DILLON CONSULTING

RIVERSIDE SOUTH DEVELOPMENT CORPORATION

Environmental Impact Study

Final - Phase 12

September 2016 – 14-9919

September 27, 2016

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Phase 12 Environmental Impact Study

Dear Ms. Jarvis,

The following Environmental Impact Study (EIS) for Phase 12 of the Riverside South Development has been prepared in accordance with the City of Ottawa's EIS guidelines. Also appended to the report is the complete Headwater Drainage Feature Assessment required by the Rideau Valley Conservation Authority.

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

DILLON CONSULTING LIMITED

Alexander Zeller, M.Sc.
Associate

Encl.

Our file: 14-9919

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Executive Summary

Dillon Consulting Limited was retained by Riverside South Development Corporation (RSDC) to complete an Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) for the proposed Phase 12 Development, located on part of 708 River Road, 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, Headwater Drainage Feature Assessment, breeding bird surveys, amphibian breeding surveys, and a Tree Inventory. The following paragraphs summarize the findings from this study.

1) The property contains a significant valleyland along the Rideau River, outside of the development area.

2) The property is not located near any provincially significant wetlands, significant woodlands, areas of natural and scientific interest, significant wildlife habitat, or any other designated natural heritage system constraints.

3) Impacts of development include erosion and sedimentation, and disturbance to breeding birds associated with the removal of woodlands and headwater drainage features from the Study Area. With the implementation of proper mitigation measures, impacts will be avoided and no residual effects are anticipated.

4) Survey results identified habitat for Bobolink, Barn Swallow, and Blanding's Turtle within the proposed area of development. Butternut was observed outside of the proposed development area within the Study Area. No other Species at Risk or Species at Risk habitat within the Study Area.

5) Headwater Drainage Features (HDF) surveys identified two HDFs located within the Study Area. The assessment determined that these features had limited functions and therefore they were assigned a management recommendation of "No Management Required".

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 RSDC Phase 12 Development, located at 708 River Road, can be accepted with the condition that;

- **All Species at Risk permitting requirements will be fulfilled to the satisfaction of the MNRF; and,**
- **The mitigation measures recommended herein will be implemented.**

1.0 Introduction

1.1 Purpose

Dillon (Dillon Consulting Limited) was retained by Riverside South Development Corporation (RSDC) to complete an Environmental Impact Study (EIS) and Tree Conservation Report (TCR) for the proposed RSDC Phase 12 Development, located at 708 River Road, in the City of Ottawa (the "Study Area")(**Figure 1**).

This EIS and TCR has been prepared to evaluate the potential for environmental impacts associated with the proposed development and to recommend mitigation measures to offset those impacts.

This EIS and TCR has been prepared to ensure that the development does not contravene the *Endangered Species Act, 2007* (ESA); retain as much natural vegetation as possible, including mature trees, stands of trees, and hedgerows; evaluate potential environmental impacts; and to develop mitigation plans addressing potential impacts.

RIVERSIDE SOUTH DEVELOPMENT CORPORATION

Phase 12
Proposed Residential Development

Figure 1:
Study Area

Legend

- Boundary of Study Area
- Waterbodies (MNR LIO)
- Wetlands (MNR LIO)
- Watercourse
- Wooded Area (MNR LIO)
- City of Ottawa Natural Heritage Area

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MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

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

N W E S

0 100 200 400 600 800
Meters

FILE LOCATION: FILE LOCATION:
Path: F:\ArcGIS_Working\149919\MXD\EIS\Oct2015\Ph12_Fig1_Study Area.mxd

PROJECT: 14-9919 STATUS: DRAFT DATE: 5/17/2016

1.2 Property Information

Owner:	Riverside South Development Corporation
Address:	708 River Road, Gloucester-South Nepean Ward
Lot and concession:	Part Lot 20 & 21, Concession 1
Property Identification Number(s):	045891836
Zoning:	Development Reserve Zone
OP designation:	General Urban Area, Major Open Space, Developing Community

Location

The Study Area is located in the community of Riverside South; bounded by Earl Armstrong Road to the North, Rideau Road to the east, and the Rideau River to the west.

