

Envinromental Impact Statement for a Revised Development Plan for Mattamy Cedarview/Lytle Park

**Report
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Submitted To:

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1.0 INTRODUCTION

Kilgour & Associates Ltd. (KAL) was retained by Mattamy Homes (Mattamy) to provide an EIS to address proposed changes to the City-approved Draft Plan of Subdivision (D07-16-14-0023) for their Cedarview Property (4497 A& B O'Keefe Court) in the west end of Ottawa. The existing plan for the property is for the development of country-lot estates. It has been approved by the City of Ottawa and was reviewed by the RVCA at the time of its submission for approval. Several headwater features however, do occur at the south end of the parcel. Under the existing approval, Mattamy can proceed with site development, removing those features entirely.

At this time, Mattamy would like to alter the existing plan to include an additional road access to the area from the south along the west side of Lytle Park. The addition of this new road to the Draft Plan provides an opportunity to alter the community layout both to retain a significant portion of those headwater reaches and to modify the drainage flow pattern around the park to reduce heating and contaminant (road salt) loading of surface waters as the move from the wooded areas of Cedarview community to the O'Keefe Drain to the south.

The purpose of this report is to evaluate the changes in impacts to the natural heritage features of the area under the modified development plan, and the required associated mitigations, relative those of the existing approved development plan.

2.0 PROPERTY INFORMATION

The subject property (Nepean, CON 4 RF PT LOTS 22 to 24; RP 4R26071 parts 6 to 9, PLAN M284 BLK 113, and CON 4 RF PT LOT 21; RP 5R13897 part 4; PINs: 046310420, 046310383, and 046310317) is a 61.4 hectare (ha) parcel south of Ottawa (Figure 1). The property is bordered by Highway 416 to west, Cedarhill Drive to the east, and O'Keefe Court to the south, and is zoned as Rural Residential (RR4), Parks and Open Space (O1), Environmental Protection (EP3), and Rural General Industrial (RG).

The purpose of the RR4 zone is to recognize lands intended for future residential development areas, limit the range of permitted uses to those which will not preclude future development options, and impose regulations which ensure a low scale and intensity of development to reflect the characteristics of existing land use (Ottawa Zoning By-laws, 2016).

The purpose of the O1 zone is to recognize lands intended for parks an open space related compatible uses and ensure that the range of permitted use and applicable regulations is in keeping with the low scale and low intensity open space nature of these lands (Ottawa Zoning By-laws, 2016).

The purpose of the EP3 zone is to recognize lands which are designated in the City off Ottawa Official Plan (Ottawa Zoning By-laws, 2016) as Natural Features and contain important environmental resources. Allowed uses of these zone include are those compatible with and assist in protecting environmental attributes of these lands and are protected for ecological, educational, and recreational reasons.

The purpose of the RG zone is to recognize lands intended for future development of light industrial uses, accommodate a range of light industrial uses and limited service commercial uses for the travelling public,

and regulate development in a manner respectful of adjacent land uses which will have a minimal impact on the surrounding area (Ottawa Zoning By-laws, 2016).

3.0 SITE AND THE NATURAL ENVIRONMENT

3.1 Methodology and Area of Detailed Assessment

Natural heritage data for this area was collected by KAL over numerous site visits through 2016 and 2017. These site visits were done to address various smaller field programs for the site directly, and for other adjacent properties, but cumulatively, provide a detailed picture of the natural history of the site.

Colour digital aerial photographs from GeoOttawa and GoogleEarth were used initially to identify natural environment features on the broader site through a desktop review. Ontario Base Map (OBM), GeoOttawa, and Ottawa OP Schedule 'L' layers were used to demarcate surface water, potential wetland areas, and other natural heritage system features and were overlaid on the aerial photographs to aid interpretation.

KAL biologists Terry Hams and Ken Allison conducted initial vegetation and ELC surveys of the Cedarview property and adjacent lands on August 25 and 26, 2016. The purpose of those site visits was to complete a vegetation inventory and classify the habitats on site, but also to determine the potential for SAR habitat presence and to characterize natural features of the site. Trees along the west side of Lytle Park (4401 O'Keefe Crt.) were further surveyed by Terry Hams on September 9, 2017. Trees in the forested area to east of Lytle Park within 60 m of O'Keefe Road were surveyed by Terry Hams on November 28, 2017.

KAL (2017) conducted an HDFA of all headwater features associated with the property in the spring and summer of 2017. Additional turtle surveys were completed on site to assess turtle presence in 2016 and for the HDFA in 2017.

Additional information on natural heritage features and wildlife species for the site was obtained from online sources, which include but are not limited to:

- Natural Heritage Information Centre (MNRF, 2016a);
- Rideau Valley Conservation Authority (RVCA, 2016);
- Species at Risk Public Registry (Canada, 2016);
- Ontario Species at Risk List (MNRF, 2016b);
- Breeding Bird Atlas of Ontario (OBBA) (Cadman *et al.* 2007);
- Bat Conservation International species profiles (BCI, 2016); and
- Reptiles and Amphibians of Ontario (Ontario Nature, 2016).

During the field visits the KAL biologist surveyed for potential habitat for SAR to occur on site. This information was used to complement desktop background review for the SAR

3.2 Surface Water, Groundwater and Fish Habitat

The site and adjacent lands lie within the Jock River watershed in the Barrhaven Catchment subwatershed (SWS) (RVCA, 2010). The Jock River is over 3 km south of the site and no major streams or tributaries occur on the site. A significant open water/marsh wetland, which is part of the Stony Swamp Wetland PSW Complex, occurs on the north-east side of the site. Other headwater drainage features (HDFs) on site are described in detail within the HDFA for the site by KAL (2017). The following are the HDF descriptions from that report for those features occurring on the south half of the Cedarview property and near Lytle park that will be subject to changes in their proposed conservation/alteration under the new development plan relative to the existing plan. The reaches included represent a subset taken directly from the full HDFA, and are thus numbered non-consecutively here (see Figure 1).

Reach 1

Reach 1 is a 930 m perennial drainage feature that is the main headwater to the O'Keefe Drain. It flows south-east beyond the eastern border of the property, conveying flow from the wetland to the roadside ditch (Reach 10) along O'Keefe Court. Outflow from the feature jogs southwest through Reach 10 to the main line of the O'Keefe Drain.

The feature has forest on the west side and a mixture of forest and lawn, with a very small amount of meadow downstream, on the east side. Instream vegetation is limited to the section adjacent to the meadow and consists of grasses. Both banks are dominated by trees.

The substrate in Reach 1 consists of clay and silt, with some gravel, cobble, and boulders. Submergent vegetation is not present, except for the section of the reach adjacent to the meadow where it is plentiful. Woody debris is common in this reach. This reach was characterized by surface flow in April, May, and July. A total of twelve fish – nine Banded Killifish and three Creek Chub (*Semotilus atromaculatus*) – were observed in this reach. No frogs or turtles were observed specifically in this reach, yet American Toads (*Anaxyrus americanus*), Gray Treefrogs (*Hyla versicolor*), Green Frogs (*Rana clamitans*), and Spring Peepers (*Pseudacris crucifer*) were heard calling from, and Painted Turtles (*Chrysemys picta*) and Snapping Turtles (*Chelydra serpentina*) were observed in, the wetland to the north.

Reach 9

Reach 9 begins at a very small culvert under Highway 416. It is a 715 m long mix of defined channels, swales and flooded areas running generally southwest through the western side of the woodland to the south of the property, turning east to flow along the northern border of Lytle Park to meet with Reach 8. Both the east and west banks run along forest. Instream vegetation is infrequent, consisting of grasses and sedges when present. Both banks are covered with a mixture of grasses, shrubs, and trees.

The substrate consisted of a mixture of clay and silt. Woody debris was highly abundant. Submergent vegetation was not present. Reach 9 had some surface flow during the April survey period, yet the majority of the reach was dry during the fish survey in May; only a small pooled area at the upstream section remained. Pooled areas in July had increased following substantial rains but were still disconnected and much of the reach was still dry. Accordingly, no fish, frogs or turtles were observed along the reach.

Reach 8

Reach 8 is a 330 m linear channel running generally south through the woodland to the south of the property, turning west to flow along the northern border of Lytle Park before turning south again to flow along the Park's western border until its confluence with Reach 9 to form Reach 6. Historical air photos from 1965 show most of this feature as a former agricultural drainage ditch between farm field. Both sides however, are now entirely forested. Instream vegetation is dense at the south end, consisting of grasses and sedges, but is absent through most of the feature. Both banks are covered with a mixture of grasses, shrubs, and trees, with the southern portion of the east bank being dominated by grasses.

The reach channel had significant flows in April with broad adjacent flooded areas, especially downstream. In May and July, the channel was still wet though flow was negligible. The majority of spring flow in the feature is runoff from the surrounding forest. The top end of the reach however, begins abruptly and is fed by a small ground water input sufficient to maintain some water within the feature in the early summer. A second small ground water input adds more groundwater 200 m downstream from the top end of the feature.

The substrate consists of a mixture of clay and silt, and woody debris was highly abundant in the upstream portion, but less so downstream. Submergent vegetation was scarce. Twenty-eight fish were observed in this reach, consisting of 25 Banded Killifish, and one each of Brook Stickleback (*Culaea inconstans*), Central Mudminnow, and Northern Redbelly Dace (*Chrosomus eos*). No frogs or turtles were observed in this reach.

Reach 6

Reach 6 extends 431 m from the confluence of Reaches 8 and 9, southwards into the pond to the south of Lytle Park, along O'Keefe Court. The feature picks up additional inputs from Reach 7. The feature was wet during all three site visits in 2017, though there was no detectable flow in May and July. In previous years, the feature has been observed to be dry by June. The east bank runs along lawn with the occasional shrub downstream. The west bank runs along forest. This reach is inundated with instream vegetation, consisting of grasses and sedges. The east bank is covered with lawn (soccer and baseball fields) with the occasional shrub downstream. The west bank is covered by grass and trees.

The substrate consists of a mixture of clay and silt, and woody debris was not present. Submergent vegetation was not present. Two Banded Killifish and one Creek Chub were observed in this reach. No frogs or turtles were observed in this reach, however, a Painted Turtle was observed basking in the downstream pond.

Temperatures within this reach were generally ~ 1°C warmer than in Reaches 8 and 9 (as measured in May and July). The pond however, at the downstream end is almost completely unshaded, resulting in significant solar warming. In July, the outflow of the pond was 4°C warmer than that of Reach 6 (i.e. 18°C in; 22°C out). This warmed outflow enters the O'Keefe Drain 150 m south of O'Keefe Court.

Reach 7

The 325 m Reach 7 used to convey flows from a culvert under Highway 416 southwest to its confluence with Reach 6 at the west-central border of Lytle Park. The north bank and the downstream section of the south bank of Reach 7 run along forest, while the upstream section of the south bank runs along a cultural meadow. That culvert however, was fully sealed once the construction of Highway 416 was completed. Instream vegetation is minimal, consisting of grasses and sedges when present. The north bank and the south downstream bank are covered with a mixture of grasses, shrubs, and trees, while the north upstream bank is covered in grasses with the occasional shrub.

