

July, 2017



MINTO COMMUNITIES - CANADA

14-1290

ENVIRONMENTAL IMPACT STUDY

Harmony Stage II

(4005 Strandherd Drive, Ottawa)



Submitted by

Dillon Consulting Limited
177 Colonnade Road, Suite 101
Ottawa, Ontario K2E 7J4

July 14, 2017



Minto Communities - Canada
200-180 Kent Street
Ottawa, ON
K1P 0B6

177 Colonnade Road
Suite 101
Ottawa, Ontario
Canada
K2E 7J4
Telephone
613.745.2213
Fax
613.745.3491

Clarke Lands Development Environmental Impact Study

Dear Mr. Lalonde,

The following updated Environmental Impact Study (EIS) for the Harmony Stage II (previously referred to as Clarke Lands) Development has been prepared in accordance with the City of Ottawa's EIS guidelines.

If you have any questions about the report please feel free to contact me to discuss.

DILLON CONSULTING LIMITED

A handwritten signature in blue ink, appearing to read "A. Zeller", is positioned above the printed name and title.

Alexander Zeller, M.Sc.
Associate

Encl.

Our file: 14-1290

Table of Contents

Executive Summary

| | | |
|------------|--|-----------|
| 1.0 | Introduction | 1 |
| 1.1 | Purpose | 1 |
| 1.2 | Property Information | 4 |
| 2.0 | Description of the Natural Environment | 6 |
| 2.1 | Landforms, Soils and Geology | 6 |
| 2.2 | Aquatic Environment | 7 |
| 2.3 | Natural Heritage Features | 7 |
| 2.3.1 | Wetlands | 7 |
| 2.3.2 | Woodlands | 8 |
| 2.3.3 | Valleylands | 8 |
| 2.3.4 | Areas of Natural and Scientific Interest | 8 |
| 2.3.5 | Significant Wildlife Habitat | 8 |
| 2.3.6 | Species at Risk | 9 |
| 2.3.7 | Fish Habitat | 10 |
| 2.4 | Trees | 10 |
| 2.5 | Incidental Wildlife | 10 |
| 2.6 | Other Development Constraints | 10 |
| 2.7 | Scope of Work | 10 |
| 3.0 | Methodology | 12 |
| 3.1 | Fieldwork | 12 |
| 3.2 | Aquatic Environment | 12 |
| 3.3 | Natural Heritage Features | 12 |
| 3.3.1 | Ecological Land Classification | 12 |
| 3.3.2 | Wetlands | 13 |
| 3.3.3 | Woodlands | 13 |
| 3.3.4 | Significant Wildlife Habitat | 13 |
| 3.3.5 | Species at Risk | 14 |
| 3.3.6 | Fish Habitat | 14 |
| 3.4 | Trees | 14 |
| 3.4.1 | Tree Inventory | 14 |

| | | |
|------------|--|-----------|
| 3.5 | Incidental Wildlife | 14 |
| 4.0 | Results | 15 |
| 4.1 | Aquatic Environment | 15 |
| 4.2 | Natural Heritage Features | 15 |
| 4.2.1 | Ecological Land Classification | 15 |
| 4.2.2 | Wetlands | 17 |
| 4.2.3 | Woodlands | 17 |
| 4.2.4 | Valleylands | 19 |
| 4.2.5 | Areas of Natural and Scientific Interest | 19 |
| 4.2.6 | Significant Wildlife Habitat | 19 |
| 4.2.7 | Species at Risk | 21 |
| 4.2.8 | Fish Habitat | 21 |
| 4.3 | Trees | 21 |
| 4.4 | Incidental Wildlife | 24 |
| 5.0 | Description of the Proposed Project | 25 |
| 6.0 | Impact Assessment and Mitigation | 27 |
| 6.1 | Aquatic Environment | 27 |
| 6.1.1 | Impacts | 27 |
| 6.1.2 | Mitigation | 27 |
| 6.2 | Natural Heritage Features | 29 |
| 6.2.1 | Vegetation Communities & Significant Woodlands | 29 |
| 6.3 | Species at Risk | 31 |
| 6.3.1 | Impacts | 31 |
| 6.3.2 | Mitigation | 31 |
| 6.4 | Trees | 31 |
| 6.4.1 | Impacts | 31 |
| 6.4.2 | Mitigation | 32 |
| 6.5 | Incidental Wildlife | 33 |
| 6.5.1 | Impacts | 33 |
| 6.5.2 | Mitigation | 33 |
| 7.0 | Cumulative Impacts | 35 |
| 8.0 | Summary and Conclusions | 36 |

Figures

| | |
|--|----|
| Figure 1: Study Area | 2 |
| Figure 2: Harmony Stages of Development..... | 3 |
| Figure 3: Land Use Changes Over Time | 6 |
| Figure 4: Existing Conditions..... | 16 |
| Figure 5: Tree Inventory | 22 |
| Figure 6: Proposed Site Plan | 26 |
| Figure 7: Environmental Impacts | 28 |

Tables

| | |
|--|----|
| Table 1: Policies and Legislation | 5 |
| Table 2: Species of Conservation Concern Identified Within the General Vicinity of the Study Area | 8 |
| Table 3: Species at Risk Identified as Potentially Occurring within the Vicinity of the Study Area | 9 |
| Table 4: Dates and Times of Field Surveys | 12 |
| Table 5: Ecological Land Classification | 18 |
| Table 6: Birds Observed June – July 2015..... | 20 |
| Table 7: Tree Species within the Study Area | 23 |
| Table 8: Specimen Trees Observed within the Study Area | 23 |
| Table 9: Incidental Wildlife Species Observed within the Study Area | 24 |

Appendices

| | |
|---|----------------------------|
| A | Agency Consultation |
| B | Fraser Clark Drain Permits |
| C | Curriculum Vitae |
| D | Site Photos |
| E | Vegetation Inventory |
| F | Species Screening Table |

References

Executive Summary

Dillon Consulting Limited was retained by Minto Communities Canada (Minto) to complete an Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) for the proposed Harmony Stage II Development, located on 4005 Strandherd Drive, in the City of Ottawa. The primary objective of the EIS and TCR is to evaluate environmental impacts associated with the proposed residential development.

Field surveys consisted of Ecological Land Classification, breeding bird surveys, and a Tree Inventory.

- 1) There is a Significant Woodland located within the proposed Stage II development area, following the Fraser Clarke drain. In the spring of 2017, this woodland was cleared under a tree clearing permit issued by the City of Ottawa.
- 2) The property is not located near any provincially significant wetlands, significant valleylands, areas of natural and scientific interest, significant wildlife habitat, or additional natural heritage constraints.
- 3) Several Specimen Trees (defined as >70cm DBH for the purposes of this report) are growing within the wooded riparian corridor of the Fraser Clarke Watercourse (municipal drain). While many of the trees within this corridor are dead or dying, the condition of the Specimen Trees was determined to be fair or better.
- 4) The possible environmental impacts resulting from the proposed Stage II development phase include erosion and sedimentation, a loss of vegetation and trees, and disturbance to breeding birds associated with the removal of trees and drainage features from the Study Area. With the implementation of proper mitigation measures, impacts will be avoided and no residual effects are anticipated.
- 5) No Species at Risk or Species at Risk habitat was identified within the Study Area.

The mitigation and compensation measures proposed in this report have been developed to avoid negative impacts associated with development on the natural environment. Overall, no negative residual impacts are anticipated as a result of this development providing that the recommended mitigation measures are implemented.

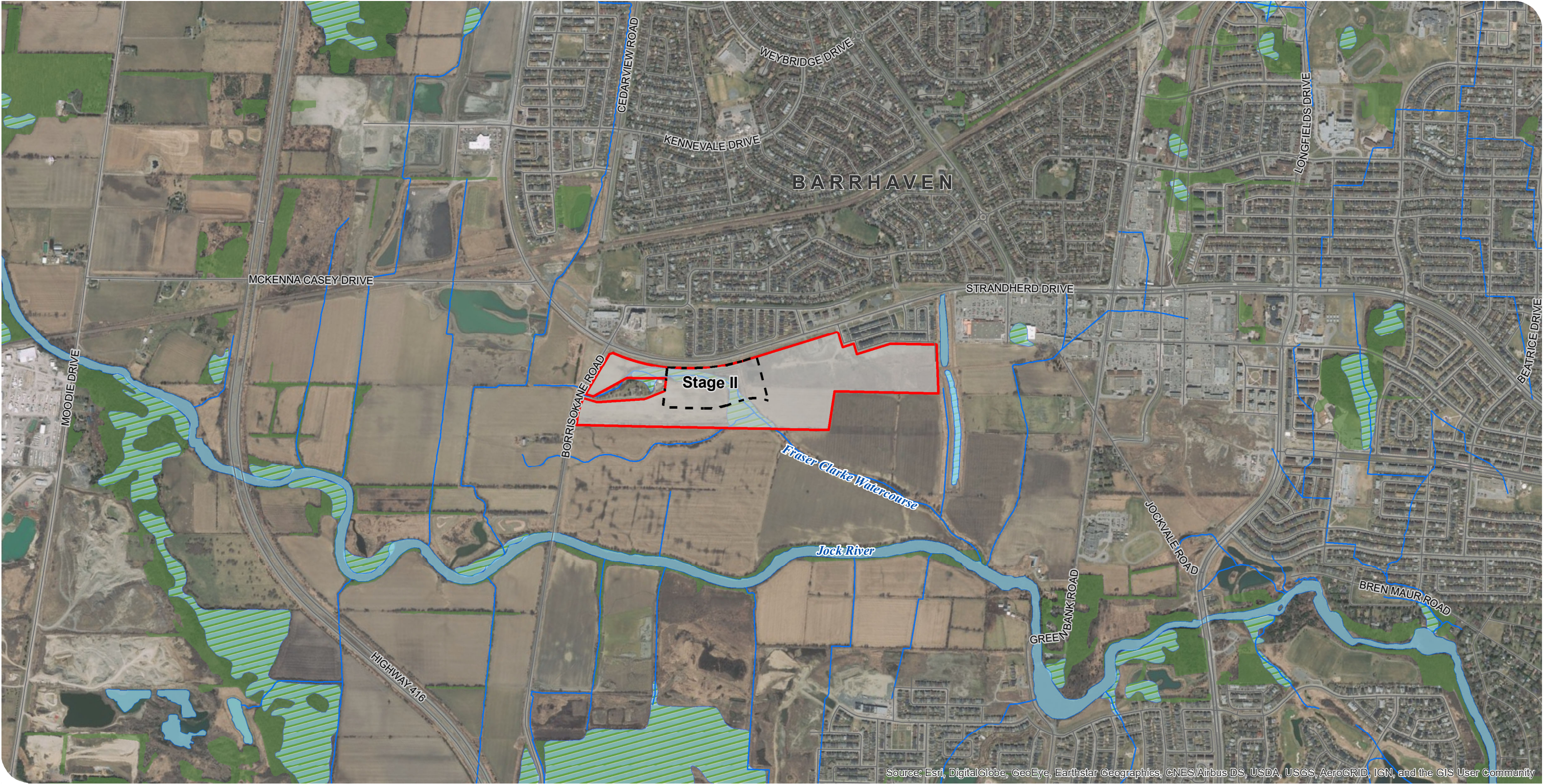
1.0 Introduction

1.1 Purpose

Dillon Consulting Limited (Dillon) was retained by Minto Communities Canada (Minto) to complete an Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) for the proposed Minto Harmony Development, located at 4005 Strandherd Drive, in the City of Ottawa (the “Study Area”)(Figure 1).

This EIS and TCR has been prepared in general accordance with the City of Ottawa’s EIS Guidelines (2nd Edition, April 2012), to evaluate the potential for environmental impacts associated with the proposed development and to recommend mitigation measures to offset those impacts. Such measures include, but are not limited to, retaining as much natural vegetation as possible, including mature trees, stands of trees, and hedgerows; as stated in the City of Ottawa Tree Conservation Report Guidelines (2012). In addition, this EIS and TCR has been prepared to identify potential issues with Species at Risk (SAR) in an effort to avoid potential contravention of the *Endangered Species Act, 2007* (ESA).

The Harmony development includes three distinct stages of construction; Stage I, Stage II, and Stage III (see Figure 2). In addition, there is a proposed school block between Stage I and II. At the time of preparation of this report, Stage I has received Draft Plan of Approval. This report will focus on the potential natural heritage impacts of development of Stage II.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community








MINTO COMMUNITIES - CANADA

Harmony Stage II Residential Development

Figure 1

Study Area



- | | | |
|--|--|--|
|  Study Area |  Watercourse |  Wooded Area (MNRF) |
|  Proposed Stage II Development Area |  Waterbody (MNRF) | |
|  Road |  Wetlands (MNRF) | |

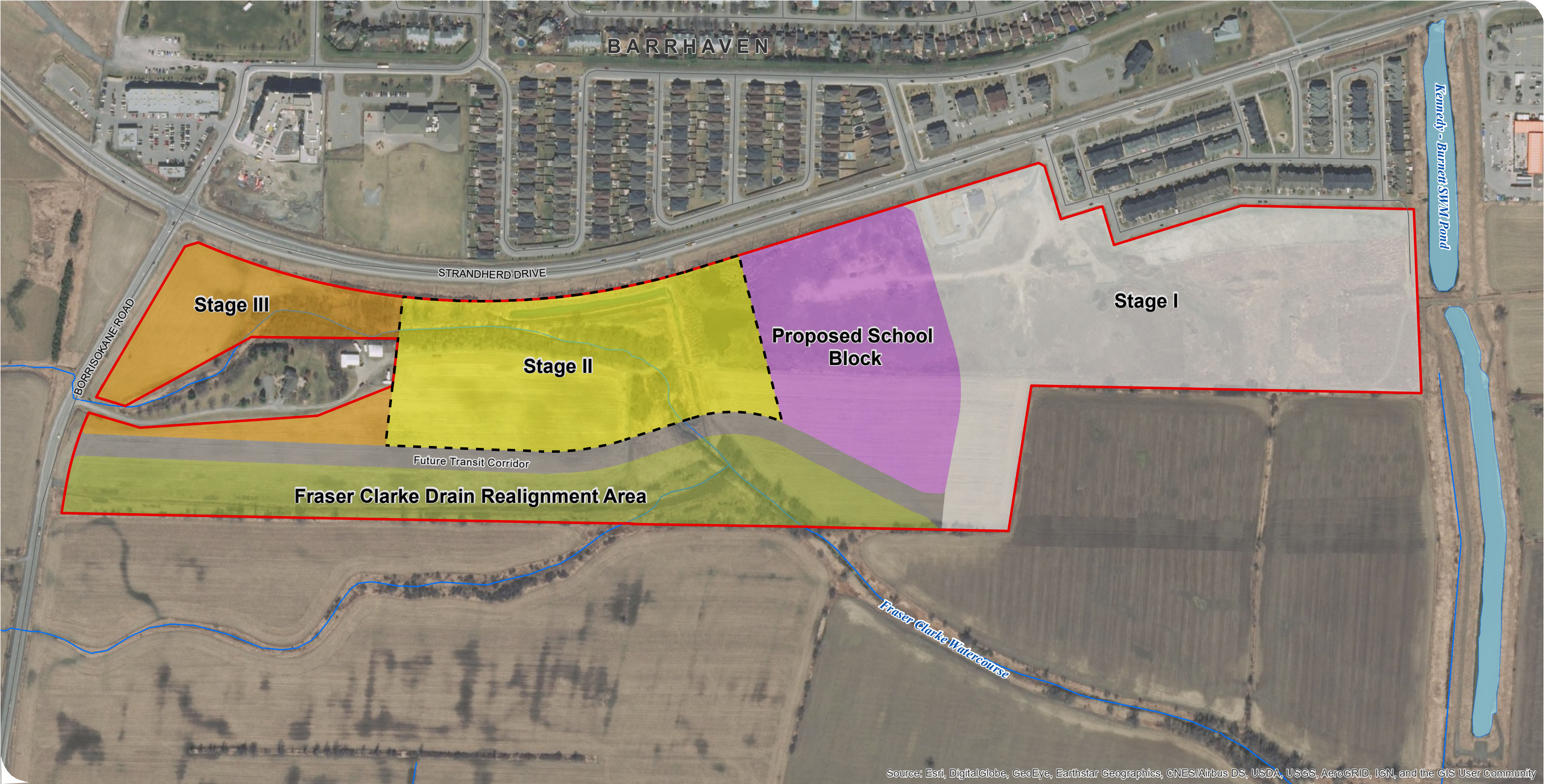


MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK
MAP CHECKED BY: AZ
MAP PROJECTION: NAD 1983 UTM Zone 18N



PROJECT: 14-1290 STATUS: FINAL DATE: 2017-07-12



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

MINTO COMMUNITIES - CANADA
Harmony Stage II Residential Development

Figure 2
Stages of Development



- | | | | |
|------------------------------------|--------------------------------------|--------------------------|-------------------------|
| Study Area | Watercourse (MNRF) | Stage I of Development | Proposed School Block |
| Proposed Stage II Development Area | Stormwater Management Pond (MNRF) | Stage II of Development | Future Transit Corridor |
| Road | Fraser Clarke Drain Realignment Area | Stage III of Development | |



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK
MAP CHECKED BY: AZ
MAP PROJECTION: NAD 1983 UTM Zone 18N



PROJECT: 14-1290 STATUS: FINAL DATE: 2017-07-12

1.2

Property Information

| | |
|---|---------------------------------------|
| <i>Owner:</i> | Minto Communities Canada |
| <i>Address:</i> | 4005 Strandherd Drive, Barrhaven Ward |
| <i>Lot and concession:</i> | Part Lot 14 & 15, Concession 3 |
| <i>Property Identification Number(s):</i> | 045950133; 045950053 |
| <i>Zoning:</i> | Development Reserve Zone |
| <i>OP designation:</i> | General Urban Area, Employment Area |

Location

The Study Area is located in the community of Barrhaven; bounded by Strandherd Drive to the north and Borrisokane Road to the west.

Land Use and Zoning

The City of Ottawa's Official Plan has designated the Study Area as General Urban Area with a small portion of Employment Area in the northwest corner. The property is zoned as Development Reserve (DR).

Policy Framework

Various regulatory agencies and legislative authorities have established a number of governing policies in an effort to protect ecological features and functions. Table 1 lists the policies and legislation that apply to the protection of natural heritage features within the Ottawa area and supporting guidance documents and resources respective to each policy. The scope of this report evaluates the natural features governed by the policies outlined in Table 1.

Table 1: Policies and Legislation

| Policy | Guidelines and Supporting Documents |
|---|---|
| PROVINCE OF ONTARIO | |
| Provincial Policy Statement (2014) | <p>Ministry of Natural Resources and Forestry (MNRF) Kemptville District Main Contact: Erin Seabert, Fish and Wildlife Technical Specialist</p> <ul style="list-style-type: none"> Records requested directly from MNRF Kemptville District relating to natural features and wildlife species (Appendix A) <p>MNRF Natural Heritage Information Centre (NHIC)</p> <ul style="list-style-type: none"> Species of Conservation Concern Natural heritage features <p>Ecological Land Classification for Southern Ontario, Second Approximation 2008</p> <p>Natural Heritage Reference Manual, Second Edition, March 2010</p> <p>Ontario Wetland Evaluation System, Southern Manual, Third Edition, 2013</p> <p>MNRF Significant Wildlife Habitat Technical Guide (2000)</p> <ul style="list-style-type: none"> Significant Wildlife Habitat Eco-region 6E Criterion Schedules, 2015 <p>Fisheries and Oceans Canada (DFO)</p> <ul style="list-style-type: none"> Ottawa River Map 15 of 16, September 2016 <p>Federal SAR Public Registry, accessed January 2016</p> <p>Ontario Breeding Birds Atlas (OBBA) - online data accessed January 2016</p> <p>Ontario Reptile and Amphibian Atlas- online data accessed January 2016</p> <p>Ontario Butterfly Atlas- online data accessed September 2015</p> <p>Atlas of the Mammals of Ontario</p> |
| Ontario <i>Endangered Species Act</i> (2007) | <p>MNRF SAR in Ontario (SARO) List (O.Reg. 230/08), January 2016</p> <p>MNRF Kemptville District Main Contact: Erin Seabert, Fish and Wildlife Technical Specialist</p> <ul style="list-style-type: none"> Received SAR occurrence records (Appendix A) <p>MNRF NHIC</p> <ul style="list-style-type: none"> SAR occurrence records <p>Ontario Breeding Birds Atlas (OBBA) - online data accessed January 2016</p> <p>Ontario Reptile and Amphibian Atlas- online data accessed January 2016</p> |
| CITY OF OTTAWA | |
| City of Ottawa Official Plan (2014) | <p>Schedules B, K, and L1, consolidated to 2014</p> <p>City of Ottawa's "geoOttawa" online mapping service</p> <p>Environmental Impact Statement Guidelines, 2nd Edition (2012)</p> <p>Protocol for Wildlife Protection During Construction (2015)</p> |
| CONSERVATION AUTHORITY | |
| <i>Conservation Authorities Act</i> , Ontario Regulation 174/06 | <p>Rideau Valley Conservation Authority (RVCA)</p> <ul style="list-style-type: none"> Floodplain mapping <p><i>Evaluation, Classification and Management of Headwater Drainage Features Guidelines (2014)</i></p> |

2.0 Description of the Natural Environment

A desktop review of the property indicates that the property is predominantly agricultural land, cultivating both row crops and hay (Figure 3). There is a watercourse within a wooded riparian area near the centre of the site within the Stage II development area, and treed hedgerows throughout the Study Area. A review of available historic aerial photos indicates that the property has been agricultural since at least 1976. The surrounding area is also agricultural with recent development to the north along Strandherd Drive.

