ostrich Fern				G5	S5	N	X	X
Medicago lupulina	Black Medick				GNR	SNA	I	X	X
Mentha canadensis	Canada Mint				G5	S5	N	X	
Mimulus ringens	Square-stemmed Monkeyflower				G5	S5	N	X	X
Mitchella repens	Partridgeberry				G5	S5	N	X	X
Monarda fistulosa	Wild Bergamot				G5	S5	N	X	X
Monotropa uniflora	Indian-pipe				G5	S5	N	U	X
Muhlenbergia frondosa	Leafy Muhly				G5	S4	N	R	
Myosotis scorpioides	True Forget-me-not				G5	SNA	I	X	X
Oenothera biennis	Common Evening-primrose				G5	S5	N	X	SR
Onoclea sensibilis	Sensitive Fern				G5	S5	N	X	X
Osmunda regalis	Royal Fern				G5	S5	N		X
Oxalis stricta	Upright Yellow Wood-sorrel				G5	SNA	I	X	X
Parthenocissus quinquefolia	Virginia Creeper				G5	S4?	N		P. inserta =SR
Phalaris arundinacea	Reed Canarygrass				G5	S5	N	X	X
Phleum pratense	Common Timothy				GNR	SNA	I	X	X
Phragmites australis	Common Reed				G5	SU	N	X	
Picea glauca	White Spruce				G5	S5	N	X	X
Pinus strobus	Eastern White Pine				G5	S5	N	X	SR

Scientific Name	Common Name	ESA	COSEWIC	SARA	G-Rank	S-Rank	Native/ Introduced	Durham Region (Varga et al. 2000)[1]	Peterborough - Durham - Victoria-Northumberland (Riley et al. 1989)[2]
Pinus sylvestris	Scots Pine				GNR	SNA	I	X	SR
Plantago lanceolata	English Plantain				G5	SNA	I	X	X
Plantago major	Common Plantain				G5	SNA	I	X	SR
Podophyllum peltatum	May-apple				G5	S5	N	X	X
Polygonatum pubescens	Hairy Solomon's Seal				G5	S5	N	X	X
Populus balsamifera	Balsam Poplar				G5	S5	N	X	X
Populus deltoides	Eastern Cottonwood				G5	S5	N	U	SR Nat
Populus grandidentata	Large-toothed Aspen				G5	S5	N	X	X
Populus tremuloides	Trembling Aspen				G5	S5	N	X	X
Prunella vulgaris	Common Self-heal				G5	S5	N	X	
Prunus serotina	Black Cherry				G5	S5	N	X	X
Prunus virginiana	Chokecherry				G5	S5	N	X	X
Ranunculus acris	Common Buttercup				G5	SNA	I	X	X
Rhamnus cathartica	European Buckthorn				GNR	SNA	I	X	X
Rhus typhina	Staghorn Sumac				G5	S5	N	X	SR
Robinia pseudoacacia	Black Locust				G5	SNA	I	X	SR
Rubus allegheniensis	Allegheny Blackberry				G5	S5	N	X	X
Rubus idaeus	Red Raspberry				G5	S5	N		
Rubus odoratus	Purple-flowering Raspberry				G5	S5	N	X	X
Rudbeckia hirta	Black-eyed Susan				G5	S5	N	X	SR
Rumex crispus	Curled Dock				GNR	SNA	I	X	X
Salix alba	White Willow				G5	SNA	I	X	
Salix bebbiana	Bebb's Willow				G5	S5	N	X	X
Salix cordata	Heart-leaved Willow				G4	S4	N		
Salix discolor	Pussy Willow				G5	S5	N	X	X
Salix eriocephala	Cottony Willow				G5	S5	N	X	X
Salix euxina	Crack Willow				GNR	SNA	I	X	X
Salix interior	Sandbar Willow				G5	S5	N		X
Sanguinaria canadensis	Bloodroot				G5	S5	N	X	X
Scirpus atrovirens	Dark-green Bulrush				G5	S5	N	X	X
Scirpus cyperinus	Common Woolly Bulrush				G5	S5	N	X	X
Scutellaria lateriflora	Mad-dog Skullcap				G5	S5	N	X	X
Sedum acre	Mossy Stonecrop				GNR	SNA	I	X	X
Sisyrinchium angustifolium	Narrow-leaved Blue-eyed-grass				G5	S4	N		
Sium suave	Common Water-parsnip				G5	S5	N	X	X
Solanum dulcamara	Bittersweet Nightshade				GNR	SNA	I	X	X