Land Use and Zoning

The Study Area falls within the Riverside South CDP. The City of Ottawa's Official Plan has designated the Study Area as a Developing Community containing General Urban Area with a small portion of Major Open Space in the northwest corner along the Rideau River. The property is zoned as Development Reserve (DR). The Study Area is also partially located within the Rideau Valley Conservation Authority (RVCA) floodplain boundary along the Rideau River; however the proposed development area is located outside of the floodplain boundary.

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)	Ministry of Natural Resources and Forestry (MNRF) Kemptville District Main Contact: Erin Seabert, Fish and Wildlife Technical Specialist • *Records requested directly from MNRF Kemptville District relating to natural features and wildlife species (Appendix A)*
	MNRF Natural Heritage Information Centre (NHIC) • *Species of Conservation Concern* • *Natural heritage features*
	Ecological Land Classification for Southern Ontario, First Approximation and its Application 1998
	Natural Heritage Reference Manual, Second Edition, March 2010
	Ontario Wetland Evaluation System, Southern Manual, Third Edition, 2013
	MNRF Significant Wildlife Habitat Technical Guide (2000) • *Significant Wildlife Habitat Eco-region 6E Criterion Schedules, 2015*
	Fisheries and Oceans Canada • *Distribution of Fish Species at Risk mapping for Rideau Valley Conservation Authority (valid May 2015- May 2016)*
	Federal Species at Risk Public Registry, accessed September 2015
	Ontario Breeding Birds Atlas (OBBA) - online data accessed September 2015
	Ontario Reptile and Amphibian Atlas- online data accessed September 2015
	Ontario Butterfly Atlas- online data accessed September 2015
	Atlas of the Mammals of Ontario
Ontario *Endangered Species Act* (2007)	MNRF Species at Risk in Ontario (SARO) List (O.Reg. 230/08), September 2015
	MNRF Kemptville District Main Contact: Erin Seabert, Fish and Wildlife Technical Specialist • *Received Species at Risk occurrence records (Appendix A)*
	MNRF NHIC • *Species at Risk occurrence records*
	Ontario Breeding Birds Atlas (OBBA) - online data accessed September 2015
	Ontario Reptile and Amphibian Atlas- online data accessed September 2015
CITY OF OTTAWA	
City of Ottawa Official Plan (2014)	Schedules B, K, and L1, consolidated to 2014 City of Ottawa's "geoOttawa" online mapping service
	Environmental Impact Statement Guidelines, 2nd Edition (2012)
	Protocol for Wildlife Protection During Construction (2015)
CONSERVATION AUTHORITY	
Conservation Authorities Act, Ontario Regulation 174/06	RVCA • *Floodplain mapping* *Evaluation, Classification and Management of Headwater Drainage Features Guidelines (2014)*

2.0 Description of the Natural Environment

A desktop review of the property indicates that the property is predominantly agricultural land, cultivating hay (**Figure 2**). There are a few scattered patches of trees within the Study Area and more treed area and wetland along the Rideau River, at the Study Area's western boundary. A review of available historic aerial photos indicates that the property has been agricultural since at least 1976, but no buildings remain within the Study Area today. The surrounding area is also agricultural with recent development to the north along Earl Armstrong Road and to the east along River Road.

FIGURE 2: 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 plains with scattered drumlins (MNRF 1984). Soils within the Study Area are comprised of medium to slightly acidic, moderately coarse to medium textured, marine estuary veneer, overlying neutral, moderately fine to fine textured marine material. They also include fluvium in abandoned river channel floors and terraces (Canada Department of Agriculture 1976).

2.2 Surface Water, Groundwater and Fish Habitat

2.2.1 Watershed Summary

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

2.2.2 Fish Habitat

The Study Area is located on the banks of the Rideau River. Although the Study Area boundary abuts the Rideau River, development is not proposed within 30m of the High Water Mark in accordance with the City of Ottawa's aquatic setbacks, and RVCA's floodplain regulation limit. In addition, background mapping suggests that there may be agricultural ditches within the Study Area flowing into the Rideau River which may provide fish habitat.