The substrate consisted of a mixture of clay and silt. Woody debris was abundant. Submergent vegetation was not present. The feature only conveys rain water to Reach 7. Blockages along the feature, such as perched culvert under the foot path crossing it force the feature to temporarily retain some waters. The reach however, is generally dry. It had some flow during the April survey period with the spring freshet, but was completely dry in May. It had small but discontinuous puddles in July, presumably due to run-off from a recent rain event. No fish, frogs or turtles were observed along the reach. The feature had initially been assigned a management directive of "Conservation" within the HDFA as the culvert had appeared to functionally connect the channel to other headwater areas upstream. With the culvert permanently blocked, the feature is ephemeral at best. The management directive should thus be revised to "Mitigation".

Reach 10

Reach 10 is a 127 m roadside ditch located along O'Keefe Court. The eastern half conveys flow south-westwards from Reach 1 before turning south-eastwards under a culvert in O'Keefe Court, while picking up additional contributions from road runoff. The western half collects and adds further road runoff. The north bank runs through a small section of meadow, but mostly along the lawns of Lytle Park, whereas the south bank runs along O'Keefe Court. This reach is inundated with grasses and sedges. Both banks are dominated by grasses.

The substrate consists of a mixture of clay and silt. Woody debris and submergent vegetation are absent. The eastern half, fed by Reach 1, was characterized by surface flow in April, May, and July. The western half held standing water in April and July (following heavy rain) and was dry in May. Four Banded Killifish were observed in the eastern half of the reach, yet no frogs or turtles were observed.

3.3 Vegetation and Land Cover

The Jock River-Barrhaven Catchment land cover is primarily composed of settlements and crop and pasture lands (37% and 22%, respectively) (RVCA 2010). Roads comprise 13% of the area with woodlands (11%), sand and gravel (9%), grassland (6%), water (2%), accounting for the remainder of the area.

Vegetation and ELC (Lee et. at., 1998) surveys were completed on the site on August 25 and 26, 2016. These surveys focused on an inventory of plant species across the site, which was separated into polygons according to different habitat types. These polygons were further defined during the surveys and were assigned ELC categories (Figure 1).

Plant surveys focused on coverage of each polygon to create a thorough plant list for each area. These surveys were completed by meandering through each polygon with a focus on covering each unique area.

Plant surveys of each area were deemed to be complete once no new plants were observed in the area. Survey were careful to sufficiently cover each area with special attention paid to areas with potential for species at risk.

A total of 225 species of plants were observed on site during the plant surveys (Appendix 1). Polygon ten had the greatest quantity of plants at 91 species, while polygon seven had the second highest at 72.

Only one SAR plant species was observed on site during the plant surveys: Butternut (*Juglans cinerea*). This tree was observed multiple times across the site. Butternut observed on site were flagged with white flagging tape and GPS coordinates were recorded for each tree (Figure 1).

The site is relatively large and composed of diverse habitat categories. Vegetation and ELC surveys were completed for the site on August 25 and 26, 2016. Habitat types were classified according to the ELC of Southern Ontario. The site was categorized into six broad ELC categories: deciduous forest, coniferous forest, mixed forest, shrubland, grassland, and wetland (Figure 1). Each habitat category was further refined based on species composition found on site.

Two areas were classified as mixed meadow habitat (MEM) and were composed of various grass and forb species with < 25% shrub and tree cover (Lee et. al, 1998) (Figure 1). Plant species observed in these areas include Common Brome Grass (*Bromus inermis*), June Meadow Grass (*Poa pratensis*), Reed Canary Grass (*Phalaris arundinacea*), Purple-Stemmed Aster (*Symphotrichum puniceum*), Red Clover (*Trifolium pratense*), White Clover (*Trifolium repens*), Calico Aster (*Symphotrichum lateriflorum*), Bird's-foot Trefoil (*Lotus corniculatus*), Common Milkweed (*Asclepias syriaca*), Cow Vetch (*Vicia cracca*), Manitoba Maple (*Acer negundo*), Staghorn Sumac (*Rhus hirta*), and Glossy Buckthorn (*Rhamnus frangula*). Mixed meadow area one is approximately 0.6 ha and bordered by Highway 416 to the west and a walking trail to the east. Mixed meadow area two is approximately 7.5 ha and surrounded by forest on all side except the west where it borders a walking trail.

Five areas were classified as deciduous forest and were composed primarily of deciduous trees species (>75%) (Lee et. al., 1998). Deciduous forest areas one and two have been further defined as Dry-Fresh Popular – White Birch Deciduous Forest (FOD3) and is primarily composed of Trembling Aspen (*Populus tremuloides*), Red Maple (*Acer rubrum*), Sugar Maple (*Acer saccharum*), Green Ash (*Fraxinus pennsylvanica*), Jack Pine (*Pinus banksiana*), White Elm (*Ulmus americana*), and White Spruce (*Picea glauca*) trees. Other plant species observed in these areas were Spreading Dogbane (*Apocynum androsaemifolium*), Wild Sarsaparilla (*Aralia nudicaulis*), Tartarian Honeysuckle (*Lonicera tatarica*), Glossy Buckthorn (*Rhamnus frangula*), White Bedstraw (*Galium mollugo*), Canada Anemone (*Anemone canadensis*), Purple-stemmed Aster, and Witch Grass (*Panicum capillare*).

Deciduous forest area three was refined to Dry-Fresh Oak-Maple Deciduous Forest (FOD2) (Lee et al., 1998). This forest is primarily composed of Sugar Maple, Red Maple, Bur Oak (*Quercus macrocarpa*), Basswood (*Tilia americana*), White Elm, White Ash, Ironwood (*Ostrya virginiana*), Balsam Popular (*Populus balsamifera*), Black Cherry (*Prunus serotina*), Butternut, White Cedar (*Thuja occidentalis*), and White Spruce tree species. Part of this area was historically used for agriculture and many old apple trees were observed in the area along with other plant species which include: Canada Aneomne, Common Strawberry, Common Milkweed, Wild Basil (*Satureja vulgaris*), Staghorn Sumac (*Rhus typhina*), Common

Juniper (*Juniperus communis*), Common Brome Grass, Wild Ginger (*Asarum canadense*), Purple-stemmed Aster, and White Snakeroot (*Ageratina altissima*).

Deciduous forest area four was defined as Fresh-Moist Lowland Deciduous Forest (FOD7) and was primarily composed of Green Ash, Black Ash (*Fraxinus nigra*), Silver Maple (*Acer saccharinum*), White Cedar (*Thuja occidentalis*), Balsam Poplar, and White Elm (*Fraxinus americana*), tree species. Other plant species observed include Joe-pye Weed (*Eupatorium maculatum*), Boneset (*Eupatorium perfoliatum*), Purple Loosestrife (*Lythrum salicaria*), Reed Canary Grass (*Phalaris arundinacea*), Bebb's Sedge (*Carex bebbii*), Spinulose Woodfern (*Dryopteris carthusiana*), Marginal Shieldfern (*Dryopteris marginalis*), Field Horsetail (*Equisetum arvense*), Red-osier Dogwood (*Cornus stolonifera*), Glossy Buckthorn, and Bouncing Bet (*Saponaria officinalis*).

Deciduous forest area five was defined as Dry-Fresh Sugar Maple Deciduous Forest (FOD5) and is primarily composed of Sugar Maple, Ironwood, Basswood, White Cedar, Green Ash, White Birch (*Betula papyrifera*), and Bur Oak tree species. Other plant species observed include Glossy Buckthorn, Wild Basil, Common Burdock (*Arctium minus*), Bittersweet Nightshade (*Solanum dulcamara*), Calico Aster, Solomon's Seal (*Polygonatum pubescens*), and Marginal Shieldfern. This area is the oldest deciduous forest section on the site and has many large trees that may qualify as specimen trees under the City of Ottawa OP (Ottawa, 2014).

Two coniferous forests areas were observed on site during the ELC and vegetation surveys (Figure 1). One coniferous forest area was defined as Dry Cedar Calcareous Shallow Coniferous Forest (FOC2). This forest area is composed of White Cedar, Jack Pine, White Elm, and Trembling Aspen tree species, while other plant species observed in this area include Poverty Grass (*Danthonia spicata*), Timothy (*Phleum pratense*), Tickle Grass (*Agrostis scabra*), Path Rush (*Juncus tenuis*), Yarrow (*Achillea millefolium*), Wire Grass (*Poa compressa*), Virgin's-bower (*Clematis virginiana*), Spreading Dogbane (*Apocynum androsaemifolium*), Choke Cherry (*Prunus virginiana*), and Bristly Rose (*Rosa acicularis*).

The second coniferous forest area was defined as Fresh-Moist White Cedar Coniferous Forest (FOC4) habitat and is composed of White Cedar, White Spruce, Green Ash, White Birch, Yellow Birch (*Betula alleghaniensis*), Basswood, Bitternut Hickory (*Carya cordiformis*), Ironwood, Sugar Maple, and Trembling Aspen tree species. Other plant species observed on White Snakeroot, White Trillium (*Trillium grandiflorum*), Wild Basil, Wild Ginger (*Asarum canadense*), Large-leaved Beggarticks (*Bidens frondosus*), Indian-tobacco (*Lobelia inflata*), Nipplewort (*Lapsana communis*), False Nettle (*Boehmeria cylindrica*), Hellbore (*Epipactis helleborine*), Sensitive Fern (*Onoclea sensibilis*), and Cypress-like Sedge (*Carex pseudo-cyperus*).

Five mixed forest areas were recorded on site during the ELC and vegetation surveys. Mixed forest areas one, two, four, and five have been defined as Dry-Fresh White Cedar Mixed Forest (FOM4) and is composed of White Pine, White Spruce, White Cedar, White Ash, White Birch, Trembling Aspen, White Elm, Sugar Maple, Red Oak, Bur Oak, Ironwood, Manitoba Maple, Large-toothed Aspen, and Green Ash. Other plant species observed in these areas include Bladder-Campion, Calico Aster, Common Juniper, Common Raspberry, English Plantain, June Meadow Grass, Nodding Ladies-tresses, Overlooked Dropseed (*Sporobolus neglectus*), Path Rush, Purple-stemmed Aster, River Grape (*Vitis riparia*), and Viper's Bugloss.

The third mixed forest area was defined as Fresh-Moist White Cedar Hardwood Mixed Forest (FOM7) and is composed of White Cedar, Trembling Aspen, White Birch, Manitoba Maple, Bitternut Hickory, Ironwood, Basswood, Black Cherry, and Butternut tree species. Other plant species observed in this area include Canada Anemone, Creeping Bellflower (*Campanula rapunculoides*), Enchanter's Nightshade, Eyebright (*Euphrasia stricta*), Heal-all, Mugwort, Nipplewort, Poison-ivy, Red Baneberry, Glossy Buckthorn, Red-Osier Dogwood, White Avens, and Yellow Wood-sorrel (*Oxalis stricta*).

Two areas of shrubland habitat were observed on site during the vegetation and ELC Surveys (Figure 1). The first area was defined as Dry – Fresh Calcareous Bedrock Mixed Thicket (THRM1) and was composed of Poverty Grass, Hawkweed (*Hieracium* sp), Path Rush, English Plantain, Overlooked Dropseed (*Sporobolus neglectus*), and Silvery Cinquefoil (*Potentilla argentea*). The second shrubland area was defined as Dry – Fresh Mixed Regeneration Thicket (THMM1) and was composed of Pearly-everlasting, Shadbush (*Amelanchier arborea*), Brown Knapweed, Red-osier Dogwood, Flat-topped Aster, Daisy Fleabane (*Erigeron annuus*), Hawthorn, Staghorn Sumac, Calico Aster, Apple trees, White Elm, and Bur Oak.

