Environmental Impact Statement for the Proposed Expansion of Cardinal Creek Village, Phase 7, Ottawa

Final Report

September 24, 2021

KILGOUR & ASSOCIATES LTD.
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EXECUTIVE SUMMARY

This Environmental Impact Statement (EIS) was prepared by Kilgour & Associates Ltd. (KAL; Appendix A) on behalf of Tamarack (Cardinal Village) Corporation in support of their application for rezoning to allow for expansion of the residential development of Cardinal Creek Village Phase 7 in the east end of Ottawa ("the Site"). In the City of Ottawa ("the City"), an EIS is required when development is proposed in or adjacent to natural heritage features. The purposes of this EIS are to identify 1) natural heritage features on or adjacent to the Site, 2) potential impacts to the proposed development on those features, and 3) mitigation measures to minimize or eliminate those impacts. The requirement of an EIS for the proposed development was triggered by the potential presence of habitat for species at risk (SAR) on and/or adjacent to the Site and the presence of a Significant Woodland on the north edge of the Site.

The Site is owned by Tamarack and is currently under phased development for the residential community of Cardinal Creek Village. The Site is characterized by a central cleared area (the Phase 7 lands) with forested areas along the north, east and south sides. The Phase 7 lands are zoned as Residential Third Density (R3Z), while the forested lands around the perimeter of the site are zoned as Environmental Protection lands (EP and EP1). The proposed expansion would require rezoning a portion of EP lands along the east edge of the site to R3Z to accommodate additional residential units, as well as rezoning EP lands at the northwest corner of the site to Developmental Reserve (DR) to expand a mixed-use commercial area.

Proposed expansion of Phase 7 development into areas currently zoned as EP will require vegetation clearing, including tree clearing. Vegetation clearing is proposed for two locations: the northwest corner of the Site and a portion of the east edge of the Site. Based on the current concept plans for the project, it is expected that an additional 0.59 ha of forested area from four small blocks will be cleared, i.e., beyond the 3.28 ha already planned to be cleared under the development phasing as currently planned. Potential impacts would be mitigated by limiting vegetation and tree clearing to what is necessary to accommodate development. To compensate for impacts to trees, forested areas at the south edge of the site will be expanded 0.88 ha under an extensive tree planting program.

The proposed expansion into forested areas has potential to affect three species at risk: Little Brown Myotis, Tri-coloured Bat and Butternut. Little Brown Myotis and Tri-coloured Bat were detected on the Site during acoustic monitoring and were assumed to be roosting in the treed area around the perimeter of the Site. Potential impacts to these two species would be mitigated by clearing trees outside the bat roosting season, which extends from April to September, inclusive. The Site would continue to provide suitable foraging habitat for these species under the proposed development, as portions of forested area around the perimeter of the Site will be retained. Eleven Butternut trees were detected within the forested area along the north edge of the Site. A Butternut Health Assessment (BHA) was completed for ten of the trees on August 31, 2021, to assess their individual health and explore implications for development in the area and conditions for removal, if required. The BHA report was submitted to the MECP on September 7, 2021.

This EIS provides a set of mitigation measures for employment in the design and construction of the proposed development, such as the use of standard erosion and sediment control measures, compensating for the loss of trees via planting native trees and shrubs, and specific mitigation measures

to prevent impacts to Butternut, Little Brown Bat and Tri-coloured Bat. Our assessment within this report of the potential for impacts to the natural heritage system is based on the implementation of these mitigation measures. It is our professional opinion that the proposed development could proceed without significant negative impacts on natural features or their ecological functions if all mitigation measures provided within this report area followed.

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List of Acronyms and Abbreviations

cm – centimetres
CRZ – critical root zone
DBH – Diameter at breast height
DFO – Department of Fisheries and Oceans (Fisheries and Oceans Canada)
ECCC – Environment and Climate Change Canada
e.g. – *exempli gratia*
EIS – Environmental Impact Statement
ELC – Ecological Land Classification
ESC – erosion and sediment control
ESA – *Endangered Species Act*
FWCA – *Fish and Wildlife Conservation Act*
GIS – geographic information system
ha – hectare
i.e. – *id est*
KAL – Kilgour & Associates Ltd.
km – kilometre
LIO – Land Information Ontario
m – metre
MBCA – *Migratory Birds Convention Act*
MECP – Ministry of Environment, Conservation and Parks
MNR – Ministry of Natural Resources
MNRF – Ministry of Natural Resources and Forestry
NHIC – Natural Heritage Information Centre
NHRM – Natural Heritage Reference Manual
PPS – Provincial Policy Statement
SAR – species at risk
SARA – *Species at Risk Act*
SARO – Species at Risk in Ontario
RVCA – Rideau Valley Conservation Authority
TCR - Tree Conservation Report
UNA – Urban Natural Area

1.0 INTRODUCTION

This Environmental Impact Study (EIS) was prepared by Kilgour & Associates Ltd. (KAL; Appendix A) on behalf of Tamarack (Cardinal Village) Corporation ("Tamarack") in support of their proposed expansion of the residential Phase 7 and Commercial development areas within the Cardinal Creek Village at Old Montreal Road and Cardinal Creek Drive in the east end of Ottawa, Ontario. In the City of Ottawa ("the City"), an EIS is required when development is proposed in or adjacent to natural heritage features (City of Ottawa, 2015). The purposes of this EIS are to identify 1) natural heritage features on or adjacent to the Site, 2) potential impacts of the proposed development to those features, and 3) mitigation measures to minimize or eliminate those impacts. The requirement of an EIS for the proposed development was triggered by the potential presence of habitat for species at risk (SAR) on and/or adjacent to the Site. This EIS provides an update to a previous EIS (Muncaster Environmental Planning, Inc., 2014) and concentrates on lands adjacent to proposed Phase 7 development.

The Site is approximately 31.43 hectares (ha), located east of Antonio Farley Street and west of Ted Kelly Lane ("the Site"; Figure 1) and falls within the Cardinal Creek Catchment of the Ottawa River East Subwatershed (Rideau Valley Conservation Authority, 2021a). The Site is characterized by a central cleared area with forested areas along the north, east and south sides.

The Site is owned by Tamarack and is currently under phased development for the residential community of Cardinal Creek Village. Designs for Phase 7 of Cardinal Creek Village have been approved, and development of the Site will comprise residential properties, with a mixed-use commercial area situated in the northwest corner of the Site. The Phase 7 lands are zoned as Residential Third Density (R3Z), while the forested lands around the perimeter of the Site are zoned as Environmental Protection lands (EP and EP1). The westernmost tip of the EP lands extends into the approved mixed-use commercial area.

The purpose of this EIS is to consider rezoning to allow for the expansion of the Phase 7 residential area into the EP zone along the east edge of the Site to permit additional residential units, and the extension of the mixed-use commercial area (Figure 1).

The Site is bordered by:

- A stormwater management facility, residential properties, and Regional Road 174 to the north
- Forested areas, residential properties, and Ted Kelly Lane to the east
- Old Montreal Road to the south
- Residential developments to the west

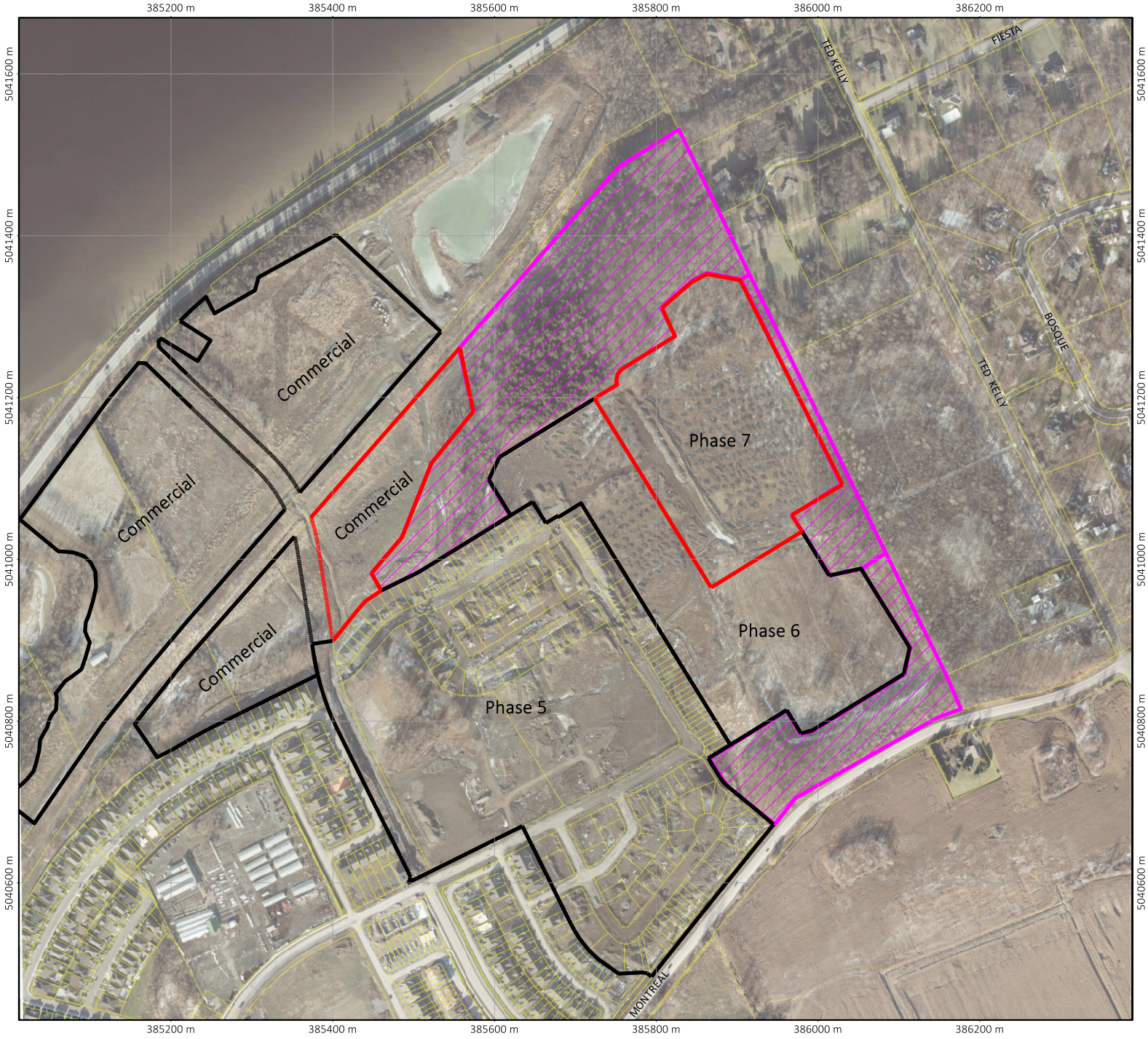

Figure 1 Map showing location context and existing conditions of the Site

Legend

CCV Phase Boundaries

- Proposed for Expansion
- Other
- EP Zone

N

0 100 m

Project: TAGG1205
MTM Zone 9
(NAD 83)
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2.0 ENVIRONMENTAL POLICY CONTEXT

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

2.1 The Provincial Policy Statement, 2020

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

2.2 City of Ottawa Official Plan

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

2.3 Species at Risk Act, 2002

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

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

2.4 *Endangered Species Act*, 2007

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

2.5 *Fisheries Act*, 1985

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

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

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

2.6 *Migratory Birds Convention Act*, 1994

The *Migratory Birds Convention Act*, 1994 (MBCA) is legislation administered by ECCC that provides protection for migratory birds listed under the Act. The disturbance, destruction, take, and killing of migratory birds, their eggs, and their nests are prohibited under the Act. The “incidental take” and work that would result in the destruction of active nests, or the wounding or killing of bird species protected under the MBCA and/or associated regulations (e.g., SARA) is prohibited.

2.7 *Fish and Wildlife Conservation Act,* 1997

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

2.8 *Conservation Authorities Act*, 1990

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

3.0 METHODS

3.1 Desktop and Background Data Review

3.1.1 Agency Consultation

The Site is located within the jurisdiction of the City of Ottawa, Rideau Valley Conservation Authority, the Ottawa District of the MECP, and DFO. The scope of this EIS was determined in consultation with the City of Ottawa and Rideau Valley Conservation Authority. This EIS was scoped to specifically address potential impacts of the proposed development to SAR. A request for confirmation of SAR potential related to the Site was submitted to MECP (Appendix B).

3.1.2 Records Review

Colour digital aerial photographs from geoOttawa (City of Ottawa, 2021a) and Google Earth Pro were used to initially identify natural environment features in the area through a desktop review. Additional background information in this report was obtained from a combination of studies and reports performed within the general area of the Site to review relevant information and to guide field studies. The review of existing information also included a desktop assessment of species listed under SARA and the ESA having some potential to occur in the broader area. Existing information was obtained from online sources, which include but are not limited to:

- Natural Heritage Information Centre (MNRF, 2021a)
- Land Information Ontario Provincially Tracked Species Grid Detail (MNRF, 2021b)
- eBird (Cornell Lab of Ornithology, 2021)
- iNaturalist (California Academy of Sciences and National Geographic Society, 2021)
- Range map extents for SAR in Canada (ECCC, 2021)
- Species at Risk Public Registry (Government of Canada, 2021)
- Aquatic Species at Risk Map (DFO, 2019)
- Species at Risk in Ontario (SARO) list (MECP, 2019a)
- Little Brown Myotis, Northern Myotis, and Tri-Coloured Bat Recovery Strategy (MECP, 2019b)
- Herp Atlas (Ontario Nature, 2019)
- Bat Conservation International Species Profiles (BCI, 2016)
- Bumble Bee Sightings Map (Bumble Bee Watch, 2021)
- Atlas of the Birds of Ontario 2001-2005 (Bird Studies Canada et al., 2009)

- RVCA Geographic Information System (GIS) Maps (RVCA, 2021b)
- Official Plan Schedules (City of Ottawa, 2003)
- *City of Ottawa Urban Natural Areas Environmental Evaluation Study* (Muncaster Environmental Planning Inc. and Brunton Consulting Services, 2005)
- *Environmental Impact Statement and Tree Conservation Report: Proposed Residential Development: Cardinal Creek Village, Phase 1, Ottawa* (Muncaster Environmental Planning Inc., 2014)

3.2 Field Studies

Detailed field studies were performed throughout the spring and summer of 2021 to document existing ecological conditions of the Site.

3.2.1 Vegetation

3.2.1.1 Ecological Land Classification

Vegetation communities on the Site were identified and mapped in the field on June 25 and 30 and July 2, 2021, using standard Ecological Land Classification (ELC) methods for Ontario (Lee et al., 1998). This method provides a consistent approach to identify, describe, name, and map vegetation communities or physiographic features on the landscape based on soils and plant species composition. This method results in a standardized description of each vegetation community to determine the natural diversity and variability of communities within a site, and to provide insight into available habitat and the type of species that may be present. More specifically, the classifications from ELC provide a basis for determining whether potential habitat for a given SAR or other ecological value may be present.

Desktop review of available aerial imagery and preliminary field visits informed how the Site may be divided into vegetation communities based on variation in land cover, topography, and vegetation structure. The dominant plant species were recorded within each proposed ecosite in the field to further divide ecosites into vegetation types (the finest resolution in ELC), where possible. Soil samples were taken using a 120 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.

3.2.1.2 Tree Survey

A detailed tree survey was performed for the Site following TCR guidelines set forth by the City (City of Ottawa 2020). All trees with a diameter at breast height (DBH) $\geq$ 50 cm having potential to be removed under the proposed development were identified, enumerated, mapped, their DBH measured, and their general health and condition documented. Butternut (*Juglans cinerea*) trees (Endangered under ESA and SARA) were also specifically looked for.

3.2.2 Breeding Birds

Morning breeding bird surveys were performed using point counts following the Ontario Breeding Bird Atlas Guide for Participants (Bird Studies Canada et al., 2001). Breeding bird surveys are to be completed from survey stations that, combined, provide suitable viewing of all habitats on a site on calm weather days with

light wind (less than 3 on the Beaufort Scale) and no precipitation. 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, with a minimum of 15 days between survey dates. Surveys took place during the mornings of June 17 and July 1, 2021.

A total of three 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 (Cadman et al., 1987) 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 2021a; for non-SAR species considered provincially significant).

3.2.3 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 Draft Survey Protocol for Eastern Whip-poor-will in Ontario (MNRF, 2014a). 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-will 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 (The Cornell Lab of Ornithology, 2019; Kaufman, 2019). 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 (2014a) 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 19 and 26 and June 23, 2021.

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 (2014a), 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.

Figure 2 Map showing the locations of breeding bird, nightjar, and bat survey stations

Legend

CCV Phase Boundaries

- Proposed for Expansion
- Other

Survey Stations

- Birds
- Nightjars
- Bats

N

0 100 m

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MTM Zone 9
(NAD 83)
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3.2.4 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, 2016).

Both monitors were installed on June 17, 2021 and removed on July 1, 2021 (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.

4.0 RESULTS

4.1 Vegetation

4.1.1 Ecological Land Classification

Five mappable (i.e., distinct) ELC units (ecosites, vegetation types, or other) were delineated on the Site (Figure 3), all of which are terrestrial classifications. Each ELC unit and the dominant vegetation therein (if appropriate) is described in detail below. The ELC designations below were used in subsequent analyses to identify potential habitat that may be used by species of interest (e.g., SAR) occurring or potentially occurring in the Study Area.

4.1.1.1 Fresh-Moist Sugar Maple – Lowland Ash Deciduous Forest (FOD6-1)

This vegetation type covers most of the north edge of the Site and extends to the south, along the eastern forested edge of the Site. The area was characterized as a steep, north-facing slope and is dominated by

Figure 3 Map showing Ecological Land Classification (ELC) units for the Site

Legend

CCV Phase Boundaries

- Proposed for Expansion
- Other

ELC 2

- CUT
- FOD6-1
- FOD6-5
- FOD8-1
- FOC4-1
- Extent of Significant Woodland

N

0 100 m

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MTM Zone 9
(NAD 83)
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Sugar Maple (*Acer saccharum*), with Basswood (*Tilia americana*), White Ash (*Fraxinus americana*) and occasional White Birch (*Betula papyrifera*) (Figure 4). The understorey is relatively open throughout this vegetation type; the subcanopy is characterized by Sugar Maple saplings, and groundcover tends to be sparse, with abundant leaf litter, Sugar Maple saplings and species of fern. This area has a thin layer of organic soils over shallow bedrock.