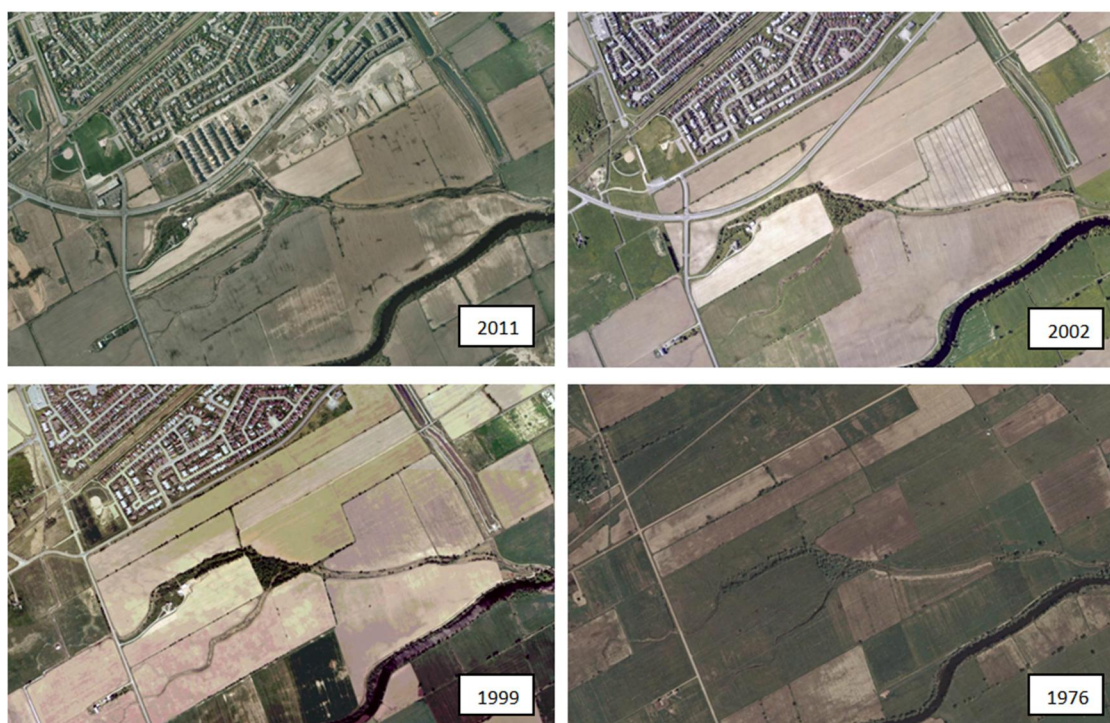


Figure 3: Land Use Changes Over Time

The following section provides a brief summary of the existing environmental conditions within the Study Area. This information provides the background information upon which the EIS and TCR is based.

2.1 Landforms, Soils and Geology

The Study Area lies over Lower Ordovician bedrock consisting of dolostone and sandstone (Ministry of Northern Development and Mines 1991). The physiography of the area is described as clay plain and limestone plain (MNRF 1984). Soils within the Study Area are comprised of slightly acidic to neutral, moderately coarse to medium textured marine estuary materials; and neutral to mildly alkaline, moderately fine textured, and modified marine veneer overlying fine textured marine clay. There are

also marine gullies with steep valley walls and narrow creek beds present (Canada Department of Agriculture 1976).

2.2 Aquatic Environment

The Study Area lies within the Jock River Subwatershed, which flows northeast into the Ottawa River (RVCA, 2010). The watershed has been widely studied by the City of Ottawa and RVCA due to development pressure within the Lower Rideau Subwatershed. Studies include the *Lower Rideau Subwatershed Report* (RVCA, 2012), and associated catchment reports, including the Jock River - Barrhaven catchment in which the Study Area is located.

A portion of watercourse within the Study Area is planned for removal. A cut/fill permit was first issued by the RVCA in 2005. The permit includes plans for relocation of the drain, removal of the trees within the riparian corridor, and creation of a new riparian habitat corridor along the new channel. This permit was reissued, together with a Tree Cutting permit from the City of Ottawa in 2009. An updated Tree Cutting permit was issued in July 2016 (see *Appendix B*). Due to the ongoing consultation with the RVCA regarding plans for this watercourse, no formal assessment of watercourses within the Study Area was completed as part of this EIS.

2.3 Natural Heritage Features

A number of natural heritage features require consideration for protection under the Ontario Provincial Policy Statement (Ontario Ministry of Municipal Affairs and Housing, 2014) and are administered by both the City of Ottawa and the Province of Ontario. These features are:

- Provincially Significant Wetlands (PSW);
- Significant woodlands;
- Significant valleylands;
- Areas of Natural and Scientific Interest (ANSI);
- Significant wildlife habitat;
- SAR habitat (endangered and threatened species); and,
- Fish habitat.

2.3.1 Wetlands

No PSWs were identified within or adjacent to the Study Area. However, MNRF mapping does identify an unevaluated wetland within the forested riparian area adjacent to the existing watercourse within the proposed Stage II development area (Figure 1). Field surveys were conducted to confirm the presence of this wetland feature.

2.3.2 Woodlands

No significant woodlands were identified within or adjacent to the Study Area during a review of available background mapping. However, a review of aerial photos shows an unevaluated woodland along the Fraser Clarke Watercourse running through the centre of the Study Area and within the proposed Stage II development area (Figure 2). This woodland has been brought forward for evaluation to determine significance.

2.3.3 Valleylands

No significant valleylands were identified within or adjacent to the Study Area.

2.3.4 Areas of Natural and Scientific Interest

No ANSIs were identified within or adjacent to the Study Area.

2.3.5 Significant Wildlife Habitat

No significant wildlife habitat has been identified with potential to occur within the Study Area due to current land use. However, several Species of Conservation Concern do have the potential to occur within or adjacent to the proposed development (see Table 2).

Table 2: Species of Conservation Concern Identified Within the General Vicinity of the Study Area

| SCIENTIFIC NAME | COMMON NAME | SARA | ESA | S-RANK1 | INFORMATION SOURCE ² |
|-------------------------------------|---|------|-----|---------|---------------------------------|
| VASCULAR PLANTS | | | | | |
| <i>Cypripedium arietinum</i> | Ram's-head Lady's-slipper | --- | --- | S3 | NHIC |
| BIRDS | | | | | |
| <i>Ammodramus savannarum</i> | Grasshopper Sparrow | --- | SC | S4B | OBBA |
| <i>Asio flammeus</i> | Short-eared Owl | SC | SC | S2N,S4B | OBBA |
| <i>Contopus virens</i> | Eastern Wood-pewee | --- | SC | S4B | OBBA |
| <i>Hylocichla mustelina</i> | Wood Thrush | --- | SC | S4B | OBBA |
| FISH | | | | | |
| <i>Moxostoma valenciennesi</i> | Greater Redhorse | --- | --- | S3 | NHIC |
| <i>Notropis bifrenatus</i> | Bridle Shiner | SC | SC | S2 | MNRF |
| HERPETOZOA | | | | | |
| <i>Chelydra serpentina</i> | Snapping Turtle | SC | SC | S3 | NHIC/ON |
| <i>Lampropeltis triangulum</i> | Milksnake | SC | --- | S3 | MNRF/ON |
| <i>Pseudacris triseriata</i> pop. 1 | Western Chorus Frog (Great Lakes / St. Lawrence - Canadian Shield Population) | THR | --- | S3 | ON |
| <i>Sternotherus odoratus</i> | Eastern Musk Turtle | THR | SC | S3 | MNRF |

| SCIENTIFIC NAME | COMMON NAME | SARA | ESA | S-RANK ¹ | INFORMATION SOURCE ² |
|----------------------------|-------------------------|------|-----|---------------------|---------------------------------|
| LEPIDOPTERA | | | | | |
| <i>Danaus plexippus</i> | Monarch | SC | SC | S2N,S4B | TEA |
| ODONATA | | | | | |
| <i>Arigomphus cornutus</i> | Horned Clubtail | --- | --- | S3 | OOA |
| <i>Enallagma aspersum</i> | Azure Bluet | --- | --- | S3 | OOA |
| <i>Lestes eurinus</i> | Amber-winged Spreadwing | --- | --- | S3 | OOA |
| <i>Stylurus notatus</i> | Elusive Clubtail | --- | --- | S2 | OOA |

¹S-Rank is an indicator of commonness in the Province of Ontario. A scale between 1 and 5, with 5 being very common and 1 being the least common. ²Information sources include: MNRF = Ministry of Natural Resources and Forestry; OBBA = Ontario Breeding Bird Atlas; ON = Ontario Nature: Ontario Reptile and Amphibian Atlas; SARA = Species at Risk Act; TEA = Toronto Entomologists' Association; OOA = Ontario Odonata Atlas--- denotes no information or not applicable.

2.3.6 Species at Risk

A number of species listed as *Endangered* and *Threatened* under the ESA have been identified as potentially occurring within the vicinity of the Study Area (see Table 3).

Table 3: Species at Risk Identified as Potentially Occurring within the Vicinity of the Study Area

| SCIENTIFIC NAME | COMMON NAME | SARA | ESA | S-RANK ¹ | INFORMATION SOURCE ² |
|------------------------------|-----------------------------|------|-----|---------------------|---------------------------------|
| VASCULAR PLANTS | | | | | |
| <i>Juglans cinerea</i> | Butternut | END | END | S3? | MNRF |
| BIRDS | | | | | |
| <i>Chaetura pelagica</i> | Chimney Swift | THR | THR | S4B,S4N | OBBA |
| <i>Dolichonyx oryzivorus</i> | Bobolink | --- | THR | S4B | MNRF/OBBA |
| <i>Hirundo rustica</i> | Barn Swallow | --- | THR | S4B | MNRF/OBBA |
| <i>Riparia riparia</i> | Bank Swallow | --- | THR | S4B | MNRF/OBBA |
| <i>Sturnella magna</i> | Eastern Meadowlark | --- | THR | S4B | MNRF/OBBA |
| MAMMALS | | | | | |
| <i>Myotis lucifugus</i> | Little Brown Myotis | END | END | S4 | MNRF/OMA |
| <i>Myotis leibii</i> | Eastern Small-footed Myotis | --- | END | S2S3 | MNRF |
| HERPETOZOA | | | | | |
| <i>Emydoidea blandingii</i> | Blanding's Turtle | THR | THR | S3 | MNRF/ON |

¹S-Rank is an indicator of commonness in the Province of Ontario. A scale between 1 and 5, with 5 being very common and 1 being the least common. ²Information sources include: MNRF = Ministry of Natural Resources and Forestry; OMA = Ontario Atlas of the Mammals; OBBA = Ontario Breeding Bird Atlas; ON = Ontario Nature: Ontario Reptile and Amphibian Atlas; --- denotes no information or not applicable.

2.3.6.1 Species at Risk Habitat

A review of aerial photos of the property was used to identify candidate SAR habitat based on habitat requirements defined by the MNRF. The woodland and meadow areas within the property may provide habitat for:

- Little Brown Bat;
- Bobolink and Eastern Meadowlark; and,
- Butternut.

The SAR habitat identified above is consistent with those identified in the MNRF's response to the Information Request (*Appendix A*).

2.3.7 Fish Habitat

A review of background resources suggests that there are tributaries to the Jock River present within the Study Area. These tributaries, as well as potential agricultural ditches within the Study Area may provide suitable habitat for fish.

2.4 Trees

A review of aerial photos suggests that the property contains woodland and fencerows that contain a mix of mature and young trees. The majority of trees were located within the woodland surrounding the watercourse near the centre of the Study Area. These trees were removed in the spring of 2017 under a permit issued by the City of Ottawa (see Appendix B)

2.5 Incidental Wildlife

A review of aerial photos and local knowledge suggests that there are several common wildlife species found within the general area with potential to occur in the Study Area.

2.6 Other Development Constraints

A review of the City of Ottawa's Natural Heritage System mapping (2012) indicates that a portion of this property is designated as floodplain (Schedule L1, consolidated to 2014).

In addition, Urban Natural Area (UNA) #51, described as 'East of Cedarview, South of Strandherd', was also identified within the Study Area.

2.7 Scope of Work

To evaluate potential natural features within the Study Area the following studies were required based on the description of the natural environment and completed as a part of this EIS and TCR. These studies

establish baseline conditions within the site and enable the assessment of potential negative impacts resulting from the proposed development.

Natural Heritage Features

- Ecological Land Classification (ELC)
 - Identification of potential wetland habitat
 - Identification of potential significant wildlife habitat
- Breeding bird surveys

Species at Risk

- Identification of potential SAR and SAR habitat

Trees

- Tree Inventory

Incidental Wildlife

- Visual and auditory observations of wildlife during all field studies

3.0 Methodology

3.1 Fieldwork

Fieldwork conducted for the EIS and TCR took place between September 2014 and January 2016 when weather conditions and timing were deemed suitable based on the survey protocols being implemented (Table 4). Fieldwork consisted of ELC of vegetation communities, Tree Inventory, and breeding bird surveys. Any incidental wildlife observations made during the surveys were also documented. Curricula Vitae of staff involved in the project have been included in *Appendix C*. The following sub-sections outline the survey methodologies used in the EIS and TCR.

Table 4: Dates and Times of Field Surveys

| Date | Time of Visit | Personnel | Weather Conditions | Air Temp (°C) | Purpose of visit |
|----------------|---------------|-------------|---|---------------|--|
| Sept. 23, 2014 | 10:35 | A. Zeller | Clear, Light breeze, no precipitation | 15 | Site Reconnaissance, Incidental Wildlife |
| June 18, 2015 | 09:30 | J. Harris | Mostly cloudy, light breeze, no precipitation | 20 | Breeding Bird Survey #1, Incidental Wildlife |
| July 3, 2015 | 09:55 | J. Harris | Clear, light breeze, no precipitation | 20 | Breeding Bird Survey #2, Incidental Wildlife |
| July 7, 2015 | 14:00 | J. Harris | Mostly clear, light breeze, no precipitation | 22 | ELC, Tree Survey, Incidental Wildlife |
| Jan. 20, 2016 | 09:15 | K. Robinson | Overcast, Light Snow | -6 | Confirm Tree Survey, and Winter Wildlife |

3.2 Aquatic Environment

As noted in Section 2.2, the removal of a portion of municipal drain, known as the Fraser Clarke Watercourse, within the Study Area had been subject to a permitting process dating back to 2005, and therefore, no further aquatic study was required as part of this EIS.

3.3 Natural Heritage Features

3.3.1 Ecological Land Classification

Vegetation communities are assessed using ELC as a first step to identify and assess potential natural heritage features within the Study Area. During the field investigations, local vegetation was characterized using the ELC System for Southern Ontario (Lee et al., 1998) in order to classify and map these ecological communities to the vegetation level. The ecological community boundaries were determined through the review of aerial photography and then further refined through on site

vegetation and tree surveys. In addition to the vegetation survey, a basic soil assessment was conducted to identify the soil moisture class within the ecosystem.

The ELC protocol recommends that a vegetation community be a minimum of 0.5 ha in size before it is defined. Patches of vegetation less than 0.5 ha or disturbed/planted vegetation were described to the community level only. In some instances, where vegetation is less than 0.5 ha, but appears relatively undisturbed and clearly fits within an ELC vegetation type, the more refined classification was used.

3.3.2 Wetlands

Wetlands within the Study Area are considered southern wetlands based on their location south of the northern limit of Ecoregions 5E, 6E, and 7E as shown on Figure 1 of the *Provincial Policy Statement*, 2014. Wetlands will be delineated and evaluated using the *Ontario Wetland Evaluation System* (MNRF 2013), as required.

3.3.3 Woodlands

The woodlands within the Study Area were assessed for significance following guidelines outlined in the City of Ottawa Official Plan Amendment No. 179. Official Plan Amendment No. 179 (Section 2.4.4 of the Official Plan) indicates the following:

Significant woodlands defined as the following:

- i. *Any treed area meeting the definition of woodlands in the Forestry Act, R.S.O 1990, c. F.26 or forest in Ecological Land Classification for Southern Ontario; and*
- ii. *In the rural 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 exists; or*
- iii. *In the urban area, any area 0.8 hectares in size or larger, supporting woodland 40 years of age and older at the time of evaluation.*

If the criteria outlined above are met, the woodland is considered significant.

3.3.4 Significant Wildlife Habitat

Although there were no areas of potential significant wildlife habitat for breeding birds identified, breeding bird surveys were conducted in order to establish baseline conditions and relative abundance within the Study Area.

3.3.4.1 Breeding Bird Survey

Diurnal breeding bird surveys conducted within the Study Area followed the methods outlined in the Ontario Breeding Bird Atlas Guide for Participants (Cadman et al 2007), and were completed in late June and early July of 2015 (two surveys). Specifically, breeding bird surveys consisted of ten minute point counts that were used to establish quantitative estimates of bird abundance in habitat types within the

Study Area. To supplement the surveys, area searches of the habitat were completed using binoculars to observe species presence and breeding activity. Area searches involved noting all individual bird species and their corresponding breeding evidence while traversing the habitat on foot.

3.3.5 Species at Risk

Several SAR have been identified with potential to occur within the general vicinity of the Study Area. Surveys for Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella Magna*) were completed in conjunction with breeding bird surveys outlined above.

3.3.6 Fish Habitat

As mentioned in Section 4.2, due to the ongoing consultation with RVCA dating back to 2005, no fish habitat surveys were conducted for this EIS.

3.4 Trees

3.4.1 Tree Inventory

Within the Study Area trees greater than 10 cm Diameter at Breast Height (DBH) were surveyed following the City of Ottawa's TCR guidelines. Large stands of trees were assessed using 10 m circular plots to estimate average species composition and stand density.

All Specimen Trees (defined as 70 cm DBH or greater for the purposes of this report), were surveyed by an approved professional. The survey for all Specimen Trees included the identification of species, DBH, condition, and location.

3.5 Incidental Wildlife

A wildlife assessment within the property was completed through incidental observations while on site. Any incidental observations of wildlife were noted, as well as other wildlife evidence such as dens, tracks, and scat. For each observation notes, and when possible, photos were taken. These observations also helped validate our conclusions on the ecological function of the ecosystems identified within the property.

4.0

Results

The following sections outline the findings from the field surveys and characterize the existing conditions within the Study Area.

4.1

Aquatic Environment

The Study Area lies within the Lower Rideau Subwatershed, which is part of the larger Rideau River Watershed. The site drains southeast toward the Jock River, one of the six catchment areas that form the Lower Rideau Subwatershed. This report will focus on the headwaters to the Jock River.

The Jock River drains an area of 555 km². Surface water quality varies across the Jock River ranging from poor to good. The catchment area is broken down into smaller catchment areas, including the Jock River- Barrhaven catchment, in which a portion of the Study Area is located. Within the Jock River- Barrhaven catchment water quality is rated as fair. Percentages of natural cover across the Jock River- Barrhaven catchment are as follows:

- *Forest cover is 9.2%*
- *Wetland cover is 0.5%*
- *Riparian cover is 25.6%*

No aquatic SAR (fish or mussels) have been identified within the Jock River in the *Lower Rideau Subwatershed Report* (2012) or available DFO Aquatic SAR mapping. Further, the NHIC database for SAR was cross-referenced and also did not contain any records within the general vicinity of the Study Area.

Tributaries to the Jock River identified in the background review form part of the Fraser Clarke Watercourse, a former municipal drain. As noted in Section 2.2, the northern-most branch of this watercourse within the Study Area will be removed for development purposes, and is subject to a permitting process that has been ongoing since 2005. Therefore, no further aquatic study has been completed as part of this EIS.

4.2

Natural Heritage Features

4.2.1

Ecological Land Classification

A total of 9 vegetation communities were observed within the Study Area during the ELC survey, 4 of which are considered natural vegetation communities. The major land use within the Study Area is agriculture with fallow field and a wooded riparian corridor along the Fraser Clarke Watercourse. The location, type, and boundaries of these communities are delineated in Figure 4. All vegetation



MINTO COMMUNITIES - CANADA
Harmony Stage II Residential Development

Figure 4
Existing Conditions



- Study Area
- Proposed Stage II Development Area
- Road
- Watercourse (MNRF)
- 30m Setback from Drain
- Stormwater Management Pond (MNRF)



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK
MAP CHECKED BY: AZ
MAP PROJECTION: NAD 1983 UTM Zone 18N



communities surveyed within the Study Area are considered common in Ontario. Table 5 outlines the communities documented during ELC surveys and summarizes the dominant vegetation cover. Reference photos for each of the plant communities observed can be found in *Appendix D*. A list of plant species observed during the field studies is included in *Appendix E*.

4.2.2 Wetlands

The site visits confirmed that the unevaluated wetland patches shown in background mapping are reed canary grass meadow with patches of cattails, and are not considered to be wetlands.

Therefore there are no wetlands present within the Study Area.

4.2.3 Woodlands

Field surveys and GIS mapping determined that the woodland located along the existing Fraser Clarke Watercourse is approximately 3.17 ha in total size and contains mature trees greater than 50 years old.