Wetland and aquatic habitat were also found on site. Wetland area one was defined as Graminoid Mineral Meadow Marsh (MAM2) and was composed of Cattail (*Typha latifolia*), Reed Canary Grass (*Phalaris arundinacea*), Joe-Pye-Weed, Field Horsetail, Fowl Mana Grass (*Glyceria striata*), Glossy Buckthorn, Purple Loosestrife, Rice Cut Grass (*Leersia oryzoides*), Sedge species (*Carex* spp.), Bebb's Sedge (*Carex bebbii*), Black Buckthorn (*Rhamnus cathartica*), and Willow species.

The wetland pond at the border of Cedarhill Golf Course is defined as Shallow Submerged Aquatic (SAS) ELC category. This pond is ringed by marsh habitat defined as Mixed Organic Shallow Marsh (MAS3) and composed of cattails, Reed Canary Grass, Rice- Cut Grass, willow shrubs, Speckled Alder, Purple Loosestrife, Water-parsnip, and Bur-reed. The Quarry Pond area is a deep rocky pond that does not contain aquatic plants and is therefore defined as Open Water (OAW).

GeoOttawa aerial photos of the site from 1965 show that most of the area was previously disturbed by human activity. Forest areas were present on site in the south east (deciduous forest area) and south west of the site which corresponds with conditions observed on site during surveys. These two areas contained the largest trees observed on site and were the most mature forests.

3.4 Site Trees

Tree ages were not specifically determined, however, the 1976 geoOttawa air photo shows forest on the north and east edges of the site. The rest of the site is substantially younger than these areas and composed of shrubs, saplings, and small trees within wet depression and grassland areas.

Lytle Park is bordered on the west side by three ELC categories. On the east side is a single ELC category Dry-Fresh Hardwood-Hemlock Mixed Forest Ecosite (FOM 3). This area is mainly composed of Sugar Maple (*Acer saccharum*) with subordinate species of Eastern Hemlock (*Tsuga canadensis*), American Basswood (*Tilia americana*), White Pine (*Pinus strobus*), American Elm (*Ulmus americana*), White Cedar (*Thuja*

occidentalis), Ironwood (*Ostrya virginiana*), Green Ash (*Fraxinus pennsylvanica*)), and Black Cherry (*Prunus serotina*). Trees ranged mainly from 25 – 50 cm, with many large Sugar Maple present.

Along the berm that separates the park from the adjacent land to the west is Fresh Deciduous Forest Ecosite (FOD4) (Lee et al., 1998). This area is fairly disturbed and composed species not found through the natural forest on site. Manitoba Maple (*Acer negundo*) is the most abundant species with subordinate species of Eastern Cottonwood (*Populus deltoides*), Green Ash, Silver Poplar (*Populus alba*), Staghorn Sumac (*Rhus typhina*), American Elm, and buckthorn species (*Rhamnus* spp). Many large Eastern Cottonwood were observed along the berm ranging in size from 30 to 50 cm.

A lowland Ash Mineral Deciduous Swamp Ecosite (SWD2) was observed to the northwest for Lytle Park. This area was composed primarily of Green Ash and Black Ash (*Fraxinus nigra*), many of which were dead or dying from Emerald Ash Borer infestation. Subordinate species observed include American Elm, buckthorn, White Cedar, and Manitoba Maple. Trees in this patch ranged from 15 to 30 cm with many snags present.

A Cultural Thicket (CUT) occurs to the southwest of Lytle Park. It was composed of shrub and tree species which include Staghorn Sumac, buckthorn, Green and Black Ash, American Elm, Red Pine, Apple species, and various other non-native shrub species such as Common Lilac (*Syringa vulgaris*) and Russian Olive (*Elaeagnus angustifolia*).

Individual trees and unique trees observed on site are reported in Table 1 and Figure 1. Butternut were observed on site to the north and east of Lytle Park. Twelve Butternut were observed within 50 m of the proposed bike trail design and thus are subject to impacts from the project. Many of these trees were showing sign of Butternut Canker; however, an inspection by a certified Butternut Health Assessor should be completed in the summer of 2018 to determine potential for retaining these trees.

Table 1: Results of tree inventory survey of the property in 2017.

Tree number	Common Name	Quantity	Diameter at Breast Height (cm)	Comments
1	Manitoba Maple	1	11, 14, 19	Multi-stem
2	Lombardy Poplar	1	21	
3	Willow species	1	19	
4	Eastern Cottonwood	1	22	
5	Balsam Poplar	1	22	
6	American Basswood	1	35, 38	Double-stem, larger stem mostly dead
7	Sugar Maple	1	53	
7	American Basswood	1	13	
8	American Basswood	1	59, 62	Double-stem
9	Sugar Maple	1	44	

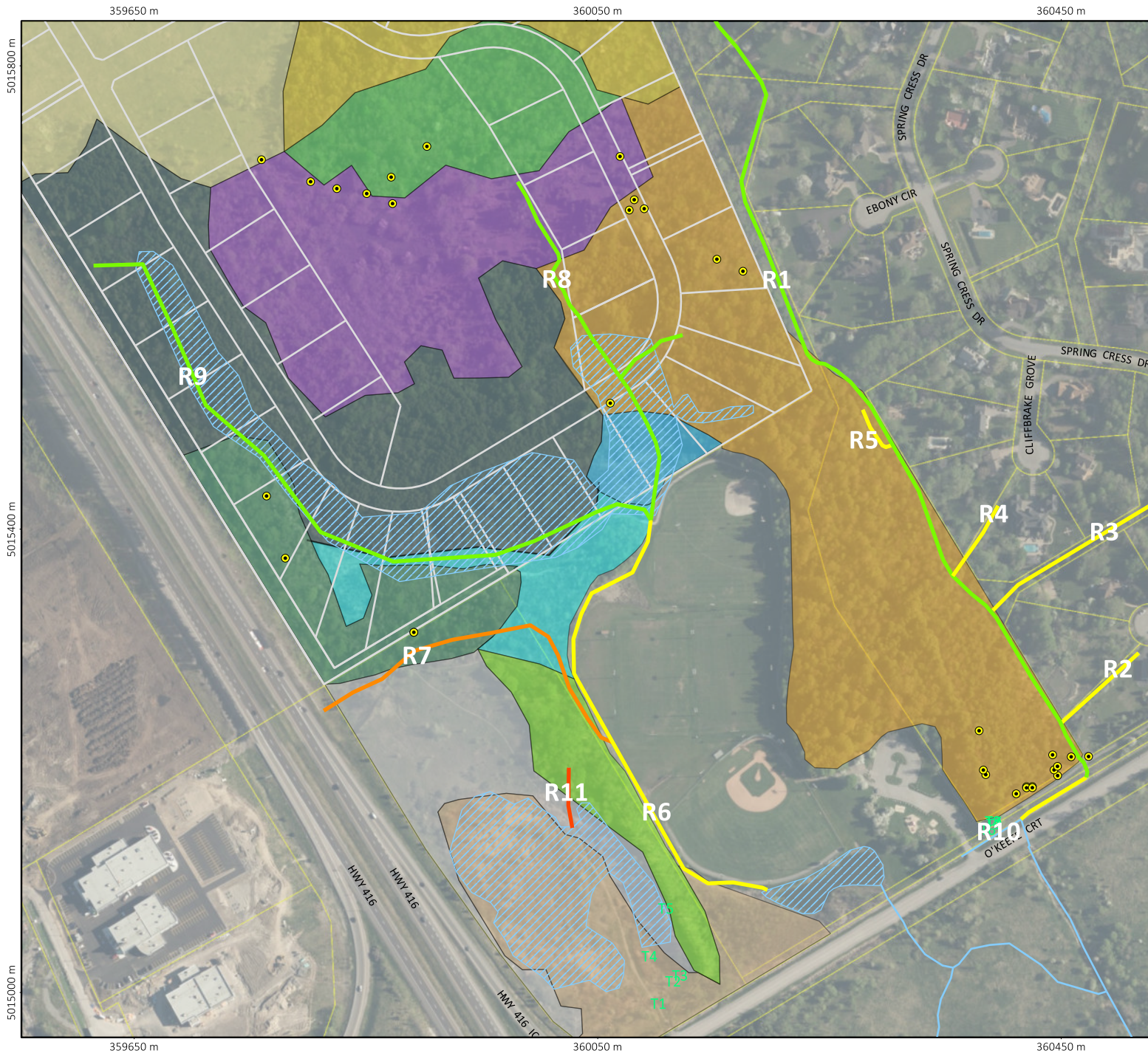





















Figure 1 Existing conditions

Headwater Features

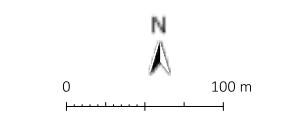
-  Wet Area
-  Maintain Recharge
-  Mitigation
-  Conservation
-  Protection

Ecological Land Class

-  CUM
-  CUT
-  FOC4
-  FOD3
-  FOD4
-  FOD5
-  FOM3
-  FOM7
-  MAM2
-  MEM
-  SWD2
-  THMM1

- Trees**
-  T# Tree number
 -  Butternut

Approved CDP



Project: MATT634
 Created By: AF
 MTM Zone 9
 (NAD 83)
 Printed on: 2017-12-12



3.6 Wildlife

3.6.1 Turtles

Methods

Five rounds of turtle surveys were performed on the site in April and May of 2016, and again in May and June of 2017. Basking surveys were completed at predetermined surveys stations in the two wetlands on site. Survey stations were selected in locations that allowed for optimal viewing of potential basking areas with turtle habitat preferences taken into account.

Surveys followed protocols set forth by the Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario (MNRF, 2014). Although these surveys primarily targeted Blanding's Turtles, all turtle species were recorded. Surveys were completed between 8 am and 5 pm on calm, sunny days with temperatures above 10°C and on cloudy days with temperatures above 15°C, and no precipitation. Binoculars of at least 10 × power were used to scan the wetland edges and basking areas from survey stations.

Results

Turtle basking surveys were completed on April 20 and 29, and May 5, 10, and 17, 2016, and on May 10, 18, 24, and June 1 and 17, 2017. Temperature and weather data for the surveys is provided in Table 1, and all five surveys rounds were completed within required temperatures. Four initial turtle survey stations were established and surveyed on the first visit in 2016, one survey station on the quarry wetland and three stations on the natural wetland. One survey station was removed after the first round because it offered limited visibility, and a new station was added that was surveyed during the next four rounds. Nine initial turtle survey stations were established and surveyed on the first visit in 2017, two survey stations at the pond on the southern border of the property, two stations on the natural wetland, and six stations targeting drains and forest wetlands. Two survey stations were removed after the first round due to the features being dry.

No turtles were observed in 2016 in the quarry pond during any of the turtle surveys. Although only one survey station was established here, it offered an unobstructed view the entire shoreline. The quarry pond has very little wetland vegetation and has deep, cold water with steep sides and little to no mud substrate, and therefore unlikely to provide overwintering or foraging habitat for turtle species.