Scientific Name	Common Name	ESA	COSEWIC	SARA	G-Rank	S-Rank	Native/ Introduced	Durham Region (Varga et al. 2000)[1]	Peterborough - Durham - Victoria-Northumberland (Riley et al. 1989)[2]
Solidago altissima	Tall Goldenrod				G5	S5	N	X	
Solidago canadensis	Canada Goldenrod				G5	S5	N	X	
Solidago gigantea	Giant Goldenrod				G5	S5	N	X	X
Solidago juncea	Early Goldenrod				G5	S5	N	U	X
Solidago nemoralis	Grey-stemmed Goldenrod				G5	S5	N	X	
Solidago rugosa	Rough-stemmed Goldenrod				G5	S5	N	X	
Sonchus arvensis	Field Sow-thistle				GNR	SNA	I	X	
Sonchus oleraceus	Common Sow-thistle				GNR	SNA	I	X	
Spiranthes incurva	Sphinx Ladies'-tresses				GNR	S5	N	U	X
Symphyotrichum lanceolatum	Panicled Aster				G5	S5	N	X	
Symphyotrichum lateriflorum	Calico Aster				G5	S5	N	X	
Symphyotrichum puniceum	Purple-stemmed Aster				G5	S5	N	X	
Tanacetum vulgare	Common Tansy				GNR	SNA	I	X	
Taraxacum officinale	Common Dandelion				G5	SNA	I	X	X
Thelypteris palustris	Marsh Fern				G5	S5	N		X
Thlaspi arvense	Field Pennycress				GNR	SNA	I	X	X
Thuja occidentalis	Eastern White Cedar				G5	S5	N	X	SR
Tiarella stolonifera	Heart-leaved Foamflower				GNR	S5	N		
Toxicodendron radicans var. rydbergii	Western Poison Ivy				G5	S5	N	X	SR
Trifolium pratense	Red Clover				GNR	SNA	I	X	X
Trillium erectum	Red Trillium				G5	S5	N	X	X
Trillium grandiflorum	White Trillium				G5	S5	N	X	X
Tsuga canadensis	Eastern Hemlock				G4G5	S5	N	X	SR
Tussilago farfara	Coltsfoot				GNR	SNA	I	X	X
Typha angustifolia	Narrow-leaved Cattail				G5	SNA	I	X	X
Typha latifolia	Broad-leaved Cattail				G5	S5	N	X	SR
Ulmus americana	White Elm				G4	S5	N	X	X
Verbascum thapsus	Common Mullein				GNR	SNA	I	X	X
Verbena hastata	Blue Vervain				G5	S5	N	X	X
Viburnum opulus var. opulus	Cranberry Viburnum				G5TNR	SNA	I	X	X
Vicia cracca	Tufted Vetch				GNR	SNA	I	X	X
Vincetoxicum rossicum	European Swallowwort				GNR	SNA	I	X	X
Viola pubescens	Yellow Violet				G5	S5	N	X	X
Viola sororia	Woolly Blue Violet				G5	S5	N	X	X
Vitis riparia	Riverbank Grape				G5	S5	N	X	X

Natural Heritage Information Centre. 2022. Vascular Plant Species List (17 February 2022).

[1]Varga, S., Leadbeater, D., Webber, J., Kaiser, J., Crins, B., Kamstra, J., Banville, D., Ashley, E., Miller, G., Kingsley, C., Jacobsen, C., Mewa, K., Tebby, L., Mosley, E., and E. Zajc. 2000. Distribution and Status of the Vascular Plants of the Greater Toronto Area. Ontario Ministry of Natural Resources Aurora District. 103 pp.

[2]Riley, J. e.t al. 1989. The Distribution and Status of the Vascular Plants of Central Region. Ontario Ministry of Natural Resources, Central Region, Richmond Hill, ON.

ESA Status

Species at Risk in Ontario list: The list of species that are classified as species at risk under the Endangered Species Act (2007).

EXT:	Extinct – A species that no longer exists anywhere.
EXP:	Extirpated – A species that no longer exists in the wild in Ontario but still occurs elsewhere.
END:	Endangered – A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act (ESA).
THR:	Threatened – A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
SC:	Special Concern (formerly Vulnerable) – A species with characteristics that make it sensitive to human activities or natural events.
NAR:	Not at Risk – A species that has been evaluated and found to be not at risk.
DD:	Data Deficient (formerly Indeterminate) – A species for which there is insufficient information for a provincial status recommendation.

COSEWIC Status

Committee on the Status of Endangered Wildlife in Canada status: Species has been assessed by COSEWIC as having status, but status is not necessarily adopted on the official Schedule 1 to SARA.