At the time the woodland was initially evaluated for the previous submission of this EIS (April 2016), this woodland did not meet the City's criteria for significance as it contained no interior habitat. On this basis, the City issued a tree clearing permit in July 2016 (see Appendix B). However, based on the updated evaluation criteria in the Official Plan Amendment No. 179 (December 2016), the woodland within the Study Area would now be considered significant as it is greater than 0.8 ha in size and is older than 40 years old. In addition, this woodland also meets the criteria for significance under the Natural Heritage Reference Manual (MNRF, 2010) as it is located within 30 m from of a watercourse that contains direct fish habitat. In the spring of 2017 this woodlot was cleared as permitted by the permit noted above.

Therefore, using the updated criteria for determining woodlands significance, there is a significant woodland present within the Study Area. However, this woodland has been cleared under permit and is no longer a natural heritage feature within the development area.

Table 5: Ecological Land Classification

| ELC CODE | CLASSIFICATION | SOILS | TOTAL AREA (HA) | VEGETATION | COMMENTS | APPENDIX D, PHOTO # |
|----------|--|-------|-----------------|--|---|---------------------|
| FODM7-7 | Fresh-Moist Manitoba Maple Lowland Deciduous Forest Type | N/A | 3.17 | Manitoba Maple (<i>Acer negundo</i>) was the dominant tree species present with Black Ash (<i>Fraxinus nigra</i>), American Elm (<i>Ulmus americana</i>), Silver Maple (<i>Acer saccharinum</i>), and Trembling Aspen (<i>Populus tremuloides</i>) associates. Shrub cover consisted of Glossy Buckthorn (<i>Frangula alnus</i>), Choke Cherry (<i>Prunus virginiana</i>), Pussy Willow (<i>Salix discolor</i>), Staghorn Sumac (<i>Rhus hirta</i>), Common Hackberry (<i>Celtis occidentalis</i>), English Hawthorn (<i>Crataegus monogyna</i>), and Wild Red Raspberry (<i>Rubus sachalinensis</i> var. <i>sachalinensis</i>). Ground cover consisted of Wild Parsnip (<i>Pastinaca sativa</i>), European Stinging Nettle (<i>Urtica dioica</i> ssp. <i>dioica</i>), Tufted Vetch (<i>Vicia cracca</i>), Spotted Jewelweed (<i>Impatiens capensis</i>), White Avens (<i>Geum canadense</i>), Canada Thistle (<i>Cirsium arvense</i>), Broad-leaved Enchanter's Nightshade (<i>Circaea canadensis</i>), Common Burdock (<i>Arctium minus</i>), Virginia Creeper (<i>Parthenocissus quinquefolia</i>), Riverbank Grape (<i>Vitis riparia</i>), and Sensitive Fern (<i>Onoclea sensibilis</i>). | Polygon: 1 Stand of dead/dying ash the northwest corner of the Study Area. | Photo 1 |
| MEGM3-8 | Reed Canary Grass Graminoid Meadow Type | N/A | 0.39 | Reed Canary Grass (<i>Phalaris arundinacea</i>) was the most abundant species present with Goldenrod species (<i>Solidago</i> sp), Scentless Chamomile (<i>Tripleurospermum inodorum</i>), Black-eyed Susan (<i>Rudbeckia hirta</i> var. <i>pulcherrima</i>), Wild Parsnip, Tufted Vetch, Awnless Brome (<i>Bromus inermis</i>), Creeping Wildrye (<i>Elymus repens</i>), Broad-leaved Cattail (<i>Typha latifolia</i>), Kentucky Bluegrass (<i>Poa pratensis</i> ssp. <i>pratensis</i>), and European Common Reed (<i>Phragmites australis</i> ssp. <i>australis</i>) associates. | Polygon: 2 Inclusion from FODM7-7. Vegetated swale along southern edge of study area boundary. | Photo 2 |
| N/A | Fallow Field | N/A | 15.4 | Tree species observed include Manitoba Maple, Balsam Poplar (<i>Populus balsamifera</i>), and Trembling Aspen (<i>Populus tremuloides</i>). Scentless Chamomile (<i>Tripleurospermum inodorum</i>) was the most abundant species present with Colt's-foot (<i>Tussilago farfara</i>), Canada Thistle, Common Timothy (<i>Phleum pratense</i>), Alsike Clover (<i>Trifolium hybridum</i>), Common Wormwood (<i>Artemisia vulgaris</i>), Wild Carrot (<i>Daucus carota</i>), Goldenrod species (<i>Solidago</i> sp), Tufted Vetch, Black Medic (<i>Medicago lupulina</i>), Daisy Fleabane (<i>Erigeron hyssopifolius</i>), Red Clover (<i>Trifolium pratense</i>), White Clover (<i>Trifolium repens</i>), Canada Goldenrod (<i>Solidago canadensis</i> var. <i>canadensis</i>), White Sweet-clover (<i>Melilotus albus</i>), Spotted Knapweed (<i>Centaurea maculosa</i>), Wild Parsnip, Garden Bird's-foot Trefoil (<i>Lotus corniculatus</i>), Common Plantain (<i>Plantago major</i>), Common Burdock, Awnless Brome (<i>Bromus inermis</i>), and White Goosefoot (<i>Chenopodium album</i>) associates. | Polygon: 3 Large vegetated mounds of soil and berm located on eastern side. | Photo 3,4 |
| TAGM5 | Fencerow | N/A | 0.64 | Tree species observed include White Ash (<i>Fraxinus americana</i>) and Crabapple species (<i>Malus</i> sp). Shrub cover consisted of Choke Cherry, Virginia Creeper, and Wild Red Raspberry. Ground cover consisted of Common Silverweed (<i>Potentilla anserina</i> ssp. <i>anserina</i>), Meadow Goat's-beard (<i>Tragopogon pratensis</i>), Yellow Avens (<i>Geum aleppicum</i>), Smooth Bedstraw (<i>Galium mollugo</i>), Tall Buttercup (<i>Ranunculus acris</i>), and Tartarian Honeysuckle (<i>Lonicera tatarica</i>). | Polygon: 4 | Photo 5 |
| OAGM1 | Annual Row Crops | N/A | 18.19 | Corn (<i>Zea mays</i>), Soy Bean (<i>Glycine max</i>) | Polygon: 5 | Photo 4 |
| CVR_4 | Rural Property | N/A | 1.68 | N/A | Polygon 6 | N/A |
| CVC_1 | Business Sector | N/A | 0.44 | N/A | Polygon 7 | Photo 6 |
| SA | Shallow Aquatic | N/A | 0.09 | N/A | Polygon: 8 | Photo 7 |

4.2.4 Valleylands

The site visit confirmed that there are no valleylands within the Study Area.

Therefore there are no significant valleylands within the Study Area.

4.2.5 Areas of Natural and Scientific Interest

There are no ANSIs present within the Study Area.

4.2.6 Significant Wildlife Habitat

See *Appendix F* for a detailed screening of Species of Conservation Concern identified in Table 2. The results of the field surveys as they apply to significant wildlife habitat are detailed below.

Breeding Bird Surveys

Breeding bird surveys were conducted from point counts in proximity to woodland habitat within the Study Area. Table 7 lists all bird species observed during breeding bird surveys in 2015. All species observed are common within the Ottawa area.

There is no significant breeding bird habitat within the Study Area.

Table 6: Birds Observed June – July 2015

| AREA SENSITIVE | SCIENTIFIC NAME | COMMON NAME | BREEDING STATUS | ABUNDANCE | PROVINCIAL STATUS | OBSERVED/ HEARD | COMMENTS |
|----------------|-------------------------------|------------------------|-----------------|-----------|-------------------|-----------------|----------|
| -- | <i>Corvus brachyrhynchos</i> | American Crow | Possible | Common | S5B | Observed | |
| Yes | <i>Carduelis tristis</i> | American Goldfinch | Possible | Common | S5B | Heard | |
| -- | <i>Turdus migratorius</i> | American Robin | Possible | Rare | S5B | Heard | |
| -- | <i>Poecile atricapillus</i> | Black-capped Chickadee | Possible | Rare | S5 | Heard | |
| -- | <i>Molothrus ater</i> | Brown-headed Cowbird | Possible | Rare | S4B | Observed | |
| -- | <i>Bombycilla cedrorum</i> | Cedar Waxwing | Possible | Sparse | S5B | Observed | |
| -- | <i>Spizella passerina</i> | Chipping Sparrow | Possible | Rare | S5B | Heard | |
| -- | <i>Quiscalus quiscula</i> | Common Grackle | Possible | Rare | S5B | Observed | |
| -- | <i>Dumetella carolinensis</i> | Gray Catbird | Confirmed | Rare | S4B | Heard | |
| -- | <i>Zenaida macroura</i> | Mourning Dove | Possible | Rare | S5 | Heard, Observed | Flyover |
| -- | <i>Agelaius phoeniceus</i> | Red-winged Blackbird | Possible | Rare | S4 | Heard, Observed | |
| -- | <i>Melospiza melodia</i> | Song Sparrow | Possible | Common | S5B | Heard, Observed | |
| -- | <i>Empidonax traillii</i> | Willow Flycatcher | Possible | Sparse | S5B | Heard, Observed | |
| -- | <i>Setophaga petechia</i> | Yellow Warbler | Possible | Rare | S5B | Heard | |

4.2.7 Species at Risk

No SAR or SAR habitat was identified during field surveys.

Therefore no SAR or SAR habitat is present within the Study Area.

See *Appendix F* for a detailed screening of SAR identified in Table 3.

4.2.8 Fish Habitat

The Fraser Clarke Watercourse within the Study Area may provide suitable fish habitat. Given that permitting for the relocation of the Fraser Clarke Watercourse was underway prior to starting this EIS study, no further assessment of fish habitat was completed. A copy of this permit can be found in *Appendix B*.

An assessment of potential fish habitat was not completed as part of this EIS.

4.3 Trees

A Tree Inventory was conducted in conjunction with the ELC survey to evaluate potential impacts to trees within the Study Area. Within the Study Area trees were primarily contained the *Fresh-Moist Manitoba Maple Lowland Deciduous Forest Type* (3.17 ha) that parallels the Fraser Clark drain and the deciduous *Fencerow* (0.64 ha) that borders the agricultural fields in the eastern portion of the property.

The dominant tree species present within the forested area is Manitoba Maple (*Acer negundo*). Other species include Black Ash (*Fraxinus nigra*), American Elm (*Ulmus americana*), Silver Maple (*Acer saccharinum*), and Trembling Aspen (*Populus tremuloides*) associates. Many of the trees identified within the northwestern portion of the forest were in poor health or already dead. The vast majority of these trees were mature ash and likely died from the Emerald Ash Borer infestation. The other trees within the forest were assessed to be in fair to good condition. However, many maples and elms within the forest also appear to be in a declining state. Approximately 1.66 ha of the forest community is located within the Stage II area.

The tree species observed within the Fencerow include White Ash (*Fraxinus americana*), Balsam Poplar (*Populus balsamifera*) and Crabapple species (*Malus sp*). All species were in fair to good condition. This fencerow community was located outside the Stage II development area.

Table 8 below outlines the tree species that were identified within the Study Area. Figure 5 illustrates the location of each stand within the Study Area.

Note: The trees within the woodlot were cleared in the spring of 2017 under a permit issued by the City of Ottawa (Appendix B). This permit was associated with the relocation of the Fraser Clarke watercourse.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

MINTO COMMUNITIES - CANADA
Harmony Stage II Residential Development

Figure 5
Tree Inventory



- | | |
|------------------------------------|-----------------------------------|
| Study Area | Watercourse (MNRF) |
| Proposed Stage II Development Area | Stormwater Management Pond (MNRF) |
| Road | |

Treed Areas and Specimen Trees within Study Area*

- | | | |
|--------------------|----------------|--------------|
| Forest (2.34 ha) | Black Ash | Silver Maple |
| Fencerow (0.64 ha) | Manitoba Maple | |

* "Specimen Tree" defined as a tree greater than 70 cm DBH and in Fair condition or better.



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK
MAP CHECKED BY: AZ
MAP PROJECTION: NAD 1983 UTM Zone 18N



PROJECT: 14-1290 STATUS: FINAL DATE: 2017-07-12

Table 7: Tree Species within the Study Area

| SCIENTIFIC NAME | COMMON NAME | NOTES |
|----------------------------|-------------------|---------------------------------|
| <i>Acer negundo</i> | Manitoba Maple | Found throughout property |
| <i>Acer saccharinum</i> | Silver Maple | Found within forest (Stage II) |
| <i>Fraxinus americana</i> | White Ash | Found within fencerow (Stage I) |
| <i>Fraxinus nigra</i> | Black Ash | Found within forest (Stage II) |
| <i>Populus balsamifera</i> | Balsam Poplar | Found within fencerow (Stage I) |
| <i>Populus tremuloides</i> | Trembling Aspen | Found throughout property |
| <i>Ulmus americana</i> | American Elm | Found within forest (Stage II) |
| <i>Malus sp.</i> | Crabapple Species | Found within fencerow (Stage I) |

In addition, a total of seven Specimen Trees were identified within the Study Area, three of which are located within the proposed Stage II development (Table 9). The locations of each Specimen Tree are shown on Figure 5.

Table 8: Specimen Trees Observed within the Study Area

| SCIENTIFIC NAME | COMMON NAME | NORTHING | EASTING | DBH | CONDITION | WITHIN STAGE II |
|-------------------------|----------------|----------|---------|------|-----------|-----------------|
| <i>Fraxinus nigra</i> | Black Ash | 5012184 | 440255 | 97 | Good/Fair | Yes |
| <i>Fraxinus nigra</i> | Black Ash | 5012189 | 440302 | 84 | Fair/Poor | Yes |
| <i>Fraxinus nigra</i> | Black Ash | 5012483 | 440871 | 83 | Good | No |
| <i>Acer negundo</i> | Manitoba Maple | 5012119 | 440520 | 79.5 | Good | No |
| <i>Acer negundo</i> | Manitoba Maple | 5012114 | 440507 | 78 | Good | No |
| <i>Acer saccharinum</i> | Silver Maple | 5012107 | 440535 | 104 | Fair/Poor | No |
| <i>Acer saccharinum</i> | Silver Maple | 5012177 | 440293 | 55 | Fair/Poor | yes |

4.4 Incidental Wildlife

Incidental wildlife species observed in the property are listed in Table 10 below. All species observed are common in the Ottawa area and have an S-Rank of S4 or S5.

Table 9: Incidental Wildlife Species Observed within the Study Area

| SCIENTIFIC NAME | COMMON NAME | RESIDENT/VISITOR | EVIDENCE |
|-----------------------------|----------------------|------------------|--------------------|
| BIRDS | | | |
| <i>Agelaius phoeniceus</i> | Red-winged Blackbird | Visitor | Vocalization |
| <i>Charadrius vociferus</i> | Killdeer | Visitor | Vocalization |
| <i>Colaptes auratus</i> | Northern Flicker | Visitor | Visual observation |
| <i>Melospiza melodia</i> | Song Sparrow | Resident | Vocalization |
| HERPTILES | | | |
| <i>Lithobates clamitans</i> | Green Frog | Resident | Vocalization |

A number of incidental wildlife observations were made within the Study Area. All of the species are common to the Ottawa area and no SAR were observed.

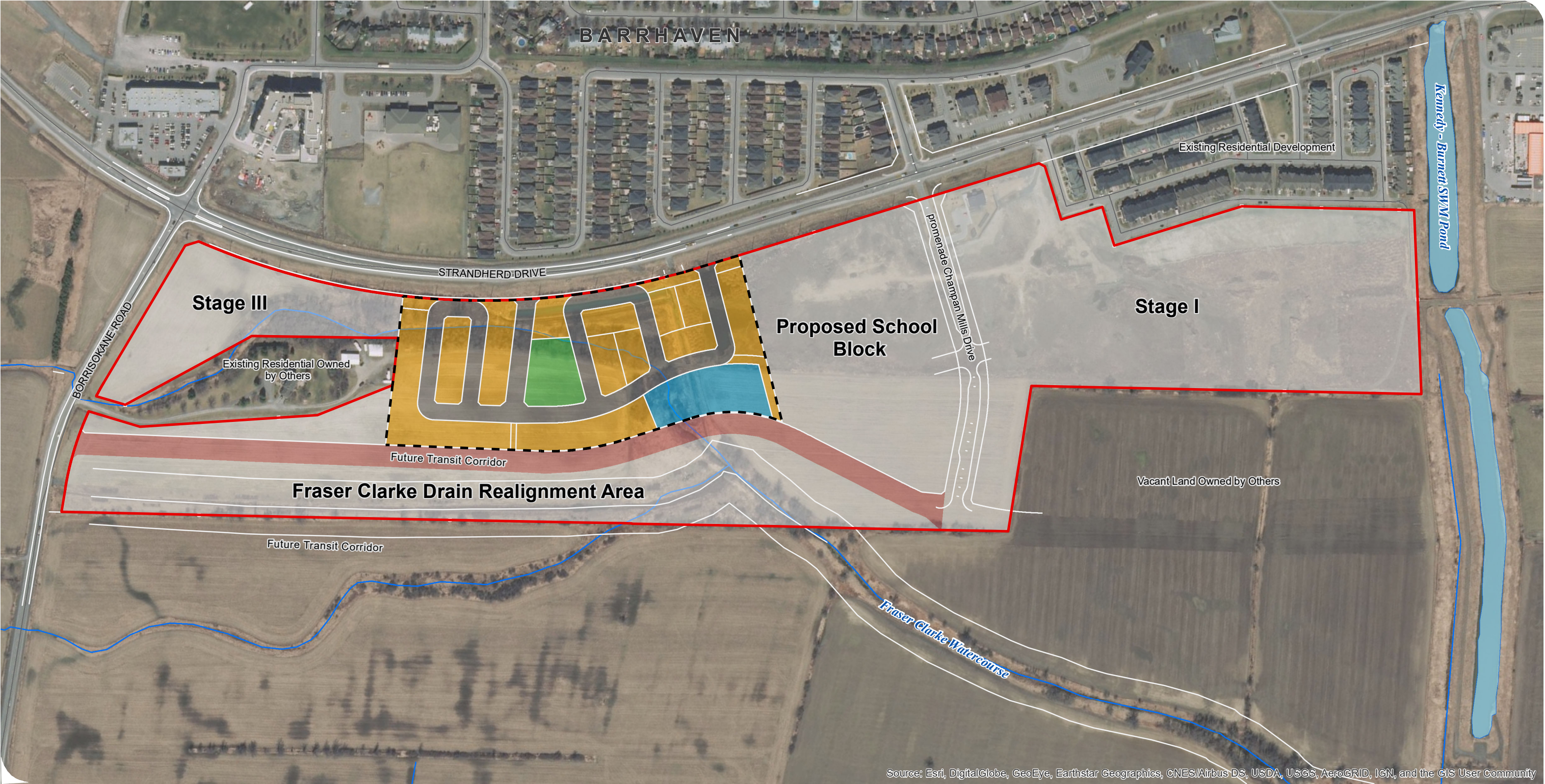
Description of the Proposed Project

Figure 6 illustrates the draft site plan for the Harmony Stage II community consisting of a mix of residential area, park/ open space, and a stormwater management block.

Property Construction

The development of this property will include the following major project components:

- Surveying and staking out the development;
- Clearing and grading property to accommodate construction;
- Installation of storm water drainage network and related infrastructure;
- Excavation to accommodate underground utilities including water, sewer, gas, and hydro;
- Paving roadways;
- Excavation and construction of houses;
- Landscaping and fencing; and,
- On-going usage and maintenance.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

MINTO COMMUNITIES - CANADA
Harmony Stage II Residential Development

Figure 6
Proposed Site Plan



- | | | | |
|------------------------------------|-----------------------------------|-------------------------------------|-----------------------|
| Study Area | Road | Other Stages and Future Development | Stage II Residential |
| Proposed Stage II Development Area | Watercourse (MNRF) | Future Transit Corridor | Stormwater Management |
| Proposed Site Plan | Stormwater Management Pond (MNRF) | Park | Stage II Roadway |



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK
MAP CHECKED BY: AZ
MAP PROJECTION: NAD 1983 UTM Zone 18N



PROJECT: 14-1290 STATUS: FINAL DATE: 2017-07-12

6.0 Impact Assessment and Mitigation

The following sections outline general measures that should be considered to mitigate the impacts associated with the Harmony Stage II development (Figure 6). This includes both construction related mitigation measures and mitigation measures to address impacts related to impacts associated with the occupation of the development.

6.1 Aquatic Environment

Impacts to the aquatic resources within the site are possible where water features are being removed for development purposes. The details of these potential impacts are being considered through the permitting process with the RVCA (*Appendix B*), and plans have been developed to fish habitat standard.

The mitigation will be incorporated into the design of the site to prevent negative impacts to the storage capacity of the watershed (i.e., stormwater management, enhancement of existing water features etc.).

