Stittsville South W4 Future Neighborhood Area

Existing Conditions Report

Final Report

October 3, 2023

Submitted To:

Hugo Lalonde
Caivan Communities
3713 Borrisokane Road
Ottawa, ON
K2J 4J4

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
CRZ – critical root zone
DFO – Department of Fisheries and Oceans (Fisheries and Oceans Canada)
ECCC – Environment and Climate Change Canada
e.g. – *exempli gratia*
EIS – Environmental Impact Study
ELC – Ecological Land Classification
ESC – erosion and sediment control
ESA – *Endangered Species Act*
FWCA – *Fish and Wildlife Conservation Act*
ha – hectare
i.e. – id est
KAL – Kilgour & Associates Ltd.
km – kilometre
m – metre
MBCA – *Migratory Birds Convention Act*
MECP – Ministry of Environment, Conservation and Parks
MNRF – Ministry of Natural Resources and Forestry
NHIC – Natural Heritage Information Centre
PPS – Provincial Policy Statement
SAR – species at risk
SARA – *Species at Risk Act*
SWH – Significant Wildlife Habitat

1.0 INTRODUCTION

This report is an Existing Conditions Report (ECR) prepared by Kilgour & Associates Ltd. (KAL; Appendix A) on behalf of Caivan (Stittsville South) Inc. and Caivan (Stittsville West) Ltd. ("the Client") in support of a future residential development on the north side of Flewellyn Road west of Shea Road in Stittsville, Ontario (with major parcels including 5993 and 6115 Flewellyn Road, and 6070 Fernbank Road constituting "the Site"; Figure 1).

The report has two main purposes related to the Site as a Future Neighborhood Area under the City's Urban Expansion in the vicinity. The first is to identify opportunities for consideration in the planning process related to development options for the Site. The second is to form the basis of a subsequent Environmental Impact Study (EIS) in support of the Concept Plan report that will be submitted to the City for development approval.

Accordingly, this report identifies natural heritage conditions on the Site based on field studies performed to date and reviews of publicly available records and data for the area. The report also outlines the policy context associated with future development plans. The content of this report (i.e. the natural heritage system review) was completed per both the *5993 And 6115 Flewellyn Road and 6070 Fernbank Road Environmental Impact Study Terms of Reference* (KAL, 2022), which were developed in consultation with the City staff in 2021/2022, and the *Environmental Impact Study Guidelines* (City of Ottawa, 2023).

The EIS that will be based on this report will be required to:

- Identify natural heritage features on or adjacent to the Site;
- Assess potential impacts of the proposed development to existing features; and
- Recommend mitigation measures to minimize or eliminate identified impacts.

This current ECR addresses the first component.

2.0 ENVIRONMENTAL POLICY CONTEXT

Natural heritage policies and legislation relevant to the proposed 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 (Government of Ontario, 1990b). The current PPS came into effect May 1, 2020 (Government of Ontario, 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; MNR, 2010). Importantly, while the 2020 PPS is the version in effect as of the date of this current report, it must be noted that the Province has already (i.e. as of April 6, 2023) released the proposed Provincial Planning Statement 2023, which is intended to simplify and integrate existing policies to achieve housing objectives while providing tools for municipalities to deliver on housing objectives, and that the public comment period for that version has concluded. It is considered likely that the 2023 edition will become the relevant planning document before a Concept Plan report is submitted to the City for development approval.

2.2 The City of Ottawa Official Plan (2021)

The City of Ottawa Official Plan (OP; City of Ottawa, 2021) was updated and recently approved by the Ministry of Municipal Affairs and Housing as part of a comprehensive review. Pursuant to subsections 17(36.5) and (38.1) of the Planning Act, the decision of the Minister of Municipal Affairs and Housing regarding an official plan adopted in accordance with section 26 of the Planning Act is final and not subject to appeal. Accordingly, the new City of Ottawa Official Plan, as approved with modifications by the Minister, came into effect on November 4, 2022. The OP provides a vision for the future growth of the city and a policy framework to guide the city's physical development. With respect to natural heritage considerations addressed under an EIS, the OP provides a framework through which species at risk and other wildlife (and their habitats), forested areas, wetlands and surface water features must be reviewed. Key portions of the OP to be considered include:

The Environmental Impact Study Guidelines (City of Ottawa, 2023a) - which outlines study requirements of the EIS;

OP Schedule C11 - which outlines the Natural Heritage System Features overlay and Natural Heritage System Core Areas;

OP Section 4.8.1 - under which the City recognizes the following natural heritage features, as defined in Ottawa's Environmental Impact Study Guidelines:

a) Significant wetlands;
b) Habitat for endangered and threatened species;
c) Significant woodlands;
d) Significant valleylands
e) Significant wildlife habitat;
f) Areas of Natural and Scientific Interest;
g) Urban Natural Features;
h) Natural Environment Areas;
i) Natural linkage features and corridors;
j) Groundwater features;
k) Surface water features, including fish habitat;
l) Landform features; and
m) Natural features or natural areas having significant cultural, economic, or historical value to the Algonquin Anishinabe Host Nation.

Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment (City of Ottawa, 2022) - which identifies wooded areas within the urban boundary that are >0.8 ha and have been continuously forested for > 60 years as "Significant Woodland'';

OP Section 4.9.3 – which provides guidelines for development and site alteration near surface water features through the provision of minimum setbacks and directives to retain wetland areas and the requirement to complete headwater drainage feature assessments (HDFA) to provide management recommendations for headwater features; and

The Protocol for Wildlife Protection during Construction (City of Ottawa, 2015) – which identifies best management practices to be employed through construction to reduce the direct impacts of development on wildlife.

The City currently has no Community Plans, Environmental Management Plans, Secondary Plan Studies or completed, that directly pertain to the Site (City of Ottawa, 2023b). The Upper Poole Creek Rehabilitation Project (Mississippi Valley Conservation Authority, 2019) addresses the nearby Poole Creek Corridor but does not include the Site. The Jock River Reach 2 Subwatershed Study is currently listed as incomplete (City of Ottawa, 2023d) but extends to include the Site. The Jock River Reach 2 Subwatershed Study Existing Conditions Report (Marshall Maklin Monaghan, 2007) identifies measures (e.g. watercourse setbacks) that are either consistent with or directly reiterate measures as provided within the City's Official Plan in place at that time. The EIS thus seeks accordance with the OP.

2.3 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 (Government of Ontario, 1990a). The Act obliges 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 under Section 28 of the Conservation Authorities Act for relevant works. This project falls under the jurisdiction of the Rideau Valley Conservation Authority (RVCA).

Bill 23, which was passed on November 28th, 2022, and received Royal Assent the same day, introduced a series of legislative and proposed regulatory changes affecting conservation authorities. It is now in effect. Among the changes under Bill 23, the definition of "watercourse" was updated from an identifiable depression to a defined channel having a bed, and banks or sides.

2.4 Species at Risk Act, 2002

The federal Species at Risk Act (SARA; Government of Canada, 2002) 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 the SARA is to prevent populations of wildlife from becoming Extirpated, Endangered, or Threatened, provide recovery Endangered or 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 (MBCA; Government of Canada, 1994) and listed as Endangered, Threatened, or Extirpated under Schedule 1 of SARA are protected wherever they occur in Canada, regardless of land ownership. SARA protections for other species do not normally extend to privately owned land. However, the Federal Minister of ECCC can and has imposed SARA protections on private projects where habitat is deemed "…*necessary for the survival or recovery of the species*…" in the area of concern.

2.5 Endangered Species Act, 2007

The provincial Endangered Species Act (ESA; Government of Ontario, 2007) is administered by the Ministry of Environment, Conservation, and Parks (MECP) and provides protection for species at risk (SAR) and their habitat. 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.

2.6 Fisheries Act, 1985

The federal Fisheries Act (Government of Canada, 1985) is administered by Fisheries and Oceans Canada (DFO) and provides protections to fish, fish habitat, and fisheries. Specifically, the Fisheries Act in its current version provides protection for all fish and fish habitat, and prohibits the harmful alteration, disruption or destruction of fish habitat.

2.7 Migratory Birds Convention Act, 1994

Nesting migratory birds are protected under the MBCA (Government of Canada, 1994). No work is permitted that would result in the destruction of active nests (nests with eggs or young birds) or the wounding or killing of bird species protected under the MBCA and/or associated regulations (e.g., SARA).

2.8 Fish and Wildlife Conservation Act, 1997

The provincial Fish and Wildlife Conservation Act (FWCA; Government of Ontario, 1997) 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. It also provides general protections for many species otherwise covered under the MBCA, the ESA and/or SARA.

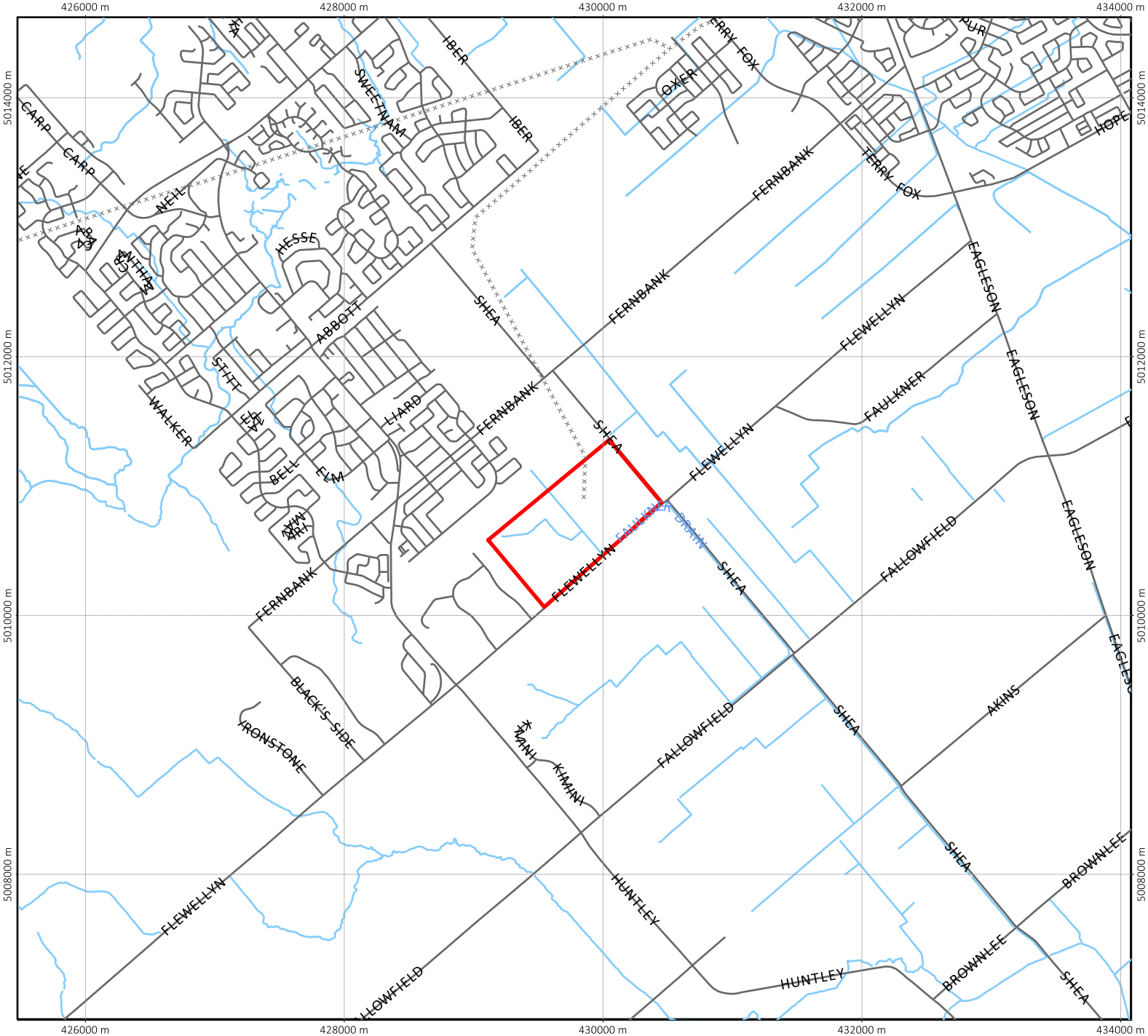


Figure 1 Site Context

Site

Utility Line

Watercourse

Roads

N

0 1000 m

Project: CAIV 1300
Map File: CAIV 1300 2309a
Universal Transverse Mercator - Zone 18 (N)
Printed on: 2023-10-03

KILGOUR & Associates

3.0 PROPERTY IDENTIFICATION

The Site (Figure 1) currently includes four major parcels (5993 and 6115 Flewellyn Road, and 6070 Fernbank Road, plus a 14.2 agricultural field on the northwest corner of Shea and Flewellyn Roads that is currently unaddressed). Several other associated parcels are also included in the Site. These are the Faulkner Stormwater Management (SWM) pond (addressed as 59 Aridus Cres.), a hydro corridor that diagonally crosses the southern end of 6070 Fernbank Road, and the small triangular parcel at 6035 Flewellyn Road below the hydro corridor. The hydro corridor is subject to mowing and thus should be maintained as cultural meadow. The SWM area includes a sanitary small pump station at its north end but is otherwise comprised almost entirely of the open pond, though the banks are sparsely vegetated. A recreational pathway extends around the east side of the SWM pond and through a portion of the hydro corridor.

Six additional 0.8 ha properties (residential parcels at 5917, 6015, 6025 6141, and 6159 Flewellyn Road, and an empty unaddressed lot on Shea Road, which is farmed as part of the larger, adjacent agricultural field), are associated with the Site. These parcels are still held by private landowners not currently associated with proposed site development, but nevertheless are considered within the context of this study as areas likely to be eventually included.

Combined, these parcels cover an area of approximately 75 hectares (ha) south of Stittsville in the west end of Ottawa. Much of the Site was historically farmed though some currently forested areas on the western half area associated with broad forested bands that have existed on the Site for more than 60 years based on historical aerial photography[1]. Much of 5993 Flewellyn Road was cleared of vegetation in ~2016 (per geoOttawa imagery) in association with the construction of the Faulkner SWM Pond. The remaining forested area in the southeast corner of the at parcels was cleared of tree cover in ~2018. Other than the hydro corridor, which is zoned O1P – Open Lands, the Site is currently zone RU – Rural.

The Site is bordered by:

- A community of R1 to R3 density residential (single homes; still partially under construction) to the north, together with parks, ponds, etc.;
- Country estate lots to the west;
- Shea Road and agricultural lands to the east; and
- Flewellyn Road and agricultural lands (with some forest blocks) to the south.

[1] National Air Photo Library Roll A18057, Photo 0049, Dated 1963-05-24

4.0 METHODOLOGY

4.1 Desktop and Background Data Review

4.1.1 General Records Review

Background information was obtained from online databases and geographic information system mapping applications to review relevant information. Aerial imagery from Google Earth, the RVCA Geoportal and the City's geoOttawa systems was used to identify existing features and confirm information found in the background review.

4.1.2 Species at Risk Screening

The review of existing information included a preliminary SAR screening for species listed under the federal SARA and provincial ESA having some record of occurrence within the broader vicinity of the Site. The screening was completed following the *Draft Client's Guide to Preliminary Screening for Species at Risk*. The results of the screening process informed the list of species that were considered in the assessment of the potential for development impact(s) to SAR or SAR habitat. Previously, the results of the preliminary SAR screening were forwarded to MECP for comment and review. The results of the screening were sent to MECP on October 4, 2022, to confirm the information collected (Appendix B). As of 2023, however, the MECP no longer provides this service, and no response will be provided. Regardless, it is considered unlikely that MECP would indicate potential for SAR beyond those already considered in this EIS.

Where it is determined through the EIS process that there is an anticipated impact of the development on SAR, an Information Gathering Form (IGF) is typically submitted to MECP for further review. The IGF process, however, is not generally necessary where the SAR management process may be handled through a Notice of Activity process associated with the Ontario Conservation Fund under O.Reg. 829/21.

- Species at Risk in Ontario (SARO; Ministry of Environment, Conservation, and Parks (MECP, 2023);
- Species at Risk Public Registry (Government of Canada, 2023);
- Natural Heritage Information Centre (NHIC; Ministry of Natural Resources, and Forestry (MNRF, 2023c);
- Land Information Ontario (MNRF, 2023b);
- Aquatic Species at Risk Map (DFO, 2023);
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019);
- Ontario Breeding Birds Atlas (Birds Canada, Canadian Wildlife Service (Environment and Climate Change Canada), et al., 2009);
- Ontario Butterfly Atlas (Toronto Entomologists' Association, 2023);
- eBird (The Cornell Lab of Ornithology, 2023b);

- iNaturalist (California Academy of Sciences and National Geographic Society, 2023);
- Bumble Bee Watch (Wildlife Preservation Canada et al., 2023);
- Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Ontario (Humphrey & Fotherby, 2019);
- Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario (Humphrey, 2017); and
- Fish ON-Line (MNRF, 2023a).

4.1.3 Agency Consultation

The Site is located within the jurisdictions of the City of Ottawa and the Rideau Valley Conservation Authority (RVCA).

4.2 Field Surveys

4.2.1 Site Work Summary

KAL undertook a field program to document existing ecological conditions on the Site and to confirm the results of the background review.

KAL biologists completed an initial field review of the site in the late summer of 2022, then completed an extensive suite of field studies through the spring and summer of 2023. Table 1 provides a summary of all field visits. Specific details of each program are further described under each study type (e.g. breeding bird surveys) in the relevant sub-sections following through the remainder of Section 4.2. Specific survey stations are shown in Figure 2

Table 1: Field Study dates

Date	Purpose	Conditions	Personnel
November 23, 2021	• Identify general site conditions • Map Butternuts along drill rig routes	• 3°C • Cloudy, no precipitation • Light breeze	• Anthony Francis
September 8, 2022	• Review general site conditions • Conduct initial ELC	• 24°C • Sunny with some clouds • 12km/h wind SW	• Anthony Francis
September 28, 2022	• Confirm ELC designations	• 14°C • Overcast • No precipitation	• Sarantia Katsaras
April 4, 2023	• Site recon	• 8°C • Sunny • 13km/h winds N	• Nick Moore • Rob Hallet
April 17, 2023	• HDFA #1	• 8°C • Light rain • Cloudy	• Nick Moore • Rob Hallet
April 20, 2023	• Frogs #1	• 8°C • 30% cloud cover • Very light wind	• Rob Hallet • Kurtis Westbury
May 19, 2023	• HDFA #2	• 21°C	• Kurtis Westbury

		• Sunny with some clouds • Strong breeze	• Nicholas Schulz
May 23. 2023	• Frogs #2	• 18°C • 0% cloud cover • No wind	• Nick Moore • Kurtis Westbury
May 29, 2023	• EWPW #1	• 18°C • No cloud cover • 75% of moon visible	• Kurtis Westbury • Maren Nielsen
June 1, 2023	• EWPW #2	• 29°C • 50% cloud cover • 90% visible	• Kurtis Westbury • Jenni Velichka
June 2, 2023	• Breeding Bird Survey #1 • ELC	• 29°C • Sunny with clouds	• Rob Hallet • Maren Nielsen
June 5, 2023	• Butternut health assessment	• 22°C • Cloudy • Slight breeze	• Maren Nielsen • Rob Hallet
June 13, 2023	• Breeding Bird Survey #2 • Move bat monitor	• 22°C • Slightly cloudy • Slight breeze	• Rob Hallet
June 30, 2023	• Frogs #3 • EWPW #3	• 22°C • Clear and smoky sky • 100% moon visibility	• Jenni Velichka • Maren Nielsen
July 5, 2023	• Breeding Bird Survey #2 • HDFA #3	• 24°C • Slight breeze • 0% cloud cover	• Nicholas Schulz

Figure 2 Study Locations

Currently Owned Properties

Bird Stations

Anuran Stations

Bat Stations

N

0 200 m

Project: CAIV 1300
Map File: CAIV 1300 2309a
Universal Transverse Mercator - Zone 18 (N)
Printed on: 2023-10-03

KILGOUR & Associates

4.2.2 Surface Water Characterization

Aerial imagery and public databases were reviewed to determine wetland areas and watercourses (MNRF, 2023c; Rideau Valley Conservation Authority, 2023a). Wetlands on the Site were delineated and characterized in the field as part of the Ecological Land Classification (ELC) exercise (see Section 4.2.3 below). A Headwater Drainage Feature Assessment (HDFA) was conducted for the Site following the methods per the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (Toronto and Region Conservation Authority & Credit Valley Conservation, 2013). The Faulkner Drain was not assessed using the HDFA protocol but was described based on existing data for the feature.

The HDFA protocol requires up to three surveys of HDFs on a site. The first is conducted near the spring freshet to identify channel and wetted dimensions at peak water levels. Fish communities and habitats are assessed later in the spring for those HDFs hydrologically capable of supporting fish. Water levels of features not found to be dry during the second visit are checked once more in mid to late summer to assess their status as permanent watercourses.

4.2.3 Ecological Land Classification

Vegetation communities on the Site were identified and mapped in the field on September 8 and September 28, 2022, and updated on June 2, 2023, using standard Ecological Land Classification (ELC) methods for Ontario (Lee et al., 1998). This method provides a consistent approach to identify, describe, and map vegetation communities or physiographic features on the landscape based on dominant plant species and soil composition. This method results in a standardized description of each vegetation community to capture 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 may be present.

A desktop review of available aerial imagery and preliminary field visits informed how the Site generally divides 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 centimetre (cm) long soil auger to characterize community substrates. Representative photos of each ELC unit on the Site were taken and are included with the community descriptions in this report.

4.2.4 Butternut Health Assessment

Butternuts on site were initially mapped on November 23, 2021, along proposed routes for drilling rigs that would be used in subsequent geotechnical surveys. The intention of that work was to adjust routes as required to avoid impacts to Butternuts. A subsequent, more detailed site review on September 8, 2022, noted that many of the previously observed Butternuts had blown down, presumably during the derecho event on May 21, 2022. A formal Butternut survey was conducted by KAL biologists Rob Hallett and Maren Nielsen on June 5, 2023, to map and assess the remaining Butternuts on the Site (Appendix C).

4.2.5 Breeding Birds

Morning breeding bird surveys were performed using point counts following the Ontario Breeding Bird Atlas Guide for Participants (Ontario Breeding Bird Atlas, 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. As per the Ontario Breeding Bird Atlas, two rounds of surveys must take place between sunrise and five hours after sunrise between May 24 and July 10. Surveys took place during the mornings of June 2 and July 5, 2023.

A total of eight breeding bird survey stations were established in representative habitats on the Site (Figure 2). All incidental observations were recorded while moving between survey points as well as during other visits to the Site. Birds were identified by song and/or direct visual observation.