Figure 4 Fresh-Moist Sugar Maple – Lowland Ash Deciduous Forest (FOD6-1), situated on the north edge of the Site on a north-facing slope

4.1.1.2 Fresh-Moist Sugar Maple – Hardwood Deciduous Forest (FOD6-5)

This vegetation type is situated on the south edge of the Site, on a north-facing slope from Old Montreal Road. The area is dominated by Sugar Maple, with abundant Basswood and Ironwood (*Ostrya virginiana*). The understorey is relatively open, with Sugar Maple and Ironwood saplings forming the subcanopy (Figure 5). Groundcover was sparse and patchy, with areas of abundant Sugar Maple saplings, Blue Cohosh (*Caulophyllum thalictroides*) and While Trillium (*Trillium grandiflorum*), with occasional Large-leaved Aster (*Eurybia macrophylla*) and False Solomon's-seal (*Maianthemum racemosum*). Groundcover also comprised abundant leaf litter. This area has a thin layer of organic soil to 15 cm, with shallow bedrock beneath.

Figure 5 Fresh-Moist Sugar Maple – Hardwood Deciduous Forest (FOD6-5) on slope north of Old Montreal Road

4.1.1.3 Fresh-Moist White Cedar Coniferous Forest (FOC4-1)

This vegetation type is situated on the north edge of the Site, on a north-facing slope. The area is dominated by a canopy comprising exclusively White Cedar (*Thuja occidentalis*) (Figure 6). The subcanopy is open and comprises occasional Sugar Maple saplings. Groundcover is dominated by leaf litter and Ostrich Fern (*Matteuccia struthiopteris*). Soils in this area are characterized by a thin layer of organic soil over shallow bedrock.

Figure 6 Fresh-Moist White Cedar Coniferous Forest (FOC4-1) situated on the north edge of the Site

4.1.1.4 Fresh-Moist Poplar Deciduous Forest (FOD8-1)

This vegetation type is located along the east edge of the Site. The canopy comprises deciduous tree species and is dominated by Trembing Aspen (*Populus tremuloides*), Large-Tooth Aspen (*Populus grandidentata*) and American Elm (*Ulmus americana*), with occasional Sugar Maple, Basswood, and Ironwood (Figure 7). Trees were relatively smaller in this vegetation type than in the adjacent Sugar Maple forest, with most tree's DBH measuring between 30 and 40 cm. The subcanopy is relatively dense, with Staghorn Sumac (*Rhus typhina*), species of Dogwood (*Cornus* spp.), and Sugar Maple, White Ash (*Fraxinus americana*) and Ironwood saplings. Groundcover comprises Canada Goldenrod (*Solidago canadensis*), Trillium and Enchanter's Night-shade (*Circaea lutetiana*), with Blue Cohosh and False Solomon's-seal. The ground in this area is relatively level and soils consist of sandy, loam soils to a depth of 70 cm.

Figure 7 Fresh-Moist Poplar Deciduous Forest (FOD8-1) situated on the east side of the Site

4.1.1.5 Sumac Cultural Thicket (CUT1-1)

This vegetation type is located in the northwest corner of the Site, representing a relatively disturbed area adjacent to residential development. Dominant species include Staghorn Sumac and Manitoba Maple (*Acer negundo*), with occasional, relatively small Green Ash (*Fraxinus pensylvanica*) and apple (*Malus* sp.) trees (Figure 8). Groundcover is dominated by Canada Goldenrod and Wild Parsnip (*Pastinaca sativa*), with Smooth Brome (*Bromus inermis*), White Sweet-clover (*Melilotus alba*) and Common Milkweed (*Asclepias syriaca*). The area is characterized as gently sloping, sandy, stiff clay soils to a depth of 60 cm.

Figure 8 Sumac Cultural Thicket (CUT1-1) situated in the northwest corner of the Site, adjacent to residential development

4.1.2 Tree Inventory

The TCR prepared for the Site includes a comprehensive tree inventory and assessment of the fate of trees on the Site (Appendix C). Trees were located along the north, east and south sides of the Site in natural forested communities. The Site contains 145 trees with DBH > 50 cm from ten species, with 89% of trees observed dominated by three species: Sugar Maple (*Acer saccharum*), white cedar (*Thuja occidentalis*) and Basswood (*Tilia americana*). Ten butternut trees were observed on the Site.

4.2 Breeding Birds

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

Table 1 Summary of dates and weather conditions of morning breeding bird surveys, 2021

Date	Cloud Cover (%)	Air Temperature (°C)	Wind (Beaufort)
June 17, 2021	0	13	1
July 1, 2021	80	15	1

A total of 33 bird species were observed on the Site via morning breeding bird surveys and incidental observations. The most commonly observed species during breeding bird surveys was Red-eyed Vireo, followed by Song Sparrow, American Robin, Rose-breasted Grosbeak and Killdeer.

Two listed at-risk bird species were observed during the morning breeding bird surveys. These SAR observations are summarized in Table 2 below.

Table 2 Summary of species at risk observations during breeding bird surveys, 2021

Species (Taxonomic name)	SARA Status	ESA Status	Dates and Locations Observed
Eastern Wood-pewee (*Contopus virens*)	Special Concern	Special Concern	June 17, 2021: BBS#2 and BBS#3
Chimney Swift (*Chaetura pelagica*)	Threatened	Threatened	June 17, 2021: BBS#1

Eastern Wood-pewee was observed in forested areas along the north and east edges of the Site. Its breeding status was not confirmed, but it was deemed to be a possible breeder due to the presence of calling males in suitable nesting habitat during the breeding season. Eastern Wood-pewee is not assigned protected habitat categories under the ESA, as they are listed as Special Concern.

Chimney Swift was observed at one point count station in the forested area along the north edge of the Site. The breeding status of this species was not confirmed, and the Site and immediately adjacent lands lack suitable nesting habitat. As Chimney Swifts may forage up to 6 km from their nest locations (Tiner, 2009) the Site is not considered to provide habitat for the species.

4.3 Nightjars

KAL surveyors completed nightjar surveys on May 19 and 26 and June 23, 2021 (Table 3), two during the first moon cycle and one in the next moon cycle, per MNRF (2014a) protocols.

Table 3 Summary of dates and weather conditions of nightjar surveys, 2021

Date	Cloud Cover (%)	Air Temperature (°C)	Wind (Beaufort)	Moon Illumination (%)	Moon Visibility (%)
2021-05-19	0-50	26	3	51	100
2021-05-26	5-10	21	2-3	100	100
2021-06-23	0	19	3	99	100

No Eastern Whip-poor-will were heard calling at either station during any of the three surveys. A single Common Nighthawk was heard during the first nightjar survey on May 19, 2021 from both survey stations.

4.4 Bats and Other Mammals

Throughout the entire bat monitoring period (June 17, 2021 to July 1, 2021), a total of 6 species of bats were recorded on the acoustic monitors (Table 4). All survey nights were warm (temperature ≥6°C) with generally low wind. There were showers during the nights of June 18, 25, 26, 29 and 30; survey nights were otherwise calm and free of precipitation. The majority of recorded bat echolocations were made by Hoary Bats (*Lasiurus cinereus*; 1167 total recordings and Big Brown Bats (*Eptesicus fuscus*; 644 total recordings). Two at-risk species were observed: Little Brown Myotis (*Myotis lucifugus*) and Tri-coloured Bat (*Perimyotis subflavus*). Acoustic monitoring captured a total of 4 recordings of Little Brown Myotis (entirely from KB02) and 26 recordings of Tri-coloured Bat (10 from KB01 and 16 from KB02).

Table 4 Number of bat recordings by species from acoustic monitoring performed June 17 to July 1, 2021 (KB01 and KB02)

	Big Brown Bat		Eastern Red Bat		Hoary Bat		Silver-haired Bat		Little Brown Myotis		Tri-coloured Bat	
Date	**KB01**	**KB02**	**KB01**	**KB02**	**KB01**	**KB02**	**KB01**	**KB02**	**KB01**	**KB02**	**KB01**	**KB02**
17-Jun	56	5			41	22	68	18			8	3
18-Jun	13	4		1	20	4	19	2			2	
19-Jun		54				26		88				2
20-Jun		38				53		34				1
21-Jun		12				27		54				
22-Jun		6		1		5		23				
23-Jun		5				22		12				1
24-Jun		31		1		33		41		1		
25-Jun		42		6		21		17				1
26-Jun		45				20		25				
27-Jun		20				140		61				
28-Jun		52		2		282		53		1		1
29-Jun		83		1		255		61		1		2
30-Jun		178		1		197		72		1		5

	Big Brown Bat		Eastern Red Bat		Hoary Bat		Silver-haired Bat		Little Brown Myotis		Tri-coloured Bat	
Date	**KB01**	**KB02**	**KB01**	**KB02**	**KB01**	**KB02**	**KB01**	**KB02**	**KB01**	**KB02**	**KB01**	**KB02**
Total	69	575		13	61	1107	87	561		4	10	16
Total Both Stations	644		13		1168		648		4		26	

KB01 experienced technical issues and only recorded bat data on two nights. KB02 consistently recorded bat data throughout the monitoring period. Note that the number of recordings obtained is not directly equivalent to the number of bats present in an area. A single bat may pass a monitor many times during an evening, triggering multiple recordings, while other bats foraging just beyond a monitor's range may never trigger recordings. Very generally, however, the number of recordings per species can be indicative of relative abundances.

4.5 Species at Risk

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

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

Species Name (Taxonomic Name)	Status under ESA	Status under Schedule 1 of SARA	Potential to Interact with Development of the Site
Birds			
Canada Warbler (*Cardellina canadensis*)	Special Concern	Threatened	Moderate
Common Nighthawk (*Chordeiles minor*)	Special Concern	Threatened	High
Eastern Wood-pewee (*Contopus virens*)	Special Concern	Special Concern	High

Species Name (Taxonomic Name)	Status under ESA	Status under Schedule 1 of SARA	Potential to Interact with Development of the Site
Evening Grosbeak (*Coccothraustes vespertinus*)	Special Concern	Special Concern	Moderate
Olive-Sided Flycatcher (*Contopus cooperi*)	Special Concern	Threatened	Moderate
Wood Thrush (*Hylocichla mustelina*)	Special Concern	Threatened	Moderate
Mammals			
Little Brown Myotis (*Myotis lucifugus*)	Endangered	Endangered	High
Tri-coloured Bat (*Perimyotis subflavus*)	Endangered	Endangered	High
Reptiles			
Eastern Milksnake (*Lampropeltis triangulum*)	Not Listed	Special Concern	Moderate
Vascular Plants			
Butternut (*Juglans cinerea*)	Endangered	Endangered	High

SAR presented in Table 5 that are not listed or are listed as Special Concern under the ESA are not considered further as SAR in this report because they do not receive individual or habitat protection under the ESA (whereas Threatened and Endangered species do). 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 Significant Wildlife Habitats (MNRF, 2015a).

Eleven Butternut trees were identified within the Sugar Maple forest community (FOD6-1) along the north edge of the Site. The radial distance of 50 m from the base of a Butternut is typically regulated as protected habitat under the ESA. The area within 25 m of the tree is recognized as important for sustaining microhabitat conditions for the parent tree (Poisson and Ursic, 2013). The area between 25 and 50 m is important for

providing suitable habitat for regeneration/progeny based on Butternut seed dispersal and sapling establishment (Hewitt and Kellman, 2002). One of the eleven Butternut trees was assessed previously (Muncaster Environmental Planning, Inc., 2014) and is not considered further in this EIS. The remaining ten Butternuts are anticipated to be affected by the proposed development. By law, what can be done to a Butternut and its associated buffer depend on the health of the Butternut, which is determined through a Butternut health assessment. The health of Butternut trees is divided into three categories (MNRF, 2014b):

- Category 1: the tree is in advanced stages of disease because of Butternut canker ("non-retainable").
- Category 2: the tree does not have Butternut canker or disease is not advanced ("retainable").
- Category 3: the tree shows signs of resistance to Butternut canker and could be useful in determining how to prevent or resist Butternut canker ("archivable").

The health of each of the ten butternuts was assessed by a certified Butternut Health Assessor (K. Black, BHA #731) following provincial guideline son August 31, 2021, to determine the health category of each tree (i.e, Category 1, 2 or 3) and associated mitigation measures. All ten of the Butternuts were assessed as Category 1. The supporting Butternut health assessment report was submitted to MECP on September 7, 2021 (Appendix E).

The rules surrounding follow-up actions based on the Butternut health categories are presented below.

- During the 30 day period after the health assessment report is submitted, the proponent must allow the MECP to access the Site for the purpose of examining the trees, upon request.
- Following the 30-day period, any Category 1 trees may be killed or harmed (i.e., the area within 50 m of the tree altered) without further process or documentation (unless the results of a MECP examination of the trees indicate that the activity is not eligible for the regulation).

4.6 Other Significant Natural Heritage Features

4.6.1 Significant Woodland

The City of Ottawa's Official Plan (2018) defines significant woodlands using the following criteria:

- Any treed area meeting the definition of woodlands in the *Forestry Act* or forest in the Ecological Land Classification for Southern Ontario; and
- In the rural area, meeting any one of the criteria in the Natural Heritage Reference Manual, as assessed in a subwatershed planning context and applied in accordance with Council-approved guidelines, where such guidelines exist; or
- In the urban area, any area 0.8 hectares in size or larger, supporting woodland 60 years of age and older at the time of evaluation.

Historical aerial imagery of the Site was reviewed to assess the age of forested areas. The oldest available photo was from 1976 (i.e., depicting conditions 45 years ago) and therefore represents a conservative approximation of conditions 60 years ago.

A portion of the forested area on the north edge of the Site meets the criteria listed above for a significant woodland within the urban area (Figure 3). This area – over 60 years in age - covers 3.8 ha and is characterized by predominantly Fresh-moist Sugar Maple – Lowland Ash Deciduous Forest (FOD6-1), with Fresh-moist White Cedar Coniferous Forest (FOD4-1).

5.0 DESCRIPTION OF THE PROPOSED PROJECT

The proposed project includes an expansion of the Cardinal Creek Village residential development. The Cardinal Creek Village Concept Plan and City of Ottawa Official Plan Amendment were adopted in August 2013. The overall Cardinal Creek Village development will comprise residential properties, schools, mixed-use blocks, a stormwater management facility, and a network of local and collector roads and supporting infrastructure, as well as parks and green spaces. Phase 7 will comprise residential properties (single-family and semi/townhouse units). A mixed-use commercial area is situated in the northwest corner of the Site.

The Site includes lands zoned as Residential Third Density (R3Z), with Environmental Protection lands along the north and east edges of the Site (EP1), as well as along south edge of the Site (EP). The westernmost tip of the EP1 lands extends into the approved mixed-use commercial area. The eastern edge of the EP1 lands received that zoning designation in large part to provide buffer to natural areas adjacent to the east side of Cardinal Creek Village. Lands to the east, however, have since been redesignated as a development reserve (i.e., zoned DR). As such, a natural buffer here is no longer required. Moreover, most of eastern edge of the EP1 zone, and portions of that area throughout the wooded feature north of Phase 7 (i.e., within the Significant Woodlands), were approved for clearing in 2014 to accommodate stormwater infrastructure. Under the current development plan only three very small blocks of forest cover (totaling 0.42 ha) would remain with treed cover at the southeastern tip of the EP1 zone. Most of the western tip is already devoid of trees.

The currently proposed expansion would see the rezoning of a portion of the eastern finger of the EP1 lands along the east edge of the Site (“Phase 7A” in Figure 9) to R3Z to accommodate additional residential units, as well as rezoning a portion of EP1 lands at the northwest corner of the Site (“Commercial A” in Figure 9) to Developmental Reserve (DR) to expand the mixed-use commercial area. These zoning changes would result in 1.16 ha of additional R3Z area and 1.48 ha of additional DR area. These new areas would occur on lands that already largely been cleared or have been approved to be cleared of natural cover to support site infrastructure. As such, the EP zoning is no longer warranted. There will be no new impacts to the Significant Woodland within the forested EP1 lands along the north edge of the Site.

The expanded community areas would result in the clearing of an additional 0.59 ha of forested area, i.e., beyond the 3.28 ha already planned to be cleared under the development phasing as currently approved. Forested areas at the south edge of the Site, however, will instead be expanded by 0.88 ha under an extensive tree planting program to restore portions of the EP zone there that currently lack any natural vegetative cover (see Section 7.1).