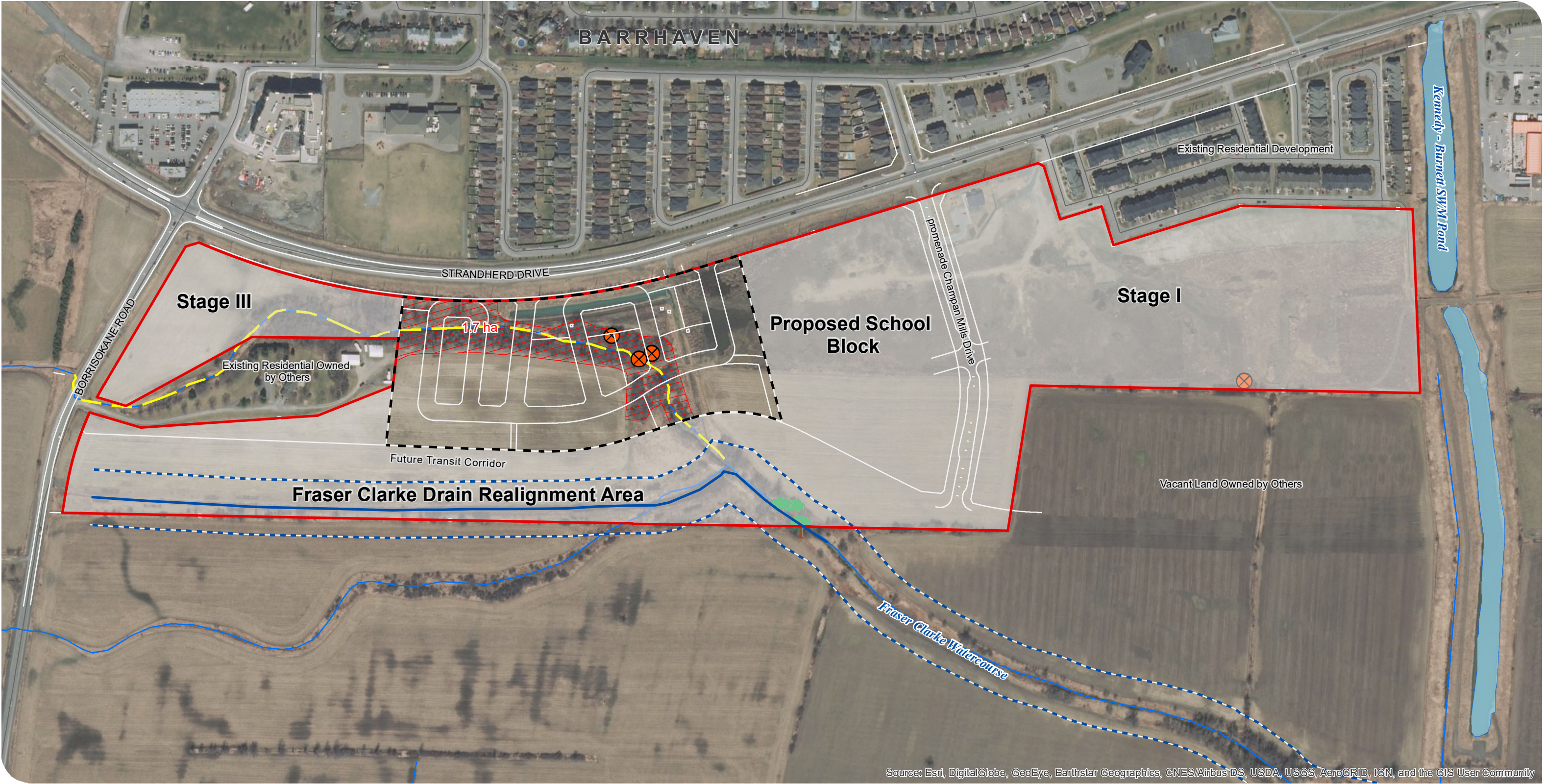
6.1.1 Impacts

Potential impacts or loss of functions may include the following where features are being removed:

- Loss of features with fish habitat, riparian, or terrestrial functions;
- Reduction in seasonal water flow into the Jock River and water storage potential within the Study Area; and,
- Reduction in water quality within the Study Area and within the Jock River.

6.1.2 Mitigation

- Limit of development shall be maintained reflecting the environmental impacts illustrated in Figure 7.
- Mitigation measures outlined in the “Application to Alter a Waterway” shall be followed as outlined in the permit (*Appendix B*).
- Heavy duty silt fencing (OPSD 219.130) and/ or other equivalent erosion and sediment control measures should be installed around the perimeter of the work area to clearly demarcate the development area and prevent erosion and sedimentation into adjacent habitats. Erosion and sediment control measures should be monitored regularly to ensure they are functioning properly and if issues are identified should be dealt with promptly;
- Stockpiling of excavated material should not occur outside the delineated work area. If stockpiling is to occur outside of this area, silt fencing should be used to contain any spoil piles to prevent sedimentation into adjacent areas. Further, stockpiling of excavated materials will not occur within 30 m of any waterbody;



MINTO COMMUNITIES - CANADA
Harmony Stage II Residential Development

Figure 7
Environmental Impacts



- | | | |
|-------------------------------|------------------------|-------------------------------------|
| Study Area | Relocated Watercourse | Stormwater Management Pond (MNRF) |
| Proposed Stage II Development | 30m Setback from Drain | Other Stages and Future Development |
| Proposed Site Plan | Watercourse (MNRF) | |

Impacts

- | | |
|------------------------------|------------------------------|
| Specimen Tree to be Removed | Removed Watercourse |
| Specimen Tree to be Retained | Cleared Significant Woodland |



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF

MAP CREATED BY: LK
MAP CHECKED BY: AZ
MAP PROJECTION: NAD 1983 UTM Zone 18N



PROJECT: 14-1290 STATUS: FINAL DATE: 2017-07-12

- A spill response plan should be developed and implemented as required;
- If dewatering is required it is recommended that dewatering ponds (OPSD219.240) or similar standards should be implemented to avoid sedimentation and erosion in adjacent areas. If dewatering requires more than 50,000 L of water to be pumped per day, appropriate permits must be obtained from the Ministry of Environment and Climate Change prior to the dewatering; and
- Develop and implement a stormwater management plan which maintains pre-development surface water flows to adjacent lands (quantity, quality, infiltrations, conveyance patterns, and seasonality of water flow).
- The relocated Fraser Clarke Watercourse will be re-vegetated with native species to provide functional habitat, replacing both the form and ecological function of the area removed. This is detailed in the Landscaping Plan completed by Stantec Consulting Ltd. included in *Appendix B*.

6.2 Natural Heritage Features

6.2.1 Vegetation Communities & Significant Woodlands

The following are the potential impacts associated with the clearing of the significant woodland and terrestrial vegetation communities within the Stage II area. The mitigation measures which follow are aimed at reducing the potential impacts the clearing will have on adjacent terrestrial communities.

6.2.1.1 Impacts

The potential impacts resulting from the clearing of the significant woodland and other terrestrial vegetation communities within the Stage II area include the following:

- Loss of approximately 6.4 ha of terrestrial communities (Figure 7). This includes;
 - 1.7 ha of Significant Woodland;
 - 1.0 ha of Meadow;
 - 2.8 ha of Cropland; and,
 - 0.9 ha of Fallow Fields.
- Accidental damage or loss of trees as a result of site alteration or construction activities;
- Loss of woodland and associated habitat within the region;
- Loss of local habitat diversity for wildlife,
- Erosion and sedimentation into adjacent vegetation communities; and,
- Loss of native diversity due to increased presence of non-native invasive species after development.

Note: A permit for the clearing of the woodland associated with the Fraser Clark drain was first issued in 2009 by the City of Ottawa, and updated in July 2016. (See Appendix B). The woodland was cleared in the spring of 2017.

6.2.1.2

Mitigation*Mitigation during construction*

The installation and maintenance of standard erosion and sediment control measures should be implemented to protect the terrestrial environment outside of the development area, including the following:

- Limit of development shall be maintained reflecting the environmental impacts illustrated in Figure 7.
- Mitigation measures outlined in the “Tree Permit for the Fraser Clark drain relocation” were followed as outlined in the permit (Appendix B);
- Heavy duty silt fencing (OPSD 219.130) should be installed around the perimeter of the work area to clearly delineate the development from the adjacent habitat. This will prevent encroachment into natural features and minimize the likelihood of animals entering the construction area. Erosion and sediment control measures should be monitored regularly to ensure they are functioning properly and if issues are identified should be dealt with promptly;
- Stockpiling of excavated material should not occur outside the delineated work area. If stockpiling is to occur outside of this area, silt fencing should be used to contain any spoil piles to prevent sedimentation into adjacent areas;
- If dewatering is required it is recommended that dewatering ponds (OPSD219.240) or similar standards should be implemented to avoid sedimentation and erosion in adjacent areas. If dewatering requires more than 50,000 L of water to be pumped per day, appropriate permits must be obtained from the Ministry of Environment and Climate Change prior to the dewatering; and,
- All construction equipment should enter the site clean and free of debris, and should be visually inspected upon entry for evidence of plant material to prevent the spread of invasive species to the site.

Mitigation after occupation

- Provide new homeowners with lists of locally appropriate native species for use in landscaping, along with information on the negative impacts of non-native species.

6.3 Species at Risk

No SAR are expected to be encountered within the Stage II development area; however, the following are potential impacts and recommended mitigation and compensation measures to avoid negative impacts to SAR and general wildlife within the area.

6.3.1 Impacts

Potential impacts to SAR within the development area include the following:

- Incidental injury or death as a result of vegetation clearing and other activities associated with site alteration or development.

6.3.2 Mitigation

- The most current SAR information available will be reviewed in comparison with EIS findings immediately prior to commencement of on-site activities to confirm that all known Species at Risk in the area have been adequately addressed in the EIS;
- Avoid vegetation clearing during sensitive times of year for local wildlife (i.e., spring and early summer);
- Conduct vegetation clearing such that existing connections to adjacent areas are maintained until the final stage of clearing, so wildlife can use these connections to leave the site;
- Ensure perimeter fencing does not prevent wildlife from leaving the site during clearing activities by clearing the area prior to installing the fence;
- Contractors and other on-site workers should be briefed on appropriate measures to reduce human-wildlife conflict during work activities; and,
- If a SAR is observed, the MNRF will be contacted as soon as possible to provide further direction if impacts are anticipated.

6.4 Trees

6.4.1 Impacts

It is estimated that approximately 720 mature trees greater than 15cm DBH were removed in the spring of 2017 to accommodate the proposed Harmony Stage II development and the relocation of the Fraser Clarke watercourse. These mature trees were located within the forested area and are all common to the Ottawa. An additional 775 trees between 10 and 15cm were also removed. These smaller trees were proliferating due to edge effects and many were suckers from the mature trees (Trembling Aspen & Manitoba Maple) in the woodlot and do not contribute to the "tree cover" within the property.

The following are impacts associated with the removal of mature trees and Specimen Trees;

- Loss of three (3) large specimen trees within the Stage II development area;
- Loss of genetic diversity for healthy mature trees;
- Loss of most productive trees;
- Loss of general wildlife habitat (e.g. song birds, small mammals, etc.); and,
- Accidental damage or loss of trees as a result of site alteration or construction activities.

6.4.2

Mitigation*Mitigation during construction*

The mitigation measures outlined below should be implemented to minimize the potential negative impacts to specimen trees and otherwise retainable trees. These mitigation measures include the following:

- A tree protection fence should be constructed around all retainable Specimen Trees and other retainable trees. The tree protection fence should be constructed at the Critical Root Zone (CRZ) boundary. This boundary is defined by the City of Ottawa's tree conservation by-law as the DBH (in cm) multiplied by 10.
- Tree protection fence can be constructed around more than one tree provided the CRZ is protected.
- The existing grading around all retainable trees must be maintained. It is not permissible to add fill or otherwise alter the grading within the CRZ.
- Ensure exhaust fumes from construction equipment is not directed towards the canopy of any trees.
- Do not attach any signs or notices to any tree.
- Do not place any material or equipment within the tree protection zone.



Tree Protection Fence

The following measures should apply to all trees that will be cut down:

- It is recommended that an effort be made to incorporate mature trees and Specimen Trees into the proposed development (i.e., parkland etc.) and relocated created Fraser Clarke Watercourse corridor along the southern boundary of the Study Area.
- Planted trees should only include species that are consistent with the City of Ottawa's TCR Guidelines.

- All ash trees removed should be treated as infected by the Emerald Ash Borer beetle and appropriately disposed of so not to infect other areas of the city.

In addition, the Term of Council's Sustainable Environmental Services (ES) strategic priority states that *"ES1-C: Maintain a 2:1 ratio (or greater) between trees planted and trees removed annually."*

Furthermore, the Official Plan policies 2.4.5 (7) for Green Spaces and policies 4.7.2 for Protection of Vegetation Cover recommend reaching the City's target of 30% tree cover for the entire City. In order to meet these targets, a Landscaping and Planting Plan should be prepared during detailed design of the project to incorporate these measures. Based on the removal of 720 mature trees (trees greater than 15cm in diameter), 1440 trees should be planted within or near to the community (i.e. within the new channel).

In addition, this landscaping and planting plan should be reconciled against the approved Landscape Plan for the revised alignment of the drain as many of these trees may have already been planted along this corridor.

6.5 Incidental Wildlife

Since most only common wildlife species were observed during field studies and no significant wildlife habitat is present, impacts on wildlife should be negligible. However, some inadvertent impacts on local wildlife maybe associated with construction activities for this development.

6.5.1 Impacts

Potential impacts to wildlife as a result of the development include the following:

- Displacement, injury, or death resulting from contact with heavy equipment during clearing and grading activities;
- Disturbance to wildlife as a result of noise associated with construction activities, particularly during breeding periods; and,
- Conflict between wildlife and humans or domestic pets following development, including predation, mortality from vehicles, and poisoning.

6.5.2 Mitigation

Mitigation during construction

The best practices outlined in the *Protocol for Wildlife Protection during Construction* (City of Ottawa, 2015) should be followed during all construction activities associated with the development. The following measures are consistent with the protocol;

- Minimize impacts to breeding birds by clearing naturalized vegetation outside of the breeding bird season (April 1 – August 31). Should any clearing be required during the breeding bird

season, nest searches conducted by a qualified person must be completed 48 hours prior to clearing activities. If nests are found, work within 10 m of the tree should cease until the nest has fledged. If no nests are present, clearing may occur. This is in accordance with the federal *Migratory Birds Convention Act*;

- Pre-stress the area on a regular basis leading up to construction to encourage wildlife to leave the area before construction starts. Other recommendations for pre-stressing are outlined in the *Protocol for Wildlife Protection during Construction* (City of Ottawa , 2015)
- Orange snow fencing should be installed around the perimeter of the work area to clearly demarcate the development area and prevent wildlife from entering the construction zone. Fencing should be monitored regularly to ensure they are functioning properly and if issues are identified should be dealt with promptly;
- Wildlife located within the construction area will be re-located to an area outside of the development into an area of appropriate habitat, as necessary;
- Construction crews working on site should be educated on local wildlife and take appropriate measures for avoiding wildlife; and,
- Should an animal be injured or found injured during construction they should be transported to an appropriate wildlife rehabilitation center for care with a small donation of money to help pay for the care (a local facility is the Rideau Valley Wildlife Sanctuary).

Mitigation after occupation

Provide Owner Awareness Package to all new residents. This information could include;

- Impacts of cat predation on bird populations and the importance of keeping household cats indoors;
- Legal restrictions of uncontrolled pets;
- The risks of feeding wildlife; and,
- Mitigation options for reducing the potential bird strikes with windows (i.e., falcon silhouette stickers for windows).

Cumulative Impacts

As this Minto Harmony Stage II development is a part of a rapidly expanding area, cumulative impacts must also be considered in the context of the local environment. Since the Minto Harmony Stage II Development has been primarily in active agriculture dating back to at least 1976, habitat features within the Study Area are limited, and the same is true for lands surrounding the development. Fragmentation and lack of connection between remnant vegetation communities and other natural features limits the potential for significant features and wildlife habitat within the local area.

In addition to the mitigation measures listed above which were developed in consideration of cumulative impacts, the following mitigation should be considered to address the cumulative impacts resulting from the proposed development. To mitigate the impacts associated with a net increase in impermeable surfaces, the following measures are recommended:

- Promote the use of rain capture systems like rain barrels; and,
- Promote the use of permeable landscaping materials during the landscaping.

Summary and Conclusions

This report outlines the environmental impacts associated with the construction and long-term occupation of the Minto Harmony Stage II Development, located 4005 Strandherd Drive, in the City of Ottawa (Figure 1). A brief summary of the key potential impacts that may occur as a result of the proposed project, the recommended mitigation measures to address these impacts can be found in Section 6.

The biggest impact associated with this development will be the loss of the significant woodland associated with the Fraser Clarke Watercourse. A permit for the clearing of this woodlot has been issued (see Appendix B) and the woodland was cleared in 2017. Aside from this woodland community, there is little natural vegetation and wildlife habitat within the Study Area. Therefore, few negative environmental impacts are likely to occur as a result of the proposed development of this property. These impacts include the removal of mature trees, loss of local native vegetation, and loss of general habitat for birds and other native wildlife.

The mitigation and compensation measures proposed in this report have been developed to avoid negative impacts associated with development on the natural environment. Overall, no residual impacts are anticipated as a result of this development provided appropriate mitigation is applied, and therefore there are no expected impediments to development.

- It is our opinion that the proposed Minto Harmony Stage II Development, located at 4005 Strandherd Drive can be accepted with the condition that the mitigation measures recommended herein will be implemented.

This study was completed by Alex Zeller, M.Sc. (Biology) with technical and field assistance provided by Jonathan Harris. Resumes of key staff are included in *Appendix C*.

The results and findings of this study have been reported without bias or prejudice. The conclusions of this study are based on our own professional opinion substantiated by the findings of this study and have not been influenced in anyway.



Alex Zeller, M.Sc.
Ecologist and Project Manager
Dillon Consulting Limited

Appendix A

Agency Consultation



Ministry of Natural Resources

Kemptville District
P.O. Box 2002
10 Campus Drive
Kemptville, ON K0G 1J0

Tel.: (613) 258-8204
Fax.: (613) 258-3920

Ministère des Richesses naturelles

District de Kemptville
CP 2002
10 Campus Drive
Kemptville, ON K0G 1J0

Tél.: (613) 258-8204
Télééc.: (613) 258-3920

Mon. Jan 5, 2015

Alex Zeller
Dillon Consulting
177 Colonnade Rd, Suite 101
Ottawa
K2E 7J4
(613) 745-6338 ext 3011
azeller@dillon.ca

Attention: Alex Zeller

Subject: Information Request - Developments
Project Name: Proposed Residential Development, Clarke Lands
Site Address: Strandherd Dr. at Cedarview Rd., Ottawa
Our File No. 2015_NEP-2901

Natural Heritage Values

The Ministry of Natural Resources (MNR) Kemptville District has carried out a preliminary review of the area in order to identify any potential natural resource and natural heritage values.

The MNR works closely with partner agencies and local municipalities in order to establish concurrent approval process and to achieve streamlined and efficient service delivery. The MNR strongly encourages all proponents to contact partner agencies (e.g. MOE, Conservation Authority, etc.) and appropriate municipalities early on in the planning process. This provides the proponent with early knowledge regarding agency requirements and approval timelines.

Natural heritage features and values contribute to the province's rich biodiversity and provide habitat for a variety of species. The following Natural Heritage values were identified:

- Private Drain, Fraser-Clarke Drain
- River, Jock River

Municipal Official Plans contain additional information related to natural heritage features. Please see the local municipal Official Plan for more information such as specific policies and direction

pertaining to activities which may impact natural heritage features. For planning advice or Official Plan interpretation, please contact the local municipality.

Where natural values and natural hazards exist (e.g., floodplains), there may be additional approvals and permitting required from the local Conservation Authority. The MNR strongly recommends contacting the local Conservation Authority for further information and approvals. Please see the MNR Kemptville Information Guide (2012) for contact information pertaining to Conservation Authorities located within the Kemptville District area.

For additional information and online mapping tools, please see the Natural Heritage Information Centre (NHIC), where additional data and files can be downloaded in both list and digital format. In addition sensitive species information can be requested and accessed through the NHIC at NHICrequests@ontario.ca.

In Addition, the following Fish species were identified: banded killifish, blackchin shiner, bluntnose minnow, brassy minnow, bridle shiner, brook stickleback, brown bullhead, Carps and Minnows, central mudminnow, common carp, common shiner, creek chub, fathead minnow, golden shiner, greater redhorse, hornyhead chub, johnny darter/tessellated darter, logperch, longnose dace, northern pike, pumpkinseed, rock bass, shorthead redhorse, silver redhorse, smallmouth bass, spottail shiner, stonecat, walleye, white sucker.

Water

Where the site is adjacent to or contains a watercourses or waterbodies, additional considerations apply. If any in-water works are to occur, there are timing restriction periods for which work in water can take place (see below). Appropriate measures should be taken to minimize and mitigate impact on water quality and fish habitat, including:

- including the installation of sediment and erosion control measures;
- avoiding removal alteration or covering of substrates used for fish spawning, feeding, overwintering or nursery areas; and
- debris control measures should be put in place to manage falling debris (e.g. spalling).

A work permit from the MNR may be required pending further details regarding the proposed works. No encroachment on the bed or banks of the waterbody (e.g. abutments, embankments, etc.) is permitted until MNR approval and clearance has been issued. In order for MNR staff to determine when a work permit is required, additional information can include:

- Detailed drawings (existing and proposed)
- Location mapping
- Registered Plan survey
- Site photographs
- Public Lands Act Forms - application forms, ownership form and landowner notification form.