2.3 Natural Heritage Features

A number of natural heritage features require consideration for protection under the Ontario Provincial Policy Statement (Ontario, 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;
- Species at Risk habitat; and,
- Fish habitat.

2.3.1 Wetlands

No PSWs were identified within or adjacent to the Study Area. MNRF mapping does patches of unevaluated wetland along the Rideau River and along the southern edge of the Study Area; however, these are outside of the anticipated area of influence for the development area for the RSDC Phase 12 Development.

2.3.2 Woodlands

No significant woodlands were identified within or adjacent to the Study Area. However, a review of available background mapping and aerial photos shows areas of unevaluated woodland along the banks of the Rideau River and throughout the Study Area. These woodlands have been brought forward for evaluation to determine significance.

2.3.3 Valleylands

No significant valleylands were identified within or adjacent to the Study Area. However, the City's OP mapping indicates that there are unstable slopes along the banks of the Rideau River. The Rideau River valley has been brought forward for evaluation to determine significance.

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

A review of the MNRF background data suggests that significant wildlife habitat for amphibian breeding has the potential to occur within the Study Area. In addition, several Species of Conservation Concern also have the potential to occur within or adjacent the RSDC Phase 12 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-RANK[1]	INFO SOURCE[2]
BIRDS					
Chlidonias niger	Black Tern	---	SC	S3B	MNRF
Contopus virens	Eastern Wood-Pewee	---	SC	S4B	MNRF, OBBA
Ammodramus savannarum	Grasshopper Sparrow	---	SC	S4B	OBBA
Falco peregrinus	Peregrine Falcon	THR	SC	S2S3B, ZN	MNRF
Asio flammeus	Short-eared Owl	SC	SC	S2N, S4B	MNRF, OBBA
Hylocichla mustelina	Wood Thrush	---	SC	S4B	MNRF, OBBA
Coturnicops noveboracensis	Yellow Rail	SC	SC	S4B	MNRF

SCIENTIFIC NAME	COMMON NAME	SARA	ESA	S-RANK[1]	INFO SOURCE[2]
HERPETOZOA					
Chelydra serpentina	Snapping Turtle	SC	SC	S3	MNRF, ON
Sternotherus odoratus	Eastern Musk Turtle	THR	SC	S3	MNRF, ON
Graptemys geographica	Northern Map Turtle	SC	SC	S3	MNRF, ON
Thamnophis sauritus septentrionalis	Eastern Ribbonsnake	SC	---	S3	MNRF
Lampropeltis triangulum	Eastern Milksnake	SC	SC	S3	MNRF, ON
Pseudacris triseriata pop. 1	Western Chorus Frog (Great Lakes/ St. Lawrence- Canadian Shield Population)	THR	SC	S3	ON
LEPIDOPTERA					
Danaus plexippus	Monarch	SC	SC	S2N, S4B	MNRF, TEA
ODONATA					
Stylurus notatus	Elusive Clubtail	---	---	S2	NHIC

[1]S-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. [2]Information 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; --- denotes no information or not applicable.

2.4 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					
Juglans cinerea	Butternut	END	END	S3?	MNRF
Platanthera leucophaea	Eastern Prairie Fringed Orchid	END	END	S2	MNRF
BIRDS					
Riparia riparia	Bank Swallow	---	THR	S4B	MNRF, OBBA
Hirundo rustica	Barn Swallow	---	THR	S4B	MNRF, OBBA
Dolichonyx oryzivorus	Bobolink	---	THR	S4B	MNRF, NHIC, OBBA
Chaetura pelagica	Chimney Swift	THR	THR	S4B, S4N	MNRF
Sturnella magna	Eastern Meadowlark	---	THR	S4B	MNRF, OBBA
Ixobrychus exilis	Least Bittern	THR	THR	S4B	MNRF
Lanius ludovicianus	Loggerhead Shrike	END	END	S2B, SZN	MNRF
Caprimulgus vociferus	Whip-poor-will	---	THR	S4B	MNRF

SCIENTIFIC NAME	COMMON NAME	SARA	ESA	S-RANK[1]	INFORMATION SOURCE[2]
MAMMALS					
Myotis lucifugus	Little Brown Myotis	END	END	S4	MNRF
HERPETOZOA					
Emydoidea blandingii	Blanding's Turtle	THR	THR	S3	MNRF, ON

[1]S-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. [2]Information sources include: MNRF = Ministry of Natural Resources and Forestry; NHIC = Natural Heritage Information Centre; OBBA = Ontario Breeding Bird Atlas; ON = Ontario Nature: Ontario Reptile and Amphibian Atlas; --- denotes no information or not applicable.