Painted turtles (*Chrysemys picta marginata*) were observed in the natural wetland during all five of the survey rounds in both years, and a single Snapping Turtle (*Chelydra serpentina*) was observed on two occasions in 2017. No other turtle species were observed during the surveys (Table 1) of the natural wetland. The wetland is ringed mostly with cattails, shrubs, and forest, but is bordered by residential development on the north and north east side and a golf course on the east side. Painted turtles were also observed in ponds on the golf course to the east of the natural wetland in both 2016 and 2017. One Painted Turtle was observed basking around the pond on the southern border of the property in 2017. No other turtles were seen at any other site in any year.

Table 2: Turtle observations

Date	Time	Weather	Air Temperature	Turtle Observations	Number of survey points
April 20, 2016	12:14	Sunny	11°C	23 MPTU	4
April 29, 2016	14:15	Sunny	11°C	31 MPTU	4
May 05, 2016	15:30	Sunny	21°C	0*	4
May 10, 2016	11:54	Sunny	10°C	37 MPTU	4
May 17, 2016	12:34	Partly Cloudy	12°C	41 MPTU	4
May 11, 2017	10:00	Partly Cloudy	14°C	2 MPTU; 1 SNTU	9
May 18, 2017	9:00	Sunny	25°C	26 MPTU	7
May 24, 2017	14:30	Sunny	24°C	14 MPTU; 1 SNTU	7
June 1, 2017	12:00	Sunny	15°C	18 MPTU	7
June 17, 2017	13:30	Sunny	25°C	3 MPTU	7

MPTU – Midland Painted Turtle; SNTU – Snapping Turtle.

* - survey was disrupted before completion.

3.6.2 Incidental Wildlife Observations

Incidental wildlife observations were conducted during all field visits to the site. All incidental species observations and evidence of species occurrence (e.g. tracks, scat) were recorded during site visits. A complete list is present in Appendix 2.

Overall, 34 wildlife species were observed on site in 2016 and 2017. The majority of species observed were birds (31 species), with two mammal species and one amphibian species also observed.

One SAR bird species was observed on site during field surveys: Bobolink (*Dolichonyx oryzivorus*). This species was observed in the large grassland area to the west of the wetland pond. Although, the observations of this species on site were before the beginning of the breeding bird surveys period (i.e. May 24 through July 10), thus the individual observed on site was likely only migrating through the area and was not necessarily breeding on site.

3.6.3 Species at Risk Habitat

KAL submitted an information request to the MNRF to access area SAR records. Based on the MNRF response and our own information review, 17 SAR listed under the *Endangered Species Act* (Ontario, 2007) and *Species At Risk Act* (Canada, 2002) were deemed as having potential to occur on or in proximity to the property (Bank Swallow [*Riparia riparia*], Barn Swallow [*Hirundo rustica*], Bobolink, Common Nighthawk [*Chordeiles minor*], Eastern Meadowlark [*Sturnella magna*], Eastern Wood-pewee [*Contopus virens*], Eastern Whip-poor-will [*Caprimulgus vociferus*], Least Bittern [*Ixobrychus exilis*], Wood Thrush [*Hylocichla mustelina*], Little Brown Myotis [*Myotis lucifuga*], Northern Long-eared Myotis [*Myotis septentrionalis*], Eastern Small-footed Myotis [*Myotis leibii*], Tri-colored Bat [*Pipistrellus subflavus*], Monarch [*Danaus plexippus*], Blanding’s Turtle, Snapping Turtle, and Butternut).

Milksnake (*Lampropeltis triangulum*) was also identified by the MNRF in their review, but has since been delisted from the ESA.

For full due diligence, Table 2 indicates the habitat requirements of these SAR plus others SAR potentially present within the broader area and whether the property may provide significant habitat. The list also includes additional entries for species under consideration for listing within the next two years.

Four SAR were observed on the property during the field visit (Bobolink, Monarch, Butternut and Snapping Turtle) (Table 2). An additional two species have a potential for occurrence on site (Eastern Wood-pewee and Wood Thrush).

Table 3. Species at risk potential for occurrence on the Onassa Springs site.

Species Name	Provincial (ESA) Status	Habitat Requirement	Habitat on Site	Project Concerns Associated with Habitat on Site
Birds				
Bank Swallow (<i>Riparia riparia</i>)	Threatened	Colonial nester; burrows in eroding silt or sand banks, sand pit walls, and other similar habitats	No nesting habitat observed on or adjacent to Site, but may forage in open habitats nearby.	Negligible potential for presence. Not a concern.
Barn Swallow (<i>Hirundo rustica</i>)	Threatened	Species prefers to nest on manmade structures such as bridges, barns, and buildings near open terrestrial and aquatic habitats where it forages.	No nesting habitat observed on site, but nesting site are available adjacent to site. May forage in open habitats on site.	Negligible potential for presence. Not a Concern.
Bobolink (<i>Dolichonyx oryzivorus</i>)	Threatened	Periodically mown, dry meadow for nesting. Habitat (meadow) should be > 10 ha, and preferably > 30 ha before bobolink are attracted to the site. Not near tall trees.	Large grassland area on site is likely to provide habitat to this species. Two males were observed in this area prior to the beginning of the breeding bird season.	Moderate potential for species to breed on site in grassland habitat. A single transient bobolink was observed in the grassy area in 2016 before the start of breeding season. None were observed during breeding season. Not a concern.
Common Nighthawk (<i>Chordeiles minor</i>)	Special Concern*	Prefers to nest in open areas with little or no ground vegetation, such as burned-over and logged areas, forest clearings, rock barrens, peat bogs, and lakeshores. Species also nests in mine tailings, sand and gravel pits, cultivated fields, orchards, urban parks, and along gravel roads and railways.	Potential breeding habitat exists in area surrounding the quarry pond; however, there are no records of species occurrence on site.	Low potential for species to breed on site, due to limited nesting habitat and no occurrence records. Not a concern.
Eastern Meadowlark (<i>Sturnella magna</i>)	Threatened	Prefers grasslands and pastures >5 ha in area with moderately tall grasses (25 to 50 cm) and abundant litter cover. High proportion of grasses to forbs and shrubs (<35% forbs and shrubs).	Large grassland area on site may provide potential breeding habitat for this species.	Low potential for species to breed on site in grassland habitat (too small). Not a concern.
Eastern Wood-pewee (<i>Contopus virens</i>)	Special Concern*	Prefers mature and intermediate-aged deciduous and mixed forest with an open understory. Often nests and forages near open areas and forest edges.	Forests on site are likely to provide nest habitat for this species.	High potential for species to breed on site; however, they are not currently protected under the <i>ESA</i> . Wooded areas will be maintained with sufficient density to continue supporting the species. Not a concern.

Species Name	Provincial (ESA) Status	Habitat Requirement	Habitat on Site	Project Concerns Associated with Habitat on Site
Eastern Whip-poor-will (<i>Caprimulgus vociferus</i>)	Threatened	Species prefers areas that are a mix of open and forested habitats such as savannahs, open woodlands, or forest openings. It nests on the ground or forest floor and has cryptic coloured eggs and are hidden from visual predators.	Potential breeding habitat on site, but no occurrence records for site. The mosaic of shrubland, woodland, and open habitat I the north and central sections of the site may provide breeding habitat for species.	Limited potential for species to breed on site with no occurrences noted in the broader area. Not a concern.
Least Bittern (<i>Ixobrychus exilis</i>)	Threatened	Found in a variety of wetland habitats often composed of cattails and areas of open pools and channels. Nests in dense vegetation above marshes near open water.	Wetland pond on site is unlikely to provide adequate breeding habitat.	Very low potential for species to breed on site in wetland pond with the adjacent golf course. Not a concern.
Wood Thrush (<i>Hylocichla mustelina</i>)	Special Concern*	Moist deciduous hardwood or mixed forests with trees >16 m in height, a closed canopy (>70%), moderate sub-canopy and shrub layer, fairly open forest floor, and moist soil.	Forests on site are likely to provide nesting habitat for this species.	Some potential for species to breed on site; however, they are not currently protected under the <i>ESA</i> . Wooded areas will be maintained with sufficient density to continue supporting the species. Not a concern.
Butterflies				
Monarch (<i>Danaus plexippus</i>)	Special Concern*	Caterpillars require Milkweed species and are confined to meadow and open areas where it grows, while adults feed on nectar ins a variety of habitats.	Milkweed is found in low abundance in many of the habitats of site, and species was observed on site during field visits.	The species is not currently protected under the <i>ESA</i> . Milkweed was found in multiple areas on site, but loss of milkweed on site is unlikely to impact local Monarch population. Not a concern.
Mammals				
Little Brown Myotis (<i>Myotis lucifuga</i>)	Endangered	Widespread, roosting in trees and buildings. Hibernate in caves or abandoned mines.	Large cavity trees and snags were observed in mature forests on site, which may be attractive to the species.	Previously high potential for summer roosting and maternity colonies on site. But area populations have been decimated so now very limited occurrence potential. No potential hibernacula were observed on site. Wooded areas will be maintained with sufficient density to continue supporting the species if present (highly urban tolerant). Timing windows for tree clearing are recommended.
Northern Long-eared Myotis (<i>Myotis septentrionalis</i>)	Endangered	Associated with boreal forests, choosing to roost under loose bark	Large trees and coniferous forests were observed on site, which may be attractive to the species.	Limited potential for summer roosting and maternity colonies on site. No potential

Species Name	Provincial (ESA) Status	Habitat Requirement	Habitat on Site	Project Concerns Associated with Habitat on Site
		and in the cavities of trees. Hibernates in caves or abandoned mines.		hibernacula were observed on site. Not a concern
Eastern Small-footed Myotis (<i>Myotis leibii</i>)	Endangered	Species roosts in a range of habitats including under rocks, rocky outcroppings, buildings, under bridges, caves, mines, and hollow trees. Hibernates in smaller caves subject to air movement.	Rocky outcroppings and cliffs were observed on site around the quarry pond and large snags occur on site, which may be attractive to the species.	Previously high potential for summer roosting and maternity colonies on site. But area populations have been decimated so now very limited occurrence potential. No potential hibernacula were observed on site. Wooded areas will be maintained with sufficient density to continue supporting the species if present (highly urban tolerant). Timing windows for tree clearing are recommended.
Tri-colored Bat (<i>Pipistrellus subflavus</i>)	Endangered	Prefers to roost in trees in old forests but sometimes uses buildings. Forage over water courses or open fields with large trees nearby. They never forage in deep woods. Hibernates in caves or abandoned mines.	Large cavity trees and snags were observed in mature forests on site, which may be attractive to the species.	Previously high potential for summer roosting and maternity colonies on site. But area populations have been decimated so now very limited occurrence potential. No potential hibernacula were observed on site. Wooded areas will be maintained with sufficient density to continue supporting the species if present (highly urban tolerant). Timing windows for tree clearing are recommended.
Turtles				
Blanding's Turtle (<i>Emydoidea blandingii</i>)	Threatened	Species prefers shallow water usually in large wetlands or shallow lakes with high abundance of emergent vegetation.	Potential habitat is found in wetland pond on site, and nesting habitat is available in gravel and sand areas along walking paths and grasslands.	Potential for occurrence on site in wetland pond was initially considered to be moderate. No observations of species occurred during two years of field visits. Resident populations within Stoney Swamp to the north west are separated by Highway 416, with cliffs abutting most of its length along the site. Turtles present in the Jock River are 3 km to the south with much of the intervening area now built up. No longer an concern.
Snapping Turtle (<i>Chelydra serpentina</i>)	Special Concern*	Freshwater habitat characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation.	Potential habitat is found in wetland pond on site, and nesting habitat is available in gravel and sand areas along walking paths and grasslands.	Observed on site in the PSW; although species is not currently protected under the ESA. Not a concern with the retention of the PSW area.
Vascular Plants				

Species Name	Provincial (ESA) Status	Habitat Requirement	Habitat on Site	Project Concerns Associated with Habitat on Site
Butternut (<i>Juglans cinerea</i>)	Endangered	Variable but typically on well-drained soils.	Species was observed in forest and shrubland habitats on site.	Multiple Butternuts were observed on site during field surveys. A "net benefit" permit from the MNRF will be required before any work is undertaken.

