June 15, 2023 **Our File: HEAFEY989.1**

Mr. Carmine Zayoun
190 Lisgar St.
Ottawa, ON
K2P 0C4

Via E-mail: carmine@zayoungroup.com

Dear Mr. Zayoun:

Subject: Review of the EIS for residential development at 37 Wildpine Court considering an updated site plan

1.0 INTRODUCTION

The purpose of this memo is to review the Environmental Impact Study ("EIS") for 37 Wildpine Court, produced by Kilgour & Associates Ltd ("KAL") and dated August 10, 2021, considering a revised site plan for the development. That EIS (appended to this memo) was written to support a community of townhomes on a parcel supporting natural heritage system features including portions of Poole Creek and the Stittsville Wetland Complex. This memo describes the revised site plan with a low-rise apartment building as the primary residential structure; it considers possible changes in the potential for developmental impacts on the natural heritage features and/or the mitigation measures required to protect such features under the new plan.

2.0 REVISED SITE PLAN

The previous site plan for the property included 29 townhomes. The roadway system for the development proposed provided an extension of Wildpine Court to connect with Ravenscroft Court in the adjacent residential area. The revised site plan still connects Wildpine Court to connect with Ravenscroft Court, though the street alignment shifts somewhat (Figure 1). The distribution of residential units changes to consist of a single, four-storey apartment building with 94 units and a small parking area (15 spaces), and two semi-detached homes in the southwest corner of the property.

The overall development footprint of the community is generally unchanged. As before, the developed area will respect a setback of 15 m from the adjacent Stittsville Wetland Complex on the north side of the parcel. For the setback from the top of bank of Poole Creek, the previous site plan had provided 30 m, except for the rear lot lines of four units to be located at the southeast corner of the Site. Those four units had required their rear lot lines to extend up to 2 m beyond the 30 m setback to permit the minimal supportable yard depth. As the revised site plan includes only open space in that area, the reduction in setback from the top of bank is no longer require; a 30 m setback will be fully respected. The 2 m reduction under the previous plan had been justified as it removed

the existing paved edge of the cul-de-sac there. The paved area will still be removed under the new plan and the soil there will be restored and reseeded.

The updated conceptual stormwater management servicing for the site directs stormwater in two general directions. Firstly, the stormwater management solution for the apartment block consists of rooftop control and two bioretention cells. The drainage system for the apartment block also includes a system to drain the lands above the extended portion of the underground garage structure. The two bioretention cells, together with the storage on the roof of the building, will provide sufficient storage and infiltration to control flows to pre-development release rates from the site and mimic the pre-development water balance. The bioretention cells include a 450mm deep surface storage basin with a level spreader overflow berm to the downstream receiver, a soil layer consisting of filter media to facilitate water quality treatment and a storage layer of clear-stone to hold runoff prior to infiltration. The west bioretention cell along the wetland side of the site is 60 m long and the east bioretention cell, fronting Poole Creek, is 30 m long. The bioretention cells are located within the setback limits of the site.

Secondly, stormwater management for the public right-of-way and residential semi-detached units fronting the right-of-way will use the existing storm sewer on Wildpine Court. Storage will be provided by means of a superpipe in the rear yard of the residential site, which will discharge to the public storm sewer. To mitigate the impact of the increased flows on the hydraulic grade line, the downstream sewer is recommended for upsizing to a 400mm diameter PVC sewer which will provide additional capacity for the increased flows.

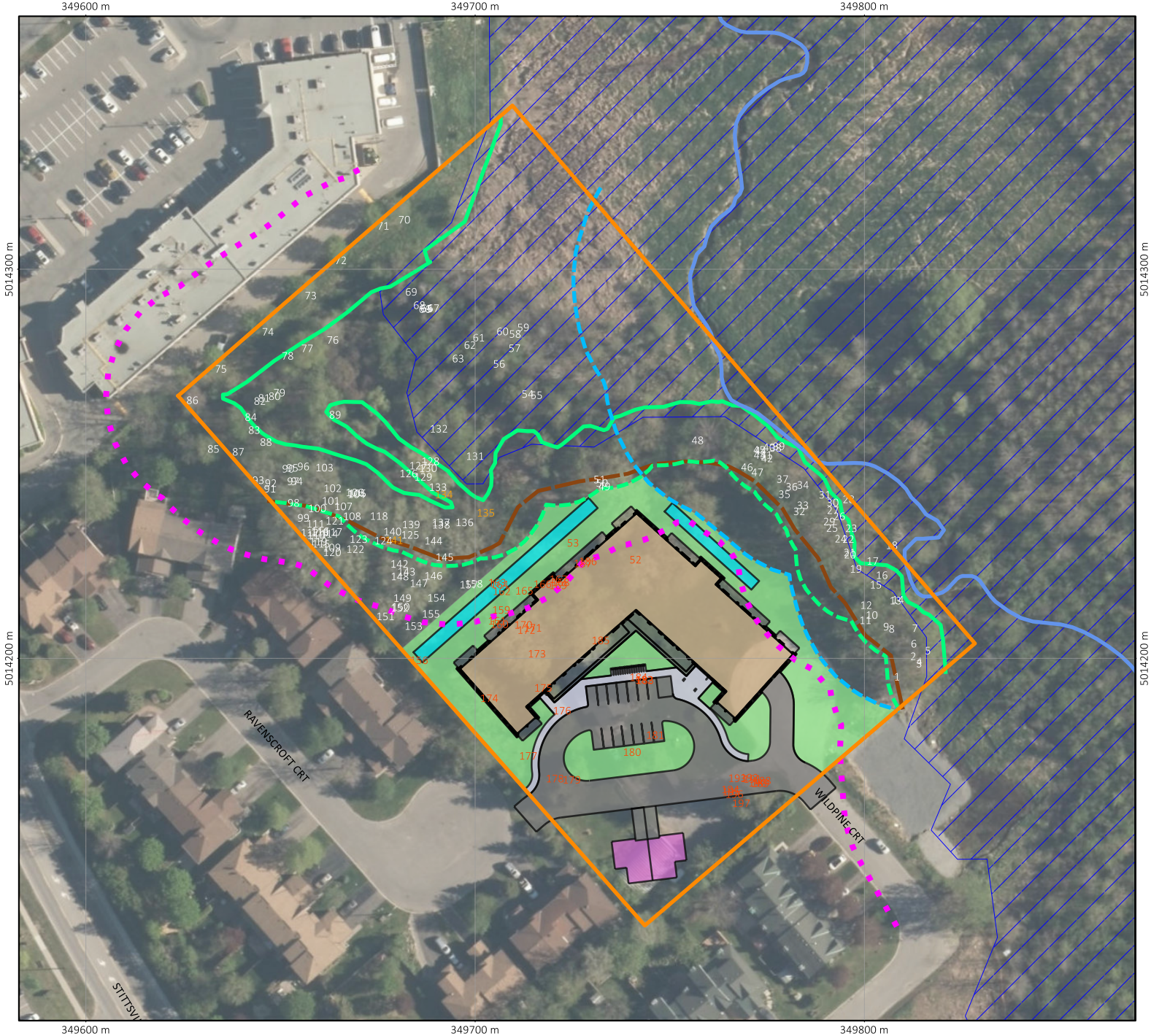

Figure 1 Revised site plan for 37 Wildpine Court

Legend

- Property Lines
- Floodplain
- Poole Creek (Top of Bank)
- Wetland Boundary
- Top Edge of Fill
- MVCA Regulation Limit

Setbacks

- Top of Bank +30 m
- Wetland +15m

Revised SIte Plan

- Apartment Building
- Semi Detached
- Roadway/Driveway
- Walkway
- Open
- Bioretention Cell

Site Trees

- # Retained
- # Removed
- # Butternut (Retained)

N

0 50 m

Map File: HEAF989.1-2306a
MTM Zone 9
(NAD 83)
Printed on: 2023-06-15

KILGOUR & Associates

3.0 NATURAL HERITAGE IMPACT ASSESSMENT AND MITIGATION MEASURES

3.1 Surface Water Features

The new development plan fully respects City of Ottawa setback requirements for Poole Creek. A portion of the development is proposed within 30 m of the adjacent wetland feature (i.e. within the MVCA's regulatory limit), which will require formal permission from MVCA. Development within that regulatory limit, however, will be setback at least 15 m from the wetland and will be situated upon the tableland created by existing fill within areas already highly disturbed and degraded. The residential development with the proposed setbacks from the wetland and the top of bank of Poole Creek is unlikely to alter the hydrology, riparian functions, or terrestrial or aquatic habitat functions of the Stittsville Wetland Complex and Poole Creek.

The SWM mitigation measures have been proposed to approximate predevelopment runoff to the wetland and maintain infiltration rates for groundwater to the wetland. The level spreaders will be located more than 15 m from the wetland and more than 30 m from Poole Creek respecting the offset requirements. The level spreaders are intended to disperse the overland flow and dissipate the energy of flows. With the proposed measures in place, it is anticipated that there will be no measurable changes to the hydrological regime of the wetland.

Mitigation recommendations to protect surface water features remain the same as provided in the EIS. Fencing between the development area and the wetland feature/Poole Creek corridor, however, would simply be situated along the outer edge of the open space around the apartment building instead of comprising "rear yard fencing".

3.2 Vegetation and Trees

The proposed development footprint is effectively unchanged from the previous site plan. All vegetation within the proposed development footprint would still be removed, including 42 trees with DBH ≥ 10 cm. ELC communities that would be impacted include: the FODM9-5 and FODM4-5 forest communities (with 0.2 ha of treed space to be removed from the edge of these communities), the FODM11 and cedar hedgerows in the southwestern corner of the Site, and the open lawn area.

The previous specification for a minimum of 29 new trees (i.e. one tree per lot), is considered the minimum level of planting to be included in the site landscape plan; further tree planting through the open space is recommended. Protection measures as described within the EIS for retained trees remain appropriate.

3.3 Species at Risk

Considerations for species at risk (SAR) focused on four species/species groups: Barn Swallows, Butternuts, Blanding's Turtles, and, as a group, SAR bats.

As the project footprint is effectively unchanged, the review of potential impacts and the recommended mitigation measures for Butternuts, Blanding's Turtles and bats remain the same. Since the completion of the previous EIS, however, Barn Swallow have been de-listed from protection under the ESA. Regardless, the birds would still be protected under as a migratory species under the ESA. As such, recommend measures to protect individuals (e.g. no removal of

active nests) must still be followed. There would no longer be a requirement, however, to file a Notice of Activity (or complete any tasks associated with that filing) if the species were to occur on the site.

3.4 General Wildlife Management

Mitigation measures indicated in the EIS to protect wildlife during site construction are still required as listed.

4.0 CONCLUSION

This memo confirms the set of mitigation measures for employment in the design and construction of the proposed residential community on the site. Our assessment within this memo and the EIS of the potential for impacts to the natural heritage system is based on the implementation of these mitigation measures. It is our professional opinion that the proposed development will have no significant negative impacts on natural features or their ecological functions if all mitigation measures provided within this report are followed.

Questions on the EIS and/or this memo can be addressed to the undersigned.

Respectfully submitted,

KILGOUR & ASSOCIATES LTD.

Anthony Francis, PhD
Senior Ecologist
E-mail: afrancis@kilgourassociates.com
16-2285 St. Laurent Blvd, Ottawa, ON, K1G 4Z6
Office: 613-260-5555
Direct: 613-367-5556

cc:

Attachments: Environmental Impact Statement – 37 Wildpine Court, Stittsville, Ottawa
August 10, 2021

Environmental Impact Statement
37 Wildpine Court, Stittsville, Ottawa

August 10, 2021

Submitted To:

Carmine Zayoun
Wildpine Trails Inc.
190 Lisgar Street
Ottawa, Ontario
K2P 0C4

KILGOUR & ASSOCIATES LTD.
www.kilgourassociates.com

TABLE OF CONTENTS

List of Figures

List of Tables

List of Appendices

List of Acronyms and Abbreviations

cm – centimetres
COSEWIC – Committee on the Status of Endangered Wildlife in Canada
DBH – Diameter at Breast Height
DFO – Department of Fisheries and Oceans (Fisheries and Oceans Canada)
ECCC – Environment and Climate Change Canada
e.g. – *exempli gratia*
EIS – Environmental Impact Statement
ELC – Ecological Land Classification
ESA – *Endangered Species Act*
ESC – Erosion and sediment control
FWCA – *Fish and Wildlife Conservation Act*
i.e. – *id est*
GIS – Geographic Information System
ha – hectare
HDFA – Headwater Drainage Features Assessment
KAL – Kilgour & Associates Ltd.
km – kilometre
LIO – Land Information Ontario
m – metre
MBCA – *Migratory Birds Convention Act*
MECP – Ministry of Environment, Conservation and Parks
Mississippi Valley Conservation Authority - MVCA
MNR – Ministry of Natural Resources
MNRF – Ministry of Natural Resources and Forestry
NHIC – Natural Heritage Information Centre
NHRM – Natural Heritage Reference Manual
PPS – Provincial Policy Statement
SAR – Species at risk
SARA – *Species at Risk Act*
SARO – Species at Risk in Ontario
SWH – Significant Wildlife Habitat
TCR – Tree Conservation Report

1.0 INTRODUCTION

This Environmental Impact Statement (EIS) was prepared by Kilgour & Associates Ltd. (KAL; Appendix A) on behalf of Wildpine Trails Inc. in support of their proposed residential development at 37 Wildpine Court in Stittsville, Ottawa (herein "the Site"; Figure 1). The Site is approximately 2 hectares (ha) and is zoned as *R3XX[1046] – Residential Third Density Zone* and is therefore intended for residential development. At the time of writing this report, the Site was dominated by wooded areas including those part of the Stittsville Wetland Complex (not a provincially significant wetland). It also contained open lawn space, a paved cul de sac, a single detached home with a separate garage and shed, a small portion of Poole Creek, and regulated floodplain of Poole Creek.

The Site is surrounded by:

- A shopping plaza, a stormwater management pond, and the Stittsville Wetland Complex to the north.
- Poole Creek and the Stittsville Wetland Complex to the east.
- A residential community on Wildpine Court to the south.
- A residential community on Ravenscroft Court to the west.

In the City of Ottawa (hereafter referred to as "the City"), an EIS is required when development or site alteration is proposed in or adjacent to natural heritage features (City of Ottawa, 2015a). The purposes of this EIS are to identify 1) natural heritage features on or adjacent to the Site, 2) potential impacts of the proposed development to those features, and 3) mitigation measures to minimize or eliminate those impacts.

2.0 ENVIRONMENTAL POLICY CONTEXT

Natural heritage policies and legislation relevant to this EIS are outlined below.

2.1 The Provincial Policy Statement, 2020

The Provincial Policy Statement (PPS) was issued under Section 3 of the *Planning Act* (1990). The current PPS came into effect on May 1, 2020. Natural features are afforded protections under Section 2.1 of the PPS. Protections may include maintenance, restoration, and improved function of diversity, connectivity, ecological function, and biodiversity of natural heritage systems. These protections restrict development and site alteration in significant natural areas (e.g., woodlands, wetlands, wildlife habitat) unless it can be demonstrated that there will be no negative effects on the features and ecological functions of those natural areas. Technical guidance for implementing the natural heritage policies of the PPS is found within the second edition of the *Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005* (NHRM; Ministry of Natural Resources (MNR), 2010). This manual recommends the approach and technical criteria for protecting natural heritage features and areas in Ontario.

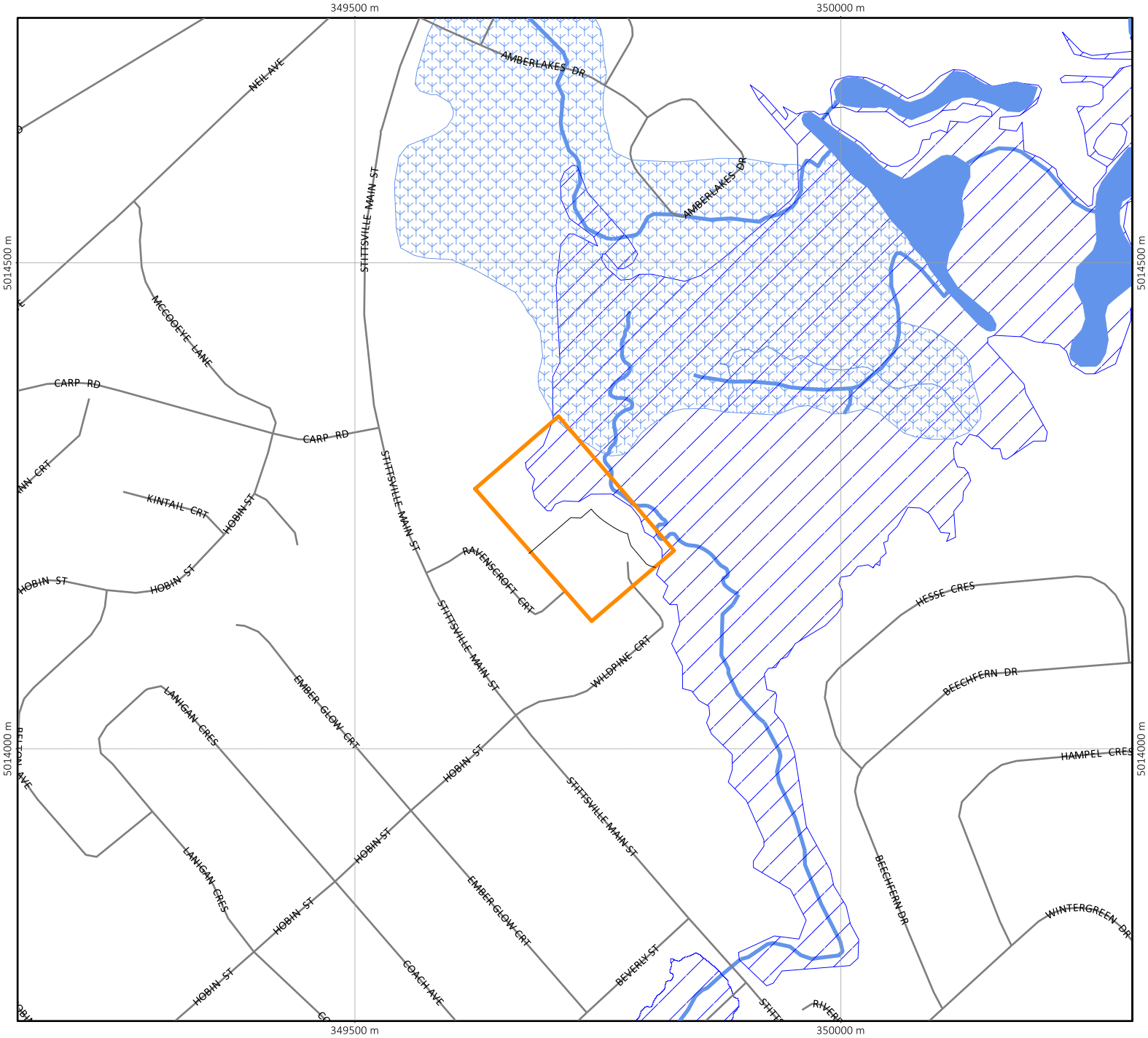

Figure 1 Map showing location context for the Site

Legend

- Property Lines
- Floodplain

Surface Water Features

- Watercourse
- Wetland

(Ontario Basemap)

N

0 >50 m

Map File: 37 Wildpine6
MTM Zone 9
(NAD 83)
Printed on: 2020-12-21

KILGOUR & Associates

2.2 City of Ottawa Official Plan

The City of Ottawa Official Plan (2003) provides direction for future growth in the City and is a policy framework to guide physical development to 2031. The Official Plan was first approved in 2003 and is updated every five years.

2.3 *Species at Risk Act*, 2002

The federal *Species at Risk Act*, 2002 (SARA) is administered by Environment and Climate Change Canada (ECCC) and provides direction to protect and ensure the survival of wildlife species in Canada. The purpose of SARA is to prevent populations of wildlife from becoming Extirpated, Endangered, or Threatened, provide recovery strategies for Endangered and Threatened species, and to manage other species to prevent them from becoming Endangered or Threatened.

All species listed on Schedule 1 of SARA are afforded protection on federal lands. Aquatic species and species of migratory birds protected by the *Migratory Birds Convention Act*, 1994 and listed as Endangered, Threatened, or Extirpated under Schedule 1 of SARA are protected wherever they occur in Canada, regardless of land ownership.

2.4 *Endangered Species Act*, 2007

The provincial *Endangered Species Act*, 2007 (ESA) is administered by the Ministry of Environment, Conservation, and Parks (MECP) and provides protection for SAR and their habitat. The Act prohibits killing, harming, harassing, possessing, transporting, buying, or selling Extirpated, Endangered, and Threatened species. Species listed as Endangered, Threatened, or Extirpated and their habitats (e.g., areas essential for breeding, rearing, feeding, hibernation, and migration) are automatically afforded legal protection under the ESA.

2.5 *Fisheries Act*, 1985

The federal *Fisheries Act,* 1985 is administered by Fisheries and Oceans Canada (DFO) and provides protections to fish, fish habitat, and fisheries. Specifically, the *Fisheries Act* provides:

- Protection for all fish and fish habitat.
- Prohibition against the "harmful alteration, disruption or destruction of fish habitat".
- Prohibition against causing "the death of fish by means other than fishing".

Projects with a scope that does not fall within DFO defined standards and codes of practice require submission of a request for review to DFO.

2.6 *Migratory Birds Convention Act*, 1994

The *Migratory Birds Convention Act*, 1994 (MBCA) is legislation administered by ECCC that provides protection for migratory birds listed under the Act. The disturbance, destruction, take, and killing of migratory birds, their eggs, and their nests are prohibited under the Act. The “incidental take” and work

that would result in the destruction of active nests, or the wounding or killing of bird species protected under the MBCA and/or associated regulations (e.g., SARA) is prohibited.

2.7 *Fish and Wildlife Conservation Act,* 1997

The provincial *Fish and Wildlife Conservation Act*, 1997 (FWCA) governs the hunting and trapping of a variety of wildlife including mammals, birds, reptiles, amphibians, and fish in Ontario, thereby facilitating the protection of wildlife and their habitat. The FWCA outlines the prohibition of hunting or trapping of specially protected species and the requirement for provincially issued licenses for the hunting or trapping of "furbearing" or "game" animals.

2.8 *Conservation Authorities Act*, 1990

Conservation Authorities were created to address erosion, flooding, and drought concerns regionally by managing at the watershed level. Conservation Authorities were given the ability to regulate under Section 28 of the *Conservation Authorities Act*, 1990. The Act provides mechanisms to regulate works and site alterations that have a potential to affect erosion, flooding, land conservation, and waterbodies within their jurisdiction. It is the obligation of all Conservation Authorities to implement Ontario Regulations 42/06 and 146/06 to 182/06 *Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*.

3.0 METHODS

3.1 Desktop and Background Data Review

3.1.1 Agency Consultation

The Site is located within the jurisdictions of the Kemptville District of the MECP and Mississippi Valley Conservation Authority (MVCA). A request for confirmation of SAR potential related to the Site was submitted to the MECP. The MECP response did not indicate a potential for any SAR beyond those already considered in this report.

The proponent has engaged in on-going consultation with MVCA regarding surface water features on the Site. KAL attended an on-site meeting with MVCA on June 23, 2020 to review natural heritage features on the Site and to confirm the boundaries of the wetland on the Site. The City has also been involved in discussions regarding setbacks from Poole Creek.

The proposed development will not impact Poole Creek and therefore no Request for Review was submitted to DFO for this project. Existing fish habitat information was utilized to complete this EIS.

3.1.2 Records Review

Colour digital aerial photographs from geoOttawa (City of Ottawa, 2020a) and Google Earth Pro were used to initially identify natural environment features in the area through a desktop review. Additional background information in this report was obtained from a combination of studies and reports performed within the general area of the Site to review relevant information and to guide field studies. The review of existing information also included a desktop assessment of species listed under SARA and the ESA

having some potential to occur in the broader area. Existing information was obtained from online sources, which include but are not limited to:

- Natural Heritage Information Centre (NHIC; MNRF, 2020a)
- Land Information Ontario Provincially Tracked Species Grid Detail (MNRF, 2020b)
- Species at Risk in Ontario (SARO) List (MECP, 2019a)
- Species at Risk Public Registry (Government of Canada, 2020)
- Aquatic Species at Risk Map (DFO, 2019)
- Atlas of the Breeding Birds of Ontario 2001-2005 (Bird Studies Canada et al., 2009)
- Herp Atlas (Ontario Nature, 2019)
- Atlas of the Mammals of Ontario (AMO; Dobbyn, 1994)
- Bat Conservation International Species Profiles (BCI, 2016)
- MVCA Regulation Public Mapping Browser (MVCA, 2020)
- Official Plan Schedules (City of Ottawa, 2003)
- Soils of the Regional Municipality of Ottawa-Carleton (Marshall et al., 1987)

3.2 Field Studies

Detailed field studies were performed throughout the spring and summer of 2020 to document existing ecological conditions of the Site (Table 1).