2.4.1 Species at Risk Habitat

A review of aerial photos of the property was used to identify candidate Species at Risk habitat based on habitat requirements defined by the MNRF. The woodlands, meadows, and the Rideau River within the property may provide habitat for:

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

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

2.5 Trees

A review of aerial photos suggests that the property contains wooded areas, drainage ditches, and fencerows that contain a mix of mature and young trees. The majority of trees are located within woodlands on the banks of the Rideau River.

2.6 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.

2.7 Other Development Constraints

This property is not considered to be a significant part of the City of Ottawa's Natural Heritage System and is not within any Natural Environment Areas or Urban Natural Features as defined by the City of Ottawa (City of Ottawa, 2014).

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

Aquatic Environment

- Headwater Drainage Features (HDF) Assessment

Natural Heritage Features

- Ecological Land Classification (ELC)
    - Wetland delineation
    - Woodland delineation
    - Identification of potential significant wildlife habitat
- Breeding bird surveys
- Amphibian breeding surveys

Species at Risk

- Identification of potential Species at Risk and Species at Risk habitat

Trees

- Tree Inventory

Incidental Wildlife

- Visual and auditory observations of wildlife during all field studies

3.0 Description of the Proposed Project

Figure 3 illustrates the draft concept plan for this community, consisting of approximately 463 residential units.

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.

RIVERSIDE SOUTH DEVELOPMENT CORPORATION

Phase 12
Proposed Residential Development

Figure 3:
Draft Development Area

Legend

Boundary of Study Area

Waterbodies (MNR LIO)

Development Area

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MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

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

N W E S

0 25 50 100 150 200
Meters

FILE LOCATION: FILE LOCATION:
Path: F:\ArcGIS_Working\149919\MXD\EIS\Oct2015\Ph12_Fig3_Plan.mxd

PROJECT: 14-9919 STATUS: DRAFT DATE: 5/17/2016

4.0 Methodology

4.1 Fieldwork

Fieldwork conducted for the EIS and TCR took place between September 2014 and August 2015 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, HDF Assessment, breeding bird surveys, and amphibian breeding 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 B***. 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 24, 2014	08:00	M. Seabert	Clear, light breeze, no precipitation	22.3	ELC and Tree Inventory
Sept 25, 2014	08:30	M. Seabert	Clear, light breeze, no precipitation	24.3	ELC and Tree Inventory
Oct 3, 2014	08:30	M. Seabert	Clear, light breeze, no precipitation	16.4	Set Wildlife Cam
Oct 7, 2014	08:30	M. Seabert	Clear, light breeze, no precipitation	8.5	Collect Wildlife Cam
Oct 16, 2014	09:00	M. Seabert	Mostly Cloudy, light precipitation	19.9	Tree Inventory
April 28, 2015	08:00	W. Moore; K. McLean	Sunny, Clear, light breeze, no precipitation	12.5	HDF Assessment #1
May 7, 2015	20:45	K. Robinson	Mostly Clear, light breeze, no precipitation	18	Amphibian Survey #1, Incidental Wildlife
May 26, 2015	08:28	J. Harris	Cloudy, light breeze, no precipitation	22	Breeding Bird Survey #1, Incidental Wildlife
May 27, 2015	22:50	K. Robinson	Mostly clear, light cloud cover, no precipitation	24	Amphibian Survey #2, Incidental Wildlife
June 17, 2015	06:58	J. Harris	Cloudy, light breeze, no precipitation	12	Breeding Bird Survey #2, Incidental Wildlife
June 24, 2015	21:30	W. Moore; K. Robinson	Mostly clear, light cloud cover, no precipitation	18.8	Amphibian Survey #3, Whip-poor-will Survey #1, Incidental Wildlife
July 3, 2015	14:00	W. Moore; B. Gottfried	Sunny, slight breeze	16.9	Electrofishing
July 9, 2015	02:00	W. Moore;	Clear, slight breeze, no	13.5	Whip-poor-will Survey