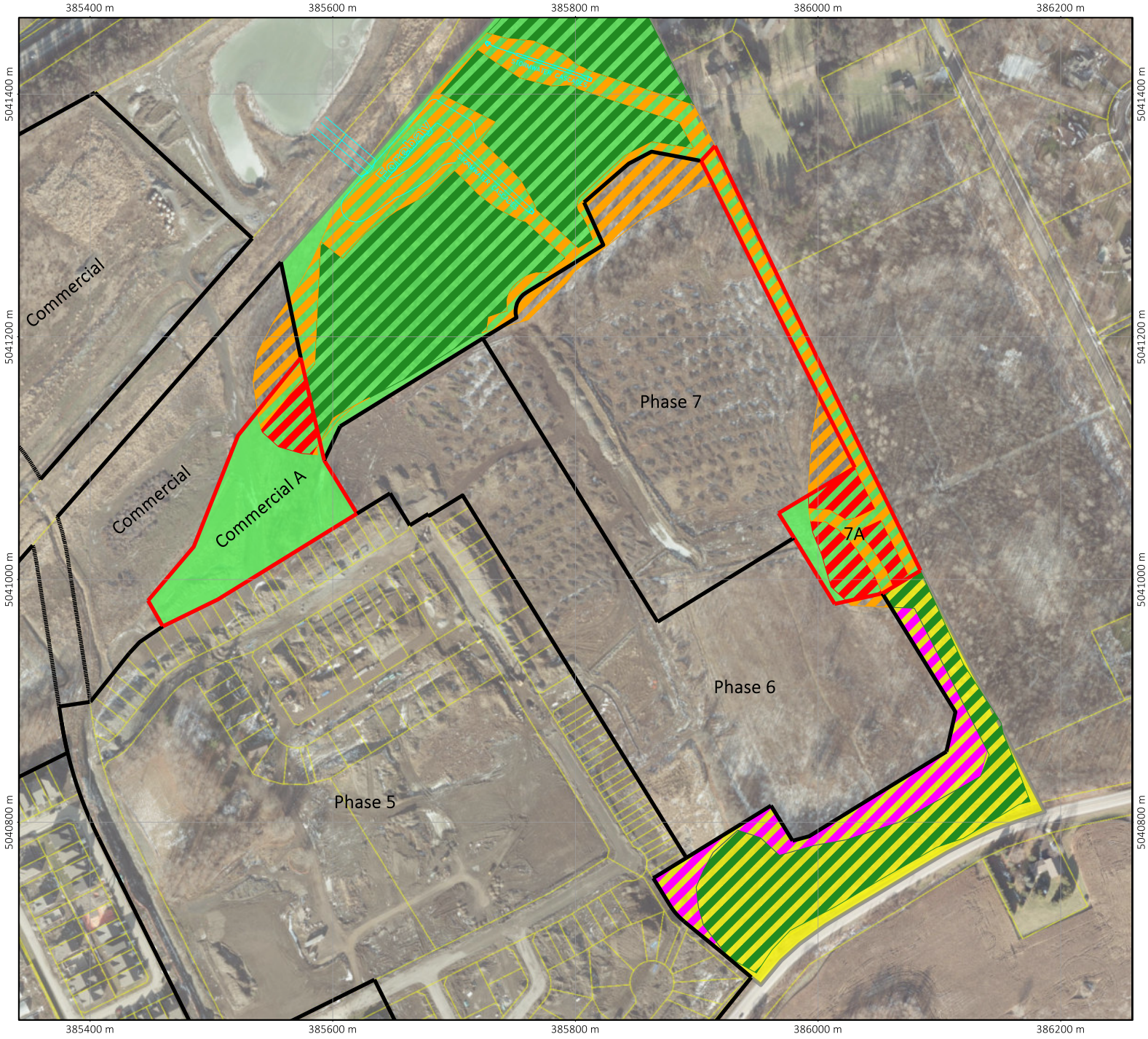

Figure 9 Map showing the proposed expansion of Cardinal Creek Village Phase 7 and Commer

Legend

CCV Phase Boundaries

- Exapansion Area
- Other
- SWM Intrastructure (Existing approvals)

Current EP Zoning

- EP
- EP1

Changes in Tree Cover

- Retained Forest Cover
- New Forest Cover
- Planned Removal Area
- New Removal Area

N

0 100 m

Project: TAGG1205
MTM Zone 9
(NAD 83)
Printed on: 2021-09-24

KILGOUR & Associates

6.0 IMPACT ASSESSMENT

6.1 Vegetation

Vegetation removal, including tree removal, will be required to accommodate proposed project construction. No rare or unique vegetation communities were observed within the proposed project area; however, to accommodate the proposed project components, clearing an additional 0.83 ha of forested area will be required to accommodate the proposed expansion. In total, 1 additional tree of ≥50 cm DBH is anticipated to be removed to accommodate the project, in addition to 34 previously planned removals.

One at-risk vegetation species (Butternut) was observed within the forested area on the north edge of the Site; impacts to Butternut are further discussed in Section 6.2.2 below.

6.2 Species at Risk

6.2.1 Little Brown Myotis and Tri-coloured Bat

Little Brown Myotis and Tri-coloured Bat were detected in the Study Area and were assumed to be roosting in the treed area around the perimeter of the Site. As Endangered Species, Little Brown Myotis and Tri-coloured Bat receive "general habitat protection" under the ESA; no defined protection currently exists for the species. Generally, trees that are used for roosting cannot be significantly altered during the roosting season (April to September, inclusive; MNRF, 2015b). Potential impacts to these two species would be mitigated by clearing trees outside of the roosting season. The Site would still provide suitable foraging habitat for Little Brown Myotis and Tri-coloured Bat under the proposed development, as some of the forested area around the perimeter of the Site will be retained.

6.2.2 Butternut

Butternut were detected in Site, within the forested area along the north edge of the Site. Eleven trees were detected, all in relatively close proximity to the proposed development. As an Endangered Species, both individual trees and their habitats are protected. Five Category 1 trees are expected to be removed to accommodate the proposed Phase 7 expansion. The remaining five Category 1 trees are anticipated to be harmed, due to encroachment into the surrounding 25 and 50 m buffer areas.

7.0 MITIGATION

7.1 Vegetation

To offset vegetation loss, native tree and shrub species must be planted, consistent with approved canopy cover targets and Cardinal Creek Village landscaping plans. Plantings may occur at ground level, on top of structures, in adjacent right-of-ways, in parks, or any other existing or future public space. Landscaping plans must be prepared to the satisfaction of the City. Tree planting should follow guidelines provided in Tree Planting in Sensitive Marine Clay Soils (City of Ottawa, 2017) by using trees with low water demand and planting trees at a distance equivalent to the full mature height of a tree from a building or foundation structure where clay soils are present.

To offset the removal of trees on-site, compensatory planting is proposed for the EP zone along the south edge of the Site. In that area, the EP boundaries are larger than the existing Fresh-Moist Sugar Maple – Hardwood Deciduous Forest, and the EP area therefore also includes weedy vegetation, such as Common Buckthorn and Wild Parsnip. Removing the Common Buckthorn and planting suitable native trees (e.g., Red Maple) would expand the forested area within the EP zone and improve the overall condition of the forest by limiting the presence of invasive edge species within the EP boundary. This expansion will add 0.88 ha of forested area to the Site.

The proponent will develop a woodland management plan for the expanded forested area to the south and for the retained forest area to the north. The woodland management plan will:

- Provide a detailed replanting plan for the southern area;
- Implement a mitigation strategy to reduce the presence of buckthorn through the features;
- Design a pathway or trail network through both areas to improve recreational access for the neighbouring residents in a manner that limits pedestrian damage; and
- Provides signage and/or other such features along the pathway/trail network to foster community care and respect for the forested features.

To minimize impacts to vegetation to be retained on the Site, the following general protection measures are recommended during site preparation and construction:

- Vegetation removal on the Site should be limited to that which is necessary to accommodate construction.
- To minimize impacts to trees to be retained on the Site:
    - Erect a fence beyond the critical root zone (CRZ; i.e., 10x the DBH) of retained trees that have roots that may extend into the project area. The fence should be highly visible (orange construction fence) and paired with erosion and sediment control fencing.
    - Pruning of branches is recommended in areas of potential conflict with construction equipment.
    - Do no place any material or equipment within the CRZ of trees.
    - Do not attach any signs, notices, or posters to any trees.
    - Do not raise or lower the existing grade within the CRZ of trees without approval.
    - Tunnel or bore when digging within the CRZ of a tree.
    - Do not damage the root system, trunk, or branches of any remaining trees.
    - Ensure that exhaust fumes from all equipment are not directed toward any tree’s canopy.

7.2 Species at Risk

7.2.1 Little Brown Myotis and Tri-coloured Bat

Little Brown Bat and Tri-coloured Bat were documented on the Site through acoustic recordings. Those species may day-roost in trees within the forested areas along the perimeter of the Site. To prevent impacts to bats in forested areas, no clearing of trees on site should take place between April and September (inclusive) without a qualified biologist first confirming the absence of bats (MNRF, 2015b).

7.2.2 Butternut

Eleven Butternut trees were documented on the Site, all situated in the forested area along the north edge, with potential to be directly or indirectly affected by proposed Phase 7 development. One Butternut was assessed as part of a previous EIS (Muncaster Environmental Planning, 2014). The remaining ten Butternuts were all identified as Category 1 trees; five of which are anticipated to be removed, and 5 are anticipated to be harmed. The health category-specific rules and actions for Category 1 trees are outlined provided in Section 4.5 of this report apply. In addition, protective/barrier fencing should be installed along the edges of the Phase 7 expansion area to prevent works from encroaching towards any Butternuts that are not removed to accommodate construction. This barrier could be provided by silt fence as part of the ESC plan for the Site. Workers should also be trained in the identification of Butternut and be familiar with the locations of the Butternuts near the Site to ensure Butternut trees and their protected habitat areas are avoided during site works as much as possible.

7.3 General Wildlife Management

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

- Vegetation clearing should not take place during sensitive times of the year for wildlife (breeding season; early spring throughout summer) unless mitigation measures are implemented and/or the habitat has been inspected by a qualified Biologist.
    - The MBCA protects migratory birds and the nests and young of migratory birds in Canada. No clearing of vegetation should occur during the breeding bird window (between April 15 and August 31; Government of Canada; 2018) to prevent impacts to birds. Combining the breeding bird window with the bat roosting season (April to September; MNRF, 2015d), no clearing of vegetation should occur between April 15 and September 30 inclusive to prevent impacts to both birds and bats.
- Do not harm, feed, or unnecessarily harass wildlife.
- Manage waste to prevent attracting wildlife to the Site. Effective mitigation measures include litter prevention and keeping all trash secured in wildlife-proof containers and promptly removing it from the Site, especially during warm weather.
- Drive slowly and avoid wildlife.

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

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

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

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

8.0 CONCLUSION

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

9.0 CLOSURE

This report was prepared for exclusive use by Tamarack (Cardinal Village) Corporation and may be distributed only by Tamarack (Cardinal Village) Corporation. Questions relating to the data and interpretation can be addressed to the undersigned.

Respectfully submitted,

KILGOUR & ASSOCIATES LTD.

Kesia Miyashita, MSc	Anthony Francis, PhD
Project Manager	Project Director

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Appendix A Qualifications of Report Authors

Kesia Miyashita, MSc

Kesia 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, Kesia has completed environmental assessments for a variety of major infrastructure projects and urban developments and has been involved in the creation of municipal natural area management plans. 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. Kesia has also conducted surveys in construction and reclamation sites and prepared revegetation plans to contribute to reclamation plans. Prior to joining Kilgour & Associates Ltd. in May 2021, Kesia completed a contract with the Canadian Wildlife Service, where she contributed to policies and guidance documents related to the interface between the *Species at Risk Act* and the *Impact Assessment Act* and developed a strong working understanding of those key pieces of federal legislation. Kesia is a Professional Biologist with the Alberta Society of Professional Biologists and a Qualified Wetland Science Practitioner in the province of Alberta.

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, invasive species, terrestrial and aquatic habitat, environmental effects monitoring and mitigation, and fate/effects of contaminants. Within each of these subject areas, Dr. Francis has completed projects addressing specific site concerns and broader policy initiatives. In the Ottawa area Dr. Francis helps clients work their way through the land development process by producing key supporting studies such Environmental Impact Statements, Integrated Environmental Reviews, and by obtaining various permits and approvals from local regulatory agencies including the conservation authorities and Ministries of Environment and Natural Resources. Dr. Francis is our local in-house geomatics specialist, capable of carrying out detailed and complex analyses of geospatial data of plant and animal distribution. He often utilizes his skills to carry out constraint studies prior to a client purchasing or planning a development for a property.

Appendix B MECP Species at Risk Correspondence

June 1, 2021 **Our File: TAGG 1205**

Carolyn Hann
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 Taggart Cardinal Creek Village

Ms. Hann:

1.0 INTRODUCTION

This letter provided by Kilgour & Associates Ltd. (KAL) is a request for information relating to the potential presence of species at risk (SAR) near the Cardinal Creek Village neighbourhood development in Orleans, Ontario ("the Site"; Figure 1). 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 (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 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 an authorization under the *Endangered Species Act* (ESA).

1.1 Site Overview

The site is approximately 13 ha in size. The zoning of the property is EP and EP1 (environmental protection zone). Adjacent lands are zoned as R3Z (residential third density) and are currently under development. Much of the adjacent lands have been recently cleared. Vegetation cover within the site comprises a relatively narrow deciduous forest stand situated around the perimeter of the Cardinal Creek lands. The site is bordered to the north by a storm pond and Highway 174, to the south by Old Montreal Road, to the

east by Ted Kelly Lane and the the west by the existing portion of Cardinal Creek Village (Figure 1).

Figure 1 Location 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.

- Environmental Impact Statement and Tree Conservation Report for Proposed Residential Development: Cardinal Creek Village Phase 1 (Muncaster Environmental Planning, 2014)
- Aquatic Species at Risk Map (DFO, 2019)
- Ontario Ministry of Natural Resources and Forestry (MNRF)
    - Natural Heritage Information Centre (MNRF, 2021a)

- Land Information Ontario Provincially Tracked Species Grid Detail (MNRF, 2021b)
- *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)

- Species at Risk in Ontario (MECP, 2021)
- Species at Risk Public Registry (Government of Canada, 2021)
- Atlas of the Breeding Birds of Ontario 2001-2005 (Bird Studies Canada et al., 2009)
- Herp Atlas (Ontario Nature, 2019)
- iNaturalist (California Academy of Sciences and National Geographic Society, 2021)
- eBird (Cornell Lab of Ornithology, 2021)
- Bumble Bee Sightings Map (Bumble Bee Watch, 2021)

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, 2021a), Land Information Ontario (MNRF, 2021b), eBird (Cornell Lab of Ornithology, 2021), and iNaturalist (California Academy of Sciences and National Geographic Society, 2021) are occurrences within approximately 5 km of the site. SAR occurrence data from the Atlas of the Breeding Birds of Ontario (Bird Studies Canada et al., 2009) and Herp Atlas (Ontario Nature, 2019) are based on the 10 x 10 km Atlas square that the site falls in (18VR63). As the site is situated near the boundary of Atlas Square 18VR63, the adjacent square (18VR64) was also included in the review.

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

Species Name (Latin name)	Information Source
Birds	
Bald eagle (*Haliaeetus leucocephalus*)	Cornell Lab of Ornithology (2021)
Bank swallow (*Riparia riparia*)	Bird Studies Canada et al. (2009), Cornell Lab of Ornithology (2021), Government of Canada (2021)

Species Name (Latin name)	Information Source
Barn swallow (*Hirundo rustica*)	Cornell Lab of Ornithology (2021), California Academy of Sciences and Natural Geographic Society (2021), Government of Canada (2021), Muncaster Environmental Planning (2014)
Black tern (*Chlidonias niger*)	Cornell Lab of Ornithology (2021), California Academy of Sciences and Natural Geographic Society (2021)
Bobolink (*Dolichonyx oryzivorus*)	MNRF (2021a), Cornell Lab of Ornithology (2021), California Academy of Sciences and Natural Geograpic Society (2021), MNRF (2021b), Government of Canada (2021)
Canada warbler (*Cardellina canadensis*)	Bird Studies Canada et al. (2009), Cornell Lab of Ornithology (2021), Government of Canada (2021)
Chimney swift (*Chaetura pelagica*)	Bird Studies Canada et al. (2009), Cornell Lab of Ornithology (2021), Government of Canada (2021)
Common nighthawk (*Chordeiles minor*)	Cornell Lab of Ornithology (2021), Government of Canada (2021)
Eastern meadowlark (*Sturnella magna*)	Bird Studies Canada et al. (2009), MNRF (2021a) Cornell Lab of Ornithology (2021), MNRF (2021b), Government of Canada (2021)
Eastern whip-poor-will (*Antrostomus vociferus*)	Government of Canada (2021)
Eastern wood-pewee (*Contopus virens*)	Bird Studies Canada et al. (2009), Cornell Lab of Ornithology (2021), Government of Canada (2021)
Golden eagle (*Aquila chrysaetos*)	Cornell Lab of Ornithology (2021)
Golden-winged warbler (*Vermivora chrysoptera*)	Government of Canada (2021)
Grasshopper sparrow (*Ammodramus savannarum*)	Government of Canada (2021)
Horned grebe (*Podiceps auritus*)	Cornell Lab of Ornithology (2021)
Least bittern (*Ixobrychus exilis*)	MNRF (2021a), Cornell Lab of Ornithology (2021),
Olive-sided flycatcher (*Contopus cooperi*)	Cornell Lab of Ornithology (2021), Government of Canada (2021)
Peregrine falcon (*Falco peregrinus*)	Cornell Lab of Ornithology (2021), Government of Canada (2021)
Red-necked phalarope (*Phalaropus lobatus*)	Cornell Lab of Ornithology (2021)
Rusty blackbird (*Euphagus carolinus*)	Cornell Lab of Ornithology (2021), Government of Canada (2021)
Short-eared owl (*Asio flammeus*)	Government of Canada (2021)
Wood thrush (*Hylocichlia mustelina*)	Bird Studies Canada et al. (2009), Cornell Lab of Ornithology (2021), Government of Canada (2021)

Species Name (Latin name)	Information Source
Yellow rail (*Coturnicops novemboracensis*)	Government of Canada (2021)
Mammals	
Gray fox (*Urocyon cinereoargenteus*)	Government of Canada (2021)
Little brown myotis (*Myotis lucifugus*)	Humphrey and Fotherby (2019)
Tri-colored bat (*Perimyotis subflavus*)	Humphrey and Fotherby (2019)
Amphibians	
Northern leopard frog (*Lithobates pipiens*)	MNRF (2021a), Government of Canada (2021)
Western chorus frog (*Pseudacris triseriata*)	Government of Canada (2021)
Arthropods	
Bogbean buckmoth (*Hemileuca* sp. 1)	Government of Canada (2021)
Gypsy cuckoo bumble bee (*Bombus bohemicus*)	Government of Canada (2021)
Macropis cuckoo bee (*Epeoloides pilosulus*)	Government of Canada (2021)
Monarch (*Danaus plexippus*)	Government of Canada (2021)
Rusty-patched bumble bee (*Bombus affinis*)	Government of Canada (2021)
Reptiles	
Blanding's turtle (*Emydoidea blandingii*)	Ontario Nature (2019), MNRF (2021b), Government of Canada (2021)
Eastern milksnake (*Lampropeltis triangulum*)	Government of Canada (2021)
Eastern musk turtle (*Sternotherus odoratus*)	Ontario Nature (2019), Governmnet of Canada (2021)
Northern map turtle (*Graptemus geographica*)	Ontario Nature (2019), MNRF (2021a), Government of Canada (2021)
Snapping turtle (*Chelydra serpentina*)	Ontario Nature (2019), MNRF (2021a), MNRF (2021b), Government of Canada (2021)
Spiny softshell (*Apalone spinifera*)	Government of Canada (2021)
Spotted turtle (*Clemmys guttata*)	Government of Canada (2021)
Wood turtle (*Glyptemys insculpta*)	Government of Canada (2021)
Fish	
American eel (*Angulla rostrata*)	MNRF (2021a)
Channel darter (*Percina copelandi*)	DFO (2019), MNRF (2021a)
Lake sturgeon (*Acipnser fulvescens*)	MNRF (2021a)
Northern brook lamprey (*Ichthyomyzon fossor*)	DFO (2019), MNRF (2021a)
River redhorse (*Moxostoma carinatum*)	DFO (2019)
Silver lamprey (*Ichthyomyzon unicuspis*)	DFO (2019), MNRF (2021a)
Vascular Plants	
American ginseng (*Panax quinquefolius*)	Government of Canada (2021)
American waterwort (*Elatine americanum*)	MNRF (2021b)
Butternut (*Juglans cinerea*)	MNRF (2021a), Government of Canada (2021), Muncaster Environmental Planning (2014)
Cattail sedge (*Carex typhina*)	MNRF (2021b)
Molluscs	

Species Name (Latin name)	Information Source
Hickorynut (*Obovaria olivaria*)	DFO (2019)
Lichens	
Pale-bellied frost lichen (*Physconia subpallida*)	Government of Canada (2021)

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, 2021) and iNaturalist (California Academy of Sciences and National Geographic Society, 2021) 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 proposed Cardinal Creek Village. 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.