The MNR does not have any water quality or quantity data available. We recommend that the Ministry of the Environment be contacted for such data along with the local Conservation Authority. For further information regarding fish habitat and protocols, please refer to the following

interagency, document, *Fish Habitat Referral Protocol for Ontario* at:
<http://www.mnr.gov.ca/264110.pdf>

Timing restriction periods in MNR Kemptville District*:

Warmwater → March 15 – June 30
→ March 15 – July 15 for St. Lawrence River & Ottawa River
Coldwater → October 1 – May 31
Mixed lakes → October 1 – June 30 (Big Rideau & Charleston)

** Please note: Additional timing restrictions may apply as it relates to Endangered and Threatened Species, including works in both water and wetland areas.*

| | FISH SPECIES | TIMING WINDOW |
|----------------|---------------------------------------|---------------------|
| Spring: | Walleye | March 15 to May 31 |
| | Northern Pike | March 15 to May 31 |
| | Lake Sturgeon | May 1 to June 30 |
| | Muskellunge | March 15 to May 31 |
| | Largemouth/Smallmouth Bass | May 1 to July 15 |
| | Rainbow Trout | March 15 to June 15 |
| | Other/Unknown Spring Spawning Species | March 15 to July 15 |

| | FISH SPECIES | TIMING WINDOW |
|--------------|-------------------------------------|------------------------|
| Fall: | Lake Trout | October 1 to May 31 |
| | Brook Trout | October 1 to May 31 |
| | Pacific Salmon | September 15 to May 31 |
| | Lake Whitefish | October 15 to May 31 |
| | Lake Herring | October 15 to May 31 |
| | Other/Unknown Fall Spawning Species | October 1 to May 31 |

Additional approvals and permits may be required for the proposed works as it relates to the Fisheries Act. Please contact your local Conservation Authority and the Department of Fisheries and Oceans to determine requirements and next steps. Where the Fisheries Act is triggered and habitat compensation, mitigation measures or best management practices are being considered; as the MNR is charged with the management of Provincial fish populations, the MNR requests ongoing involvement in such discussions in order to ensure population conservation. Furthermore, local Conservation Authorities may also have additional approvals for works in and adjacent to water and wetland features. Finally, Transport Canada's Navigable Waters Protection Division may require review and approval of the proposed project. Please contact these local agencies directly for more information.

As per the Natural Heritage Reference Manual (Section 13; OMNR 2010) the MNR strongly recommends that an Ecological Site Assessment be carried out to more thoroughly determine the presence of natural heritage features, and Species at Risk and their habitat located on site. The MNR can provide survey methodology for particular species at risk and their habitats. In addition, the local planning authority may have more details pertaining to the requirements of the assessment process, which will result in allow for the municipality to make planning decisions which are consistent with the Provincial Policy Statement (2005).

Species at Risk

With the new Endangered Species Act (ESA, 2007) in effect, it is important to understand which species and habitats exist in the area and the implications of the legislation. A review of the Natural Heritage Information Centre (NHIC) and internal records and aerial photograph interpretation indicate that there is a potential for the following Threatened (THR) and/or Endangered (END) species on the site or in proximity to it:

- Bank Swallow (THR)
- Butternut (END)
- Barn Swallow (THR)
- Blanding's Turtle (THR)
- Bobolink (THR)
- Eastern Meadowlark (THR)
- Eastern Small-footed Myotis (END)
- Little Brown Bat (END)

All Endangered and Threatened species receive individual protection under section 9 of the ESA and receive general habitat protection under Section 10 of the ESA, 2007. Thus any potential works should consider disturbance of possible important habitat (e.g. nesting sites). Please note that as of June 30, 2013 general habitat protection applies to all Threatened and Endangered species. The habitat of these listed species is protected from damage and destruction and certain activities may require authorization(s) under the ESA. Please keep this date in mind when planning any species and habitat surveys

Species receiving General Habitat protection:

- Barn Swallow (THR)
- Blanding's Turtle (THR)
- Bobolink (THR)
- Butternut (END)
- Eastern Meadowlark (THR)
- Little Brown Bat (END)

If the proposed activity is known to have an impact on the species mentioned above or any other SAR, an authorization under the Endangered Species Act, 2007 (ESA) may be required. It is recommended that MNR Kemptville be contacted prior to any activities being carried out to discuss potential survey and mitigation measures to avoid contravention of the ESA.

Habitat has been identified within the project area that appears suitable for one or more species listed by SARO as Special Concern (SC). In Addition, one or more Special Concern species has been documented to occur either on the site or nearby. Species listed as Special Concern are not protected under the ESA, 2007. However, please note that some of these species may be protected under the Fish and Wildlife Conservation Act. Species of Special Concern for consideration:

- Bridle Shiner (SC)
- Snapping Turtle (SC)
- Eastern Musk Turtle (SC)

- Milksnake (SC)
- Monarch (SC)

If any of these or any other species at risk are discovered throughout the course of the work, and/or should any species at risk or their habitat be potentially impacted by on site activities, MNR should be contacted immediately and operations be modified to avoid any negative impacts to species at risk or their habitat until further direction is provided by MNR.

Please note that information regarding species at risk is based on documented occurrences only and does not include an interpretation of potential habitat within or in proximity to the site in question. Although this data represents the MNR's best current available information, it is important to note that a lack of information for a site does not mean that additional features and values are not present. i.e.: Species at Risk (SAR) or their habitat could still be present at the location or in the immediate area. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed; or their habitat is not damaged or destroyed through the activities carried out on the site. The MNR continues to strongly encourage ecological site assessments to determine the potential for SAR habitat and occurrences. When a SAR or potential habitat for a SAR does occur on a site, it is recommended that the proponent contact the MNR for technical advice and to discuss what activities can occur without contravention of the Act. If an activity is proposed that will contravene the ESA (such as Section 9 or 10), the proponent must contact the MNR to discuss the potential for a permit (Section 17). For specific questions regarding the Endangered Species Act (2007) or SAR, please contact a district Species at Risk Biologist at sar.kemptville@ontario.ca. For more information regarding the ESA (2007), please see attached ESA Information Sheet.

As of July 1, 2013, the approvals processes for a number of activities that have the potential to impact SAR or their habitat were changed in an effort to streamline approvals processes while continuing to protect and sustainably manage Ontario's natural resources. For those activities that require registration with the Ministry, businesses and individuals will be able to do so through a new online system. The online system will also include information to help guide individuals and businesses through the new processes. For further information on which activities are authorized through this new online registration process and how to apply, please refer to the following website: http://www.mnr.gov.on.ca/en/About/2ColumnSubPage/STDPROD_104342.html. General inquiries may be directed towards Kemptville District MNR, while questions and comments involving the new online forms can be directed to the Registry Approvals Service Centre (RASC) at 1-855-613-4256 or mnr.rasc@ontario.ca.

Please note: The advice in this letter may become invalid if:

- The Committee on the Status of Species at Risk in Ontario (COSSARO) re-assesses the status of the above-named species OR adds a species to the SARO List such that the section 9 and/or 10 protection provisions apply to those species.
- Additional occurrences of species are discovered.
- Habitat protection comes into force for one of the above-mentioned species through the creation of a habitat regulation (see general habitat protection above).

This letter is valid until: Tue. Jan 5, 2016

MNR is streamlining and automating its approvals processes for natural resource-related activities. Some activities that may otherwise contravene the ESA may be eligible to proceed without a permit from MNR provided that regulatory conditions are met for the ongoing protection of species at risk and their habitats. There are regulatory provisions for projects that have attained a specified level of approval prior to, or shortly after, the specified species or its habitat became protected under the ESA. These requirements include registering the activity with the Ministry of Natural Resources, taking steps to immediately minimize adverse effects on species and habitat, and developing a mitigation plan. Anyone intending to use this regulatory provision is strongly advised to review Ontario Regulation 242/08 under the Endangered Species Act, 2007 for the full legal requirements.

For more information please check out the following link <http://www.ontario.ca/environment-and-energy/development-and-infrastructure-projects-and-endangered-or-threatened-species>

The MNR would like to advise, by way of this letter, that we continue to be circulated on information with regards to this project. If you have any questions or require clarification please do not hesitate to contact me.

Sincerely,

Erin Seabert
Management Biologist
erin.seabert@ontario.ca

Encl.\

- ESA Infosheet
- NHIC/LIO Infosheet

Appendix B

Fraser Clark Drain Permits

DATE: 19 November 2009
FILE #: RV5-03/05
CONTACT: Hal Stimson

Clarke Family Farm Partnership
1122 Cameo Drive
OTTAWA, Ontario
K2C 1Y7

SUBJECT: APPLICATION TO ALTER A WATERWAY

Ontario Regulation 174/06 under the Conservation Authorities Act
for watercourse known as the **Fraser-Clarke Municipal Drain** in parts of Lot(s)
14/15, Concession 3 (former city of Nepean) now in the City of Ottawa

Dear Mr. Clarke

The Rideau Valley Conservation Authority has reviewed your application under the *Conservation Authorities Act* (Ontario Regulation 174/06, Alteration to Waterway) and on behalf of the Department of Fisheries and Oceans (DFO) pursuant to the federal *Fisheries Act*. Under agreement with DFO, the Conservation Authority is the screening agent for all projects in or near water considered to be or have the ability to be fish habitat. An RVCA biologist has been consulted respecting this project. The project, as we understand it, is for:

- 1) Realignment of approximately one kilometer of the existing drain to a new location as shown in Drawings;
 - No. FP-2, Project No. 160400208 Titled Proposed Conditions *revision 4 dated 09.09.25* as prepared by Stantec Consulting Ltd.
 - and Drawing CS-1, Project No. 160400208 Titled Cross Sections *revision 4 dated 09.09.25* also prepared by Stantec Consulting Ltd.
- 2) Fill and landscape the existing and the new drain per Drawings;
 - No. GP-1, Project No. 60400208 titled Proposed Grading Plan *revision 4 dated 09.09.25* as prepared by Stantec Consulting Ltd.
 - No. LA-1, Project No. 60400208 titled Landscape Plan *revision 5 dated 09.09.25* as prepared by Stantec Consulting Ltd.
 - No. EC-1, Project No. 60400208 titled Erosion Control Plan *revision 5 dated 09.09.25* as prepared by Stantec Consulting Ltd.
 - No. FP-1 titled Existing Conditions *revision No 4 dated 09.09.25* and Relocate native fill material in the flood plain per the above drawings.

This proposal was reviewed under Ontario Regulation 174/06 (made pursuant to the Conservation Authorities Act) as administered by the Conservation Authority in consideration of the Authority's Development Policies for the Construction of Buildings/Structures, Placing of Fill and Alteration to Waterways. An engineering assessment has indicated that the revised lot grading plan satisfies the Conservation Authority's requirements for an incrementally balanced "cut" and "fill" so as to result in preservation of flood plain storage volumes.

Based upon the review of the provided documents and plans this proposal does not compromise the principles of the RVCA policies regarding an alteration to a waterway, or the placing of fill, providing that sediment and erosion control is established prior to the work being undertaken. Sediment must be controlled both during and after construction. Providing the project is completed with adequate sediment control measures in place, it should not result in any significant effects on flood control, pollution and/or conservation of land.

Based on the information submitted with the permit application we have concluded that the proposed work is not expected to result in the harmful alteration, disruption or destruction of fish habitat providing proper sediment controls are established and monitored during and after the construction period and the annual timing restriction window for fish habitat is respected. The project therefore does not contravene Section 35(1) of the *Fisheries Act*, which states;

"No person shall carry on any work or undertakings that results in the harmful alteration, disruption or destruction of fish habitat"

By this letter the Rideau Valley Conservation Authority hereby grants you permission to undertake works on your property as described in your proposal, **subject to the following conditions:**

- 1) That all work be completed as described in the supplied construction drawings as listed above. Any changes to the proposed work must be submitted in writing to the Conservation Authority for review prior to commencement. No conditions are subject to change/revision by any on-site contractors.
- 2) Upon completion of the grading, the owner (at their expense) must submit a finished grade plan to confirm that the project has been completed in accordance with the approved plan. The finished grade plan should be prepared and/or approved by a licensed professional engineer (PEO) or Ontario Land Surveyor.
- 3) **A refundable fill deposit of \$3000.00 is to be submitted to the Rideau Valley Conservation Authority. The deposit will be returned less a 10% administration fee upon RVCA acceptance of the final grading plan.**
- 4) The Authority must receive in writing, confirmation that a registered easement has been established which restricts any future changes in the grading of the proposed "cut" area; this is most easily done by creation of a permanent easement to be registered on a portion of the property that will be identified in an R-Plan deposited in the local Land Registry Office for the Province of Ontario - the wording of the easement agreement should be such that the owners (current and/or future) agree to make no changes to the grades by the placing or dumping of fill, and to construct no structures without prior written permission of the RVCA. It should also grant to the RVCA a right of access to enter the land for the purposes of inspection to ensure that the created flood plain storage has not been removed by unauthorized filling operations. The preparation of the R-Plan should be completed by an Ontario Land Surveyor and the easement documents should be prepared by solicitors acting on behalf of the owners, at the owner's expense.
- 5) Sediment and erosion control measures shall be in place **before** any excavation or construction works commence. All sediment/erosion control measures are to be monitored daily and maintained as necessary to ensure good working order and are to remain in place until landscaping has been established. All sediment control measures must prevent entry of sediment into the water or the movement of re-suspended sediment. In the event that the erosion and sedimentation control measures are deemed not to be performing adequately; the contractor shall undertake additional measures as appropriate to the situation to the satisfaction of the Conservation Authority. The Conservation Authority reserves the right to withdraw permission in the event of observed non-compliance.

- 6) All disturbed areas must be stabilized and re-vegetated upon completion of work and restored to a pre-disturbed state or better. Sediment and erosion control measures must be left in place until all areas have been stabilized with suitable vegetative cover.
- 7) To mitigate the loss of existing riparian vegetation on the old channel both banks of the new channel must be planted with trees and shrubs to provide a cooling effect for the water within the watercourse before it flows into the Jock River. The Landscape plan prepared by Stantec Consulting Ltd., dated 09.09.25 (revision 5) has been reviewed and will mitigate any potential thermal impacts to the Jock River. All plantings must be established within one calendar year from the date of completion of the works.
- 8) All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in manner that prevents any deleterious substance (e.g. petroleum products, silt, debris, etc.) from entering the water.
- 9) Activities such as equipment refueling and maintenance must be conducted away from the water to prevent entry of petroleum products, debris, or other deleterious substances into the water. No heavy equipment (including small construction machinery such as a "Bobcat") is permitted on the bed of the drain while subject to water flow for any reason at any time.
- 10) Only clean material free of fine particulates should be placed in the water. Only clean native material originating from within the site only and free of any form of contaminants may be used as fill.
- 11) Work should be completed in the dry or during low water conditions (August/September). Dry conditions are possible on this portion of the watercourse due to the fact that it is classified as a type F intermittent drain. Work in water shall not be conducted at times when flows are elevated due to local rain events, storms, or seasonal floods.
- 12) Work on the new channel may take place in the winter. However, the stabilization and re-vegetation of the banks of the new channel must be completed and stable before the new channel outlets to the downstream section of the existing watercourse. The old channel must be kept in place until the new channel outlet is constructed and fully operational.
- 13) The applicant is to notify Authority staff upon commencement and completion of the works.
- 14) The applicant agrees that Authority staff may visit the subject property, before, during and after project completion, to ensure compliance with the conditions as set out in the letter of permission;
- 15) A complete new application must be submitted should any work as specified in this letter be ongoing or planned for or after November 19, 2009. *Nothing in this letter shall be taken as approval or endorsement for any other drainage works other than as shown on the approved Stantec drawings.*
- 16) **No in water work is to occur between March 15 and June 30, during any given year to protect local fish populations during their spawning and nursery time periods.**
- 17) Any stockpiled materials should be stored and stabilized away from the water.

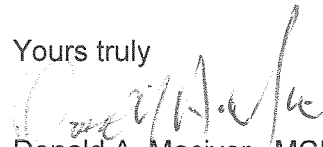
It must also be noted that the newly created section of the watercourse will likely result in the creation of fish habitat based on significant proposed grade changes. Any future proposed works on the new channel will require a fish habitat assessment of the new portion of the watercourse and approval under Section 28 *Conservation Authorities Act*, a Section 35 *Fisheries Act* review as well as approval under any other applicable legislation.

By this letter the Rideau Valley Conservation Authority assumes no responsibility or liability for any flood, erosion, or slope failure damage which may occur either to your property or the structures on it or if any activity undertaken by you adversely affects the property or interests of adjacent landowners.

This letter does not relieve you of the necessity or responsibility for obtaining approval from your municipality such as Ontario Planning Act zoning or site plan approvals or for acquiring **any** other federal or provincial permits including but not limited to approvals under the Lakes and Rivers Improvement Act, the Public Lands Act, the Species at Risk Act or the Municipal Drainage Act.

Nothing in this letter of permission is intended to imply or confer any right of occupation or use of public land. This permit assumes that all appropriate authorizations have been obtained from the adjoining affected landowners. This permission may not be transferred to any other party.

Yours truly



Donald A. Maciver MCIP, RPP
Director of Planning

HS/hs

c.c. M. Gagne, City Ottawa
M. Ford P. Eng. Stantec

Note:

The applicant agrees that Authority staff may visit the site before, during and after construction for the purpose of determining compliance with any conditions as set out in this letter of permission. This letter of permission does not come into full force and effect until the attached copy of this letter is returned to the Authority offices in Manotick signed and dated which return shall be taken as indicating acceptance of the conditions of the Authority's approval and acknowledgment that the details of the proposal as described in this letter are a fair and accurate representation of the proposed undertaking.

Pursuant to the provisions of S. 28(12) of the Conservation Authorities Act (R.S.O. 1998) any or all of the conditions set out above may be appealed to the Executive Committee of the Conservation Authority in the event that they are not satisfactory or can not be complied with.

Forty eight hours written notice to the Conservation Authority is required regarding the commencement of work.

Signed: _____

Date: _____



File Number D06-01-16-0071

25 July 2016

Minto Communities - Canada
200-180 Kent St,
Ottawa, ON K1P 0B6

Attention: Hugo Lalonde, MCIP, RPP; Land Development Manager

Dear Mr. Lalonde:

**Re: Tree Permit for the Fraser Clark drain relocation at 4005 Strandherd Dr,
Ottawa issued in accordance with Urban Tree Conservation By-law No. 2009-
200**

This letter confirms receipt of the October 9 2009 Tree Conservation Report prepared by MMM Group.

Permission is hereby granted to remove the trees identified within the TCR subject to the following conditions:

1. This permit replaces the October 27 2009 permit issued for 3231 Cedarview Road.
2. All requirements under ESA 2007 must be met prior to tree removal.
3. The following protection measures must be implemented for retained trees, both on site and on adjacent sites as per the TCR and/or the grading plan, landscaping plan and site servicing plan, and prior to any site works or tree removal:
 - Under the guidance of an arborist, erect a fence at the critical root zone (CRZ) of trees where the CRZ is established as being 10 centimetres from

the trunk of a tree for every centimetre of trunk diameter at breast height. The CRZ is calculated as DBH X 10 cm.;

- 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 or any tree;
 - Ensure that exhaust fumes from all equipment are NOT directed towards any tree canopy.
4. Tree protection measures must be maintained for the duration of construction on site.
 5. Mark Richardson, Planning Forester with the City of Ottawa's Planning, Infrastructure and Economic Development Department will be notified at least two business days prior to the commencement of tree removal operations.
 6. A minimum of one replacement tree is planted for every tree removed. Where possible, these replacement trees shall be native to the Ottawa area, sourced from nurseries growing seed-zone appropriate planting stock, and appropriate to the site conditions as recommended by a qualified arborist.
 7. No clearing of vegetation shall occur between April 15 and August 15, unless a qualified biologist has determined that no bird nesting is occurring within 5 days prior to the clearing. A pre-clearing survey for active stick nests and cavity nests shall also be conducted between April 1 and April 15, in order to identify and protect early-nesting owls and raptors.
 8. The permit holder will comply with any federal regulations or orders relating to the movement of wood or wood products including ministerial orders issued by the Canadian Food Inspection Agency.
 9. Impacts on wildlife will be minimized in accordance to Ottawa's Wildlife Protocol.

Unless otherwise specified, this permit does not authorize the harm or removal of trees located on either City-owned land or adjacent properties. In addition, this permit does not relieve the owner, applicant and/or permit holder from any responsibility to comply with all applicable provincial or federal legislation.

Please note that any personal information required for this permit is collected under the authority of Section 135 of the Municipal Act, 2001, S.O. 2001, c. 25, as amended and will be used for the administration and enforcement of the City's Urban Tree Conservation By-law No. 2009-200, as amended.

If you have any questions regarding this permission, please contact Mark Richardson R.P.F, in the Planning and Growth Management Department at 613-580-2424, ext. 23839.

In signing this letter in duplicate you agree to the following:

- (a) to comply with the above noted conditions;
- (b) to indemnify and save harmless the City from any claims, demands and causes of action arising out of or incurred by reason of the issuance of permit or the tree removal, and;
- (c) that the removal of the above-noted trees in this permit is done at the owner's risk and the City of Ottawa assumes no responsibility for the removal or any residual effects of the removal.

Please sign both copies of the letter. Retain one copy for yourself, and mail the second copy back to the City at the address located at the bottom of this page.