* Species status is, or will soon be, under review and thus may change in the near future.

Species occurring or having some potential to occur on site due to presence of habitat.

3.7 Other Natural Heritage Features

There are no provincially or locally significant valleylands or Life Science Areas of Natural and Scientific Interest on or adjacent to the site. The wetland pond on the property is part of the Stoney Swamp Wetland Complex and is considered a significant wetland. The forests on the property have the potential to be classified as significant woodlands due to size and age class of the forests, but the City has already approved them for development.

4.0 PROJECT DESCRIPTION

The Draft Plan as currently approved (Figure 1) is for a community of country style estate lots across the site, which would result in some tree cover removal over the entire site. Each lot is limited to a maximum of 25% tree removal. The south end of the community however, includes a central open area (originally planned as an extension of the Cedar Hill golf course), ringed by a road (herein the crescent) with estate lots on each side, and extending to the edge of the property. While many trees could/would be retained on these lots, houses built there would necessitated the near-complete removal of all HDFs there (i.e. Reaches 8 and 9).

Under the amended development plan (Figure 2), a 22 m wide corridor for a new south access road would be run from O'Keefe Court along the west side of Lytle Park to the crescent. Reach 9, and its adjacent low-lying flooded areas during spring freshet, will be retained and preserved within a natural area transferred to the City. The upper portion of Reach 8 will be cut off by the crescent and removed (as it would be under the existing plan), but Reach 9 will be extended eastward along a realignment through the lower floodplain areas of Reach 8 to feed surface flows directly to Reach 1. The majority of the floodplain area associated with Reach 8 would thus be retained here.

The new south access road will be constructed in the late summer or fall of 2018 and will temporarily terminate at a turning circle to be located on the crescent ROW.








The top end of Reach 7 would no longer receive flows from Reach 8 and 9, but would continue to drain the south most tip of the existing Reach 8 spring flood area, the elevation of which is ~ 40 cm below the height of the bank of the new Reach 9 extension 40 m to the north. Reach 7 would also continue to receive runoff from the sports fields in Lytle park, conveying it to the existing pond feature in the park's south west corner. The 223 m long centre section of Reach 7 however, would be piped along the roadway to minimize the intrusion of the road corridor into the park. Catch basins located along the east side of the road corridor along the road will allow all portions of the park's sports fields to continue draining into that system.

Reach 6 is planned to be fully removed from the adjacent site by the site owners as that parcel is developed as a commercial block. Its contributions to downstream systems will be replicated and replaced through lot level conveyance measures such as well vegetated swales as that area is developed. That work and its associated mitigations though are not a Mattamy project and are separate from the proposal being evaluated here. The proposed roadway however, does not include a culvert or allow for any other connection for Reach 6 to Reach 7. The construction of the road will thus be coordinated with site development/management of the neighbouring property and their removal of Reach 6.

Currently, Reach 1, upon reaching O'Keefe Crt, dekes westward for 67 m through the road side ditch before passing through a culvert to joint with the O'Keefe Municipal Drain. A new westward channel will be created from the southern end of Reach 1, parallel to the existing roadside ditch to connect flows from the Reach to the Drain separate from the ditch along the edge of the forest where the walking path is currently located. The pathway will be relocated to a raised berm to be constructed between the ditch and the new channel.



Figure 2 Proposed amended development plan

- Revised CDP**
-  Lot Lines
 -  Retained Natural Corridor
- Headwater Features**
-  Flood Area
 -  Conservation
 -  Protection
 -  New
 -  Pipe

N

0 100 m

Project: MATT634
 Created By: AF
 MTM Zone 9
 (NAD 83)
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5.0 IMPACT ASSESSMENT

5.1 Significant Woodlands / Trees

The forests at the south end of the Cedarview property, and those around the PSW, appear to be the oldest on site and were visible in the 1965 GeoOttawa air photos (ELC: FOC4, FOD5, FOM4, and FOM7). These areas are both indicated under the City of Ottawa OP Schedule 'L' (Ottawa, 2014) and have the potential to be deemed significant woodlands. The forest area immediately adjacent to the PSW was to be preserved under the existing site plan. The new modified plan does not change this. The City has approved country estate development throughout the entire forested area of the south half of the property.

Under the modified community plan, fifteen estate lots totalling 5.9 ha along the south and west sides of the community will instead remain fully forested. Trees will remove along the 22 m wide corridor at the south edge of the property to allow for the new road to connect to road ringing the central park area. A band of trees 8 to 10 m wide must also be cleared through eastern half of the forested south side to allow for the realignment of the lower Reach 9 to connect to Reach 1.

The narrow band of trees (0.39 ha) within the FOD4 forest finger of the berm on the west side of Lytle Park will also be removed to accommodate the new roadway. Trees will also be removed from that crescent as the base is built up for road, though that construction activity is part of the existing Draft Plan approval and will be complete at a later date.

5.2 Impacts to Species at Risk

Four SAR were observed on site during field surveys: Bobolink, Monarch, Butternut and Snapping Turtle. A total of 44 Butternuts were observed on site during field surveys within the southern portion of the property and in areas around Lytle Park. Of these, 14 are located within 50 m of the new access road or proposed channel realignments. None of the 14 trees must be directly removed because of the proposed work, though the proposed works are sufficiently close to be considered as harmful to the trees. None of the trees have been yet been evaluate through a BHA. If a BHA finds the trees to in poor health, such that they are deemed non-retainable, they will no longer be subject to the *ESA*.

The other three SAR observed on site were all noted in central northward portions of the property > 400 m from the proposed roadway or channel realignment within habitat types well separate from these proposed works. No impacts from the proposed changes to the community design are anticipated to any of these species.

5.3 Impacts to Wildlife

The mosaic of habitats on site could be attractive to and support a diverse wildlife community. The site contains wetland, shrublands, various woodland types, and grasslands. The previous EIS completed for the site showed a diverse wildlife community; however, there was less development adjacent to the site at this time. During the site visits in 2016 there appeared to be a high level of human disturbance adjacent to the site, and use of the walking and biking trails through the site.

The wildlife community on the site has likely decreased since the previous EIS. There is little interconnectedness between the habitats on site and other habitats in the landscape, as previous stated. Due to this it is unlikely that many large mammals have stable populations on site (e.g. coyotes, deer) and most species on site are highly tolerant of human activity (e.g. woodchuck, raccoon, squirrels).

5.4 Impacts to Surface Water Features

Under the new proposal, the upper portions of Reach 9 will be preserved, within a natural corridor providing 30 to 45 m of buffer to the main line of the feature (469 m in length) and retaining the adjacent areas subject to spring flooding. The lower portion of Reach 9 (i.e. east of the new road) will be slightly realigned and extended eastward to form a 317 m feature connecting directly to Reach 1. Reach 8 will be removed above the crescent, but portions within the retained natural corridor will remain. Reach 8 will thus be reduced from 339 m to 84 m. Under the existing approved development plan for the area, both Reaches 9 and 8 will nearly be removed with a loss of 1,026 m of headwater channel. Under the new proposal, 870 m of HDF channel length will instead be retained and/or created. The area along these features subject to flooding during the spring freshet is currently 3.5 ha. Under the existing plan, the area available for spring storage capacity is reduce to 0.8 ha. Under the new proposal, 2.9 ha of the area is retained within the natural corridor.

A 223m portion of Reach 7 will be piped along new road corridor. A further 67 m of new channel will be constructed at the end of Reach 1 along the foot of the forest area there to allow baseflow from Channel 1 to bypass the O'Keefe Crt. roadside ditch. The combination of the new Reach 1 extension and the Reach 9 realignment will allow cold surface water from forests of the Cedarview community area to enter into the O'Keefe Drain without being subjected to undue solar warming in the pond along Reach 7, or road salt loading through the roadside ditch.

6.0 MITIGATIONS

6.1 Mitigations for Trees

As per the approval, tree coverage on estate lots must not be reduced by more than 25%. Tree removal within the new drain corridor along the lower Reach 9 must limited to a swath of the narrowest width possible to allow for the realignment, and should generally be less 8 m. The banks of the new feature must be revegetated, subject to a detailed landscape plan to be developed, that will aim to re-establish forest cover through the cut. Trees species planted within the corridor should consist of Red Maple, Silver Maple and Yellow Birch.

Where trees are to be removed, the following mitigation measures are recommended:

- Tree removal within the site should be limited to that which is necessary to accommodate site construction.

- To minimize impact to remaining trees during future site development:
 - Erect a fence at the Critical Root Zone (CRZ) of trees. The fence should be highly visible (e.g. orange construction fence) and paired with erosion 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 the tree;
 - Do not attach any signs, notices or posters to any tree;
 - Do not raise or lower the existing grade within the CRZ without approval;
 - Tunnel or bore when digging within the CRZ of a tree;
 - Do not damage the root system, trunk or branches of any tree; and
 - Ensure that exhaust fumes from all equipment are NOT directed towards any tree's canopy.
- The *Migratory Bird Convention Act* (Canada, 1994) protects the nests and young of migratory breeding birds in Canada. The City of Ottawa guidelines require no clearing of trees or vegetation between April 1 and August 15, unless a qualified biologist has determined that no nesting is occurring within 5 days prior to the clearing (Ottawa, 2014).

6.2 Mitigations for Species at Risk

Any construction taking place within 50 m of a Butternut must either be authorized by the MNRF through a standard permitting process, or subjected to a review by an MNRF SAR Biologist confirming that no harm will come to a Butternut. As a BHA has not been conducted for the individuals occurring directly within the development area, any such negotiations with the MNRF must be preceded by a BHA to be conducted in 2018.

Eastern Wood-pewee and Wood Thrush were both deemed to have potential to occur on site within the wooded areas around the road corridor and the Reach 9 realignment. Both of these species are listed as special concern, and not afforded habitat protections under the *ESA* (2007). Individuals are protected however from direct harm and/or damage to active nest sites, under the *Migratory Bird Convention Act* (Canada, 1994). Effective timing windows for land clearing will insure the protection of individuals and active nests. No clearing of trees or vegetation should be completed from April 1 through August 15 (Ottawa, 2017c), without a pre-clearing surveys completed by a biologist knowledge in bird identification and habitat preferences.

Although it is considered unlikely that SAR bats are using the site, timing windows for tree clearing must be applied. Trees should only be cleared outside of the active season for bats from May through October. If this timing window cannot be implemented, then a pre-clearing survey of the trees must be completed with a combination of cavity searches and acoustic monitoring.