Bird species were classed as regionally rare based on an analysis of data from the Atlas of Breeding Birds of Ontario (2009) based on Hill's Site Regions, now Ecoregions. The federal and provincial significance of bird species were classed based on species' listings under Schedule 1 of SARA and the ESA, and species tracked by NHIC (MNRF, 2023c; for non-SAR species considered provincially significant).

4.2.6 Nightjars

Night-time bird surveys to confirm the presence/absence of at-risk nightjars, specifically Eastern Whip-poor-will (*Antrostomus vociferus*), and their potential breeding territories were conducted following the Survey Protocol for Eastern Whip-poor-will in Ontario (MNRF, 2014; Ontario Breeding Bird Atlas, 2021). This protocol calls for three separate night-time surveys between May 18 and June 30 that are timed based on moon conditions. Eastern Whip-poor-wills usually forage in the semi-darkness of early morning and dusk, but on nights when the moon is more than half full, they are likely to forage all night long under the brighter conditions. Their broods are timed such that the young hatch approximately 10 days before the full moon when the parents have more time (and moonlight) to catch food for them (Kaufman, 2019; The Cornell Lab of Ornithology, 2023a). As such, this species is more detectable during a full moon period.

As per the draft protocol, surveys were completed within a week of the full moon while the moon was visible above the horizon (greater than 50% illuminated) and started at least 30 minutes after sunset and ended while the moon was still visible. Surveys were conducted under field conditions with no precipitation, little or no wind, clear skies, temperature of 10°C or above, and good visibility (low cloud cover). The timing of Eastern Whip-poor-will surveys is also optimal for observing Common Nighthawk (*Chordeiles minor*), as that species is generally best heard calling in the late evening. MNRF (2014) recommends a minimum of three surveys to be completed during the breeding season, with two ideally occurring in late May or the first week of June during a week preceding or just after a full moon, and a third survey in the next available full moon period (middle/end of June). Nightjar surveys took place on the evenings of May 29th, June 1st, and June 30th, 2023.

Survey points are to be established at 500 m intervals along the survey route (the aim is to have one survey point for every 30 ha of typical habitat). Two survey stations were used for nightjar surveys (EWPW1 and EWPW2; Figure 2), and these stations covered habitats that were considered most likely to uncover nightjars (i.e., they were close to edge habitats along wooded areas that would provide feeding opportunity near potential nesting areas). As per MNRF (2014), each point count station had a fixed radius of 300 m so

that the absolute number of birds could be counted within a reasonable hearing range (note that calling Eastern Whip-poor-will can be heard up to 1 km away under ideal conditions). Surveyors were careful not to walk directly through suitable nightjar habitat in between survey stations to avoid stepping on any potential Eastern Whip-poor-will eggs, which are cryptically coloured and laid on the forest floor.

4.2.7 Anurans

Anuran (frog and toad) surveys were performed following the Marsh Monitoring Program (Birds Canada, Environmental Canada, et al., 2009). This protocol calls for multiple survey stations across a site to capture spatial and habitat variability. The Marsh Monitoring Program advises that each station be visited 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.

Anuran surveys are to begin one half hour after sunset and end before midnight on evenings with appropriate temperatures and light winds (≤3 on the Beaufort Scale[1]). Anuran surveys took place on the evenings of April 20th, May 23rd, and June 30th, 2023. Additional observations of amphibians were made throughout the spring and summer during other field visits.

4.2.8 Bats and Other Mammals

Bat monitoring was completed following acoustic surveys under the MNRF's Survey Protocol for Species at Risk Bats within Treed Habitats (2017). This is currently the recommended protocol for confirming the presence/absence of Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-coloured Bat (*Perimyotis subflavus*), where it is determined that potentially suitable habitat for the establishment of maternity roosts is present. Wooded areas on the Site were deemed potentially suitable habitat for the establishment of maternity roosts during KAL's preliminary desktop review and initial field visits. Trees with characteristics suitable for bat roosting were observed in the area.

All species of bats in a given area are detectable under this protocol if ultrasonic acoustic monitors are used and the signal-to-noise ratio can be analyzed from sonogram displays to identify bat calls to species level. Under the protocol, acoustic monitors are to be installed for a minimum of 10 nights between June 1 and June 30, with recordings commencing after dusk and continuing for five hours. KAL installed two acoustic monitors on the Site (Figure 2): on at the edge of the forested area on the north edge of the Site, and one at the edge of the forested area near the southeast corner of the Site. The acoustic monitors were placed in these locations to capture the best potential bat habitat on the Site (potential roosting habitat in wooded areas and potential foraging habitat over adjacent open areas) and to increase the likelihood of detecting bats based on their echolocating behaviour. Bats use echolocation more frequently in cluttered environments (Falk et al., 2014), so installing monitors along the edges of wooded areas rather than in the middle of open foraging areas likely increases bat detectability. The monitors were placed just outside of the cluttered environment (forested area) as the distinguishability of calls among species diminishes within such locations (National Park Service, 2020). Both monitors were installed on June 13, 2023, and removed on July 4, 2023 (14 nights of data collection).

Incidental observations of other mammals present in the Study Area were collected during all field visits. Mammal observations were limited to sightings of scat, tracks, and in some cases, direct observations.

5.0 RESULTS

5.1 General Natural Heritage Context

The nearest lands zoned EP-Environmental Protection surrounding the Site are approximately 850 m northwest of the northwest corner of the site. These EP lands are associated with the Fernbank Wetland (not a Provincially Significant Wetland [PSW]) located to the west of Stittsville Main Street. The closest PSW is the Goulbourn Wetland complex located 1.8 km to the northwest of the Site. Wetland estimates from within the geoOttawa system (City of Ottawa, 2023c) purport the potential presence of wetland along the east edge of the site. Those mappings, however, are estimates from 2011 and this area has been subject to active agricultural usage since 2018. The currently existing extent of wetland cover is assessed in Sections 5.3 and 5.4 below.

There are no Areas of Natural and Scientific Interest in this portion of Stittsville (Muncaster, 2019). No environmental constraints were indicated on the site in Schedule K of the City's previous Official Plan (Muncaster, 2019). Most of the forested portions of the Site are designated as potential Natural Heritage System Features within Schedule C11 of the City's current OP.

5.2 Landforms, Soils, and Geology

The topography of the broader area is generally flat with loamy, fine sand soils over clay or fluvial materials (Schut & Wilson, 1987). The eastern edge of the site is indicated in regional soil maps as part Osgoode Association, with fine loamy sand with poor drainage. The remainder of the Site is indicated as part of the Reevecraig Association, also with (alkaline) loamy fine sand but typically over clay causing poor drainage. Soil cores taken across the Site during the ELC investigation confirmed the upper soil layers as consisting of ~80 cm of fine loamy sand, but generally hit fluvial-type material with sufficient gravel texture to preclude deeper coring. Across most of the Site, soil was moist/fresh but with no noticeable mottles or gley above ~60 cm depth. Accumulated organic material on the surface was never more than 5 cm in depth except in the small swamp pocket at the north end of the site where the organic layer was 10 to 15 cm in depth.

5.3 Ecological Land Classification

A total of ten distinct landcovers or ELC units were delineated on the Site (Figure 3). The majority of the western portion of the Site is a mixed Eastern White Cedar forest, a Poplar dominant deciduous forest, and meadow areas, with smaller areas of Scots Pine plantation and an Eastern White Cedar Swamp. The eastern portion of the Site is dominated by a thicket community and open agricultural lands. KAL biologists were not permitted direct access to the small, residential parcels along Flewellyn Road as they were still privately-owned at the time-of-survey. Road-side and aerial image reviews, however, indicate land cover on the small parcels (other than of the manicured spaces directly associated with houses and lawns) to correspond with the adjacent landcover of the Site.

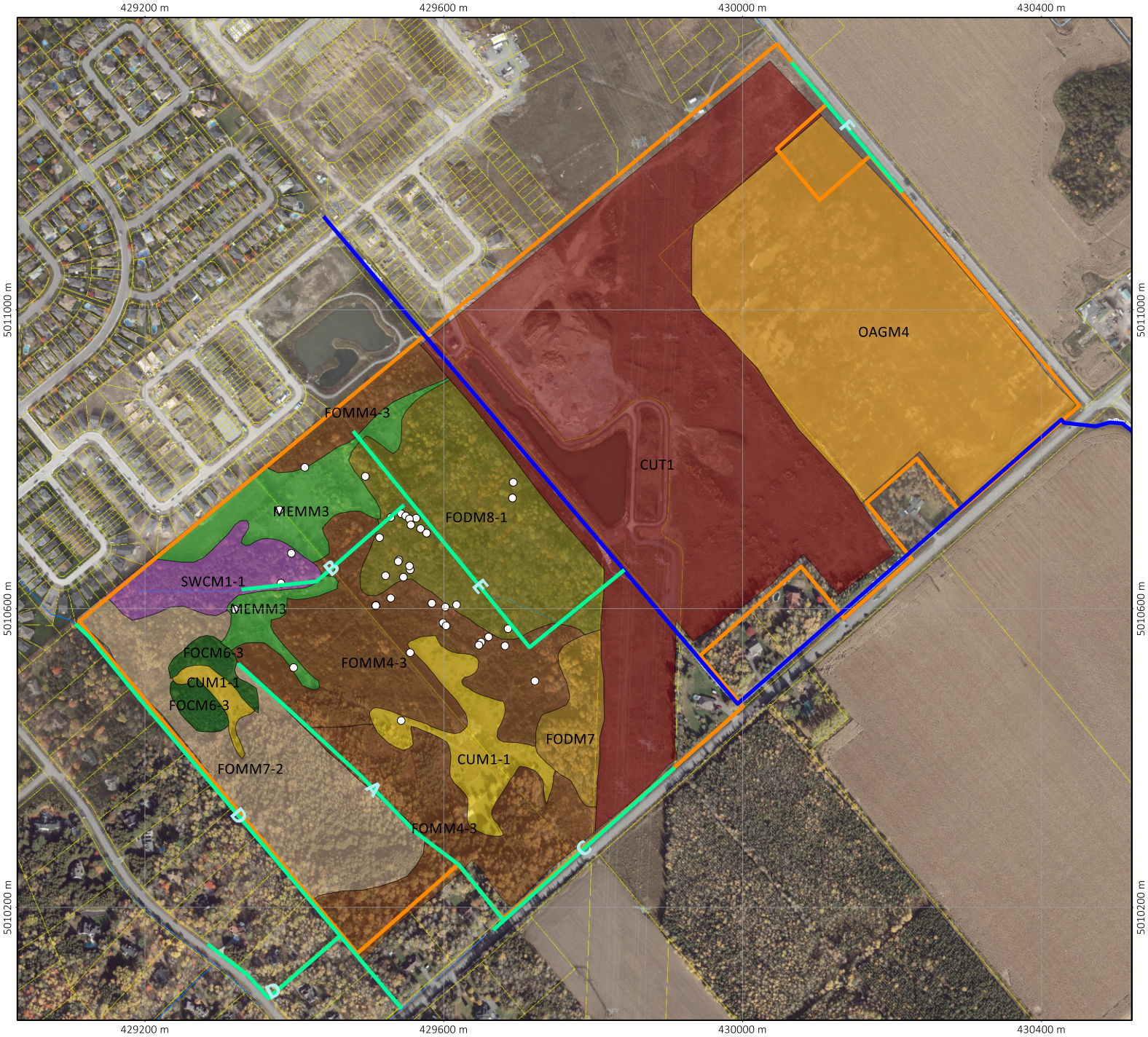


Figure 3 Existing Conditions

Currently Owned Properties

ELC

- CUM1-1
- CUT1
- FOCM6-3
- FODM7
- FODM8-1
- FOMM4-3
- FOMM7-2
- MEMM3
- OAGM4
- SWCM1-1

Butternut

HDF

Faulkner Drain

N

0 200 m

Project: CAIV 1300
Map File: CAIV 1300 2309a
Universal Transverse Mercator - Zone 18 (N)
Printed on: 2023-10-03

KILGOUR & Associates

5.3.1 Dry - Fresh White Cedar – Hardwood Mixed Forest Type (FOMM4-3)

A broad swath of the western portion of the Site is characterized as a Dry - Fresh White Cedar – Hardwood Mixed Forest Type (FOMM4-3) community (Figure 4). It is dominated by Eastern White Cedar (*Thuja occidentalis*; 10-20 cm DBH), Trembling Aspen *(Populus tremuloides*; 10-20 cm DBH), Green Ash (*Fraxinus pennsylvanica*; 10-15 cm DBH), Butternut (*Juglans cinerea*; 20-50 cm DBH), Large tooth Aspen (*Populus grandidentata*; ~15 cm DBH), White Spruce (*Picea glauca*; 30 cm DBH), White Pine (*Pinus strobus*; 25 cm DBH), Larch/Tamarack (*Larix laricina*; 15-20 cm DBH), American Beech (*Fagus grandifolia*; 10-15 cm DBH), and American Elm (*Ulmus americana*). The understory is predominantly Common Buckthorn (*Rhamnus cathartica*), Common Juniper (*Juniperus communis*), Poison Ivy (*Toxicodendrion radicans*), Spinulose Wood Fern (*Dryopteris carthusiana*), Trembling Aspen Saplings *(Populus tremuloides*), Basswood Saplings (*Tillia americana*), Garlic Mustard (*Alliaria petiolata*), Canada Goldenrod (*Solidago canadensis*), Red Raspberry (*Rubus ideaus*), Purple flowering raspberry (*Rubus odoratus*), Pin Cherry (*Prunus pensylvanica*), Tall Thimbleweed (*Anemone virginiana*), Spiked Speedwell (*Veronica spicata*), Riverbank Grape (*Vitis riparia*), New England Aster (*Symphyotrichum novae-angliae*), Sensitive Fern (*Onoclea sensibillis*), False Solomon's Seal (*Maianthemum racemosum*), and Rough goldenrod (*Solidago rugosa*).

Figure 4. Dry - Fresh White Cedar – Hardwood Mixed Forest Type (FOMM4-3)

5.3.2 Fresh - Moist White Cedar - Hardwood Mixed Forest Type (FOMM7-2)

The western-most extent of the Site is characterized as a Fresh - Moist White Cedar - Hardwood Mixed Forest Type (FOMM7-2) community (Figure 5). It is dominated by Eastern White Cedar (*Thuja occidentalis*; 5-15 cm DBH), White Birch (*Betula papyrifera*; 10-20 cm DBH), Trembling Aspen *(Populus tremuloides*; 10-35 cm DBH), White Ash (*Fraxinus americana*; 5-8 cm DBH), White Spruce (*Picea glauca*; ~10 cm DBH), and Balsam Fir (*Abies Balsamea*) tree species. Understory and groundcover species include Alder Buckthorn (*Rhamnus frangula*), White Willow Saplings (*Salix alba*), Ostrich Fern (*Matteuccia struthiopteris*), Spinulose Wood Fern (*Dryopteris carthusiana*), Sensitive Fern (*Onoclea sensibillis*), Common Lady Fern (*Athyrium filix-femina*), Virginia Creeper (*Parthenocissus quinquefolia*), Jack in the Pulpit (*Arisaema triphyllum*), Canada Mayflower (*Maianthemum canadense*), Garlic Mustard (*Alliaria petiolata*), Eastern Hemlock (*Tsuga canadensis*) saplings, and Green Ash (*Fraxinus pennsylvanica*) saplings.

Figure 5. Fresh - Moist White Cedar - Hardwood Mixed Forest Type (FOMM7-2)

5.3.3 Dry – Moist Old Field Meadow Type (CUM1-1)

A Dry – Moist Old Field Meadow Type (CUM1-1; Figure 6) is located centrally on the Site. This area is characteristic of previous disturbance with scattered tree species including Large tooth Aspen (*Populus grandidentata*; ~5 cm DBH), Trembling Aspen (*Populus tremuloides*; 10-25 cm DBH), Eastern White Cedar (*Thuja occidentalis*; ~10 cm DBH), Scots Pine (*Pinus sylvestris*; 5-10 cm DBH), American Beech (*Fagus*

grandifolia; ~10 cm DBH), Apple Spp. (*Malus*; 8-10 cm DBH), White Spruce (*Picea glauca*; 20-25 cm DBH), Larch/Tamarack (*Larix laricina*; ~5-10 cm DBH), Green Ash (*Fraxinus pennsylvanica*; <5 cm DBH). Shrub and groundcover species included Common Juniper (*Juniperus communis*), Trembling Aspen (*Populus tremuloides*) saplings, Orchard Grass (*Dactylis glomerata*), Wild Strawberry (*Fragaria vesca*), Canada Goldenrod (*Solidago canadensis*), Poison Ivy (*Toxicodendron radicans*), Red Raspberry (*Rubus idaeus*), Alder Buckthorn (*Rhamnus frangula*), Common Blackberry (*Rubus allegheniensis*), Reed Canary Grass (*Phalaris arundinacea*), Meadow Buttercup (*Ranunculus acris*), Common Dandelion (*Taraxacum officinale*), Purple Flowering Raspberry (*Rubus odoratus*), Box Elder (*Acer negundo*) saplings, Pin Cherry (*Prunus pensylvanica*), Cow Vetch (*Vicia cracca*), Bebb's Willow (*Salix bebbiana),* Queen Annes Lace (*Daucus carota*), Common Mullein (*Verbascum thapsus*), New England Aster (*Symphyotrichum novae-angliae*), Yarrow (*Achillea millefolium*), Smooth Bromegrass (*Bromus inermis*), Prairie Fleabane (*Erigeron strigosus*), Bird's-foot Trefoil (*Lotus corniculatus*), Kentucky Bluegrass (*Poa pratensis*), Brown Eyed Susan (*Rudbeckia triloba*), Common ragweed (*Ambrosia artemisiifolia),* Silver Cinquefoil (*Potentilla argentea*), Vipers Bugloss (*Echium vulgare*), Rough Cinquefoil (*Potentilla norvegica*), and Bladder Campion (*Silene vulgaris*) species.

Figure 6. Dry – Moist Old Field Meadow Type (CUM1-1)

5.3.4 Dry – Fresh Mixed Meadow Ecosite (MEMM3)

A Dry – Fresh Mixed Meadow Ecosite (MEMM3) is located in the northwest corner of the Site (Figure 7). This area is mainly characterized by Eastern White Cedar (*Thuja occidentalis*), Scots Pine (*Pinus sylvestris;*

~10-20 DBH), Larch/Tamarack (*Larix laricina*; ~10 DBH), and Butternut (*Juglans cinerea*; ~10-20 DBH). Shrub and groundcover species included Common Juniper (*Juniperus communis*), Orchard grass (*Dactylis glomerata*), Wild strawberry (*Fragaria vesca*), Canada Goldenrod (*Solidago canadensis*), Alder Buckthorn (*Rhamnus frangula*), Common Blackberry (*Rubus allegheniensis*), American Elm Saplings (*Ulmus americana*), White Meadowsweet (*Spiraea alba*), Common Dandelion (*Taraxacum officinale*), Purple flowering Raspberry (*Rubus odoratus*), Box Elder Saplings (*Acer negundo*), Pin Cherry (*Prunus pensylvanica*), Common milkweed (*Asclepias syriaca*), Cow Vetch (*Vicia cracca*), Bebbs Willow (*Salix bebbiana*), Apple Spp. (*Malus spp*.), Meadow Horsetail (*Equisetum pratense*), White Panicle Aster (*Symphyotrichum lanceolatum*), Purple Loosestrife (*Lythrum salicaria*), Red Osier Dogwood (*Cornus sericea*), New England Aster (*Symphyotrichum novae-angliae*), Sensitive Fern (*Onoclea sensibilis*), Glossy Buckthorn (*Rhamnus frangula*), Jow Pye Weed (*Eutrochium purpureum*), Birds-foot Trefoil (*Lotus corniculatus*), Grass goldenrod (*Euthamia graminifolia*), American Vetch (*Vicia americana*), and Yellow Toadflax (*Linaria vulgaris*).

Figure 7. Dry – Fresh Mixed Meadow Ecosite (MEMM3)

5.3.5 Dry – Fresh Scots Pine Naturalized Coniferous Plantation Type (FOCM6-3)

A Fresh Scots Pine Naturalized Coniferous Plantation Type (FOCM6-3) is located in the northwest corner of the Site (Figure 8). It is mainly dominated by Scots Pine (*Pinus sylvestris*; ~10-20 cm DBH), Jack Pine (*Pinus banksiana*; ~15 cm DBH), Eastern White Cedar (*Thuja occidentalis*), White Pine (*Pinus strobus*; ~20 cm DBH), White Birch (*Betula papyrifera*; 10-20 cm DBH), Butternut (*Juglans cinerea*), American Beech (*Fagus*

grandifolia), and Green Ash (*Fraxinus pennsylvanica*; 10-15 cm DBH). Shrub and groundcover species included Wild Strawberry (*Fragaria vesca*), Fragrant bedstraw (Galium trifler), Deptford Pink (*Dianthus armeria*), Thimbleweed (*Anemone virginiana*), Common Juniper (*Juniperus communis*), Orchard grass (*Dactylis glomerata*), Red Raspberry (*Rubus idaeus*), Alder Buckthorn (*Rhamnus frangula*), Common Blackberry (*Rubus allegheniensis*), Reed Canary Grass (*Phalaris arundinacea*), Meadow Buttercup (*Ranunculus acris*), Common Dandelion (*Taraxacum officinale*), Cow Vetch (*Vicia cracca*), Apple Spp. (*Malus spp*.), and Bebbs Willow (*Salix bebbiana*).

Figure 8. Dry – Fresh Scots Pine Naturalized Coniferous Plantation Type (FOCM6-3)

5.3.6 White Cedar Mineral Coniferous Swamp (SWCM1-1)

A White Cedar Mineral Coniferous Swamp (SWCM1-1) is located on Site (Figure 9). It is dominated by Eastern White Cedar (*Thuja occidentalis*) and has ground cover consisting of Bulblet Bladder Fern (*Cystopteris bulbifera*), Alder Buckthorn (*Rhamnus frangula*), Interrupted Fern (*Osmunda claytoniana*), Sensitive Fern (*Onoclea sensibilis),* and Poison Ivy (*Toxicodendron radicans*).

Figure 9. White Cedar Mineral Coniferous Swamp (SWCM1-1)

5.3.7 Fresh – Moist Lowland Deciduous Forest Ecosite (FODM7)

A Fresh-Moist Lowland Deciduous Forest Ecosite (FODM7) is located in the center of the Site (Figure 10). It is dominated by Trembling Aspen (*Populus tremuloides*) Eastern White Cedar (*Thuja occidentalis*), Butternut (*Juglans cinerea*), Black Ash (*Fraxinus nigra*), and Balsam Poplar (*Populus balsamifera*). Its ground cover consists of Common Buckthorn (*Rhamnus cathartica*), Poison Ivy (*Toxicodendron radicans*), White Panicle Aster (*Symphyotrichum lanceolatum*), Riverbank Grape (*Vitis riparia*), Common Ragweed (*Ambrosia artemisiifolia*), and Yellow Sweet Clover (*Melilotus officinalis*).