Table 1 Summary of field visits to the Site in 2020

Date	Purpose	Average Weather Conditions
2020-05-05	• Anuran survey #1	8°C, 5% cloud cover, no precipitation, wind: 1-2 on Beaufort scale[1]
2020-05-21	• Anuran survey #2	18-20°C, 0-10% cloud cover, no precipitation, wind: 0 on Beaufort scale
2020-05-22	• Delineation of top of bank of Poole Creek • Wetland boundary delineation • HDFA[2] survey #1 • Bat habitat suitability assessment and identification of suitable maternity roost trees	N/A

2020-06-03	• Bird survey #1 • Wetland boundary delineation (continued) • Vegetation survey #1 • HDFA survey #2	13°C, 90-100% cloud cover, no precipitation, wind: 1 on Beaufort scale
2020-06-12	• Install bat acoustic monitors	N/A
2020-06-19	• Bird survey #2 • Tree inventory • Butternut health assessment • Anuran survey #3	24°C, 0-10% cloud cover, no precipitation, wind: 1-2 on Beaufort scale
2020-06-23	• Confirm wetland boundaries with MVCA	N/A
2020-06-25	• Uninstall bat acoustic monitors	N/A
2020-07-15	• Vegetation survey #2 • HDFA survey #3	N/A

Table Notes: [1]The Beaufort Wind Force Scale is an empirical measure that relates wind speed to observed conditions at sea or land. The scale is as follows: **0**: calm, smoke rises vertically, wind speed <1km/hr; **1**: light air, smoke drift indicates wind direction, leaves and wind vanes are stationary, wind speed = 1.1-5.5km/hr; **2**: light breeze, wind felt on exposed skin, leaves rustle, wind vanes begin to move, wind speed = 5.6-11km/hr, **3**: gentle breeze, leaves and small twigs constantly moving, light flags extended, wind speed = 12-19km/hr.

[2]HDFA = Headwater Drainage Features Assessment

3.2.1 Surface Water Features

3.2.1.1 Headwater Drainage Features Assessment / Wetland Delineation

A Headwater Drainage Features Assessment (HDFA) was completed for the Site following the "Standard" survey type (Toronto and Region Conservation Authority and Credit Valley Conservation (TRCA and CVC), 2014; Appendix B). This included surveying for surface water features on and adjacent to the Site during the spring, delineating the boundaries of the wetland on the Site, and characterizing surface water levels in the wetland during the spring and summer. The boundaries of the portion of the wetland that falls on the Site were delineated following techniques used in the Ontario Wetland Evaluation System (OWES; MNR, 2014a) to determine where appropriate setbacks for the wetland may fall. Preliminary wetland boundaries on the Site were determined via desktop using aerial imagery and topographic mapping and confirmed in the field based on plant species composition and soils.

An assessment of fish habitat was not performed for Poole Creek since the creek is known to contain a variety of fish species (e.g., MVCA, Rideau Valley Conservation Authority (RVCA), & South Nation Conservation Authority (SNC), 2019; MVCA, 2009).

3.2.1.2 Poole Creek Delineation

The top of bank of Poole Creek adjacent to the Site (i.e. the western bank of Poole Creek along the eastern edge of the Site) was delineated in the field to determine where appropriate setbacks for the creek may fall (City of Ottawa, 2008). The top of bank in this study was defined as "*the maximum point to which water can rise within the channel before spilling across the adjacent land"* (City of Ottawa, 2020b). For the

portion of Poole Creek that was investigated for this study, the top of bank corresponded with the normal high-water mark, which is defined as "*a visible demarcation mark made by the action of water under natural conditions on the bank of a body of water which action has been so common and usual and so long continued or that it has created a difference between the character of the vegetation or soil on one side of the mark and the character of the vegetation or soil on the other side of the mark"* (MNRF, 2019). The top of bank/normal high-water mark was delineated in the field using a handheld GPS.

3.2.2 Vegetation

3.2.2.1 Ecological Land Classification

Vegetation communities on the Site were documented using standard Ecological Land Classification (ELC) methods for southern Ontario (Lee et al., 1998). ELC provides a consistent approach to identify, describe, name, and map vegetation communities or physiographic features on the landscape based on plant species and soil composition. This method results in a standardized description of each vegetation community to determine the natural diversity and variability of communities within a site, and to provide insight into available habitat and the type of species that may be present. More specifically, the classifications from ELC provide a basis for determining whether potential habitat for a given SAR or other ecological value (e.g., Significant Wildlife Habitat) may be present. Where possible, communities were mapped to the most detailed ELC level of "vegetation type". In some cases, where a suitable "vegetation type" did not exist, or mapping to this level did not provide a great deal of additional or appropriate information, communities are described using the higher ELC level of "ecosite".

Desktop reviews of available aerial imagery (Google EarthPro; City of Ottawa, 2020a) and preliminary field visits informed how the Site may be divided into vegetation communities based on variation in land cover, topography, and vegetation structure. The dominant plant species were recorded within each proposed ecosite in the field to further divide ecosites into vegetation types (the finest resolution in ELC), where possible. Soil samples were taken using a 120 cm long soil auger to characterize community substrates. Representative photos of each ELC unit on Site were taken and are included with the community descriptions in this report.

3.2.2.2 Vascular Plant Survey

During the visits to each vegetation community in 2020, a detailed vegetation survey of vascular plants was developed. Where identification was uncertain, specimens were collected and identified later using conventional taxonomic literature and detailed examination as required. Species and communities of significance (i.e. federal, provincial, or regional) were determined using accepted status lists and publications, including the federal Species at Risk Public Registry (Government of Canada, 2020), the SARO list (MECP, 2019a), NHIC (MNRF, 2020), and *Appendix A – Vascular Plants of the City of Ottawa, with the Identification of Significant Species* (Brunton, 2005).

3.2.2.3 Tree Inventory

A detailed tree inventory was performed for the entire Site following TCR guidelines (Appendix C; City of Ottawa, 2018a):

- Clusters and hedgerows of trees of the same species were demarcated as such. The number of individuals within a cluster/hedgerow was counted and the size range in diameter at breast height (DBH) of trees within a cluster/hedgerow was determined.

- "Distinctive" trees (i.e. those with DBH ≥ 50 cm), uncommon species, and protected species that occurred within a cluster or hedgerow were individually mapped and not counted in the aggregate metrics for the cluster/hedgerow.

- All other trees (i.e. not in clusters or hedgerows of all the same species) with DBH ≥ 10 cm were individually mapped.

- Butternut trees (listed as Endangered under the ESA and SARA) live Butternuts that fell within 50 m of the proposed development footprint were assessed by a qualified Butternut Health Assessor[1].

3.2.3 Birds

Breeding bird surveys were performed via point count surveys following the *Ontario Breeding Bird Atlas Guide for Participants* (Bird Studies Canada et al., 2001). Breeding bird surveys are to be completed from survey stations that, combined, provide suitable viewing of all habitats on a site on calm weather days with light wind (less than 3 on the Beaufort scale) and no precipitation.

Breeding bird surveys must take place between sunrise and five hours after sunrise between May 24 and July 10, with a minimum of 15 days between survey dates (Bird Studies Canada et al., 2001). This protocol calls for two surveys per year during the breeding bird window. The two rounds of surveys were conducted from three survey stations (BBS-1 through BBS-3; Figure 2).

The designation of regionally rare bird species based on "Hill's Site Regions", now ecoregions (Cadman et al., 1987).

3.2.4 Amphibians

Aural amphibian surveys were performed following the Marsh Monitoring Program (Bird Studies Canada et al., 2008). This protocol calls for multiple survey stations at a site to capture spatial and habitat variability. Amphibian surveys were performed from two stations (MMP-1 and MMP-2; Figure 2). The Marsh Monitoring Program advises that each station be visited a minimum of three times at night, no less than 15 days apart, during the spring and early summer.

Following this protocol, the timing of the three frog surveys is based on nighttime air temperature:

- Early breeders (Wood Frog, Western Chorus Frog, Spring Peeper): above 5°C.

- Mid-season breeders (Mink Frog, American Toad, Gray Treefrog): above 10°C.

- Late breeders (Green Frog, Bullfrog): above 17°C.

Amphibian surveys began one half hour after sunset and ended before 01:00 am on evenings with appropriate temperatures and light winds.

[1] For most activities that would involve killing or harming a Butternut, eligibility for an exemption under Ontario Regulation 242/08 under the ESA is dependent on the category to which a tree is assigned following a Butternut health assessment and the details of the proposed activity (e.g., the number of trees to be affected; MNR, 2014b).

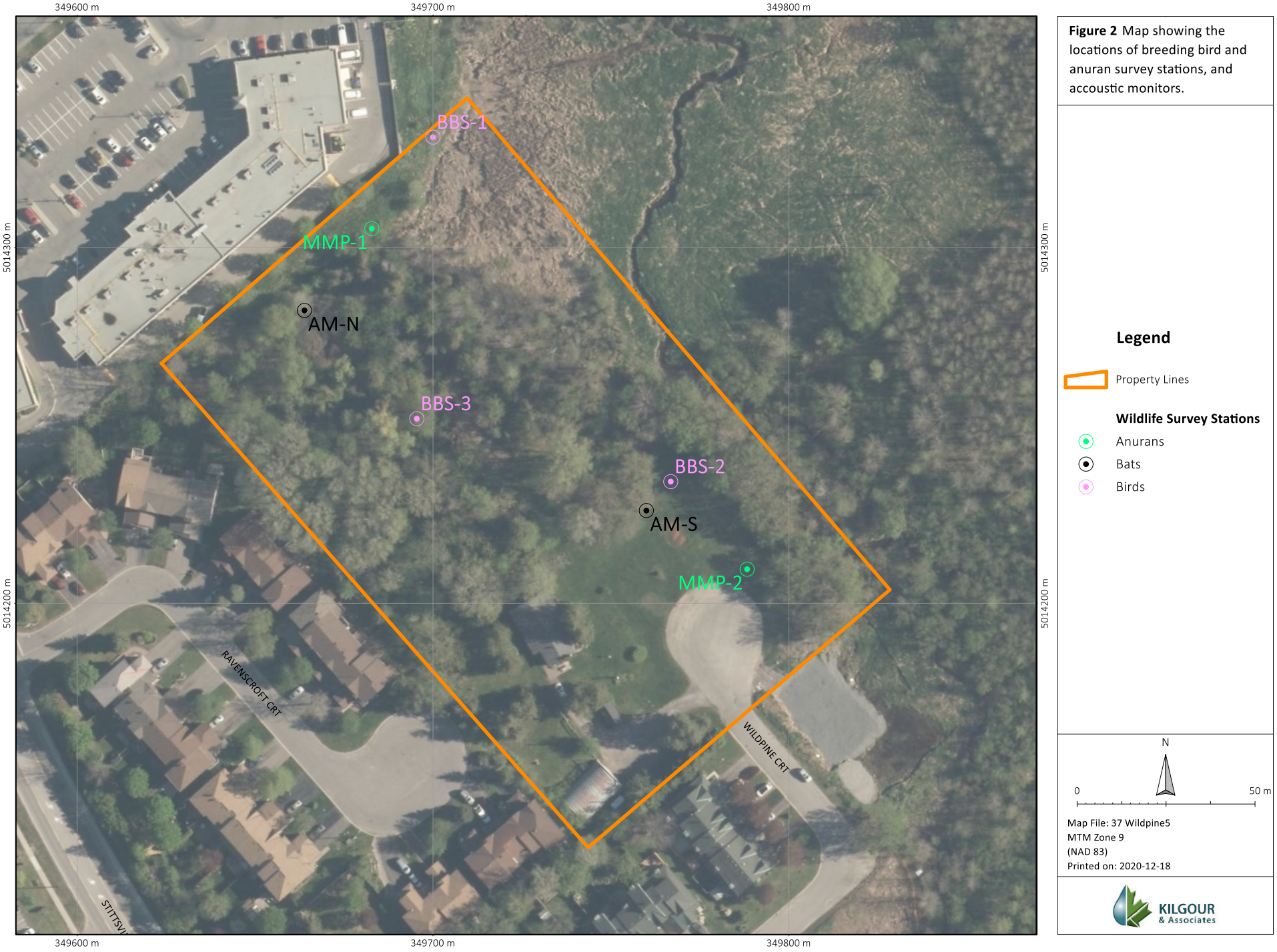

Figure 2 Map showing the locations of breeding bird and anuran survey stations, and accoustic monitors.

Legend

Property Lines

Wildlife Survey Stations

- Anurans
- Bats
- Birds

N

0 50 m

Map File: 37 Wildpine5
MTM Zone 9
(NAD 83)
Printed on: 2020-12-18

KILGOUR & Associates

Any incidental observations of amphibians were recorded during other Site visits. Rocks, fallen wood, and other debris were turned over to check for salamanders throughout the field campaign.

3.2.5 Reptiles

Specific surveys to confirm the presence/absence of turtles on and adjacent to the Site were not conducted since the Stittsville Wetland Complex is known to provide habitat for at-risk turtles based on previous work completed in the vicinity (KAL, 2017).

Incidental observations of reptiles on Site were recorded. Rocks, fallen wood, and other debris on Site were turned over to check for snakes during field visits. Potential basking sites and/or hibernacula for snakes were also noted.

3.2.6 Bats and Other Mammals

Bat surveys were conducted following the *Survey Protocol for Species at Risk Bats within Treed Habitats* (MNRF, 2017a). This is currently the recommended protocol for confirming the presence/absence of Little Brown Myotis, Northern Myotis, and Tri-coloured Bat, where it is determined that potentially suitable habitat for the establishment of maternity roosts is present. These three bat species are listed as Endangered under the ESA and SARA. This protocol is also useful for detecting the presence of bat species that are not at risk.

Following MNRF (2017a), we conducted a preliminary bat habitat suitability assessment and survey to identify suitable maternity roost trees (i.e. trees with dead/dying leaf clusters; trees with cracks, crevices, hollows, cavities, and/or loose or naturally exfoliating bark). Two acoustic monitors (AM-N and AM-S; Figure 2) were installed on Site in locations that would maximize the probability of detecting bats based on the presence of suitable maternity roost trees, the presence of nearby open foraging areas, and the echolocating behaviour of bats (Figure 2). Bats use echolocation more frequently in cluttered environments (Falk et al., 2014), so installing monitors along the edges of treed areas containing suitable maternity roost trees rather than in the middle of treed areas likely increased bat detectability. The monitors were placed just outside of the cluttered environment as the distinguishability of call among species diminishes within such locations (National Park Service, 2016). Acoustic monitors were set to commence recordings at dusk and continue for five hours from June 12 until June 24, 2020.

Incidental observations of other mammals were collected during field visits. Mammal observations were limited to sightings of scat, tracks, dens, and in some cases, direct observations.

4.0 DESCRIPTION OF THE SITE AND THE NATURAL ENVIRONMENT

4.1 Landforms, Soils, and Geology

The Site is primarily flat around the existing house, lawn, and cul de sac area, with a decline in elevation towards the floodplain of Poole Creek and the Stittsville Wetland Complex. This elevational change is mostly gradual but is relatively steep in some places where greater amounts of fill were previously added along the edges of the wetland.

Soil mapping shows the Site is predominantly underlain by organic soils of the Huntley association with 160 cm or more of moderately well decomposed forest peat over loamy or sandy material. Soils of the Huntley association have poor to very poor drainage. The Goulbourn association is also a significant soil land type unit on the Site, with similar soils to those of the Huntley association (40-160 cm of moderately to well decomposed forest peat over loamy or sandy material; poor to very poor drainage; Marshall et al., 1987).

4.2 Surface Water Features

The only surface water features identified on the Site are Poole Creek and the Stittsville Wetland Complex (Appendix B).

4.2.1 Wetland Delineation

The boundaries of the portion of the wetland that falls on the Site were determined through field and desktop methods and in consultation with MVCA (Figure 3). The boundaries of the wetland were clear in the field based on the transition between wetland and upland vegetation and elevational change. The upland edge of the wetland also contained a considerable amount of fill (which has since naturalized with vegetation) that divided the wetland from upland areas. The fill that was historically placed over central portions of the Site forms a raised, relatively-flat tableland with its leading edge extending roughly from the northwestern to southeastern corners of the property. From the edge of the tableland, the fill slopes down to the edge of the wetland on the Site over a span of approximately 12 m (the built-up slope has a maximum width of 15 m). The total wetland area on the Site is approximately 0.6 ha and consists of several types of wetland: meadow marsh, cattail marsh, deciduous thicket (tall shrub) swamp, mixed swamp, and deciduous swamp.

4.2.2 Poole Creek Delineation

The top of bank/normal high-water mark of Poole Creek was mapped in the field within 30 of the eastern property line (Figure 3). Further than 30 m from the Site, Poole Creek is presented based on City of Ottawa (2020a) data.

4.3 Vegetation

4.3.1 Ecological Land Classification

Ten distinct landcover units (i.e. ELC ecosites, vegetation types, or other) were delineated on the Site (Figure 4). Five of these units are terrestrial communities and five are wetland communities. Each unit and the dominant vegetation therein is described in detail below.

Figure 3 Delineation of wetland and Poole Creek

Legend

Property Lines

Aquatic Habitat

Poole Creek

Wetland Boundary

N

0 50 m

Map File: 37 Wildpine6
MTM Zone 9
(NAD 83)
Printed on: 2020-12-21

KILGOUR & Associates

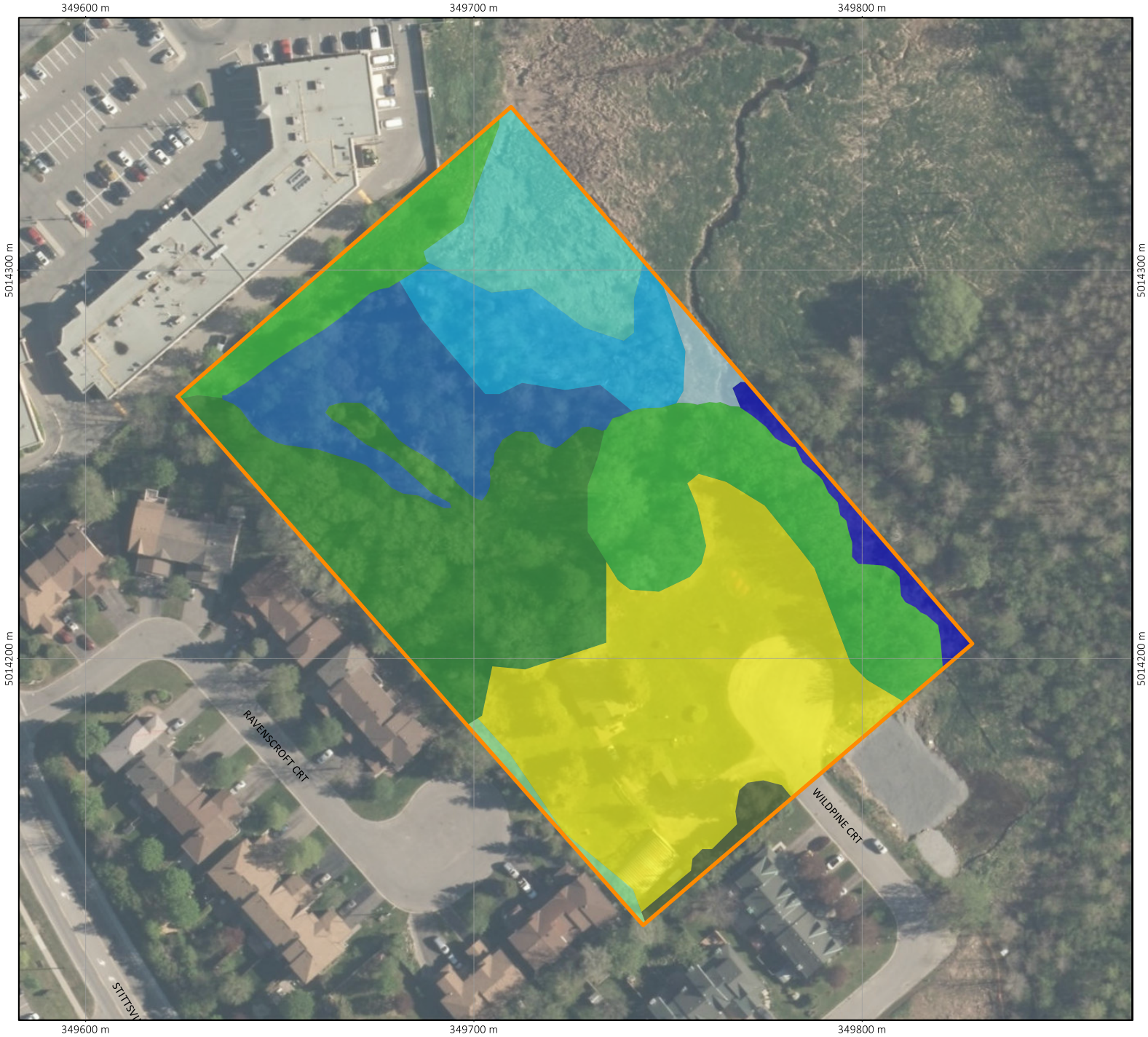

Figure 4 Ecological Land Classificationfor the Site

Legend

Property Lines

ELC

- FODM11
- FODM4-5
- FODM9-5
- Cedar Hedge
- Lawn
- MASO1-4
- MAS3-1
- SWT3-2
- SWM4-1
- SWD6

N

0 50 m

Map File: 37 Wildpine5
MTM Zone 9
(NAD 83)
Printed on: 2020-12-18

KILGOUR & Associates

4.3.1.1 Terrestrial Communities

Fresh – Moist Bitternut Hickory Deciduous Forest Type (FODM9-5)

The FODM9-5 vegetation type makes up the wooded area in the northwestern portion of the Site (Figure 4). It is lower lying than the open lawn and residential area of the Site and is located upland of the adjacent wetland. It is dominated by Bitternut Hickory (*Carya cordiformis*) followed by American Elm (*Ulmus americana*) and Black Ash (*Fraxinus americana*; Figure 5). The understory is dominated by Glossy Buckthorn (*Rhamnus frangula*). Ground cover here includes Glossy Buckthorn saplings, Ostrich Fern (*Matteuccia struthiopteris*), and Sensitive Fern (*Onoclea sensibilis*).

Figure 5 Fresh – Moist Bitternut Hickory Deciduous Forest Type (FODM9-5)

Dry – Fresh Manitoba Maple Deciduous Forest Type (FODM4-5)

This vegetation type is located adjacent to the riparian corridor of Poole Creek on the eastern edge of the Site and slightly extends west at the interface of the open lawn/residential area of the Site and the wetland (Figure 4. The FODM4-5 community also occurs along the northwestern edge of the Site. These locations are dominated by Manitoba Maple (*Acer negundo;* Figure 6). The understory is relatively open and in most places is primarily composed of Glossy Buckthorn. Ground cover is dominated by non-native and/or invasive species such as Bull Thistle (*Cirsium vulgare*), Common Burdock (*Arctium minus*), Dame's Rocket (*Hesperis matronalis*), Garlic Mustard (*Alliaria petiolata*), and Wormseed Mustard (*Erysimum cheiranthoides*). These communities are heavily disturbed, with the FODM4-5 community near Poole Creek effectively demarcating the location of fill that was previously added along the edge of the wetland on the Site (Figure 7). The FODM4-5 community on the northwestern edge of the Site is directly south of the plaza northwest of the Site and has several signs of disturbance such as informal footpaths and trash.

Figure 6 Dry – Fresh Manitoba Maple Deciduous Forest Type (FODM4-5) from a distance

Figure 7 Fill along the edge of the wetland in the southeastern corner of the Site within the FODM4-5 community

Naturalized Deciduous Hedgerow Ecosite (FODM11)

There is a hedgerow along the southwestern edge of the Site, west of the open lawn/residential area, that is dominated by Manitoba Maple and includes Eastern White Cedar (*Thuja occidentalis*), Glossy Buckthorn, and Tartarian Honeysuckle (*Lonicera tatarica*; Figure 4; Figure 8).

Figure 8 Naturalized Deciduous Hedgerow Ecosite (FODM11)

Open Lawn/Residential Area

This ELC unit is used to describe the area on the Site with open manicured lawn, a paved cul de sac, and a single detached home with a separate garage and shed (Figure 4; Figure 9). There are flower gardens around the house with garden cultivar escapees along the edges of adjacent ELC units. Around the house and shed there are mature trees and shrubs in low density.