Date	Time of Visit	Personnel	Weather Conditions	Air Temp (°C)	Purpose of visit
		K. Robinson	precipitation		#2
July 28, 2015	13:30	W. Moore; K. Robinson	Sunny, no precipitation	25.3	HDF Assessment #2
August 11, 2015	09:45	M. Wolosinecky	Cloudy, slight breeze, heavy precipitation	19.2	Tree Survey

4.2 Aquatic Environment

An HDF Assessment was conducted within Study Area based on requirements from the RVCA. This assessment was completed in conjunction with the EIS and has been included in ***Appendix C***.

4.3 Natural Heritage Features

4.3.1 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, 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.

In early 2007, the MNRF refined their original vegetation type codes to more fully encompass the vast range of natural and cultural communities across Southern Ontario. Through this process many new codes have been added while some have changed slightly. These new ELC codes have been used for reporting purposes in this study as they are more representative of the vegetation communities within the Study Area.

4.3.2 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), if required.

4.3.3 Woodlands

According to the City of Ottawa's Official Plan a woodland must meet each of the criteria listed below in a contiguous forested area in order to be deemed significant:

i. *Mature stands of trees 80 years of age or older;*
ii. *Interior forest habitat located more than 100 m inside the edge of a forest patch; and,*
iii. *Woodland adjacent to a surface water feature such as a river, stream, drain, pond or wetland, or any groundwater feature, including springs, seepage areas, or areas of groundwater upwelling.*

Woodlands within the Study Area that meet each of the criteria listed above will be considered significant.

4.3.4 Significant Wildlife Habitat

Although there were no areas of potential significant wildlife habitat for breeding birds identified, it was determined that both breeding bird surveys and amphibian breeding surveys would be conducted in order to establish baseline conditions within the Study Area. Amphibian breeding surveys are also required as part of the HDF Assessment (***Appendix C***).

4.3.4.1 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.

4.3.4.2 Amphibian Breeding Survey

Amphibian monitoring followed the Marsh Monitoring Program protocol (Bird Studies Canada, 2009). In accordance with the protocol, three different surveys were conducted between April 1 and June 30, with at least two weeks between each survey. Surveys began at least one half hour after sunset during evenings with a minimum night temperature of 5°C, 10°C, and 17°C

for each of the three respective surveys. Survey points aligned with the wetland feature along the Rideau River at the western boundary of the Study Area.

Each amphibian survey generally involved standing at a predetermined station for 3 minutes and listening for frog calls. The calling activity of individuals estimated to be within 100 m of the observation point were documented. All individuals beyond 100 m were recorded as outside the count circle and calling activity was not recorded. Calling activity was then ranked using one of the three abundance code categories:

Code 1: Calls not simultaneous, number of individual can be accurately counted;
Code 2: Some calls simultaneous, number of individuals can be reliably estimated; and,
Code 3: Calls continuous and overlapping, number of individuals cannot be estimated.

In areas were appropriate habitat exists vernal pools were also visually examined for egg masses and amphibian larvae in conjunction with other field surveys. These searches occurred between April and June when amphibians were concentrated around suitable breeding habitat.

4.4 Species at Risk

Several Species at Risk have been identified with potential to occur within the general vicinity of the Study Area. Surveys for Bobolink and Eastern Meadowlark were completed in conjunction with breeding bird surveys outlined above. In addition, surveys for Eastern Whip-poor-will were conducted at the request of the City of Ottawa.

4.4.1 Crepuscular Bird Surveys

Crepuscular bird breeding surveys were undertaken over two site visits in June and early July during periods with at least 50% lunar illumination and low cloud cover. These surveys followed the Nightjar Monitoring Protocol provided by the MNRF (2011) and generally consisted of point counts where suitable habitat for target species occur and were accessible.