Figure 10. Fresh – Moist Lowland Deciduous Forest Ecosite (FODM7)

5.3.8 Fresh – Moist Poplar Deciduous Forest Type (FODM8-1)

A Fresh – Moist Poplar Deciduous Forest Type (FODM8-1; Figure 11) is located on Site and is dominated by Trembling Aspen (*Populus tremuloides*; 10-20 cm DBH), White Birch (*Betula papyrifera;* 10-20 cm DBH), Balsam Poplar (*Populus balsamifera*; 10-25 cm DBH), Butternut (*Juglans cinerea*; 10-20 cm DBH), Eastern White Cedar (*Thuja occidentalis*; 10-20 cm DBH), Basswood (*Tilia americana*; ~30 cm DBH), Red Maple (*Acer rubrum*; ~27 cm DBH), American Elm (*Ulmus americana*; 10-20 cm DBH), and Black Ash (*Fraxinus nigra*). Its ground cover consists of Sugar Maple saplings (*Acer saccharum*), Milkweed (*Asclepias*), Common Juniper (*Juniperus communis*), Trembling Aspen saplings (*Populus tremuloides*), Sensitive Fern (*Onoclea sensibilis*), Ostrich Fern (*Matteuccia struthiopteris),* Interrupted Fern (*Osmunda claytoniana*), Orchard grass (*Dactylis glomerata*), Canada Goldenrod (*Solidago canadensis*), Poison Ivy (*Toxicodendron radicans*), Alder Buckthorn (*Rhamnus frangula*), White Meadowsweet (*Spiraea alba*), Pin Cherry (*Prunus pensylvanica*), Bloodroot (*Sanguinaria*), Meadow Horsetail (*Equisetum pratense*), Gray's Sedge (*Carex grayi*), Eastern Prickly Gooseberry (*Ribes cynosbati*), White snakeroot (*Ageratina altissima*), Solomon's Seal (*Polygonatum*), Broad-leaved helleborine (*Epipactis helleborine*), Virginia Creeper (*Parthenocissus quinquefolia*), White turtlehead (*Chelone glabra*), White willow (*Salix alba*), New England Aster (*Symphyotrichum novae-angliae*), and Clematis virginiana (*Clematis virginiana*).

Figure 11. Fresh – Moist Poplar Deciduous Forest Type (FODM8-1)

5.3.9 Medium Mineral Open Pasture Type (OAGM4)

A Medium Mineral Open Pasture Type (OAGM4) on Site (Figure 12) is dominated by shrub community species such as Canada Goldenrod (*Solidago canadensis*), Meadow Horsetail (*Equisetum pratense*), Purple Aster (*Symphyotrichum patens*), Common Mullein (*Verbascum thapsus*), Meadow Buttercup (*Ranunculus acris*), Wild Strawberry (*Fragaria vesca*), and Common Dandelion (*Taraxacum officinale*).

Figure 12. Medium Mineral Open Pasture Type (OAGM4)

5.3.10 Cultural Thicket Ecosite (CUT1)

A Cultural Thicket Ecosite (CUT1; Figure 13) on Site is dominated by Bebb's Willow (*Salix bebbiana*), Alder Buckthorn (*Rhamnus frangula*), Trembling Aspen Saplings (*Populus tremuloides*), White Willow (*Salix alba*), White Meadowsweet (*Spiraea alba*), and Milkweed (*Asclepias*).

Figure 13. Cultural Thicket Ecosite (CUT1)

5.4 Surface Water, Groundwater and Fish Habitat

The Site is located within the Rideau River watershed and the Jock River subwatershed (Ministry of Natural Resources and Forestry – Government of Ontario, 2023; Rideau Valley Conservation Authority, 2023b). The Site contains a portion of the Faulkner Drain. The drain traverses the Site from north (near Hickstead Way) to south, turning east and becoming a roadside ditch along Flewellyn Road, towards Shea Road. The drain continues south down Shea Road, eventually joining the Flowing Creek Phase 1 Drain, just south of Brownlee Road (Figure 1).

The HDFA identified six (6) HDFs located on and adjacent to the Site. One group of channels is primarily associated with the Faulkner Municipal Drain, and the second group primarily conveys water from within the forested areas on the Site towards the Faulkner drain (Figure 3).

During the ELC survey, one wetland pocket was identified on the Site, the White Cedar Mineral Coniferous Swamp (SWCM1-1) vegetation community.

5.4.1 Faulkner Drain

The Site contains a portion of the Faulkner Drain, which, per geoOttawa mapping, appears to be primarily a tributary of Flowing Creek, but with connections to the Monahan Drain as well. The Faulkner Drain and the

Site are mapped within both the Flowing Creek catchment and the Monahan Drain catchment within RVCA catchment reports, suggesting that the Faulkner Drain is not a significant hydrological contributor to the overall subwatershed and catchment area. The Faulkner Drain is addressed, minimally, within the *Jock River Reach 2 & Mud Creek Subwatershed Study Existing Conditions Report* (Marshall Maklin Monaghan, 2007). Descriptions in that subwatershed study are generally limited to noting that: the drain is a tributary to the Monahan Drain; it includes very few tributaries of its own; and is in generally poor condition. The subwatershed study does not set any specific setback requirements for watercourses other than to indicate that are to be set in accordance with the City's Official Plan. An existing 18 m easement is registered in favour of the City over the length of the Caivan lands; the 18m corridor extends northward into the adjacent community directly abutting existing development.

Under the current Official Plan, setbacks to water courses are determined in accordance with Section 4.9.3:

> *2) Where a Council-approved watershed, subwatershed or environmental management plan does not exist, or provides incomplete recommendations, the minimum setback from surface water features shall be the greater of the following:*
>
> *a) Development limits as established by the conservation authority's hazard limit, which includes the regulatory flood line, geotechnical hazard limit and meander belt;*
>
> *b) Development limits as established by the geotechnical hazard limit in keeping with Council approved Slope Stability Guidelines for Development Applications;*
>
> *c) 30 metres from the top of bank, or the maximum point to which water can rise within the channel before spilling across the adjacent land; and*
>
> *d) 15 metres from the existing stable top of slope, where there is a defined valley slope or ravine.*

However, per Policy 5):

> *5) Where development or site alteration is proposed within or adjacent to headwater drainage features, and the proponent is requesting an exception to the minimum setback identified in Policy 2), the proposal and supporting studies must address the following to the satisfaction of the City:*
>
> *a) Evaluation and description of the project site, sensitivity of the headwater drainage features and sampling methods;*
>
> *b) Assessment and classification of hydrological function, riparian conditions, fish and fish habitat and terrestrial habitat; and*
>
> *c) Management recommendations regarding the need to protect, conserve, mitigate, maintain recharge or maintain/replicate terrestrial linkages of the headwater drainage features and a corresponding recommendation for an appropriate minimum setback.*

In the consideration of setback requirements for the drain different from the standard values provided in OP Section 4.9.3 2), the ecological services that are, or would be provided by the setbacks must be considered. The drain currently receives input from a stormwater management pond treating the runoff

from the recent urban residential development immediately to the north of the Site. With 3:1 side slopes the channel cross-section is over 12 m wide from top-of-slope to top-of-slope. The typical trapezoid shape of the constructed channel, straight alignment, grass swale and minimal canopy cover greatly impact the aquatic habitat attributes of the channel. Existing residential land uses adjacent to the Faulkner Drain just north of the Site do not provide any setback buffer. For its entire length beyond the Site to its confluence with Flowing Creek, the feature exists as a roadside ditch with no natural setback. Other than where the western side of the drain abuts the forested areas on the Site (FODM8-1 vegetation community), no natural riparian land exists for the length of the feature. The potential for functionality as habitat (beyond the existing forest) or as a wildlife corridor generally, is considered to be negligible. Select retention of forested space within the existing adjacent significant woodland area on the west side of the drain can be anticipated to provide the 30 m setback per OP Section 4.9.3 2c).

For the remainder of the feature, however, the retained buffer would be limited to providing filtration of overland runoff to the drain and allochthonous inputs. This functionality can be anticipated to be provided by a setback of 15 m with simple vegetation (e.g. grasses, forbs and shrubs). The setback could be reduced to as little as 5 m (i.e. which would still be greater than the 0 m setback provided by adjacent developments) so long as:

- Site grading is designed to ensure all adjacent overland flow is directed to a SWM system for quality and quantity control before release (i.e. to otherwise prevent direct, unfiltered/unmitigated surface flow) to the drain; and

- The landscape plan for the setback space includes extensive tree planting. Continuous tree cover would need to be present within setback space along the more southerly side of the drain to maximize shading potential. Tree cover on the more northerly side could be sparser to allow City maintenance access to the channel but should nevertheless be planned to generate at least 40% canopy cover at maturity.

5.4.2 HDFA

The HDFA identified six (6) HDFs located on and adjacent to the Site. Three HDFs (tributaries A, B and D) are associated with the forested areas and White Cedar swamp on the Site, while three (tributaries C, E and F) are associated with the Faulkner Drain.

Tributary D is a man-made, engineered lot swale drain feature that originates in the northwestern corner of the Site, within the FOMM7-2 vegetation community. It follows the western property boundary and is present within portions of the rear yard allowances of the western adjacent residences. It primarily functions as a drainage feature supporting spring run-off and after heavy rainfall. The chain of classification descriptors leads to a management directive of Mitigation for this reach. As this feature is located off of the Site, it will be retained and will continue to provide an overland flow route during the spring freshet. A development setback of 5 m would be anticipated to protect the limited flows with the feature if mature tree cover were maintained within that space.

Tributary A originates directly south of the White Cedar Swamp (SWCM1-1) community and flows southward as a braided channel towards Flewellyn Road. It primarily functions as a drainage feature supporting spring run-off and after heavy rainfall. The chain of classification descriptors, as listed in the

HDFA report (Appendix D) leads to a standard management directive of “Mitigation” for this reach. Further discussion and review of the standard HDFA mitigations for this and the other HDFa occurring directly on the Site are included below.

Tributary B originates within the SWCM1-1 community and flows southeast, eventually joining Tributary E. It has a standing water pool present with interstitial flow towards the Flewellyn Drain. While areas of standing water can potentially function as amphibian breeding habitat, no amphibians were observed within this reach. The chain of classification descriptors leads to a management directive of Protection for this reach.

Tributary C is a roadside ditch feature that originates at the southwestern corner of the Site, at the terminus of Tributary D. It flows eastward, joining the Faulkner Drain. Tributary C is a permanent feature that has water present year-round. This feature was confirmed to function as amphibian breeding habitat and fish habitat. The chain of classification descriptors leads to a management directive of Protection for this reach. It is recommended that this feature be retained to maintain overland flow conditions on the Site and along Flewellyn Road.

Tributary E is a constructed, linear channel feature that originates within the FOMM4-3 and MEMM3 vegetation communities and flows south eventually turning eastward joining the Faulkner Drain. It has intermittent standing water pools present with intermittent flow towards Faulkner Drain. Standing water contributes to groundwater recharge and can function as amphibian breeding habitat. Breeding amphibians were observed within this reach. The chain of classification descriptors leads to a management directive of Protection for this reach.

Tributary F is a roadside ditch feature located along Shea Road at the eastern Site boundary. It is located adjacent to an idle agricultural field and connects downstream to the Faulkner Drain at the intersection with Flewellyn Road. It primarily functions as a drainage feature supporting spring run-off and after heavy rainfall. Breeding amphibians were not observed within this reach. Significant groundworks have and continue to occur in the southern portion of this tributary, and a large portion of this tributary has been altered and/or removed. This chain of classification descriptors leads to a management directive of Protection for this reach.

Standard HDFA management directives of “Mitigation” indicate that the feature may be maintained, replicated, or enhanced using natural channel design techniques to maintain or enhance the overall productivity of the reach. There is no requirement to retain the feature per se, but on-site flow, outlet flows, and overall water balance for the area must be maintained by providing mitigation measures to infiltrate clean stormwater. Standard HDFA management directives of “Protection” indicate that the feature may be maintained and/or enhanced, but typically should not be relocated. The general directive is for the feature to be protected and its riparian zone enhanced where feasible. Notably for Tributaries B and E, however, these tributaries are sourced from the SWCM1-1 community wetland. As the wetland would be unlikely to remain with development occurring on the western half of the Site, (i.e. even with standard setbacks) the hydrology of those Tributaries is unlikely to remain regardless of protections otherwise applied.

5.4.3 Wetlands

One isolated wetland was identified on the Site during the ELC survey, the White Cedar Mineral Coniferous Swamp (SWCM1-1) vegetation community. Species within this community are limited to Eastern White Cedar (*Thuja occidentalis*), Bulblet Bladder Fern (*Cystopteris bulbifera*), Alder Buckthorn (*Rhamnus frangula*), Interrupted Fern (*Osmunda claytoniana*), Sensitive Fern (*Onoclea sensibilis),* and Poison Ivy (*Toxicodendron radicans*). This community has developed in a low-lying area, with organic loamy soils. Mottling and gley were encountered at a depth of ~30 cm.

HDF B originates in the SWCM1-1 community, and HDFs A and D originate adjacent to the SWCM1-1 community. As described above, HDF A and HDF D have management directives of "Mitigation", and HDF B has a management directive of "Protection".

The hydrology of the White Cedar Mineral Coniferous Swamp (SWCM1-1) wetland community, however, is maintained by overland flow and precipitation catchment into the low-lying area (Paterson Group, 2023). HDF D is located within the FOMM7-2 vegetation community and is sufficiently removed from the SWCM1-1 community, and it is, therefore, our opinion that the White Cedar Mineral Coniferous Swamp (SWCM1-1) wetland community is not contributing significantly to the hydrology of Tributary D. Tributary B originating in the SWCM1-1 community that eventually joins Tributary E and the Faulkner Drain are both constructed channels traversing the forested areas on the Site, but are ultimately fed by very shallow water transport through the adjacent soils rather than true groundwater upwellings. Development occurring on the western portions of the property is likely to alter subsurface flows, removing groundwater supply to the swamp wetland feature and therefore negating any potential impact to Tributaries B and E.

5.4.4 Fish Habitat

The HDFA follows Ontario Stream Assessment Protocol (OSAP) methodologies for descriptions of flow conditions, riparian vegetation and site features that are important components of habitat (headwater sampling protocol OSAP S4.M10) and includes an electrofishing survey to describe fish and fish habitat (OSAP S4.M10). During the electrofishing survey conducted on May 18, 2023, six fish were caught belonging to 4 species. Two Northern Redbelly Dace were caught in Tributary B, and one Eastern Blacknose Dace, one Northern Redbelly Dace, one Creek Chub and one Brook Stickleback were caught in Tributary C.

The Faulkner Drain was subject to an extensive clean-out program by the City in 2022 between the Faulkner SWM pond and its confluence with Flowing Creek ~5 km to the south. As is typical of municipal drain clean outs, the entire length of the feature was dredged with excavators to restore the trapezoidal form with no remaining organic substrate, woody structure or in-water vegetation. KAL conducted a fish relation program along the entire length of the drain to support this work between August 8, and September 28, 2022. Fish species captured are indicated in Table 2 below.

Table 2. Fish species in the upper and lower reaches of the Faulkner Drain

Common Name	Species
* Blacknose Dace	*Rhinichthys atratulus*
Bluegill	*Lepomis macrochirus*
* Bluntnose minnow	*Pimephales notatus*

* Brook Stickleback	*Culaea inconstans*
* Central Mudminnow	*Umbra limi*
Central Stoneroller	*Campostoma anomalum*
* Common Shiner	*Luxilus cornutus*
* Creek Chub	*Semotilus atromaculatus*
* Fathead Minnow	*Pimephales promelas*
* Finescale Dace	*Chrosomus neogaeus*
Golden Shiner	*Notemigonus crysoleucas*
* Johnny Darter	*Etheostoma nigrum*
Long Nose Dace	*Rhinichthys cataractae*
Northern Pike	*Esox lucius*
* Northern Redbelly Dace	*Chrosomus eos*
Pumpkinseed	*Lepomis gibbosus*
* Rock Bass	*Ambloplites rupestris*
* White Sucker	*Catostomus commersonii*

* Species caught in upper reaches of the Drain in proximity to the Site. Other fish species were only present in the lower reaches.

5.5 Wildlife Surveys

5.5.1 Breeding Birds

Morning breeding bird surveys were conducted on the dates outlined in Table 1.

Table 3 Summary of dates and weather conditions of morning breeding bird surveys, 2023

Date	Cloud Cover (%)	Air Temperature (°C)	Wind (Beaufort)
June 2, 2023	30	18	2
July 13, 2023	100	15	2
July 5, 2023	0	24	1

A total of 44 bird species were observed on the Site via morning breeding bird surveys and incidental observations. The following bird species were detected: Acadian Flycatcher (*Empidonax virescens),* Alder Flycatcher *(Empidonax alnorum)*, American Crow (*Corvus brachyrhynchos*), American Goldfinch (*Spinus tristis*), American Kestrel (*Falco sparverius*), American Redstart (*Setophaga ruticilla*), American Robin (*Turdus migratorius*), American Tree Sparrow (*Spizelloides arborea*), Black-capped Chickadee (*Poecile atricapillus*), Blue Jay (*Cyanocitta cristata*), Brown Thrasher (*Toxostoma rufum*), Canada Goose (*Branta canadensis*), Chimney Swift (*Chaetura pelagica*), Common Grackle (*Quiscalus quiscula*), Common Yellowthroat (*Geothlypis trichas*), Eastern Wood-Pewee (*Contopus virens*), European Starling (*Sturnus vulgaris*), Field Sparrow (*Spizella pusilla*), Great Crested Flycatcher (*Myiarchus crinitus*), Green Heron

(*Butorides virescens*), Hermit Thrush (*Catharus guttatus*), House Wren (*Troglodytes* aedon), Killdeer (*Charadrius vociferus*), Mallard (*Anas platyrhynchos*), Mourning Dove (*Zenaida macroura*), Northern Cardinal (*Cardinalis cardinalis*), Ovenbird (*Seiurus aurocapilla*), Rose-breasted Grosbeak (*Pheucticus ludovicianus*), Ring-billed Gull (*Larus delawarensis*), Red-breasted Nuthatch (*Sitta canadensis*), Red-eyed Vireo (*Vireo olivaceus*), Ruff (*Calidris pugnax*), Red-winged Black Bird (*Agelaius phoeniceus*), Savannah Sparrow (*Passerculus sandwichensis*), Song Sparrow (*Melospiza melodia*), Swamp Sparrow (*Melospiza georgiana*), Tree Swallow (*Tachycineta bicolor*), Veery (*Catharus fuscescens*), Warbling Vireo (*Vireo gilvus*), Wild Turkey (*Meleagris gallopavo*), Winter Wren (*Troglodytes hiemalis*), Wood Thrush (*Hylocichla mustelina*), White-throated Sparrow (*Zonotrichia albicollis*), and Yellow Warbler (*Setophaga petechia*). The most commonly observed species during breeding bird surveys were American Crow, American Goldfinch, American Robin, Common Yellowthroat, and Song Sparrow.

Four listed at-risk bird species were observed during the morning breeding bird surveys. These SAR observations are summarized in Table 4 below.

Table 4 Summary of species at risk observations during breeding bird surveys, 2023

Species (Taxonomic name)	SARA Status	ESA Status	Dates and Locations Observed
Acadian Flycatcher (*Empidonax*)	Endangered	Endangered	June 2, 2023: BBS#6
Chimney Swift (*Chaetura pelagica*)	Threatened	Threatened	June 13, 2023: BBS#1
Eastern Wood-pewee (*Contopus virens*)	Special Concern	Special Concern	June 2 and June 13, 2023: BBS#2 and BBS#3
Wood Thrush (*Hylocichla mustelina)*	Special Concern	Threatened	June 4, 2023: BBS#1

5.5.2 Nightjars

KAL surveyors completed nightjar surveys on May 29th and June 1st and 29 2023 (Table 5), two during the first moon cycle and one in the next moon cycle, per MNRF (2014) protocols.

Table 5 Summary of dates and weather conditions of nightjar surveys, 2021

Date	Cloud Cover (%)	Air Temperature (°C)	Wind (Beaufort)	Moon Illumination (%)	Moon Visibility (%)
2023-05-29	0-25	18	0	75	100

2023-06-1	50-75	29	1	90	90
2023-06-29	0	22	0	70	100

No Eastern Whip-poor-will were heard calling at either station during any of the three surveys. No Common Nighthawks were observed on the Site.

5.5.3 Anurans

Anuran surveys were performed on April 20th, May 23rd, and June 30th, 2023, at eight stations distributed across the Site to capture spatial and habitat variability. A total of five frog species were observed on the Site via evening Frog surveys and incidental observations. The following frog species and maximum call codes were detected Spring Peeper *(Pseudacris crucifer)* 3*,* Western Chorus Frog *(Pseudacris triseriata)* 3, Wood Frog *(Lithobates sylvaticus)* 3, American Toad *(Anaxyrus americanus)* 1, and Green Frog *(Rana clamitans)* 2. A summary of the weather conditions during the anuran survey is provided in Table 6.

Table 6 Dates and weather conditions of anuran surveys

Date/Time	Wind (Beaufort Scale)	Air Temperature (°C)	Cloud Cover (%)	Precipitation
2023-04-20	1	8	30	None
2023-05-23	0	20	0	None
2023-06-30	0	22	0	None

Table 7 Summary of anurans detected during anuran surveys

Common Name	Scientific Name	Station(s) Observed	Survey Date(s) Observed	Highest Calling Code[1]
American toad	*Anaxyrus americanus*	MMP1, MMP3, MMP4, MMP5, MMP6, MMP7	2023-05-23, 2023-06-29	1
Green frog	*Rana clamitans*	MMP6, MMP7	2023-06-29	2
Spring peeper	*Pseudacris crucifer*	MMP4, MMP5, MMP6, MMP8	2023-04-20, 2023-05-23	3
Western chorus frog	*Pseudacris triseriata*	MMP5	2023-04-20,	3
Wood frog	*Lithobates sylvaticus*	MMP1, MMP5, MMP6	2023-04-20,	3

5.5.4 Bats and Other Mammals

Two acoustic bat monitors were installed for 14 nights and placed facing an open meadow community, where the greatest likelihood for bat activity would occur on the Site. Conditions were ideal with mainly clear or cloudy nights and warm temperatures (≥15°C). Bat species identified within the Site include Big Brown Bat (*Eptesicus fuscus*), Hoary bat (*Lasiurus cinereus*), and Silver-haired Bat (*Lasionycteris noctivagans*). The southern bat monitor was placed on June 2nd, 2023, within a hydro corridor. The North Bat monitor was installed on June 2nd, 2023, in a forested community and moved to a second location on June 13, 2023, to cover a wider area of the northern forest. Bat monitor locations are shown in Figure 2.