Figure 9 Open lawn/residential area

Cedar Hedge

There is a hedgerow dominated by Eastern White Cedar in the southern corner of the Site along the driveway near the shed and the house (Figure 4; Figure 10).

Figure 10 Cedar hedge next to driveway

4.3.1.2 Wetland Communities

Maple Organic Deciduous Swamp Ecosite (SWD6)

The SWFD6 ecosite makes up the treed corridor of Poole Creek along the eastern edge of the Site (Figure 4). Note that SWD6 is typically used to describe organic swamps dominated by Red Maple (*Acer rubrum*), Silver Maple (*Acer saccharinum*), and/or Freeman's Maple (*Acer freemanii*), but, this swamp is dominated by Manitoba Maple followed by Crack Willow (*Salix fragilis*; Figure 11). The dominant shrub species is Speckled Alder (*Alnus incana*) and ground cover is dominated by Spotted Jewelweed (*Impatiens capensis*).

Figure 11 Maple Organic Deciduous Swamp Ecosite (SWD6)

Cattail Organic Shallow Marsh Type (MAS3-1)

The northeastern corner of the Site consists of the MAS3-1 community and is dominated by a near-homogenous cover of Broad-leaved Cattail (*Typha latifolia*; Figure 4; Figure 12).

Figure 12 Cattail Organic Shallow Marsh Type (MAS3-1)

Reed Canary Grass Organic Shallow Marsh Type (MASO1-4)

The riparian corridor of Poole Creek north of the SWD6 ecosite on the Site consists of meadow marsh dominated by Reed Canary Grass (*Phalaris arundinacea*; Figure 4; Figure 13).

Figure 13 Reed Canary Grass Organic Shallow Marsh Type (MASO1-4)

Willow Organic Thicket Swamp Type (SWT3-2)

Southwest of the MAS3-1 community is a thicket (tall shrub) swamp dominated by Peachleaf Willow (*Salix amygdaloides*) followed by Glossy Buckthorn (Figure 4; Figure 14).

Figure 14 Willow Organic Thicket Swamp Type (SWT3-2)

White Cedar – Hardwood Organic Mixed Swamp Type (SWM4-1)

The northwestern to southeastern edge of the wetland on the Site is a treed swamp co-dominated by Black Ash, Eastern White Cedar, and Manitoba Maple (Figure 4; Figure 15). The understory is dominated by Glossy Buckthorn and the ground cover is dominated by Spotted Jewelweed.

Figure 15 White Cedar – Hardwood Organic Mixed Swamp Type

4.3.2 Vascular Plant Inventory

A comprehensive list of vascular plants encountered on the Site was compiled (Appendix D). A summary of Vascular plant species of federal, provincial, and regional significance and those that are uncommon in Ottawa were identified (Table 2).

Table 2 Summary of federally, provincially, and regionally significant vascular plant species found on the Site

Federally Significant Species	Butternut (*Juglans cinerea*)
Provincially Significant Species	Butternut (*Juglans cinerea*)
Regionally Significant Species	Black Knapweed (*Centaurea nigra*), Chives (*Allium schoenoprasum*), Field Mustard (*Brassica rapa*), Field Thistle (*Cirsium discolor*), Garden Phlox (*Phlox paniculata*), Siberian Elm (*Ulmus pumila*), White Oak (*Quercus alba*)
Uncommon Species	Great Burdock (*Arctium lappa*), False Sunflower (*Heliopsis helianthoides*), Dame's Rocket (*Hesperis matronalis*), Field Peppergrass (*Lepidium campestre*), White Cockle (*Silene latifolia*), Crown Vetch (*Coronilla varia*), Lily-of-the-valley (*Convallaria majalis*), Black Raspberry (*Rubus occidentalis*), Peachleaf willow (*Salix amygdaloides*), Kidney-leaved Violet (*Viola renifolia*)

The vascular plant species significance was determined based on the following:

- Species of federal significance are those listed on the Species at Risk Public Registry (Government of Canada, 2020).
- Species of provincial significance are those listed on the SARO list (MECP, 2019a) or are tracked on NHIC (MNRF, 2020a).
- Regionally significant species are those designated by Brunton (2005), which are known from 10 or fewer contemporary populations (post-1969) in Ottawa. This includes “rare” (five or fewer populations) and “sparse” (six to 10 populations) categories employed by Gillet and White (1978) and Brunton (1998).
- Uncommon species are those designated by Brunton (2005) and are found only occasionally within suitable habitat, often in small numbers. The habitat of uncommon species is often geographically limited.

4.3.3 Tree Inventory

A Tree Conservation Report was produces for the Site and includes a comprehensive tree inventory and determination of the fate of trees on Site (Appendix C). In general, 197 trees with DBH ≥ 10 cm were identified on the Site, with the most dominant species being Manitoba Maple, Eastern White Cedar, and Bitternut Hickory. The City defines “distinctive” trees as those with a DBH ≥ 50 cm (City of Ottawa, 2018a); the Site has 11 distinctive trees.

4.4 Wildlife

4.4.1 Birds

A total of 26 bird species were observed on the Site (Table 3). One SAR was observed: Eastern Wood-pewee (*Contopus virens*; Special Concern under ESA and SARA). No regionally rare bird species (Cadman et al., 1987) were observed.

Table 3 Summary of bird observations for the Site

Common Name	Scientific Name	Station(s) Observed	Date(s) Observed (2020)
American Crow	*Corvus brachyrhynchos*	BBS-1, BBS-3	June 3
American Goldfinch	*Spinus tristis*	BBS-1, BBS-2, BBS-3	June 3, June 19
American Redstart	*Setophaga ruticilla*	BBS-3	June 19
American Robin	*Turdus migratorius*	BBS-1, BBS-2, BBS-3	May 20 (inc.)[1], May 22 (inc.), June 3, June 19
American Tree Sparrow	*Spizella arborea*	BBS-1	June 19
Black-capped Chickadee	*Poecile atricapillus*	BBS-2	June 19
Canada Goose	*Branta canadensis*	BBS-1	May 20 (inc.)
Common Grackle	*Quiscalus quiscula*	BBS-1, BBS-2, BBS-3	June 3, June 18
Common Raven	*Corvus corax*	BBS-3	June 19
Common Yellowthroat	*Geothlypis trichas*	BBS-1, BBS-2, BBS-3	June 3, June 19
Eastern Wood-pewee	*Contopus virens*	BBS-3	May 22 (inc.), June 3
European Starling	*Sturnus vulgaris*	BBS-2, BBS-3	June 19
Gray Catbird	*Dumetella carolinensis*	BBS-1, BBS-3	May 20 (inc.), June 3, June 19
House Finch	*Haemorhous mexicanus*	BBS-2, BBS-3	June 19
Mallard	*Anas platyrhynchos*	BBS-1	June 3
Mourning Dove	*Zenaida macroura*	BBS-1, BBS-3	June 3, June 19
Northern Cardinal	*Cardinalis cardinalis*	BBS-3	June 3, June 19
Red-eyed Vireo	*Vireo olivaceus*	BBS-1, BBS-3	June 19
Red-winged Blackbird	*Agelaius phoeniceus*	BBS-1, BBS-2, BBS-3	May 20 (inc.[1]), May 22 (inc.), June 3, June 19
Ring-billed Gull	*Larus delawarensis*	BBS-1, BBS-3	May 20 (inc.), June 3, June 19
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	BBS-3	June 19
Scarlet Tanager	*Piranga olivacea*	N/A	May 22 (inc.)
Song Sparrow	*Melospiza melodia*	BBS-1, BBS-2, BBS-3	May 20 (inc.), June 3, June 19
Swamp Sparrow	*Melospiza georgiana*	BBS-1	June 3
Warbling Vireo	*Vireo gilvus*	BBS-2, BBS-3	June 3, June 19

Common Name	Scientific Name	Station(s) Observed	Date(s) Observed (2020)
Yellow Warbler	*Setophaga petechia*	BBS-2	May 22 (inc.), June 3, June 19

Table Notes: [1]Incidental observation made outside of breeding bird surveys.

4.4.2 Amphibians

No anurans were observed during evening aural surveys or during other visits to the Site. No salamanders were incidentally observed.

4.4.3 Reptiles

Specific surveys for reptiles were not conducted. An Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) was incidentally observed on the Site on May 22, 2020.

4.4.4 Bats and Other Mammals

Three species of bats were recorded on the two acoustic monitors installed on the Site (Table 4). The majority of recorded echolocations were made by Silver-haired Bats (*Lasionycteris noctivagans*). Big Brown Bats (*Eptesicus fuscus*) and Hoary Bats (*Lasiurus cinereus*) were also recorded. No at-risk bat species were detected.

Table 4 Summary of results of bat acoustic monitoring for the Site

Date	Big Brown Bat		Hoary Bat		Silver-haired Bat	
Monitor	**AM-N**	**AM-S**	**AM-N**	**AM-S**	**AM-N**	**AM-S**
2020/06/12						
2020/06/13			1		3	
2020/06/14						1
2020/06/15	1	2	1	1	5	4
2020/06/16	1				11	5
2020/06/17	2	2	2	4	55	6
2020/06/18	3	3	3	8	16	10
2020/06/19	4		5	4	4	5
2020/06/20			4	2	20	2
2020/06/21		1	1		10	8
2020/06/22			3	2	29	1
2020/06/23			5		19	10
2020/06/24			6		27	4
2020/06/25			2		1	3
Sum	**11**	**8**	**33**	**21**	**200**	**59**
	19		**54**		**259**	

In addition to the acoustic data, two bats were seen foraging over the open lawn area on the Site on the evening of May 20, 2020.

4.5 Species at Risk

The potential for SAR to interact with the proposed development of the Site was assessed based on our review of existing information, ELC communities (habitat classification), and field surveys (Appendix E). Species assessed as having a moderate to high potential to interact with the proposed development are considered further in the discussion (Table 5).

Table 5 Summary of species at risk assessed as having a moderate to high potential to interact with the proposed development

Species Name (*Taxonomic Name*)	Status under ESA	Status under Schedule 1 of SARA	Potential to Interact with Development of the Site
Birds			
Barn Swallow (*Hirundo rustica*)	Threatened	Threatened	Moderate
Eastern Wood-pewee (*Contopus virens*)	Special Concern	Special Concern	High
Rusty Blackbird (*Euphagus carolinus*)	Special Concern	Special Concern	Moderate
Wood Thrush (*Hylocichla mustelina*)	Special Concern	Threatened	Moderate
Reptiles			
Blanding's Turtle (*Emydoidea blandingii*)	Threatened	Threatened	High
Milksnake (*Lampropeltis triangulum*)	Not Listed	Special Concern	Moderate
Snapping Turtle (*Chelydra serpentina*)	Special Concern	Special Concern	Moderate
Mammals			
Little Brown Myotis (*Myotis lucifugus*)	Endangered	Endangered	Moderate
Arthropods			
Monarch (Danaus *plexippus*)	Special Concern	Special Concern	Moderate
Vascular Plants			
Butternut (*Juglans cinerea*)	Endangered	Endangered	High

4.5.1 At-risk Birds

Barn Swallow, Rusty Blackbird, and Wood Thrush were not observed during 2020 field surveys but were still assessed as having a moderate potential to interact with the proposed development due to previous observation records of the species in the general area and the presence of potentially suitable habitat on the Site. Of these three at-risk bird species, only Barn Swallow and its defined habitats would be protected under the ESA (due to the species' Threatened Status), if it were to occur on the Site. Rusty Blackbird and

Wood Thrush are listed as Special Concern under the ESA and therefore do not receive protection for individuals or their habitats. These bird species are subject to protection under the MBCA, which offers protection for individuals, their young, and their nests, as it does for most other bird species observed on the Site.

An Eastern Wood-pewee was observed in the FODM9-5 community in 2020 (Figure 16). The species is therefore considered to have a high potential to interact with the proposed development.

4.5.2 At-risk Reptiles

The Stittsville Wetland Complex was previously identified as suitable Blanding's Turtle habitat based on the occurrence of a Blanding's observation within 2 kilometres (km) of the feature (KAL, 2017). Blanding's Turtle habitat "Categories" are defined based on distances from suitable wetlands (MECP, 2019b). Category 2 Habitat is defined as the suitable wetland itself and all areas within 30 m of it (MECP, 2019b). The species may use Category 2 Habitat for a variety of life processes including feeding, mating, thermoregulation, movement, and protection from predators (MECP, 2019b). The area beyond Category 2 Habitat out to a distance of 250 m from the wetland is defined as Category 3 Habitat. Blanding's Turtles may use Category 3 Habitats as movement corridors between nesting and overwintering (i.e. Category 1 Habitats) and other Category 2 Habitats (MECP, 2019b). With the edge of the Stittsville Wetland Complex occurring directly on the Site, both Category 2 and Category 3 Habitats are considered to be present there.

Category 2 and 3 habitats areas must not be altered without consulting with the MECP. Habitat alteration will require either an "overall benefit permit" (MECP, 2019c) or the agreement of the MECP that the proposed works do not constitute a negative impact to the functionality of the habitat areas through a Letter of Advice. Attaining an overall benefit permit may obligate the permittee to (1) create habitat for Blanding's Turtle, (2) make a financial contribution to Blanding's Turtle research, or (3) conduct other activities that are deemed to result in a net benefit to the species. A Letter of Advice from the MECP would specify a set of mitigation measures to prevent harm to turtles and/or their habitat. So long as the project proponent follows all the prescribed measures, the project would not be considered to violate the ESA; there would be no need for the MECP to either require or issue a permit for the work to proceed within the Category 2 or 3 Habitats on the Site.

Unlike Blanding's Turtle, the Site is not confirmed habitat for Milksnake or Snapping Turtle, but the Site and adjacent areas likely provide suitable habitat for both species and observation records exist for both species in the general area. Milksnake is not listed under the ESA so is not addressed further in this EIS. Snapping Turtle does not receive protection for individuals or habitats under the ESA but it does as a Specially Protected Reptile under the FWCA.

4.5.3 At-risk Bats

Little Brown Myotis was not detected during acoustic monitoring surveys but occurs throughout the Ottawa area in/near wooded areas throughout the region. Buildings and trees on the Site provide suitable roosting habitat for the species and adjacent open areas would provide suitable foraging habitat. Little Brown Myotis is therefore considered to have a moderate potential to interact with the proposed development. As an Endangered SAR, Little Brown Myotis receives "general habitat protection" under the ESA with no defined limits of critical habitat. Generally, trees that Little Brown Myotis uses for roosting cannot be cut down during the roosting season (May to September inclusive; MNRF, 2015a). Similarly,

Figure 16 Observations of species at risk on the Site

Legend

Property Lines

Species at Risk

Butternut

Eastern Wood-pewee

N

0 50 m

Map File: 37 Wildpine5
MTM Zone 9
(NAD 83)
Printed on: 2020-12-18

KILGOUR & Associates

buildings that at-risk bats are confirmed to be roosting in cannot be significantly altered during the roosting season.

4.5.4 At-risk Insects

Monarch is generally common in the Ottawa area and potentially suitable habitat for the species exists on the Site. This species was not observed on the Site and does not receive protection under the ESA and is therefore not addressed further in this report.

4.5.5 At-risk Plants

Three Butternut trees were found on the Site (Figure 16). Two of these Butternuts were dead and one was assessed as a Category 3 tree (Appendix F), meaning that it exhibited evidence that it may be resistant to or tolerant of infection by Butternut canker (*Ophiognomonia clavigignenti-juglandacearum*). Category 3 trees are especially important to the recovery of Butternut because they may be useful in determining sources of resistance to Butternut canker (MNR, 2014b). Removing or harming (e.g. building within 50 m) a Category 3 Butternut requires an authorization under the ESA. The authorization, if granted, will set out the conditions of authorization, which may include the requirement that the tree be archived (e.g., through seed collection or cloning by grafting and then planted in Butternut archives; MNR, 2014b).

4.6 Other Significant Natural Heritage Features

The Site is not mapped as containing a Natural Heritage System on Schedule L3 of the City's Official Plan (2003). It is identified as containing floodplain associated with Poole Creek. As indicated throughout this report, the Site contains a portion of the Stittsville Wetland Complex which is not a provincially significant wetland. The Site does not contain Significant Woodland based on the City's guidelines for identification (2018b) and the NHRM (MNR, 2010). The Site does not contain Significant Valleylands, Earth/Life Science Areas of Natural and Scientific Interest, or important greenspace linkages.

4.6.1 Significant Wildlife Habitat

Based on the Significant Wildlife Habitat (SWH) Criteria Schedules for Ecoregion 6E (MNRF, 2015b), the Site contains one confirmed SWH: Habitat for Special Concern and Rare Wildlife Species. This SWH is associated with the observation of Eastern Wood-pewee in the FODM9-5 community on the Site. The area of the SWH is the area of habitat to the finest ELC scale (MNRF, 2015b); therefore, the FODM9-5 community is the SWH.

The FODM11, FODM4-5, FODM9-5, SWM4-1, and SWD6 communities are candidate SWHs for Bat Maternity Colonies because they are treed communities in which more than 10 Big Brown Bats and five adult female Silver-Haired Bats may occur (MNRF, 2015b). Big Brown Bats and Silver-Haired Bats were detected on the Site via acoustic monitoring, but the number and/or gender of each bat species cannot be discerned from the acoustic data. As each bat may be recorded multiple times per evening, the number of calls recorded suggests bats there are likely few individuals present. It is possible that SWH for Bat Maternity Colonies exists on the Site but this cannot be confirmed with the acoustic data that were collected.

Note that even though SWH is defined on a provincial level by MNRF, the protection of confirmed SWHs is a municipal matter.

5.0 DESCRIPTION OF THE PROPOSED PROJECT

The proposed development is limited to the southern half of the Site and consists of 29 townhomes with front and rear yard space (Figure 17). The proposed development also includes extending Wildpine Court to connect with Ravenscroft Court.

Development will respect a setback of 15 m from wetland areas. It will also respect a 30 m setback from the top of bank of Poole Creek, except for the rear lot lines of four units to be located at the southeast corner of the Site. These four units require their rear lot lines to extend up to 2 m beyond the 30 m setback to permit a minimal yard length of 4 m. At their closest point to the creek, these rear lot lines are 28 m from the top of bank but will be situated along what is currently the existing paved edge of the cul de sac on the Site. These proposed setbacks were developed in consultation with the City and MVCA.

Stormwater management (SWM) for the Site will be managed through two separate systems; the primary system for the northwest portion of the Site which will outlet to the wetland area, and the secondary system for the southeast portion of the site which will outlet to Poole Creek.

The primary system will consist of an Etobicoke Exfiltration System (EES) which accommodates frequent flows for infiltration, supplemented by a conventional piped sewer system and a perched outlet to the wetland via a control orifice and level spreader. Additional underground storage will maintain post-development flows to the wetland to pre-development levels. The EES will consist of twin underground perforated pipes set within a clear stone envelope under the storm sewer on the private lane. The EES will be connected to the manhole at the intersection and will be graded to the northwest along the private laneway. The system will allow for storage and infiltration with an outlet to the wetland. The perched outlet to the wetland will incorporate a level spreader to ensure that any flows discharging via the perched outlet will mimic the spread of shallow overland flow to the wetland in the pre-development condition. Additional underground storage will be located to the north of the northwest end of the private right-of-way.

The catchment draining to Poole Creek consists only of clean water runoff from roofs and rear yards and the drainage area has been limited to an extent whereby the post-development drainage from the smaller catchment is comparable to the pre-development runoff. By not providing controls, the runoff consists of sheet flow to the creek along the channel banks and is similar to predevelopment conditions. No point discharges to Poole Creek are proposed which in turn means that no erosion potential is being created.

Site preparation is anticipated to begin in the fall of 2021 with building construction anticipated to begin in early 2022. Site preparation would require the removal of all vegetation within the proposed development footprint, but most Site trees would be retained.

Figure 17 Proposed development

Legend

- Property Lines

Proposed Development

- Block Plan
- Other
- Level Spreader
- Pathway
- Water Management Area
- Townhome
- Poole Creek - Top of Bank
- Wetland Boundary

Setbacks

- Top of Bank +28 m
- Top of Bank +30 m
- Wetland +15m

N

0 — 50 m

Map File: 37 Wildpine6
MTM Zone 9
(NAD 83)
Printed on: 2021-08-10

KILGOUR & Associates

6.0 IMPACT ASSESSMENT

6.1 Surface Water Features

Development of the residential community with the proposed setbacks from the wetland and the top of bank of Poole Creek is unlikely to alter the hydrology, riparian functions, or terrestrial or aquatic habitat functions of the Stittsville Wetland Complex and Poole Creek. The residential units would be situated upon the tableland created by existing fill within areas already highly disturbed and degraded as indicated by the presence of rubble, trash, and non-native and/or invasive species.

The SWM mitigation measures have been proposed to, and are shown in the modelling to achieve, predevelopment runoff to the wetland and maintain infiltration rates for groundwater to the wetland (JL Richards, 2021). Any runoff to the wetland from the development is via a control orifice upstream of a level spreader. The level spreader is located up to 15 m from the wetland in line with the offset requirements. The level spreader is intended to disperse the overland flow and dissipate the energy of flows through the control orifice. With the proposed measures in place, it is anticipated that there will be no measurable changes to the hydrological regime of the wetland.

The proponent must seek formal permission from MVCA to alter areas within 30 m of the wetland.

6.2 Vegetation and Trees

All vegetation within the proposed development footprint would be removed, including 42 trees with DBH ≥ 10 cm (3 of which are distinctive trees with DBH ≥ 50 cm; Appendix C). ELC communities that would be impacted include: the FODM9-5 and FODM4-5 forest communities (with 0.2 ha of treed space to be removed from the edge of these communities), the FODM11 and cedar hedgerows in the southwestern corner of the Site, and the open lawn area.

6.3 Species at Risk

6.3.1 At-risk Birds

The proposed development would involve removing the house, shed, and garage on the Site which have potential to provide nesting habitat for Barn Swallow. As no individuals were observed during the 2020 field season, no impacts are currently anticipated to the species under the proposed development plan. It is possible, however, that this species may utilize this habitat on the Site prior to development since it is known to occur in the general area based on previous observation records. Specific mitigation measures are provided for Barn Swallows in Section 7.3.1 to ensure that there are no negative impacts to this species as the project is undertaken.

The FODM9-5 community (and adjacent forested areas) provide habitat for Eastern Wood-pewee, a SAR listed as Special Concern, and is confirmed SWH for Special Concern and Rare Wildlife Species. Approximately 0.2 ha of the contiguously forested area on the Site (i.e. forest and swamp communities not including hedgerows) would be removed under the proposed development. This would leave approximately 0.9 ha of forested habitat which is sufficient to support a nesting pair of Eastern Wood-pewees (Freemark, 1999). This species and the associated SWH are not protected under the ESA. No significant impacts to Eastern Wood-pewee are anticipated.

6.3.2 At-risk Reptiles

The proposed development footprint falls within areas defined as Category 2 and Category 3 habitats for Blanding's Turtle based on proximity to the wetland (MECP, 2019b). All of the proposed development areas on the Site, however, are situated within the raised fill area. These areas are not considered to be functionally supportive of turtle life processes consistent with Category 2 habitat (e.g. feeding, mating, thermoregulation, etc.; MECP 2019b). The proposed development zone also directly abuts existing areas of development on the south and west sides. As such, it is unlikely to provide corridor functionality for access to other wetlands and is not considered to be functionally supportive of turtle life processes consistent with Category 3 habitat (i.e. movement corridors; MECP 2019b). The proposed development is not anticipated to negatively impact the ability of the wetland area on and/or adjacent to the Site to support Blanding's Turtles.

Blanding's Turtles and/or other at-risk reptiles that may be present in the Stittsville Wetland Complex have the potential to be harmed during site preparation and construction if they are able to access the Site. The potential for Site access by such fauna either during or following construction, however, can be mitigated through the appropriate use of exclusion measures (e.g. fencing).

6.3.3 At-risk Bats

As no at-risk bats were detected during the 2020 field campaign, no impacts are currently anticipated to the at-risk bats under the proposed development plan. Little Brown Myotis, however, is known to occur in the general area. The proposed development would involve removing buildings (house, garage, and shed) and trees that could provide roosting habitat for Little Brown Myotis if it were to occur on the Site prior to development. Specific mitigation measures are provided for Little Brown Myotis in Section 7.3.3 to ensure that there are no negative impacts to this species as the project is undertaken.

6.3.4 At Risk Plants

The Category 3 Butternut on the Site falls within 25 m of the proposed development footprint. The area within 25 m of a Butternut is important for sustaining microhabitat conditions for the parent tree (Poisson and Ursic, 2013) and is considered protected habitat. The area from 25 m to 50 m from the stem is regulated as protected habitat for regeneration/progeny. The Category 3 Butternut is therefore likely to be harmed by the proposed development and the proponent is consequently required to seek an authorization to harm Butternut under the ESA.