4.5 Trees

4.5.1 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 as a whole based on species composition and basal area as per standard ELC protocol. All Large Trees (50 cm DBH or greater) were surveyed by an approved professional as outlined in the City of Ottawa's guidelines. The survey for all Large Trees included the identification of species, DBH, condition, and location. Trees measuring less than 50 cm DBH were estimated based on their density, average size, and overall health.

4.6 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.

5.0 Results

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

5.1 Aquatic Environment

Two ephemeral watercourses were identified iwthin the the Study Area was confirmed during the HDF Assessment (see ***Appendix C***). These features primarily consist of old ditches and swales across the agricultural fields.

The site drains north and west towards the Rideau River, with tributaries conveying flow from spring thaw and heavy rain events downstream toward the river.

Note: A Letter of Permission – Ontario Regulation 174/06, Section 28 Conservation Authorities Act 1990, was issued by Rideau Valley Conservation Authority on March 11, 2015 for a permit to alter a waterway by infill of approximately 175 m of two existing watercourse features through the placement of approximately 11,300 m^3 of fill on the Riverside South Phase 12 Lands.

5.1.1 Fish Habitat

A total of two tributaires to the Rideau River were evaluated for potential fish habitat within the Study Area during the HDF Assessment conducted in 2015. The assessment determined that no fish habitat is present within the Study Area. This is due to the ephemeral nature of the features with no habitat upstream of the Study Area and a lack of connection to the Rideau River. Further, the features were dry and densely vegetated (or tilled) during subsequent site visits in July 2015.

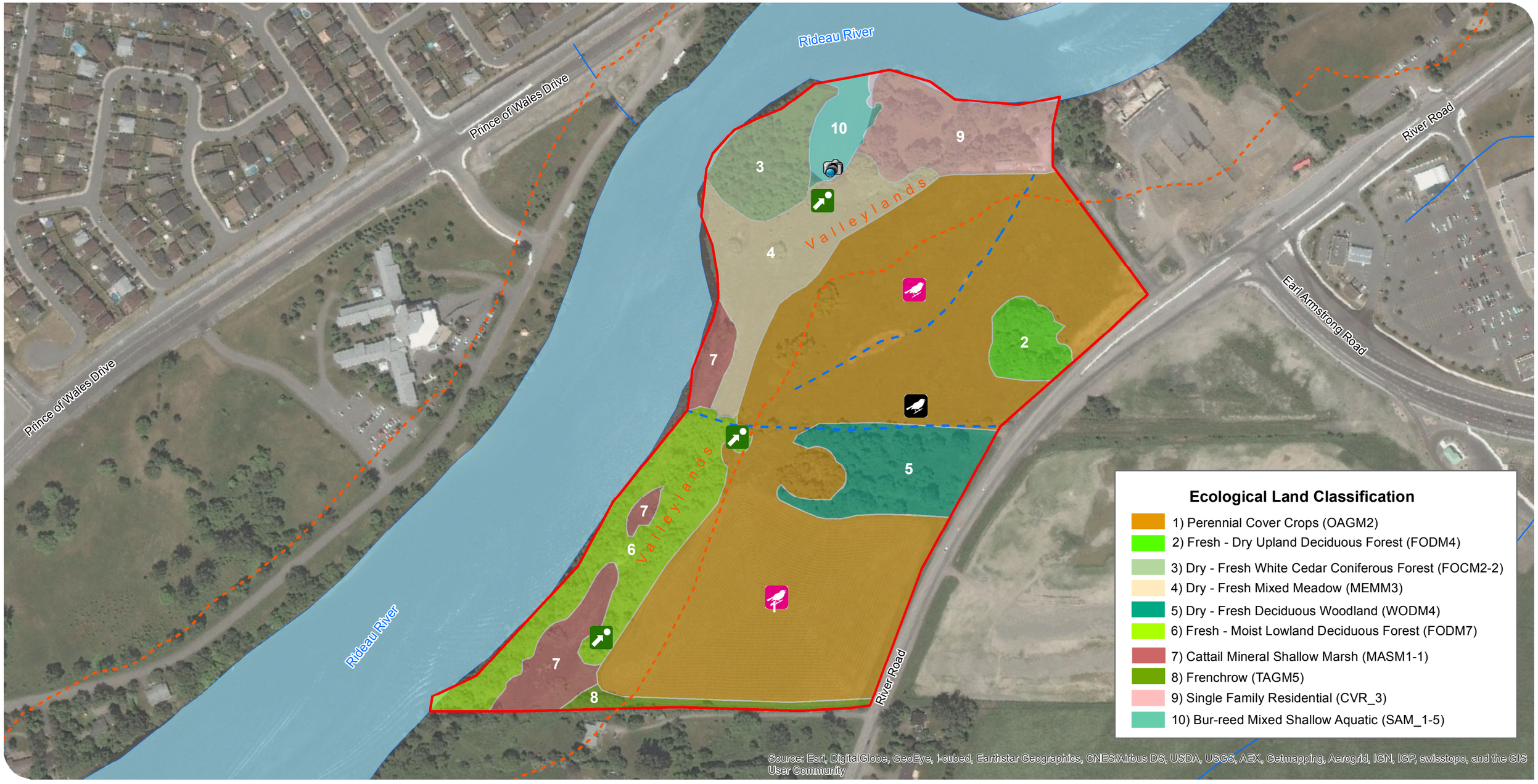
Full results from the HDF Assessment are outlined in ***Appendix C***. Both tributaries were assessed to have contributing functions with a management recommendation of "No Management Required". These features can be removed with no specific mitigation or compensation required.