Survey Station	Survey Dates	Habitat Description	Big Brown Bat	Eastern Red Bat	Hoary Bat	Little Brown Bat	Silver-haired Bat	Tri-Colored Bat	Mean Number of Calls per Night
AM-1 (North)	2023-05-25 to 2023-06-02	Mixed forest opening to a small meadow	85	0	2	0	37	1	9

Survey Station	Survey Dates	Habitat Description	Big Brown Bat	Eastern Red Bat	Hoary Bat	Little Brown Bat	Tri-Colored Bat	Silver-haired Bat	Mean Number of Calls per Night
AM-2 (South)	2023-05-25 to 2023-06-02	Open hydro corridor with sparse shrubs and trees	2108	12	1761	1	5	4229	585

5.6 Species at Risk

An assessment of species listed under SARA and ESA was completed to identify species having some potential to occur on or near the Site, including Extirpated, Endangered, Threatened, and Special Concern species. Species listed as Extirpated, Endangered, and Threatened are afforded species and habitat protection under the ESA. Federal protections under SARA are always in force for listed species of fish and migratory birds. For species of other groups, SARA normally only applies on federal lands or on projects having some level of participation with or oversight by the federal government. However, SARA-based protections can be imposed by ministerial order on a case-by-case basis in situations where provincial-level protections are deemed inadequate to otherwise protect a species. Such protections are not expected to apply to the Site.

The SAR assessment evaluated whether the Site may provide suitable habitat for SAR (i.e. considering species known to occur in the Ottawa area; Appendix E) and whether they have potential to interact with future development of the Site. An assessment of the potential for SAR and their potential habitat was completed based on the results of the field surveys, ELC (i.e., habitat availability), and a desktop review that considered known species ranges, historic observation records, and preferred habitat requirements of these species (Appendix E). A total of twelve species subject protections as SAR under the ESA and/or SARA were initially considered to have a moderate to high potential to occur on the Site and/or interact with the project (Table 8). Of those twelve species, four were observed to occur on the Site, and only one is considered likely to be negatively impacted by the project. Those species are discussed below.

Table 8 Species at risk with moderate or high potential to interact with the project

Common Name	Taxonomic Name	Status under Endangered Species Act	Status under Species at Risk Act (Schedule 1)	Potential to Interact with Development of the Site
Birds				
Barn Swallow	*Hirundo rustica*	Special Concern	Threatened	Not detected on the Site
Bobolink	*Dolichonyx oryzivorus*	Threatened	Threatened	Not detected on the Site
Canada Warbler	*Cardellina canadensis*	Special Concern	Threatened	Not detected on the Site
Chimney Swift	*Chaetura pelagica*	Threatened	Threatened	Limited/Transient presence only. A single fly-over was detected on the south side of the property. The species is considered unlikely to be resident on the Site. Low probability of interaction with the project
Common Nighthawk	*Chordeiles minor*	Special Concern	Threatened	Not detected on the Site
Eastern Meadowlark	*Sturnella magna*	Threatened	Threatened	Not detected on the Site
Eastern Wood-Peewee	*Contopus virens*	Special Concern	Special Concern	Detected on the Site during breeding bird surveys
Eastern Whip-poor-will	*Antrostomus vociferus*	Threatened	Threatened	Not detected on the Site
Olive-sided Flycatcher	*Contopus cooperi*	Special Concern	Threatened	Not detected on the Site
Wood Thrush	*Hylocichla mustelina*	Special Concern	Threatened	Detected on the Site during breeding bird surveys
Mammals				
Eastern Small-footed Myotis	*Myotis leibii*	Endangered	Not Listed	Not detected on the Site
Little Brown Myotis	*Myotis lucifugus*	Endangered	Endangered	Limited/Transient presence only - low probability of negative interactions if tree clearing occurs outside of the active season
Northern Myotis	*Myotis septentrionalis*	Endangered	Endangered	Not detected on the Site
Tri-colored Bat	*Perimyotis subflavus*	Endangered	Endangered	Limited/Transient presence only - low probability of negative interactions if tree clearing occurs outside of the active season
Vascular Plants				
Butternut	*Juglans cinerea*	Endangered	Endangered	High – present on site in areas likely to be developed

SAR presented in Table 6 do not include listed species that are not directly protected as SAR on the Site under the ESA or SARA (e.g. listed only as Special Concern, or are protected only federally and are not birds or fish). However, individuals of these species are protected under other regulations addressing wildlife conservation generally, such as the FWCA, the MBCA, and the PPS. In addition, species listed as Special Concern under the ESA may receive habitat protection if they are observed in habitats that meet the criteria for designation as SWH for Special Concern Species (MNRF, 2015a). Species of Species Concern will be discussed with SWH in Section 5.8.

5.6.1 Chimney Swift

A single chimney swift was observed one time flying over the south end of the Site. There are no structures present on Site (i.e. chimneys or comparable human-built constructs) that would offer suitable nesting locations. While the species can nest in cavities in large, old trees, this is not their preferred nesting habitat.

Moreover, the trees within the southwestern portion of the Site over which the bird was observed tend almost entirely < 35 cm DBH. Given the low nesting potential of the Site, the single observation, and the tendency for the species to feed over large distances away from its nest (MNRF, 2018), the observation is considered to be a fly-over; the species is not considered to be resident on the Site. The potential for development impacts to the species generally is thus considered to be low.

5.6.2 SAR Bats

The Little Brown Myotis and Tri-colored Bat were detected at the monitoring stations on the Site and therefore likely forages and/or roosts in proximity to the Site. The numbers of detections, however, were very low, suggesting only a limited transient presence over most of the Site. As Endangered species, Little Brown Myotis and Tri-colored Bat receive "general habitat protection" under the ESA. Any vegetation removal on the Site would not result in a loss of roosting habitat for the Little Brown Myotis and Tri-colored Bat.

Regardless, individuals of listed bat species may periodically roost diurnally in trees or buildings on the site during the active season (April 1 to September 30 inclusive; MNRF, 2017), i.e., bats could briefly use any site tree or structure as a rest stop, but only opportunistically (not as a required habitat element). Potential impacts to individual at-risk bats directly would be mitigated by clearing trees, removing structures (or commencing construction works on them) outside of the roosting season. Following this tree-clearing window would also avoid potential interactions with birds and bird nests protected under the Migratory Birds Convention Act (MBCA; Government of Canada, 1994). As such, the Little Brown Myotis and Tri-colored Bat are generally considered unlikely to be impacted by future site development.

5.6.3 Butternut

Butternut, endangered under the ESA and SARA, are often found along stream banks as they prefer to grow in moist, well-drained loams; however, the species can tolerate a large range of soil types. Butternut are intolerant of shade and competition, as they require ample sunlight to grow (Poisson & Ursic, 2013).

A total of 45 Butternuts were observed on the Site (Figure 3). These were the individuals that remained following the 2022 derecho event; a number of toppled and dead Butternuts were evident during the BHA assessment, but these were not considered. All 45 remaining trees were determined to be Category 2 or 3 and are thus protected as SAR under the ESA (Appendix C). These trees were located predominantly within the central FODM8-1 forest ecosite, which is the most mature forested area on the property.

Development within any portion of this would lead to the removal of Butternuts. The BHA (Appendix C) may be used to support a project registration through the Ontario Conservation Fund in accordance with O. Reg. 829/21. Completion of the registration through this process would permit the removal of trees as required to proceed with site development while ensuring an overall net benefit for the species.

5.7 Significant Natural Heritage Features

5.7.1 Significant Woodlands and Canopy Cover

The City of Ottawa's (2022) Significant Woodland Policy, defines Significant Woodlands within the urban boundary as any area 0.8 hectares in size or larger, supporting woodland 60 years of age and older at the time of evaluation. Significant Woodland on the Site was thus demarcated by delineating the boundaries of wooded areas on and adjacent to the property based on aerial imagery from 1963[2]. Portions of the demarcated areas that were noted as subsequently deforested in historical aerial imagery between 1965 and 2023 within the geoOttawa system were removed. Remaining areas greater than 0.8 ha in size were deemed to constitute Significant Woodland. A total of 10.0 ha of the wooded areas on the Site thus constitute Significant Woodland.

Significant Woodland features on the site are characterized according to screening criteria per the City's Significant Woodlands policy (2022; Table 9)

Table 9. Characterization of Significant Woodland Areas

Social Values	
Unusual recreational, educational or cultural opportunities	None. The Site consists of private property with no public use supported.
Qualifying Cultural, Heritage, or Historical Features	None. There are no existing designations within the OP.
Indigenous values established through consultation	None. No values are identified in the Jock River Subwatershed Study or in the nearby Stittsville Mainstreet or Fernbank CDPs.
Hazard lands	
Constrained areas	None. Subject area has no hazards (e.g. floodplain, meander belts, steep or unstable slopes, restrictive soils or karst).
Habitat and Landscape Connectivity	
Adjacency and connectivity	None. Not part of Natural Heritage System Core Area or identified greenspace. Forested areas on the Site extend to abut areas of dense residential development to the north and west. As such, they cannot serve as connection corridors between other natural areas.
Specialized habitat	Limited. There are no uncommon community types or rare species within the wooded areas. Many of the largest trees on the Site (primarily poplar species) were blown down in the 2022 derecho event (including the largest previously remaking Butternuts). The current forest mix consists of trees neither especially large nor uncharacteristically old for the broader area. The Significant Woodlands do contain remaining Butternuts (i.e. those not blown down) and some small clusters of Black Ash, which are both listed as SAR.

[2] National Air Photo Library Roll A18057, Photo 0049, Dated 1963-05-24

Figure 14 Significant Woodland

Legend

Significant Woodland
Portions on Site

N

0 200 m

Project: CAIV 1300
Map File: CAIV 1300 2309a
Universal Transverse Mercator - Zone 18 (N)
Printed on: 2023-10-03

KILGOUR & Associates

An iTree Canopy assessment of the Site compares the canopy services across the Site generally and within the areas constituting significant woodlands (Table 10). Assessments were each based on distributions of 100 random sample points across the entire Site and Significant Woodlands respectively.

Table 10. Assessment of canopy benefits of the trees across the Site generally and within the areas of Significant Woodland.

Land Cover Distribution						
Land Cover Type	General Site			Significant Woodlands Only		
	Area (ha)	Area (%)		Area (ha)	Area (%)	
Grass/Herbaceous	42.04 ± 4.12	51.00 ± 5.00		0.10 ± 1.00	1.00 ± 1.00	
Impervious Buildings	0.00 ± 0.00	0.00 ± 0.00		0.00 ± 0.00	0.00 ± 0.00	
Impervious Other	1.65 ± 1.17	2.00 ± 1.41		0.00 ± 0.00	0.00 ± 0.00	
Impervious Road	0.00 ± 0.00	0.00 ± 0.00		0.00 ± 0.00	0.00 ± 0.00	
Soil/Bare Ground	4.95 ± 2.02	6.00 ± 2.45		0.00 ± 0.00	0.00 ± 0.00	
Tree/Shrub	32.97 ± 4.04	40.00 ± 4.90		9.88 ± 0.10	99.00 ± 0.99	
Water	0.82 ± 0.82	1.00 ± 1.00		0.00 ± 0.00	0.00 ± 0.00	
Total	82.43	100		9.98	100.00	
Tree Benefit Estimates: Carbon						
	General Site			**Significant Woodlands Only**		
	Carbon (t) ± SE	**CO_2 Equiv. (t) ± SE**	**Value (CAD) ± SE**	**Carbon (t) ± SE**	**CO_2 Equiv. (t) ± SE**	**Value (CAD) ± SE**
Sequestered annually in trees	100.90 ± 12.36	369.96 ± 45.31	$25,895 ± $3,172	30.25 ± 0.30	110.90 ± 1.11	7,763 ± 78
Total stored in trees	2,533.94 ± 310.34	9,291.12 ± 1,137.93	$650,330 ± $79,649	759.61 ± 7.63	2785.24 ± 27.99	194,970 ± 1,960
Tree Benefit Estimates: Air Pollution						
Pollutant Removed Annually	**General Site**			**Significant Woodlands Only**		
	Amount (kg) ± SE	**Value (CAD) ± SE**		**Amount (kg) ± SE**	**Value (CAD) ± SE**	
CO - Carbon Monoxide	33.33 ± 4.08	$4 ±$1		9.99 ± 0.10	$1 ± $0	
NO_2 - Nitrogen Dioxide	181.71 ± 22.26	$7 ± $1		54.47 ± 0.55	$2 ± $0	
O_3 - Ozone	1,809.78 ± 221.65	$383 ± $47		542.53 ± 5.45	$115 ± $1	
SO_2 – Sulfur Dioxide	114.51 ± 14.02	$1 ± $0		34.33 ± 0.35	$0 ± $0	
PM2.5 - Particulate Matter <2.5 µm	87.94 ± 10.77	$791 ± $97		26.36 ± 0.26	$237 ± $2	
PM10 - Particulate Matter 2.5 – 10 µm	606.21 ± 74.25	$278 ±34		181.73 ± 1.83	$83 ± $1	
Tree Benefit Estimates: Hydrological						
Benefit	**General Site**			**Significant Woodlands Only**		
	Amount (l) ±SE	**Value (CAD)**		**Amount (l) ±SE**	**Value (CAD)**	
Avoided Runoff	159.49 ± 19.53	$1		47.81 ± 0.48	$0	
Evaporation	13,168.09 ± 1,612.76	N/A		3,947.45 ± 39.67	N/A	
Interception	13,241.78 ± 1,621.78	N/A		3,969.55 ± 39.90	N/A	
Transpiration	17,818.46 ± 2,182.31	N/A		5,341.51 ± 53.68	N/A	
Potential Evaporation	99,780.41 ± 12,220.55	N/A		29,911.59 ± 300.62	N/A	
Potential Evapotranspiration	81,412.47 ± 9,970.95	N/A		24,405.36 ± 245.28	N/A	

Trees within Significant Woodlands (and other forested portions of the Site) generally furnish areas with near-100% canopy cover. Large portions of the Site, however, (e.g. the eastern half of the Site with its agricultural fields) provide near-0% canopy. This uneven distribution results in the iTree calculation of 40% existing canopy cover for the Site as a whole. The iTree tree review then provides a metric of the services currently provided by the site trees (located directly within Significant Woodland features or across the site generally).

Future site development will almost certainly result in the replacement of forested areas (>95% canopy) with other land uses having lower canopy coverage (e.g. streetscapes). Losses in canopy, however, should be equivalently offset with targeted tree planting where development will occur in currently open/agricultural areas. Residential areas should target a minimum of 25% canopy cover at maturity. Open lands associated with SWM facilities and park spaces that are not otherwise specifically programmed as sports fields should target at least 60% canopy cover at maturity to generate (semi-) wooded features that would be distributed across the future community. Proposed development plans will be evaluated through iTree to ensure no loss of canopy-related services under a future redistribution of trees.

5.8 Significant Wildlife Habitat

The Significant Wildlife Habitat (SWH) Criteria Schedule for Ecoregion 6E (MNRF, 2015) identifies four main types of significant wildlife habitat: seasonal concentration areas, rare vegetation communities, specialized habitat for wildlife and habitats of Species of Conservation Concern.

5.8.1 Seasonal Concentration Areas

The background information reviewed for the Site did not identify any seasonal concentration areas for animals. No obvious signs or evidence of use as a seasonal concentration area were observed and none are likely to occur on the Site.

5.8.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

Rare Vegetation Communities

Rare vegetation communities typically include those that have developed on cliff and talus slopes, sand barrens, shallow soils over limestone bedrock (alvar), old growth forests, savannahs, and tallgrass prairies. No rare vegetation communities were observed on the Site.

Specialized Wildlife Habitat

Specialized Wildlife Habitat includes waterfowl nesting areas, Bald Eagle and Osprey nesting, foraging and perching habitat, woodland raptor nesting habitat, turtle nesting areas, seeps and springs, woodland amphibian breeding habitat, wetland breeding habitat, and woodland area-sensitive bird breeding habitat. One pool of standing water was observed in Tributary B during the HDFA. The SWH Criteria requires the presence of 2 or more springs to be considered SWH. Per Section 5.4.3, however, water within site HDFs is due only to short-distance, horizontal migration through shallow soils rather than groundwater springs.

Woodland amphibian breeding habitat is present on the Site. KAL's amphibian surveys recorded the presence of Spring Peeper (*Pseudacris crucifer*), Western Chorus Frog (*Pseudacris triseriata*), and Wood Frog (*Lithobates sylvaticus*) within the MMP5 and MMP6 stations, all of which are listed as potential significant wildlife species in the SWH criteria. As two or more of these species with a Call Level Code of 3 were recorded, the habitat of the breeding area plus a 230 m radius of woodland area is confirmed to be SWH. Only the areas near MMP5 and MMP6 stations will therefore be considered SWH.

No other Specialized Wildlife Habitats were identified or observed on the Site.

Habitats of Species of Conservation Concern

Habitats of Species of Conservation Concern include marsh bird breeding habitat, open country bird habitat, shrub/early successional bird breeding habitat, terrestrial crayfish and special concern and rare wildlife species. Habitats of Species of Conservation Concern do not include habitats of Endangered or Threatened species as identified by the ESA. Our background review did not identify the presence of any of the Habitats of Species of Conservation Concern and no Species of Conservation Concern were observed on the Site.

5.9 Other Natural Heritage Features

No Provincially Significant Wetlands (PSW) and/or Areas of Natural and Scientific Interest (ANSI) are located on or adjacent to the Site. The Site does not contain significant woodlands, valleylands or greenspace linkages. No other significant natural heritage features are located within 120 m of the Site.

6.0 OPPORTUNITIES

The Site is proposed for residential development to meet the City's approved housing projections. The design of this new residential neighbourhood provides opportunities to contribute to the urban canopy, provide natural and active recreational areas and to improve areas of aquatic habitat on site compatible with urban form and infrastructure.

Portions of the Site include forest cover, some of which is characterized as significant. Forest cover on the Site, however, is unevenly distributed (i.e. almost entirely forested on the west half, with almost no tree cover on the east half). The forest cover that does exist (on the western half) currently has no public access and thus provides no public recreational value. The opportunity for new development intends to mitigate tree removal on the western half of the site (to support residential development) with the inclusion of treed parks, open spaces, and street trees throughout the neighbourhood achieving social benefits to the residents. Offsite compensation within the subwatershed could also be an available tool to further achieve increased canopy cover.

HDFs on the Site currently exist in primarily forested areas on the Site such that they include extensive tree cover along their riparian corridors. However, the HDFs themselves are hydrologically limited, having insufficient water level though most of the year to support fish or other aquatic wildlife. Future Site redevelopment is anticipated to require the construction of several different SMP pond facilities to support

stormwater management for the area. The outlet channels for each feature provide an opportunity to design local watercourses following principals of natural channel design and with increased levels of hydration that would support improved habitat for local biota beyond the limited capacity afforded by the current HDFs. Regarding the previously discussed forest cover on the Site, SWM block planning should include extensive canopy cover that also allows new watercourses to still be situated directly within a forested riparian context.

7.0 CLOSURE

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

Respectfully submitted,

KILGOUR & ASSOCIATES LTD.

Maren Nielsen, BES, EMA
Biologist, Project Manager
E-mail: mnielsen@kilgourassociates.com
16-2285 St. Laurent Blvd, Ottawa, ON, K1G 4Z6
Office: 613-260-5555
Cell: 613-367-5562

Anthony Francis, PhD
Director of Land Development
E-mail: afrancis@kilgourassociates.com
16-2285 St. Laurent Blvd, Ottawa, ON, K1G 4Z6
Office: 613-260-5555
Cell: 613-367-5556

CC: Bruce Kilgour (KAL)

8.0 LITERATURE CITED

Birds Canada, Canadian Wildlife Service (Environment and Climate Change Canada), Ministry of Natural Resources and Forestry – Government of Ontario, Ontario Field Ornithologists (OFO), & Ontario Nature. (2009). *Ontario Breeding Birds Atlas*. https://www.birdsontario.org/jsp/datasummaries.jsp

Birds Canada, Environmental Canada, & U.S. Environmental Protection Agency. (2009). *Marsh Monitoring Program Participant's Handbook for Surveying Amphibians* (p. 13). https://www.ohwetlands.org/uploads/5/0/6/9/50693061/handbook_mmp_amphibians_2009.pdf

California Academy of Sciences and National Geographic Society. (2023). *iNaturalist*. iNaturalist. https://www.inaturalist.org/

City of Ottawa. (2015). *Protocol for Wildlife Protection during Construction*. https://documents.ottawa.ca/sites/documents/files/documents/construction_en.pdf

City of Ottawa. (2021). *City of Ottawa Official Plan*.

City of Ottawa. (2022). *Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment*. https://documents.ottawa.ca/sites/documents/files/significant_woodlands_en.pdf

City of Ottawa. (2023a). *Environmental Impact Study Guidelines*. https://documents.ottawa.ca/sites/documents/files/eis_guidelines_tor_en.pdf

City of Ottawa. (2023b). *Completed Plans*. https://ottawa.ca/en/planning-development-and-construction/community-design/subwatershed-studies/completed-plans#

City of Ottawa. (2023c). *geoOttawa*. https://maps.ottawa.ca/geoottawa/

City of Ottawa. (2023d). *Jock River Reach 2 and Mud Creek Subwatershed Studies*. https://ottawa.ca/en/city-hall/public-engagement/projects/jock-river-reach-2-and-mud-creek-subwatershed-studies#section-a6bc04a5-27e8-40c3-9734-64bd79daa452

COSEWIC. (2012). *COSEWIC assessment and status report on the Eastern Wood-pewee* Contopus virens *in Canada* (p. x + 39). Committee on the Status of Endangered Wildlife in Canada.

https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Eastern%20Wood-pewee_2013_e.pdf

DFO. (2023). *Aquatic Species at Risk Map*. Fisheries and Oceans Canada (Previously Department of Fisheries and Oceans, "DFO"). https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Falk, B., Jokobsen, L., Surlykke, A., & Moss, C. F. (2014). *Bats coordinate sonar and flight behavior as they forage in open and cluttered environments*. https://journals.biologists.com/jeb/article/217/24/4356/12989/Bats-coordinate-sonar-and-flight-behavior-as-they

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

Government of Canada. (1994). Migratory Birds Convention Act*, 1994 (S.C. 1994, c. 22)*. 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*. https://laws.justice.gc.ca/eng/acts/S-15.3/

Government of Canada. (2023). *Species at Risk Public Registry*. https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10

Government of Ontario. (2020). *Provincial Policy Statement, 2020—Under the Planning Act*. https://files.ontario.ca/mmah-provincial-policy-statement-2020-accessible-final-en-2020-02-14.pdf

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

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

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

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

Humphrey, C. (2017). *Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario* (Ontario Recovery Strategy Series, p. vii + 76). Prepared for the Ontario Ministry of Natural Resources and Forestry. https://files.ontario.ca/mnrf_sar_rs_esfm_final_accessible.pdf

Humphrey, C., & Fotherby, H. (2019). *Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Ontario. Adoption of the Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Canada (Environment and Climate Change Canada 2018).* (Ontario Recovery Strategy Series, p. vii + 35). Prepared by the Ministry of the Environment, Conservation and Parks. https://files.ontario.ca/mecp-rs-bats-2019-12-05.pdf

Kaufman, K. (2019). *Audubon Guide to North American Birds: Eastern Whip-poor-will*. Audubon. https://www.audubon.org/field-guide/bird/eastern-whip-poor-will

Lee, H. R., Bakowsky, W., Riley, J., Bowles, J., Puddister, M., Uhlig, P., & Mcmurray, S. (1998). *Ecological Land Classification for Southern Ontario: First Approximation and its Application*. Ontario Ministry of Natural Resources. https://www.researchgate.net/profile/Wasyl-Bakowsky/publication/248626765_Ecological_Land_Classification_for_Southern_Ontario_First_Approximation_and_Its_Application/links/560e7abd08ae48337515fd59/Ecological-Land-Classification-for-Southern-Ontario-First-Approximation-and-Its-Application.pdf

Marshall Maklin Monaghan. (2007). *Jock River Reach 2 & Mud Creek Subwatershed Study Existing Conditions Report*.