Regards,



John L. Moser
General Manager, Planning, Infrastructure and Economic Development Department
Directeur général, Service de planification, d'Infrastructure et de Développement
économique
110 Laurier Ave. W. | 110, avenue Laurier ouest
Ottawa, ON K1P 1J1

Attachment 1

Property Address where tree removal will occur: **4005 Strandherd Road, Ottawa**

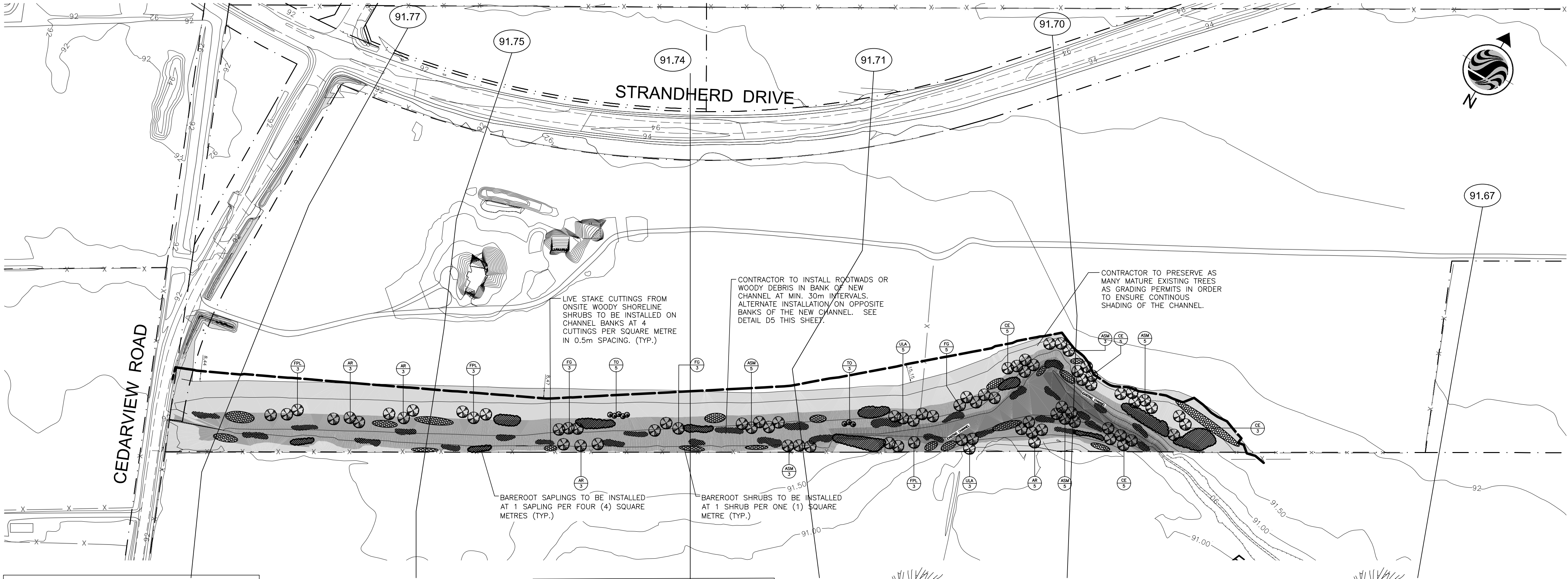
Name of Owner/Property Manager: **Hugo Lalonde**

Date: _____

Print: _____

Signature: _____ Witness: _____

**NOTE: THIS PERMIT AND THE APPROVED TREE CONSERVATION REPORT
AND/OR LANDSCAPE PLAN MUST BE AVAILABLE ON-SITE DURING TREE
REMOVAL, GRADING, CONSTRUCTION, AND ANY OTHER SITE ALTERATION
ACTIVITIES**



HARVESTING AND STORING LIVE CUT BRANCHES:

1. HARVEST AND INSTALL CUTTINGS WHILE THE PLANTS ARE DORMANT. THIS PERIOD IS GENERALLY FROM LATE FALL WHEN THE PLANTS ARE ENTERING DORMANCY TO EARLY SPRING BEFORE THE BUDS BREAK.
2. WHEN HARVESTING LIVE CUT BRANCHES, SELECT HEALTHY, LIVING WOOD FROM TWO OR MORE LOCATIONS.
3. USE LIVE WOOD THAT IS 1-4 YEARS OLD AND REASONABLY STRAIGHT.
4. MAKE CLEAN CUTS USING A CHAIN SAW OR SIMILAR TOOL.
5. DURING THE DORMANT SEASON, WHEN THE LIVE CUT BRANCHES CAN NOT BE INSTALLED IMMEDIATELY AFTER HARVESTING STORE IN THE FOLLOWING MANNER FOR TWO TO FOUR DAYS:
 - IN A SHADED POND, LAKE OR STREAM
 - UNDER A TARP IN A COOL, MOIST AREA, OR
 - IN MOIST EARTH IN A COOL SHADY AREA
 - NEVER STORE ON ASPHALT ROADSIDES OR IN THE SUN.
6. DURING THE GROWING SEASON, LIVE CUT BRANCHES MAY BE STORED FOR UP TO TWO MONTHS UNDER REFRIGERATION. HOWEVER, THEY MUST BE HARVESTED IN THE DORMANT SEASON.
7. THE FRESHER THE MATERIAL, THE LOWER THE STRESS AND THE BETTER THE SUCCESS.

SEED MIX

CERTIFIED CANADA NO. 1 MIXTURE, MINIMUM GERMINATION OF 75%, MINIMUM PURITY OF 97%. ALL SEED MUST BE FROM A RECOGNIZED SEED FIRM, MEETING THE REQUIREMENTS FOR THE SEEDS ACT FOR CANADA NO. 1 SEED. SEED SHALL BE CERTIFIED NO. 1 GRADE. A GERMINATION TEST MAY BE REQUESTED AND ALL LAWN SEED MUST COMPLY WITH FEDERAL AND PROVINCIAL SEED LAWS.

FOR LOW MAINTENANCE LANDSCAPING:

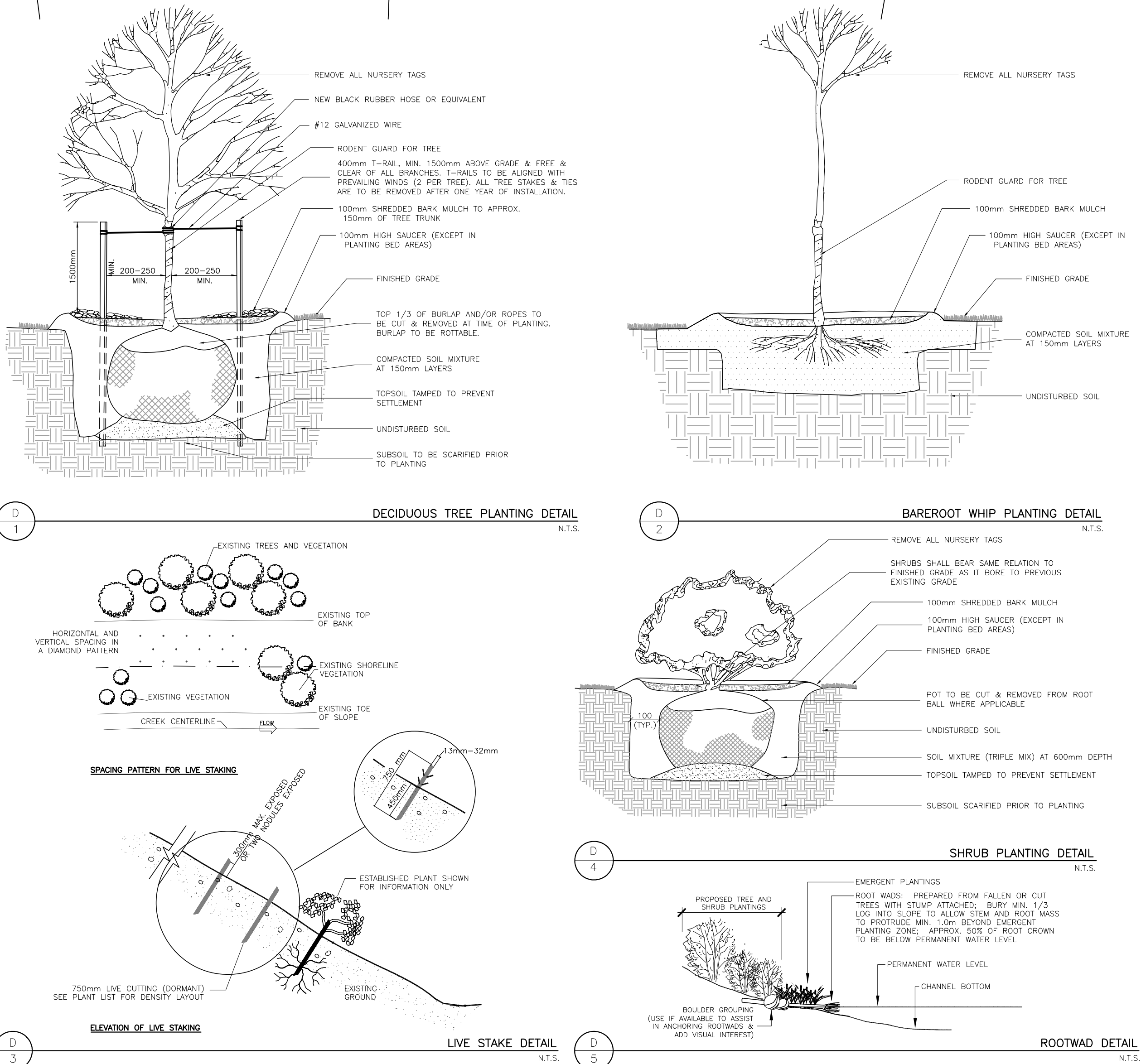
- 10% WHITE CLOVER
- 20% FIESTA II PERENNIAL RYEGRASS
- 25% TALL FESCUE
- 20% CREEPING RED FESCUE
- 15% TIMOTHY
- 10% CHEST KENTUCKY BLUEGRASS

SEEDING RATE: 2.0KG PER 100 SQ.M.

FOR 'QUICK' GREEN-UP, ADD 0.625 KG PER 100 SQ.M ANNUAL RYE INTO MIX

LANDSCAPE NOTES:

1. CONTRACTOR SHALL SUPPLY ALL PLANTS AND MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE WORK SHOWN ON THIS DRAWING. ANY DISCREPANCIES BETWEEN QUANTITIES SHALL BE REPORTED TO THE CONTRACT ADMINISTRATOR FOR DIRECTION.
2. PLANT MATERIALS COLLECTED FROM WILD SOURCES WILL NOT BE ACCEPTED. CONTRACT ADMINISTRATOR MAY REQUIRE THAT SUPPLIER INVOICES FOR PLANT MATERIAL BE SUBMITTED FOR INSPECTION.
3. STAKING (LAYOUT) OF PLANT MATERIALS TO BE APPROVED BY THE CONTRACT ADMINISTRATOR PRIOR TO INSTALLATION. DRAWING MAY BE SCALED FOR APPROXIMATE LAYOUT OF INDIVIDUAL TREES AND PLANTING BEDS.
4. CONTRACT ADMINISTRATOR RESERVES THE RIGHT TO REFUSE ACCEPTANCE OF ANY PLANT DISPLAYING POOR GROWTH HABITS, INJURY OR DISEASE. ANY PLANT MATERIAL THAT IS REJECTED BY THE CONTRACT ADMINISTRATOR WILL BE PROMPTLY REMOVED FROM THE SITE BY THE CONTRACTOR AND REPLACED WITH MATERIAL OF ACCEPTABLE QUALITY AT NO ADDITIONAL COST TO THE PROJECT.
5. ALL DECIDUOUS AND CONIFEROUS TREES AND SHRUBS SHALL BE PLANTED AND STAKED IN ACCORDANCE WITH THE PLANTING DETAILS ON THIS DRAWING.
6. ALL PLANT MATERIALS TO CONFORM TO THE CANADIAN NURSERY LANDSCAPE ASSOCIATION (CNLA) FOR VARIETY, SIZE AND CONDITION. ANY PLANTS THAT DO NOT CONFORM TO THESE STANDARDS WILL BE PROMPTLY REMOVED FROM THE SITE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT.
7. ANY SUBSTITUTIONS OF PLANT MATERIALS OR QUANTITIES REQUIRES THE WRITTEN APPROVAL OF THE CONTRACT ADMINISTRATOR. BAREROOT MATERIAL SHOULD BE SUBSTITUTED WITH POTTED OR WIRE BASKET MATERIAL IF PLANTING IS NOT COMPLETED IN THE SPRING.
8. PLANTS ARE NOT TO BE INSTALLED OR TRANSPLANTED DURING EXTREME HEAT, DROUGHT OR OTHER UNDESIRABLE CONDITIONS. CONTRACTOR SHALL NOT PROCEED IN UNCERTAINTY. CONTACT CONTRACT ADMINISTRATOR FOR DIRECTION.
9. THE CONTRACTOR SHALL RELOCATE ANY TREE OR SHRUB ON THE PROPERTY AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
10. ALL PLANT MATERIALS WILL BE PLANTED IN AN APPROVED TOPSOIL. NO ADDITIONAL SOILS OR ADDITIVES WILL BE PERMITTED UNLESS SPECIFIED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT.
11. TOPSOIL TO BE FREE FROM WEEDS, SUBSOIL, ROOTS, STONES, LUMPS OF CLAY AND TOXIC MATERIAL.
12. SHREDDED BARK MULCH TO BE UNIFORMLY APPLIED UNDER ALL TREES AND IN PLANTING BEDS TO 60 mm IN THICKNESS. SAMPLE TO BE SUBMITTED TO THE CONTRACT ADMINISTRATOR FOR APPROVAL PRIOR TO PLACEMENT.
13. INSTALL APPROVED WRAPAROUND TYPE TREE GUARDS ON ALL DECIDUOUS TREES OVER 2000 mm IN HEIGHT. ENSURE THAT THE BOTTOM 50 mm OF THE TREE GUARD EXTENDS BELOW SOIL TO PREVENT ENTRY BY RODENTS.
14. ANY DEAD OR DAMAGED BRANCHES OF TREES OR SHRUBS TO BE PRUNED ACCORDING TO STANDARDS AND TIMING APPROPRIATE TO EACH SPECIES.
15. CONTRACTOR TO VERIFY ALL DIMENSIONS AND QUANTITIES AND REPORT ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR.
16. CONTRACTOR TO IDENTIFY WITH OWNER AND CONTRACT ADMINISTRATOR ANY MAINTENANCE REQUIREMENTS NECESSARY FOR WARRANTY PURPOSES.
17. ALL WORKMANSHIP AND MATERIALS TO BE GUARANTEED FOR TWO YEARS FOLLOWING SUBSTANTIAL COMPLETION AS DOCUMENTED BY THE CONTRACT ADMINISTRATOR.
18. CONTRACT ADMINISTRATOR RESERVES THE RIGHT TO EXTEND CONTRACTOR'S WARRANTY RESPONSIBILITIES FOR AN ADDITIONAL YEAR IF, AT THE END OF INITIAL WARRANTY PERIOD, LEAF DEVELOPMENT AND GROWTH IS NOT SUFFICIENT TO ENSURE FUTURE SURVIVAL AS DETERMINED BY THE CONTRACT ADMINISTRATOR.
19. PROVIDE UNIT PRICES TO ALLOW FOR ADDITIONS / DELETIONS TO THE CONTACT.
20. CONTRACTOR TO VERIFY ON SITE ALL UNDERGROUND UTILITY LOCATIONS PRIOR TO PLANTING.
21. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING LANDSCAPED AREAS AND MUST MAKE ALL NECESSARY RESTORATIONS AND REPAIRS.
22. CONTRACTOR SHALL REMOVE ALL TREE STAKES AND ASSOCIATED GUY WIRES AND ATTACHMENT DEVICES AFTER THE SPECIFIED WARRANTY PERIOD.
23. ALL TREE LOCATIONS SHALL CONFORM TO THE SETBACK REQUIREMENTS ESTABLISHED BY THE CONTRACT ADMINISTRATOR.



PLANT LIST

| SYM | Qty | Botanical Name | Common Name | CAL (mm) | HT (mm) | Root | Remarks |
|---|------|-----------------------|---------------------|----------|---------|------|--|
| DECIDUOUS TREES: | | | | | | | |
| AR | 14 | Acer rubrum | Red Maple | 50 | | W.B. | |
| ASM | 21 | Acer saccharinum | Silver Maple | 50 | | W.B. | |
| CE | 18 | Celtis occidentalis | Common Hackberry | 50 | | W.B. | |
| FG | 11 | Fagus grandifolia | American Beech | 50 | | W.B. | |
| FPL | 9 | Fraxinus pensylvanica | Green Ash | 50 | | W.B. | |
| ULA | 8 | Ulmus americana | American Elm | 50 | | W.B. | |
| CONIFEROUS TREES: | | | | | | | |
| TO | 8 | Thuja occidentalis | White Cedar | | 1500 | B.B | |
| DECIDUOUS AND CONIFEROUS BAREROOT SAPLINGS: | | | | | | | |
| Saplings shall be installed with an even mix of bareroot material in each planting area. Saplings to be installed at 1 sapling per 4 square metres. | | | | | | | |
| | 79 | Acer rubrum | Red Maple | | 2000 | B.R. | |
| | 79 | Acer saccharinum | Silver Maple | | 2000 | B.R. | |
| | 79 | Celtis occidentalis | Common Hackberry | | 2000 | B.R. | |
| | 79 | Fagus grandifolia | American Beech | | 2000 | B.R. | |
| | 79 | Fraxinus pensylvanica | Green Ash | | 2000 | B.R. | |
| | 79 | Thuja occidentalis | White Cedar | | 2000 | B.R. | |
| | 79 | Ulmus americana | American Elm | | 2000 | B.R. | |
| DECIDUOUS SHRUBS: | | | | | | | |
| Shrubs shall be installed with an even mix of bareroot material in each planting area. Shrubs to be installed at 1 shrub per square metre. | | | | | | | |
| CFO | 225 | Cornus racemosa | Gray Dogwood | | 600 | B.R. | |
| COR | 225 | Cornus sericea | Red Osier Dogwood | | 600 | B.R. | |
| RRO | 225 | Rubus odoratus | Flowering Raspberry | | 600 | B.R. | |
| SAC | 225 | Salix candida | Hoary Willow | | 600 | B.R. | |
| SAD | 225 | Salix discolor | Pussy Willow | | 600 | B.R. | |
| SAE | 225 | Salix exigua | Sandbar Willow | | 600 | B.R. | |
| SCM | 225 | Sambucus canadensis | American Elder | | 600 | B.R. | |
| VL | 225 | Viburnum lentago | Nannyberry | | 600 | B.R. | |
| Live stakes to be installed at 4 stakes per square metre. | | | | | | | |
| | 8640 | Live Stake Cuttings | | | 900 | B.R. | Live stakes to come from onsite woody shoreline material such as dogwood or willow shrubs. |



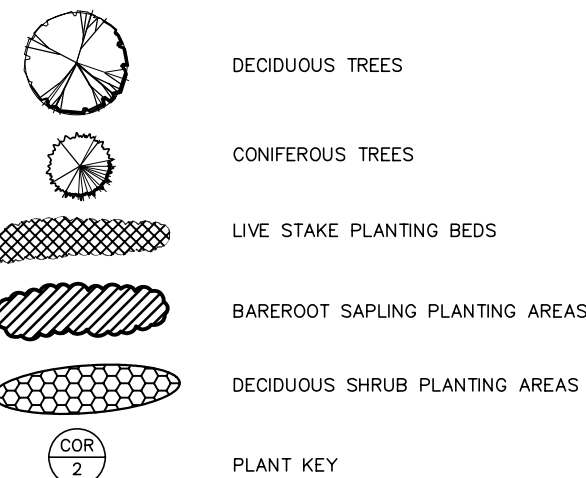
Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa ON Canada
K1Z 7T1
Tel. 613.722.4420
Fax. 613.722.2799
www.stantec.com

Copyright Reserved

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.
The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

Legend

91.67 EXISTING FLOOD PLAIN ELEVATION (RVCA 2001)



Notes

1. SEED TO BE INSTALLED WITH 100MM DEPTH TOPSOIL.
2. SEED TO BE PLACED IN ALL DISTURBED AREAS.

| | | | |
|--------------------------------------|-----|-----|----------|
| 2. REVISED ALIGNMENT-CEDARVIEW DITCH | HMT | EDV | 07.06.12 |
| 1. REVISED ALIGNMENT | HMT | DLM | 07.05.25 |
| 0. ISSUED FOR REVIEW BY RVCA | EDV | EDV | 05.11.18 |

Revision By Appd. YY.MM.DD

File Name: Dwn. Chkd. Dsgn. YY.MM.DD

Seal



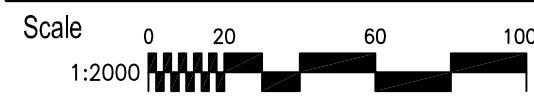
Client/Project
CLARKE FAMILY FARM PARTNERSHIP

Ottawa ON Canada

Title

LANDSCAPE PLAN

Project No. 160400208
Drawing No. Sheet Revision



Appendix C

Curriculum Vitae

Whitney Moore, B.Sc.