6.4 Other Significant Natural Heritage Features

In addition to impacting SWH for Special Concern and Rare Wildlife Species (Eastern Wood-pewee), the proposed development would impact candidate SWH for Bat Maternity Colonies because it requires the removal of some or all trees from the following treed ELC communities: FODM11, FODM4-5, FODM9-5, SWM4-1, and SWD6. Whether this candidate SWH is confirmed SWH for Bat Maternity Colonies is currently unknown.

7.0 MITIGATION

7.1 Surface Water Features

The project must implement City- and MVCA-approved setbacks from Poole Creek and the wetland, respectively, and fulfill any obligations that may be associated with a permit from MVCA to alter areas within 30 m of the wetland. The project must be carefully designed to ensure that surface water flows do not alter water temperature, quality, and quantity within Poole Creek and the wetland.

The project will require standard erosion and sediment control (ESC) measures to protect the Stittsville Wetland Complex and Poole Creek. The ESC plan must be developed to the satisfaction of the City and MVCA and should include:

- A multi-facetted approach to provide ESC.
- Silt fence paired with sturdy construction fence along the project perimeter.
- Retention of existing vegetation and stabilization of exposed soils with vegetation where possible.
- Limiting the duration of soil exposure and phasing project works.
- Limiting the size of disturbed areas by minimizing nonessential clearing and grading.
- Minimizing the total slope length and the gradient of disturbed areas.
- Refueling of machinery should occur >30 m from the wetland and Poole Creek and all machinery will remain on the project-side of silt and construction fence.
- Maintaining overland sheet flow and avoiding concentrated flows.
- Storing/stockpiling materials >30 m away from the wetland and Poole Creek.

Rear yards of lots must have long-term/permanent fence to discourage residents and their pets from interacting with the wetland and Poole Creek and to prevent the escape of garden cultivars and non-native species into natural areas. The proponent must also develop and provide a Homeowner Awareness Manual to residents to encourage responsible stewardship and appreciation for adjacent natural heritage features.

KAL recommends enhancing the area between the proposed development footprint and the wetland and Poole Creek to restore a naturalized buffer, where feasible. This would help restore hydrological and riparian and terrestrial habitat functions that may have been lost due to the historical placement of fill along the wetland's edge. Enhancement works could involve removing invasive species and re-vegetating with appropriate native species. However, since this buffer is regulated by MECP (as protected Blanding's Turtle habitat) and MVCA, an enhancement project would require permission from both agencies. The potential for an enhancement project could be addressed during consultations with these agencies for other regulatory processes involved with the project.

7.2 Vegetation / Trees

To offset vegetation loss, native tree and shrub species must be planted, with a minimum of one tree per lot. Landscaping plans must be prepared to the satisfaction of the City. The following tree and shrub species are recommended for planting and should be used to direct the development of the landscape plan for the Site. The following species are appropriate given site conditions and are native and non-invasive: Alternate-leaf Dogwood (*Cornus alternifolia*), American Beech (*Fagus grandifolia*), Balsam Poplar (*Populus balsamifera*), Basswood (*Tilia americana*), Bitternut Hickory, Black Cherry (*Prunus serotina*), Black Walnut (*Juglans nigra*), Bur Oak (*Quercus macrocarpa*), Chokecherry (*Prunus virginiana*), Eastern White Cedar, Hawthorns (*Crataegus* spp.), Ironwood (*Ostrya virginiana*), Largetooth Aspen (*Populus grandidentata*), Maple-leaf Viburnum (*Viburnum acerifolium*), Nannyberry (*Viburnum lentago*), Northern Bush-honeysuckle (*Diervilla lonicera*), Peachleaf Willow (*Salix amygdaloides*), Pin Cherry (*Prunus pensylvanica*), Red Maple, Red Oak (*Quercus rubra*), Serviceberries (*Amelanchier* spp.), Silver Maple, Sugar Maple (*Acer saccharum*), Tamarack (*Larix laricina*), Trembling Aspen (*Populus tremuloides*), White Birch (*Betula papyrifera*), Yellow Birch (*Betula alleghaniensis*), White Oak, White Pine (*Pinus strobus*), and White Spruce (*Picea glauca*).

To minimize impacts to trees to be retained on the Site, the following general protection measures are recommended during site preparation and construction (City of Ottawa, 2018a):

- Tree removal on Site should be limited to that which is necessary to accommodate construction.
- To minimize impacts to trees to be retained on the Site:
    - Erect a fence beyond the critical root zone (CRZ; i.e. 10x the DBH) of retained trees that have roots that may extend into the project area. The fence should be highly visible (orange construction fence) and paired with erosion and sediment control fencing.
    - Pruning of branches is recommended in areas of potential conflict with construction equipment.
    - Do not place any material or equipment within the CRZ of trees.
    - Do not attach any signs, notices, or posters to any trees.
    - Do not raise or lower the existing grade within the CRZ of trees without approval.
    - Tunnel or bore when digging within the CRZ of a tree.
    - Do not damage the root system, trunk, or branches of any remaining trees.
    - Ensure that exhaust fumes from all equipment are not directed towards any tree's canopy.

7.3 Species at Risk

7.3.1 At-risk Birds

Since the proposed development would involve removing the house, shed, and garage on the Site which could provide nesting habitat for Barn Swallow, mitigation measures are required to prevent impacts to this species:

- Site buildings should be removed before April 15, 2021. If buildings cannot be removed before that date, there is a possibility that they could become nesting habitat for Barn Swallows.
    - The proponent shall install appropriate exclusion netting on the structures outside of the breeding bird period (April 15 to August 15; City of Ottawa, 2015a) as soon as possible to prevent nesting (MNRF, 2017b). This netting shall be inspected by a qualified Biologist to ensure its functionality; **OR**
    - A qualified Biologist shall inspect the structures for nests within five days prior to their alteration/demolition.
- If a Barn Swallow nest is found, the proponent is to follow the streamlined regulatory process for altering a structure that contains a Barn Swallow nest. The process, under "Exemptions Requiring Notice to be Given on Registry" under Section 23.5 of Ontario Regulation 242/08 (MECP, 2019d; Government of Ontario, 2007), includes:
    - Registering the work with the MNRF before the work begins via a "notice of activity form" (note that even though the MECP now deals with SAR issues, the registry is still through the MNRF).
    - Minimizing the effects of the activity on Barn Swallow.
    - Creating, maintaining, and monitoring new nesting habitat for Barn Swallow.
    - Preparing and maintaining records that relate to the activity and the habitat.

7.3.2 At-risk Reptiles

The proponent will be required to consult with the MECP with respect to Blandings' Turtles. Consultations are considered likely to result in a Letter of Advice from MECP concurring the that proposed development will not functionally impact Blanding's Turtle habitat. No requirement for an overall benefit permit (MECP, 2019b) is currently anticipated. A Letter of Advice will indicate the mitigation measures required to ensure the safety of turtles occurring within the wetland both during construction and following its completion.

In addition to complying with any obligations imposed by the MECP (as may be required), the following mitigation measures must be implemented (unless specifically directed otherwise by the MECP) to prevent impacts to Blanding's Turtles and other at-risk reptiles that may occur in the area:

- All on-site workers are to receive SAR identification and awareness training for at-risk reptiles delivered by a qualified Biologist.

- Prior to vegetation clearing, sweeps of areas to be cleared must be conducted by a qualified Biologist to ensure the absence of at-risk reptiles.

- Temporary exclusion fence shall be installed prior to the turtle active season (April through October; MNRF, 2015c), if possible, and must follow recommendations in *Reptile and Amphibian Exclusion Fencing: Best Practices* (MNR, 2013). Temporary exclusion fence may be paired with ESC measures and must be installed along the perimeter of the project area but outside of the wetland. Temporary exclusion measures are to be inspected weekly by a qualified Biologist during the turtle active season.

    - Rear yard fences will double as long-term/permanent wildlife exclusion fences. Once these rear yard fences are installed, temporary exclusion measures may be removed.

- If an at-risk reptile is encountered during project works, nearby works shall cease immediately. If the SAR is in immediate harm's way, it should be safely and humanely moved into nearby wetland habitat following *Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders* (https://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_tx_sar_hnd_mnl_en.pdf). If the SAR is not in immediate harm's way, the project Biologist shall be contacted for direction. Photographs and notes (species, health, gender, behaviour, location) will be taken for all encounters.

    - The proponent must obtain a Wildlife Scientific Collector's Authorization from the MNRF to handle at-risk reptiles.

    - All encounters with Threatened and Endangered species must be reported to the MECP within 24 hours of an encounter.

7.3.3 At-risk Bats

Vegetation shall not be removed during the bat roosting season (May through September; MNRF, 2015a) to prevent impacts to Little Brown Myotis and other bat species. Similarly, the house, shed, and garage on the Site should not be altered or removed during the bat roosting season. Alternatively, these structures may be removed during the roosting season if bat emergence surveys following MNR (2014c) can demonstrate that at-risk bats are not roosting in the structures.

7.3.4 Butternut

The proponent must obtain an authorization under the ESA to harm the Category 3 Butternut on the Site and must comply with all obligations of the authorization, which may include archiving the tree and/or planting Butternuts. In addition, the proponent must implement the following mitigation measures to reduce impacts to Butternut:

- A sweep shall be conducted by a qualified Biologist to check for additional Butternuts within one month prior to clearing an area. If additional live Butternuts fall within 25 m of the project area, their health must be assessed by a qualified Butternut Health Assessor to determine appropriate follow-up actions.

- Take reasonable steps to avoid direct damage from machinery and other development activities to the Category 3 Butternut by maintaining a buffer around the tree's dripline using orange construction fence. The protective fence shall be inspected and adjusted or repaired as necessary to maintain tree protection for the length of the project.

- Perform all construction activities occurring within 25 m of the Category 3 Butternut by hand or with small machinery, where possible.

- Minimize indirect damage to the Category 3 Butternut by cleanly cutting roots and mulching exposed roots to prevent further damage.

- Mitigate soil erosion by minimizing vegetation removal adjacent to the Category 3 Butternut and re-vegetate disturbed areas as soon as possible.

7.4 General Wildlife Management

The following mitigation measures shall be implemented during project works to generally protect wildlife:

- Tree and vegetation clearing should not take place during sensitive times of the year for wildlife (breeding season; early spring throughout summer) unless mitigation measures are implemented and/or the habitat has been inspected by a qualified biologist.
    - The MBCA protects migratory birds and the nests and young of migratory birds in Canada. No clearing of vegetation shall occur during the breeding bird window (between April 15 and August 15; City of Ottawa, 2015a) to prevent impacts to birds. Combining the breeding bird window with the bat roosting season (May to September), no clearing of vegetation shall occur between April 15 and September 30 inclusive to prevent impacts to both birds and bats. If vegetation clearing is to occur between April 1 and 15, a pre-clearing survey for active stick nests and cavity nests must be conducted to identify and protect early-nesting owls and raptors (City of Ottawa, 2015a).

- Do not harm, feed, or unnecessarily harass wildlife.

- Manage waste to prevent attracting wildlife to the Site. Effective mitigation measures include litter prevention and keeping all trash secured in wildlife-proof containers and promptly removing it from the Site, especially during warm weather.

- Drive slowly and avoid hitting wildlife.

- Manage stockpiles and equipment on Site to prevent wildlife from being attracted to artificial habitat. Cover and contain any piles of soil, fill, brush, rocks and other loose materials and cap ends of pipes where necessary to keep wildlife out. Ensure that trailers, bins, boxes, and vacant buildings are secured at the end of each workday to prevent access by wildlife.

- Check the entire work site for wildlife prior to beginning work each day.

- Inspect ESC measures and protective fence and/or other installed wildlife exclusion measures daily and after each rain event to ensure their integrity and continued function.

- Monitor construction activities to ensure compliance with the project-specific protocol (where applicable) or any other requirements.

- Construction and maintenance of buildings shall follow the City's *Bird-Safe Design Guidelines* (City of Ottawa, 2020c).

8.0 CONCLUSION

This report provides a set of mitigation measures for employment in the design and construction of the proposed residential community on the Site. Our assessment within this report of the potential for impacts to the natural heritage system is based on the implementation of these mitigation measures. It is our professional opinion that the proposed development will have no significant negative impacts on natural features or their ecological functions if all mitigation measures provided within this report are followed.

9.0 CLOSURE

This report was prepared for exclusive use by Wildpine Trails Inc. and may be distributed only by or in accordance with the express instructions of Wildpine Trails Inc. Questions relating to the data and interpretation can be addressed to the undersigned.

Respectfully submitted,

KILGOUR & ASSOCIATES LTD.

Katherine Black, MSc
Biologist

Anthony Francis, PhD
Project Director and Senior Ecologist

10.0 LITERATURE CITED

Bat Conservation International (BCI). 2016. Species Profiles. Available online at: http://www.batcon.org/resources/media-education/species-profiles

Bird Studies Canada, Ontario Field Ornithologists, Environment Canada, Ontario Nature, Ministry of Natural Resources, and Federation of Ontario Naturalists. 2001. Ontario Breeding Bird Atlas Guide for Participants. Available online at: https://www.birdsontario.org/download/atlas_feb03.pdf

Bird Studies Canada, United States Environmental Protection Agency, and Environment Canada. 2008. Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Revised). Available online at: https://www.birdscanada.org/bird-science/marsh-monitoring-program/

Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Nature Resources, and Ontario Nature. 2009. Atlas of the Breeding Birds of Ontario 2001-2005 (Atlas 2). Available online at: https://www.birdsontario.org/atlas-2/

Brunton, D.F. 1998. Distributionally Significant Vascular Plants of the Region of Ottawa-Carleton. Planning and Development Approvals Department Report #28-09, Regional Municipality of Ottawa-Carleton, Ottawa.

Brunton, D.F. 2005. City of Ottawa Urban Natural Areas Environmental Evaluation Study Appendix A – Vascular Plants of the City of Ottawa, with Identification of Significant Species. Available online at: https://app06.ottawa.ca/calendar/ottawa/citycouncil/ec/2005/05-24/AppendixA%20-%20OTTAWA%20FLORA%20(APR%2005).htm

Cadman, M.D., P.F.J. Eagles, and F.M. Helleiner. 1987. Atlas of Breeding Birds of Ontario. University of Waterloo Press, Waterloo, Ontario.

California Academy of Sciences and National Geographic Society. 2020. iNaturalist. Available online at: https://www.inaturalist.org/

City of Ottawa. 2003. Official Plan. Available online at: https://ottawa.ca/en/planning-development-and-construction/official-plan-and-master-plans/official-plan

City of Ottawa. 2008. Zoning By-law 2008-250. Part 2 – General Provisions, Section 69 – Setback from Watercourses. Available online at: https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/planning-development-and-construction/maps-and-zoning/zoning-law-no-2008-250/zoning-law-2008-250-consolidation/part-2-general-provisions-sections-55-74

City of Ottawa. 2015a. Environmental Impact Statement Guidelines. Available online at: https://documents.ottawa.ca/sites/default/files/documents/eis_guidelines2015_en.pdf

City of Ottawa. 2015b. Protocol for Wildlife Protection during Construction. Available online at: http://greenspace-alliance.ca/wp-content/uploads/2015/01/ConstructionProtocol_draftNov21-14_EN-red.pdf

City of Ottawa. 2018a. Urban Tree Protection By-law No. 2009-200. Available online at: https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/tree-conservation-urban-law-no-2009-200

City of Ottawa. 2018b. Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment (draft guidelines). Available online at: https://documents.ottawa.ca/sites/default/files/significant_woodlands_draft_guidelines_FINAL.pdf

City of Ottawa. 2020a. geoOttawa. Available online at: https://maps.ottawa.ca/geoottawa/

City of Ottawa. 2020b. New Official Plan. Preliminary Draft dated November 20, 2020. Available online at: https://engage.ottawa.ca/the-new-official-plan/news_feed/draft-new-official-plan

City of Ottawa. 2020c. Bird-Safe Design Guidelines. Available online at: https://app05.ottawa.ca/sirepub/cache/2/31wsrrojyfv5xtvm0wjkrxel/66359212022020100330333.PDF

Committee on the Status of Endangered Wildlife in Canada. 2011. COSEWIC Assessment and Status Report on the Macropis Cuckoo Bee (*Epeoloides pilosulus*) in Canada. Available online at: https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_macropis_cuckoo_bee_0911_eng.pdf

Committee on the Status of Endangered Wildlife in Canada. 2015. COSEWIC Assessment and Status Report on the Black-foam Lichen (*Anzia colpodes*) in Canada. Available online at: https://sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Black-foam%20Lichen_2015_e.pdf

Cornell Lab of Ornithology. 2020. eBird: An online database of bird distribution and abundance. Available online at: https://ebird.org/home

Dobbyn J.S. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists, Don Mills, Ontario, 120 pp.

Falk, B., L. Jakobsen, A. Surlykke, and C.F. Moss. 2014. Bats coordinate sonar and flight behavior as they forage in open and cluttered environments. Journal of Experimental Biology, 217: 4356-4364. DOI: 10.1242/jeb.114132

Fisheries and Oceans Canada. 2019. Aquatic Species at Risk Map. Available online at: https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Freemark, K. 1999. Area sensitivity and thresholds for birds in fragmented hardwood forests. Canadian Wildlife Service, Hull, Quebec.

Gillett, J. M. and White, D.J. 1978. Checklist of Vascular Plants of the Ottawa - Hull Region, Canada. National Museum of Natural Sciences, Ottawa.

Government of Canada. 1985. *Fisheries Act* (R.S.C., 1985, c. F-14). Available online at: https://laws-lois.justice.gc.ca/eng/acts/f-14/

Government of Canada. 1984. *Migratory Birds Convention Act*, 1994 (S.C. 1994, c. 22). Available online at: https://laws-lois.justice.gc.ca/eng/acts/m-7.01/

Government of Canada. 2002. *Species at Risk Act* (S.C. 2002, c. 29). Available online at: https://laws.justice.gc.ca/eng/acts/S-15.3/

Government of Canada. 2020. Species at Risk Public Registry. Available online at: http://www.registrelep-sararegistry.gc.ca/sar/index/default_e.cfm

Government of Ontario. 1990. *Conservation Authorities Act*, R.S.O. 1990, c. C.27. Available online at: https://www.ontario.ca/laws/statute/90c27

Government of Ontario. 1990. *Planning Act*, R.S.O. 1990, c. P.13. Available online at: https://www.ontario.ca/laws/statute/90p13

Government of Ontario. 1987. *Fish and Wildlife Conservation Act*, 1997, S.O. 1997, c. 41. Available online at: https://www.ontario.ca/laws/statute/97f41

Government of Ontario. 2007. *Endangered Species Act*, 2007, S.O. 2007, c. 6. Available online at: https://www.ontario.ca/laws/statute/07e06

JL Richards. 2021. Hydrologic Impact Study Wildpine Trails. Report Number: JLR No.: 29803-000. Report Date: July 22, 2021.

Kilgour & Associates Ltd. (KAL). 2017. Environmental Impact Statement - 10 Wildpine Court. Final Report – Revised. February 1, 2017.

Lee, H.R., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, North Bay.

Marshall, I.B., J. Dumanski, E.C. Huffman, and P.J. Lajoie (Ontario Ministry of Agriculture and Food). 1987. Soils of the Regional Municipality of Ottawa-Carleton (Excluding the Ottawa Urban Fringe) Sheet 3, Ontario, Soil Survey Point No 58. Copies available from: Communications Branch, Ontario Ministry of Agriculture and Food, Parliament Buildings, Toronto, Ontario, M7A 2B2.

Ministry of Environment, Conservation and Parks. 2019a. Species at Risk in Ontario List. Available online at: https://www.ontario.ca/page/species-risk-ontario

Ministry of Environment, Conservation and Parks. 2019b. Blanding's Turtle General Habitat Description. Available online at: https://www.ontario.ca/page/blandings-turtle-general-habitat-description#:~:text=Suitable%20habitat%20for%20Blanding's%20Turtles,marsh%20complexes%20(Joyal%20et%20al.

Ministry of Environment, Conservation and Parks. 2019c. Species at Risk Overall Benefit Permits. Available online at: https://www.ontario.ca/page/species-risk-overall-benefit-permits#:~:text=The%20overall%20benefit%20permit%20authorizes,of%20a%20species%20at%20risk

Ministry of Environment, Conservation and Parks. 2019d. Alter a Structure (Habitat for Barn Swallow). Available online at: https://www.ontario.ca/page/alter-structure-habitat-barn-swallow

Ministry of Environment, Conservation and Parks. 2019e. Nine-spotted Lady Beetle. Available online at: https://www.ontario.ca/page/nine-spotted-lady-beetle

Ministry of Environment, Conservation and Parks. 2019f. Rapids Clubtail. Available online at: https://www.ontario.ca/page/rapids-clubtail

Ministry of Environment, Conservation and Parks. 2019g. Rusty-patched Bumble Bee. https://www.ontario.ca/page/rusty-patched-bumble-bee

Ministry of Environment, Conservation and Parks. 2019h. Pale-bellied Frost Lichen. Available online at: https://www.ontario.ca/page/pale-bellied-frost-lichen

Ministry of Environment, Conservation and Parks. 2020a. Gray Fox. Available online at: https://www.ontario.ca/page/grey-fox

Ministry of Environment, Conservation and Parks. 2020b. Transverse Lady Beetle. Available online at: https://www.ontario.ca/page/transverse-lady-beetle

Ministry of Natural Resources. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Ontario Ministry of Natural Resources. Second Edition. March 18, 2010.

Ministry of Natural Resources. 2013. Reptile and Amphibian Exclusion Fencing: Best Practices, Version 1.0. Species at Risk Branch Technical Note. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. 11 pp.

Ministry of Natural Resources. 2014a. Ontario Wetland Evaluation System: Southern Manual. 3rd Edition, Version 3.3. Available online at: https://files.ontario.ca/environment-and-energy/parks-andprotected-areas/ontario-wetland-evaluation-system-southen-manual-2014.pdf

Ministry of Natural Resources. 2014b. Butternut Assessment Guidelines – Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act*, 2007. Available online at: https://www.ontario.ca/document/2019-review-progress-towards-protection-and-recovery-ontarios-species-risk/butternut

Ministry of Natural Resources. 2014c. Use of Buildings and Isolated Trees by Species at Risk Bats: Survey Methodology. October 2014. MNRF Guelph District.

Ministry of Natural Resources and Forestry. 2015a. Technical Note: Species at Risk (SAR) Bats. OMNRF Regional Operations Division. 37 pp.

Ministry of Natural Resources and Forestry. 2015b. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. OMNRF Regional Operations Division: Southern Region Resources Section, Peterborough, Ontario. 39 pp.

Ministry of Natural Resources and Forestry. 2015c. Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario. OMNRF, Species Conservation Policy Branch. Peterborough, Ontario. ii + 16 pp.

Ministry of Natural Resources and Forestry. 2017a. Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-Colored Bat. OMNRF Guelph District. 13 pp.

Ministry of Natural Resources and Forestry. 2017b. Best Management Practices for Excluding Barn Swallows and Chimney Swifts from Buildings and Structures. Available online at: https://files.ontario.ca/barschswbmpenpdffinalv.1.017ja241.pdf

Ministry of Natural Resources and Forestry. 2019. *Lakes and Rivers Improvement Act* Administrative Guide. Available online at: https://www.ontario.ca/page/lakes-and-rivers-improvement-act-administrative-guide#section-3

Ministry of Natural Resources and Forestry (MNRF). 2020a. Natural Heritage Information Centre: Make Natural Heritage Map. Available online at: https://www.ontario.ca/page/make-natural-heritage-area-map

Ministry of Natural Resources and Forestry (MNRF). 2020b. Land Information Ontario Provincially Tracked Species Grid Detail. Available online at: https://geohub.lio.gov.on.ca/datasets/provincially-tracked-species-grid-detail

Mississippi Valley Conservation Authority. 2009. Poole Creek Macro Stream Assessment Report Summer 2009. Available online at: http://www.renaud.ca/public/PooleCreek/2009-MVC-Poole-Creek-Macro-Stream-Assessment.pdf

Mississippi Valley Conservation Authority. 2020. Interactive Property Map. Available online at: https://mvc.on.ca/development-permits/interactive-property-map/

Mississippi Valley Conservation Authority, Rideau Valley Conservation Authority, and South Nation Conservation. 2019. City Stream Watch 2019 Summary Report. Available online at: https://mvc.on.ca/citizen-science-stewardship/city-stream-watch/

National Park Service (Department of the Interior). 2016. Guidance for Conducting Acoustic Surveys for Bats Version 1: Detector Deployment, File Processing and Database Version 1.7 Natural Resource Report NPS/NRSS/NRR—2016/1282.