Therefore no fish habitat is present within the Study Area.

5.2 Natural Heritage Features

5.2.1 Ecological Land Classification

A total of 10 vegetation communities were observed within the Study Area during the ELC survey, 7 of which are considered natural vegetation communities. The major land use within the Study Area is agriculture with small areas of woodland and wetland concentrated along the banks of the Rideau River. The location, type, and boundaries of these communities are delineated in **Figure 4**. All vegetation 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***.



RIVERSIDE SOUTH DEVELOPMENT CORPORATION

Phase 12
Proposed Residential Development

Figure 4:
Existing Conditions & Constraints

Legend
- Boundary of Study Area
- Ephemeral Headwater Streams
- Waterbodies (MNR LIO)

Survey Points
- Wildlife Camera
- Bobolink and Breeding Birds
- Nightjar Survey Point
- Amphibian Survey Point

Environmental Constraints
- RVCA Regulation Limit (source: geoOttawa)

** Valleylands captured within Regulation Limits.*

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MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

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

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PROJECT: 14-9919 STATUS: DRAFT DATE: 5/17/2016

TABLE 5: ECOLOGICAL LAND CLASSIFICATION

ELC CODE	CLASSIFICATION	SOILS	AREA (HA)	VEGETATION	COMMENTS	APPENDIX D, PHOTO #
OAGM2	Perennial Cover Crops	Fine Sand (A Horizon); Loam (B Horizon)	8.20	Grass species (*Grass sp*) is the dominant species with Grape sp (*Vitis sp*), Burdock sp (*Arctium sp*), Goldenrod sp (*Solidago sp*), Swamp Aster (*Symphyotrichum puniceum var. puniceum*), Common Yarrow (*Achillea millefolium*), Vetch species (*Vicia sp*), Canada Thistle (*Cirsium arvense*), and Butter-and-eggs (*Linaria vulgaris*) associates. Manitoba Maple (*Acer negundo*) and Black Walnut (*Juglans nigra*) were the tree species observed.	Polygon: 1	1
FODM4	Fresh-Moist Upland Deciduous Forest	Fine Sand	0.35	Silver Maple (*Acer saccharinum*) was the dominant tree species with Manitoba Maple (*Acer negundo*), Red Maple (*Acer rubrum*), Green Ash (*Fraxinus pennsylvanica*), and Black Walnut (*Juglans nigra*) associates. Shrub cover consisted of Common Buckthorn (*Rhamnus cathartica*) and Staghorn Sumac (*Rhus hirta*). Ground cover consisted of Virginia Creeper (*Parthenocissus quinquefolia*), Grape species (*Vitis sp*), Nettle species (*Urtica sp*), Moss species (*Moss sp*), Grass species (*Grass sp*), Clover species (*Trifolium sp*), Reed Canary Grass (*Phalaris arundinacea*), Goldenrod species (*Solidago sp*), Burdock species (*Arctium sp*), Swamp Aster (*Symphyotrichum puniceum var. puniceum*), and Currant species (*Ribes sp*).	Polygon: 2	2