MECP. (2023). *Species at Risk in Ontario*. Ministry of the Environment, Conservation, and Parks. http://www.ontario.ca/page/species-risk-ontario

Ministry of Natural Resources and Forestry – Government of Ontario. (2023). *Ontario Watershed Information Tool* [Land Information Ontario]. https://www.lioapplications.lrc.gov.on.ca/OWIT/index.html?viewer=OWIT.OWIT&locale=en-CA

Mississippi Valley Conservation Authority. (2019). *Upper Poole Creek Restoration Plan*. https://mvc.on.ca/wp-content/uploads/2020/12/Upper-Poole-Creek-Restoration-Plan-DRAFT-updated-2020-for-website.pdf

MNR. (2010). *Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition*. Ministry of Natural Resources. https://docs.ontario.ca/documents/3270/natural-heritage-reference-manual-for-natural.pdf

MNRF. (2014). *Draft Survey Protocol for Easter Whip-poor-will (*Caprimulgus vociferus*) in Ontario* (OMNRF Species at Risk Branch, p. iii + 10). Ministry of Natural Resources and Forestry.

MNRF. (2015). *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (OMNRF Regional Operations Division: Southern Region Resources Section, p. 39). Ministry of Natural Resources and Forestry. https://dr6j45jk9xcmk.cloudfront.net/documents/4775/schedule-6e-jan-2015-access-ver-final-s.pdf

MNRF. (2017). *Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis, and Tri-Coloured Bat* (p. 13). Ministry of Natural Resources and Forestry.

MNRF. (2023a). *Fish ON-Line*. Ministry of Natural Resources and Forestry. https://www.lioapplications.lrc.gov.on.ca/fishonline/Index.html?viewer=FishONLine.FishONLine&locale=en-CA

MNRF. (2023b). *Land Information Ontario*. Ministry of Natural Resources and Forestry. http://www.ontario.ca/page/land-information-ontario

MNRF. (2023c). *Natural Heritage Information Centre: Make a Natural Heritage Map*. Ministry of Natural Resources and Forestry. http://www.ontario.ca/page/make-natural-heritage-area-map

MNRF. (2023d). *Wood Thrush*. https://www.ontario.ca/page/wood-thrush

National Park Service. (2020). *Bat Monitoring Protocol for the Great Lakes Inventory and Monitoring Network*. http://npshistory.com/publications/interdisciplinary/im/nrr-2020-2126.pdf

Ontario Breeding Bird Atlas. (2001). *Guide for Participants*. Atlas Management Board, Federation of Ontario Naturalists, Don Mills. https://www.birdsontario.org/jsp/download/obba_guide_en.pdf

Ontario Breeding Bird Atlas. (2021). *Ontario Nightjar Survey: Instruction Manual*. https://www.birdsontario.org/wp-content/uploads/Atlas-3-Nightjar-Survey-Protocol_Feb26.pdf

Ontario Nature. (2019). *Ontario Reptile and Amphibian Atlas*. https://www.ontarioinsects.org/herp/index.html?Sort=0&area2=squaresCounties&records=all&myZoom=5&Lat=47.5&Long=-83.5

Paterson Group. (2023). *Hydrogeological Existing Conditions Report: Proposed Residential Development 5993 & 6115 Flewellyn Road & 6030 & 6070 Fernbank Road Ottawa, Ontario* (Report PH4625-1).

Poisson, G., & Ursic, M. (2013). *Recovery Strategy for the Butternut (*Juglans cinerea*) in Ontario* (Ontario Recovery Strategy Series, p. v + 12 pp. + Appendix vii + 24 pp). Prepared for the Ontario Ministry of Natural Resources. Adoption of the Recovery Strategy for the Butternut (*Juglans cinerea*) in Canada (Environment Canada 2010). https://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_rs_bttrnt_en.pdf

Rideau Valley Conservation Authority. (2023a). *Map A Property*. https://www.rvca.ca/regulations-planning/map-a-property

Rideau Valley Conservation Authority. (2023b). *RVCA Subwatersheds and Catchments*. Subwatershed Reports. https://watersheds.rvca.ca/

Schut, L. W., & Wilson, E. A. (1987). *The Soils of the Regional Municipality of Ottawa-Carleton (Excluding the Ottawa Urban Fringe)—Volume 1 and 2*. https://sis.agr.gc.ca/cansis/publications/surveys/on/on58/index.html

The Cornell Lab of Ornithology. (2023a). *All About Birds: Eastern Whip-poor-will*. https://www.allaboutbirds.org/guide/Eastern_Whip-poor-will/overview

The Cornell Lab of Ornithology. (2023b). *eBird: An online database of bird distribution and abundance*. https://ebird.org/home

Toronto and Region Conservation Authority & Credit Valley Conservation. (2013). *Evaluation, Classification and Management of Headwater Drainage Features Guidelines*. https://trcaca.s3.ca-central-1.amazonaws.com/app/uploads/2021/08/31112457/HDF-EVALUATION-CLASSIFICATION-MANAGEMENT_2014.pdf

Toronto Entomologists' Association. (2023). *Ontario Butterfly Atlas*. https://www.ontarioinsects.org/atlas/

Wildlife Preservation Canada, The Xerces Society, The University of Ottawa, BeeSpotter, The Natural History Museum, London, & the Montreal Insectarium. (2023). *Bumble Bee Watch: Bumble Sightings Map*. https://www.bumblebeewatch.org/app/#/bees/map?filters=%7B%22sightingstatus_id%22:%5B%5D,%22species_id%22:%5B%2237%22%5D,%22province_id%22:%5B%5D%7D

Appendix A Qualifications of Report Authors

Maren Nielsen, BES

Maren is an Ecologist with a background in terrestrial ecology. She has over five years of comprehensive field, laboratory and technical report writing experience through a combination of graduate and undergraduate studies and work experience. Maren completed a Bachelor of Environmental Studies with Honours at York University and a Graduate Certificate in Environmental Management and Assessment from Niagara College Canada. Maren has over two years of environmental and agricultural consulting experience, assisting clients to navigate the land development and site rehabilitation processes as well as obtaining permits and approvals from regulatory agencies. She has led numerous studies including Environmental Assessments (EA), Environmental Impact Studies (EIS), Opportunities & Constraints Analysis, Agricultural Impact Assessments (AIA), LEAR Studies and Minimum Distance Separation (MDS) I & II studies. Maren has carried out field programs for the collection of soils, water, sediment, and benthos as well as vegetation surveys, wildlife surveys, wind turbine avian and bat mortality monitoring, and land use surveys. Since joining Kilgour & Associates Ltd. in 2023, Maren has worked on a variety of land development projects and completed numerous Environmental Impact Studies (EIS), Headwater Drainage Feature Assessments (HDFA), Existing Conditions Reports, Opportunities and Constraints Analysis, and Species at Risk (SAR) monitoring. Maren is a certified wetland evaluator under the Ontario Wetland Evaluation System (OWES).

Nicholas Schulz, BSc

Nicholas completed both his BSc and MSc at Carleton University. He began his research in biology, studying food waste on small scale farms in Eastern Ontario and thereafter transitioned to the Aquatic Ecosystems & Environmental Change (AEEC) lab where studied land use impacts on algae in ponds within the Ottawa area. During this project he gained experience conducting large scale studies and producing reports for a variety of stakeholders including Ducks Unlimited and the Canadian Museum of Nature.

As a student he worked for both the public and private sector gaining valuable knowledge of both the policy and, hands on aspects of the environmental industry. Through his work and school experience Nicholas has obtained a plethora of field and laboratory experience to analyze and document the natural environment. He has experience with a multitude of terrestrial field work including erosion and sediment control inspections, environmental effects monitoring, and various field surveys (birds, bats, anurans, turtles etc).

Anthony Francis, PhD

Dr. Francis 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).

Kesia Miyashita, MSc

Ms. Miyashita has over six years of experience in environmental consulting and more than ten seasons of field experience in ecosystems in Alberta and British Columbia. During her career in environmental consulting, Ms. Miyashita has completed environmental assessments for a variety of major infrastructure projects and urban developments. Her expertise is in vascular and non-vascular plant ecology, with experience in both terrestrial and wetland ecosystems; she has performed vegetation community inventories, rare plant surveys, and weed surveys in a variety of natural environments, including native forest, urban nature preserves, grasslands, and wetlands. Ms. Miyashita joined Kilgour & Associates Ltd. in May of 2021 and has since contributed to numerous Environmental Impact Study and tree conservation reports, delineation of natural heritage features and SAR surveys. Ms. Miyashita is a Professional Biologist with the Alberta Society of Professional Biologists and a Qualified Wetland Science Practitioner in the province of Alberta.

Appendix B MECP Species at Risk Correspondence

October 4, 2022 **Our File: CAIV 1300**

Management Biologist
Permissions and Compliance Section
Ontario Ministry of Environment, Conservation and Parks
10-1 Campus Drive
Kemptville, ON
K0G 1J0

Reference: Species at risk information request for 5993 and 6115 Flewellyn Road and 6070 Fernbank Road in Stittsville

1.0 INTRODUCTION

This letter is a request for information relating to the potential presence of species at risk (SAR) for the proposed development at 5993 and 6115 Flewellyn Road and 6070 Fernbank Road, Stittsville, Ontario. This letter includes a desktop review of SAR occurrence records using the resources and guidelines outlined in the draft document, *Client's Guide to Preliminary Screening for Species at Risk* (Ministry of the Environment, Conservation and Parks (MECP), 2019). We (Kilgour & Associates Ltd.; KAL) are seeking confirmation from MECP regarding the list of SAR that may occur on or near the project site. Potential impacts to SAR will be assessed via an Environmental Impact Study (EIS) that we will be preparing for our client. If impacts to SAR are anticipated, we will recommend that our client notifies MECP and engages in consultation to further consider potential impacts, avoidance and/or mitigation measures, and whether the project may require authorization under the *Endangered Species Act* (ESA).

1.1 Site Overview

The site is 67.24 ha in size and is located at 5993 and 6115 Flewellyn Road and 6070 Fernbank Road (Figure 1). The zoning of the property is Rural Countryside (RU), and it is currently a naturalized lot with a hydro corridor some agricultural activities. The site is dominated by mixed forest and cultural meadow, with agricultural activities in the northeast corner.

The centroid coordinates of the subject project area are:

Latitude: 45.245871°, Longitude: -75.895627°

The site is bordered by:

- Residential to the north;
- Agricultural lands to the east;
- Agricultural lands and forest to the south; and
- Residential, forest, and wetland to the west.

Figure 1 Location and existing conditions of the site

2.0 SPECIES AT RISK RESOURCES REVIEW AND RESULTS

We reviewed the following online resources to determine SAR occurrences on and/or nearby the site.

- Aquatic Species at Risk Map (DFO, 2022)
- Ontario Ministry of Natural Resources and Forestry (MNRF)
    - Natural Heritage Information Centre (MNRF, 2022a)

- Land Information Ontario Provincially Tracked Species Grid Detail (MNRF, 2022b)
- Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Ontario (Humphrey and Fotherby, 2019)
- Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario (Humphrey, 2017)

- Species at Risk in Ontario (MECP, 2022)
- Species at Risk Public Registry (Government of Canada, 2022)
- Atlas of the Breeding Birds of Ontario 2001-2005 (Birds Canada et al., 2009)
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019)
- iNaturalist (California Academy of Sciences and National Geographic Society, 2022)
- eBird (Cornell Lab of Ornithology, 2022)
- Bumble Bee Watch (Wildlife Preservation Canada et al., 2022)
- Ontario Butterfly Atlas (Toronto Entomologists' Association, 2022)

The results of the SAR desktop review are indicated in Table 1. Note that occurrence data in Table 1 from the Natural Heritage Information Centre (MNRF, 2022a), Land Information Ontario (MNRF, 2022b), eBird (Cornell Lab of Ornithology, 2022), and iNaturalist (California Academy of Sciences and National Geographic Society, 2022) are occurrences within ~5 km of the site. SAR occurrence data from the Ontario Breeding Birds Atlas (Birds Canada et al., 2009) and the Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019) are based on the 10 x 10 km Atlas square that the site falls in. As this Site was located at the corner of four squares (18VR21, 18VR31, 18VR20, 18VR30) data was gather from all.

Table 1 List of species at risk with potential to occur on or near the project site based on our desktop review

Species Name (*Scientific name*)	Information Source
Birds	
Bald Eagle (*Haliaeetus leucocephalus*)	Cornell Lab of Ornithology (2022); California Academy of Sciences and National Geographic Society (2022)
Bank Swallow (*Riparia riparia*)	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)

Species Name (*Scientific name*)	**Information Source**
Barn Swallow (*Hirundo rustica*)	Birds Canada et al. (2009); MNRF (2022a); MNRF (2022b); Cornell Lab of Ornithology (2022)
Bobolink (*Dolichonyx oryzivorus*)	Birds Canada et al. (2009); MNRF (2022a); MNRF (2022b); Cornell Lab of Ornithology (2022)
Canada Warbler (*Cardellina canadensis*)	MNRF (2022a)
Chimney Swift (*Chaetura pelagica*)	Cornell Lab of Ornithology (2022)
Common Nighthawk (*Chordeiles minor*)	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)
Eastern Meadowlark (*Sturnella magna*)	Birds Canada et al. (2009); MNRF (2022a); MNRF (2022b); Cornell Lab of Ornithology (2022)
Eastern Whip-poor-will (*Antrostomus vociferus*)	Birds Canada et al. (2009); MNRF (2022a)
Eastern Wood-Pewee (*Contopus virens*)	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)
Evening Grosbeak (*Coccothraustes vespertinus*)	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)
Grasshopper Sparrow (*Ammodramus savannarum*)	Birds Canada et al. (2009)
Hudsonian Godwit (*Limosa haemastica*)	Cornell Lab of Ornithology (2022)
Least Bittern (*Ixobrychus exilis*)	MNRF (2022a)
Lesser Yellowlegs (*Tringa flavipes*) *	Cornell Lab of Ornithology (2022)
Olive-sided Flycatcher (*Contopus cooperi*)	Cornell Lab of Ornithology (2022)
Peregrine Falcon (*Falco peregrinus*)	Cornell Lab of Ornithology (2022); California Academy of Sciences and National Geographic Society (2022)
Rusty Blackbird (*Euphagus carolinus*)	Cornell Lab of Ornithology (2022)
Wood Thrush (*Hylocichla mustelina*)	Birds Canada et al. (2009); MNRF (2022a); Cornell Lab of Ornithology (2022)
Mammals	
Eastern Small-footed Myotis (*Myotis leibii*)	Humphrey (2017)
Little Brown Myotis (*Myotis lucifugus*)	Humphrey and Fotherby (2019)
Northern Myotis (*Myotis septentrionalis)*	Humphrey and Fotherby (2019)
Tri-colored Bat (*Perimyotis subflavus*)	Humphrey and Fotherby (2019)
Amphibians	
Western Chorus Frog (*Pseudacris triseriata*)	Ontario Nature (2019); MNRF (2022a)
Reptiles	
Blanding's Turtle (*Emydoidea blandingii*)	Ontario Nature (2019); MNRF (2022a); MNRF (2022b); California Academy of Sciences and National Geographic Society (2022)

Species Name (*Scientific name*)	Information Source
Eastern Milksnake (*Lampropeltis triangulum*)	Ontario Nature (2019); MNRF (2022a); MNRF (2022b); California Academy of Sciences and National Geographic Society (2022)
Midland Painted Turtle (*Chrysemys picta marginata*)	Ontario Nature (2019); MNRF (2022a); California Academy of Sciences and National Geographic Society (2022)
Northern Map Turtle (*Graptemys geographica*)	MNRF (2022a); California Academy of Sciences and National Geographic Society (2022)
Snapping Turtle (*Chelydra serpentina*)	Ontario Nature (2019); MNRF (2022a); MNRF (2022b); California Academy of Sciences and National Geographic Society (2022)
Arthropods	
Monarch (*Danaus plexippus*)	California Academy of Sciences and National Geographic Society (2022); Toronto Entomologists' Association (2022)
Yellow-banded Bumble Bee (*Bombus terricola*)	MNRF (2022a)
Fish	
American Eel (*Anguilla rostrata*)	MNRF (2022a)
Vascular Plants	
Black Ash (*Fraxinus nigra*)	MNRF (2022a); California Academy of Sciences and National Geographic Society (2022)
Butternut (*Juglans cinerea*)	MNRF (2022a)
Lichens	
Flooded Jellyskin (*Leptogium rivulare*)	MNRF (2022a); MNRF (2022b)

* Lesser Yellowlegs is not currently listed under the ESA or SARA (currently it is listed as Threatened under COSEWIC). However, it will be added to SARO as Threatened on Jan 25, 2023. As the project likely will not commence until after Jan 25, 2023, it has been included here.

The local conservation authority (Rideau Valley Conservation Authority) does not have a SAR geodatabase and no additional SAR information was found in their relevant watershed/subwatershed reports.

We note that observation records on eBird (Cornell Lab of Ornithology, 2022) and iNaturalist (California Academy of Sciences and National Geographic Society, 2022) are crowd-sourced and rely heavily on data submitted by volunteer citizen scientists that are not necessarily vetted by experts. As such, observation records from these sources are considered non-confirmed by KAL, but are included in this preliminary SAR screening based on guidelines set forth by MECP (2019).

3.0 CLOSURE

Thank you for considering this SAR information request for 5993 and 6115 Flewellyn Road and 6070 Fernbank Road. We look forward to any comments you may have. Questions relating to the contents of this letter can be addressed to the undersigned.

Respectfully submitted,

KILGOUR & ASSOCIATES LTD.

Sarantia Katsaras, BA
Biologist
E-mail: skatsaras@kilgourassociates.com
Office: (613) 260-5555
16-2285 St. Laurent Blvd, Ottawa, ON, K1G 4Z6

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

cc: Kesia Miyashita (KAL)

4.0 LITERATURE CITED

Birds Canada, Canadian Wildlife Service (Environment and Climate Change Canada), Ministry of Natural Resources and Forestry – Government of Ontario, Ontario Field Ornithologists (OFO), and Ontario Nature. 2009. Atlas of the Breeding Birds of Ontario 2001-2005. Available online at: https://www.birdsontario.org/jsp/datasummaries.jsp

California Academy of Sciences and National Geographic Society. 2022. iNaturalist. Available online at: https://www.inaturalist.org/

The Cornell Lab of Ornithology. 2022. eBird: An online database of bird distribution and abundance. Available online at: https://ebird.org/home

Fisheries and Oceans Canada (previously Department of Fisheries and Oceans, "DFO"). 2022. Aquatic Species at Risk Map. Available online at: https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Government of Canada. 2022. Species at Risk Public Registry. Available online at: http://www.registrelep-sararegistry.gc.ca/sar/index/default_e.cfm

Humphrey, C. 2017. Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. vii + 76 pp. Available online at: https://files.ontario.ca/mnrf_sar_rs_esfm_final_accessible.pdf

Humphrey, C. and H. Fotherby. 2019. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), Northern Myotis (Myotis septentrionalis) and Tri-colored Bat (Perimyotis subflavus) in Ontario. Ontario Recovery Strategy Series. Prepared by the Ministry of the Environment, Conservation and Parks, Peterborough, Ontario. vii + 35 pp. + Appendix. Adoption of the Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada (Environment and Climate Change Canada 2018). Available online at: https://files.ontario.ca/mecp-rs-bats-2019-12-05.pdf

Ministry of Environment, Conservation, and Parks. 2019. Client's Guide to Preliminary Screening for Species at Risk. Draft – May 2019. Ministry of Environment, Conservation and Parks: Species at Risk Branch, Permission and Compliance. 9 pp. Available online at: https://www.lambtonshores.ca/en/invest-and-build/resources/Documents/Building-and-Renovating/Client-Guide-to-Preliminary-Screening-May-2019.pdf

Ministry of Environment, Conservation, and Parks. 2022. Species at Risk in Ontario. Available online at: https://www.ontario.ca/page/species-risk-ontario

Ministry of Natural Resources and Forestry. 2022a. 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. 2022b. Land Information Ontario. Available online at: https://www.ontario.ca/page/land-information-ontario

Ontario Nature. 2019. Ontario Reptile and Amphibian Atlas. Available online at: https://www.ontarioinsects.org/herp/index.html?Sort=0&area2=squaresCounties&records=all&myZoom=5&Lat=47.5&Long=-83.5

Toronto Entomologists' Association. 2022. Ontario Butterfly Atlas. Available online at: https://www.ontarioinsects.org/atlas/

Wildlife Preservation Canada et al. 2022. Bumble Bee Watch: Bumble Sightings Map. Available online at: https://www.bumblebeewatch.org/app/#/bees/map?filters=%7B%22sightingstatus_id%22:%5B%5D,%22species_id%22:%5B%2237%22%5D,%22province_id%22:%5B%5D%7D

Appendix C Butternut Health Assessment

Ministry of the Environment,
Conservation and Parks

Butternut Health Expert's Report Template – Version 2022

Instructions to Butternut Health Experts (BHEs):

Please enter the 6-character BHE Report number: HAL546

BHE Report numbering format:
BHE Report numbers are to be assigned by the BHE using the first 3 letters of BHE's last name, followed by BHE's own 3-digit report numbering system. If the BHE's last name has fewer than 3 letters, use the full last name and numbers for the remaining characters.