Ontario Nature. 2019. Herp Atlas. Available online at: https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas/species/

Poisson, G., and M. Ursic. 2013. Recovery Strategy for the Butternut (*Juglans cinerea*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. v + 12 pp. + Appendix vii + 24 pp. Adoption of the Recovery Strategy for the Butternut (*Juglans cinerea*) in Canada (Environment Canada 2010).

Toronto and Region Conservation Authority and Credit Valley Conservation. 2014. Evaluation, Classification and Management of Headwater Drainage Features Guidelines. Available online at: https://cvc.ca/wp-content/uploads/2014/02/HDFA-final.pdf

Appendix A Qualifications of Report Authors

Katherine Black, MSc

Ms. Black is a Biologist with over six years of comprehensive field, laboratory, and report-writing experience in biology. She has worked in a variety of research settings, including technical laboratories, greenhouses, construction sites, and remote fly-in field sites. Katie's background is predominantly in terrestrial ecology; she has performed vegetation and wildlife surveys in a variety of natural and disturbed environments, including wetland, tundra, field, and forest environments. She has also worked on projects in aquatic ecology, ecohydrology, and biostatistics. Katie joined Kilgour & Associates Ltd. in January of 2019 and has since contributed to numerous Environmental Impact Statements (EIS), Tree Conservation Reports (TCR), Headwater Drainage Feature Assessments (HDFA), Integrated Environmental Reviews (IER), Constraints Analyses, Existing Conditions Reports, delineation of natural heritage features, species at risk (SAR) monitoring, erosion and sediment control inspections, water quality monitoring, fish dissections, and sorting and identification of aquatic macroinvertebrates. Ms. Black is certified in the Ontario Wetland Evaluation System protocol, Ontario Reptile and Amphibian Survey methods, and Butternut Health Assessment (BHA #731).

Anthony Francis, PhD

Dr. Francis is a Senior Ecologist with 20 years of consulting experience to both government agencies and private industry. He has worked on a diversity of projects relating to species at risk, invasive species, terrestrial and aquatic habitat, environmental effects monitoring and mitigation, and fate/effects of contaminants. Within each of these subject areas, Dr. Francis has completed projects addressing specific site concerns and broader policy initiatives.

In the Ottawa area, Dr. Francis helps clients work their way through the land development process by producing key supporting studies such as Environmental Impact Statements, Integrated Environmental Reviews, and by obtaining various permits and approvals from local regulatory agencies including the conservation authorities and Ministries of Environment and Natural Resources. Dr. Francis is our local in-house geomatics specialist, capable of carrying out detailed and complex analyses of geospatial data of plant and animal distribution. He often utilizes his skills to carry out constraint studies prior to a client purchasing or planning a development for a property.

Appendix B Headwater Drainage Features Assessment Report for the Site

Headwater Drainage Features Assessment Report
37 Wildpine Court, Stittsville, Ottawa, Ontario

December 11, 2020

KILGOUR & ASSOCIATES LTD.
www.kilgourassociates.com

TABLE OF CONTENTS

List of Figures

List of Tables

List of Acronyms and Abbreviations

CVC – Credit Valley Conservation
ELC – Ecological Land Classification
HDFA – Headwater Drainage Features Assessment
KAL – Kilgour & Associates Ltd.
MVCA – Mississippi Valley Conservation Authority
OSAP – Ontario Stream Assessment Protocol
OWES – Ontario Wetland Evaluation
TRCA – Toronto and Region Conservation Authority

1.0 INTRODUCTION

Kilgour & Associates Ltd. (KAL) was retained by Wildpine Trails Inc. to provide a Headwater Drainage Features Assessment (HDFA) report for 37 Wildpine Court in Stittsville, Ottawa, Ontario (herein "the Site"; Figure 1). This HDFA report provides a detailed description of the single headwater drainage feature on the Site. A headwater drainage feature is a non-permanently flowing drainage feature that may not have a defined bed or banks; they are first-order and zero-order intermittent and ephemeral channels, swales, and connected headwater wetlands, but do not include rills or furrows (Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC), 2014). Based on this definition, the Site only contains one headwater feature which is a headwater wetland. A headwater wetland is a wetland that is connected downstream through surface flow (TRCA and CVC, 2014). The wetland on the Site is part of the Stittsville Wetland complex (not a provincially significant wetland) and is connected downstream to Poole Creek via surface flow. Poole Creek is not considered a headwater drainage feature because it is a permanently flowing feature. As such, this HDFA report provides information on the headwater wetland's aquatic and riparian habitat and the presence of biota along with appropriate management options for the feature (TRCA & CVC, 2014).

1.1 Property Information

The Site is approximately 2 hectares (ha) and is zoned *R3XX[1046] – Residential Third Density Zone* and is therefore intended for residential development. At the time of writing this report, the Site was dominated by wooded areas including those part of the Stittsville Wetland complex. The Site also contained open lawn space, a paved cul de sac, a single detached home with a separate garage and shed, a small portion of Poole Creek, and regulated floodplain of Poole Creek.

The Site is surrounded by:

- A shopping plaza, a stormwater management pond, and the Stittsville Wetland complex to the north;
- Poole Creek and the Stittsville Wetland complex to the east;
- A residential community on Wildpine Court to the south; and
- A residential community on Ravenscroft Court to the west.

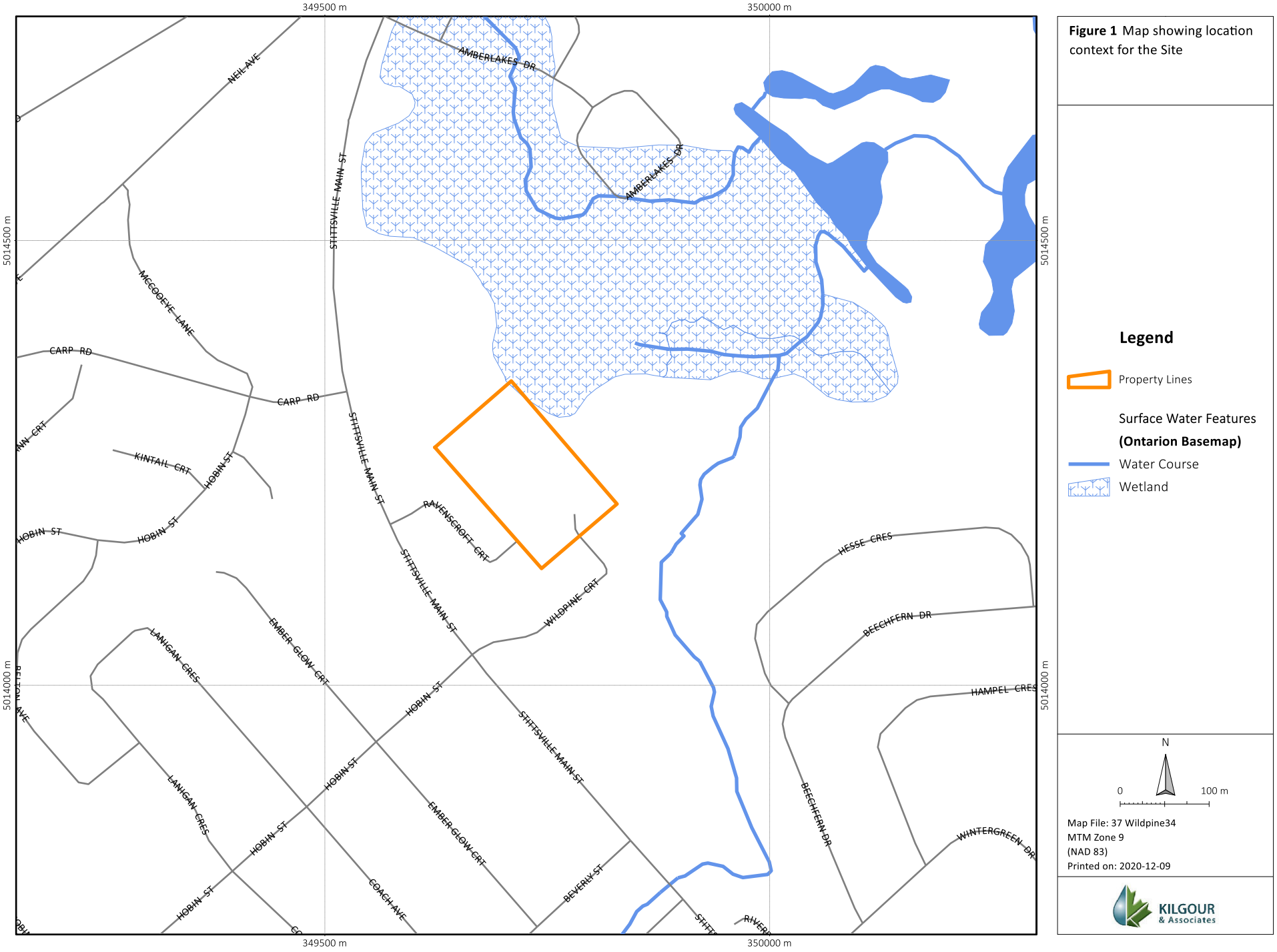

Figure 1 Map showing location context for the Site

Legend

- Property Lines
- Surface Water Features **(Ontarion Basemap)**
- Water Course
- Wetland

N

0 100 m

Map File: 37 Wildpine34
MTM Zone 9
(NAD 83)
Printed on: 2020-12-09

KILGOUR & Associates

2.0 METHODS

Survey methods for the headwater wetland on the Site followed the "Standard" survey type for HDFAs (TRCA & CVC, 2014; Table 1).

Table 1 Data requirements for the Standard survey type for Headwater Drainage Features Assessments

Survey Type	Sensitivity, Feature Form, and Flow	Mandatory Data Requirements		Additional Data Requirements for HDF Alterations	
		Flow Condition	Riparian	Fish and Fish Habitat	Terrestrial Assessment
Standard	Sensitive species/habitat possible and/or ill-defined form, intermittent flow likely	Ontario Stream Assessment Protocol (OSAP) S4.M10 (Headwaters)	OSAP S4.M10 (Headwaters)	OSAP S3.M1	Marsh Monitoring Protocol for Amphibians; Ecological Land Classification; Ontario Wetland Evaluation System (for wetlands ≥ 0.5 ha)

Table Notes: Adapted from Toronto and Region Conservation Authority and Credit Valley Conservation (2014)

Site investigations were performed in the spring and summer of 2020 to perform anuran (frog and toad) surveys, delineate the wetland's boundaries, characterize surface water levels in the spring and summer, and document vegetation communities (Table 2). The Standard survey type for HDFAs calls for an assessment of fish habitat using OSAP S3.M1; however, since the wetland did not contain any open water or permanent standing water, fish sampling was not conducted. The adjacent Poole Creek is known to contain a variety of fish species (e.g., MVCA, RVCA, & SNC, 2019; MVCA, 2009).

Table 2 Summary of site investigations

Date	Purpose
2020-05-05	Anuran survey #1.
2020-05-21	Anuran survey #2.
2020-05-22	Delineate the wetland's boundaries and characterize surface water levels and vegetation during spring conditions.
2020-06-03	Delineate the wetland's boundaries and characterize surface water levels and vegetation during spring conditions (continued).
2020-06-19	Anuran survey #3.
2020-06-23	Confirm wetland boundaries with Mississippi Valley Conservation Authority (MVCA).
2020-07-15	Investigate the wetland's surface water levels and vegetation during summer conditions.

2.1 Anuran Surveys

Aural anuran surveys were performed following the Marsh Monitoring Program (Bird Studies Canada et al., 2008). This protocol calls for multiple survey stations at a site to capture spatial and habitat variability. Accordingly, surveys were performed from two stations ("MMP-1" and "MMP-2" on Figure 2) adjacent to the wetland on the Site. The Marsh Monitoring Program advises that each station be visited a minimum of three times at night, no less than 15 days apart, during the spring and early summer.

Following this protocol, the timing of the three anuran surveys is based on nighttime air temperature:

- Early breeders (Wood Frog, Western Chorus Frog, Spring Peeper): above 5°C;
- Mid-season breeders (Mink Frog, American Toad, Gray Treefrog): above 10°C; and
- Late breeders (Green Frog, Bullfrog): above 17°C.

Three rounds of anuran surveys were performed and began one half hour after sunset and ended before 1:00 am on evenings with appropriate temperatures and light winds.

Any additional observations of amphibians were recorded during other visits to the Site. Rocks, fallen wood, and other debris were turned over to check for salamanders throughout the broader field campaign.

Figure 2 Map showing the locations of anuran survey stations for the Site

Legend

Property Lines

Wildlife Survey Stations

Anurans

N

0 50 m

Map File: 37 Wildpine34
MTM Zone 9
(NAD 83)
Printed on: 2020-12-11

KILGOUR & Associates

2.2 Wetland Delineation

The boundaries of the wetland on the Site were delineated following techniques used in the Ontario Wetland Evaluation System (OWES; MNR, 2014). Wetland boundaries on the Site were determined in the field based on plant species composition and soils, and via desktop using aerial imagery and elevation mapping. A biologist from MVCA visited the Site with KAL biologists to review the wetland's boundaries and agreed with KAL's delineation. Since this wetland was previously evaluated and scored using OWES (did not rank as provincially significant), a wetland evaluation was not performed.

2.3 Ecological Land Classification

Vegetation communities on the Site were characterized following Ecological Land Classification (ELC; Lee et al., 1998). This method results in a standardized description of each vegetation community, giving information on dominant plant species and soils.

2.4 Surface Water Levels

Surface water levels in the wetland were qualitatively assessed by conducting walking surveys of wetland on the Site during the spring and summer. This involved confirming whether the wetland contained standing surface water, if it was surface-damp, or if the soil surface was dry.

3.0 RESULTS

3.1 Anuran Surveys

No anurans were observed during evening aural surveys (Table 3) or during other site visits.

Table 3 Results of anuran surveys for the headwater wetland on the Site

Date	Air Temperature (°C)	Wind (Beaufort Scale)[1]	Cloud Cover (%)	Precipitation	Anuran Species Observed
2020/05/05	8	1 to 2	5	None	None
2020/05/20	19	0	5	None	None
2020/06/19	25	1	5	None	None

Table Notes: [1]The Beaufort Wind Force Scale is an empirical measure that relates wind speed to observed conditions at sea or land. The scale is as follows: **0**: calm, smoke rises vertically, wind speed <1km/hr; **1**: light air, smoke drift indicates wind direction, leaves and wind vanes are stationary, wind speed = 1.1-5.5km/hr; **2**: light breeze, wind felt on exposed skin, leaves rustle, wind vanes begin to move, wind speed = 5.6-11km/hr, **3**: gentle breeze, leaves and small twigs constantly moving, light flags extended, wind speed = 12-19km/hr.

3.2 Wetland Delineation

The boundaries of the wetland on the Site, as determined through field and desktop methods and in consultation with MVCA, are shown in Figure 3. The boundaries of the wetland were clear in the field based on the transition between wetland and upland vegetation and elevational change. The upland edge at the wetland boundary is comprised of a considerable amount of fill material that has since naturalized with vegetation. The total wetland area on the Site is approximately 0.6 ha and consists of several types

of wetland: meadow marsh, cattail marsh, deciduous thicket (low shrub) swamp, mixed swamp, and deciduous swamp.

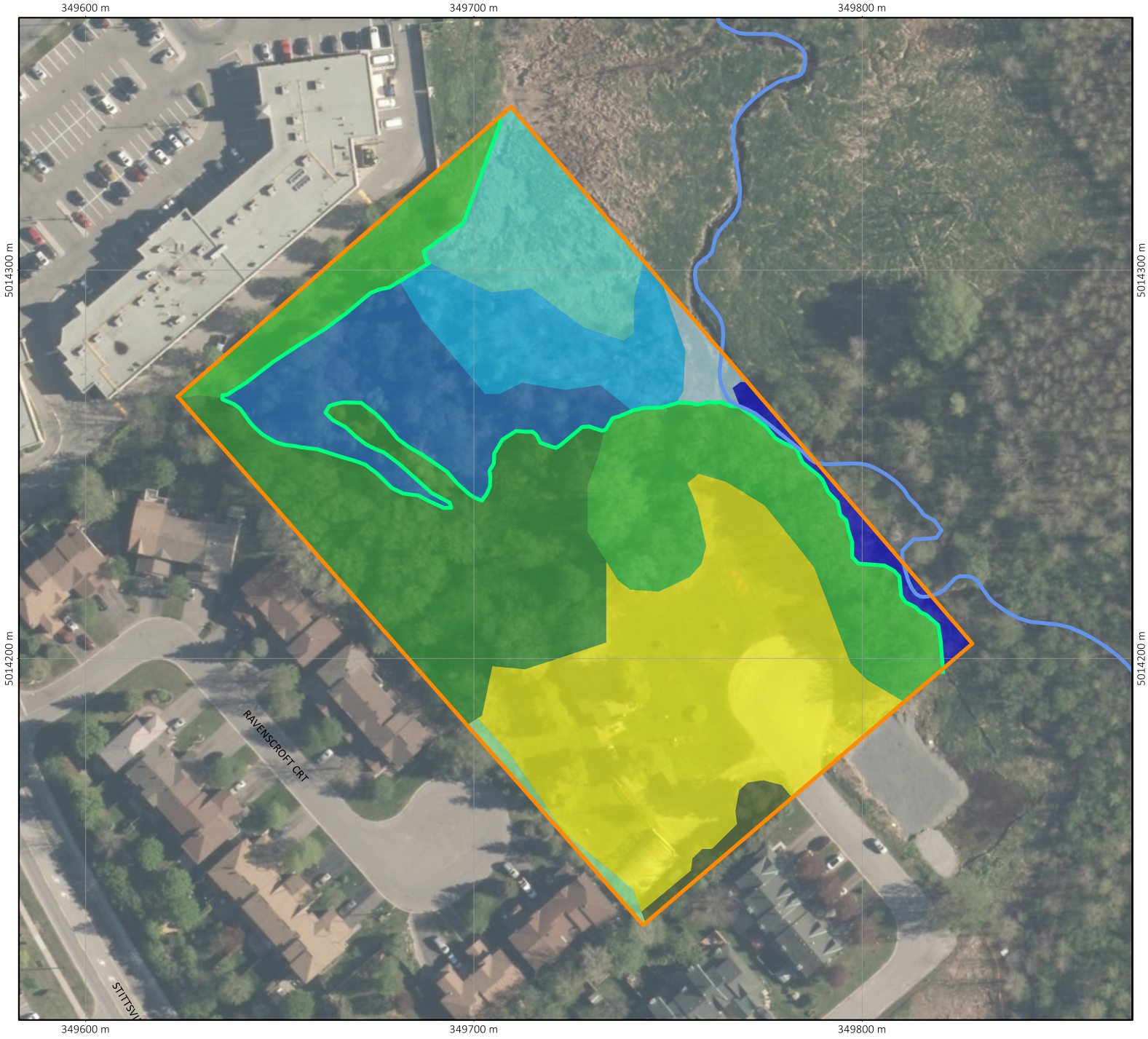

Figure 3 Map showing the boundaries and Ecological Land Classification for the portion of the headwater wetland that falls on the Site

Legend

Property Lines

Aquatic Habitat

Poole Creek

Wetland Boundary

ELC

FODM11

FODM4-5

FODM9-5

Cedar Hedge

Lawn

MASO1-4

MAS3-1

SWT3-2

SWM4-1

SWD6

N

0 50 m

Map File: 37 Wildpine34
MTM Zone 9
(NAD 83)
Printed on: 2020-12-11

KILGOUR & Associates

3.3 Ecological Land Classification

Five distinct vegetation communities were delineated within wetland on the Site using ELC (Figure 3). Each wetland community and the dominant vegetation therein are described below. On the Site, the wetland is fully bounded by terrestrial forest ecosites including Dry – Fresh Manitoba Maple Deciduous Forest (FODM4-5) and Fresh – Moist Bitternut Hickory Deciduous Forest (FODM9-5; Figure 3).

3.3.1 Maple Organic Deciduous Swamp Ecosite (SWD6)

The SWFD6 ecosite makes up the treed corridor of Poole Creek along the eastern edge of the Site (Figure 4). Note that SWD6 is typically used to describe organic swamps dominated by Red Maple (*Acer rubrum*), Silver Maple (*Acer saccharinum*), and/or Freeman's Maple (*Acer freemanii*). However, this swamp is dominated by Manitoba Maple (*Acer negundo*) followed by Crack Willow (*Salix fragilis*). The dominant shrub species is Speckled Alder (*Alnus incana*) and ground cover is dominated by Spotted Jewelweed (*Impatiens capensis*).

Figure 4 Photo of the Maple Organic Deciduous Swamp Ecosite (SWD6) within the headwater wetland on the Site

3.3.2 Cattail Organic Shallow Marsh Type (MAS3-1)

The northeastern corner of the Site consists of the MAS3-1 community and is dominated by a near-homogenous cover of Broad-leaved Cattail (*Typha latifolia*; Figure 5).

Figure 5 Photo of the Cattail Organic Shallow Marsh Type (MAS3-1) within the headwater wetland on the Site

3.3.3 Reed Canary Grass Organic Shallow Marsh Type (MASO1-4)

The riparian corridor of Poole Creek north of the SWD6 ecosite on the Site consists of meadow marsh dominated by Reed Canary Grass (*Phalaris arundinacea*; Figure 6).

Figure 6 Photo of the Reed Canary Grass Organic Shallow Marsh Type (MASO1-4) within the headwater wetland on the Site

3.3.4 Willow Organic Thicket Swamp Type (SWT3-2)

Southwest of the MAS3-1 community is a thicket (tall shrub) swamp dominated by Peachleaf Willow (*Salix amygdaloides*) followed by Glossy Buckthorn (*Rhamnus frangula;* Figure 7).

Figure 7 Photo of the Willow Organic Thicket Swamp Type (SWT3-2) within the headwater wetland on the Site

3.3.5 White Cedar – Hardwood Organic Mixed Swamp Type (SWM4-1)

The northwestern to southeastern edge of the headwater wetland on the Site is a treed swamp co-dominated by Black Ash (*Fraxinus nigra*), Eastern White Cedar (*Thuja occidentalis*), and Manitoba Maple (Figure 8). The understory is dominated by Glossy Buckthorn and the ground cover is dominated by Spotted Jewelweed.

Figure 8 Photo of the White Cedar – Hardwood Organic Mixed Swamp Type (SWM4-1) within the headwater wetland on the Site

3.4 Surface Water Levels

Throughout the spring, vegetation communities within the wetland on the Site had either shallow standing water or were surface damp. The SWM4-1 community was the wettest and contained scattered lower-lying pockets with a maximum water depth of approximately 20 cm. The MAS3-1, MASO1-4, and SWT3-2 communities were dry in the summer while the SWD6 and SWM4-1 communities were still surface damp.

4.0 CLASSIFICATION

Information obtained regarding anuran presence, aquatic and terrestrial habitat, and hydrology was used to apply the appropriate classification to the wetland by identifying the functions the feature provides (TRCA & CVC, 2014; Table 4). The hierarchical functions ranking for each classification type ranges from (lowest to highest): limited, contributing, valued, and important functions.

Table 4 Summary of functional classifications for the headwater wetland on the Site

Classification Type	Functions Ranking	Notes
Hydrology	Valued	Wetland with intermittent standing surface water; hydrologically connected to Poole Creek.
Riparian Conditions	Important	The feature type is a wetland.
Fish and Fish Habitat	Contributing	No spawning/rearing, feeding, cover, refuge, or migration habitat or habitat for at-risk fish species within the wetland. Likely contributes allochthonous materials to downstream fish-bearing habitat in Poole Creek.
Terrestrial Habitat	Valued	Wetland habitat but no evidence of breeding amphibians. Presence of fish in Poole Creek likely prevents amphibian presence in the wetland on the Site. May provide "stepping stone" habitat (e.g., stop-over to higher quality habitat) or suitable habitat for feeding or hydration for low mobility amphibians.

5.0 MANAGEMENT RECOMMENDATIONS

The functions rankings (classifications) identified for the hydrology, riparian conditions, fish habitat, and terrestrial habitat of the wetland form the basis of the management recommendation for the feature (Table 4; Figure 9; TRCA and CVC, 2014). .