Snapping Turtles were observed in the PSW, which will not be impacted by the project. Areas along other water ways where work is being conducted however, will require exclusion fencing and regular site inspections to ensure snapping turtles are not entering the worksites.

The typical wildlife mitigation measures listed in Section 6.4 will also help to reduce potential impacts to SAR.

6.3 Mitigations for Wildlife

The following mitigation measures must be implemented during any clearing and development of the lots on site:

- Areas shall not be cleared during sensitive time of the year for wildlife, unless mitigation measures are implemented and/or the habitat has been inspected by a qualified biologist.
- In water works cannot occur between March 15 and July 1. Fish must be relocated and excluded from any headwater area subject works prior to the commencement of that work. Removals and subsequent exclusion monitoring are to be conducted by a qualified biologist.
- Site clearing should be planned to help guide wildlife out of the area during development of the site (i.e. start on one side and move toward the far side guiding wildlife in that direction).
- Do not harm, feed, or unnecessarily harass wildlife.
- Food wastes and other garbage – effective mitigation measures include waste control (prevent littering); keeping all trash secured in wildlife-proof containers, and prompt removal from the site (especially in warm weather).
- Drive slowly and avoid hitting wildlife where possible.
- Water – effective mitigation measures include ensuring proper site drainage to limit standing pools of water; fencing off temporary storm ponds and other waterbodies within the work space (and not permitting wildlife access to any potentially contaminated waterbodies); and, use appropriate sediment and erosion control measures to protect the quality of surface water adjacent to or downstream of the work space.
- Shelter – effective mitigation measures include covering or containing piles of soil, fill, brush, rocks and other loose materials; capping ends of pipes where necessary to keep wildlife out; ensuring that trailers, bins, boxes, and vacant buildings are secured at the end of each work day to prevent access by wildlife.
- Checking the work site (including previously cleared areas) for wildlife, prior to beginning work each day;
- Regularly inspecting protective fencing or other installed measures to ensure their integrity and continued function; and,

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

6.4 Mitigations for Surface Water Features

Alteration of any of the surface water features on site, including headwater features southward flowing into or near Lytle Park, can only be done with a permit to alter a waterway from the RVCA. The requirement of a Fisheries Authorization (FA) from DFO must be determined through a Request-For-Review process. If an FA is deemed necessary, it must be in place prior to commencing work.

Site development will require at minimum, standard erosion and sediment control mitigation measures are in place to protect wetlands, streams, and drains from sediment laden runoff. Such measures include:

- Adopt a multi-barrier approach to provide erosion and sediment control;
- Retain existing vegetation and stabilize exposed soils with vegetation where possible;
- Limit the duration of soil exposure and phase construction when possible;
- Limit the size of disturbed areas by minimizing nonessential clearing and grading;
- Minimize slope length and gradient of disturbed areas;
- Maintain overland sheet flow and avoid concentrated flows; and
- Store/stockpile soil away (e.g. greater than 15 metres) from watercourses, drainage features and top of steep slopes.

Future grading and development of Cedarview community must ensure that street drainage from the crescent is not directed towards the realigned Reach 9 without suitable quality control through a storm water management system.

The road crossing of Reach 9 must employ a box culvert that is designed with a natural bottom with a span of at least 3 m and a height of 1 m of above the normal high water mark. The top edge along the road and the channel edges approaching both sides of the culverts must either be surrounded by permanent amphibian fencing so as to constrain and direct frogs and turtles through the culverts and limit direct access to the road above.

7.0 CLOSURE

It is our professional opinion that no negative impacts are anticipated to SAR or SAR habitat under this proposed revision to the approved development plan for the area. Preservation of significant portions of headwater features permitted under the revised plan along with channel alterations and additions that

will improve water quality to downstream receivers provide a greatly reduce the environmental impact the existing approved plan.

KILGOUR & ASSOCIATES LTD.



Anthony Francis, PhD
Senior Ecologist

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Appendix 1
Plant Survey Table

Scientific Name	Common Name	PX	P1	P2	P3	P4	P5	P6	P7	P9	P10	Status/ Sites (from Brunton, 2005)
<i>Acer ginnala</i> Maxim. * (Current name: <i>Acer tataricum</i> subsp. <i>ginnala</i> (Maxim.) Wesmael)	Amur Maple										X	Uncommon (spreading invasive)
<i>Acer negundo</i> L.	Manitoba Maple	X		X			X	X				Common
<i>Acer rubrum</i> L.	Red Maple		X			X						Common
<i>Acer saccharinum</i> L.	Silver Maple									X		Common
<i>Acer saccharum</i> Marsh.	Sugar Maple			X		X			X	X	X	Common
<i>Achillea millefolium</i> L.	Yarrow	X	X		X			X			X	Common
<i>Actaea pachypoda</i> Ell.	White Baneberry								X			Common
<i>Actaea rubra</i> (Ait.) Willd.	Red Baneberry					X	X		X			Common
<i>Agalinis tenuifolia</i> (Vahl.) Raf.	Slender Gerardia			X								Uncommon (locally abundant)
<i>Ageratina altissima</i> (L.) King & Robins. (<i>Eupatorium rugosum</i> Houtt.)	White Snakeroot						X		X	X	X	Common
<i>Agrimonia gryposepala</i> Wallr.	Hooked Agrimony				X						X	Common
<i>Agrostis scabra</i> Willd.	Tickle Grass		X									Uncommon
<i>Alisma triviale</i> Pursh	Water-plantain								X			Common
<i>Alliaria petiolata</i> (Bieb.) Cov. & Grande * (<i>A. officinalis</i> Andz.)	Garlic-mustard					X						Common (aggressively spreading invasive)
<i>Ambrosia artemisiifolia</i> L.	Ragweed	X			X							Common
<i>Amelanchier arborea</i> (Michx. f.) Fern. ssp. <i>laevis</i> (Wieg.) McKay (<i>A. laevis</i> Wieg.)	Shadbush		X								X	Common
<i>Anaphalis margaritacea</i> (L.) Benth. & Hook.	Pearly-everlasting				X			X			X	Common
<i>Anemone canadensis</i> L.	Canada Anemone		X		X	X	X	X	X	X	X	Common
<i>Antennaria</i> sp.	Pussy-toes						X					Common
<i>Apocynum androsaemifolium</i> L.	Spreading Dogbane		X						X		X	Common
<i>Aralia nudicaulis</i> L.	Wild Sarsaparilla		X						X	X		Common
<i>Arctium minus</i> Bernh. *	Common Burdock	X				X	X	X	X	X	X	Common
<i>Arisaema triphyllum</i> (L.) Schott	Jack-in-the-pulpit								X		X	Common
<i>Artemisia vulgaris</i> L. *	Mugwort	X					X					Common
<i>Asarum canadense</i> L.	Wild Ginger								X		X	Common
<i>Asclepias incarnata</i> L.	Swamp Milkweed					X				X	X	Common
<i>Asclepias syriaca</i> L.	Common Milkweed	X		X		X		X				Common
<i>Asparagus officinalis</i> L. *	Asparagus										X	Common
<i>Athyrium filix-femina</i> (L.) Roth var. <i>angustum</i> (Willd.) Lawson	Lady Fern					X						Common
<i>Barbarea vulgaris</i> R. Br. *	Yellow-rocket	X										Common
<i>Berteroa incana</i> (L.) DC. *	Hoary-alyssum							X				Common
<i>Betula alleghaniensis</i> Britt.	Yellow Birch								X			Common
<i>Betula papyrifera</i> Marsh.	White Birch			X	X	X	X		X	X	X	Common
<i>Bidens cernuus</i> L.	Nodding Beggarticks				X	X			X	X		Common
<i>Bidens frondosus</i> L.	Large-leaved Beggarticks								X			Common
<i>Boehmeria cylindrica</i> (L.) Sw.	False Nettle								X			Uncommon
<i>Bromus inermis</i> Leyss. *	Common Brome Grass	X			X		X	X			X	Common
<i>Campanula rapunculoides</i> L. *	Creeping Bellflower						X					Common
<i>Carduus acanthoides</i> L. *	Plumeless Thistle			X								Uncommon
<i>Carex arctata</i> Boott	Compressed Sedge								X			Common
<i>Carex bebbii</i> (Bailey) Fern.	Bebb's Sedge									X		Common
<i>Carex pseudo-cyperus</i> L.	Cypress-like Sedge								X			Common
<i>Carex retrorsa</i> Schw.	Back-turned Sedge								X			Common

<i>Carex</i> spp.	Sedge (non-flowering)									X		Common
<i>Carya cordiformis</i> (Wang) K. Koch	Bitternut Hickory				X	X	X			X	X	Common (local)
<i>Caulophyllum giganteum</i> (Farw.) Loc. & Black. (<i>C. thalictroides</i> var. <i>giganteum</i> Farw.)	Blue-cohosh					X				X		Common
<i>Celastrus scandens</i> L.	Bittersweet				X						X	Common
<i>Centaurea jacea</i> L. *	Brown Knapweed							X		X	X	Rare
<i>Chelidonium majus</i> L. *	Celandine					X						Uncommon (locally abundant)
<i>Chenopodium simplex</i> (Torr.) Raf. (<i>C. gigantospermum</i> Aellen; <i>C. hybridum</i> auct., non L.)	Maple-leaved Goosefoot											Common
<i>Cichorium intybus</i> L. *	Chickory	X			X			X				Common
<i>Cicuta bulbifera</i> L.	Bulblet Water-hemlock					X						Common
<i>Circaea lutetiana</i> L. ssp. <i>canadensis</i> (L.) Asch. & Magnus	Enchanter's-nightshade					X	X					Common
<i>Cirsium arvense</i> (L.) Scop. *	Canada Thistle	X				X		X		X	X	Common
<i>Cirsium vulgare</i> (Savi) Tenore *	Bull Thistle	X								X		Common
<i>Clematis virginiana</i> L.	Virgin's-bower		X			X	X	X				Common
<i>Clinopodium vulgare</i> L. * (<i>Satureja vulgaris</i> (L.) Fritsch)	Wild Basil			X	X	X	X		X	X	X	Common
<i>Cornus alternifolia</i> L.f.	Alternate-leaved Dogwood										X	Common
<i>Cornus sericea</i> L. (Current name: <i>C. stolonifera</i> Michx.)	Red-osier Dogwood				X	X	X			X	X	Common
<i>Crataegus</i> spp.	Hawthorn							X	X		X	Common
<i>Cynanchum rossicum</i> (Klepov) Barb. * (<i>Vincetoxicum medium</i> auct., non (R. Br.) Dcne; <i>V. rossicum</i> (Klepov) Barb.)	Swallow-wort		X									Uncommon (locally abundant invasive)
<i>Cystopteris bulbifera</i> (L.) Bernh.	Bulblet Bladder-fern								X	X		Common
<i>Dactylis glomerata</i> L. *	Orchard Grass										X	Common
<i>Danthonia spicata</i> (L.) P. Beauv. ex Roemer & Schultes	Poverty Grass		X	X	X		X					Common
<i>Daucus carota</i> L. *	Wild Carrot	X	X		X		X	X		X	X	Common
<i>Dichanthelium acuminatum</i> (Sw.) Gould & Clarke	Panic Grass				X							Common
<i>Doellingeria umbellata</i> (Mill) Nees (<i>Aster umbellatus</i> Mill.)	Flat-topped Aster					X			X	X	X	Common
<i>Dryopteris carthusiana</i> (Vill.) H.P. Fuchs (<i>D. spinulosa</i> (Muell.) Watt)	Spinulose Woodfern								X	X		Common
<i>Dryopteris marginalis</i> (L.) A. Gray	Marginal Shieldfern									X		Common
<i>Echium vulgare</i> L. *	Viper's Bugloss	X		X	X							Common
<i>Elymus repens</i> (L.) Gould * (<i>Agropyron repens</i> (L.) P.Beauv.)	Quack Grass										X	Common
<i>Epipactis helleborine</i> (L.) Crantz *	Helleborine					X	X		X			Common
<i>Equisetum arvense</i> L.	Field Horsetail				X	X				X		Common
<i>Equisetum variegatum</i> Schleich.	Variiegated Scouring-rush				X							Uncommon
<i>Erigeron annuus</i> (L.) Pers.	Daisy Fleabane				X						X	Common
<i>Erysimum cheiranthoides</i> L. *	Wormseed Mustard						X					Common
<i>Euonymus alatus</i> (Thunb.) Sieb. *	Winged Spindle-tree					X						Rare
<i>Eupatorium maculatum</i> L.	Joe-Pye-weed					X				X		Common
<i>Eupatorium perfoliatum</i> L.	Boneset					X				X		Common
<i>Euphrasia stricta</i> Wolf. *	Eyebright		X	X			X					Common (spreading).
<i>Euthamia graminifolia</i> (L.) Nutt. (<i>Solidago graminifolia</i> (L.) Salisb.)	Narrow-leaved Goldenrod	X						X		X	X	Common