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cc: Bruce Kilgour (KAL)

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Appendix C Tree Conservation Report for the Proposed Expansion of Cardinal Creek Village Phase 7, Ottawa

Tree Conservation Report for the Proposed Expansion of Cardinal Creek Village, Phase 7, Ottawa

Final Report

September 24, 2021

KILGOUR & ASSOCIATES LTD.
www.kilgourassociates.com

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List of Acronyms and Abbreviations

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

1.0 INTRODUCTION

Kilgour & Associates Ltd. (KAL) was retained by Tamarack (Cardinal Village) Corporation ("Tamarack") to provide a Tree Conservation Report (TCR) in support of their application for a proposed expansion of the residential Phase 7 and Mixed-use Commercial areas within the Cardinal Creek Village development at Old Montreal Road and Cardinal Creek Drive in the east end of Ottawa, Ontario ("the Site"; Figure 1). The purpose of a TCR is to demonstrate how tree cover will be retained on sites subject to development using a "design with nature approach" to planning and engineering. A design with nature approach incorporates natural features of a site into the design and engineering of a proposed development. This TCR has been prepared following guidelines set forth by the City of Ottawa (2020). This report identifies and describes trees on the Site prior to its proposed development. This TCR provides an overview of trees that would likely be removed under current concept plans to inform an Environmental Impact Study for the Site. Tree cut permit applications for the Site will be prepared once detailed design plans for the Site Plan Control application confirm required tree removals.

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

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

2.0 PROPERTY INFORMATION

The Site is owned by Tamarack (contact person: Michelle Taggart) and is currently under phased development for the residential community of Cardinal Creek Village (Figure 1). The Site is located on undeveloped lands east of Antonio Farley Street and west of Ted Kelly Lane. The Site is approximately 31.43 hectares (ha); the majority of the Site comprises lands cleared for development, with natural forested communities along the north, east and south edges of the Site. The proposed Phase 7 lands are zoned as Residential Third Density (R3Z), while the forested lands around the perimeter of the site are zoned as Environmental Protection lands (EP and EP1).

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

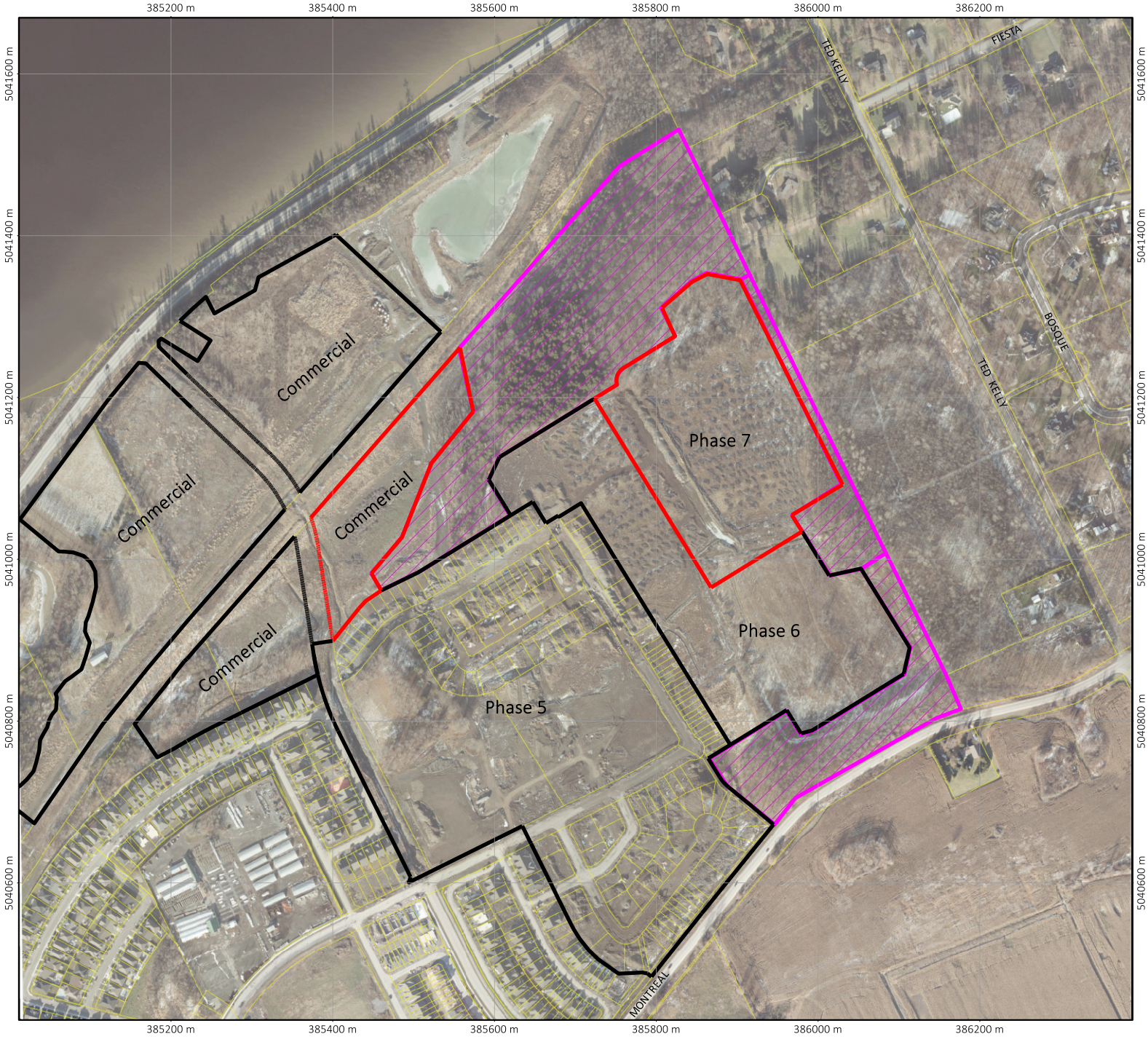

Figure 1 Map showing location context and existing conditions of the Site

Legend

CCV Phase Boundaries

- Proposed for Expansion
- Other
- EP Zone

N

0 100 m

Project: TAGG1205
MTM Zone 9
(NAD 83)
Printed on: 2021-08-26

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The Site is bordered by:

- A stormwater management facility, residential properties, and Regional Road 174 to the north
- Forested areas, residential properties, and Ted Kelly Lane to the east
- Old Montreal Road to the south
- Residential developments to the west

2.1 Property Owner and Applicant Contact Information

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

Organization	Role	Contact Person	Phone Number	Email Address
Tamarack Developments	Property Owner	Michelle Taggart	613-316-1779	mtaggart@taggart.ca

2.2 Arborist Contact Information and Qualifications

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

Organization	Role	Contact Person	Phone Number	Email Address
KAL	Biologist	Kesia Miyashita, MSc	**(613) 260-5555**	kmiyashita@kilgourassociates.com
KAL	Biologist	Katherine Black, MSc	**(613) 260-5555**	kblack@kilgourassociates.com
KAL	Biologist	Anthony Francis, PhD	**(613) 260-5555**	afrancis@kilgourassociates.com

Kesia Miyashita (MSc) 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; 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.

Katherine Black (MSc) has over six years of comprehensive field experience in biology and has worked in a variety of field settings, including undisturbed natural environments, construction sites, and greenhouses. Ms. Black's background is predominantly in vegetation ecology; she has performed vegetation surveys in a variety of natural and disturbed environments, including wetland, tundra, field, and forest environments.

Since joining KAL in 2019, Ms. Black has contributed to numerous Environmental Impact Statements and TCRs. Ms. Black is also a certified Butternut Health Assessor (BHA #731).

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

2.3 Additional Applications

Not applicable.

3.0 EXSITING CONDITIONS

3.1 Tree Inventory

A detailed inventory of trees on the Site was undertaken on June 25, June 30 and July 2, 2021, following guidelines set forth by the City of Ottawa (2020). All trees with a diameter at breast height (DBH) ≥ 50 cm having potential to be removed under the proposed development were identified, enumerated, mapped, their DBH measured, and their general health and condition documented (Appendix A, Figure 2). Butternut (*Juglans cinerea*) trees (Endangered under ESA and SARA) were also specifically looked for. Overall, data from 154 trees on Site were recorded; of those, 145 trees with DBH ≥ 50 cm from ten species were identified on the Site. Three species represented 89% of trees observed: Sugar Maple (*Acer saccharum*), Eastern White Cedar (*Thuja occidentalis*), and Basswood (*Tilia americana*; Table 3).

3.1.1 Ecological Significance of Trees on Site

One significant tree species (i.e., those listed under the *Species at Risk Act* (SARA), the *Endangered Species Act* (ESA), or those tracked on the Natural Heritage Information Centre (MNRF, 2021)) was documented on-Site. Eleven Butternut trees (*Juglans cinerea*; Endangered under ESA and SARA) were observed in the forested area on the north edge of the Site. The Butternut trees ranged in size from 23 cm DBH to 67 cm DBH; two Butternut trees had DBH $\underline{\geq}$ 50 cm.

Given their suburban context, all the trees on the Site likely play a role in the regulation of relative humidity, sequestration of carbon and removal of pollutants, wind-shielding, shading and reduction of urban heat island effects, and filtration of dust, noise, and light pollution. They also provide some habitat structure in the surrounding urban landscape for both common species as well as species of significance (i.e., species at are at risk, rare, or provincially or federally significant).

Figure 2 Map showing existing trees on the Site

Legend

CCV Phase Boundaries

- Proposed for Expansion
- Other

ELC 2

- CUT
- FOD6-1
- FOD6-5
- FOD8-1
- FOC4-1
- Extent of Significant Woodland

T# Tree

N

0 100 m

Project: TAGG1205
MTM Zone 9
(NAD 83)
Printed on: 2021-08-26

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3.2 Other Natural Environment Elements

3.2.1 Surface Water Features

The Site does not contain any surface water features.

3.2.2 Steep Slopes

The north edge of the Site was characterized as a steep, north-facing slope supporting a Fresh-Moist Sugar Maple – Lowland Ash Deciduous Forest vegetation community. The area was dominated by Sugar Maple (*Acer saccharum*), with a relatively open understorey, with abundant leaf litter, Sugar Maple saplings and ferns. This area had a thin layer of organic soils over shallow bedrock.

Table 3 Tree species count and percent composition for the Site

Species Common Name	Species Taxonomic Name	Count	Percent Composition (%)
American Elm	*Ulmus americana*	1	0.65
Basswood	*Tilia americana*	10	6.49
Bur Oak	*Quercus macrocarpa*	3	1.95
Butternut	*Juglans cinerea*	11	7.14
Green Ash	*Fraxinus pennsylvanica*	3	1.95
Sugar Maple	*Acer saccharum*	108	70.13
White Ash	*Fraxinus americana*	1	0.65
White Birch	*Betula papyrifera*	1	0.65
White Cedar	*Thuja occidentalis*	12	7.79
White Pine	*Pinus strobus*	3	1.95
Snag (species unknown)		1	0.65
SUM		**154**	**100.0**

3.2.3 Valued Woodlots

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

3.2.4 Significant Woodlands

Section 2.4.2 of the City's Official Plan defines significant woodlands as:

i. Any treed area meeting the definition of woodlands in the *Forestry Act*, R.S.O. 1990, c. F.26 or forest in the Ecological Land Classification for Southern Ontario; and

ii. In the rural area, meeting any one of the criteria in the Natural Heritage Reference Manual, as assessed in a subwatershed planning context and applied in accordance with Council-approved guidelines, where such guidelines exist; or

iii. In the urban area, any area 0.8 hectares in size or larger, supporting woodland 60 years of age and older at the time of the evaluation.

Historical aerial imagery of the site was reviewed to assess the age of forested areas. The oldest available photo was from 1976 (i.e., depicting conditions 45 years ago) and therefore represents a conservative approximation of conditions 60 years ago.

A portion of the forested area on the north edge of the Site meets the criteria listed above for a significant woodland within the urban area (Figure 2). This area comprises 3.8 ha and is characterized by predominantly Fresh-moist Sugar Maple – Lowland Ash Deciduous Forest (FOD6-1), with Fresh-moist White Cedar Coniferous Forest (FOD4-1).

3.2.5 Greenspace Linkages

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

3.2.6 Distinctive Trees

One hundred and forty-nine distinctive trees (DBH ≥ 30 cm) were identified on the Site (Appendix A).

3.2.7 Unique Ecological Features

The Site does not contain any riparian woodlots, rare communities, or other unique ecological features.

3.2.8 Species at Risk

The potential for SAR to interact with the proposed development of the Site was assessed based on KAL's review of existing information and in-field habitat assessment.

Little Brown Myotis (*Myotis lucifugus*) and Tri-coloured Bat (*Perimyotis subflavus)* were detected in the Study Area during bat acoustic monitoring and were assumed to be roosting in the treed area around the perimeter of the site. Both species are listed as Endangered under the ESA and SARA.

Butternut (*Juglans cinerea*) were detected in Site, within the forested area along the north edge of the Site. Eleven trees were detected with potential to be directly or indirectly affected by the proposed Phase 7 development. One Butternut tree was assessed previously (Muncaster Environmental Planning Inc., 2014) and is not further discussed here. Butternut Health Assessments were completed for the remaining ten trees on August 31, 2021. All ten Butternut trees were determined to be Category 1 trees. Five trees are anticipated to be removed to accommodate Phase 7 expansion, while the five other trees are anticipated to be harmed, due to encroachment into the protected buffer areas around a Butternut.

All other SAR with potential to generally occur in the Ottawa area were assessed as having a low or negligible potential to interact with the proposed development.

4.0 PROPOSED DEVELOPMENT

The proposed project includes an expansion of the Cardinal Creek Village residential development. The Cardinal Creek Village Concept Plan and City of Ottawa Official Plan Amendment were adopted in August 2013. The overall Cardinal Creek development will comprise residential properties, schools, mixed-use blocks, a stormwater management facility, and a network of local and collector roads and supporting infrastructure, as well as parks and green spaces. Phase 7 will comprise residential properties (single-family and semi/townhouse units). A mixed-use commercial area is situated in the northwest corner of the Site (Figure 3).

The Site comprises lands zoned as Residential Third Density (R3Z), with Environmental Protection (EP and EP1) lands along the north, east and south edges of the Site. The westernmost tip of the EP lands extends into the approved mixed-use commercial area.

The proposed expansion would require rezoning a portion of EP lands along the east edge of the site to R3Z to accommodate additional residential units, as well as rezoning a portion of EP lands at the northwest corner of the Site to Developmental Reserve (DR) to expand the mixed-use commercial area. This will result in 1.16 ha of additional R3Z area and 1.48 ha of addition Mixed Use area. There will be no anticipated impacts to the Significant Woodland and forested EP lands along the north edge of the Site or the forested EP lands on the south edge of the Site. Previous approvals secured in 2014 will facilitate construction of stormwater infrastructure in the Significant Woodland and installation of utility lines within the EP zone on the east edge of the Site, with associated tree clearing to accommodate work in both areas, per approvals. The expanded residential community areas will result in the clearing of an additional 0.59 ha of forested area, i.e., beyond the 3.28 ha already planned to be cleared under the development phasing as currently planned. Forest areas at the south edge of the site, however, will be expanded 0.88 ha under an extensive tree planting program (see Section 5.2).