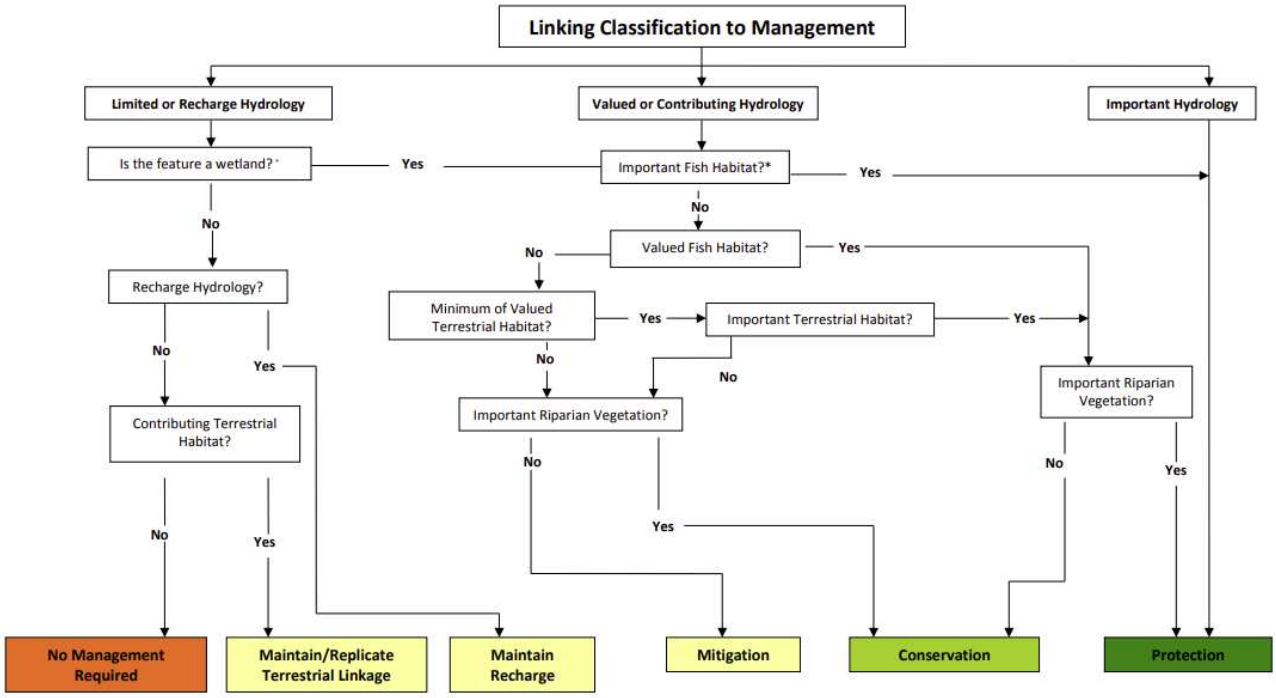

Figure 9 Flow chart providing direction on management options based on the wetland's classifications adapted from TRCA and CVC (2014)

The management recommendation for the wetland on the Site is **Conservation**. Conserving the wetland includes (TRCA & CVC, 2014):

- Maintaining and/or enhancing the feature;
- Restoring hydrological and riparian and terrestrial habitat functions that may have been lost due to the historical placement of fill along the wetland's edge, as feasible;
- Maintaining catchment flows (e.g., maintaining onsite flows through low impact development and/or natural design techniques and/or stormwater management design);
- Designing and locating the onsite stormwater management system such that impacts to the wetland (e.g., sediment loading, temperature changes) are avoided; and
- Maintaining a development setback from the wetland to prevent impacts to the feature.

Ontario Regulation 153/06 of the *Conservation Authorities Act* (1990) prohibits or restricts development and site alterations near wetlands to prevent flooding, erosion, and other hazards. A permit will be required from MVCA if site alteration is to occur within 30 m of the wetland.

The "top edge of the fill" that had been on the Site is generally situated ≤15 m beyond the current wetland edge (Figures 10 and 11). Portions of the Site beyond 15 m from the wetland edge are located within an artificially raised tableland and are indistinct from the hydrology, riparian, or terrestrial habitat functions of areas >30 m from the wetland. The 15m buffer adjacent to the wetland encompasses the transition zone from upland to wetland and should be protected accordingly. The natural character of this area,

however, has been significantly degraded. This area should be reserved as a setback from the wetland and be subject to an enhancement program including the removal of invasive species and accumulated trash, and the planting of native species that are typical of transition areas between wetland and upland habitats.

Figure 10 Photo of fill and rubble on the edge of the wetland on the Site

Figure 11 Map showing the "top edge of fill" mark around the wetland on the Site

Legend

Property Lines

Aquatic Habitat

Poole Creek

Wetland Boundary

Top Edge of Fill

N

0 50 m

Map File: 37 Wildpine34
MTM Zone 9
(NAD 83)
Printed on: 2020-12-11

KILGOUR & Associates

6.0 CLOSURE

This report was prepared for exclusive use by Wildpine Trails Inc. and may be distributed only by Wildpine Trails Inc. Questions relating to the data and interpretation can be addressed to the undersigned.

Respectfully submitted,

KILGOUR & ASSOCIATES LTD.

Katherine Black, MSc	Anthony Francis, PhD
Biologist	Project Director

7.0 LITERATURE CITED

Bird Studies Canada, United States Environmental Protection Agency, and Environment Canada. 2008. Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Revised). Available online at: https://www.birdscanada.org/bird-science/marsh-monitoring-program/

Credit Valley Conservation Authority and Toronto and Region Conservation Authority (CVC & TRCA). 2014. Evaluation, Classification, and Management of Headwater Drainage Features Guidelines. January 2014. Available online at: https://cvc.ca/wp-content/uploads/2014/02/HDFA-final.pdf

Government of Ontario. 2013. Ontario Regulation 153/06: Mississippi Valley Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses under *Conservation Authorities Act*, R.S.O. 1990, c. C.27. Available online at: https://www.ontario.ca/laws/regulation/060153

Lee, H.R., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, North Bay.

Ministry of Natural Resources (MNR). 2014. Ontario Wetland Evaluation System: Southern Manual. 3rd Edition, Version 3.3. Available online at: https://files.ontario.ca/environment-and-energy/parks-andprotected-areas/ontario-wetland-evaluation-system-southen-manual-2014.pdf

Mississippi Valley Conservation Authority. 2009. Poole Creek Macro Stream Assessment Report. Available online at: http://www.renaud.ca/public/PooleCreek/2009-MVC-Poole-Creek-Macro-Stream-Assessment.pdf

Mississippi Valley Conservation Authority, Rideau Valley Conservation Authority, and South Nation Conservation. 2019. City Stream Watch 2019 Summary Report. Available online at: http://www.renaud.ca/public/PooleCreek/2009-MVC-Poole-Creek-Macro-Stream-Assessment.pdf

Appendix C Tree Conservation Report for the Site

Tree Conservation Report
37 Wildpine Court, Stittsville, Ottawa

August 10, 2021

KILGOUR & ASSOCIATES LTD.
www.kilgourassociates.com

TABLE OF CONTENTS

List of Figures

List of Tables

List of Appendices

List of Acronyms and Abbreviations

CRZ – Critical root zone
DBH – Diameter at breast height
ESA – *Endangered Species Act*
KAL – Kilgour & Associates Ltd.
MNRF – Ministry of Natural Resources and Forestry
SAR – Species at risk
SARA – *Species at Risk Act*
TCR – Tree Conservation Report

1.0 INTRODUCTION

Kilgour & Associates Ltd. (KAL) was retained by Wildpine Trails Inc. to provide a Tree Conservation Report (TCR) for the proposed development of 37 Wildpine Court in Stittsville, Ottawa (herein the "Site"). The purpose of a TCR is to demonstrate how tree cover will be retained on sites subject to development using a "design with nature approach" to planning and engineering. A design with nature approach incorporates natural features of a site into the design and engineering of a proposed development. This TCR has been prepared following the City of Ottawa's guidelines (2018a). This report identifies and describes tree cover on the project site prior to its proposed development.

A TCR is required for all Plans of Subdivision, Site Plan Control Applications, Common Elements Condominium Applications, and Vacant Land Condominium Applications where there is a tree of 10 cm in diameter at breast height (DBH) or greater on a site and/or if there is a tree on an adjacent site that has a critical root zone (CRZ) extending onto a development site. A "tree" is defined as any species of woody perennial plant, including its root system, which has reached or can reach a minimum height of at least 450 cm at physiological maturity. The CRZ is calculated as DBH x 10 cm.

The removal of trees on a project site cannot occur until written approval of the TCR has been granted through a tree permit as per the City of Ottawa's Tree Protection By-law. The approval of the TCR will come in the form of a letter (the tree permit) from the General Manager[1] with conditions specific to the site, tree retention, and associated tree protection and tree removal. The approved TCR is a requirement for the approval of the development applications listed above. A copy of the report must be available on-site during tree removal, grading, construction, or any other site alteration activities, and for the duration of construction on the site.

2.0 PROPERTY INFORMATION

The Site is owned by Wildpine Trails Inc. It is approximately 2 ha and is zoned as *R3XX[1046] – Residential Third Density Zone*. At the time of writing this report, the Site was dominated by wooded areas including those part of the Stittsville Wetland Complex (not a provincially significant wetland). It also contained open lawn space, a paved cul de sac, a single detached home with a separate garage and shed, a small portion of Poole Creek, and regulated floodplain of Poole Creek (Figure 1).

The Site is surrounded by:

- A shopping plaza, a stormwater management pond, and the Stittsville Wetland Complex to the north.
- Poole Creek and the Stittsville Wetland Complex to the east.
- A residential community on Wildpine Court to the south.
- A residential community on Ravenscroft Court to the west.

[1] General Manager of the Public Works & Environmental Services Department or the General Manager of the Planning, Infrastructure and Economic Development Department of the City of Ottawa, or their designate.

Figure 1 Existing conditions on the Site

Legend

- Property Lines
- Floodplain
- Poole Creek - Top of Bank
- Wetland Boundary
- Top Edge of Fill

N

0 50 m

Map File: 37 Wildpine6
MTM Zone 9
(NAD 83)
Printed on: 2020-12-21

KILGOUR & Associates

2.1 Property Owner and Applicant Contact Information

Table 1 Organization, role, contact person, phone number, and email address for property owner and applicant

Organization	Role	Contact Person	Phone Number	Email Address
Wildpine Trails Inc.	Property Owner and Applicant	Carmine Zayoun	**(305) 607-8749**	carmine.zayoun@gmail.com

2.2 Arborist Contact Information and Qualifications

Table 2 Organization, role, contact person, phone number, and email address for arborists

Organization	Role	Contact Person	Phone Number	Email Address
KAL	Biologist	Katherine Black, MSc	**(613) 260-5555**	kblack@kilgourassociates.com
KAL	Biologist	Anthony Francis, PhD	**(613) 260-5555**	afrancis@kilgourassociates.com
KAL	Biologist	Robert Hallett, Tech. Dipl.	**(613) 260-5555**	rhallett@kilgourassociates.com

Katherine Black (MSc) has over six years of comprehensive field, laboratory, and report-writing experience in biology. She has worked in a variety of field settings, including natural environments, construction sites, and greenhouses. Ms. Black's background is predominantly in vegetation ecology; she has performed vegetation surveys in a variety of natural and disturbed environments, including wetland, tundra, field, and forest environments. Since joining KAL in 2019, Ms. Black has contributed to numerous Environmental Impact Statements and TCRs. Ms. Black is also a certified Butternut Health Assessor (BHA #731).

Anthony Francis (PhD) is a Senior Ecologist with 20 years' consulting experience to both government agencies and private industry. He has worked on a diversity of projects relating to species at risk (SAR), invasive species, terrestrial and aquatic habitat, environmental effects monitoring and mitigation, and fate/effects of contaminants. Within each of these subject areas, Dr. Francis has completed projects addressing specific site concerns and broader policy initiatives. Dr. Francis' academic background is in spatial ecology with a focus on tree species diversity. As a Senior Ecologist at KAL, he regularly completes TCRs, Environmental Impact Statements, and Integrated Environmental Reviews for land development projects throughout Ottawa and eastern Ontario. He is also a certified Butternut Health Assessor (BHA #104).

Robert Hallett (Tech. Dipl.) has a broad background in monitoring both terrestrial and aquatic environments. Rob has 10 years of experience conducting tree surveys in support of TCRs and is a certified Butternut Health Assessor (BHA 546).

2.3 Additional Planning Applications

Not applicable.

3.0 EXSITING CONDITIONS

3.1 Tree Inventory

A detailed inventory of all trees on the Site was performed on June 19, 2020 following the City of Ottawa's TCR guidelines (2018a):

- Clusters and hedgerows of trees of the same species were demarcated as such. The number of individuals within a cluster/hedgerow was counted and the size range in diameter at breast height (DBH) of trees within a cluster/hedgerow was determined.
    - "Distinctive" trees (i.e., those with DBH ≥ 50 cm), uncommon species, and protected species that occurred within a cluster or hedgerow were individually mapped and not counted in the aggregate metrics for the cluster/hedgerow.
- All other trees (i.e., not in clusters or hedgerows of all the same species) with DBH ≥ 10 cm were individually mapped.
- Butternut trees (listed as Endangered under the *Endangered Species Act* (ESA) and *Species at Risk Act* (SARA)) were specifically searched for. The health of live Butternuts that fell within 50 m of the proposed development footprint were assessed by a qualified Butternut Health Assessor[2].

The detailed results of the tree inventory are presented in Appendix A and are shown in Figure 2. In general, 197 trees with DBH ≥ 10 cm were identified on the Site, with the most dominant species being Manitoba Maple (*Acer negundo*), Eastern White Cedar (*Thuja occidentalis*), and Bitternut Hickory (*Carya cordiformis*; Table 3). Eleven distinctive trees (DBH ≥ 50) cm were identified.

[2] For most activities that would involve killing or harming a Butternut, a person's eligibility for an exemption under Ontario Regulation 242/08 under the ESA is dependent on the category to which a tree is assigned following a Butternut health assessment and the details of the proposed activity (e.g., the number of trees to be affected; MNR, 2014).

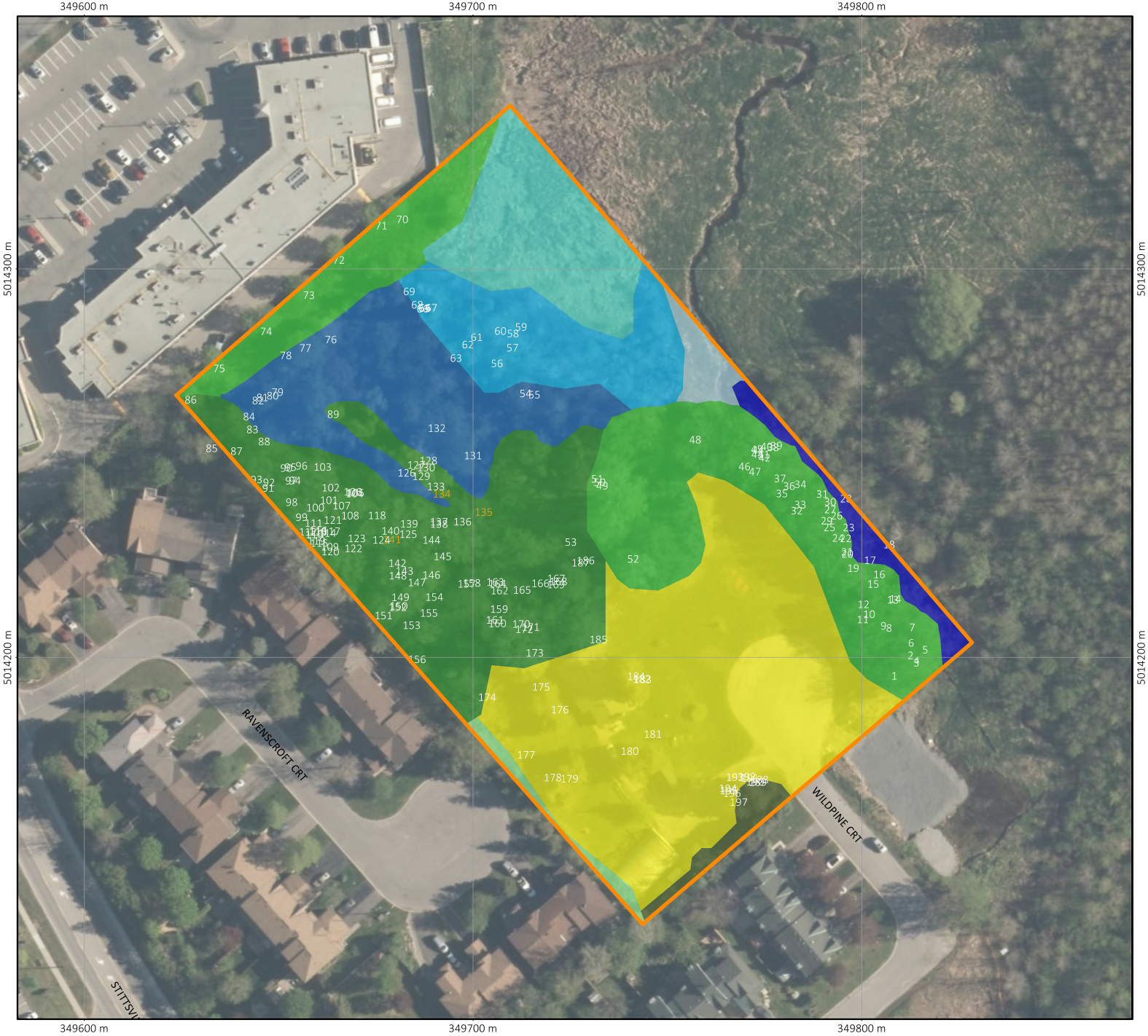

Figure 2 Existing trees on the Site

Legend

Property Lines

Site Trees

\# Tree (>10cm DBH)

\# Butternut

ELC

- FODM11
- FODM4-5
- FODM9-5
- Cedar Hedge
- Lawn
- MASO1-4
- MAS3-1
- SWT3-2
- SWM4-1
- SWD6

N

0 — 50 m

Map File: 37 Wildpine6
MTM Zone 9
(NAD 83)
Printed on: 2020-12-21

KILGOUR & Associates

Table 3 Tree species count and percent composition for the Site

Species	Count	Percent Composition
American Elm (*Ulmus americana*)	14	7.1
Basswood (*Tilia americana*)	9	4.6
Bitternut Hickory (*Carya cordiformis*)	43	21.8
Black Ash (*Fraxinus americana*)	9	4.6
Butternut (*Juglans cinerea*)	3	1.5
Crack Willow (*Salix fragilis*)	5	2.5
Eastern Cottonwood (*Populus deltoides*)	3	1.5
Eastern White Cedar (*Thuja occidentalis*)	44	22.3
Ironwood (*Ostrya virginiana*)	5	2.5
Manitoba Maple (*Acer negundo*)	45	22.8
Siberian Elm (*Ulmus pumila*)	2	1.0
Silver Maple (*Acer saccharinum*)	1	0.5
Sugar Maple (*Acer saccharum*)	5	2.5
Trembling Aspen (*Populus tremuloides*)	5	2.5
White Oak (*Quercus alba*)	1	0.5
White Pine (*Pinus strobus*)	1	0.5
White Spruce (*Picea glauca*)	1	0.5
Yellow Birch (*Betula alleghaniensis*)	1	0.5
SUM	197	100.0

3.1.1 Ecological Significance of Trees on the Site

The Site contains three Butternuts (two dead and one live), a federally and provincially significant tree species that is listed as Endangered under the ESA and SARA. The live Butternut was assessed as a Category 3 Butternut, meaning that it exhibited evidence that it may be resistant to or tolerant of infection by Butternut canker (*Ophiognomonia clavigignenti-juglandacearum*). Category 3 trees are especially important to the recovery of Butternut because they may be useful in determining sources of resistance to Butternut canker (MNR, 2014).

The Site also contains one White Oak (*Quercus alba*) and one Siberian Elm (*Ulmus pumila*), both of which are regionally significant (rare) species in the Ottawa area (Brunton, 2005), though Siberian Elm is non-native.

Ecological functions of the trees on-site include:

- Providing terrestrial and riparian habitat for wildlife such as common mammals and birds.
- Providing a vegetated buffer between Poole Creek and the Stittsville Wetland Complex and the adjacent developed areas, including:
    - Regulation of relative humidity and other microclimatic variables.
    - Sequestration of carbon.

- Removal of pollutants.
- Wind-shielding.
- Shading and reduction of urban heat island effects.

3.2 Other Natural Environment Elements

3.2.1 Surface Water Features

The Site includes a portion of the Stittsville Wetland Complex. The total wetland area on the Site is approximately 0.6 ha and consists of several types of wetland: meadow marsh (Ecological Land Classification code MASO1-4), cattail marsh (MAS3-1), deciduous thicket (tall shrub) swamp (SWT3-2), mixed swamp (SWM4-1), and deciduous swamp (SWD6; Figure 2). The upland edge of the wetland on the Site contains a considerable amount of fill that extends approximately 15 m out from the wetland. This upland edge of the wetland is degraded as indicated by the presence of rubble, trash, and non-native and/or invasive species.

The southeastern corner of the Site contains a small portion of the channel of Poole Creek and the eastern edge of the Site contains floodplain associated with Poole Creek.

Mitigation measures to prevent impacts to these surface water features are provided in the Environmental Impact Statement prepared for the project (KAL, 2020).

3.2.2 Steep Slopes

The Site does not contain any steep slopes, valleys, or escarpments.

3.2.3 Valued Woodlots

The Site does not contain any woodlots designated as Urban Natural Features or Natural Environment Areas, areas evaluated in the *City of Ottawa Urban Natural Areas Environmental Evaluation Study* (UNAEES; Muncaster Environmental Planning Inc. and Brunton Consulting Services, 2005), or other areas that meet the criteria used in the UNAEES.

3.2.4 Significant Woodlands

The Site does not contain any significant woodlands per the City of Ottawa's significant woodland guidelines (2018b).

3.2.5 Greenspace Linkages

The Site does not contain any greenspace linkages identified in the Greenspace Master Plan (City of Ottawa, 2016) or as may occur in the larger landscape.

3.2.6 Distinctive Trees

The Site contains 11 distinctive trees (Appendix A).

3.2.7 Unique Ecological Features

The Fresh-Moist Deciduous Bitternut Hickory Deciduous Forest (FODM9-5; Figure 2) on the Site is Significant Wildlife Habitat for Special Concern and Rare Wildlife Species (MNRF, 2015a) due to an observation of Eastern Wood-pewee (*Contopus virens*; Special Concern under ESA and SARA) here by KAL in 2020. All treed communities on-site are candidate Significant Wildlife Habitat for Bat Maternity Colonies because they are treed ecosites in which more than 10 Big Brown Bats (*Eptesicus fuscus*) and five adult female Silver-Haired Bats (*Lasionycteris noctivagans*) may occur (MNRF, 2015a). Big Brown Bats and Silver-Haired Bats were detected on the Site via acoustic monitoring by KAL in 2020, but the number and/or gender of each bat species could not be discerned from the acoustic data. It is therefore possible that Significant Wildlife Habitat for Bat Maternity Colonies exists on the Site but this cannot be confirmed with the acoustic data that were collected (KAL, 2020).

The Site does not contain other unique ecological features as may be identified in the Natural Heritage Information Centre (MNRF, 2020), Ecological Land Classification (Lee et al., 1998), or other Ministry of Natural Resources and Forestry data.

3.2.8 Species at Risk

The potential for SAR to occur on the Site and interact with the proposed development was assessed based on KAL's review of existing information, Ecological Land Classification (in-field habitat assessment), and field surveys conducted in 2020 (KAL, 2020). A total of ten species were assessed as having a moderate to high potential to interact with the proposed development (Table 4). Mitigation measures to prevent impacts to SAR listed as Endangered and Threatened are provided in the Environmental Impact Statement prepared for the project (KAL, 2020).

Table 4 Summary of species at risk assessed as having a moderate to high potential to interact with the proposed development (KAL, 2020)

Species Name (*Taxonomic Name*)	Status under ESA	Status under Schedule 1 of SARA	Potential to Interact with Development of the Site
Birds			
Barn Swallow (*Hirundo rustica*)	Threatened	Threatened	Moderate
Eastern Wood-pewee (*Contopus virens*)	Special Concern	Special Concern	High
Rusty Blackbird (*Euphagus carolinus*)	Special Concern	Special Concern	Moderate
Wood Thrush (*Hylocichla mustelina*)	Special Concern	Threatened	Moderate
Reptiles			
Blanding's Turtle (*Emydoidea blandingii*)	Threatened	Threatened	High

Species Name (*Taxonomic Name*)	Status under ESA	Status under Schedule 1 of SARA	Potential to Interact with Development of the Site
Milksnake (*Lampropeltis triangulum*)	Not Listed	Special Concern	Moderate
Snapping Turtle (*Chelydra serpentina*)	Special Concern	Special Concern	Moderate
Mammals			
Little Brown Myotis (*Myotis lucifugus*)	Endangered	Endangered	Moderate
Arthropods			
Monarch (Danaus *plexippus*)	Special Concern	Special Concern	Moderate
Vascular Plants			
Butternut (*Juglans cinerea*)	Endangered	Endangered	High

4.0 PROPOSED DEVELOPMENT

The proposed development is limited to the southern half of the Site and consists of 29 single detached houses with front and rear yard space (Figure 3). The proposed development also includes extending Wildpine Court to connect with Ravenscroft Court.