  Disponible en français

BHE Report Number: HAL546

Cover letter to client:
Insert your cover letter to your client here and include the below list of enclosures.

Enclosures:

1. Information from the Ministry of the Environment, Conservation and Parks about Butternut and the *Endangered Species Act, 2007*
2. Butternut Health Expert's Report, including the completed Butternut Data Collection Form

Ministry of the Environment, Conservation and Parks

Species at Risk Branch
40 St. Clair Avenue West
14th Floor
Toronto ON M4V 1M2

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction des espèces en péril
40, avenue St. Clair Ouest
14e étage
Toronto ON M4V 1M2

Information for the Property Owner (or person(s) who requested the enclosed Butternut Health Expert's Report):

The enclosed Butternut Health Expert's Report (BHE Report) documents the results of the Butternut health assessment that was conducted by the Butternut Health Expert (BHE) identified in the top section of the report. If there are other Butternut trees (of any size or age) at the site that may be impacted by a proposed activity that are not identified in the enclosed BHE Report, they too must be assessed by a BHE before commencing any actions that may impact those Butternut trees or their habitat.

Butternut (*Juglans cinerea*) is listed as an endangered species in Schedule 2 of Ontario Regulation (O. Reg.) 230/08 "the Species at Risk in Ontario List". As an endangered species, the *Endangered Species Act, 2007* (ESA) prohibits adversely impacting Butternut and its habitat. A permit or agreement under the ESA is required before engaging in an activity that is otherwise prohibited under the ESA. The activity may be eligible for the Butternut conditional exemption in Part V of O. Reg. 830/21, provided the requirements of the regulation are met.

If the proposed activity is eligible for the conditional exemption in Part V of O. Reg. 830/21, the next step is to submit the BHE Report and the Butternut Data Collection Form enclosed in this package to the Ministry of the Environment, Conservation and Parks (MECP).

If the enclosed BHE Report does not identify which Butternut tree(s) are proposed to be killed, harmed or taken and the reasons for doing so (e.g., if "unknown" is indicated in Table 1) or if the information in the last two columns of Table 1 has changed since the date this BHE Report was produced, **do not edit the BHE Report to update this information**. Instead, the report must be submitted together with a cover letter that identifies which Butternut tree(s) are proposed to be killed, harmed or taken (by referencing the tree identification numbers) when you submit the BHE Report to MECP.

The BHE Report must be submitted to MECP at least 30 days before registering an activity in respect of the Butternut conditional exemption. MECP may need to examine the Butternut trees subject to the report during this 30-day period. **Adversely impacting Butternut trees during this 30-day period or before registration is completed is prohibited by the ESA.** Further, the conditional exemption for Butternut does not apply unless the requirements of Part V of O. Reg. 830/21 are being followed.

If the proposed activity is eligible for the Butternut conditional exemption, you may register the proposed activity using the "**Notice of Butternut Impact**" form after the 30-day period has elapsed.

If the proposed activity is not eligible for a regulatory exemption, please contact MECP to determine whether the proposed activity would require a permit or agreement under the ESA in order to proceed.

Please retain this information and a copy of the BHE Report for your records, along with any other documentation you may receive from MECP should an examination of the trees occur.

This information should not be relied upon to determine legal obligations. To determine your legal obligations, consult the *Endangered Species Act, 2007* and the relevant regulations made thereunder. These may be found at www.ontario.ca/laws. If legal advice is required, consult a legal professional. In the event of an error on this template or a conflict between this template and any applicable law, the law prevails.

If you have any questions, please contact MECP at SAROntario@ontario.ca.

Butternut Health Expert's Report (BHE Report)

BHE Report Number: HAL546

Butternut Health Expert Contact Information

Name of Butternut Health Expert

Last Name	First Name
HALLETT	ROBERT

Mailing Address

Unit Number	Street Number	Street Name	PO Box
16	2285	St. Laurent Blvd	

City/Town	Province	Postal Code
Ottawa	Ontario	K1G 4Z6

Telephone Number	Email Address
613-367-5549	rhallett@kilgourassociates.com

Summary of qualifications as a Butternut Health Expert

a) expertise in relation to butternut

Completed numerous Butternut Health Assessments, certified BHE

b) expertise, education, training and experience necessary to assess the health of butternut trees

Completed the MNRF Butternut Health Assessor Course. Robert is a certified BHE

Property Owner Contact Information

Name of Property Owner (or representative)

Last Name	First Name
Caivan Communities	

Mailing Address

Unit Number	Street Number	Street Name	PO Box
	3713	Borrisokane Road	

Lot Number	Concession	Township	Rural Route

City/Town	Province	Postal Code
Ottawa	Ontario	K2J 4J4

Telephone Number	Email Address
613-518-1864	AP@caivan.com

Site Location

Unit Number	Street Number	Street Name	PO Box
	6115	Flewellyn Road	

Lot Number	Concession	Township	Rural Route

City/Town	Province	Postal Code
Stittsville	Ontario	K2A 1B6

Additional Site Location Information

Date(s) of Butternut health assessment

Start Date (yyyy/mm/dd) 2023/06/05

End Date (yyyy/mm/dd) 2023/06/05

Date BHE Report prepared (yyyy/mm/dd) 2023/08/15

Map datum used: ☑ NAD83 ☐ WGS84

Total number of trees assessed in this BHE Report 45

The assessed trees were numbered on site using White flagging tape

The numbers at the site correspond to the tree identification numbers referenced in this report.

This BHE Report includes the following tables:

- Table 1: Butternut trees assessed by the BHE
- Table 2: Trees determined by the BHE to be Butternut hybrids
- Table 3: Summary of Butternut health assessment results

Table 1: Butternut trees assessed by the BHE

Tree ID #	UTM coordinates	Accuracy (+/-)	Category[1] (1, 2 or 3)	Tree stem diameter[2] (cm)	Is tree stem shorter than 1.37 m? (Yes/No)	Cultivated? (Yes/No)	Proposed to be: (killed, harmed, taken, or unknown[3])	If tree is proposed to be killed, harmed or taken, indicate reason tree is to be killed, harmed or taken, if known
001	18N 429543 5010450	5m	2	25	No	No	killed	Site development
002	18N 429399 5010521	5m	2	51	No	No	killed	" "
003	18N 429320 5010599	5m	3	11	No	No	killed	" "
004	18N 429382 5010634	5m	3	29	No	No	killed	" "
005	18N 429396 5010674	5m	3	23	No	No	killed	" "
006	18N 429380 5010732	5m	2	19	No	No	killed	" "
007	18N 429414 5010789	5m	3	30	No	No	killed	" "
008	18N 429495 5010777	5m	2	19	No	No	killed	" "
009	18N 429514 5010695	5m	2	43	No	No	killed	" "
010	18N 429529 5010722	5m	3	35	No	No	killed	" "

Tree ID #	UTM coordinates	Accuracy (+/-)	Category[1] (1, 2 or 3)	Tree stem diameter[2] (cm)	Is tree stem shorter than 1.37 m? (Yes/No)	Cultivated? (Yes/No)	Proposed to be: (killed, harmed, taken, or unknown[3])	If tree is proposed to be killed, harmed or taken, indicate reason tree is to be killed, harmed or taken, if known
011	18N 429543 5010727	5m	2	24	No	No	killed	Site development
012	18N 429549 5010724	5m	2	22	No	No	killed	" "
013	18N 429563 5010721	5m	3	30	No	No	killed	" "
014	18N 429554 5010720	5m	3	29	No	No	killed	" "
015	18N 429556 5010712	5m	2	41	No	No	killed	" "
016	18N 429569 5010707	5m	3	0	No	No	unknown	dead tree
017	18N 429577 5010701	5m	3	0	No	No	unknown	dead tree
018	18N 429555 5010652	5m	3	0	No	No	unknown	dead tree
019	18N 429554 5010657	5m	3	0	No	No	unknown	dead tree
020	18N 429540 5010665	5m	3	46	No	No	killed	Site development
021	18N 429539 5010663	5m	3	55	No	No	killed	" "
022	18N 429546 5010642	5m	3	23	No	No	killed	" "
023	18N 429522 5010644	5m	3	35	No	No	killed	" "
024	18N 429529 5010614	5m	3	33	No	No	killed	" "
025	18N 429509 5010604	5m	3	4	No	No	killed	" "
026	18N 429509 5010604	5m	3	4	No	No	killed	" "
027	18N 429509 5010604	5m	3	4	No	No	killed	" "
028	18N 429509 5010604	5m	3	4	No	No	killed	" "

Tree ID #	UTM coordinates	Accuracy (+/-)	Category[1] (1, 2 or 3)	Tree stem diameter[2] (cm)	Is tree stem shorter than 1.37 m? (Yes/No)	Cultivated? (Yes/No)	Proposed to be: (killed, harmed, taken, or unknown[3])	If tree is proposed to be killed, harmed or taken, indicate reason tree is to be killed, harmed or taken, if known
029	18N 429509 5010604	5m	3	4	No	No	killed	Site development
030	18N 429509 5010604	5m	3	4	No	No	killed	" "
031	18N 429555 5010541	5m	3	12	No	No	killed	" "
032	18N 429600 5010579	5m	3	36	No	No	killed	" "
033	18N 429599 5010581	5m	3	0	No	No	unknown	Dead tree
034	18N 229603 5010577	5m	3	0	No	No	unknown	Dead tree
035	18N 429602 5010602	5m	2	21	No	No	killed	" "
036	18N 429584 5010607	5m	3	40	No	No	killed	" "
037	18N 429617 5010605	5m	3	36	No	No	killed	" "
038	18N 429660 5010562	5m	3	33	No	No	killed	" "
039	18N 429650 5010555	5m	3	28	No	No	killed	" "
040	18N 429647 5010551	5m	3	35	No	No	killed	" "
041	18N 429686 5010573	5m	3	46	No	No	killed	" "
042	18N 429682 5010550	5m	2	48	No	No	killed	" "
043	18N 429722 5010503	5m	2	29	No	No	killed	" "
044	18N 429693 5010769	5m	2	36	No	No	killed	" "
045	18N 429692 5010748	5m	3	48	No	No	killed	" "

[1] Details regarding the extent to which the tree is affected by Butternut Canker is presented in the Butternut Data Collection Form that accompanies this BHE Report.

[2] Diameter of the tree stem rounded to nearest cm, measured in accordance with the Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007*

[3] In this column, "unknown" indicates that at the time of assessment and reporting, there are no proposals to kill, harm or take this tree that are known to the BHE.

Table 2: Trees determined by the BHE to be Butternut hybrids

Tree ID #	UTM coordinates	Method used (genetic testing or field identification)	Additional Comments on Method Used

Table 3: Summary of Butternut health assessment results

Result	Total number of trees in this category	Information for persons planning activities that may impact Butternut
Category 1	0	• Category 1 Butternut tree — the Butternut tree is affected by Butternut Canker to such an advanced degree that retaining the tree would not support the protection or recovery of Butternut trees in the area in which the tree is located.
		• If the proposed activity will kill, harm or take one or more Butternut trees of any category (including Category 1), the BHE Report must be submitted to MECP at SARontario@ontario.ca.
Category 2	12	• Category 2 Butternut tree — the Butternut tree is not affected by Butternut Canker or the Butternut tree is affected by Butternut Canker but the degree to which it is affected is not as advanced as a Category 1 Butternut tree and retaining the tree could support the protection or recovery of Butternut trees in the area in which the tree is located.
		• Activities that may kill, harm or take up to a **maximum of fifteen (15)** Category 2 trees may be eligible for the conditional exemption in Part V of Ontario Regulation 830/21. Refer to the regulation for eligibility conditions and requirements that must be fulfilled.
		• If the proposed activity will kill, harm or take more than fifteen (15) Category 2 trees, **contact MECP** for information on how to seek an ESA authorization (e.g., a permit).

Result	Total number of trees in this category	Information for persons planning activities that may impact Butternut
Category 3	33	• Category 3 Butternut tree — the Butternut tree may be useful in determining sources of resistance to Butternut Canker.
		• Activities that may kill, harm or take up to a **maximum of five (5)** Category 3 trees may be eligible for the conditional exemption in Part V of Ontario Regulation 830/21. Refer to the regulation for eligibility conditions and requirements that must be fulfilled.
		• If the proposed activity will kill, harm or take more than five (5) Category 3 trees, contact MECP for information on how to seek an ESA authorization (e.g., a permit).
Cultivated	0	• An activity that will kill, harm or take a cultivated Butternut tree that was required to be planted to fulfil a condition of an ESA permit or agreement, or a conditional exemption, is **not** eligible for the exemption for cultivated trees that is provided by subsection 25 (5) of O. Reg. 830/21. Refer to the regulation for eligibility conditions.
Hybrid	0	• Hybrid Butternut trees are not protected under the ESA but impacts to these trees may be subject to local municipal by-laws and other legislation.

Additional Information on Cultivated Tree Determination

Please note:

- A BHE Report that is submitted to MECP must include the completed Butternut Data Collection Form. As appropriate, please also ensure additional relevant documentation to support the assessment (e.g., completed Data Sheets for Field Identification of Butternut Hybrids, evidence that the Butternut was cultivated) and all relevant maps and photographs are provided.
- During the 30-day period that follows the submission of this BHE Report to MECP, no Butternut trees (of any category) may be killed, harmed or taken. MECP may need to examine the Butternut trees subject to the report during this 30-day period.

Butternut Health Expert's Comments
Note to BHEs: use this space to provide general comments.

Butt

Appendix D Headwater Drainage Feature Assessment

Headwater Drainage Feature Assessment for Caivan Development Corporation, Flewellyn Road Properties

2023-09-08

Draft Report

KILGOUR & ASSOCIATES LTD.
www.kilgourassociates.com

Project Number: CAIV 1300

TABLE OF CONTENTS

List of Figures

List of Tables

List of Appendices

List of Acronyms and Abbreviations

EEM – Environmental Effects Monitoring
EIS – Environmental Impact Statement
KAL – Kilgour & Associates Ltd.
HDFA – Headwater Drainage Feature Assessment
HDFs – Headwater Drainage Features

1.0 INTRODUCTION

This report is a Headwater Drainage Feature Assessment (HDFA) prepared by Kilgour & Associates Ltd. (KAL) on behalf of Caivan Development Corporation in support of future residential development located at 5993 and 6115 Flewellyn Road, and 6070 Fernbank Road in Stittsville, Ontario (hereafter referred to as "the Site").

This report provides a detailed description of the Headwater Drainage Features (HDFs) on and adjacent to the property following field methodologies identified in the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (Toronto and Region Conservation Authority & Credit Valley Conservation, 2013)), herein referred to as the HDF Guidelines.

2.0 HEADWATER DRAINAGE FEATURES

2.1 Overview

This study identifies and describes six (6) HDFs located on and adjacent to the Site (Figure 1). There are two main groups of channels that flow across and adjacent to the Site. The Site consists of forested areas, wetland areas, meadow, a hydro line, a stormwater pond, and an idle agricultural field. Surrounding land uses are predominantly residential and agricultural.

One group of channels is primarily associated with the Faulkner Municipal Drain, and the second group primarily conveys water from within the forested areas on the Site towards the Faulkner drain.

2.2 Assessment Methodology

The Standard level of assessment follows Ontario Stream Assessment Protocol (OSAP) methodologies for descriptions of flow conditions, riparian vegetation and site features that are important components of habitat (headwater sampling protocol OSAP S4.M10) and includes an electrofishing survey to describe fish and fish habitat (OSAP S4.M10). Additionally, the Ecological Land Classification for Southern Ontario (ELC) was applied to the Site (Lee et al., 1998), with specific focus on the riparian zone of each segment, and determined habitat community types present on the Site. An assessment of amphibian breeding was conducted following the Marsh Monitoring Protocol (MMP) (Birds Canada et al., 2009).

OSAP investigations of HDFs were conducted on April 17, 2023 during spring freshet, and electrofishing surveys on May 18, 2023. Two amphibian surveys following the MMP were conducted on April 20, 2023 and May 23, 2023. The ELC survey was conducted on June 02, 2023.

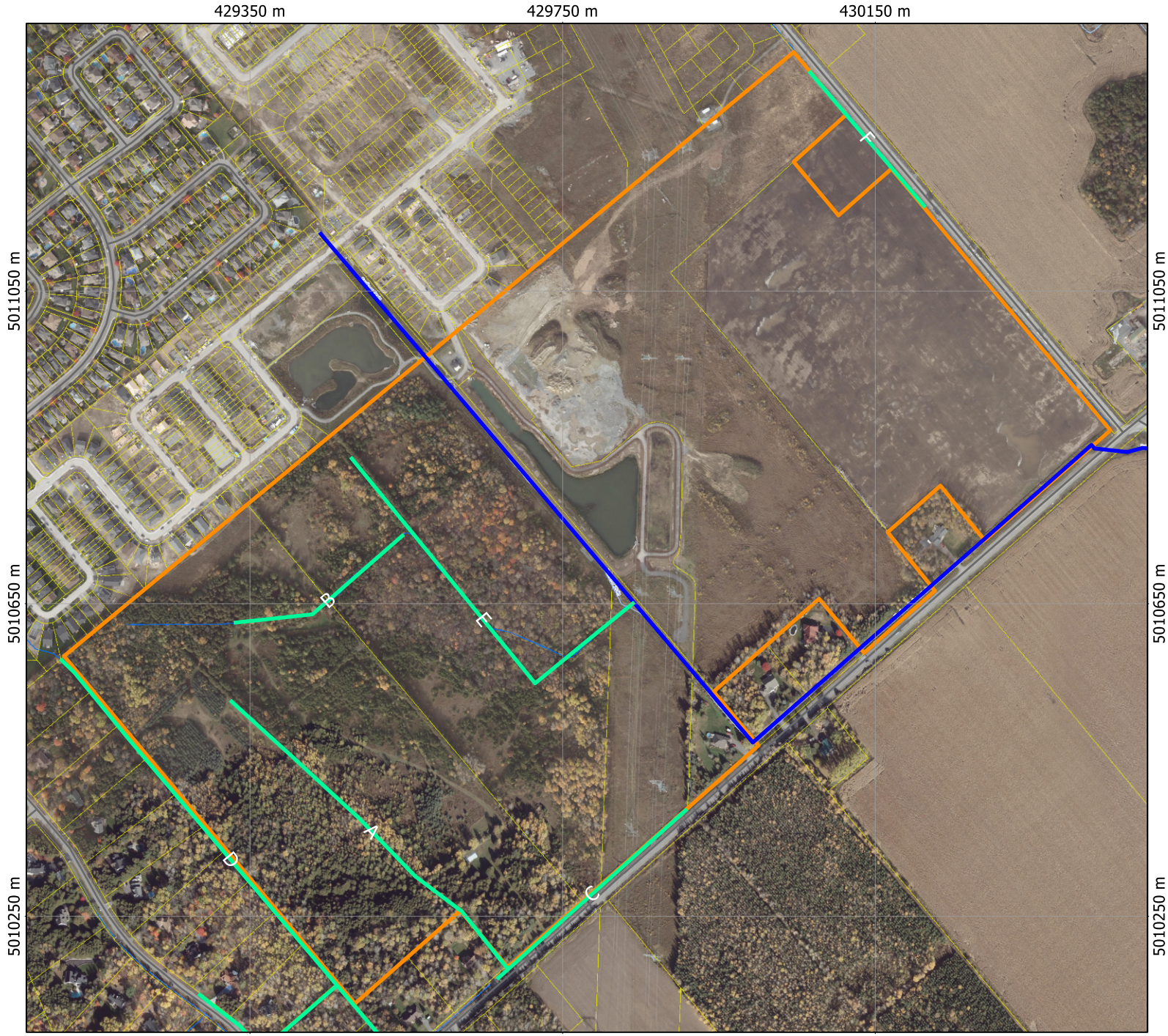


Figure Head Water Drainage Assesment

Tributaries

Faulkner Drain

N

0 200 m

Project: CAIV 1300
Map File: CAIV 1300 2308a-AFRANCIS-KAL
Universal Transverse Mercator - Zone 18 (N)
Printed on: 2023-09-27

KILGOUR & Associates

2.3 General Reach Descriptions

Images of Reaches A through F are provided in Appendix A.

2.3.1 Tributary A

Tributary A is a 465 m roadside ditch that flows southward and turns into a braided channel as it approaches Flewellyn Road. It originates within a cedar swamp wetland located centrally on the Site and flows through a mixed forest primarily composed of Eastern White Cedar and upland deciduous tree species. Tributary A was observed to have minimal flow during spring freshet, lacks in-stream vegetation and contains organic substrate. The mean bankfull width of the feature is approximately 0.73 m.

2.3.2 Tributary B

Tributary B is a ditch feature located in the northern portion of the Site, traversing the Site from west to east. The upstream reach flows southeast and while the downstream reach flows east. It flows primarily through deciduous forest and meadow communities. Tributary B was observed to have minimal flow during spring freshet, does not contain aquatic vegetation, and contains primarily organic substrate with sand and cobble. The mean bankfull width of Tributary B is approximately 0.93 m.

2.3.3 Tributary C

Tributary C is a permanent roadside ditch feature that flows eastward along Flewellyn Road from the western Site boundary to Shea Road, and connects to the Faulkner Drain just east of the hydro cut area. Riparian vegetation is primarily lawn and it contains primarily gravel and cobble substrate. It contains submerged vegetation and has a mean wetted width of approximately 1.85 m.

2.3.4 Tributary D

Tributary D is a tile feature that flows southward along the western Site boundary, traversing the Site from the northern Site boundary through the cedar swamp and mixed forest communities and joins Tributary C at the southern Site boundary. The majority of the feature does not contain vegetation; however, the downstream reach contains robust emergent vegetation and submergent vegetation. The mean bankfull width of Tributary D is approximately 1.59 m and contains organic substrate.

2.3.5 Tributary E

Tributary E is an channelized or constrained feature that flows from the terminus of Tributary B southeast through the mixed deciduous forest community and redirects and flows east into the Faulkner Drain that flows southeast at the boundary of the forested area and stormwater pond area. Tributary E lacks in-stream vegetation and has a mean bankfull width of approximately 2.06 m and contains organic substrate with sand and silt.

2.3.6 Tributary F

Tributary F is a roadside ditch that flows southeast along the eastern Site boundary and Shea Road. The meadow riparian vegetation is present on the left bank, and limited vegetation is present on the right

bank. In-stream vegetation consists of grasses. The mean bankfull width of Tributary F is approximately 1.30 m and contains a mixed substrate of organic, silt, and gravel.

2.4 Component Classifications

Tables 1-4 below summarize the functions provided by the six (6) Drainage Features.