BIOLOGIST

wmoore@dillon.ca

PERSONAL PROFILE

Whitney is a biologist with experience in reviewing environmental applications and reports for various government agencies using applicable legislation, policies and procedures. She has reviewed natural heritage assessments and species at risk reports for renewable energy projects and work permit applications for shoreline works in Ontario. She is knowledgeable in both terrestrial and aquatic habitats and has expertise in wildlife and habitat protection requirements and worked on projects involving species at risk permitting, writing natural heritage assessment reports and amendments and post-construction mortality monitoring for wind farms.

RELEVANT EXPERIENCE

Biologist, Solar Farms, Canadian Solar Solutions Inc., Ontario

Completed Renewable Energy Approval (REA) amendment reports for several solar projects for submission to the Ministry of the Environment. Prepared Notice of Activity forms for the Ministry of Natural Resources species at risk registry and prepared species at risk letters and habitat management plans. A sampling of the solar projects this work was completed for includes:

SunE Demorestville LP
Alfred LP
Aria LP
CityLights LP
DiscoveryLights LP
EarthLight LP
FotoLight LP
CSI Glenarm LP

Biologist, Dufferin Wind Farm, Dufferin Wind Power Inc.

Coordinated the Ontario Renewable Energy Approvals (REA) process a 49 turbine (100 MW) wind farm and assessed two transmission options - a 30 km 69 kV option and a 40 km 230 kV option. The project included a wind resource assessment, turbine siting, noise assessment, transmission routing, natural heritage assessment, visual assessment, public and agency consultation, and aboriginal consultation.

Biologist, Integrity Digs, Enbridge Gas New Brunswick, Southern Ontario

Completed permit application packages for Integrity Digs in various conservation authority jurisdictions. Completed Environmental Clearance memos for several Integrity Dig sites across southern Ontario.

EDUCATION

B.Sc. (Hons), Biology, Wilfrid Laurier University, 2009

Biologist, ESLC Wind Farms, GDF Suez Energy

Assisted in obtaining both provincial and federal permits for post-construction mortality monitoring at two wind farms in southern Ontario. Prepared the health and safety plans and assisted in scheduling the post-construction monitoring. Prepared project binders for staff involved in the projects.

Biologist, Erieau Wind Farms, GDF Suez Energy

Assisted in obtaining both provincial and federal permits for post-construction mortality monitoring at two wind farms in southern Ontario. Prepared the health and safety plans and assisted in scheduling the post-construction monitoring. Prepared project binders for staff involved in the projects.

Biologist, Windsor Phase III Solar, Samsung Renewable Energy Inc., Location

Completed the renewable energy approval and a system impact assessment as they related to 50 MW transmission connected solar projects. The project included substation design, transmission line design review and energy studies.

Biologist, Southgate Phase III Solar, Samsung Renewable Energy Inc., Location

Completed the renewable energy approval and a system impact assessment as they related to 50 MW transmission connected solar projects. The project included substation design, transmission line design review and energy studies.

EMPLOYMENT HISTORY

DILLON CONSULTING LIMITED

2013 - Present Biologist

ONTARIO MINISTRY OF NATURAL RESOURCES

2013 Renewable Energy Planning Ecologist

2012 A/Integrated Resource Management Technical Specialist

2010 - 2012 Renewable Energy Planning Ecologist

2010 Lands Technician

FISHERIES AND OCEANS CANADA

2009 - 2010 Fish Habitat Biologist

QUINTE CONSERVATION AUTHORITY

2009 Watershed Technician

MINISTRY OF THE ENVIRONMENT

2008 Abatement Summer Student

PROFESSIONAL DEVELOPMENT

Headwater and Barrier Attrition Workshop, Rideau Valley Conservation Authority, April 2015

Post-Construction Bird and Bat Mortality Monitoring Training, MNR, 2014

Bat Maternity Colony Habitat Training, MNR, 2014

Advanced Open Water with Coral Reef Research Specialty, PADI, Seychelles, 2014

Ecological Flow Requirements Workshop, WWF Canada and Grand River Conservation Authority, 2011

Small Non-Pleasure Vessel Basic Safety (MED A3) Certified, MNR, 2011

Ontario Wetland Evaluation System Course, MNR, 2011

Fish Identification Course (Level 1), MNR, 2011

Clear Writing, MNR, 2011

Environmental Review Tribunal Training, MNR, 2011

Project Management 101 Training, MNR, 2011

Introduction to ArcGIS training, ERSI, 2010

Data Sensitivity Training (Natural Heritage Information Centre), MNR, 2010

Pleasure Craft Operators Card, Government of Canada, 2010

ATIP Training, Department of Fisheries and Oceans Canada, 2010

Habitat Referral Protocol Training, Department of Fisheries and Oceans Canada, 2010

Ontario Benthos Biomonitoring Network Training, Quinte Conservation Authority, 2009

PADI Open Water, Southwest Sulawesi, Indonesia, 2007

Coral Reef Population Researcher, Cap Ternay, Seychelles

Check Your Watershed Day, Lower Trent Conservation Authority, Brighton, Ontario

Coral Reef Research Assistant, Hoga Island, Indonesia

Alexander Zeller, B.ES., M.Sc.

ASSOCIATE

azeller@dillon.ca

PERSONAL PROFILE

Alex is an ecologist with experience in natural resource, urban development, water resources and planning fields. His broad knowledge of ecology, GIS and remote sensing has proved a successful complement to large-scale environmental planning projects.

RELEVANT EXPERIENCE

URBAN DEVELOPMENT

Project Manager, Riverside South Phase 12, Urbandale Corporation, Ottawa, Ontario

Completed a planning rationale, environmental impact statement, tree conservation report, and headwater stream assessment for a new development in Riverside South. Project work included field surveys, reporting, agency consultation and approval applications.

Lead Biologist, Henderson Lands, Lioness Developments Inc., Kemptville, Ontario

Completed a planning rationale, environmental impact statement, tree conservation report, and headwater stream assessment for a new development in Kemptville. Project work included field surveys, reporting, agency consultation and approval applications.

Lead Biologist, Huntmar Lands - 130 Huntmar Drive, Urbandale Construction Ltd., Ottawa, Ontario

Completed a traffic impact study, environmental impact statement, and tree conservation report for a new development in the Kanata West Lands. Project work included field surveys, reporting, agency consultation and approval applications.

Project Manager, Riverside South Phase 15, Riverside South Development Corporation, Ottawa, Ontario

Completed a planning rationale, environmental impact statement, tree conservation report, and headwater stream assessment for a new development in Riverside South. Project work included field surveys, reporting, agency consultation and approval applications.

Project Manager, Riverside South Phase 14, Riverside South Development Corporation, Ottawa, Ontario

Completed a planning rationale, environmental impact statement, tree conservation report, and headwater stream assessment for a new development in Riverside South. Project work included field surveys, reporting, agency consultation and approval applications.

EDUCATION

M.Sc., Biology, Lakehead University, 2007

B.ES. (Hons), Lakehead University, 2003

Project Manager, Riverside South Phase 16, Riverside South Development Corporation, Ottawa, Ontario

Completed an environmental impact statement and headwater stream assessment for a new development in Riverside South. Project work included field surveys, reporting, agency consultation and approval applications.

Project Manager, Clark Lands Development, Environmental Impact Statement, Minto Communities Inc., Ottawa, Ontario

Prepared a combined Environmental Impact Statement and Tree Conservation Report in support of a plan of subdivision for a residential development.

Project Manager and Lead Biologist, Plotter's Key Development, Minto Communities Inc., Ottawa, Ontario

Completed an Environmental Impact Statement and Tree Conservation Study for a development in Stittsville. The study was completed as part of an application for residential development. The project included Species at Risk surveys and permitting, mitigation development, a restoration plan, and agency consultation.

Project Manager and Lead Biologist, Fernbank Lands Development, Richcraft Homes, Ottawa, Ontario

Completed an Environmental Impact Statement and Tree Conservation Study for a development in west Ottawa. The study was completed as part of an application for residential development. The project included Species at Risk surveys and permitting, mitigation development, and agency consultation.

Project Manager and Terrestrial Ecologist, Ecological Screening Assessment, Walton Development & Management Inc., Ottawa, Ontario

Documented natural features through background review of secondary sources and field studies to determine potential constraints to development that may exist as a result of the natural environment. Also identified stewardship and enhancement opportunities on a number of properties in southwest Ottawa.

Project Manager, Country Hill Estates, City of Ottawa, Ontario

Completed a Scoped Environmental Impact Statement to specifically address concern for the impact of a rural residential development in south Ottawa on species at risk.

Project Manager, Chapman Mills Environmental Impact Statement, Minto Developments Inc., Ottawa, Ontario

Prepared an environmental impact statement addendum assessing the impact of a residential development on trees and local hydrology within a small woodlot.

NATURAL RESOURCES STUDIES

Project Manager/Lead Biologist, Ecological Land Classification, National Capital Commission, Ottawa, Ontario

Completed mapping of all ecotypes within the NCC's urban and greenbelt lands to be used for future ecological landscape management projects. The ecological mapping used Ontario Ecological Land Classification and covered an area of ~62 km².

GIS Analyst/Biologist, Species at Risk Survey, Defence Construction Canada, CFB Shilo, Manitoba

Completed a survey of 24 possible species at risk in Range Area 9, modelled habitat use by 18 species and completed an internal environmental assessment to plan for digbox training.

Project Manager/Lead Biologist, Species at Risk Screening Study, City of Ottawa, Ontario

Completed this study to identify the potential threat of 489 planned infrastructure projects had to species at risk (SAR). The study also developed tools for the management and implementation of this data. These tools included a suite of mitigation recommendations, a GIS database of the screening results, Google Earth files of all the results to ease accessibility of the spatial data, a document summarizing and illustrating the SAR that may be found and a SAR screening process flowchart.

Project Manager/Lead Biologist, Innes Road Environmental Monitoring, Enbridge Gas Distribution Inc., Ottawa, Ontario

Provided environmental monitoring and environmental awareness training for the pipeline installation along Innes Road. The project developed a bespoke environmental awareness training program to ensure the on staff contractors were aware of the environmental constraints and mitigation measures expected on site. The project also included ongoing construction environmental monitoring to ensure construction complied with mitigation requirements and all potential impacts were minimized.

Project Biologist, Ottawa West Reinforcement Pipeline Environmental Assessment, Enbridge Gas Distribution Inc., Western Ontario

Conducted detailed biophysical surveys to support environmental authorizations, pre and post construction water well monitoring and development of a detailed mitigation strategy for the installation of 20 km of 24 inch natural gas pipeline. Mitigation measures included; physical mitigation measures, environmental awareness training, daily on-site environmental monitoring, environmental compensation; and an assessment of agricultural crop loss and associated compensation.

Project Ecologist, Terry Fox Drive Extension, Construction Services, City of Ottawa, Ontario

Completed the construction and contract administration for the 5.4 km extension of Terry Fox Drive including sidewalks, recreational pathways, storm and sanitary sewers, floodplain compensation, preloading, street lighting and traffic signals, utility coordination and environmental features and remediation. Wildlife crossings, turtle fencing and a retaining wall guidance system was installed for animal protection and post-construction monitoring was completed to monitor their effectiveness. *Environmental Achievement Award, Transportation Association of Canada, 2014.*

Project Ecologist, Terry Fox Drive, Final Design, City of Ottawa, Ontario

Completely reworked the preliminary design based on geotechnical and species at risk constraints related to the compressed construction schedule. The design, tendering and construction administration process included updating the transportation model, a detailed traffic management plan, public consultation, natural environment inventory, a drainage strategy and stormwater management plan, and full-time environmental monitoring. *Award of Merit - Transportation, Consulting Engineers of Ontario, 2013.*

Lead Landscape Ecologist, Natural Heritage Study, County of Frontenac, Ontario

Completed a study to increase understanding of natural heritage features and systems across the Frontenacs (~4000 km²). The project included a comprehensive map to identify component environmental features of the natural heritage system; identification of significant areas for protection; policies addressing land use, growth and environmental preservation and conservation; recommendations for restoration and enhancement; and steps to encourage and facilitate private stewardship.

GIS Analyst and Biologist, Westside Creek Wetland Reconfiguration, St. Marys Cement Inc. (Canada), Bownmanville, Ontario

Developed and implemented a ten-year monitoring program for a reconfigured 24.7 ha wetland and 2.8 km creek. The program was developed to understand the impacts on natural populations and confirm that the habitat components were installed and functioning in a satisfactory manner.

Lead Ecologist, Rideau Corridor Landscape Strategy, Parks Canada, Ontario

Completed a landscape character assessment study as a component of an overall landscape strategy for the Rideau corridor from the Ottawa River to Lake Ontario. The Rideau Corridor Landscape Character Assessment combines GIS mapping, visual analysis tools, and other desk based research with public consultation and visual preference surveys to identify areas of distinctive landscape character within the Corridor which may be sensitive to physical and visual changes.

Project Ecologist, Birds Creek Secondary Plan, Municipality of Hastings Highlands, Ontario

Developed a secondary plan for the area including a land use study, public consultation, innovative “Healthy Hamlet” approach and urban design. The project included statutory processes including County of Hastings Official Plan amendments and Ministry of Municipal Affairs and Housing liaison. Responsibilities include consultation with public and client, assessing the existing natural resources, assisting in incorporating natural heritage features into the plan and developing GIS mapping for study area.

Ecologist and Spatial Analyst, Greater Toronto Area Reinforcement Pipeline Environmental Assessment, Enbridge Gas New Brunswick Inc., Ontario

Provided environmental and socio-economic constraints and opportunities input for the installation of a reinforced natural gas supply line throughout the GTA. The project included several potential routes followed by additional work to ascertain the feasibility of installation with a marine environment and in northern areas of the GTA. Also provided environmental and due diligence support for the proposed pipeline route and potential alternatives.

Project Ecologist, Infrastructure Master Plan, Town of Perth, Ontario

Reviewed water servicing alternatives in support of a master plan for a proposed new build-out north of Highway 7, including hydraulic analysis of servicing alternatives, including establishing design requirements, water delivery, fire flow, water storage requirements, sewage lift station and cost evaluations.

Project Ecologist, Commercial Vehicle Inspection Facilities (CVIFs) Strategic Plan, Ministry of Transportation, Ontario

Devised a province-wide strategy to increase commercial driver and vehicle safety. The condition assessment reviewed remaining useful life and life-cycle costs for the existing 16 truck inspections stations (TISs) due for reconstruction/upgrade to CVIFs. The project included

planning and implementation with site-specific schematic layouts, cost estimates, and CVIF conversion options based on present conditions, and outlined steps to be taken to manage the conversion of the TISs to CVIFs.

Project Ecologist, Regional Ecology Planning Framework, Regional Municipality of Wood Buffalo, Alberta

Developed an ecological planning framework to aid the municipality in balancing development pressures with municipal-specific environmental conservation goals. Responsible for developing the GIS-based ecological planning model and decision support tools created specifically for the municipality.

Ecologist and Spatial Analyst, Land Use Plan, Tlicho Government, Northwest Territories

Prepared a regional land use plan to guide the management of the 39 000 km² Tlicho settled land claim area. The project resulted in a draft plan that accommodates the Tlicho way of life, and considers the economic and social well-being of the Nation into the future. Specific works included development of the GIS database and spatial model within the GIS to aid in the production of the final land use plan. This model incorporates traditional indigenous knowledge and ecological features with economic and social influences to identify suitable land use zones.

Project Ecologist, Ecological Area Preservation Strategy, City of Yellowknife, Northwest Territories

Completed a multi-year study to develop a strategy for preserving valued natural areas for city growth over the next 50 years. A GIS based landscape database was developed to provide quantitative and qualitative information needed to guide development decisions affecting natural areas within the urban boundary. Public consultation included interviews, an open house and a community design charrette.

Project Ecologist, Satellite Image Classification, Tsuu T'ina First Nation, Calgary, Alberta

Conducted a satellite image classification to update outdated vegetation mapping. Landsat-7 TM data was classified using IDRISI Andes software. Training areas were delineated to represent the various vegetation communities in the image and a maximum likelihood classification method was used to classify the image. The results of the image classification proved to be excellent and corresponded to ground-truth landcover classes very well.

Project Biologist, Matthews Lake Habitat Restoration, Public Works Government Services Canada, Fort Smith, Northwest Territories

Completed the fish habitat restoration and enhancement at work at the lake, as compensation to the loss of fish habitat in lakes and streams associated with a nearby diamond mine development. Post-construction monitoring was also provided.

ENVIRONMENTAL ASSESSMENTS

Project Ecologist, Enbridge Ottawa West Pipeline Reinforcement Environmental Assessment, Enbridge, Ontario

Conducted an Environmental Assessment for submission to the National Energy Board for the construction and installation of a 20 km, 24 inch natural gas pipeline. Specific works included evaluating the natural heritage system, outlining mitigation requirements, agency consultation, and undertaking ecological field surveys as required. Mitigation measures included; physical mitigation measures, environmental awareness training, daily on-site environmental

monitoring, environmental compensation; and an assessment of agricultural crop loss and associated compensation.

Project Ecologist, Terry Fox Drive Environmental Assessment Addendum, City of Ottawa, Ontario

Prepared an addendum to the environmental study report. The addendum addressed Phase 1 preliminary design improvements to the alignment and geometric features, stormwater management facilities and natural environment impact mitigation features, and grade separation options of a railway.

Project Ecologist, Goulbourn Forced Road Environmental Assessment, City of Ottawa, Ontario

Completed planning and functional design for the widening and upgrade of two interconnected major collector roadways. Both projects were done under "Schedule C" of the Municipal Class EA guidelines. Specific works included evaluating the natural heritage system, outlining mitigation requirements, facilitation at public open house and undertaking ecological field surveys as required.

Project Ecologist, Eagleson Road/Fernbank Road Environmental Assessment, City of Ottawa, Ontario

Completed planning and functional design studies for widening/upgrade of two interconnected suburban arterial roadways. Both projects were done under "Schedule C" of the Municipal Class EA guidelines. The study area included residential, park space and recreational land uses along the 1.5 km corridor. Key challenges addressed were the crossing of Monahan Drain and the rural to urban roadway transition. Public consultation comprised three public open houses.

EMPLOYMENT HISTORY

DILLON CONSULTING LIMITED

2006 - Present Ecologist, Associate

ONTARIO MINISTRY OF NATURAL RESOURCES

2001 - 2006 Research Technician (Contract)

LAKEHEAD UNIVERSITY

2003 - 2005 Teaching Assistant - Geography and Biology Departments

PROFESSIONAL DEVELOPMENT

Ecological Land Classification Training (MNR), 2010

Landscape Ecology (Lakehead University, Thunder Bay, Ontario), 2005

Quantitative Methods in Ecology (Lakehead University, Thunder Bay, Ontario), 2005

Disturbance Ecology (Lakehead University, Thunder Bay, Ontario), 2004

Advanced GIS (Lakehead University, Thunder Bay, Ontario), 2003

Remote Sensing (Lakehead University, Thunder Bay, Ontario), 2003

Water Resource Management (Lakehead University, Thunder Bay, Ontario), 2003

Natural Resource Management (Lakehead University, Thunder Bay, Ontario), 2003

PUBLICATIONS

Gleeson, J., A.Zeller and J.W. McLaughlin. 2006. Peat as a Fuel Source in Ontario: A Preliminary Literature Review, Ontario Forest Research Institute, Forest Research Information Paper 161, Sault Ste. Marie, Ontario.