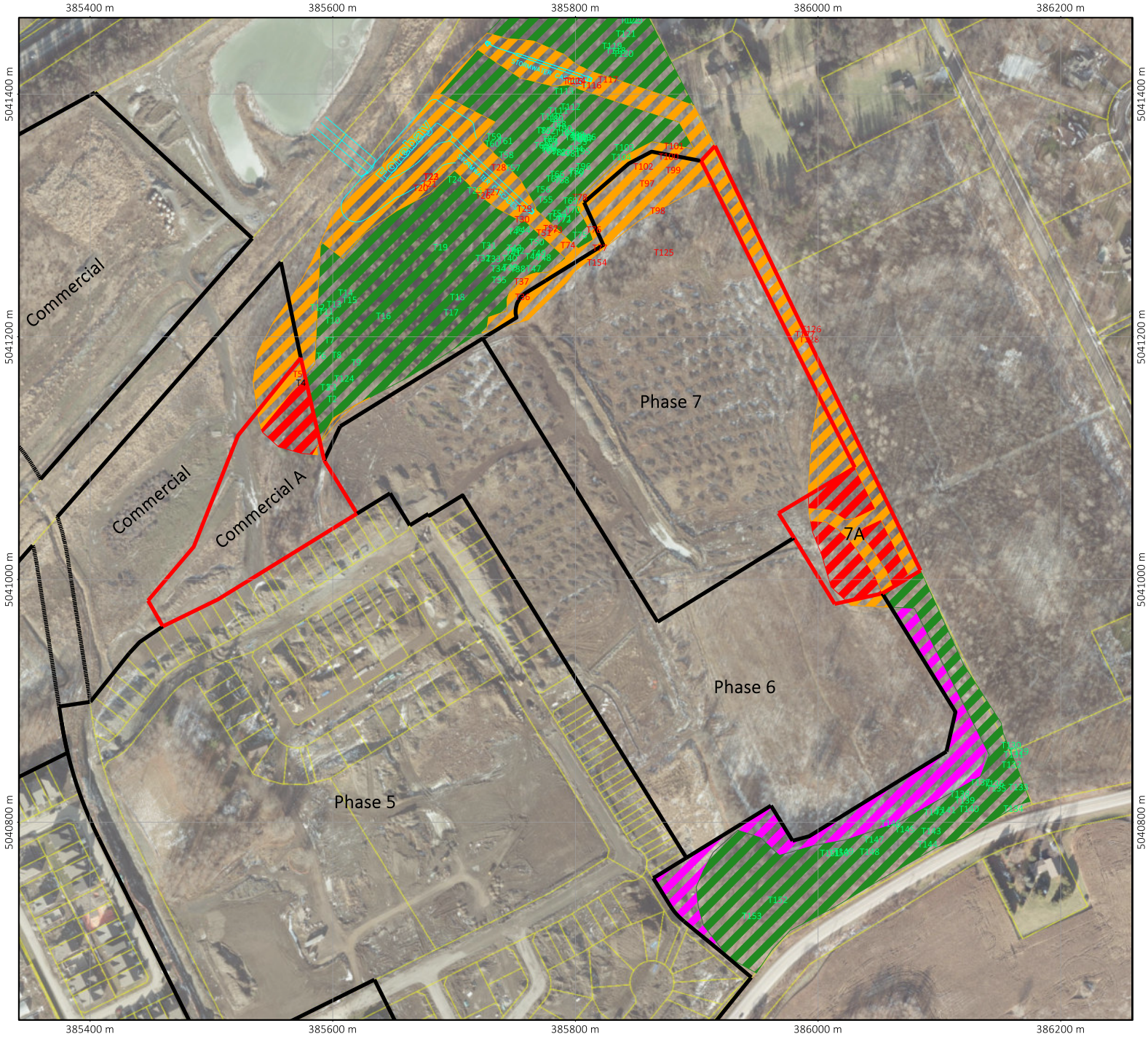

Figure 3 Map showing the proposed expansion of Cardinal Creek Village Phase 7 and Commercial Area

Legend

CCV Phase Boundaries

- Exapansion Area
- Other
- SWM Intrastructure (Existing approvals)

Changes in Tree Cover

- Retained Forest Cover
- New Forest Cover
- Planned Removal Area
- New Removal Area
- T# New Tree Removal
- T# Planned Tree Removal
- T# Retained Tree

N

0 100 m

Project: TAGG1205
MTM Zone 9
(NAD 83)
Printed on: 2021-09-24

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5.0 MITIGATION MEASURES

5.1 Site Preparation and Construction

The following mitigation measures must be applied during Site preparation and construction:

- Tree removal should be limited to that which is necessary to accommodate construction.
- Tree and vegetation clearing should not take place during sensitive times of the year for wildlife (breeding season; early spring throughout summer) unless mitigation measures are implemented and/or the habitat has been inspected by a qualified biologist.
    - The *Migratory Birds Convention Act* protects the nests and young of migratory breeding birds in Canada. No clearing of vegetation shall occur between April 15 and July 31, unless a qualified biologist has determined that no nesting is occurring within five days prior to the clearing (City of Ottawa, 2015).
- To minimize impacts to remaining trees during development (City of Ottawa, 2015):
    - Erect a fence beyond the CRZ of retained trees. The fence should be highly visible (orange construction fence) and paired with erosion and sediment control fencing. Pruning of branches is recommended in areas of potential conflict with construction equipment;
    - Do not place any material or equipment within the CRZ of trees unless otherwise approved by the General Manager;
    - Do not attach any signs, notices, or posters to any trees unless otherwise approved by the General Manager;
    - Do not raise or lower the existing grade within the CRZ of trees unless otherwise approved by the General Manager;
    - Do not extend any hard surface or significantly change landscaping within the CRZ of trees unless otherwise approved by the General Manager;
    - Do not damage the root system, trunk, or branches of any remaining trees unless otherwise approved by the General Manager;
    - Use tunneling or boring when digging within the CRZ of a tree; and
    - Ensure that exhaust fumes from equipment are not directed towards any tree's canopy.

5.2 Tree Planting Recommendations

To offset vegetation loss, native tree and shrub species must be planted. The landscape plan for the project must aim for 40% canopy cover (at maturity) over the entire Site. The project's landscape architect shall determine whether the proposed landscape plan meets this canopy cover goal. Plantings may occur at

ground level, on top of structures, in adjacent rights-of-way, in parks, or any other existing or future public space. Tree planting shall also implement the design standard of planting one tree for every five parking spaces in ground-level parking lots in support of Official Plan Section 4.9 – Energy Conservation Through Design. Landscaping plans must be prepared to the satisfaction of the City. Tree planting should follow guidelines provided in *Tree Planting in Sensitive Marine Clay Soils* (City of Ottawa, 2017) by using trees with low water demand and planting trees at a distance equivalent to the full mature height of a tree from a building or foundation structure.

In particular, to offset loss of trees on the east edge of the site, compensatory planting is proposed for the EP zone along the south edge of the Site. In that area, the EP boundaries are larger than the existing Fresh-Moist Sugar Maple – Hardwood Deciduous Forest, and the EP area therefore also includes weedy vegetation, such as Common Buckthorn and Wild Parsnip. Removing the Common Buckthorn and planting suitable native trees (e.g., Red Maple) would expand the forested area within the EP zone and improve the overall condition of the forest by limiting the presence of invasive edge species within the EP boundary.

The following tree and shrub species are recommended for planting and should be used to direct the development of the landscape plan for the Site. The following species are appropriate given site conditions and are native and non-invasive: Alternate-leaf Dogwood (*Cornus alternifolia*), Basswood (*Tilia americana*), Bitternut Hickory, Black Cherry (*Prunus serotina*), Black Walnut (*Juglans nigra*), Bur Oak (*Quercus macrocarpa*), Chokecherry (*Prunus virginiana*), Eastern White Cedar, Hawthorns (*Crataegus* spp.), Ironwood (*Ostrya virginiana*), Largetooth Aspen (*Populus grandidentata*), Maple-leaf Viburnum (*Viburnum acerifolium*), Nannyberry (*Viburnum lentago*), Northern Bush-honeysuckle (*Diervilla lonicera*), Peachleaf Willow (*Salix amygdaloides*), Pin Cherry (*Prunus pensylvanica*), Red Maple (*Acer rubrum*), Red Oak, Serviceberries (*Amelanchier* spp.), Sugar Maple, Trembling Aspen, White Birch (*Betula papyrifera*), Yellow Birch (*Betula alleghaniensis*), White Oak (*Quercus alba*), and White Pine (*Pinus strobus*).

6.0 CLOSURE

This report was prepared for exclusive use by Tamarack (Cardinal Village) Corporation and may be distributed only by Tamarack (Cardinal Village) Corporation. Questions relating to the data and interpretation can be addressed to the undersigned.

Respectfully submitted,

KILGOUR & ASSOCIATES LTD.

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Appendix A Tree inventory table for the Site

Tree ID	Species Name (Taxonomic name)	Number of stems	DBH (cm)	Trunk Health[1]	Canopy Health[1]	Decay Class[2]	Comments	Location	Fate
T 1	American Elm (*Ulmus americana*)	1	74	G	G	2	on steep slope	45.505664°, -75.466070°	Retained
T 2	Sugar Maple (*Acer saccharum*)	2	57	G	G	1	on steep slope	45.505576°, -75.465999°	Retained
T 3	Sugar Maple (*Acer saccharum*)	1	96	F	F	2	on steep Slope, roots exposed on downslope side	45.505664°, -75.466001°	Retained
T 4	Basswood (*Tilia americana*)	1	95	F	G	1	forked dbh taken below fork	45.505699°, -75.466324°	New Removal
T 5	Sugar Maple (*Acer saccharum*)	1	72	F	F	2	bark gone on one side	45.505764°, -75.466358°	Planned for Removal
T 6	White Cedar (*Thuja occidentalis*)	1	52	G	G	1		45.505897°, -75.466107°	Retained
T 7	White Cedar (*Thuja occidentalis*)	1	52	G	G	1		45.506013°, -75.466017°	Retained
T 8	White Cedar (*Thuja occidentalis*)	1	81	F	G	2	base calved out. bark gone from one side	45.505902°, -75.465944°	Retained
T 9	Sugar Maple (*Acer saccharum*)	1	69	G	G	1		45.505844°, -75.465738°	Retained
T 10	White Pine (*Pinus strobus*)	1	75	G	G	1		45.506159°, -75.465982°	Retained
T 11	White Pine (*Pinus strobus*)	1	55	G	G	1	woodpecker holes. roots exposed down slope	45.506227°, -75.466050°	Retained
T 12	White Ash (*Fraxinus americana*)	1	88	P	P	4	cavities on trunk. ash borer galleries	45.506257°, -75.466139°	Retained
T 13	Sugar Maple (*Acer saccharum*)	1	119	P	P	2	forked, dbh below fork	45.506278°, -75.465964°	Retained
T 14	White Cedar (*Thuja occidentalis*)	1	62	P	P	3	insect galleries	45.506363°, -75.465841°	Retained
T 15	White Cedar (*Thuja occidentalis*)	1	51	G	G	1		45.506309°, -75.465799°	Retained
T 16	White Cedar (*Thuja occidentalis*)	3	52	G	G	1		45.506187°, -75.465445°	Retained
T 17	White Cedar (*Thuja occidentalis*)	1	52	G	G	1		45.506207°, -75.464731°	Retained
T 18	White Cedar (*Thuja occidentalis*)	2	59	G	G	1		45.506320°, -75.464663°	Retained
T 19	White Birch (*Betula papyrifera*)	1	52	G	G	1	wound in trunk healed over	45.506692°, -75.464837°	Retained
T 20	White Pine (*Pinus strobus*)	1	130	P	P	6	just a stump approx 5m tall, dbh is an estimate.	45.507133°, -75.465036°	Planned for Removal

Tree ID	Species Name (Taxonomic name)	Number of stems	DBH (cm)	Trunk Health[1]	Canopy Health[1]	Decay Class[2]	Comments	Location	Fate
T 21	White Cedar (*Thuja occidentalis*)	1	52	G	G	1		45.507162°, -75.464943°	Planned for Removal
T 22	White Cedar (*Thuja occidentalis*)	1	71	G	G	1	some cavities	45.507214°, -75.464928°	Planned for Removal
T 23	White Cedar (*Thuja occidentalis*)	2	72	G	G	1	some cavities	45.507216°, -75.464920°	Planned for Removal
T 24	White Cedar (*Thuja occidentalis*)	4	55	G	G	1	cavities in trunk	45.507192°, -75.464676°	Retained
T 25	Sugar Maple (*Acer saccharum*)	1	84	G	G	1		45.507109°, -75.464465°	Retained
T 26	Basswood (*Tilia americana*)	1	53	G	P	2	canopy dead, sending out suckers	45.507070°, -75.464378°	Planned for Removal
T 27	Sugar Maple (*Acer saccharum*)	1	78	G	G	1		45.507094°, -75.464278°	Planned for Removal
T 28	Sugar Maple (*Acer saccharum*)	1	50	G	G	1		45.507277°, -75.464210°	Planned for Removal
T 29	Sugar Maple (*Acer saccharum*)	1	81	P	P	6	snag. lots of shelf fungus, a big cavity.	45.506969°, -75.463945°	Planned for Removal
T 30	Sugar Maple (*Acer saccharum*)	1	94	F	P	3	no live canopy. bark peeling	45.506890°, -75.463970°	Planned for Removal
T 31	Sugar Maple (*Acer saccharum*)	1	88	G	F	2		45.506699°, -75.464325°	Retained
T 32	Sugar Maple (*Acer saccharum*)	1	84	G	G	1		45.506606°, -75.464387°	Retained
T 33	Sugar Maple (*Acer saccharum*)	1	67	G	G	2		45.506600°, -75.464277°	Retained
T 34	Sugar Maple (*Acer saccharum*)	2	86	G	F	2	1 stem dead	45.506527°, -75.464228°	Retained
T 35	Sugar Maple (*Acer saccharum*)	1	100	G	F	2		45.506444°, -75.464220°	Retained
T 36	Sugar Maple (*Acer saccharum*)	1	107	G	F	2	Edge of forest	45.506315°, -75.463975°	Planned for Removal
T 37	Sugar Maple (*Acer saccharum*)	1	89	G	G	1		45.506429°, -75.463985°	Planned for Removal
T 38	Sugar Maple (*Acer saccharum*)	1	71	F	G	1		45.506523°, -75.464020°	Retained
T 39	Sugar Maple (*Acer saccharum*)	1	68	G	G	1		45.506535°, -75.464102°	Retained

Tree ID	Species Name (Taxonomic name)	Number of stems	DBH (cm)	Trunk Health[1]	Canopy Health[1]	Decay Class[2]	Comments	Location	Fate
T 40	Sugar Maple (*Acer saccharum*)	1	74	G	G	1		45.506603°, -75.464106°	Retained
T 41	Sugar Maple (*Acer saccharum*)	1	79	G	G	1		45.506644°, -75.464068°	Retained
T 42	Sugar Maple (*Acer saccharum*)	1	69	G	G	1		45.506657°, -75.464026°	Retained
T 43	Sugar Maple (*Acer saccharum*)	1	85	G	G	1		45.506679°, -75.464055°	Retained
T 44	Sugar Maple (*Acer saccharum*)	1	96	P	P	4		45.506812°, -75.463962°	Retained
T 45	Sugar Maple (*Acer saccharum*)	1	67	G	G	1		45.506801°, -75.464038°	Retained
T 46	Sugar Maple (*Acer saccharum*)	1	91	G	G	1	Cavity at base	45.506614°, -75.463865°	Retained
T 47	Sugar Maple (*Acer saccharum*)	1	63	G	G	1	Cavities at base	45.506524°, -75.463855°	Retained
T 48	Sugar Maple (*Acer saccharum*)	1	78	G	G	1		45.506604°, -75.463747°	Retained
T 49	Sugar Maple (*Acer saccharum*)	1	85	G	G	1		45.506638°, -75.463802°	Retained
T 50	Sugar Maple (*Acer saccharum*)	1	115	G	G	1		45.506721°, -75.463819°	Retained
T 51	Sugar Maple (*Acer saccharum*)	1	88	G	G	1		45.506789°, -75.463743°	Planned for Removal
T 52	Sugar Maple (*Acer saccharum*)	1	67	G	G	1		45.506822°, -75.463668°	Planned for Removal
T 53	Sugar Maple (*Acer saccharum*)	1	79	G	P	6	Stump w/ bark intact	45.506907°, -75.463620°	Retained
T 54	Sugar Maple (*Acer saccharum*)	1	78	G	G	1		45.506932°, -75.463577°	Retained
T 55	Sugar Maple (*Acer saccharum*)	1	56	G	G	1		45.507034°, -75.463720°	Retained
T 56	Sugar Maple (*Acer saccharum*)	1	106	F	G	1		45.507110°, -75.463745°	Retained
T 57	Sugar Maple (*Acer saccharum*)	1	69	G	G	1	Nails in trunk; along trail	45.507272°, -75.464060°	Retained
T 58	Sugar Maple (*Acer saccharum*)	1	51	G	G	1		45.507370°, -75.464128°	Retained
T 60	Sugar Maple (*Acer saccharum*)	1	66	G	G	1		45.507506°, -75.464256°	Retained
T 59	Sugar Maple (*Acer saccharum*)	1	54	G	G	1		45.507454°, -75.464274°	Retained
T 61	Sugar Maple (*Acer saccharum*)	1	54	G	G	1		45.507473°, -75.464135°	Retained
T 62	Sugar Maple (*Acer saccharum*)	1	61	G	G	1	Chimney cavities	45.507544°, -75.463682°	Retained

Tree ID	Species Name (Taxonomic name)	Number of stems	DBH (cm)	Trunk Health[1]	Canopy Health[1]	Decay Class[2]	Comments	Location	Fate
T 63	Sugar Maple (*Acer saccharum*)	1	62	G	G	1	Large cavity	45.507437°, -75.463754°	Retained
T 64	Sugar Maple (*Acer saccharum*)	1	68	G	G	1		45.507464°, -75.463656°	Retained
T 65	Sugar Maple (*Acer saccharum*)	1	69	G	G	1		45.507397°, -75.463675°	Retained
T 66	Sugar Maple (*Acer saccharum*)	1	76	G	G	1		45.507222°, -75.463595°	Retained
T 67	Sugar Maple (*Acer saccharum*)	1	69	G	G	1		45.507188°, -75.463634°	Retained
T 68	Basswood (*Tilia americana*)	1	53	G	G	1		45.507178°, -75.463545°	Retained
T 69	Sugar Maple (*Acer saccharum*)	2	102	G	G	1		45.507024°, -75.463459°	Retained
T 70	Sugar Maple (*Acer saccharum*)	1	51	G	G	1		45.506956°, -75.463431°	Retained
T 71	Sugar Maple (*Acer saccharum*)	1	78	G	G	1		45.506893°, -75.463523°	Retained
T 72	Sugar Maple (*Acer saccharum*)	1	76	G	P	5	Stump w/ bark intact	45.506885°, -75.463534°	Retained
T 73	Sugar Maple (*Acer saccharum*)	1	67	G	G	1	Large cavity	45.506810°, -75.463622°	Planned for Removal
T 74	Green Ash (*Fraxinus pennsylvanica*)	1	58	P	P	5		45.506694°, -75.463490°	Planned for Removal
T 75	Sugar Maple (*Acer saccharum*)	1	122	F	G	1	Lots of cavities	45.506768°, -75.463362°	Retained
T 76	Butternut (*Juglans cinerea*)	2	42	P	P	4	BN001	45.506807°, -75.463215°	Planned for Removal
T 77	Butternut (*Juglans cinerea*)	1	38	F	F	2	KAL BN002	45.506671°, -75.463154°	Planned for Removal
T 78	Sugar Maple (*Acer saccharum*)	2	88	F	G	1	cavities in trunk	45.507048°, -75.463356°	Planned for Removal
T 79	Basswood (*Tilia americana*)	1	124	G	G	1	large cavity at base almost 2m tall	45.507224°, -75.463397°	Retained
T 80	Sugar Maple (*Acer saccharum*)	1	53	G	G	1		45.507241°, -75.463388°	Retained
T 81	Sugar Maple (*Acer saccharum*)	1	72	G	G	1		45.507374°, -75.463426°	Retained
T 83	Sugar Maple (*Acer saccharum*)	1	58	G	G	1		45.507386°, -75.463572°	Retained
T 82	Sugar Maple (*Acer saccharum*)	1	68	G	G	1		45.507380°, -75.463531°	Retained