Development will respect a setback of 15 m from wetland areas. It will also respect a 30 m setback from the top of bank of Poole Creek, except for the rear lot lines of four units to be located at the southeast corner of the Site. These four units require their rear lot lines to extend up to 2 m beyond the 30 m setback to permit a minimal yard length of 4 m. At their closest point to the creek, these rear lot lines are 28 m from the top of bank, but will be situated along the existing paved edge of the cul de sac on the Site. These proposed setbacks were determined in consultation with the City of Ottawa and Mississippi Valley Conservation Authority.

Site preparation is anticipated to begin in the spring of 2021 with building construction anticipated to begin in mid-2021. Site preparation would require the removal of all vegetation within the proposed development footprint, including 42 trees with DBH ≥ 10 cm (3 of which are distinctive trees with DBH ≥ 50 cm; Appendix A).

The pathway to the northwest corner of the Site is proposed to be an unpaved trail. The final route for the pathway will be established as part of the detailed design and Site landscape plan, but will adjusted as required to avoid removing trees. Worn foot paths are currently present within that portion of the Site.

Figure 3 Map showing the proposed development of the Site

Legend

- Property Lines

Proposed Development

- Block Plan
- Other
- Level Spreader
- Pathway
- Water Management Area
- Townhome

Site Trees

- # Retained
- # Removed
- # Butternut (Retained)

N

0 — 50 m

Map File: 37 Wildpine6
MTM Zone 9
(NAD 83)
Printed on: 2021-08-10

KILGOUR & Associates

5.0 MITIGATION MEASURES

5.1 Site Preparation and Construction

To effectively minimize impacts on site trees, the following mitigation measures must be applied during site preparation and construction (City of Ottawa, 2018a; City of Ottawa, 2015):

- Tree removal should be limited to that which is necessary to accommodate construction.
- Tree and vegetation clearing should not take place during sensitive times of the year for wildlife (breeding season; early spring throughout summer) unless mitigation measures are implemented and/or the habitat has been inspected by a qualified biologist.
    - The *Migratory Birds Convention Act*, 1994 protects the nests and young of migratory breeding birds in Canada. No clearing of vegetation shall occur during the breeding bird window (April 15 and August 15) to prevent impacts to birds. Combining the breeding bird window with the bat roosting season (May to September; MNRF, 2015b), no clearing of vegetation shall occur between April 15 and September 30 inclusive to prevent impacts to both birds and bats. If vegetation clearing is to occur between April 1 and 15, a pre-clearing survey for active stick nests and cavity nests must be conducted to identify and protect early-nesting owls and raptors.
- To minimize impacts to remaining trees during development:
    - Erect a fence beyond the critical root zone (CRZ; equivalent to ten times the diameter of trunk) of retained trees that have roots that may extend into the project area. The fence should be highly visible (orange construction fence) and paired with erosion and sediment control fencing. Pruning of branches is recommended in areas of potential conflict with construction equipment;
    - Do not place any material or equipment within the CRZ of trees unless otherwise approved by the General Manager;
    - Do not attach any signs, notices, or posters to any trees unless otherwise approved by the General Manager;
    - Do not raise or lower the existing grade within the CRZ of trees unless otherwise approved by the General Manager;
    - Do not extend any hard surface or significantly change landscaping within the CRZ of trees unless otherwise approved by the General Manager;
    - Do not damage the root system, trunk, or branches of any remaining trees unless otherwise approved by the General Manager;
    - Use tunneling or boring when digging within the CRZ of a tree; and

- Ensure that exhaust fumes from equipment are not directed towards any tree's canopy.

5.2 Tree Planting Recommendations

To offset vegetation loss, native tree and shrub species must be planted, with a minimum of one tree per lot. Landscaping plans must be prepared to the satisfaction of the City of Ottawa. The following tree and shrub species are recommended for planting and should be used to direct the development of the landscape plan for the Site. These species are appropriate given site conditions and are native and non-invasive: Alternate-leaf Dogwood (*Cornus alternifolia*), American Beech (*Fagus grandifolia*), Balsam Poplar (*Populus balsamifera*), Basswood (*Tilia americana*), Bitternut Hickory, Black Cherry (*Prunus serotina*), Black Walnut (*Juglans nigra*), Bur Oak (*Quercus macrocarpa*), Chokecherry (*Prunus virginiana*), Eastern White Cedar, Hawthorns (*Crataegus* spp.), Ironwood (*Ostrya virginiana*), Largetooth Aspen (*Populus grandidentata*), Maple-leaf Viburnum (*Viburnum acerifolium*), Nannyberry (*Viburnum lentago*), Northern Bush-honeysuckle (*Diervilla lonicera*), Peachleaf Willow (*Salix amygdaloides*), Pin Cherry (*Prunus pensylvanica*), Red Maple, Red Oak (*Quercus rubra*), Serviceberries (*Amelanchier* spp.), Silver Maple, Sugar Maple (*Acer saccharum*), Tamarack (*Larix laricina*), Trembling Aspen (*Populus tremuloides*), White Birch (*Betula papyrifera*), Yellow Birch (*Betula alleghaniensis*), White Oak, White Pine (*Pinus strobus*), and White Spruce (*Picea glauca*).

6.0 CLOSURE

This report was prepared for exclusive use by Wildpine Trails Inc. and may be distributed only by or in accordance with the express instructions of Wildpine Trails Inc. Questions relating to the data and interpretation can be addressed to the undersigned.

Respectfully submitted,

KILGOUR & ASSOCIATES LTD.

Katherine Black, MSc	Anthony Francis, PhD
Biologist	Project Director and Senior Ecologist

7.0 LITERATURE CITED

Brunton, D.F. 2005. City of Ottawa Urban Natural Areas Environmental Evaluation Study Appendix A – Vascular Plants of the City of Ottawa, with Identification of Significant Species. Available online at: https://app06.ottawa.ca/calendar/ottawa/citycouncil/ec/2005/05-24/AppendixA%20-%20OTTAWA%20FLORA%20(APR%2005).htm

City of Ottawa. 2015. Environmental Impact Statement Guidelines. Available online at: https://documents.ottawa.ca/sites/documents/files/documents/eis_guidelines2015_en.pdf

City of Ottawa. 2016. Greenspace Master Plan. Available online at: https://ottawa.ca/en/planning-development-and-construction/official-plan-and-master-plans/greenspace-master-plan

City of Ottawa. 2018a. By-law No. 2009-200. Available online at: https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/tree-conservation-urban-law-no-2009-200

City of Ottawa. 2018b. Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment. Available online at: http://ottwatch.ca/meetings/file/572913

Government of Canada. 1984. *Migratory Birds Convention Act*, 1994 (S.C. 1994, c. 22). Available online at: https://laws-lois.justice.gc.ca/eng/acts/m-7.01/

Government of Canada. 2002. *Species at Risk Act*. 2002. S.C. 2002, c. 29. Available online at: https://laws.justice.gc.ca/eng/acts/S-15.3/

Government of Ontario. 2007. *Endangered Species Act*. 2007. S.O. 2007, c.6. Available online at: https://www.ontario.ca/laws/statute/07e06

Lee, H.R., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, North Bay.

Ministry of Natural Resources. 2014. Butternut Assessment Guidelines – Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act*, 2007. Available online at: https://www.ontario.ca/document/2019-review-progress-towards-protection-and-recovery-ontarios-species-risk/butternut

Ministry of Natural Resources and Forestry. 2015a. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. OMNRF Regional Operations Division: Southern Region Resources Section, Peterborough, Ontario. 39 pp.

Ministry of Natural Resources and Forestry. 2015b. Technical Note: Species at Risk (SAR) Bats. OMNRF Regional Operations Division. 37 pp.

Ministry of Natural Resources and Forestry (MNRF). 2020. Natural Heritage Information Centre: Make Natural Heritage Map. Available online at: https://www.ontario.ca/page/make-natural-heritage-area-map

Muncaster Environmental Planning Inc. and Brunton Consulting Services. 2005. City of Ottawa Urban Natural Areas Environmental Evaluation Study Final Report. A report prepared for the Environmental Management Division, Planning & Growth Management Department, City of Ottawa. Available online at: https://app06.ottawa.ca/calendar/ottawa/citycouncil/pdc/2005/05-24/Final%20Report_UNAEES.htm

Appendix A Tree Inventory Table

Appendix D Vascular Plant Inventory for the Site

Family Name	Species Scientific Name	Species Common Name	Global Rank	Provincial Rank	SARA Status	ESA Status	Brunton (2005)
Aceraceae	*Acer negundo* L.	Manitoba Maple	G5	S5	-	-	Common
Aceraceae	*Acer saccharinum* L.	Silver Maple	G5	S5	-	-	Common
Aceraceae	*Acer saccharum* Marsh.	Sugar Maple	G5	S5	-	-	Common
Aceraceae	*Acer rubrum* L.	Red Maple	G5	S5	-	-	Common
Aceraceae	*Acer spicatum* Lam.	Mountain Maple	G5	S5	-	-	Common
Agavaceae	*Yucca filamentosa* L.	Yucca (garden cultivar)	G5	-	-	-	-
Anacardiaceae	*Toxicodendron rydbergii* (Rydb.) Greene	Poison-ivy	G5	S5	-	-	Common
Anacardiaceae	*Rhus typhina* L.	Staghorn Sumac	G5	S5	-	-	Common
Apiaceae	*Daucus carota* L.	Wild Carrot	GNR	SNA	-	-	Common
Apocynaceae	*Asclepias syriaca* L.	Common Milkweed	G5	S5	-	-	Common
Apocynaceae	*Vinca* sp.	Periwinkle (garden cultivar)	-	-	-	-	-
Aquifoliaceae	*Ilex mucronata* (L.) Loes.	Mountain Holly	G5	S5	-	-	-
Araceae	*Arisaema triphyllum* (L.) Schott	Jack-in-the-pulpit	G5	S5	-	-	Common
Araliaceae	*Hedera helix* L.	English Ivy (garden cultivar)	GNR	SNA	-	-	-
Asphodelaceae	Hemerocallis Stella D'Oro	Stella D'Oro Daylily (garden culti	-	-	-	-	-
Asteraceae	*Centaurea nigra* L.	Black Knapweed	GNR	SNA	-	-	Rare
Asteraceae	*Eupatorium perfoliatum* L.	Boneset	G5	S5	-	-	Common
Asteraceae	*Cirsium vulgare* (Savi) Tenore	Bull Thistle	GNR	SNA	-	-	Common
Asteraceae	*Solidago canadensis* L.	Canada Goldenrod	G5	SNR	-	-	Common
Asteraceae	*Cirsium arvense* (L.) Scop.	Canada Thistle	G5	SNA	-	-	Common
Asteraceae	*Cichorium intybus* L.	Chicory	GNR	SNA	-	-	Common
Asteraceae	*Artemisia vulgaris* L.	Common Mugwort	GU	SNA	-	-	Common
Asteraceae	*Erigeron annuus* (L.) Pers.	Daisy Fleabane	G5	S5	-	-	Common
Asteraceae	*Taraxacum officinale* Weber	Common Dandelion	G5	SNA	-	-	Common
Asteraceae	*Arctium lappa* L.	Great Burdock	GNR	SNA	-	-	Uncommon
Asteraceae	*Arctium minus* Bernh.	Common Burdock	GNR	SNA	-	-	Common
Asteraceae	*Leucanthemum vulgare* Lam.	Ox-eye Daisy	GNR	SNA	-	-	Common
Asteraceae	*Leucanthemum × superbum* (J.W. Ingram) Berg. ex Kent.	Shasta Daisy	GNA	-	-	-	-
Asteraceae	*Eupatorium maculatum* L.	Spotted Joe-pye Weed	G5	S5	-	-	Common
Asteraceae	*Cirsium discolor* L.	Field Thistle	G5	S3	-	-	Regionally significant
Asteraceae	*Achillea millefolium* L.	Yarrow	G5	SNA	-	-	Common
Asteraceae	*Heliopsis helianthoides* (L.) Sw.	False Sunflower	G5	SNR	-	-	Uncommon
Balsaminaceae	*Impatiens capensis* Meerb.	Spotted Jewelweed	G5	S5	-	-	Common
Betulaceae	*Ostrya virginiana* (Mill.) K. Koch	Ironwood	G5T5	SNR	-	-	Common
Betulaceae	*Alnus incana* (L.) Moench ssp. rugosa (Du Roi) Clausen	Speckled Alder	G5	S5	-	-	Common
Betulaceae	*Betula alleghaniensis* Britt.	Yellow Birch	G5	S5	-	-	Common
Boraginaceae	*Echium vulgare* L.	Viper's Bugloss	GNR	SNA	-	-	Common
Brassicaceae	*Hesperis matronalis* L.	Dame's Rocket	G4G5	SNA	-	-	Uncommon (spreading invasive)
Brassicaceae	*Thlaspi arvense* L.	Field Penny-cress	GNR	SNA	-	-	Common
Brassicaceae	*Lepidium campestre* (L.) Ait. f.	Field Peppergrass	GNR	SNA	-	-	Uncommon
Brassicaceae	*Alliaria petiolata* (Bieb.) Cov. & Grande	Garlic Mustard	GNR	SNA	-	-	Common (aggressive invasive)
Brassicaceae	*Brassica rapa* L.	Field Mustard	GNRTNR	SNA	-	-	Rare
Brassicaceae	*Berteroa incana* (L.) DC.	Hoary-alyssum	GNR	SNA	-	-	Common
Brassicaceae	*Erysimum cheiranthoides* L.	Wormseed Mustard	G5	S5?	-	-	Common
Campanulaceae	*Campanula rapunculoides* L.	Creeping Bellflower	GNR	SNA	-	-	Common
Caprifoliaceae	*Lonicera tatarica* L.	Tartarian Honeysuckle	GNR	SNA	-	-	Common (aggressive invasive)
Caryophyllaceae	*Silene vulgaris* (Moench) Garcke	Bladder Campion	GNR	SNA	-	-	Common
Caryophyllaceae	*Dianthus* sp.	Dianthus (garden cultivar)	-	-	-	-	-
Caryophyllaceae	*Silene latifolia* Poir.	White Cockle	GNR	SNA	-	-	Uncommon
Clusiaceae	*Hypericum perforatum* L.	St. John's-wort	GNR	SNA	-	-	Common

Family Name	Species Scientific Name	Species Common Name	Global Rank	Provincial Rank	SARA Status	ESA Status	Brunton (2005)
Convolvulaceae	*Fallopia cilinodis* (Michx.) Holub	Bindweed	GNR	SNA	-	-	Common
Cornaceae	*Cornus alternifolia* L.f.	Alternate-leaved Dogwood	G5	S5	-	-	Common
Cornaceae	*Cornus sericea* L.	Red-osier Dogwood	G5	S5	-	-	Common
Crassulaceae	*Sedum* sp.	Stonecrop (garden cultivar)	-	-	-	-	-
Cucurbitaceae	*Echinocystis lobata* (Michx.) T.& G.	Wild Cucumber	G5	S5	-	-	Common
Cupressaceae	*Thuja occidentalis* L.	Eastern White Cedar	G5	S5	-	-	Common
Dryopteridaceae	*Matteuccia struthiopteris* (L.) Todaro	Ostrich Fern	G5	S5	-	-	Common
Dryopteridaceae	*Onoclea sensibilis* L.	Sensitive Fern	G5	S5	-	-	Common
Equisetaceae	*Equisetum hyemale* L.	Scouring-rush Horsetail	G5T5	S5	-	-	Common
Fabaceae	*Lotus corniculatus* L.	Bird's-foot trefoil	GNR	SNA	-	-	Common
Fabaceae	*Trifolium pratense* L.	Red Clover	GNR	SNA	-	-	Common
Fabaceae	*Vicia cracca* L.	Cow Vetch	GNR	SNA	-	-	Common
Fabaceae	*Coronilla varia* L.	Crown Vetch	GNR	SNA	-	-	Uncommon (locally abundant)
Fabaceae	*Melilotus alba* Desr.	White Sweet-clover	-	-	-	-	Common
Fabaceae	*Trifolium campestre* Schreb.	Low Hop Clover	GNR	SNA	-	-	Common
Fagaceae	*Fagus grandifolia* Ehrh.	American Beech	G5	S4	-	-	Common
Fagaceae	*Quercus rubra* L.	Red Oak	G5	S5	-	-	Common
Fagaceae	*Quercus alba* L.	White Oak	G5	S5	-	-	Regionally significant
Geraniaceae	*Geranium* sp.	Perennial Geranium (garden cul	-	-	-	-	-
Grossulariaceae	*Ribes cynosbati* L.	Prickly Gooseberry	G5	S5	-	-	Common
Iridaceae	*Iris versicolor* L.	Blue-flag	G5	S5	-	-	Common
Iridaceae	*Iris* sp.	Iris (garden cultivar)	-	-	-	-	-
Juglandaceae	*Carya cordiformis* (Wangenh.) K. Koch	Bitternut Hickory	G5	S5	-	-	Common
Juglandaceae	*Juglans cinerea* L.	Butternut	G3	S2?	END	END	Common
Lamiaceae	*Monarda* sp.	Bee-balm (garden cultivar)	-	-	-	-	-
Lamiaceae	*Glechoma hederacea* L.	Ground-ivy	GNR	SNA	-	-	Common
Liliaceae	*Allium schoenoprasum* L.	Chives	G5	S4	-	-	Rare
Liliaceae	*Asparagus officinalis* L.	Garden Asparagus	G5?	SNA	-	-	Common
Liliaceae	*Convallaria majalis* L.	Lily-of-the-valley (garden cultivar	G5	SNA	-	-	Uncommon (locally abundant invasive)
Liliaceae	*Trillium grandiflorum* (Michx.) Salisb.	Great White Trillium	G5	S5	-	-	Common
Lythraceae	*Lythrum salicaria* L.	Purple Loosestrife	G5	SNA	-	-	Common (invasive)
Oleaceae	*Fraxinus nigra* Marsh.	Black Ash	G5	S4	-	-	Common
Oleaceae	*Fraxinus pennsylvanica* Marsh.	Green Ash	G5	S4	-	-	Common
Oleaceae	*Syringa* sp.	Lilac (garden cultivar)	-	-	-	-	-
Oleaceae	*Fraxinus nigra* Marsh.	Black Ash	G5	S4	-	-	Common
Onagraceae	*Circaea lutetiana* L. ssp. *canadensis* (L.) Asch. & Magnus	Enchanter's Nightshade	G5T5	S5	-	-	Common
Papaveraceae	*Sanguinaria canadensis* L.	Bloodroot	G5	S5	-	-	Common
Pinaceae	*Pinus strobus* L.	White Pine	G5	S5	-	-	Common
Pinaceae	*Picea glauca* (Moench) Voss	White Spruce	G5	S5	-	-	Common
Plantaginaceae	*Plantago major* L.	Common Plantain	G5	SNA	-	-	Common
Poaceae	*Bromus* sp.	Brome	-	-	-	-	-
Poaceae	*Digitaria* sp.	Crabgrass	-	-	-	-	-
Poaceae	*Agrostis stolonifera* L.	Creeping Bent-grass	G5	SNA	-	-	Common
Poaceae	*Poa pratensis* L.	Kentucky Bluegrass	G5	S5	-	-	Common
Poaceae	*Elymus repens* (L.) Gould	Quack Grass	GNR	SNA	-	-	Common
Poaceae	*Bromus inermis* Leyss.	Common Brome Grass	G5	SNA	-	-	Common
Poaceae	*Phalaris arundinacea* L.	Reed Canary Grass	G5	S5	-	-	Common (locally abundant introduction)
Polemoniaceae	*Phlox paniculata* L.	Garden Phlox	G5	SNA	-	-	Rare
Polygonaceae	*Rumex crispus* L.	Curled Dock	GNR	SNA	-	-	Common
Ranunculaceae	*Anemone canadensis* L.	Canada Anemone	G5	S5	-	-	Common

Family Name	Species Scientific Name	Species Common Name	Global Rank	Provincial Rank	SARA Status	ESA Status	Brunton (2005)
Ranunculaceae	*Thalictrum pubescens* Pursh	Tall Meadow-rue	G5	S5	-	-	Common
Rhamnaceae	*Rhamnus cathartica* L.	European Buckthorn	GNR	SNA	-	-	Common (aggressive invasive)
Rhamnaceae	*Rhamnus frangula* L.	Glossy Buckthorn	GNR	SNA	-	-	Common (aggressive invasive)
Rosaceae	*Dasiphora fruticosa* (L.) Rydb.	Shrubby Cinquefoil (garden culti	G5	S5	-	-	-
Rosaceae	*Spiraea* sp.	Meadowsweet (garden cultivar)	-	-	-	-	-
Rosaceae	*Rubus occidentalis* L.	Black Raspberry	G5	S5	-	-	Uncommon
Rosaceae	*Rubus allegheniensis* Porter	Common Blackberry	G5	S5	-	-	Common
Rosaceae	*Rubus odoratus* L.	Purple-flowering Raspberry	G5	S5	-	-	Common
Rosaceae	*Fragaria virginiana* Duchesne	Common Strawberry	G5	S5	-	-	Common
Rutaceae	*Zanthoxylum americanum* Mill.	Prickly-ash	G5	S5	-	-	Common
Salicaceae	*Salix bebbiana* Sarg.	Bebb's Willow	G5	S5	-	-	Common
Salicaceae	*Salix fragilis* L.	Crack Willow	GNRQ	SNA	-	-	-
Salicaceae	*Populus grandidentata* Michx.	Largetooth Aspen	G5	S5	-	-	Common
Salicaceae	*Salix amygdaloides* Anderss.	Peachleaf willow	G5	S5	-	-	Uncommon
Salicaceae	*Populus tremuloides* Michx.	Trembling Aspen	G5	S5	-	-	Common
Salicaceae	*Populus deltoides* Marsh.	Eastern Cottonwood	G5	S5	-	-	Common
Scrophulariaceae	*Verbascum thapsus* L.	Great Mullein	G5	SNA	-	-	Common
Solanaceae	*Solanum dulcamara* L.	Deadly Nightshade	GNR	SNA	-	-	Common
Tiliaceae	*Tilia americana* L.	Basswood	G5	S5	-	-	Common
Typhaceae	*Typha latifolia* L.	Broadleaf Cattail	G5	S5	-	-	Common
Typhaceae	*Typha angustifolia* L.	Narrowleaf Cattail	G5	SNA	-	-	Common
Ulmaceae	*Ulmus americana* L.	American Elm	G4	S5	-	-	Common
Ulmaceae	*Ulmus pumila* L.	Siberian Elm	GNR	SNA	-	-	Rare
Violaceae	*Viola pubescens* Ait.	Downy Yellow Violet	G5	S5	-	-	Common
Violaceae	*Viola renifolia* A. Gray	Kidney-leaved Violet	G5	S5	-	-	Uncommon
Violaceae	*Viola sororia* Willd.	Woolly Blue Violet	G5	SNR	-	-	Common
Vitaceae	*Parthenocissus vitacea* (Knerr) Hitchc.	Virginia Creeper	G5	S5	-	-	Common
Vitaceae	*Vitis riparia* Michx.	Riverbank Grape	G5	S5	-	-	Common

Appendix E Species at Risk Screening for the Site

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources for the General Area	Habitat Description	Habitat on or Near the Site	Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)
Avian						
Bald Eagle (*Haliaeetus leucocephalus*)	**Special Concern**	**Not at Risk**	Cornell Lab of Ornithology (2020)	Nest in mature forests near open water. In large trees such as Pine and Poplar.	None.	Negligible potential.
Bank Swallow (*Riparia riparia*)	**Threatened**	**Threatened**	Bird Studies Canada et al. (2009)	Colonial nester; burrows in eroding silt or sand banks, sand pit walls, and human-made sand piles. Often found on banks of rivers and lakes.	None. The banks of nearby Poole Creek are not suitable for nesting.	Negligible potential.
Barn Swallow (*Hirundo rustica*)	**Threatened**	**Threatened**	Cornell Lab of Ornithology (2020), Bird Studies Canada et al. (2009)	Nests on barns and other structures. Forages in open areas for flying insects. Lives in close association with humans and prefers to nest on structures such as open barns, under bridges, and in culverts.	The house, shed, and garage on the Site provide suitable nesting habitat. The open lawn area provides suitable foraging habitat.	Moderate potential.
Black Tern (*Chlidonias niger*)	**Special Concern**	**No Status**	N/A	Build floating nests in loose colonies in shallow marshes, especially in cattails.	The cattail and meadow marshes on the Site and the stormwater pond to the north may provide stop-over habitat for migrants but are unlikely to provide nesting habitat (wetland areas on the Site have insufficient surface water; lack of larger waterbodies nearby).	Low potential.
Bobolink (*Dolichonyx oryzivorus*)	**Threatened**	**Threatened**	Cornell Lab of Ornithology (2020), Bird Studies Canada et al. (2009)	Periodically mown, dry meadow for nesting. Habitat (meadow) should be >10 ha, and preferably >30 ha before Bobolink are attracted to the area. Not near tall trees.	None.	Negligible potential.
Canada Warbler (*Cardellina canadensis*)	**Special Concern**	**Threatened**	N/A	Prefers wet forests with dense shrub layers. Nests located on or near the ground on mossy logs or roots, along stream banks or on hummocks.	Treed swamps and riparian areas of Poole Creek on and adjacent to the Site may provide suitable habitat.	Low potential.