Table 1 Hydrology Classification of the headwater drainage features on the Flewellyn Road Properties, 2023

Drainage Feature	Hydrology Classification					
	Assessment Period	Flow Conditions		Flow Classification	Modifiers	Hydrological Function
		Description	(OSAP Code)			
A	April 17, 2023 May 18, 2023	Minimal Surface flow No surface water	4 1	Intermittent/Ephemeral	No source other than spring run-off and after heavy rain	**Contributing Functions**
B	April 17, 2023 May 18, 2023	Minimal Surface flow Interstitial flow	4 4	Perennial	Pool present with interstitial flow from upstream ATV trail	**Important Functions**
C	April 17, 2023 May 18, 2023	Surface flow substantial Surface flow substantial	5 5	Perennial	Roadside ditch wet along all of Flewellyn Road along Site boundary	**Important Functions**
D	April 17, 2023 May 18, 2023	Minimal Surface flow No surface water /Standing water	4 2	Ephemeral	No source other than spring run-off and after heavy rain	**Contributing Functions**
E	April 17, 2023 May 18, 2023	Minimal Surface flow Minimal Surface flow	4 4	Perennial	Water is present throughout the year. Upstream minimal flow then no flow with intermitted small pools downstream	**Important Functions**
F	April 17, 2023 May 18, 2023	Minimal Surface flow Minimal Surface flow	4 4	Perennial	Water is present throughout the year. Downstream under construction. Outlets into Faulkner Drain	**Important Functions**

Table 2 Riparian Classification for headwater drainage features on the Flewellyn Road Properties, 2023

Drainage Feature	Riparian Classification			
	OSAP Descriptions	**OSAP Riparian Codes**	**ELC Codes**	**Riparian Conditions**
A	RUB - Forest LUB - Forest	RUB - 7 LUB - 7	FOM4, CUM1-1 SWCM1-1	**Valued/Contributing Functions**
B	RUB - Forest LUB - Forest	RUB - 7 LUB - 7	CUM1-1, FODM3-1	**Important Functions**
C	RUB - Lawn LUB - Lawn	RUB - 2 LUB - 2	FOM4, CUT1, OAGM4	**Important Functions**
D	RUB - Forest LUB - Forest	RUB - 7 LUB - 7	SWCM1-1, FOM4	**Valued/Contributing Functions**
E	RUB - Forest LUB - Forest	RUB - 7 LUB - 7	FODM3-1	**Important Functions**
F	RUB - None LUB - Meadow	RUB - 1 LUB - 4	OAGM4	**Important Functions**

Table Notes: RUB – right upstream bank, LUB – left upstream bank

Table 3 Fish and Fish Habitat Classification for the headwater drainage features on the Flewellyn Road Properties, 2023

Drainage Feature	Riparian Classification		
	Fish Observation **Fishing effort**	**Fish & Fish Habitat Designation***	**Modifiers/Notes**
A	Dry	Limited Functions	
B	Fish present, no SAR present; 166.8 S	Important Functions	Two fish caught belonging to one species. Species is very common and highly tolerant
C	Fish present; no SAR present; 468.6 S	Important Functions	Four fish caught belonging to four species. Species all very common and highly tolerant
D	Dry	Limited Functions	
E	No fish present; 90 S	Contributing Functions	
F	No fish present; 60 S	Limited Functions	

Table 4 Terrestrial Classifications on the Flewellyn Road Properties, 2023

Drainage Feature	Description	Amphibians	Terrestrial Classification
A	This reach provides habitat to the adjacent White Cedar Swamp and mixed forest vegetation communities	Wood Frogs were observed in the feature	Valued Functions
B	There is no wetland habitat present. This feature connects deciduous and mixed forest types on the Site	No frogs were observed within the vicinity of this feature	Limited Functions
C	This reach is a permanent roadside ditch that is wet year-round	Frogs were observed adjacent to this feature (Chorus Frog, Spring Peeper, Wood Frog)	Important Functions
D	This reach provides habitat to the adjacent White Cedar Swamp vegetation community	No frogs were observed within the vicinity of this feature	Limited Functions
E	There is no wetland habitat present. This feature connects a forest with the Flewellyn Drain and adjacent SWP	Frogs were observed within the vicinity of this feature (Wood Frog, Spring Peeper)	Valued Functions
F	This reach is a permanent roadside ditch that is wet year-round and very heavily vegetated	No frogs were observed within the vicinity of this feature	Contributing Functions

2.5 Reach Summary

Dimensions of the Headwater Drainage Features are summarized in Table 5 below.

Drainage Feature	Length (m)	Mean Bankfull Width (m)	Mean Wetted Width (m)	Mean Depth (m)
A	465 m	0.73	0.72	0.07
B	378 m	0.93	0.91	0.21
C	1, 185 m	-	1.85	0.17
D	675 m	1.59	1.56	0.36
E	478 m	2.06	2.02	0.15
F	640 m	1.30	2.14	0.25

3.0 MANAGEMENT RECOMMENDATIONS

The classification categories identified in Section 2 provide the basis of the management recommendations provided here. The following flow chart (Figure 2) combines and translates the classification results to management recommendations.

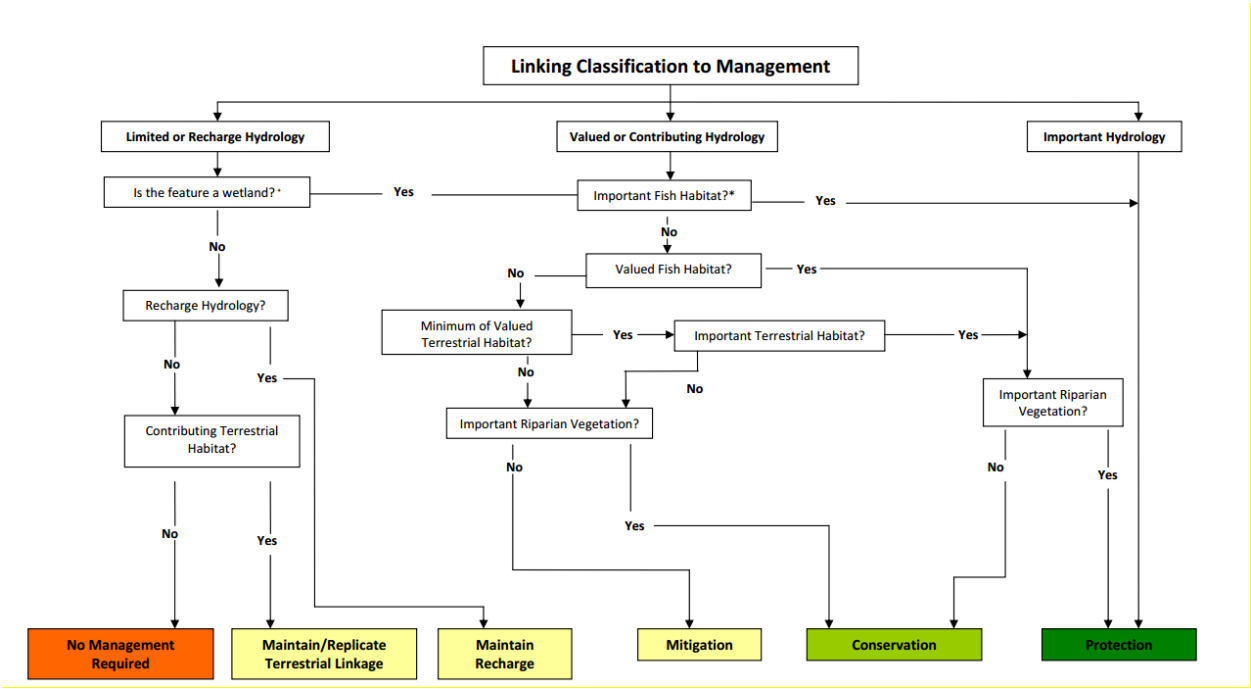


Figure 2 Headwater Drainage Feature Assessment (HDFA) flow chart providing direction on management options

3.1 Periphery Reaches

3.1.1 Tributary A

This feature is a drainage ditch that becomes braided downstream and is a direct connection between the edge of a white cedar swamp and mixed forest to the Flewellyn roadside ditch and Flewellyn Drain. It primarily functions as a drainage feature supporting spring run-off and after heavy rainfall. Following the HDFA Guide flow chart linking component classification to management directives, this reach:

1. Provides Valued/Contributing Hydrology;
2. Provides Valued/Contributing Riparian Vegetation;
3. Provides Limited Fish Habitat; and,
4. Provides Valued Terrestrial Habitat.

This chain of classification descriptors leads to a management directive of **Mitigation** for this reach. This feature may be maintained, replicated, or enhanced using natural channel design techniques to maintain or enhance overall productivity of the reach. This feature provides ephemeral flow and water storage functions during and (for a short time) after spring freshet and following large rain events only. Additionally, amphibians were heard calling during MMP surveys. There is no requirement to retain the feature per se, but on-site flow, outlet flows, and overall water balance for the area must be maintained by providing mitigation measures to infiltrate clean stormwater.

3.1.2 Tributary B

This feature is a ditch feature located within mixed and deciduous forest communities and connects downstream to Tributary E. It has a standing water pool present with interstitial flow towards the Flewellyn Drain. Standing water contributes to groundwater recharge and can function as amphibian breeding habitat. No amphibians were observed within this reach. Following the HDFA Guide flow chart linking component classification to management directives, this reach:

1. Provides Important Hydrology;
2. Provides Important Fish Habitat;
3. Provides Important Riparian Vegetation; and,
4. Provides Limited Terrestrial Habitat.

This chain of classification descriptors leads to a management directive of **Protection** for this reach. This feature may be maintained and/or enhanced, but cannot be relocated. The feature should be protected and its riparian zone enhanced where feasible. The hydroperiod must be maintained. Use natural channel design techniques or wetland design to restore and enhance existing habitat features if and where needed. Stormwater management systems must be designed to avoid impacts (i.e. sediment, temperature) to this tributary.

3.1.3 Tributary C

This feature is a roadside drainage ditch that conveys flow along Flewellyn Road, eventually meeting the Faulkner Drain (Tributary F) at Shea Road. Tributary C is a permanent feature that has water present year-round. This feature was confirmed to function as amphibian breeding habitat and fish habitat. Following the HDFA Guide flow chart linking component classification to management directives, this reach:

1. Provides Important Hydrology;
2. Provides Important Fish Habitat;
3. Provides Important Riparian Vegetation; and,
4. Provides Important Terrestrial Habitat.

This chain of classification descriptors leads to a management directive of **Protection** for this reach. This feature may be maintained and/or enhanced, but cannot be relocated. The feature should be protected and its riparian zone enhanced where feasible. The hydroperiod must be maintained. Use natural channel design techniques or wetland design to restore and enhance existing habitat features if and where needed. Stormwater management systems must be designed to avoid impacts (i.e. sediment, temperature) to this tributary.

3.1.4 Tributary D

This feature is a tile feature that flows from the northwest portion of the Site and from the adjacent residential area southward towards Tributary C. It is a direct connection between the edge of a white cedar swamp and mixed forest to the Flewellyn roadside ditch and Flewellyn Drain. It primarily functions as a drainage feature supporting spring run-off and after heavy rainfall. Following the HDFA Guide flow chart linking component classification to management directives, this reach:

1. Provides Valued/Contributing Hydrology;
2. Provides Limited Fish Habitat;
3. Provides Valued/Contributing Riparian Vegetation; and
4. Provides Limited Terrestrial Habitat.

This chain of classification descriptors leads to a management directive of **Mitigation** for this reach. This feature may be maintained, replicated, or enhanced using natural channel design techniques to maintain or enhance overall productivity of the reach. This feature provides ephemeral flow and water storage functions during and (for a short time) after spring freshet and following large rain events only. There is no requirement to retain the feature per se, but on-site flow, outlet flows, and overall water balance for the area must be maintained by providing mitigation measures to infiltrate clean stormwater.

3.1.5 Tributary E

This feature is a channelized or constrained feature located within mixed and deciduous forest communities and connects downstream to the Faulkner Drain. It has intermittent standing water pools present with intermittent flow towards Faulkner Drain. Standing water contributes to groundwater recharge and can function as amphibian breeding habitat. Breeding amphibians were observed within this reach. Following the HDFA Guide flow chart linking component classification to management directives, this reach:

1. Provides Important Hydrology;
2. Provides Contributing Fish Habitat;
3. Provides Important Riparian Vegetation; and,
4. Provides Valued Terrestrial Habitat.

This chain of classification descriptors leads to a management directive of **Protection** for this reach. This feature may be maintained and/or enhanced, but cannot be relocated. The feature should be protected and its riparian zone enhanced where feasible. The hydroperiod must be maintained. Use natural channel design techniques or wetland design to restore and enhance existing habitat features if and where needed. Stormwater management systems must be designed to avoid impacts (i.e. sediment, temperature) to this tributary.

3.1.6 Tributary F

This feature is a roadside ditch feature located along Shea Road adjacent to an idle agricultural field and connects downstream to the Faulkner Drain at the intersection with Flewellyn Road. It primarily functions as a drainage feature supporting spring run-off and after heavy rainfall. Breeding amphibians were not observed within this reach. Following the HDFA Guide flow chart linking component classification to management directives, this reach:

1. Provides Important Hydrology;
2. Provides Limited Fish Habitat;
3. Provides Important Riparian Vegetation; and,
4. Provides Contributing Terrestrial Habitat.

This chain of classification descriptors leads to a management directive of **Protection** for this reach. This feature may be maintained and/or enhanced, but cannot be relocated. The feature should be protected and its riparian zone enhanced where feasible. The hydroperiod must be maintained. Use natural channel design techniques or wetland design to restore and enhance existing habitat features if and where needed. Stormwater management systems must be designed to avoid impacts (i.e. sediment, temperature) to this tributary.

4.0 CLOSURE

This report provides detailed descriptions of the Headwater Drainage Features on and adjacent to 5993 and 6115 Flewellyn Road, and 6070 Fernbank Road, and provides management recommendations to direct future development near those features. Questions may be addressed to the undersigned.

Respectfully submitted,

KILGOUR & ASSOCIATES LTD.

Maren Nielsen, BES, EMA
Biologist
E-mail: mnielsen@kilgourassociates.com
16-2285 St. Laurent Blvd, Ottawa, ON, K1G 4Z6
Office: 613-260-5555
Cell: 613-367-5562

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

5.0 LITERATURE CITED

Birds Canada, Environmental Canada, & U.S. Environmental Protection Agency. (2009). *Marsh Monitoring Program Participant's Handbook for Surveying Amphibians* (p. 13). https://www.ohwetlands.org/uploads/5/0/6/9/50693061/handbook_mmp_amphibians_2009.pdf

Lee, H. R., Bakowsky, W., Riley, J., Bowles, J., Puddister, M., Uhlig, P., & Mcmurray, S. (1998). *Ecological Land Classification for Southern Ontario: First Approximation and its Application*. Ontario Ministry of Natural Resources. https://www.researchgate.net/profile/Wasyl-Bakowsky/publication/248626765_Ecological_Land_Classification_for_Southern_Ontario_First_Approximation_and_Its_Application/links/560e7abd08ae48337515fd59/Ecological-Land-Classification-for-Southern-Ontario-First-Approximation-and-Its-Application.pdf

Toronto and Region Conservation Authority & Credit Valley Conservation. (2013). *Evaluation, Classification and Management of Headwater Drainage Features Guidelines*. https://trcaca.s3.ca-central-1.amazonaws.com/app/uploads/2021/08/31112457/HDF-EVALUATION-CLASSIFICATION-MANAGEMENT_2014.pdf

Appendix A Site Photos

Figure 3 Tributary A

Figure 4 Tributary B

Figure 5 Tributary B

Figure 6 Pool

Figure 7 Tributary C

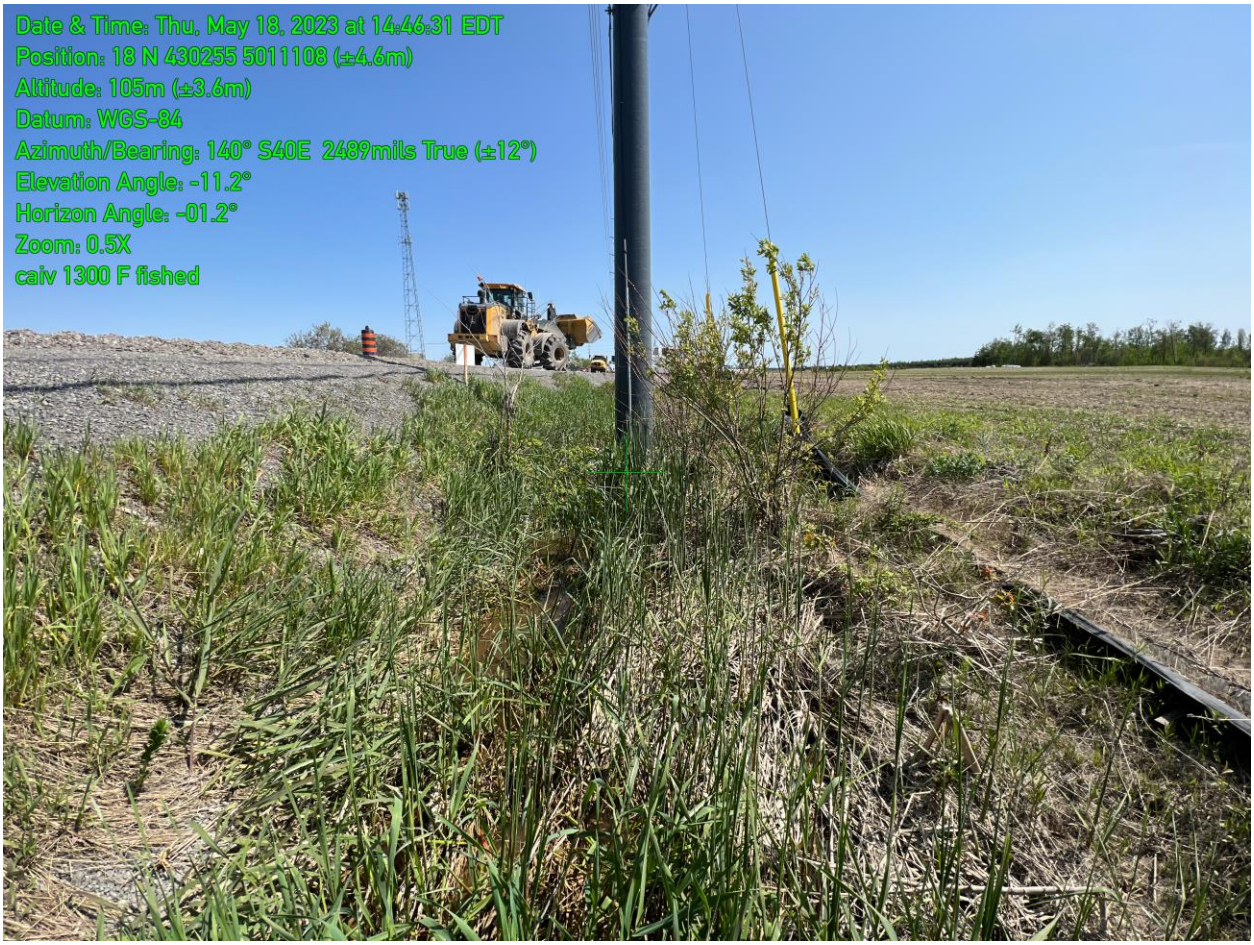
Figure 8 Tributary D

Figure 9 Tributary E

Figure 10 Tributary E

Figure 11 Tributary F

Figure 12 Tributary F



Appendix E Species at Risk Assessment

Species Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
Birds						
Bald Eagle (*Haliaeetus leucocephalus*)	**Special Concern**	**Not at Risk**	Cornell Lab of Ornithology (2022); California Academy of Sciences and National Geographic Society (2022)	Nest in mature forests near open water. In large trees such as pine and poplar.	The available open water near the Site is limited to the Faulkner SWM Pond, which would not provide feeding habitat suitable to support the species.	Negligible
Bank Swallow (*Riparia riparia*)	**Threatened**	**Threatened**	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)	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.	The open meadows and farm fields of the western portion of the site provide some potential as feeding habitat, but no banks suitable for nesting are evident on or adjacent to the Site.	Low
Barn Swallow (*Hirundo rustica*)	**Threatened (Special Concern as of Jan 25, 2023)**	**Threatened**	Birds Canada et al. (2009); MNRF (2022a); MNRF (2022b); Cornell Lab of Ornithology (2022)	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 open meadows and farm fields of the western portion of the site provide some potential as feeding habitat. While houses to the north, south and east of the Site likely provide limited nesting potential, suitable barns are present within 100 m of the western edge of the Site.	High – note, however, that the species will not no longer be subject to protections currently provided by the ESA by the start of the project.
Black Tern (*Chlidonias niger*)	**Special Concern**	**Not at Risk**	n/a	Build floating nests in loose colonies in shallow marshes with abundant emergent vegetation, especially in cattails.	There is no suitable habitat near the Site and the species is not known to occur in the vicinity.	Negligible
Bobolink (*Dolichonyx oryzivorus*)	**Threatened**	**Threatened**	Birds Canada et al. (2009); MNRF (2022a); MNRF (2022b); Cornell Lab of Ornithology (2022)	Breeds in hayfields, pastures, agricultural fields, and abandoned fields with tall grass that are ≥5 ha, and preferably >30 ha.	Cultural meadow areas on the western half of the site are too small to support the species. Cultural meadows on the eastern side of the site are becoming sufficiently shrubby to reduce the likelihood of use by the species, but still offer suitable breeding habitat. Active agricultural areas in the southeast corner may provide suitable habitat depending on the selection of crop species.	High
Canada Warbler (*Cardellina canadensis*)	**Special Concern**	**Threatened**	MNRF (2022a)	Prefers moist forests with dense shrub layers. Nests located on or near the ground on mossy logs or roots, along stream banks or on hummocks. Area-sensitive species that usually require a minimum of 30 ha of continuous forest for breeding habitat (OMNR, 2000).	Most of the western half of the Site provides highly suitable nesting habitat.	High