<i>Fragaria virginiana</i> Duchesne	Common Strawberry	X	X	X	X	X	X	X	X	X	X	Common
<i>Fraxinus americana</i> L.	White Ash	X		X								Common
<i>Fraxinus nigra</i> Marsh.	Black Ash									X		Common
<i>Fraxinus pennsylvanica</i> Marsh.	Green Ash		X	X	X	X		X	X	X	X	Common
<i>Galeopsis tetrahit</i> L. *	Hemp-nettle										X	Common
<i>Galium mollugo</i> L. *	White Bedstraw		X		X			X			X	Common (spreading aggressively).
<i>Galium palustre</i> L.	Marsh Bedstraw					X					X	Common
<i>Geum aleppicum</i> Jacq.	Yellow Avens					X		X				Common
<i>Geum canadense</i> Jacq.	White Avens					X	X					Common
<i>Glyceria striata</i> (Lam.) A. Hitchc.	Fowl Manna Grass									X		Common
<i>Helianthus tuberosus</i> L. *	Jerusalem-artichoke	X					X		X	X		Uncommon
<i>Hemerocallis fulva</i> L. *	Day Lily										X	Common
<i>Hieracium</i> sp. *	Hawkweed		X	X			X					Common
<i>Hypericum perforatum</i> L. *	Common St. John's-wort	X		X	X						X	Common
<i>Impatiens capensis</i> Meerb.	Spotted Touch-me-not					X				X		Common
<i>Inula helenium</i> L. *	Elecampane									X		Common
<i>Juglans cinerea</i> L.	Butternut					X	X		X		X	Provincial Conservation Concern (S3?); Common [severe population decline anticipated due to rapid spread of disease]
<i>Juncus tenuis</i> Willd.	Path Rush		X	X					X		X	Common
<i>Juniperus communis</i> L.	Common Juniper		X	X	X		X	X			X	Common
<i>Lactuca scariola</i> L. *	Prickly-lettuce					X			X			Common
<i>Laportea canadensis</i> (L.) Wedd.	Canada Wood-nettle								X			Common
<i>Lapsana communis</i> L. *	Nipplewort						X		X			Uncommon
<i>Larix laricina</i> (Du Roi) K. Koch	Larch				X	X						Common
<i>Leersia oryzoides</i> (L.) Sw.	Rice Cut-grass					X				X		Common
<i>Lemna minor</i> L.	Small Duckweed					X						Common
<i>Leucanthemum vulgare</i> Lam. * (<i>Chrysanthemum leucanthemum</i> L.)	Ox-eye Daisy				X						X	Common
<i>Linaria vulgaris</i> Hill *	Toadflax	X									X	Common
<i>Lithospermum officinale</i> L. *	Gromwell	X			X			X				Common
<i>Lobelia inflata</i> L.	Indian-tobacco								X			Common
<i>Lonicera tatarica</i> L. *	Tartarian Honeysuckle		X	X	X	X	X			X	X	Common (aggressively invasive)
<i>Lotus corniculatus</i> L. *	Bird's-foot Trefoil	X			X		X	X		X		Common
<i>Lycopus americanus</i> Muhl.	Cut-leaved Bugleweed					X					X	Common
<i>Lycopus uniflorus</i> Michx.	Northern Bugleweed					X						Common
<i>Lythrum salicaria</i> L. *	Purple Loosestrife				X	X	X		X	X		Common (invasive)
<i>Maianthemum racemosum</i> (L.) Link (<i>Smilacina racemosa</i> (L.) Desf.)	False Solomon's-seal								X		X	Common
<i>Malus sylvestris</i> (L.) Mill. * (<i>Pyrus pumila</i> L.)	Domestic Apple	X		X	X	X	X	X	X	X	X	Common
<i>Matteuccia struthiopteris</i> (L.) Todaro	Ostrich Fern								X			Common
<i>Medicago lupulina</i> L. *	Black Medic				X							Common
<i>Melilotus alba</i> Desr. *	White Sweet-clover	X			X		X	X			X	Common
<i>Melilotus officinalis</i> (L.) Desr. *	Yellow Sweet-clover							X				Common
<i>Muhlenbergia mexicana</i> (L.) Trin.	Mexican Muhlenbergia								X			Common
<i>Oenothera biennis</i> L.	Evening-primrose			X								Common? [taxonomic problem]
<i>Onoclea sensibilis</i> L.	Sensitive Fern					X			X	X		Common
<i>Origanum vulgare</i> L. *	Wild Marjoram				X		X	X			X	Common (local)
<i>Ostrya virginiana</i> (Mill.) K. Koch	Ironwood			X		X	X		X	X	X	Common

<i>Oxalis stricta</i> L. (<i>O. europea</i> Jord.; <i>O. fontana</i> Bunge; <i>O. dillenii</i> Jacq.)	Yellow Wood-sorrel				X	X	X		X		X	Common
<i>Panicum capillare</i> L.	Witch Grass		X		X							Common
<i>Parthenocissus vitacea</i> (Knerr) Hitchc.	Virginia Creeper	X			X	X	X			X		Common
<i>Pastinaca sativa</i> L. *	Wild Parsnip							X				Common
<i>Persicaria amphibia</i> (L.) S. F. Gray (<i>Polygonum amphibium</i> L.)	Water Smartweed								X			Common
<i>Phalaris arundinacea</i> L. [*]	Reed Canary Grass	X				X		X		X		Common (locally abundant introduction)
<i>Phleum pratense</i> L. *	Timothy		X	X				X			X	Common
<i>Phryma leptostachya</i> L.	Lopseed								X			Uncommon
<i>Physalis heterophylla</i> Nees	Clammy Ground-cherry	X						X				Common
<i>Picea glauca</i> (Moench) Voss	White Spruce			X	X	X			X		X	Common
<i>Pilea pumila</i> (L.) A. Gray	Clearweed					X			X			Uncommon
<i>Pinus banksiana</i> Lamb.	Jack Pine		X									RS (3*): Constance Bay Sand Hills (locally abundant); Baskins Beach*; Carp Hills [also several large plantations].
<i>Pinus strobus</i> L.	White Pine			X		X					X	Common
<i>Pinus sylvestris</i> L. *	Scot's Pine			X								Rare [frequently planted]
<i>Plantago lanceolata</i> L. *	English Plantain		X	X							X	Common
<i>Plantago major</i> L. *	Common Plantain				X		X		X			Common
<i>Poa compressa</i> L. *	Wire Grass	X	X	X	X						X	Common
<i>Poa palustris</i> L.	Swamp Meadow Grass										X	Common
<i>Poa pratensis</i> L. *	June Meadow Grass	X	X	X			X	X				Common
<i>Polygonatum pubescens</i> (Willd.) Pursh	Solomon's-seal								X	X		Common
<i>Populus alba</i> L. *	White Poplar							X				Common
<i>Populus balsamifera</i> L.	Balsam Poplar				X					X	X	Common
<i>Populus deltoides</i> Marsh.	Eastern Cottonwood	X			X	X		X				Common
<i>Populus grandidentata</i> Michx.	Large-toothed Aspen				X			X				Common
<i>Populus tremuloides</i> Michx.	Trembling Aspen		X	X	X	X	X		X		X	Common
<i>Potentilla argentea</i> L. *	Silvery Cinquefoil		X	X	X							Common
<i>Potentilla recta</i> L. *	Rough-fruited Cinquefoil	X			X			X			X	Common
<i>Prunella vulgaris</i> L. [*]	Heal-all		X		X	X	X		X	X	X	Common
<i>Prunus nigra</i> Ait.	Canada Plum										X	Common
<i>Prunus pensylvanica</i> L.f.	Fire Cherry							X				Common
<i>Prunus serotina</i> Ehrh.	Black Cherry	X	X		X		X	X			X	Common
<i>Prunus virginiana</i> L.	Choke Cherry		X			X		X			X	Common
<i>Pteridium aquilinum</i> (L.) Kuhn var. <i>latiusculum</i> (Desv.) Underw.	Bracken			X								Common
<i>Quercus macrocarpa</i> Michx.	Bur Oak			X	X					X	X	Common
<i>Quercus rubra</i> L.	Red Oak		X	X		X						Common
<i>Ranunculus acris</i> L. *	Common Buttercup									X		Common
<i>Rhamnus cathartica</i> L. *	Black Buckthorn	X	X	X	X	X	X	X	X	X	X	Common (aggressive invasive)
<i>Rhamnus frangula</i> L. * (Current name: <i>Frangula alnus</i> Mill.)	Glossy Buckthorn	X	X	X	X	X	X	X	X	X	X	Common (aggressive invasive)
<i>Rhus hirta</i> (L.) Sudworth (Current name: <i>R. typhina</i> L.)	Staghorn Sumac	X		X	X	X	X	X	X		X	Common
<i>Ribes</i> spp.	Currant					X	X		X	X	X	Common
<i>Rosa acicularis</i> Lindl.	Bristly Rose		X	X								Common
<i>Rubus allegheniensis</i> Porter	Blackberry										X	Common
<i>Rubus odoratus</i> L.	Purple-flowered Raspberry					X	X		X			Common