Tree ID	Species Name (Taxonomic name)	Number of stems	DBH (cm)	Trunk Health[1]	Canopy Health[1]	Decay Class[2]	Comments	Location	Fate
T 84	Sugar Maple (*Acer saccharum*)	1	58	G	G	1		45.507423°, -75.463666°	Retained
T 85	Sugar Maple (*Acer saccharum*)	1	69	G	G	1		45.507413°, -75.463687°	Retained
T 86	Sugar Maple (*Acer saccharum*)	1	62	G	G	1	Large cavity	45.507484°, -75.463667°	Retained
T 87	Sugar Maple (*Acer saccharum*)	1	61	G	G	1		45.507548°, -75.463728°	Retained
T 88	Sugar Maple (*Acer saccharum*)	1	69	G	G	1		45.507593°, -75.463569°	Retained
T 89	Sugar Maple (*Acer saccharum*)	2	53	G	G	1	1 stem dead	45.507633°, -75.463600°	Retained
T 90	Sugar Maple (*Acer saccharum*)	1	77	G	G	1		45.507560°, -75.463511°	Retained
T 91	Sugar Maple (*Acer saccharum*)	2	139	G	G	1	Cavity at base	45.507495°, -75.463427°	Retained
T 92	Sugar Maple (*Acer saccharum*)	1	8	G	G	1	Forked	45.507501°, -75.463353°	Retained
T 93	Sugar Maple (*Acer saccharum*)	1	67	G	G	1		45.507460°, -75.463351°	Retained
T 94	Sugar Maple (*Acer saccharum*)	1	73	G	G	1		45.507408°, -75.463391°	Retained
T 95	Green Ash (*Fraxinus pennsylvanica*)	1	66	G	G	1		45.507390°, -75.463320°	Retained
T 96	Sugar Maple (*Acer saccharum*)	1	54	G	G	1		45.507277°, -75.463318°	Retained
T 97	Butternut (*Juglans cinerea*)	1	53	F	P	3	KAL BN 003	45.507144°, -75.462647°	Planned for Removal
T 98	Sugar Maple (*Acer saccharum*)	1	111	F	G	1	Large cavity	45.506941°, -75.462538°	Planned for Removal
T 99	Butternut (*Juglans cinerea*)	1	67	F	P	3	BN004	45.507240°, -75.462369°	Planned for Removal
T 100	Butternut (*Juglans cinerea*)	1	23	F	P	3	BN005	45.507341°, -75.462416°	Planned for Removal
T 101	Butternut (*Juglans cinerea*)	1	40	P	P	2	BN006	45.507419°, -75.462360°	Retained
T 102	Butternut (*Juglans cinerea*)	1	33	P	P	5	BN007	45.507270°, -75.462684°	Planned for Removal
T 103	Butternut (*Juglans cinerea*)	1	24	P	P	4	BN008	45.507414°, -75.462882°	Retained
T 104	Butternut (*Juglans cinerea*)	1	23	G	G	1	BN009	45.507342°, -75.462915°	Retained

Tree ID	Species Name (Taxonomic name)	Number of stems	DBH (cm)	Trunk Health[1]	Canopy Health[1]	Decay Class[2]	Comments	Location	Fate
T 105	Bur Oak (*Quercus macrocarpa*)	1	53	G	G	1	Gypsy moth caterpillars	45.507490°, -75.463335°	Retained
T 106	Sugar Maple (*Acer saccharum*)	1	81	G	G	1		45.507495°, -75.463285°	Retained
T 107	Sugar Maple (*Acer saccharum*)	1	63	G	G	1		45.507481°, -75.463313°	Retained
T 108	Sugar Maple (*Acer saccharum*)	2	74	G	G	1	Cavern at base	45.507512°, -75.463403°	Retained
T 109	Sugar Maple (*Acer saccharum*)	1	77	G	G	1		45.507530°, -75.463507°	Retained
T 110	Sugar Maple (*Acer saccharum*)	1	69	G	G	1		45.507650°, -75.463658°	Retained
T 111	Sugar Maple (*Acer saccharum*)	1	63	G	G	1		45.507693°, -75.463575°	Retained
T 112	Sugar Maple (*Acer saccharum*)	1	85	F	G	1	Cavities	45.507720°, -75.463443°	Retained
T 113	Sugar Maple (*Acer saccharum*)	1	62	G	G	1		45.507836°, -75.463512°	Retained
T 115	Sugar Maple (*Acer saccharum*)	1	71	G	G	1		45.507913°, -75.463386°	Retained
T 114	Sugar Maple (*Acer saccharum*)	2	50	G	G	1		45.507909°, -75.463412°	Planned for Removal
T 116	Sugar Maple (*Acer saccharum*)	1	97	F	F	2	Chimney cavities	45.507878°, -75.463220°	Planned for Removal
T 117	Sugar Maple (*Acer saccharum*)	1	106	F	G	1	Chimney cavities	45.507919°, -75.463045°	Planned for Removal
T 118	Green Ash (*Fraxinus pennsylvanica*)	1	72	G	P	3	Cavities	45.508132°, -75.462959°	Retained
T 119	Bur Oak (*Quercus macrocarpa*)	1	69	G	G	1	Gypsy moth caterpillars	45.508167°, -75.462998°	Retained
T 120	Bur Oak (*Quercus macrocarpa*)	1	73	G	G	1	Gypsy moth caterpillars	45.508109°, -75.462879°	Retained
T 121	Sugar Maple (*Acer saccharum*)	1	62	G	G	1		45.508257°, -75.462851°	Retained
T 122	Sugar Maple (*Acer saccharum*)	1	54	G	G	1		45.508355°, -75.462804°	Retained
T 123	Sugar Maple (*Acer saccharum*)	1	68	G	G	1	Cavities	45.508357°, -75.462775°	Retained
T 124	Butternut (*Juglans cinerea*)	1	23	F	F	2	BN010	45.505727°, -75.465867°	Retained
T 125	Snag (unknown sp.)	1	112	P	P	5		45.506631°, -75.462479°	Planned for Removal

Tree ID	Species Name (Taxonomic name)	Number of stems	DBH (cm)	Trunk Health[1]	Canopy Health[1]	Decay Class[2]	Comments	Location	Fate
T 126	Basswood (*Tilia americana*)	2	62	F	F	2	one of the stems is dead.	45.506055°, -75.460930°	Planned for Removal
T 127	Basswood (*Tilia americana*)	2	59	G	G	1		45.506011°, -75.461002°	Planned for Removal
T 128	Sugar Maple (*Acer saccharum*)	1	5	G	G	1	p	45.505973°, -75.460959°	Planned for Removal
T 129	Sugar Maple (*Acer saccharum*)	1	52	G	G	1		45.502897°, -75.458805°	Retained
T 130	Sugar Maple (*Acer saccharum*)	1	53	G	G	1		45.502945°, -75.458885°	Retained
T 131	Sugar Maple (*Acer saccharum*)	1	62	G	G	1		45.502875°, -75.458859°	Retained
T 132	Sugar Maple (*Acer saccharum*)	1	63	G	G	1		45.502800°, -75.458883°	Retained
T 133	Sugar Maple (*Acer saccharum*)	1	61	G	G	1		45.502633°, -75.458813°	Retained
T 134	Basswood (*Tilia americana*)	1	65	G	G	1		45.502474°, -75.458869°	Retained
T 135	Sugar Maple (*Acer saccharum*)	1	59	G	G	1		45.502627°, -75.459046°	Retained
T 136	Sugar Maple (*Acer saccharum*)	1	73	G	G	1		45.502661°, -75.459070°	Retained
T 137	Sugar Maple (*Acer saccharum*)	1	122	G	G	1	trunk forks above dbh measurement point	45.502673°, -75.459216°	Retained
T 138	Sugar Maple (*Acer saccharum*)	2	73	G	G	1		45.502588°, -75.459432°	Retained
T 139	Sugar Maple (*Acer saccharum*)	1	53	G	G	1		45.502540°, -75.459379°	Retained
T 140	Sugar Maple (*Acer saccharum*)	1	53	G	G	1		45.502476°, -75.459339°	Retained
T 141	Sugar Maple (*Acer saccharum*)	1	56	F	G	2	losing bark from one side of trunk. Growing on Slope, roots somewhat exposed on downslope side.	45.502471°, -75.459581°	Retained
T 142	Sugar Maple (*Acer saccharum*)	2	50	F	G	2	patches of bark lost on both trunks	45.502456°, -75.459709°	Retained
T 143	Basswood (*Tilia americana*)	3	53	G	G	1		45.502316°, -75.459739°	Retained
T 144	Sugar Maple (*Acer saccharum*)	1	50	G	G	1		45.502218°, -75.459778°	Retained
T 145	Sugar Maple (*Acer saccharum*)	1	50	G	G	1		45.502331°, -75.460016°	Retained
T 146	Basswood (*Tilia americana*)	2	58	G	G	1		45.502376°, -75.460165°	Retained

Tree ID	Species Name (Taxonomic name)	Number of stems	DBH (cm)	Trunk Health[1]	Canopy Health[1]	Decay Class[2]	Comments	Location	Fate
T 147	Sugar Maple (*Acer saccharum*)	1	51	G	G	1		45.502258°, -75.460344°	Retained
T 148	Sugar Maple (*Acer saccharum*)	1	51	G	G	1	owl pellet ? at base of tree.	45.502168°, -75.460392°	Retained
T 149	Sugar Maple (*Acer saccharum*)	1	59	G	G	1		45.502173°, -75.460666°	Retained
T 150	Sugar Maple (*Acer saccharum*)	1	58	G	G	1		45.502162°, -75.460715°	Retained
T 151	Sugar Maple (*Acer saccharum*)	1	51	G	G	1		45.502162°, -75.460810°	Retained
T 152	Sugar Maple (*Acer saccharum*)	1	50	G	G	1		45.501820°, -75.461366°	Retained
T 153	Basswood (*Tilia americana*)	1	69	G	G	1		45.501703°, -75.461642°	Retained
T 154	Butternut (*Juglans cinerea*)	1	26	F	F	2	BN011	45.506563°, -75.463186°	Planned for Removal

Table Notes: [1]G = Good: tree displays less than 15% deficiency/defect; F = Fair: tree displays 15-40% deficiency/defect; P = Poor: tree displays greater than 40% deficiency/defect

[2]1 = Healthy live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, no live canopy, bark and branches intact; 4 = Recently dead, bark peeling, only large branches intact; 5 = Older dead tree, 90% bark lost, few branch stubs, broken top; 6 = Very old dead tree, advanced decay, no branches, part of the stem has rotted away.

Appendix D Regional Species at Risk Screening

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources (within 10 km of the Site)	Habitat Description	Habitat on the Site	Potential to Interact with Development of the Site (None, Negligible, Low, Moderate, or High)[1]
Birds						
Bald Eagle (*Haliaeetus leucocephalus*)	**Special Concern**	**Not at Risk**	Cornell Lab of Ornithology, 2021	Nest in mature forests near open water. In large trees such as pine and poplar.	The Site does not appear to contain suitable habitat.	Low
Bank Swallow (*Riparia riparia*)	**Threatened**	**Threatened**	Bird Studies Canada et al., 2009, Cornell Lab of Ornithology, 2021	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 Site does not appear to contain suitable nesting habitat.	Low
Barn Swallow (*Hirundo rustica*)	**Threatened**	**Threatened**	Cornell Lab of Ornithology, 2021; California Academy of Sciences and National Geographic Society, 2021; Muncaster Environmental Planning, 2014	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.	Buildings on and near the Site may provide suitable nesting habitat.	Low
Black Tern (*Chlidonias niger*)	**Special Concern**	**No Status**	Cornell Lab of Ornithology, 2021; California Academy of Sciences and National Geographic Society, 2021; MNRF, 2021b	Build floating nests in loose colonies in shallow marshes, especially in cattails.	The Site does not appear to contain suitable habitat.	Low
Bobolink (*Dolichonyx oryzivorus*)	**Threatened**	**Threatened**	MNRF, 2021; Cornell Lab of Ornithology, 2021; California Academy of Sciences and National Geographic Society, 2021; MNRF, 2021b	Periodically mown, dry meadow for nesting. Habitat (meadow) should be >10 ha, and preferably >30 ha before Bobolink are attracted to the area. Not near tall trees.	The Site does not appear to contain suitable habitat.	Low

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources (within 10 km of the Site)	Habitat Description	Habitat on the Site	Potential to Interact with Development of the Site (None, Negligible, Low, Moderate, or High)[1]
Canada Warbler (*Cardellina canadensis*)	**Special Concern**	**Threatened**	Bird Studies Canada et al., 2009; Cornell Lab of Ornithology, 2021	Prefers wet forests with dense shrub layers. Nests located on or near the ground on mossy logs or roots, along stream banks or on hummocks.	Forested areas on-Site may provide suitable habitat.	Moderate
Cerulean Warbler (*Setophaga cerulea)*	**Threatened**	**Threatened**		Prefers mature deciduous forests.	Mature deciduous forests on-Site may provide suitable habitat.	Low
Chimney Swift (*Chaetura pelagica*)	**Threatened**	**Threatened**	Bird Studies Canada et al., 2009; Cornell Lab of Ornithology, 2021; KAL, 2021	Nests in traditional-style open brick chimneys (and rarely in hollow trees). Tends to stay close to water.	The Site does not appear to contain suitable habitat.	Low
Common Nighthawk (*Chordeiles minor*)	**Special Concern**	**Threatened**	Cornell Lab of Ornithology, 2021; KAL, 2021	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-Site may provide suitable habitat.	High
Eastern Meadowlark (*Sturnella magna*)	**Threatened**	**Threatened**	Bird Studies Canada et al., 2009; MNRF, 2021a; Cornell Lab of Ornithology, 2021; MNRF, 2021b	Periodically mown, dry meadow for nesting. Habitat (meadow) should be >10 ha, and preferably >30 ha before Eastern Meadowlark are attracted to the area. Not near tall trees.	The Site does not appear to contain suitable habitat.	Low
Eastern Whip-poor-will (*Antrostomus vociferus*)	**Threatened**	**Threatened**		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.	Forested areas on-Site may provide suitable habitat.	Low

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources (within 10 km of the Site)	Habitat Description	Habitat on the Site	Potential to Interact with Development of the Site (None, Negligible, Low, Moderate, or High)[1]
Eastern Wood-pewee (*Contopus virens*)	**Special Concern**	**Special Concern**	Bird Studies Canada et al., 2009; Cornell lab of Ornithology, 2021; KAL 2021	Woodland species often found in the mid-canopy layer near clearings and edges of deciduous and mixed forests.	Forested areas on-Site may provide suitable habitat.	High
Evening Grosbeak (*Coccothraustes vespertinus*)	**Special Concern**	**Special Concern**		Nests in trees or large shrubs; prefers mature coniferous forests but will also use deciduous forests, parklands, and orchards.	Forested areas on-Site may provide suitable habitat.	Moderate
Golden Eagle (*Aquila chrysaetos*)	**Endangered**	**No Status**	Cornell Lab of Ornithology, 2021	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.	The Site does not appear to contain suitable habitat.	Low
Golden-winged Warbler (*Vermivora chrysoptera*)	**Special Concern**	**Threatened**		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.	The Site does not appear to contain suitable habitat.	Negligible
Grasshopper Sparrow (*Ammodramus savannarum*)	**Special Concern**	**Special Concern**		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 Site does not appear to contain suitable habitat.	Negligible
Henslow's Sparrow (*Ammodramus henslowii*)	**Endangered**	**Endangered**		Prefers extensive, dense, tall grasslands where it can easily conceal its small ground nest. Tends to avoid fields that have been grazed or are crowded with trees and shrubs.	The Site does not appear to contain suitable habitat.	Negligible
Horned Grebe (*Podiceps auritus*)	**Special Concern**	**No Status**	Cornell Lab of Ornithology, 2021	Nest in small ponds, marshes, and shallow bays that contain areas of open water and emergent vegetation.	The Site does not appear to contain suitable habitat.	Low
Least Bittern (*Ixobrychus exilis*)	**Threatened**	**Threatened**	MNRF, 2021a; Cornell Lab of Ornithology, 2021	Found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels.	The Site does not appear to contain suitable habitat.	Low

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources (within 10 km of the Site)	Habitat Description	Habitat on the Site	Potential to Interact with Development of the Site (None, Negligible, Low, Moderate, or High)[1]
Loggerhead Shrike (*Lanius ludovicianus*)	**Endangered**	**Endangered**		Prefers pasture or other grasslands with scattered low trees and shrubs. Lives in fields or alvars (areas of exposed bedrock) with short grass, which makes it easier to spot prey.	The Site does not appear to contain suitable habitat.	Low
Olive-sided Flycatcher (*Contopus cooperi*)	**Special Concern**	**Threatened**	Cornell Lab of Ornithology, 2021	Found along natural forest edges and openings. Will use forests that have been logged or burned if there are ample tall snags and trees to use for foraging perches.	Forested areas on-Site may provide suitable habitat.	Moderate
Peregrine Falcon (*Falco peregrinus*)	**Special Concern**	**Special Concern**	Cornell Lab of Ornithology	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.	The Site does not appear to contain suitable habitat.	Low
Red Knot (*Calidris canutus rufa*)	**Endangered**	**Endangered**		Prefer open beaches, mudflats, and coastal lagoons where they feast on molluscs, crustaceans, and other invertebrates.	The Site does not appear to contain suitable habitat.	Negligible
Red-headed Woodpecker (*Melanerpes erythrocephalus*)	**Special Concern**	**Threatened**		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.	Forested areas on-Site may provide suitable habitat	Low
Rusty Blackbird (*Euphagus carolinus*)	**Special Concern**	**Special Concern**	Cornell lab of Ornithology	Prefers wet wooded or shrubby areas. Nests at edges of boreal wetlands and coniferous forests. These areas include bogs, marshes, and beaver ponds.	Forested areas on-Site may provide suitable habitat.	Low
Short-eared Owl (*Asio flammeus*)	**Special Concern**	**Special Concern**		Lives in open areas such as grasslands, marshes, and tundra where it nests on the ground and hunts for small mammals.	The Site does not appear to contain suitable habitat.	Negligible
Wood Thrush (*Hylocichla mustelina*)	**Special Concern**	**Threatened**	Bird Studies Canada et al., 2009; Cornell Lab of Ornithology, 2021	Lives in mature deciduous and mixed (conifer-deciduous) forests. They seek moist stands of trees with well-developed undergrowth and tall trees for singing and perching. Usually build nests in Sugar Maple or American Beech.	Forested areas on-Site may provide suitable habitat.	Moderate

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Yellow Rail (*Coturnicops noveboracensis*)	**Special Concern**	**Special Concern**		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.	The Site does not appear to contain suitable habitat.	Negligible
Mammals						
Algonquin Wolf (*Canis* sp.)	**Threatened**	**Special Concern**		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.
Eastern Cougar (*Puma concolor*)	**Endangered**	**No Status**		Lives in large, undisturbed forests or other natural areas where there is little human activity.	The Site does not appear to contain suitable habitat.	Negligible
Eastern Small-footed Myotis (*Myotis leibii*)	**Endangered**	**Not Listed**		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.	Hollow trees on-Site may provide roosting habitat.	Low
Gray Fox (*Urocyon cinereoargenteus*)	**Threatened**	**Threatened**		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; KAL 2021	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	Forested areas and buildings on-Site may provide suitable habitat.	High

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				access to many different roosting areas.		
Northern Myotis / Northern Long-eared Bat (*Myotis septentrionalis*)	**Endangered**	**Endangered**		Associated with boreal forests, choosing to roost under loose bark and in the cavities of trees.	Forests on-Site may provide suitable habitat.	Low
Tri-coloured Bat / Eastern Pipistrelle (*Perimyotis subflavus*)	**Endangered**	**Endangered**	Humphrey and Fotherby, 2019; KAL, 2021	Roosts mainly in trees during summer; overwinters in caves and mines along with other species, but often uses deeper parts of the hibernaculum.	Forested areas on-Site may provide suitable habitat	High
Amphibians						
Western Chorus Frog (*Pseudacris triseriata*)	**No Status**	Great Lakes-St. Lawrence population: **Threatened**		Inhabits forest openings around woodland ponds but can also be found in or near damp meadows, marshes, bottomland swamps, and temporary ponds in open country, or even urban areas.	The Site does not appear to contain suitable habitat.	Negligible
Arthropods						
Bogbean Buckmoth (*Hemileuca* sp. 1)	**Endangered**	**Endangered**		Restricted to open, chalky, low shrub fens containing large amounts of bogbean, an emergent wetland flowering plant.	The Site does not appear to contain suitable habitat.	Negligible
Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*)	**Endangered**	**Endangered**		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.