EXT:	Extinct – A species that no longer exists.
EXP:	Extirpated – A species no longer existing in the wild in Canada, but occurring elsewhere.
END:	Endangered – A species facing imminent extirpation or extinction.
THR:	Threatened – A species likely to become endangered if limiting factors are not reversed.
SC:	Special Concern (formerly vulnerable) – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
NAR:	Not At Risk – A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
DD:	Data Deficient (formerly Indeterminate) – Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

SARA Schedule 1 Status

Species at Risk Act Schedule 1 Status: Schedule 1 is the official list of species that are classified as extirpated, endangered, threatened, and of special concern. The Act establishes Schedule 1, as the official list of species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed species are implemented.

EXT:	Extinct – A species that no longer exists.
EXP:	Extirpated – A species that no longer exists in the wild in Canada but exists elsewhere in the wild.
END:	Endangered – A species that is facing imminent extirpation or extinction.
THR:	Threatened – A species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC:	Special Concern – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Global Rank

GX	Presumed Extinct (species)/Eliminated (ecological communities and systems) — Species not located despite intensive searches and virtually no likelihood of rediscovery. Ecological community or system eliminated throughout its range, with no restoration potential.
GH	Possibly Extinct (species)/ Eliminated (ecological communities and systems) — Known from only historical occurrences but still some hope of rediscovery. There is evidence that the species may be extinct or the ecosystem may be eliminated throughout its range, but not enough to state this with certainty.
G1	Critically Imperiled—At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2	Imperiled—At high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors.
G3	Vulnerable—At moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors.
G4	Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5	Secure—Common; widespread and abundant.

Appendix D - Botanical Inventory Plant List
300056758 Farewell Heights Secondary Plan Natural Heritage Evaluation

Variant Ranks

G#G#:	Range Rank – A numeric range rank (e.g., G2G3, G1G3) is used to indicate the range of uncertainty about the exact status of a taxon or ecosystem type. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).
GU:	Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. NOTE: Whenever possible (when the range of uncertainty is three consecutive ranks or less), a range rank (e.g., G2G3) should be used to delineate the limits (range) of uncertainty.
GNR:	Unranked – Global rank not yet assessed
GNA:	Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

Rank Qualifiers

?:	Inexact Numeric Rank – Denotes inexact numeric rank; this should not be used with any of the Variant Global Conservation Status Ranks or GX or GH.
Q:	Questionable taxonomy that may reduce conservation priority – Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower priority (numerically higher) conservation status rank. The "Q" modifier is only used at a global level and not at a national or subnational level.
C:	Captive or Cultivated Only – Taxon or ecosystem at present is presumed or possibly extinct or eliminated in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population or ecosystem restoration, not yet established. The "C" modifier is only used at a global level and not at a national or subnational level. Possible ranks are GXC or GHC. This is equivalent to "Extinct" in the Wild (EW) in IUCN's Red List terminology (IUCN 2001).

Subnational Rank

S-Rank: Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks but consider only those factors within the political boundaries of Ontario.

S1:	Critically Imperiled – Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2:	Imperiled – Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3:	Vulnerable – Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4:	Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5:	Secure – Common, widespread, and abundant in the nation or state/province.
S#S#:	Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
SX:	Presumed Extirpated – Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH:	Possibly Extirpated (Historical) – Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
SE:	Species is considered exotic in Ontario
SNR:	Unranked – Nation of state/province conservation status not yet assessed.
SU:	Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA:	Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

Native?:

N:	Native to Ontario. Species does not have exotic status under NHIC database.
I:	Introduced to Ontario. Species has exotic status rank under NHIC database.

The Distribution and Status of the Vascular Plants of the Greater Toronto Area (Varga et. al. 2000).

E:	Endangered – Cucumber Tree (Magnolia acuminata)
N:	Nationally Rare – rare in every province in which it occurs. A rare species is one that because of biological characteristics, occurs at edge of range, exists in low numbers, or in very restricted areas in the region under consideration.
P:	Provincially Rare – a species S-ranked (S1-SX) from the National Museum's "Atlas of Rare Vascular Plants of Ontario" (Argus et.al. 1982-88).
R:	Regionally Rare – Native species are considered regionally rare if the species in considered rare wherever it occurs in Central Region especially in areas where recent local determinations of rarity have been made and/or if it is considered provincially rare in the portions in which species' status is insufficiently documented. Only naturally occurring populations are considered.
X:	Present
+ or I:	Introduced species.

Appendix D - Botanical Inventory Plant List
300056758 Farewell Heights Secondary Plan Natural Heritage Evaluation

The Distribution and Status of the Vascular Plants of Central Region (Riley et. al.1989).

X:	Present
U:	Uncommon native species
R:	Rare native species
R#:	Number of stations for a rare native species
E:	Extirpated native species
+ or I:	Introduced species
X+:	Introduced in municipality
SR:	Sight record – no herbarium collection based date for presence
LR:	Literature record

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