<i>Rubus strigosus</i> Michx. (<i>R. idaeus</i> L. var. <i>strigosus</i> (Michx.) Max.)	Common Raspberry			X	X	X	X	X	X	X	X	X	Common
<i>Rudbeckia hirta</i> L. [*]	Brown-eyed Susan				X		X	X				X	Common
<i>Rumex crispus</i> L. *	Curled Dock	X						X		X			Common
<i>Salix nigra</i> Marsh.	Black Willow				X								Uncommon
<i>Salix</i> spp. (shrubby species)	Willow					X							Common
<i>Sambucus canadensis</i> L.	Canada Elderberry											X	Uncommon
<i>Sambucus racemosa</i> L. ssp. <i>pubens</i> (Michx.) House (<i>S. pubens</i> Michx.)	Red Elderberry						X		X				Common
<i>Sanguinaria canadensis</i> L.	Bloodroot											X	Common
<i>Saponaria officinalis</i> L. *	Bouncing-bet							X		X			Common
<i>Saxifraga virginensis</i> Michx. (Current name: <i>Micranthes virginensis</i> (Michx.) Small)	Early Saxifrage			X									Common
<i>Schoenoplectus pungens</i> (Vahl) Palla (<i>Scirpus pungens</i> Vahl)	Three-square Bulrush											X	Common
<i>Scirpus hattorianus</i> Fern. (<i>S. atrovirens</i> Willd., p. pt.)	Mosquito Bulrush								X				Common
<i>Scutellaria lateriflora</i> L.	Mad-dog Skullcap								X				Common
<i>Senecio pauperculus</i> Muhl.	Balsam Ragwort		X	X									Common
<i>Setaria viridis</i> (L.) P. Beauv. *	Green Bristlegrass											X	Common
<i>Silene vulgaris</i> (Moench) Garcke * (<i>S. cucubalus</i> Wibel)	Bladder Campion	X		X	X		X	X		X	X		Common
<i>Solanum dulcamara</i> L. *	Bittersweet Nightshade					X		X	X	X			Common
<i>Solidago altissima</i> L. (<i>S. canadensis</i> L. var. <i>scabra</i> (Muhl.) T. & G.)	Tall Goldenrod	X											Common
<i>Solidago canadensis</i> L.	Canada Goldenrod	X	X		X	X	X	X	X	X	X	X	Common
<i>Solidago nemoralis</i> Ait.	Old-field Goldenrod		X	X	X		X	X					Common
<i>Sonchus arvensis</i> L. *	Sow-thistle					X		X					Common
<i>Spiraea alba</i> Du Roi var. <i>alba</i>	Meadowsweet		X	X		X							Common
<i>Spiranthes cernua</i> (L.) Rich.	Nodding Ladies-tresses			X									Common
<i>Sporobolus neglectus</i> Nash	Overlooked Dropseed		X	X				X					Common
<i>Stachys palustris</i> L. *	Woundwort											X	Uncommon
<i>Symphotrichum cordifolium</i> (L.) Nesom (<i>Aster cordifolius</i> L.)	Heart-leaved Aster		X										Common
<i>Symphotrichum lateriflorum</i> (L.) A. & D. Love (<i>Aster lateriflorus</i> (L.) Britt.)	Calico Aster	X		X	X	X	X	X		X	X		Common
<i>Symphotrichum novae-angliae</i> (L.) Nesom (<i>Aster novae-angliae</i> L.; <i>Virgulus novae-angliae</i> (L.) Rev. & Keen)	New England Aster	X				X		X					Common
<i>Symphotrichum puniceum</i> (L.) Nesom (<i>Aster puniceus</i> L.)	Purple-stemmed Aster	X	X	X	X	X	X	X				X	Common
<i>Syringa vulgaris</i> L. *	Lilac						X					X	Common
<i>Taraxacum officinale</i> Weber *	Common Dandelion	X			X								Common
<i>Thuja occidentalis</i> L.	White Cedar		X	X	X	X	X	X	X	X	X	X	Common
<i>Tilia americana</i> L.	Basswood				X	X	X	X	X	X	X	X	Common
<i>Toxicodendron rydbergii</i> (Rydb.) Greene (Current name: <i>Toxicodendron radicans</i> (L.) Kuntze var. <i>rydbergii</i> (Small ex Rydberg) Erskine)	Poison-ivy		X			X	X		X				Common
<i>Tragopogon dubius</i> Scop. * (<i>T. major</i> Jacq.)	Goat's-beard			X				X					Common

<i>Tragopogon pratensis</i> L. *	Goat's-beard	X					X				X	Common
<i>Trifolium pratense</i> L. *	Red Clover	X		X	X		X	X		X		Common
<i>Trifolium repens</i> L. *	White Clover	X									X	Common
<i>Trillium erectum</i> L.	Red Trillium								X			Common
<i>Trillium grandiflorum</i> (Michx.) Salisb.	White Trillium								X			Common
<i>Tussilago farfara</i> L. *	Colts-foot				X	X			X	X		Uncommon (spreading common).
<i>Typha angustifolia</i> L.	Narrow-leaved Cat-tail					X				X		Common
<i>Typha latifolia</i> L.	Common Cat-tail					X				X		Common
<i>Ulmus americana</i> L.	White Elm		X	X		X		X	X	X	X	Common
<i>Ulmus thomasii</i> Sarg.	Rock Elm							X			X	Uncommon (locally abundant)
<i>Urtica dioica</i> L. ssp. <i>gracilis</i> (Ait.) Selander	Slender Stinging Nettle								X			Common
<i>Verbascum thapsus</i> L. *	Mullein			X	X						X	Common
<i>Veronica officinalis</i> L. *	Common Speedwell					X	X					Common
<i>Viburnum acerifolium</i> L.	Maple-leaf Viburnum					X	X					Common
<i>Viburnum lentago</i> L.	Southern Wild-raisin					X		X			X	Common
<i>Viburnum trilobum</i> Marsh. (<i>V. opulus</i> L. var. <i>americanum</i> (Mill.) Ait.)	Highbush-cranberry									X		Uncommon
<i>Vicia cracca</i> L. *	Cow Vetch	X			X	X	X	X		X	X	Common
<i>Vinca minor</i> L.	Periwinkle					X						Uncommon (invasive)
<i>Viola</i> spp.	Violet					X	X		X			Common
<i>Vitis riparia</i> Michx.	River Grape	X		X	X	X	X	X	X	X	X	Common
<i>Waldsteinia fragarioides</i> (Michx.) Tratt.	Barren Strawberry							X				Common

* - Species is considered an introduced species to Ontario.

Sources: Brouillet, L., F. Coursol, S.J. Meades, M. Favreau, M. Anions, P. Bélisle & P. Desmet. 2010+. VASCAN, the Database of Vascular Plants of Canada. <http://data.canadensys.net/vascan/> (consulted on 2014-07-08)

Brunton, D. 2005. Urban Natural Areas Environmental Study. Appendix A - Vascular Plants of the City of Ottawa, with the identification of significant species. City of Ottawa.

Stevens, P. F. (2001 onwards). Angiosperm Phylogeny Website. Version 12, July 2012. <http://www.mobot.org/MOBOT/research/APweb/>.

(PS) - Provincial Conservation Concern - typically known from fewer than 100 populations known in Ontario; the NatureServe subnational conservancy status rank (SRANK) assigned to each species by the Ontario Heritage Information Centre (Oldham 1999) is noted, followed by the statement of their status in Ottawa. NatureServe codes employed here are:

- S1 - Extremely rare in Ontario; usually 5 or fewer occurrences;
- S2 - Very rare in Ontario; usually between 6 and 20 occurrences or with many individuals in fewer occurrences
- S3 - Rare in Ontario; usually between 21 and 100 occurrences;
- S4 - Uncommon to locally common in Ontario and apparently secure; usually between 101 and 1000 occurrences.

(RS) - Regionally Significant - known from X0 or fewer contemporary populations (post-1969) in the City of Ottawa. This includes the Rare (5 or fewer populations) and sparse (6 to 10 populations) categories employed by Gillett & White (1978) and Brunton (1998). Species known only from pre-1970 records are annotated as Rare (Historic). The year 1970 was selected as a reasonable limit of our understanding of 'contemporary' since it constitutes a sufficiently long period of time (35 years) for the development of a comprehensive set of data while still offering the likelihood of substantially unchanged site conditions at particular locations.

Appendix 2
Incidental Wildlife Observations

Common Name	Scientific Name	Common Name	Scientific Name
Birds		Birds (continued)	
American Goldfinch	<i>Spinus tristis</i>	Nashville Warbler	<i>Leiothlypis ruficapilla</i>
American Redstart	<i>Setophaga ruticilla</i>	Northern Flicker	<i>Colaptes auratus</i>
American Robin	<i>Turdus migratorius</i>	Palm Warbler	<i>Setophaga palmarum</i>
Baltimore Oriole	<i>Icterus galbula</i>	Pileated Woodpecker	<i>Hylatomus pileatus</i>
Black-capped Chickadee	<i>Poecile atricapillus</i>	Purple Finch	<i>Haemorhous purpureus</i>
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	Red-breasted Nuthatch	<i>Sitta canadensis</i>
Blue Jay	<i>Cyanocitta cristata</i>	Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Bobolink ¹	<i>Dolichonyx oryzivorus</i>	Swamp Sparrow	<i>Melospiza georgiana</i>
Brown-headed Cowbird	<i>Molothrus ater</i>	Yellow Warbler	<i>Setophaga petechia</i>
Canada Goose	<i>Branta canadensis</i>	Yellow-rumped Warbler	<i>Setophaga coronata</i>
Chipping Sparrow	<i>Spizella passerina</i>	Amphibians and Reptiles	
Common Grackle	<i>Quiscalus quiscula</i>	Leopard Frog	<i>Lithobates pipiens</i>
Common Merganser	<i>Mergus merganser</i>	Midland Painted Turtle	<i>Chrysemys picta marginata</i>
Downy Woodpecker	<i>Picoides pubescens</i>	Mammals	
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Chipmunk	<i>Tamias striatus</i>
European Starling	<i>Sturnus vulgaris</i>	Red Squirrel	<i>Tamiasciurus hudsonicus</i>
Field Sparrow	<i>Spizella pusilla</i>	Arthropods	
Great Egret	<i>Ardea alba</i>	Monarch ¹	<i>Danaus plexippus</i>
Green Heron	<i>Butorides virescens</i>	Canadian Tiger Swallowtail	<i>Papilio canadensis</i>
Golden-crowned Kinglet	<i>Regulus satrapa</i>	Eastern Tailed Blue	<i>Cupido comyntas</i>
Mallard	<i>Anas platyrhynchos</i>		

1 = species is designated as threatened under the Endangered Species Act (2007).

2 = Species is designated as endangered under the Endangered Species Act (2007).

Appendix 3
Qualifications of Report Authors

Anthony Francis, PhD

Dr. Francis is an ecologist with over 18 years of experience in both terrestrial and aquatic projects. His doctoral thesis work on global plant diversity patterns included conducting tree surveys across North America. As a consulting ecologist he has worked on diverse ecological projects including literature reviews of forestry management and species-at-risk; environmental studies of contaminants (metals and suspended particulates); geomatic and statistical analyses for federal and provincial ministries as well as for private industry; and aquatic and terrestrial species inventories. He has contributed to environmental impact statements and federal environmental screening assessments for creek realignments and other infrastructure projects across Ontario.

Terry Hams M.Sc.

Terry is a terrestrial ecologist with over 10 years of experience in terrestrial field work and six years of experience in ecological consulting. He has worked on various projects across the United States and Canada surveying for terrestrial plants and wildlife. Terry has worked on Environmental Assessments for potash mines, Environmental Impact Statements, Constraints Assessments, and Species at Risk Assessments. He has experience performing of Species at Risk surveys across Canada and has extensive knowledge of terrestrial plant and wildlife species.