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Macropis Cuckoo Bee *(Epeoloides pilosulus)*	**Not listed**	**Endangered**		Found in habitats supporting both Macropis bees and their food plant, Yellow Loosestrife (*Lysimachia*).	Has not been observed in Ontario in over 45 years (COSEWIC, 2011).	None.
Monarch (*Danaus plexippus*)	**Special Concern**	**Special Concern**		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.	Milkweed on-Site may provide suitable habitat.	Low
Mottled Duskywing (*Erynnis martialis*)	**Endangered**	**No Status**		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.	The Site does not appear to contain suitable habitat.	Negligible
Nine-spotted Lady Beetle (*Coccinella novemnotata*)	**Endangered**	**No Status**		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.
Rapids Clubtail *(Gomphus quadricolor)*	**Endangered**	**Endangered**		Inhabits a wide variety of riverine habitats ranging in size from the St. Lawrence River to small creeks. Larvae are typically found in microhabitats with slow to moderate flow and fine sand or silt substrates where they burrow into the stream bed. Adults disperse from the river after emerging and feed in the forest canopy and other riparian vegetation.	There are no records of this species in Ottawa (MECP, 2019d).	None.
Rusty-patched Bumble Bee (*Bombus affinis*)	**Endangered**	**Endangered**		Can be found in open habitat such as mixed farmland, urban settings, savannah, open woods, and sand dunes.	The range of this species is limited to southwestern Ontario (MECP, 2019e).	None.
Transverse Lady Beetle (*Coccinella transversoguttata*)	**Endangered**	**Special Concern**		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.

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West Virginia White butterfly (*Pieris virginiensis*)	**Special Concern**	**No Status**		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.		
Yellow-banded Bumble Bee (*Bombus terricola*)	**Special Concern**	**Special Concern**		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.	Woodlands and open areas on-Site may provide suitable habitat	Negligible
Lichens						
Black-foam Lichen (*Anzia colpodes*)	**No Status**	**Threatened**		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**	**Threatened**		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.	The Site does not appear to contain suitable habitat.	Negligible

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Pale-bellied Frost Lichen (*Physconia subpallida*)	**Endangered**	**Endangered**		Typically grows on the bark of hardwood trees such as White Ash, Black Walnut, and American Elm. Can also be found growing on fence posts and boulders.	There are no recent records of the species in the Ottawa area (MECP, 2019f).	None.
Reptiles						
Blanding's Turtle (*Emydoidea blandingii*)	**Threatened**	**Threatened**	Ontario Nature, 2019; MNRF, 2021b	Quiet lakes, streams, and wetlands with abundant emergent vegetation. Also frequently occurs in adjacent upland forests.	The Site does not appear to contain suitable habitat.	Low
Eastern Musk Turtle / Stinkpot (*Sternotherus odoratus*)	**Special Concern**	**Special Concern**	Ontario Nature, 2019	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.	The Site does not appear to contain suitable habitat.	Low
Eastern Ribbonsnake *(Thamnophis sauritus)*	**Special Concern**	**Threatened**		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.	The Site does not appear to contain suitable habitat.	Negligible
Midland Painted Turtle (*Chrysemys picta marginata*)	**No Status**	**Special Concern**		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 Site does not appear to contain suitable habitat.	Negligible
Milksnake (*Lampropeltis triangulum*)	**Not Listed**	**Special Concern**		Found in variety of open, scrubby or edge habitats, including pastures.	Edge habitats on-Site may provide suitable habitat.	Moderate

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Northern Map Turtle (*Graptemys geographica*)	**Special Concern**	**Special Concern**	Ontario Nature, 2019; MNRF, 2021	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.	The Site does not appear to contain suitable habitat.	Low
Snapping Turtle (*Chelydra serpentina*)	**Special Concern**	**Special Concern**	Ontario nature, 2019; MNRF, 2021a; MNRF, 2021b	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 Site does not appear to contain suitable habitat.	Low
Spiny Softshell (*Apalone spinifera*)	**Endangered**	**Threatened**		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 Site does not appear to contain suitable habitat.	Negligible
Spotted Turtle (*Clemmys guttata*)	**Endangered**	**Endangered**		Semi-aquatic and prefers ponds, marshes, bogs, and even ditches with slow-moving, unpolluted water and an abundant supply of aquatic vegetation.	The Site does not appear to contain suitable habitat.	Negligible
Wood Turtle (*Glyptemys insculpta*)	**Endangered**	**Threatened**		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 does not appear to contain suitable habitat.	Negligible
Vascular Plants						

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources (within 10 km of the Site)	Habitat Description	Habitat on the Site	Potential to Interact with Development of the Site (None, Negligible, Low, Moderate, or High)[1]
American Chestnut (*Castanea dentata*)	**Endangered**	**Endangered**		Typical habitat is upland deciduous forests on sandy acidic soils. Occurs with Red Oak, Black Cherry, Sugar Maple, and beech.	Upland deciduous forests on-Site may provide suitable habitat.	Low
American Ginseng (*Panax quinquefolius*)	**Endangered**	**Endangered**		Grows in rich, moist, but well-drained, and relatively mature, deciduous woods dominated by Sugar Maple, White Ash, and American Basswood.	Mature deciduous forests on-Site may provide suitable habitat.	Low
Butternut (*Juglans cinerea*)	**Endangered**	**Endangered**	MNRF, 2021a; Muncaster Environmental Planning, 2014; KAL, 2021	Commonly found in riparian habitats but is also found on rich, moist, well-drained loams and well-drained gravels, especially those of limestone origin.	Well-drained forest areas may provide suitable habitat.	High
Eastern Prairie Fringed-orchid (*Platanthera leucophaea*)	**Endangered**	**Endangered**		Populations are found in three main habitat types: fens, tallgrass prairie, and moist old fields.	The Site does not appear to contain suitable habitat.	Negligible
Fish						
American Eel (*Anguilla rostrata*)	**Endangered**	**Endangered**	MNRF, 2021a	Primarily nocturnal, hiding in soft substrate or submerged vegetation during the day.	The Site does not appear to contain suitable habitat.	Low
Bridle Shiner (*Notropis bifrenatus*)	**Special Concern**	**Special Concern**		Prefers clear water with abundant vegetation over silty or sandy substrate.	The Site does not appear to contain suitable habitat.	Negligible
Channel Darter (*Percina copelandi*)	**Special Concern**	**Threatened**	DFO, 2019; MNRF, 2021a	Prefers clean streams and lakes with moderate current over sandy or rocky substrate.	The Site does not appear to contain suitable habitat.	Low
Lake Sturgeon (*Acipenser fulvescens*)	**Endangered**	**No Status**	MNRF, 2021a	Only found in large lakes and rivers. Forages in cool water, 4-9 m deep over soft substrate; spawns in shallower, fast-flowing areas over rocks or gravel.	The Site does not appear to contain suitable habitat.	Low
Northern Brook Lamprey (*Ichthyomyzon fossor*)	**Special Concern**	**Special Concern**	DFO, 2019; MNRF, 2021a	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	The Site does not appear to contain suitable habitat.	Low

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources (within 10 km of the Site)	Habitat Description	Habitat on the Site	Potential to Interact with Development of the Site (None, Negligible, Low, Moderate, or High)[1]
				spawning, including fast flowing riffles comprised of rock or gravel.		
Northern Sunfish (*Lepomis peltastes*)	**Special Concern**	**No Status**		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.	The Site does not appear to contain suitable habitat.	Negligible
River Redhorse (*Moxostoma carinatum*)	**Special Concern**	**Special Concern**	DFO, 2019	Prefers fast-flowing, clear rivers over rocky substrate.	The Site does not appear to contain suitable habitat.	Low
Silver Lamprey (*Ichthyomyzon unicuspis*)	**Special Concern**	**Special Concern**	DFO, 2019; MNRF, 2021a	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.	The Site does not appear to contain suitable habitat.	Low

[1]**None**: the range of the species does not overlap with the Site, the species is documented as no longer occurring in the ecoregion, or it is extremely unlikely for the species to occupy the Site due to access barriers.
Negligible: No observation records exist for within 10 km of the Site and the Site does not contain suitable habitat. The species has potential for unpredictable presence on/use of the Site.
Low: No observation records exist for within 10 km of the Site but suitable habitat exists on the Site, or suitable habitat does not exist on the Site but observation records exist for within 10 km.
Moderate: The species is known to occur within 10 km of the Site and suitable habitat exists on the Site.
High: The species is known to occur on or adjacent to the Site and suitable or confirmed habitat exists on the Site.

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Appendix E Butternut Health Assessment Report

Kilgour & Associates Ltd.
Environmental Consultants

September 7, 2021 **Our File: TAGG 1205**

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

To whom it may concern:

Reference: Butternut Health Assessment for Cardinal Creek Village in Orleans, Ottawa

Please accept this letter regarding a Butternut health assessment report (731-002) prepared by Kilgour & Associates Ltd. on behalf of Tamarack Developments. The report addresses 10-Category 1 Butternuts located on a parcel associated with the proposed expansion of Cardinal Creek Village, a residential subdivision located east of Antonio Farley Street in Orleans, Ottawa, Ontario (no civic address is associated with the subject property). An electronic version of this report was emailed to SAROntario@ontario.ca on September 7, 2021. Please contact me if you have any questions regarding the report. The following enclosures are included in the report:

1. Information from the Ministry of Natural Resources and Forestry about Butternut and the *Endangered Species Act, 2007*
2. Butternut Health Assessor's Report
3. Original data forms
4. Copies of the Excel data spreadsheet (BHA Tree Analysis)

Regards,

KILGOUR & ASSOCIATES LTD.

Katherine Black, MSc
Senior Biologist

Ministry of Natural Resources and Forestry

Species At Risk
P.O. Box 7000, 300 Water Street
Peterborough ON K9J 8M5

Ministère des Richesses naturelles et des Forêts

Espèces en péril
C.P. 7000, 300, rue Water
Peterborough ON K9J 8M5

The enclosed Butternut Health Assessor's Report documents the results of the Butternut health assessment that was conducted by the designated Butternut Health Assessor (BHA) 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 affected by the activity and they are not identified in the enclosed BHA Report, they too must be assessed by a designated BHA.

Butternut is listed as an endangered species on the Species at Risk in Ontario List, and as such, it is protected under the *Endangered Species Act, 2007* (ESA) from being killed, harmed, or removed. If you are planning to undertake an activity that may affect Butternut, you may be eligible to follow the requirements set out in section 23.7 of Ontario Regulation 242/08 under the ESA, or you may need to seek an authorization under the ESA (e.g., a permit).

Please visit e-laws at the link provided below for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled. Information about Butternut is also available at: http://www.ontario.ca/environment-and-energy/butternut-trees-your-property.

If you are eligible to kill, harm or take Butternut under section 23.7 of the regulation, your first step is to submit the BHA Report and the original data forms enclosed in this package to the local Ministry of Natural Resources and Forestry (MNRF) District Manager. Note that MNRF cannot accept photocopies or scanned electronic copies of the data forms.

Note regarding changes:

If the enclosed BHA Report does not identify which Butternut tree(s) are proposed to be killed, harmed, or taken in Table 1 (i.e., if "unknown" is indicated in the second last column of Table 1), or, if the information in the last two columns of Table 1 has changed since the date this BHA Report was produced, **do not make any edits to the BHA Report**. Instead, please attach 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 enclosed BHA Report to the local MNRF District Manager.

The BHA Report must be submitted at least 30 days prior to registering an eligible activity to kill, harm, or remove a Butternut tree. During this 30 day period, no Butternut trees (of any category) may be killed, harmed, or removed, and MNRF may contact you for an opportunity to examine the trees. If MNRF chooses to examine the trees, a representative of MNRF will contact you using the information you supplied when you submitted the BHA Report.

If you are eligible to follow the rules in regulation under section 23.7, you may register your activity using the "Notice of Butternut Impact" form on the MNRF Registry **after the 30 day period has elapsed**.

If you are **not** eligible to follow the rules in regulation under section 23.7, please contact the local MNRF district office to determine whether you will need to seek an authorization (e.g., a permit). A link to the directory of MNRF offices is provided below.

Note that municipal by-laws and legislation other than the ESA may also be applicable to the removal or harming of trees.

Please retain this information and a copy of the BHA Report (including copies of all data forms) for your records, along with any other documentation you may receive from MNRF should an examination of the trees occur. If you have any questions, please contact your local MNRF district office.

Links:

Endangered Species Act, 2007:
http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

Ontario Regulation 242/08 (refer to section 23.7):
http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm

MNRF Office Locations:
https://www.ontario.ca/government/ministry-natural-resources-and-forestry-regional-and-district-offices

Butternut Health Assessor's Report Number: 731-002

Katherine Black (BHA #731)
16C-2285 St. Laurent Boulevard
Ottawa, Ontario
K1G 4Z6
(613) 260-5555
kblack@kilgourassociates.com

Michelle Taggart
3187 Albion Road South
Ottawa, Ontario
K1V 8Y3
mtaggart@taggart.ca

Site location: Cardinal Creek Village east of Antonio Farley Street (no civic address), Orleans, Ottawa

Date(s) of Butternut health assessment: August 31, 2021
Date BHA Report prepared: September 7, 2021

Map datum used: x NAD83 ☐ WGS84

Total number of trees assessed in this BHA Report: 10

The assessed trees were numbered on site using white flagging tape. The numbers at the site correspond to the tree numbers referenced in this report.

This BHA Report includes the following tables:

- Table 1: Butternut Trees Assessed
- Table 2: Trees Determined by BHA to be Butternut Hybrids
- Table 3: Summary of Assessment Results

Table 1: Butternut Trees Assessed

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: unknown[4], killed, harmed or taken)*	If tree is proposed to be killed, harmed, or taken, indicate reason tree is proposed to be killed, harmed or taken:
001	18T 463815 5039357	1	42	N	Harmed	The tree falls within 50 m an area proposed to be

[1] The extent to which the tree is affected by Butternut Canker is presented in the Excel document titled, "BHA Tree Analysis" that accompanies this BHA Report.
[2] Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08.
[3] dbh: diameter at breast height, rounded to nearest cm (if tree is shorter than breast height, enter zero)
[4] In this column, "unknown" indicates that at the time of assessment, there are no proposals to kill, harm or take this tree that are known to the BHA.

Tree #	UTM coordinates	Category[1] (1, 2, or 3[2])	dbh[3] (cm)	Cultivated? (Y/N)	Proposed to be: (enter one: unknown[4], killed, harmed or taken)	If tree is proposed to be killed, harmed, or taken, indicate reason tree is proposed to be killed, harmed or taken:
						cleared in support of development as a residential subdivision.
002	18T 463820 5039342	1	38	N	Killed	The tree falls directly within an area proposed to be cleared in support of development as a residential subdivision.
003	18T 463859 5039394	1	53	N	Killed	The tree falls directly within an area proposed to be cleared in support of development as a residential subdivision.
004	18T 463881 5039405	1	67	N	Killed	The tree falls directly within an area proposed to be cleared in support of development as a residential subdivision.
005	18T 463878 5039416	1	23	N	Killed	The tree falls directly within an area proposed to be cleared in support of development as a residential subdivision.
006	18T 463882 5039425	1	40	N	Harmed	The tree falls within 50 m an area proposed to be cleared in support of development as a residential subdivision.
007	18T 463857 5039408	1	33	N	Killed	The tree falls directly within an area proposed to be cleared in support of development as a residential subdivision.
008	18T 463841 5039424	1	24	N	Harmed	The tree falls within 50 m an area proposed to be cleared in support of development as a residential subdivision.
009	18T 463839 5039416	1	23	N	Harmed	The tree falls within 50 m an area proposed to be cleared in support of development as a

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: unknown[4], killed, harmed or taken)*	If tree is proposed to be killed, harmed, or taken, indicate reason tree is proposed to be killed, harmed or taken:
						residential subdivision.
011	18T 463817 5039330	1	26	N	Harmed	The tree falls within 50 m an area proposed to be cleared in support of development as a residential subdivision.