Zeller, A.J. 2005. Using landscape indices to model environmental gradients within the Mixedwood Boreal Forests of northwestern Ontario, Canada. Poster Presentation at Ontario Ecology and Ethology Colloquium, 2005. Ottawa, Ontario

Appendix D

Site Photos

Ecological Land Classification Photos

Photo 1

July 7, 2015

Notes:
 Fresh-Moist
 Manitoba Maple
 Lowland Deciduous
 Forest Type
 (FODM7-7)



Photo 2

July 7, 2015

Notes:
 Reed Canary Grass
 Graminoid Meadow
 Type (MEGM3-8)



Photo 3

July 7, 2015

Notes:
 Fallow Field



Photo 4

July 7, 2015

Notes:
 Annual Row Crop
 (OAGM1)
 (Background);
 Fallow Field
 (Foreground)



Photo 5

June 26, 2015

Notes:
 Fencerow (TAGM5)



Photo 6

July 7, 2015

Notes:
 Business Sector
 (CVC_1)



Photo 7

July 7, 2015

Notes:
Open Water (OAW)



Appendix E

Vegetation Inventory

| Scientific Name | Common Name | S-Rank | Coefficient Conservation | Coefficient Wetness |
|---|-------------------------------------|--------|--------------------------|---------------------|
| <i>Acer negundo</i> | Manitoba Maple | SNA | --- | 5 |
| <i>Acer saccharinum</i> | Silver Maple | S4? | 6 | 1 |
| <i>Ambrosia artemisiifolia</i> | Annual Ragweed | SNA | --- | 5 |
| <i>Arctium minus</i> | Common Burdock | SNA | --- | -3 |
| <i>Artemisia vulgaris</i> | Common Wormwood | S5 | 0 | -4 |
| <i>Asclepias syriaca</i> | Common Milkweed | SNA | --- | 3 |
| <i>Barbarea vulgaris</i> | Bitter Wintercress | SNA | --- | -4 |
| <i>Bromus inermis</i> | Awnless Brome | S5 | --- | -1 |
| <i>Carex vulpinoidea</i> | Fox Sedge | S5 | 0 | 1 |
| <i>Celtis occidentalis</i> | Common Hackberry | S5 | 4 | -3 |
| <i>Centaurea maculosa</i> | Spotted Knapweed | S5 | 2 | 0 |
| <i>Chenopodium album</i> | White Goosefoot | S5 | 5 | -4 |
| <i>Cichorium intybus</i> | Chicory | S5 | 0 | 0 |
| <i>Circaea canadensis</i> | Broad-leaved Enchanter's Nightshade | S5 | 2 | 1 |
| <i>Cirsium arvense</i> | Canada Thistle | SNA | --- | -2 |
| <i>Cirsium vulgare</i> | Bull Thistle | S5 | 1 | 5 |
| <i>Cornus sericea ssp sericea</i> | Red-osier Dogwood | --- | --- | --- |
| <i>Crataegus monogyna</i> | English Hawthorn | S5 | 0 | -2 |
| <i>Dactylis glomerata</i> | Orchard Grass | S5 | --- | --- |
| <i>Daucus carota</i> | Wild Carrot | SNA | --- | -1 |
| <i>Dianthus armeria</i> | Deptford Pink | S5 | 3 | -3 |
| <i>Echinochloa crus-galli</i> | Large Barnyard Grass | SNA | --- | 0 |
| <i>Echinocystis lobata</i> | Wild Mock-cucumber | SNA | --- | 5 |
| <i>Echium vulgare</i> | Common Viper's-bugloss | SNA | --- | 5 |
| <i>Elymus repens</i> | Creeping Wildrye | SNA | --- | 0 |
| <i>Epilobium sp</i> | Willowherb species | S5 | 1 | 3 |
| <i>Equisetum arvense</i> | Field Horsetail | --- | --- | --- |
| <i>Erigeron hyssopifolius</i> | Daisy Fleabane | SNA | --- | 3 |
| <i>Erysimum cheiranthoides</i> | Wormseed Wallflower | SNA | --- | 3 |
| <i>Frangula alnus</i> | Glossy Buckthorn | SNA | --- | 5 |
| <i>Fraxinus americana</i> | White Ash | SNA | --- | 5 |
| <i>Fraxinus nigra</i> | Black Ash | SNA | --- | 1 |
| <i>Galeopsis tetrahit var. tetrahit</i> | Common Hemp-nettle | SNA | --- | 2 |
| <i>Galium mollugo</i> | Smooth Bedstraw | SNA | --- | 2 |
| <i>Geum aleppicum</i> | Yellow Avens | SNA | --- | 5 |

| Scientific Name | Common Name | S-Rank | Coefficient Conservation | Coefficient Wetness |
|--|----------------------------|--------|--------------------------|---------------------|
| <i>Geum canadense</i> | White Avena | SNA | --- | 3 |
| <i>Glycine max</i> | Soy Bean | S5 | 3 | -5 |
| <i>Hieracium lachenalii</i> | Common Hawkweed | S5 | 3 | -2 |
| <i>Hypericum perforatum</i> | Common St. John's-wort | SNA | --- | -1 |
| <i>Impatiens capensis</i> | Spotted Jewelweed | SNA | --- | 5 |
| <i>Lemna minor</i> | Lesser Duckweed | S5 | 4 | -4 |
| <i>Leucanthemum vulgare</i> | Oxeye Daisy | SNA | --- | 5 |
| <i>Lonicera tatarica</i> | Tartarian Honeysuckle | S5 | 0 | -2 |
| <i>Lotus corniculatus</i> | Garden Bird's-foot Trefoil | SNA | --- | 5 |
| <i>Lythrum salicaria</i> | Purple Loosestrife | SNA | --- | 5 |
| <i>Malus sp</i> | Crabapple Species | S4? | 6 | 1 |
| <i>Malva sylvestris</i> | High Cheeseweed | SNA | --- | 5 |
| <i>Medicago lupulina</i> | Black Medic | SNA | --- | -3 |
| <i>Melilotus albus</i> | White Sweet-clover | S5 | 0 | -4 |
| <i>Oenothera sp</i> | Primrose sp | SNA | --- | 3 |
| <i>Onoclea sensibilis</i> | Sensitive Fern | SNA | --- | -4 |
| <i>Papaver rhoeas</i> | Corn Poppy | S5 | --- | -1 |
| <i>Parthenocissus quinquefolia</i> | Virginia Creeper | S5 | 0 | 1 |
| <i>Pastinaca sativa</i> | Wild Parsnip | S5 | 4 | -3 |
| <i>Persicaria maculosa</i> | Spotted Lady's-thumb | S5 | 2 | 0 |
| <i>Phalaris arundinacea</i> | Reed Canary Grass | S5 | 5 | -4 |
| <i>Phleum pratense</i> | Common Timothy | S5 | 0 | 0 |
| <i>Phragmites australis</i> ssp. <i>australis</i> | European Common Reed | S5 | 2 | 1 |
| <i>Plantago major</i> | Common Plantain | SNA | --- | -2 |
| <i>Poa pratensis</i> ssp. <i>pratensis</i> | Kentucky Bluegrass | S5 | 1 | 5 |
| <i>Populus balsamifera</i> | Balsam Poplar | --- | --- | --- |
| <i>Populus tremuloides</i> | Trembling Aspen | S5 | 0 | -2 |
| <i>Potentilla anserina</i> ssp. <i>anserina</i> | Common Silverweed | S5 | --- | --- |
| <i>Potentilla norvegica</i> | Norwegian Cinquefoil | SNA | --- | -1 |
| <i>Prunus virginiana</i> | Choke Cherry | S5 | 3 | -3 |
| <i>Ranunculus acris</i> | Tall Buttercup | SNA | --- | 0 |
| <i>Rhus hirta</i> | Staghorn Sumac | SNA | --- | 5 |
| <i>Ribes sp</i> | Currant Species | SNA | --- | 5 |
| <i>Rubus sachalinensis</i> var. <i>sachalinensis</i> | Wild Red Raspberry | SNA | --- | 0 |

| Scientific Name | Common Name | S-Rank | Coefficient Conservation | Coefficient Wetness |
|---|---|--------|--------------------------|---------------------|
| <i>Rudbeckia hirta</i> var. <i>pulcherrima</i> | Black-eyed Susan | S5 | 1 | 3 |
| <i>Rumex crispus</i> | Curly Dock | --- | --- | --- |
| <i>Salix discolor</i> | Pussy Willow | SNA | --- | 3 |
| <i>Setaria pumila</i> | Yellow Foxtail | SNA | --- | 3 |
| <i>Silene vulgaris</i> | Maiden's Tears | SNA | --- | 5 |
| <i>Sisymbrium officinale</i> | Common Tumble Mustard | SNA | --- | 5 |
| <i>Solanum dulcamara</i> | Climbing Nightshade or Bittersweet Nightshade | SNA | --- | 1 |
| <i>Solidago canadensis</i> var. <i>canadensis</i> | Canada Goldenrod | SNA | --- | 2 |
| <i>Solidago</i> sp | Goldenrod Species | SNA | --- | 2 |
| <i>Sonchus oleraceus</i> | Common Sow-thistle | SNA | --- | 5 |
| <i>Taraxacum officinale</i> | Common Dandelion | SNA | --- | 3 |
| <i>Thlaspi arvense</i> | Field Penny-cress | S5 | 3 | -5 |
| <i>Tragopogon pratensis</i> | Meadow Goat's-beard | S5 | 3 | -2 |
| <i>Trifolium hybridum</i> | Alsike Clover | SNA | --- | -1 |
| <i>Trifolium pratense</i> | Red Clover | SNA | --- | 5 |
| <i>Trifolium repens</i> | White Clover | S5 | 4 | -4 |
| <i>Tripleurospermum inodorum</i> | Scentless Chamomile | SNA | --- | 5 |
| <i>Tussilago farfara</i> | Colt's-foot | S5 | 0 | -2 |
| <i>Typha latifolia</i> | Broad-leaved Cattail | SNA | --- | 5 |
| <i>Ulmus americana</i> | American Elm | SNA | --- | 5 |
| <i>Urtica dioica</i> ssp. <i>dioica</i> | European Stinging Nettle | S4? | 6 | 1 |
| <i>Verbascum thapsus</i> | Common Mullein | SNA | --- | 5 |
| <i>Verbena hastata</i> | Blue Vervain | SNA | --- | -3 |
| <i>Vicia cracca</i> | Tufted Vetch | S5 | 0 | -4 |
| <i>Vitis riparia</i> | Riverbank Grape | SNA | --- | 3 |
| <i>Zea mays</i> | Corn | SNA | --- | -4 |

Appendix F

Species Screening Table

TABLE F-1: SPECIES OF CONSERVATION CONCERN AND SPECIES AT RISK WITH THE POTENTIAL TO OCCUR IN SURVEY AREA

| SCIENTIFIC NAME | COMMON NAME | GENERAL HABITAT ACCORDING TO THE MNRF SIGNIFICANT WILDLIFE HABITAT TECHNICAL GUIDE | CONSERVATION STATUS | | | SOURCE | POTENTIAL HABITAT WITHIN STUDY AREA | RATIONALE | DEVELOPMENT IMPLICATIONS AND IMPACTS |
|---------------------------------|-------------------------|---|---------------------|------------------------|---------|------------|-------------------------------------|---|---|
| | | | Federal (SARA) | Provincial (ESA, 2007) | S-Rank | | | | |
| SPECIES OF CONSERVATION CONCERN | | | | | | | | | |
| <i>Cypripedium arietinum</i> | Ram’s-head Lady-slipper | Cedar woodland on limestone plains, wooded fens and sandy sites. | --- | --- | S3 | NHIC | No | As the site is located within limestone and clay plains, this could potentially be found here. However, Ram’s-head Lady-slipper was not identified during field surveys within the Study Area. | None- species and/or habitat not affected |
| <i>Contopus virens</i> | Eastern Wood-pewee | Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks. | --- | SC | S4B | MNRF, OBBA | No | There is very little woodland located within the Study Area, and wooded areas are limited to the riparian buffer along the Fraser Clarke Watercourse and ditches and hedgerows. Therefore, as this species requires more expansive tracts of forest, suitable habitat is not present within the Study Area. | None- species and/or habitat not affected |
| <i>Ammodramus savannarum</i> | Grasshopper Sparrow | Well-drained grassland or prairie with low cover of grasses, taller weeds on sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities; perches for singing; requires tracts of grassland > 10 ha. | --- | SC | S4B | OBBA | No | As the land use within the Study Area is primarily row crop agriculture, there are no tracts of grassland >10 ha in size. There are only areas of regenerating meadow (fallow field) throughout which would not provide suitable habitat for this species. | None- species and/or habitat not affected |
| <i>Asio flammeus</i> | Short-eared Owl | Grasslands, open areas or meadows that are grassy or bushy; marshes, bogs or tundra; both diurnal and nocturnal habits; ground nester; home range 25 -125 ha; requires 75-100 ha of contiguous open habitat. | SC | SC | S2N,S4B | MNRF, OBBA | No | As the Study Area is primarily row crop agriculture, the Study Area does not contain any tracts of meadow or grassland large enough to support habitat for this species. | None- species and/or habitat not affected |
| <i>Hylocichla mustelina</i> | Wood Thrush | Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m. | --- | SC | S4B | MNRF, OBBA | No | This species requires large undisturbed tracts of forest. As wooded areas within the Study Area are small and sparse, this type of habitat is not present. | None- species and/or habitat not affected |
| <i>Notropis bifrenatus</i> | Bridle Shiner | Bridle Shiners prefer clear, unpolluted streams, rivers and lakes which have an abundance of aquatic vegetation. These vegetated areas provide suitable spawning habitat and places to feed and hide from predators. Bridle Shiners prefer warm water habitats where the bottom is either sand, silt or organic debris, which is necessary for the establishment of aquatic vegetation. | SC | SC | S2 | MNRF | Yes | Water quality within the Jock River-Barrhaven catchment is rated as fair. Further, watercourses within the Study Area drain agricultural areas and therefore, the quality is likely to low to support habitat for this species. | None- species and/or habitat not affected |
| <i>Moxostoma valenciennesi</i> | Greater Redhorse | This species is typically found in clear, relatively fast-moving rivers and in both shallow and deep waters in some lakes. They are unable to survive in even the slightest polluted waters. | --- | --- | S3 | MNRF | Yes | Water quality within the Jock River-Barrhaven catchment is rated as fair. Further, watercourses within the Study Area drain agricultural areas and therefore, the quality is likely to low to support habitat for this species. | None- species and/or habitat not affected |
| <i>Lampropeltis triangulum</i> | Eastern Milksnake | Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones or boards in outbuildings; often uses communal nest sites. | SC | SC | S3 | MNRF, ON | No | No potential snake hibernacula were identified through ELC surveys or other field work in 2015. | None- species and/or habitat not affected |

| SCIENTIFIC NAME | COMMON NAME | GENERAL HABITAT ACCORDING TO THE MNRF SIGNIFICANT WILDLIFE HABITAT TECHNICAL GUIDE | CONSERVATION STATUS | | | SOURCE | POTENTIAL HABITAT WITHIN STUDY AREA | RATIONALE | DEVELOPMENT IMPLICATIONS AND IMPACTS |
|-------------------------------------|---|--|---------------------|------------------------|---------|------------|-------------------------------------|---|--|
| | | | Federal (SARA) | Provincial (ESA, 2007) | S-Rank | | | | |
| <i>Sternotherus odoratus</i> | Eastern Musk Turtle | Aquatic; except for when laying eggs; shallow slow moving water of lakes, streams, marshes and ponds; hibernate in underwater mud, in banks or in muskrat lodges; eggs are laid in debris or under stumps or fallen logs at water's edge; often share nest sites; sometimes congregate at hibernation sites. | THR | SC | S3 | MNRF, ON | Yes | There is potential habitat for this species within the Fraser Clarke Watercourse. | Unknown- Watercourse considered independently from this report |
| <i>Chelydra serpentina</i> | Snapping Turtle | Permanent, semi-permanent freshwater; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28 ha. | SC | SC | S3 | MNRF, ON | Yes | There is potential habitat for this species within the Fraser Clarke Watercourse. | Unknown- Watercourse considered independently from this report |
| <i>Pseudacris triseriata</i> pop. 1 | Western Chorus Frog (Great Lakes / St. Lawrence - Canadian Shield Population) | Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools. | THR | --- | S3 | ON | No | Although there are watercourses located within the Study Area, there is no significant wildlife habitat for breeding amphibians present based on the description in the 6E Ecoregion Criterion Schedule (MNRF 2015). | None- species and/or habitat not affected |
| <i>Danaus plexippus</i> | Monarch | The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest. Caterpillars eat exclusively milkweed. And adults require the nectar of wildflowers to feed. | SC | SC | S2N,S4B | MNRF, TEA | No | This species may be observed passing through the site, however since there are no undisturbed fields with abundant meadow and milkweed, suitable habitat for this species is not present. Further, since this site is not within 5 km of Lake Ontario, it cannot be considered as significant wildlife habitat for migratory butterflies. | None- species and/or habitat not affected |
| <i>Arigomphus cornutus</i> | Horned Clubtail | Usually found at bog-edged ponds, small marshy lakes, slow streams, and rivers. | --- | --- | S3 | OOA | No | No bog habitat is present within the Study Area to provide suitable habitat for this species. | None- species and/or habitat not affected |
| <i>Enallagma aspersum</i> | Azure Bluet | Prefers vegetated and bog-bordered ponds or occasionally boggy swamps with no fish. | --- | --- | S3 | OOA | No | No bog habitat is present within the Study Area to provide suitable habitat for this species. | None- species and/or habitat not affected |
| <i>Stylurus notatus</i> | Elusive Clubtail | Large rivers and large lakes with sandy bottoms, sometimes also with silt and gravel. | --- | --- | S2 | OOA | No | No large rivers or lakes are located within the Study Area. | None- species and/or habitat not affected |
| <i>Lestes eurinus</i> | Amber-winged Spreadwing | Prefers ponds and small lakes. | --- | --- | S3 | OOA | No | No ponds or small lakes are present within the Study Area. | None- species and/or habitat not affected |
| SPECIES AT RISK | | | | | | | | | |
| <i>Juglans cinerea</i> | Butternut | Mixed deciduous forests. | END | END | S3? | MNRF | Yes | Butternut may be found within hedgerows within the Study Area, however, this species was not observed within the Study Area during field surveys. | None- species and/or habitat not affected |
| <i>Riparia riparia</i> | Bank Swallow | Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water; nesting sites are limiting factor for species presence. | --- | THR | S4B | MNRF, OBBA | No | There are no steep banks within the Study Area that would provide suitable nesting habitat for this species. | None- species and/or habitat not affected |

| SCIENTIFIC NAME | COMMON NAME | GENERAL HABITAT ACCORDING TO THE MNRF SIGNIFICANT WILDLIFE HABITAT TECHNICAL GUIDE | CONSERVATION STATUS | | | SOURCE | POTENTIAL HABITAT WITHIN STUDY AREA | RATIONALE | DEVELOPMENT IMPLICATIONS AND IMPACTS |
|------------------------------|---------------------|--|---------------------|------------------------|---------|------------------|-------------------------------------|--|---|
| | | | Federal (SARA) | Provincial (ESA, 2007) | S-Rank | | | | |
| <i>Hirundo rustica</i> | Barn Swallow | Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water. | --- | THR | S4B | MNRF, OBBA | Yes | There are barns located within close proximity to the Study Area, however no Barn Swallows were observed during breeding bird surveys or any other field surveys in 2015. | None- species and/or habitat not affected |
| <i>Dolichonyx oryzivorus</i> | Bobolink | Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha. | --- | THR | S4B | MNRF, NHIC, OBBA | No | There are no expansive grasslands >30 ha within the Study Area. | None- species and/or habitat not affected |
| <i>Chaetura pelagica</i> | Chimney Swift | Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water. | THR | THR | S4B,S4N | MNRF | No | As the Study Area is located within agricultural lands with no anthropogenic structures or cliffs, suitable habitat for Chimney Swift would not be present as they prefer urban areas with buildings for nesting. Further, this species was not observed during breeding bird surveys. | None- species and/or habitat not affected |
| <i>Sturnella magna</i> | Eastern Meadowlark | Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size. | --- | THR | S4B | MNRF, OBBA | No | There are no expansive grasslands >30 ha within the Study Area. | None- species and/or habitat not affected |
| <i>Myotis lucifugus</i> | Little Brown Myotis | Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges. | END | END | S4 | MNRF | Yes | No structures are present within the Study Area to provide roosting habitat for this species (i.e., barns, attics, etc.). There are trees located within the Study Area containing which may be suitable for roosting. | Unknown |
| <i>Emydoidea blandingii</i> | Blanding's Turtle | Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; basks on logs, stumps, or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs. | THR | THR | S3 | MNRF, ON | No | There are no shallow marshes, or large water bodies within the Study Area to provide suitable habitat for this species. | None- species and/or habitat not affected |

References

Literature Cited

City of Ottawa. 2012. Environmental Impact Statement Guidelines, 2nd edition, April 2012. Completed by the Land Use and Natural Systems Branch. Available at http://ottawa.ca/calendar/ottawa/citycouncil/occ/2012/06-27/pec/04%20-%20Doc%201%20-%20EIS%20Guidelines_2012%5b1%5d.pdf

City Of Ottawa, 2013. GeoOttawa Aerial Photo Mapping. Available at <http://maps.ottawa.ca/geoOttawa/>

City of Ottawa. 2003. Official Plan. Available at http://www.ottawa.ca/city_hall/ottawa2020/official_plan/index_en.html

City of Ottawa, 2015. Protocol for Wildlife Protection during Construction. Available at http://documents.ottawa.ca/sites/documents.ottawa.ca/files/documents/construction_en.pdf

Environment Canada. Species at Risk Public Registry. <http://www.sararegistry.gc.ca>. Accessed January 2016.

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application.

Ontario Breeding Bird Atlas (OBBA). 2001. Guide for Participants. Atlas Management Board, Federation of Ontario Naturalists, Don Mills. Available at: http://www.birdsontario.org/atlas/download/obba_guide_en.pdf

Ontario Ministry of Municipal Affairs and Housing. Provincial Policy Statement. 2014. Available at <http://www.mah.gov.on.ca/Page10679.aspx>.

Ontario Ministry of Natural Resources and Forestry. 2015. Eco-region criteria schedule 6E. Available at: <http://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTE1ODc5&statusId=MTg4ODY4&language=en>

Ontario Ministry of Natural Resources and Forestry. Natural Heritage Information Centre Database. <http://nhic.mnr.gov.on.ca/>. Accessed January 2016.

Ontario Ministry of Natural Resources and Forestry. 2000. Significant Wildlife Habitat Technical Guide. 151pp.

Ontario Ministry of Natural Resources and Forestry. The Species at Risk in Ontario (SARO) List.
http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080230_e.htm.
Accessed January 2016.

Ontario Nature. Ontario Reptile and Amphibian Atlas 2010 (Updated 2013).
http://www.ontarionature.org/protect/species/reptiles_and_amphibians/index.php.
Accessed January 2016.

Ontario Nature 2013. Dragonfly and Damselfly (Odonata) Guide.
<http://onnaturemagazine.com/dragonfly-and-damselfly-odonata-guide.html>

RVCA. Lower Rideau Subwatershed Report 2012. Available at
http://www.rvca.ca/watershed/subwatershed_reporting/lower/lower_rideau.html

Toronto Entomologists Association. Ontario Butterfly Atlas Online (Updated 2013).
http://www.ontarioinsects.org/atlas_online.htm.
Accessed January 2016.