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources for the General Area	Habitat Description	Habitat on or Near the Site	Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)
Cerulean Warbler (*Setophaga cerulea)*	**Threatened**	Threatened	N/A	Prefers mature deciduous forests.	None.	Negligible potential.
Chimney Swift (*Chaetura pelagica*)	**Threatened**	**Threatened**	N/A	Nests in traditional-style open brick chimneys (and rarely in hollow trees). Tends to stay close to water.	The brick chimney on the house on the Site may provide suitable nesting habitat and adjacent areas provide suitable foraging habitat.	Low potential.
Common Nighthawk (*Chordeiles minor*)	**Special Concern**	**Threatened**	N/A	Nests in a wide variety of open sites, including beaches, fields, and gravel rooftops with little to no ground vegetation. They also nest in cultivated fields, orchards, urban parks, mine tailings and along gravel roads/railways but tend to occupy more natural sites.	None.	Negligible potential.
Eastern Meadowlark (*Sturnella magna*)	**Threatened**	**Threatened**	Cornell Lab of Ornithology (2020), Bird Studies Canada et al. (2009)	Periodically mown, dry meadow for nesting. Habitat (meadow) should be >10 ha, and preferably >30 ha before Eastern Meadowlark are attracted to the area. Not near tall trees.	None.	Negligible potential.
Eastern Whip-poor-will (*Antrostomus vociferus*)	**Threatened**	**Threatened**	N/A	Nests on the ground in open deciduous or mixed woodlands with little underbrush.	None.	Negligible potential.
Eastern Wood-pewee (*Contopus virens*)	**Special Concern**	**Special Concern**	Cornell Lab of Ornithology (2020), Bird Studies Canada et al. (2009); observed by KAL during 2020	Woodland species often found in the mid-canopy layer near clearings and edges of deciduous and mixed forests.	Wooded areas on the Site provide suitable habitat.	High potential.

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources for the General Area	Habitat Description	Habitat on or Near the Site	Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)
			field surveys for the Site			
Evening Grosbeak (*Coccothraustes vespertinus*)	**Special Concern**	**Special Concern**	Bird Studies Canada et al. (2009)	Nests in trees or large shrubs; prefer mature coniferous forests but will also use deciduous forests, parklands, and orchards.	Wooded areas on the Site may provide suitable habitat but this habitat type (deciduous forest/swamp and mixed swamp) is not typical habitat.	Low potential.
Golden Eagle (*Aquila chrysaetos*)	**Endangered**	**No Status**	N/A	Nest in remote, undisturbed areas, usually building their nests on ledges on a steep cliff/riverbank or large trees if needed. Most hunting is done near open areas such as large bogs or tundra.	None.	Negligible potential.
Golden-winged Warbler (*Vermivora chrysoptera*)	**Special Concern**	**Threatened**	N/A	Ground-nests in areas of young shrubs surrounded by mature forest. Often found in areas that have recently been disturbed such as field edges, hydro or utility right-of-ways, or logged areas.	None.	Negligible potential.
Grasshopper Sparrow (*Ammodramus savannarum*)	**Special Concern**	**Special Concern**	N/A	Lives in open grassland areas with well-drained sandy soil. Will also nest in hayfields and pastures, as well as alvars, prairies, and occasionally grain crops such as barley. It prefers areas that are sparsely vegetated, and its nests are well hidden in the field, woven from grasses in a small cup-like shape.	None.	Negligible potential.
Henslow's Sparrow (*Ammodramus henslowii*)	**Endangered**	**Endangered**	N/A	Prefers extensive, dense, tall grasslands where it can easily conceal its small ground nest. Tends to avoid fields that have been grazed or are crowded with trees and shrubs.	None.	Negligible potential.
Horned Grebe (*Podiceps auritus*)	**Special Concern**	**No Status**	N/A	Nest in small ponds, marshes, and shallow bays that contain areas of open water and emergent vegetation.	Marsh areas on the Site do not contain open water except for the channel of Poole Creek (high flow). The stormwater management pond to the north	Low potential.

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources for the General Area	Habitat Description	Habitat on or Near the Site	Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)
					(off-Site) may provide suitable stop-over habitat.	
Least Bittern (*Ixobrychus exilis*)	**Threatened**	**Threatened**	N/A	Found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels.	Marsh areas on the Site do not contain open water except for the channel of Poole Creek (high flow). The stormwater management pond to the north (off-Site) may provide suitable stop-over habitat.	Low potential.
Loggerhead Shrike (*Lanius ludovicianus*)	**Endangered**	**Endangered**	N/A	Prefers pasture or other grasslands with scattered low trees and shrubs. Lives in fields or alvars (areas of exposed bedrock) with short grass, which makes it easier to spot prey.	None.	Negligible potential.
Olive-sided Flycatcher (*Contopus cooperi*)	**Special Concern**	**Threatened**	N/A	Found along natural forest edges and openings. Will use forests that have been logged or burned if there are ample tall snags and trees to use for foraging perches.	Wooded areas and adjacent open areas on the Site may provide suitable habitat.	Low potential.
Peregrine Falcon (*Falco peregrinus*)	**Special Concern**	**Special Concern**	N/A	Nests on tall, steep cliff ledges close to large bodies of water. Urban peregrines raise their young on ledges of tall buildings, even in busy downtown areas.	None.	Negligible potential.
Red Knot (*Calidris canutus rufa*)	**Endangered**	**Endangered**	N/A	Prefer open beaches, mudflats, and coastal lagoons where they feast on molluscs, crustaceans, and other invertebrates.	None.	Negligible potential.
Red-headed Woodpecker (*Melanerpes erythrocephalus*)	**Special Concern**	**Threatened**	N/A	Lives in open woodland and woodland edges and is often found in parks, golf courses, and cemeteries. These areas typically have many dead trees, which the birds use for nesting and perching.	Wooded areas on the Site may provide suitable habitat.	Low potential.
Rusty Blackbird (*Euphagus carolinus*)	**Special Concern**	**Special Concern**	Cornell Lab of Ornithology (2020)	Prefers wet wooded or shrubby areas (nests at edges of boreal wetlands and coniferous forests). These areas include bogs, marshes, and beaver ponds.	Tree and thicket swamps on the Site may provide suitable habitat.	Moderate potential.
Short-eared Owl (*Asio flammeus*)	**Special Concern**	**Special Concern**	N/A	Lives in open areas such as grasslands, marshes, and tundra where	None.	Negligible potential.

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources for the General Area	Habitat Description	Habitat on or Near the Site	Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)
				it nests on the ground and hunts for small mammals.		
Wood Thrush (*Hylocichla mustelina*)	**Special Concern**	**Threatened**	Bird Studies Canada et al. (2009)	Lives in mature deciduous and mixed (conifer-deciduous) forests. They seek moist stands of trees with well-developed undergrowth and tall trees for singing and perching. Usually build nests in Sugar Maple or American Beech.	Wooded areas on the Site may provide suitable habitat.	Moderate potential.
Yellow Rail (*Coturnicops noveboracensis*)	**Special Concern**	**Special Concern**	N/A	Lives deep in the reeds, sedges, and marshes of shallow wetlands, where they nest on the ground. The marshy areas used by Yellow Rails have an overlying dry mat of dead vegetation that is used to make roofs for nests.	Marsh areas on and adjacent to the Site may provide suitable habitat.	Low potential.
Mammals						
Algonquin Wolf (*Canis* sp.)	**Threatened**	**Special Concern**	N/A	Not restricted to a specific habitat type but typically occurs in deciduous and mixed forest landscapes.	None.	Negligible potential.
Eastern Cougar (*Puma concolor*)	**Endangered**	**No Status**	N/A	Lives in large, undisturbed forests or other natural areas where there is little human activity.	None.	Negligible potential.
Eastern Small-footed Myotis (*Myotis leibii*)	**Endangered**	**Not Listed**	KAL (K. Black) personal communication with MECP (S. Snell) on December 17, 2020 (response to SAR information request)	In the spring and summer, Eastern Small-footed Myotis will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. Overwinters in caves and abandoned mines.	Trees and buildings on the Site may provide roosting habitat.	Low potential.
Gray Fox (*Urocyon cinereoargenteus*)	**Threatened**	**Threatened**	N/A	Lives in deciduous forests and marshes. Their dens are usually found in dense shrubs close to a water source, but they will also use rocky areas, hollow trees, and underground burrows dug by other animals.	The range of Gray Fox is limited to southwestern Ontario (MECP, 2020a).	Negligible potential.

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources for the General Area	Habitat Description	Habitat on or Near the Site	Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)
Little Brown Myotis (*Myotis lucifugus*)	**Endangered**	**Endangered**	KAL (K. Black) personal communication with MECP (S. Snell) on December 17, 2020 (response to SAR information request)	During the day they roost in trees and buildings. They often select attics, abandoned buildings, and barns for summer colonies where they can raise their young. They can squeeze through very tiny spaces (as small as six millimetres across) allowing them access to many different roosting areas.	Trees and buildings on the Site may provide roosting habitat.	Moderate potential.
Northern Myotis / Northern Long-eared Bat (*Myotis septentrionalis*)	**Endangered**	**Endangered**	KAL (K. Black) personal communication with MECP (S. Snell) on December 17, 2020 (response to SAR information request)	Associated with boreal forests, choosing to roost under loose bark and in the cavities of trees.	None.	Negligible potential.
Tri-coloured Bat / Eastern Pipistrelle (*Perimyotis subflavus*)	**Endangered**	**Endangered**	N/A	Roosts mainly in trees during summer; overwinters in caves and mines along with other species, but often uses deeper parts of the hibernaculum.	Trees and buildings on the Site may provide roosting habitat.	Low potential.
Amphibians						
Western Chorus Frog (*Pseudacris triseriata*)	**No Status**	Great Lakes-St. Lawrence population: **Threatened**	Ontario Nature (2019)	Inhabits forest openings around woodland ponds but can also be found in or near damp meadows, marshes, bottomland swamps, and temporary ponds in open country, or even urban areas.	Wetland areas on and adjacent to the Site may provide suitable habitat.	Low potential.
Arthropods						

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources for the General Area	Habitat Description	Habitat on or Near the Site	Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)
Bogbean Buckmoth (*Hemileuca* sp. 1)	**Endangered**	**Endangered**	N/A	Restricted to open, chalky, low shrub fens containing large amounts of bogbean, an emergent wetland flowering plant.	None.	Negligible potential.
Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*)	**Endangered**	**Endangered**	N/A	Live in diverse habitats including open meadows, mixed farmlands, urban areas, boreal forest, and montane meadows. Host nests occur in abandoned underground rodent burrows and rotten logs.	Currently only known to occur in Pinery Provincial Park.	Negligible potential.
Macropis Cuckoo Bee *(Epeoloides pilosulus)*	**Not listed**	**Endangered**	N/A	Found in habitats supporting both Macropis bees and their food plant, Yellow Loosestrife (*Lysimachi*a).	Has not been observed in Ontario in over 45 years (COSEWIC, 2011).	Negligible potential.
Monarch (*Danaus plexippus*)	**Special Concern**	**Special Concern**	N/A	Milkweeds are the sole food plant for Monarch caterpillars. These plants predominantly grow in open and periodically disturbed habitats such as roadsides, fields, wetlands, prairies, and open forests.	The open lawn and wetland areas on the Site provide suitable habitat. Milkweed was observed by KAL during 2020 field surveys.	Moderate potential.
Mottled Duskywing (*Erynnis martialis*)	**Endangered**	**No Status**	N/A	Requires host plants such as the New Jersey Tea and Prairie Redroot. These plants grow in dry, well-drained soils or alvar habitat within oak woodland, pine woodland, roadsides, riverbanks, shady hillsides, and tall grass prairies.	None.	Negligible potential.
Nine-spotted Lady Beetle (*Coccinella novemnotata*)	**Endangered**	**No Status**	N/A	Occurs within agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows, riparian areas, and isolated natural areas.	There have been no records of this species in Ontario since the mid-1990s (MECP, 2019e).	Negligible potential.
Rapids Clubtail *(Gomphus quadricolor)*	**Endangered**	**Endangered**	N/A	Inhabits a wide variety of riverine habitats ranging in size from the St. Lawrence River to small creeks. Larvae are typically found in microhabitats with slow to moderate flow and fine sand or silt substrates where they burrow into the stream bed. Adults disperse from the river after emerging and feed in the	There are no records of this species in Ottawa (MECP, 2019f).	Negligible potential.

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources for the General Area	Habitat Description	Habitat on or Near the Site	Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)
				forest canopy and other riparian vegetation.		
Rusty-patched Bumble Bee (*Bombus affinis*)	**Endangered**	**Endangered**	N/A	Can be found in open habitat such as mixed farmland, urban settings, savannah, open woods, and sand dunes.	The range of this species is limited to southwestern Ontario (MECP, 2019g).	Negligible potential.
Transverse Lady Beetle (*Coccinella transversoguttata*)	**Endangered**	**Special Concern**	N/A	Able to live in a wide range of habitats, including agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows and riparian areas.	There have been no records of the species in Ontario since 1990 (MECP, 2020b).	Negligible potential.
West Virginia White (*Pieris virginiensis*)	**Special Concern**	**No Status**	N/A	Lives in moist, deciduous woodlots. Requires a supply of toothwort, a small, spring-blooming plant that is a member of the mustard family, since it is the only food source for larvae.	Wooded areas on the Site may provide suitable habitat. Toothwort was not observed on the Site.	Low potential.
Yellow-banded Bumble Bee (*Bombus terricola*)	**Special Concern**	**Special Concern**	N/A	This species is a forage habitat generalist, able to use a variety of nectaring plants and environmental conditions. Can be found in mixed woodlands, particularly for nesting and overwintering, as well as a variety of open habitat such as native grasslands, farmlands, and urban areas.	All areas on the Site may provide suitable habitat given that the species is able to thrive in a variety of environmental settings.	Low potential.
Lichens						

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources for the General Area	Habitat Description	Habitat on or Near the Site	Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)
Black-foam Lichen (*Anzia colpodes*)	**No Status**	**Threatened**	N/A`	Grows on the trunks of mature deciduous trees growing on level or sloped land where high humidity is supplied by nearby wetlands, lakes, or streams. The most common host is Red Maple but it also occurs on White Ash, Sugar Maple, Red Oak, and very occasionally on other species.	Assumed to no longer occur in Ontario (COSEWIC, 2015).	Negligible potential.
Flooded Jellyskin (*Leptogium rivulare*)	**No Status**	**Threatened**	N/A	Grows in seasonally flooded habitats, typically on the bark of deciduous trees, on rocks along the margins of seasonal ponds, and on rocks along shorelines and stream/riverbeds.	Treed swamps on the Site may provide suitable habitat.	Low potential.
Pale-bellied Frost Lichen (*Physconia subpallida*)	**Endangered**	**Endangered**	N/A	Typically grows on the bark of hardwood trees such as White Ash, Black Walnut, and American Elm. Can also be found growing on fence posts and boulders.	There are no records of the species in the Ottawa area (MECP, 2019h).	Negligible potential.
Reptiles						
Blanding's Turtle (*Emydoidea blandingii*)	**Threatened**	**Threatened**	MNRF (2020b), Ontario Nature (2019), KAL (2017)	Quiet lakes, streams, and wetlands with abundant emergent vegetation. Also frequently occurs in adjacent upland forests.	Wetland areas on and adjacent to the Site provide suitable habitat.	High potential.

Species Name (*Taxonomic Name*)	**Status under *Endangered Species Act* (ESA)**	**Status under Schedule 1 of the *Species at Risk Act* (SARA)**	**Observation Record Sources for the General Area**	**Habitat Description**	**Habitat on or Near the Site**	**Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)**
Eastern Musk Turtle / Stinkpot (*Sternotherus odoratus*)	**Special Concern**	**Special Concern**	N/A	Found in ponds, lakes, marshes, and rivers that are generally slow-moving, have abundant emergent vegetation, and muddy bottoms that they burrow into for winter hibernation.	Wetland areas on and adjacent to the Site provide suitable habitat.	Low potential.
Eastern Ribbonsnake *(Thamnophis sauritus)*	**Special Concern**	**Threatened**	N/A	The Eastern Ribbonsnake is semi-aquatic. It is most frequently found along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	Wetland areas on and adjacent to the Site provide suitable habitat.	Low potential.
Milksnake (*Lampropeltis triangulum*)	**Not Listed**	**Special Concern**	Ontario Nature (2019)	Found in variety of open, scrubby or edge habitats, including pastures.	Most areas on the Site likely provide suitable habitat.	Moderate potential.
Northern Map Turtle (*Graptemys geographica*)	**Special Concern**	**Special Concern**	N/A	Lives in rivers and lakeshores where it basks on emergent rocks and fallen trees throughout the spring and summer. In winter, they hibernate on the bottom of deep, slow-moving sections of river.	None.	Negligible potential.
Snapping Turtle (*Chelydra serpentina*)	**Special Concern**	**Special Concern**	MNRF (2020a), MNRF (2020b), California Academy of Sciences and National Geographic Society (2020), Ontario Nature (2019)	Spend most of their lives in the water. Prefer shallow waters so they can hide under the soft mud and leaf litter with only their noses exposed to the surface to breathe.	Wetland areas on and adjacent to the Site provide suitable habitat.	Moderate potential.
Spiny Softshell (*Apalone spinifera*)	**Endangered**	**Threatened**	N/A	Found primarily in rivers and lakes but also in creeks, ditches, and ponds near rivers. Habitat requirements are open sand or gravel nesting areas, shallow muddy or sandy areas to bury in, deep pools for hibernation, areas for basking, and suitable habitat for crayfish and other food species.	Poole Creek and its riparian corridor may provide suitable habitat.	Low potential.

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources for the General Area	Habitat Description	Habitat on or Near the Site	Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)
Spotted Turtle (*Clemmys guttata*)	**Endangered**	**Endangered**	N/A	Semi-aquatic and prefers ponds, marshes, bogs, and even ditches with slow-moving, unpolluted water and an abundant supply of aquatic vegetation.	Poole Creek and its riparian corridor may provide suitable habitat.	Low potential.
Wood Turtle (*Glyptemys insculpta*)	**Endangered**	**Threatened**	N/A	Prefers clear rivers, streams, or creeks with a slight current and sandy or gravelly bottom. Wooded areas are essential habitat but they are found in other habitats such as wet meadows, swamps, and fields.	Poole Creek and its riparian corridor and wooded areas on the Site may provide suitable habitat.	Low potential.
Vascular Plants						
American Chestnut (*Castanea dentata*)	**Endangered**	**Endangered**	N/A	Typical habitat is upland deciduous forests on sandy acidic soils. Occurs with Red Oak, Black Cherry, Sugar Maple, and beech.	None.	Negligible potential.
American Ginseng (*Panax quinquefolius*)	**Endangered**	**Endangered**	N/A	Grows in rich, moist, but well-drained, and relatively mature, deciduous woods dominated by Sugar Maple, White Ash, and American Basswood.	Wooded areas on the Site may provide suitable habitat.	Low potential.
Butternut (*Juglans cinerea*)	**Endangered**	**Endangered**	KAL observations during 2020 field surveys for the Site, KAL (K. Black) personal communication with	Commonly found in riparian habitats but is also found on rich, moist, well-drained loams and well-drained gravels, especially those of limestone origin.	Wooded areas on the Site provide suitable habitat.	High potential.

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources for the General Area	Habitat Description	Habitat on or Near the Site	Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)
			MECP (S. Snell) on December 17, 2020 (response to SAR information request)			
Eastern Prairie Fringed-orchid (*Platanthera leucophaea*)	**Endangered**	**Endangered**	N/A	Populations are found in three main habitat types: fens, tallgrass prairie, and moist old fields.	None.	Negligible potential.
Fish						
American Eel (*Anguilla rostrata*)	**Endangered**	**Endangered**	N/A	Primarily nocturnal, hiding in soft substrate or submerged vegetation during the day. Also protected under the *Fisheries Act*.	None.	Negligible potential.
Bridle Shiner (*Notropis bifrenatus*)	**Special Concern**	**Special Concern**	N/A	Prefers clear water with abundant vegetation over silty or sandy substrate.	None.	Negligible potential.
Channel Darter (*Percina copelandi*)	**Special Concern**	**Threatened**	N/A	Prefers clean streams and lakes with moderate current over sandy or rocky substrate.	None.	Negligible potential.
Lake Sturgeon (*Acipenser fulvescens*)	**Endangered**	**No Status**	N/A	Only found in large lakes and rivers. Forages in cool water, 4-9 m deep over soft substrate; spawns in shallower, fast-flowing areas over rocks or gravel.	None.	Negligible potential.
Northern Brook Lamprey (*Ichthyomyzon fossor*)	**Special Concern**	**Special Concern**	N/A	Non-parasitic species. Prefers shallow areas with warm water. Larvae live in burrows in soft substrate for up to seven years.	None.	Negligible potential.
Northern Sunfish (*Lepomis peltastes*)	**Special Concern**	**No Status**	N/A	Lives in shallow vegetated areas of quiet, slow flowing rivers and streams, as well as warm lakes and ponds with sandy banks or rocky bottoms.	None.	Negligible potential.
River Redhorse	**Special Concern**	**Special Concern**	N/A	Prefers fast-flowing, clear rivers over rocky substrate.	None.	Negligible potential.

Species Name (*Taxonomic Name*)	**Status under *Endangered Species Act* (ESA)**	**Status under Schedule 1 of the *Species at Risk Act* (SARA)**	**Observation Record Sources for the General Area**	**Habitat Description**	**Habitat on or Near the Site**	**Potential to Interact with Development of the Site (Negligible, Low, Moderate, High)**
(*Moxostoma carinatum*)						
Silver Lamprey (*Ichthyomyzon unicuspis*)	**Special Concern**	**Special Concern**	N/A	Requires clear water where they can find fish hosts, relatively clean stream beds of sand and organic debris for larvae to live in, and unrestricted migration routes for spawning. Larvae live 4-7 years in burrows (prefer soft substrates); filter-feed on plankton.	None.	Negligible potential.

Appendix F Butternut Tree Analysis for the Site

BHA Tree Analysis (version: December 2013)

This table is to be completed by a designated Butternut Health Assessor (BHA).

BHA Report #	**N/A**	**Assessment Date(s)**	**19-Jun-20**	**Total # Butternut Trees in BHA Report**	**1**
BHA ID #	**546**	**BHA Name**	**Robert Hallett**		
Landowner / Client Name			**Carmine Zayoun, Wildpine Trails Inc.**		
Property Location			**37 Wildpine Court, Stittsville, Ottawa, ON K2S 1C6**		

input field data										automatic calculations from field data						**Categories: 1: non-retainable, 2: retainable, 3: archivable**				
Tree #	Live Crown %	Tree dbh (cm)	# bole cankers: sooty (S) (will be assigned 2.5 cm per canker)		# bole cankers: open (O) (will be assigned 5 cm per canker)		# root flare (RF) cankers		<40 m from cankered tree? (Y or N)	**Circ.** (cm) = Pi x dbh	total **bole canker width** (sooty x 2.5 + open x 5)	total **RF canker width** (sooty x 2.5 + open x 5)	bole canker **%** of circ.	RF canker **%** of circ.	total bole & root canker % of 2xCirc	LC% >/= 50 & BC% = 0	LC% >70 & BRC % <20	LC % >70 & BC % <20	**Preliminary tree call**	**FINAL TREE CALL** a Cat 2, dbh>20cm <40m from a Cat 1
			S <2 m	S >2 m	O <2 m	O >2 m	RF S	RF O		**Circ** (cm)	**BC** (cm)	**RC** (cm)	**BC%**	**RC%**	**BRC%**					
1	100	59	6	3	1	0	3	1	y	185.3	27.5	12.5	**14.8**	**6.7**	**10.8**	1	2	2	**2**	**3**