Table 2: Trees Determined by BHA to be Butternut Hybrids

Tree #	UTM coordinates	Method used (genetic testing or field identification):

Table 3: Summary of Assessment Results

Result:	**Total #:**	**Important information for persons planning activities that may affect Butternut:**
Category 1	10	• A Category 1 tree is one that is affected by butternut canker to such an advanced degree that retaining the tree would not support the protection or recovery of butternut in the area in which the tree is located; and is considered “non-retainable”. • During the 30 day period that follows your submission of this BHA Report to the MNRF District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MNRF may contact you for an opportunity to examine the trees. • Category 1 trees may be killed, harmed or taken **after** the 30 day period that follows submission of this BHA Report to the MNRF District Manager, unless the results of an MNRF examination indicate that the assessment has not been conducted in accordance with the document entitled “Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007”*.
Category 2	0	• A Category 2 tree is one that is not affected by Butternut Canker, or is affected by Butternut Canker but the degree to which it is affected is not too advanced and retaining the tree could support the protection or recovery of butternut in the area in which the tree is located, and is considered “retainable”. • During the 30 day period that follows your submission of this BHA Report to the MNRF District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MNRF may contact you for an opportunity to examine the trees. • Activities that may kill, harm or take up to a **maximum of ten (10)** Category 2 trees may be eligible to follow the rules in section 23.7 of Ontario Regulation 242/08, in accordance with the conditions and requirements set out in the regulation. • Refer to e-Laws for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm • Activities that may kill, harm or take more than ten (10) Category 2 trees are not eligible to follow the rules in section 23.7 of Ontario Regulation 242/08. Contact the local MNRF district

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
		office for information on how to seek an ESA authorization (e.g., a permit) or consider an alternative that would be eligible for the regulation.
Category 3	0	• A Category 3 tree is one that may be useful in determining sources of resistance to Butternut Canker, and is considered “archivable”. • Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08. • Contact the local MNRF district office for information on how to seek an ESA authorization, or consider an alternative that will avoid killing, harming or taking any Category 3 trees.
Cultivated	0	• An activity that involves killing, harming, or taking a cultivated Butternut tree that was not required to be planted to fulfill a condition of an ESA permit or a condition of a regulation, may be eligible for the exemption provided by subsection 23.7 (11) of O. Reg. 242/08. • Prior to undertaking the activity, the owner or occupier of the land on which the Butternut is located (or person acting on their behalf) will need to determine whether the exemption for cultivated trees is applicable by determining whether or not the tree was cultivated as a result of the requirements for an exemption under O. Reg. 242/08 or a condition of a permit issued under the ESA. This information can be accessed by contacting the local MNRF district office. • The owner or occupier of the land on which the Butternut is located (or person acting on their behalf) is encouraged to append the details regarding whether the tree was planted to satisfy a requirement (e.g., the permit number or registration number) to this BHA Report for their records.
Hybrid	0	• Hybrid Butternut trees are not protected under the ESA, but their removal may be subject to municipal by-laws and other legislation.

Butternut Health Assessor’s Comments:

The 10-Category 1 Butternuts included in this report are located in a cluster approximately 0.7 hectares in size. This cluster is located in a Sugar Maple forest that is approximately 10 hectares.

Please refer to notes on field forms for additional details on the trees.

This concludes the summary of the BHA Report. A complete BHA Report must also include:

1. All original (hard copy) data forms (i.e., all completed sets of Form 1 and Form 2), and
2. Electronic and printed copies of the Excel data analysis spreadsheet.

0cm 3cm 15cm

Butternut Data Collection Form 1 - 2010 Edition

(PLEASE USE BLOCK LETTERS)

Surveyor ID or BHA # 0731

Date (dd/mm/yyyy) 31 - 08 - 2021

Shaded fields are mandatory for Butternut Health Assessments

Surveyor Contact
First KATHERINE Last BLACK
Email KBLACK@KILGOURASSOCIATES.COM
Telephone ( ) - Telephone Other ( ) - x

Property Owner (check if same as surveyor) ☐
First Last
or Company TAMARACK DEVELOPMENTS
Email mtaggart@taggart.ca
Telephone (613) 316-1779 Telephone Other ( ) - x

Property Owner's Mailing address
Address 3187 ALBION ROAD SOUTH Postal Code K1V8Y3 Prov. ON
City OTTAWA

Tree Location (if different from mailing address)
Address/(911#) CARDINAL CREEK VILLAGE EAST OF
Township ANTONIO FARLEY STREET Lot Con
City ORLEANS, OTTAWA (no parcel address)

Directions
From hwy 417, take Ottawa Regional Rd 174 to Trim Rd/Ottawa Regional Rd 57 in Cumberland. Continue on Trim Rd, take Old Montreal Rd to Cardinal Creek Drive.

☒ Yes ☐ No Can Share Location Information with other Butternut Recovery Organizations?
☒ Yes ☐ No Site visits OK? (prior arrangments will always be made for a site vist)

> (Greater than)
< (Less than)

Butternut Trees Tally by Diameter Class

(Do a dot tally in blank space; write total# in box for each)

Tree Condition	< 3 cm	3-15 cm	16-30cm	>30 cm
Vigorous: > 50% Live Crown Minor or no cankers				
Poor Vigor: <50% Live Crown or >50% Live Crown + heavily cankered stem			3	4
Dead				3

Historically, do some trees produce seeds? ☒ Y ☐ N ☐ Unkown

Estimated area containing butternut for properties > 1 acre (0.4 hectares): 0.1 ☐ Acres ☒ Hectares

10 Butternuts clustered in southeastern portion of remaining Sugar Maple forest. Entire forest is ~40 ha within environmental protection zone.

Overall Property Description (area(s) containing Butternut)
☐ Rolling Upland ☐ Bottomland
☒ Valley Slope ☐ Variable
☐ Tableland ☐ Unknown

Vegetation Community/ies
☐ Open ☐ Fencerow
☐ Shrubland ☐ Roadside
☒ DeciduousForest ☐ Quary
☐ ConiferForest ☐ UrbanYard
☐ MixedForest ☐ UrbanPark

Other

Soil Drainage
☐ Well Drained
☐ Moderately Drained
☐ Poorly Drained
☒ Unknown

Soil Texture
☐ Clay ☐ Sand
☐ Clay Loam ☒ Variable
☐ Loam ☐ Unknown
☐ Loamy Sand

Soil Depth
☐ > 1metre
☐ 30 - 99cm
☒ < 30cm
☐ Variable
☐ Unknown

Organic over shallow bedrock.

Please enter matching numerical page link code on forms 1 and 2

Page Link 073103

(Contact Information follows all applicable privacy policies and guidelines)

Please return forms to:
Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731

Butternut Data Collection FORM 2 (2010 Edition)

(PLEASE USE BLOCK LETTERS)

Shaded fields are mandatory for Butternut Health Assessments

Fill when Form 1 indicates canker is well established. The information opn Form 2 must be filled out for all trees when doing a Butternut Health Assessment.

TAG Site Code(A,B,...Z, AA...) | Surveyor ID or BHA # 0731

Surveyor Last Name: BLACK

Date (dd/mm/yyyy): 31-08-2021

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree # 001 | Zone 18 | Easting 463815 | Northing 5039357

Crown Class: 2 | Live Crown %: 0 | Main Stem Length(m) Below crown: 8 | Seed

☐ Twig Dieback ☑ Branch Dieback ☑ Defoliation ☐ Discolouration

#Stems: 2 | DBH(cm): 42

Butternut Origin: ☑ Natural ☐ Planted ☐ Unknown

Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☑ None

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 3

	#Open	#Sooty
Root	3	0
=<2m	6	1
>2m	4	1

Metres from badly cankered tree: ☒ < 40 ☐ > 40 ☐ None Found

Competing Species: Sugar Maple; White Ash

1 stem dead. Peeling bark. Signs of insect infestation. Tree is dead.

Tree # 008 | Zone 18 | Easting 463841 | Northing 5039424

Crown Class: 2 | Live Crown %: 0 | Main Stem Length(m) Below crown: 7 | Seed

☐ Twig Dieback ☑ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: 1 | DBH(cm): 24

Butternut Origin: ☑ Natural ☐ Planted ☐ Unknown

Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☑ None

Assess below live crown: #Epic-Live 0 | #Epic-Dead 1 | Bark Type S | # Callused Wounds 0

	#Open	#Sooty
Root	0	0
=<2m	3	0
>2m	0	1

Metres from badly cankered tree: ☒ < 40 ☐ > 40 ☐ None Found

Competing Species: Sugar Maple; White Ash

Peeling bark. Signs of insect infestation. Open wounds are large. Stem is rotten. Tree is dead. Dead, many small patches of peeling bark.

Tree # 009 | Zone 18 | Easting 463839 | Northing 5039416

Crown Class: 2 | Live Crown %: 95 | Main Stem Length(m) Below crown: 9 | Seed

☐ Twig Dieback ☑ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: 1 | DBH(cm): 23

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☒ None

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type S | # Callused Wounds 6

	#Open	#Sooty
Root	0	3
=<2m	4	9
>2m	1	0

Metres from badly cankered tree: ☒ < 40 ☐ > 40 ☐ None Found

Competing Species: Sugar Maple; White Ash; Grape

>2m + canopy look healthy; tree otherwise looks unhealthy.

Tree # 007 | Zone 18 | Easting 463957 | Northing 5039408

Crown Class: 2 | Live Crown %: 0 | Main Stem Length(m) Below crown: 5 | Seed

☐ Twig Dieback ☑ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: 1 | DBH(cm): 33

Butternut Origin: ☑ Natural ☐ Planted ☐ Unknown

Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☑ None

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type S | # Callused Wounds 0

	#Open	#Sooty
Root		
=<2m		
>2m		

Metres from badly cankered tree: ☒ < 40 ☐ > 40 ☐ None Found

Competing Species: Sugar Maple; White Ash

~80% bark loss on main stem. Tree is dead. Signs of insect infestation. (-) Insufficient bark to count cankers/wounds.

Tree # 003 | Zone 18 | Easting 463859 | Northing 5039394

Crown Class: 2 | Live Crown %: 0 | Main Stem Length(m) Below crown: 8 | Seed

☐ Twig Dieback ☑ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: 1 | DBH(cm): 53

Butternut Origin: ☑ Natural ☐ Planted ☐ Unknown

Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live 0 | #Epic-Dead 0 | Bark Type D | # Callused Wounds 4

	#Open	#Sooty
Root	2	
=<2m	6	5
>2m	3	3

Metres from badly cankered tree: ☒ < 40 ☐ > 40 ☐ None Found

Competing Species: White Ash; Sugar Maple

Root flare has sig. bark loss. Signs of insect infestation

Please enter matching page link code on forms 1 and 2

Page Link: 07310 3

(Contact Information follows all applicable privacy policies and guidelines)

Please return forms to:
Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731

p. 2 of BHA forms

Butternut Data Collection FORM 2 (2010 Edition)

(PLEASE USE BLOCK LETTERS)

Shaded fields are mandatory for Butternut Health Assessments

Fill when Form 1 indicates canker is well established. The information opn Form 2 must be filled out for all trees when doing a Butternut Health Assessment.

TAG Site Code(A,B,...Z, AA...) | Surveyor ID or BHA # 0731

Surveyor Last Name BLACK

Date (dd/mm/yyyy) 31 - 08 - 2021

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree # 004 | Zone 18 | Easting 463881 | Northing 5039405

2nd stem. 20cm 15cm

Crown Class: 2 | Live Crown %: 45 | Main Stem Length(m) Below crown: 8

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

☐ Twig Dieback ☑ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: 2 | DBH(cm): 67

Butternut Origin: ☑ Natural ☐ Planted ☐ Unknown

Assess below live crown:

	#Open	#Sooty
2 #Epic-Live		
0 #Epic-Dead		
S Bark Type		
16 # Callused Wounds		
Root	2	4
=<2m	5	16
>2m	4	12

Metres from badly cankered tree: ☑ < 40 ☐ > 40 ☐ None Found

Competing Species: Sugar Maple, Wild Grape

4 main branches. Orange lichen on upper branches. Difficult to assess % live crown due to dense canopy (Sugar Maple)

Tree # 005 | Zone 18 | Easting 463878 | Northing 5039416

Crown Class: 2 | Live Crown %: 40 | Main Stem Length(m) Below crown: 7

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☑ None

☐ Twig Dieback ☑ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: 1 | DBH(cm): 23

Butternut Origin: ☑ Natural ☐ Planted ☐ Unknown

Assess below live crown:

	#Open	#Sooty
0 #Epic-Live		
0 #Epic-Dead		
S Bark Type		
23 # Callused Wounds		
Root	1	0
=<2m	5	13
>2m	3	7

Metres from badly cankered tree: ☑ < 40 ☐ > 40 ☐ None Found

Competing Species: Sugar Maple, Hwd. Elm!

Sig. bark loss on root flare. Signs of insect infestation.

Tree # 006 | Zone 18 | Easting 463882 | Northing 5039425

Crown Class: 2 | Live Crown %: 60 | Main Stem Length(m) Below crown: 8

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☑ None → but difficult to see due to dense canopy

☐ Twig Dieback ☑ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: 1 | DBH(cm): 40

Butternut Origin: ☑ Natural ☐ Planted ☐ Unknown

Assess below live crown:

	#Open	#Sooty
0 #Epic-Live		
0 #Epic-Dead		
S Bark Type		
12 # Callused Wounds		
Root	0	0
=<2m	12	10
>2m	6	13

Metres from badly cankered tree: ☑ < 40 ☐ > 40 ☐ None Found

Competing Species: Sugar Maple

Sig. bark loss @ root flare. Signs of insect infestation. <2m lots of peeling bark.

Tree # 002 | Zone 18 | Easting 463820 | Northing 5039342

Crown Class: 1 | Live Crown %: 95 | Main Stem Length(m) Below crown: 9

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☑ None

☐ Twig Dieback ☑ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: 1 | DBH(cm): 38

Butternut Origin: ☑ Natural ☐ Planted ☐ Unknown

Assess below live crown:

	#Open	#Sooty
0 #Epic-Live		
0 #Epic-Dead		
S Bark Type		
12 # Callused Wounds		
Root	5	0
=<2m	8	4
>2m	2	4

Metres from badly cankered tree: ☑ < 40 ☐ > 40 ☐ None Found

Competing Species: Sugar Maple, Basswood

Unique bark / texture.

Tree # 011 | Zone 18 | Easting 463817 | Northing 5039330

Crown Class: 1 | Live Crown %: 100 | Main Stem Length(m) Below crown: 7

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☑ None

☐ Twig Dieback ☑ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: | DBH(cm): 26

Butternut Origin: ☑ Natural ☐ Planted ☐ Unknown

Assess below live crown:

	#Open	#Sooty
1 #Epic-Live		
0 #Epic-Dead		
S Bark Type		
5 # Callused Wounds		
Root	3	1
=<2m	5	0
>2m	0	1

Metres from badly cankered tree: ☑ < 40 ☐ > 40 ☐ None Found

Competing Species: Sugar Maple

Bark loss @ root flare due to open wounds.

Please enter matching page link code on forms 1 and 2

Page Link 07 31 03

(Contact Information follows all applicable privacy policies and guidelines)

Please return forms to:
Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731

BHA Tree Analysis (version: December 2013)

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

BHA Report #	731-002	Assessment Date(s)	31-Aug-21	Total # Butternut Trees in BHA Report	10
BHA ID #	731	BHA Name	Katherine Black		
Landowner / Client Name			Tamarack Developemnts		
Property Location			Cardinal Creek Village east of Antonio Farley St (no civic address), Ottawa		

input field data										automatic calculations from field data						Categories: 1: non-retainable, 2: retainable, 3: archivable				
Tree #	Live Crown %	Tree dbh (cm)	# bole cankers: sooty (S) (will be assigned 2.5 cm per canker)		# bole cankers: open (O) (will be assigned 5 cm per canker)		# root flare (RF) cankers		<40 m from cankered tree? (Y or N)	Circ. (cm) = Pi x dbh	total bole canker width (sooty x 2.5 + open x 5)	total RF canker width (sooty x 2.5 + open x 5)	bole canker % of circ.	RF canker % of circ.	total bole & root canker % of 2xCirc	LC% >/= 50 & BC% = 0	LC% >70 & BRC % <20	LC% >70 & BC % <20	Preliminary tree call	FINAL TREE CALL a Cat 2, dbh>20cm <40m from a Cat 1
			S <2 m	S >2 m	O <2 m	O >2 m	RF S	RF O		Circ (cm)	BC (cm)	RC (cm)	BC%	RC%	BRC%					
1	0	42	1	1	6	4	0	3	y	131.9	55.0	15.0	**41.7**	**11.4**	**26.5**	1	1	1	**1**	**1**
2	95	38	4	4	8	2	5	0	y	119.3	70.0	12.5	**58.7**	**10.5**	**34.6**	1	1	1	**1**	**1**
3	0	53	5	3	6	8	0	2	y	166.4	90.0	10.0	**54.1**	**6.0**	**30.0**	1	1	1	**1**	**1**
4	45	67	16	12	5	4	4	2	y	210.4	115.0	20.0	**54.7**	**9.5**	**32.1**	1	1	1	**1**	**1**
5	0	23	13	7	5	3	0	0	y	72.22	90.0	0.0	**124.6**	**0.0**	**62.3**	1	1	1	**1**	**1**
6	60	40	10	13	12	6	5	0	y	125.6	147.5	12.5	**117.4**	**10.0**	**63.7**	1	1	1	**1**	**1**
7	0	33	0	0	0	0	0	0	y	103.6	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
8	0	24	0	1	3	0	0	0	y	75.36	17.5	0.0	**23.2**	**0.0**	**11.6**	1	1	1	**1**	**1**
9	95	23	9	0	4	1	3	0	y	72.22	47.5	7.5	**65.8**	**10.4**	**38.1**	1	1	1	**1**	**1**
10										0	0.0	0.0	#####	#####	#####	####	###	###	##	#DIV/0!
11	100	26	0	1	5	0	1	3	y	81.64	27.5	17.5	**33.7**	**21.4**	**27.6**	1	1	1	**1**	**1**
12										0	0.0	0.0	#####	#####	#####	####	###	###	##	#DIV/0!
13										0	0.0	0.0	#####	#####	#####	####	###	###	##	#DIV/0!
14										0	0.0	0.0	#####	#####	#####	####	###	###	##	#DIV/0!
15										0	0.0	0.0	#####	#####	#####	####	###	###	##	#DIV/0!
16										0	0.0	0.0	#####	#####	#####	####	###	###	##	#DIV/0!
17										0	0.0	0.0	#####	#####	#####	####	###	###	##	#DIV/0!
18										0	0.0	0.0	#####	#####	#####	####	###	###	##	#DIV/0!
19										0	0.0	0.0	#####	#####	#####	####	###	###	##	#DIV/0!
20										0	0.0	0.0	#####	#####	#####	####	###	###	##	#DIV/0!
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28										0	0.0	0.0	#####	#####	#####	####	###	###	##	#DIV/0!
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31										0	0.0	0.0	#####	#####	#####	####	###	###	##	#DIV/0!