Species Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
Cerulean Warbler (*Setophaga cerulea)*	**Threatened**	**Endangered**	n/a	Prefers mature deciduous forests. Area-sensitive species that require large forests (>100 ha) (OMNR, 2000).	Deciduous forest cove in the central portion of the Site is of a suitable type but is too small to provide habitat and the species is not known to occur in the vicinity.	Negligible
Chimney Swift (*Chaetura pelagica*)	**Threatened**	**Threatened**	Cornell Lab of Ornithology (2022)	Nests in traditional-style open brick chimneys (and rarely in hollow trees). Tends to stay close to water.	Houses on or adjacent to the Site appear to have modern chimneys that would not provide suitable nesting or roosting habitat. Some trees on Site may be suitable but these are not the preferred habitat of the species.	Moderate
Common Nighthawk (*Chordeiles minor*)	**Special Concern**	**Threatened**	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)	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.	Open areas on the Site provide marginal nesting conditions.	Moderate
Eastern Meadowlark (*Sturnella magna*)	**Threatened**	**Threatened**	Birds Canada et al. (2009); MNRF (2022a); MNRF (2022b); Cornell Lab of Ornithology (2022)	Breeds in hayfields, pastures, agricultural fields, and abandoned fields with tall grass that are ≥5 ha, and preferably >30 ha.	Cultural meadow areas on the western half of the site are too small to support the species. Cultural meadows on the eastern side of the site are becoming sufficiently shrubby to reduce the likelihood of use by the species, but still offer suitable breeding habitat. Active agricultural areas in the southeast corner may provide suitable habitat depending on the selection of crop species.	High
Eastern Whip-poor-will (*Antrostomus vociferus*)	**Threatened**	**Threatened**	Birds Canada et al. (2009); MNRF (2022a)	Suitable breeding habitats generally include open and half treed areas and often exhibit a scattered distribution of treed and open space. Lays eggs directly on the forest floor. Roosts are typically located in forest habitat on a low branch or directly on the ground. Home range size varies from 20 to 500 ha (mean 136 ha) (ECCC, 2018).	The entire western half of the site provides suitable habitat.	High
Eastern Wood-Pewee (*Contopus virens*)	**Special Concern**	**Special Concern**	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)	Woodland species often found in the mid-canopy layer near clearings and edges of intermediate age and mature deciduous and mixed forests with little understory.	The entire western half of the site provides suitable habitat.	High

Species Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
Evening Grosbeak (*Coccothraustes vespertinus*)	**Special Concern**	**Special Concern**	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)	Nests in trees or large shrubs. Prefers mature coniferous forests (fir and/or spruce dominated), but will also use deciduous forests, parklands, and orchards. Its abundance is strongly linked to the cycle of Spruce Budworm.	Forest habitat on the Site is suitable but not optimal.	Moderate
Golden Eagle (*Aquila chrysaetos*)	**Endangered**	**Not at Risk**	n/a	Nests 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. Migration only; no reported nests in Ottawa.	There is no suitable habitat near the Site and the species is not known to occur in the vicinity.	Negligible
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. Requires >10 ha of habitat (OMNR, 2000).	The center of the site between mature forests and shrubby meadows provides optimal habitat, but the species is not known to occur in the vicinity.	Low
Grasshopper Sparrow (*Ammodramus savannarum*)	**Special Concern**	**Special Concern**	Birds Canada et al. (2009)	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.	The cultural meadows of the eastern half of the Site have limited suitability given their expanding shrub coverage, but the active agricultural areas in the southeast corner may be highly suitable depending on crop selection.	Moderate
Henslow's Sparrow (*Ammodramus henslowii*)	**Endangered**	**Endangered**	n/a	Prefers poorly drained grasslands with tall, dense grass where it can easily conceal its small ground nest. Tends to avoid fields that have been grazed or are crowded with trees and shrubs. Prefer ≥50 ha areas, but can inhabit ≥5 ha.	Habitat is suitable but the species is not known to occur in the vicinity.	Negligible
Horned Grebe (*Podiceps auritus*)	**Special Concern**	**Special Concern**	n/a	Nest in small ponds, marshes, and shallow bays that contain areas of open water and emergent vegetation. Migrant only; no reported nests in Ottawa.	There is no suitable habitat near the Site and the species is not known to nest in the vicinity.	Negligible
Hudsonian Godwit (*Limosa haemastica*)	**Threatened**	**No Status**	Cornell Lab of Ornithology (2022)	They use a wide variety of habitats during migration, such as freshwater marshes, saline lakes, flooded fields, shallow ponds, coastal wetlands, and	There is no suitable habitat near the Site and the species is not known to nest in the vicinity.	Negligible

Species Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
				mudflats. Migrant only; breeds in far north.		
Least Bittern (*Ixobrychus exilis*)	**Threatened**	**Threatened**	MNRF (2022a)	Found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels. They prefer larger marshes >5 ha in size and are intolerant of loss of habitat and human disturbance (OMNR, 2000).	There is no suitable habitat near the Site.	Negligible
Lesser Yellowlegs (*Tringa flavipes*)	**No Status (Threatened as of Jan 25, 2023)**	**No Status (Threatened as of Jan 25, 2023)**	Cornell Lab of Ornithology (2022)	Breeds in boreal wetlands. Nests on dry ground or forest openings near peatlands, marshes, and ponds in the boreal forest and taiga. Migrant only; nests in far north (Government of Canada, 2021).	There is no suitable habitat near the Site and the species is not known to nest in the vicinity.	Negligible
Loggerhead Shrike (*Lanius ludovicianus*)	**Endangered**	**Endangered**	n/a	Prefers grazed pastures or other grasslands with scattered low trees and shrubs, especially hawthorns. Lives in fields or alvars (areas of exposed bedrock) with short grass, which makes it easier to spot prey.	Habitat potential near the Site is very limited and the species is not known to nest in the vicinity.	Negligible
Louisiana Waterthrush (*Seiurus motacilla*)	**Threatened**	**Threatened**	n/a	Found in large tracts of mature deciduous or mixed forests in steep, forested ravines with running streams. Clear headwater streams and associated wetlands are preferred sites, but it will also inhabit wooded swamps (Environment Canada, 2011).	Habitat potential near the Site is very limited and the species is not known to nest in the vicinity.	Negligible
Olive-sided Flycatcher (*Contopus cooperi*)	**Special Concern**	**Threatened**	Cornell Lab of Ornithology (2022)	Found along coniferous or mixed 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.	The center of the site between mature forests and shrubby meadows provides suitable habitat.	High
Peregrine Falcon (*Falco peregrinus*)	**Special Concern**	**Special Concern**	Cornell Lab of Ornithology (2022); California Academy of Sciences and National Geographic Society (2022)	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.	There is no suitable habitat near the Site.	Negligible
Red Knot (*Calidris canutus rufa*)	**Endangered**	**Endangered**	n/a	Prefer open beaches, mudflats, and coastal lagoons where they feast on molluscs, crustaceans, and other	There is no suitable habitat near the Site and the species is not known to nest in the vicinity.	Negligible

Species Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
				invertebrates. Migrant only; nests in far north.		
Red-headed Woodpecker (*Melanerpes erythrocephalus*)	**Endangered**	**Endangered**	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.	The entire western half of the site provides suitable habitat, but the species is not known to occur in the vicinity.	Negligible
Red-necked Phalarope (*Phalaropus lobatus*)	**Special Concern**	**Special Concern**	n/a	Lives in coastal and inland marshes where it feeds in shallow ponds and nests on the grassy edges. Always near water during migration. Migrant only; nests in far north.	There is no suitable habitat near the Site and the species is not known to nest in the vicinity.	Negligible
Rusty Blackbird (*Euphagus carolinus*)	**Special Concern**	**Special Concern**	Cornell Lab of Ornithology (2022)	Prefers wet wooded or shrubby areas. Nests at edges of boreal wetlands and coniferous forests. These areas include bogs, marshes, and beaver ponds.	The northwestern portion of the Site provides a small area of potential habitat of limited suitability.	Low
Short-eared Owl (*Asio flammeus*)	**Special Concern (Threatened as of Jan 25, 2023)**	**Special Concern**	n/a	Lives in open areas such as grasslands, marshes, and tundra where it nests on the ground and hunts for small mammals.	The eastern half of the site provides potentially suitable habitat, but the species is not known to nest in the vicinity.	Negligible
Wood Thrush (*Hylocichla mustelina*)	**Special Concern**	**Threatened**	Birds Canada et al. (2009); MNRF (2022a); Cornell Lab of Ornithology (2022)	Lives in mature deciduous and mixed forests. They seek moist stands of trees with well-developed undergrowth and tall trees for singing and perching. Prefers nesting in large forest mosaics, but will also use fragmented forests. Usually build nests in Sugar Maple or American Beech.	Much of the western half of the site provides suitable habitat.	High
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.	There is no suitable habitat near the Site and the species is not known to nest in the vicinity.	Negligible
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.	This species only occurs in Algonquin Provincial Park and surrounding townships, along with other areas in central Ontario including in and around Killarney Provincial Park, Kawartha Highlands Signature Site, and Queen Elizabeth II Wildlands (MECP, 2019a).	None

Species Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
Eastern Cougar (*Puma concolor*)	**Endangered**	**No Status**	n/a	Lives in large, undisturbed forests or other natural areas where there is little human activity.	The proximity of urban development makes the Site unsuitable as habitat.	None
Eastern Small-footed Myotis (*Myotis leibii*)	**Endangered**	**Not Listed**	Humphrey (2017)	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.	Habitat on site is generally suitable, but the species is considered rare in Ottawa with only historical records from the downtown core.	Low
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 this species has recently been reduced to west of Lake Superior in the Rainy River District and on Pelee Island in west Lake Eerie (MECP, 2020a).	None
Little Brown Myotis (*Myotis lucifugus*)	**Endangered**	**Endangered**	Humphrey and Fotherby (2019)	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.	Habitat on site is generally suitable.	Moderate
Northern Myotis / Northern Long-eared Bat (*Myotis septentrionalis*)	**Endangered**	**Endangered**	Humphrey and Fotherby (2019)	Associated with deciduous and mixed forests, choosing to roost under loose bark and in the cavities of trees. They forage along and within forests as well as in hayfields and pastures adjacent to mixed forests.	Habitat on site is generally suitable.	Moderate
Tri-colored Bat / Eastern Pipistrelle (*Perimyotis subflavus*)	**Endangered**	**Endangered**	Humphrey and Fotherby (2019)	Roosts mainly in trees during summer; overwinters in caves and mines along with other species, but often uses deeper parts of the hibernaculum. Foraging occurs in forested riparian areas, over water, and within gaps in forest canopies.	Habitat on site is generally suitable.	Moderate
Amphibians						
Western Chorus Frog (*Pseudacris triseriata*)	**Not Listed**	Great Lakes/ St. Lawrence population: **Threatened**	Ontario Nature (2019); MNRF (2022a)	Inhabits forest openings around woodland ponds but can also be found in or near damp meadows, marshes, bottomland swamps, and	Drainage ditch/stream, pond and wetland areas on the Site provide suitable habitat.	Moderate

Species Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
				temporary ponds in open country, or even urban areas.		
Reptiles						
Blanding's Turtle (*Emydoidea blandingii*)	**Threatened**	**Endangered**	Ontario Nature (2019); MNRF (2022a); MNRF (2022b); California Academy of Sciences and National Geographic Society (2022)	Quiet lakes, streams, and wetlands with abundant emergent vegetation. Also frequently occurs in adjacent upland forests.	The Faulkner Drain was subject to cleanout by the City in the fall of 2022 and is unlikely to provide suitable wetland space for the species. Other than the Faulkner SWM pond, which similarly has low suitability, no suitable wetland features occur within >500 m of the Site. Following provincial guidance on the species, no Category 2 or 3 habitat is considered to occur on the Site.	Low
Eastern Milksnake (*Lampropeltis triangulum*)	**Not Listed**	**Special Concern**	Ontario Nature (2019); MNRF (2022a); MNRF (2022b); California Academy of Sciences and National Geographic Society (2022	Found in variety of open, scrubby or edge habitats, including pastures.	As a habitat generalist, much of the Site may be considered suitable for the species.	High – but the species is not protected as a SAR within the context of the development of the Site.
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.	Other than the Falkner SWM Pond, which is marginal at best, the Site does not generally provide suitable habitat, and the species is not known to occur in the vicinity.	Negligible
Eastern Ribbonsnake *(Thamnophis sauritus)*	**Special Concern**	**Special Concern**	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.	Wet areas around the Site provide suitable habitat, but the species is not known to occur in the vicinity.	Low
Midland Painted Turtle (*Chrysemys picta marginata*)	**Not Listed**	**Special Concern**	Ontario Nature (2019); MNRF (2022a); California Academy of Sciences and National Geographic	Inhabits waterbodies, such as ponds, marshes, lakes and slow-moving creeks that have a soft bottom and provide abundant basking sites and aquatic vegetation. Often bask on shorelines or on logs and rocks that protrude from the water.	The Faulkner SWM Pond provides some habitat suitability.	High – but the species is not protected as a SAR within the context of the development of the Site.

Species Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
			Society (2022)			
Northern Map Turtle (*Graptemys geographica*)	**Special Concern**	**Special Concern**	MNRF (2022a); California Academy of Sciences and National Geographic Society (2022)	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.	Water features on or near the Site are generally too small to support the species.	Low
Snapping Turtle (*Chelydra serpentina*)	**Special Concern**	**Special Concern**	Ontario Nature (2019); MNRF (2022a); MNRF (2022b); California Academy of Sciences and National Geographic Society (2022)	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.	The Faulkner SWM Pond provides some habitat suitability. Other water features on or near the Site are generally too small to support the species.	High – but the species is not protected as a SAR within the context of the development of the Site.
Spiny Softshell (*Apalone spinifera*)	**Endangered**	**Endangered**	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.	The Faulkner SWM Pond provides some habitat suitability. Other water features on or near the Site are generally too small to support the species. Regardless, the species is not known to occur in the vicinity.	Negligible
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.	The Site provides some habitat suitability, but the species is not known to occur in the vicinity.	Negligible
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.	The Site provides some habitat suitability, but the species is not known to occur in the vicinity.	Negligible
Arthropods						
American Bumble bee (*Bombus pensylvanicus*)	**No Status (Special Concern as of Jan 25, 2023)**	**No Status**	n/a	Habitat generalist. Requires a variety of habitat throughout it's life stages. Often found in or adjacent to open fields and meadows, grasslands, farmlands, and other undisturbed open habitats (Government of	As a habitat generalist, much of the Site may be considered suitable, but the species is not known to occur in the vicinity.	Negligible – but the species is not protected as a SAR within the context of the development of the Site anyway.

Species Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
				Canada, 2019).		
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.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
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 (MECP, 2019b).	None
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).	None
Monarch (*Danaus plexippus*)	**Special Concern**	**Special Concern**	California Academy of Sciences and National Geographic Society (2022); Toronto Entomologists' Association (2022)	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 cultural meadows of the eastern half of Site support Milkweed and are considered suitable habitat.	High – but the species is not protected as a SAR within the context of the development of the Site.
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.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
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, 2019c).	None
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	The range of this species is limited to southwestern Ontario (MECP, 2019e).	None

Species Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
				dunes.		
Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*)	**No Status (Endangered as of Jan 25, 2023)**	**No Status**	n/a	Habitat generalist. Host nests occur in meadows, old fields, farmlands, croplands, urban areas, and woodlands (Government of Canada, 2020).	As a habitat generalist, much of the Site may be considered suitable, but the species is not known to occur in the vicinity.	Negligible - but the species is not protected as a SAR within the context of the development of the Site anyway.
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).	None
West Virginia White butterfly (*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.	The forests of the western half of the Site may be suitable, but the species is not known to occur in the vicinity.	Negligible
Yellow-banded Bumble Bee (*Bombus terricola*)	**Special Concern**	**Special Concern**	MNRF (2022a)	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.	As a habitat generalist, much of the Site may be considered suitable.	Moderate – but the species is not protected as a SAR within the context of the development of the Site.
Fish						
American Eel (*Anguilla rostrata*)	**Endangered**	**No Status**	n/a	Primarily nocturnal, hiding in soft substrate or submerged vegetation during the day.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Bridle Shiner (*Notropis bifrenatus*)	**Special Concern**	**Special Concern**	n/a	Prefers clear water with abundant vegetation over silty or sandy substrate.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Channel Darter (*Percina copelandi*)	**Special Concern**	**Special Concern**	n/a	Prefers clean streams and lakes with moderate current over sandy or rocky substrate.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Cutlip Minnow (*Exoglossum maxillingua)*	**Threatened**	**Special Concern**	n/a	Lives in warmer rivers and creeks with clear, slow-moving water, and a rocky or gravel bottom.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
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	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None

Species Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
				rocks or gravel.		
Northern Brook Lamprey (*Ichthyomyzon fossor*)	**Special Concern**	**Special Concern**	n/a	Inhabits clear, coolwater streams. The larval stage requires soft substrates such as silt and sand for burrowing which are often found in the slow-moving portions of a stream. Adults are found in areas associated with spawning, including fast flowing riffles comprised of rock or gravel.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Northern Sunfish (*Lepomis peltastes*)	**Special Concern**	**Special Concern**	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.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
River Redhorse (*Moxostoma carinatum*)	**Special Concern**	**Special Concern**	n/a	Prefers fast-flowing, clear rivers over rocky substrate.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
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.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Molluscs						
Hickorynut (*Obovaria olivaria*)	**Endangered**	**Endangered**	n/a	Live on the sandy beds in large, wide, deep rivers – usually more than two or three metres deep – with a moderate to strong current. Ottawa River.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
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.	The Site may be suitable, but the species is not known to occur in the vicinity.	Negligible
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.	The Site is not generally suitable and there are no records of the species in the vicinity.	Negligible

Species Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
Black Ash (*Fraxinus nigra*)	**Endangered**	**No Status**	MNRF (2022a); California Academy of Sciences and National Geographic Society (2022)	Predominantly a wetland species found in swamps, floodplains, and fens.	The entire Site is generally suitable for the species and individuals were observed there.	High – note, the implementation of legal protections for the species under the ESA has been delayed.
Butternut (*Juglans cinerea*)	**Endangered**	**Endangered**	MNRF (2022a)	Commonly found in riparian habitats but is also found on rich, moist, well-drained loams and well-drained gravels, especially those of limestone origin.	The entire Site is generally suitable for the species and individuals were observed there.	High
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.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Lichens						
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).	None
Flooded Jellyskin (*Leptogium rivulare*)	**No Status**	**Special Concern**	MNRF (2022a); MNRF (2022b)	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 areas along water features have some potential to support the species.	Moderate – but the species is not protected as a SAR within the context of the development of the Site.

LITERATURE CITED

Birds Canada, Canadian Wildlife Service (Environment and Climate Change Canada), Ministry of Northern Development, Mines, Natural Resources and Forestry – Government of Ontario, Ontario Field Ornithologists (OFO), and Ontario Nature. 2009. Atlas of the Breeding Birds of Ontario 2001-2005. Available online at: https://www.birdsontario.org/jsp/datasummaries.jspBumble Bee Watch. 2021. Bumble Bee Sightings Map. Available online at: https://www.bumblebeewatch.org/app/#/bees/map?filters=%7B%22sightingstatus_id%22:%5B%5D,%22species_id%22:%5B%2237%22%5D,%22province_id%22:%5B%5D%7D

California Academy of Sciences and National Geographic Society. 2022. iNaturalist. Available online at: https://www.inaturalist.org/

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

The Cornell Lab of Ornithology. 2022. eBird: An online database of bird distribution and abundance. Available online at: https://ebird.org/home

Environment Canada. 2011. Management Plan for the Louisiana Waterthrush (Seiurus motacilla) in Canada [Proposed]. Species at Risk Act Management Plan Series. Environment Canada, Ottawa. iii + 18 pp. Available online at: https://www.sararegistry.gc.ca/virtual_sara/files/plans/mp_louisiana_waterthrush_e.pdf

Environment and Climate Change Canada (ECCC). 2018. Recovery Strategy for the Eastern Whip-poor-will (*Antrostomus vociferus*) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. vi + 107 pp. Available online at: https://files.ontario.ca/mecp-rs-easternwhip-poor-will-2019-12-05.pdf

Fisheries and Oceans Canada (previously Department of Fisheries and Oceans, “DFO”). 2022. Aquatic Species at Risk Map. Available online at: https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Government of Canada. 2019. American Bumble Bee (*Bombus pensylvanicus*): COSEWIC assessment and status report 2018. Available online at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/american-bumble-bee-2018.html

Government of Canada. 2020. Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*): COSEWIC assessment and status report 2019. Available online at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/suckley-cuckoo-bumble-bee-2019.html

Government of Canada. 2021. Lesser Yellowlegs (*Tringa flavipes*): COSEWIC assessment and status report 2020. Available online at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/lesser-yellowlegs-2020.html

Government of Canada. 2022. Species at Risk Public Registry. Available online at: http://www.registrelep-sararegistry.gc.ca/sar/index/default_e.cfm

Humphrey, C. and H. Fotherby. 2019. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), Northern Myotis (Myotis septentrionalis) and Tri-colored Bat (Perimyotis subflavus) in Ontario. Ontario Recovery Strategy Series. Prepared by the Ministry of the Environment, Conservation and Parks, Peterborough, Ontario. vii + 35 pp. + Appendix. Adoption of the Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada (Environment and Climate Change Canada 2018). Available online at: https://files.ontario.ca/mecp-rs-bats-2019-12-05.pdf

Humphrey, C. 2017. Recovery Strategy for the Eastern Small-footed Myotis (Myotis leibii) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. vii + 76 pp. Available online at: https://files.ontario.ca/mnrf_sar_rs_esfm_final_accessible.pdfMinistry of Environment, Conservation and Parks. 2019a. Algonquin Wolf. Available online at: https://www.ontario.ca/page/algonquin-wolf

Ministry of Environment, Conservation and Parks. 2022. Species at Risk in Ontario. Available online at: https://www.ontario.ca/page/species-risk-ontario

Ministry of Environment, Conservation and Parks. 2019b. Gypsy Cuckoo Bumble Bee. Available online at: https://www.ontario.ca/page/gypsy-cuckoo-bumble-bee

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

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

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

Ministry of Environment, Conservation and Parks. 2019f. 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 Mines, Northern Development, Natural Resources and Forestry. 2022a. Natural Heritage Information Centre: Make Natural Heritage Map. Available online at: https://www.ontario.ca/page/make-natural-heritage-area-map

Ministry of Mines, Northern Development, Natural Resources and Forestry. 2022b. Land Information Ontario. Available online at: https://www.ontario.ca/page/land-information-ontario

Ontario Ministry of Natural Resources. 2000. Significant Wildlife Habitat: Technical Guide. Available online at: https://dr6j45jk9xcmk.cloudfront.net/documents/3620/significant-wildlife-habitat-technical-guide.pdf

Ontario Nature. 2019. Ontario Reptile and Amphibian Atlas. Available online at: https://www.ontarioinsects.org/herp/index.html?Sort=0&area2=squaresCounties&records=all&myZoom=5&Lat=47.5&Long=-83.5

Toronto Entomologists' Association. 2022. Ontario Butterfly Atlas. Available online at: https://www.ontarioinsects.org/atlas/

Wildlife Preservation Canada et al. 2022. Bumble Bee Watch: Bumble Sightings Map. Available online at: https://www.bumblebeewatch.org/app/#/bees/map?filters=%7B%22sightingstatus_id%22:%5B%5D,%22species_id%22:%5B%2237%22%5D,%22province_id%22:%5B%5D%7D