FOCM2-2	Dry-Fresh White Cedar Coniferous Forest	Humic Soil (A Horizon); Sandy Loam (B Horizon)	0.65	Eastern White Cedar (*Thuja occidentalis*) was the dominant species observed with Scotch Pine (*Pinus sylvestris*), Green Ash (*Fraxinus pennsylvanica*), Balsam Poplar (*Populus balsamifera*), Paper Birch (*Betula papyrifera*), and Crack Willow (*Salix fragilis*) associates. Shrub cover consisted of Common Buckthorn (*Rhamnus cathartica*). Ground cover consisted of Aster species (*Symphyotrichum sp*), Creeping Jennie (*Lysimachia nummularia*), Grape species (*Vitis sp*), Canada Wild-ginger (*Asarum canadense*), Sensitive Fern (*Onoclea sensibilis*), Virginia Creeper (*Parthenocissus quinquefolia*), Swamp Aster (*Symphyotrichum puniceum var. puniceum*), Common Yarrow (*Achillea millefolium*), Wild Carrot (*Daucus carota*) and Goldenrod species (*Solidago sp*).	Polygon: 3	3
MEMM3	Dry-Fresh Mixed Meadow	Silty Sand (A Horizon); Sandy Loam (B Horizon)	1.26	Ground cover was dominated by Grass species (*Grass sp*) and Goldenrod species (*Solidago sp*) with Swamp Aster (*Symphyotrichum puniceum var. puniceum*), Annual Ragweed (*Ambrosia artemisiifolia*), Canada Thistle (*Cirsium arvense*), Wild Carrot (*Daucus carota*), Milkweed species (*Asclepias sp*), Aster species (*Symphyotrichum sp*), Grape species (*Vitis sp*), Reed Canary Grass (*Phalaris arundinacea*), Burreed species (*Sparganium sp*), Common Yarrow (*Achillea millefolium*), and Narrow-leaved Cattail (*Typha angustifolia*) associates. Tree species observed were Manitoba Maple (*Acer negundo*), Scotch Pine (*Pinus sylvestris*), Willow species (*Salix sp*), and Green Ash (*Fraxinus pennsylvanica*). Shrub cover consisted of Ground Juniper (*Juniperus communis*).	Polygon: 4	4
WODM4	Dry-Fresh Deciduous Woodland (WODM4)	Fine Sand	0.94	Manitoba Maple (*Acer negundo*) was the dominant tree species with American Basswood (*Tilia americana*), Silver Maple (*Acer saccharinum*), and Black Walnut (*Juglans nigra*) associates. Shrub cover consisted of Staghorn Sumac (*Rhus hirta*), Honeysuckle species (*Lonicera sp*), and Common Buckthorn (*Rhamnus cathartica*). Ground cover consisted primarily of Reed Canary Grass (*Phalaris arundinacea*) and Grass species (*Grass sp*) with Burdock species (*Arctium sp*), Moss species (*Moss sp*), Grape species (*Vitis sp*), Nettle species (*Urtica sp*), Creeping Jennie (*Lysimachia nummularia*), Aster species (*Symphyotrichum sp*), and Common Dandelion (*Taraxacum officinale*).	Polygon: 5	5
FODM7	Fresh-Moist Lowland Deciduous Forest	Fine Sand	1.43	Manitoba Maple (*Acer negundo*), Green Ash (*Fraxinus pennsylvanica*), and American Elm (*Ulmus americana*) were the dominant tree species with Crack Willow (*Salix fragilis*), Butternut (*Juglans cinerea*), American Basswood (*Tilia americana*), Bur Oak (*Quercus macrocarpa*), and Northern Red Oak (*Quercus rubra*) associates. Shrub cover consisted of Common Buckthorn (*Rhamnus cathartica*). Ground cover was dominated by Aster species (*Symphyotrichum sp*), Moss species (*Moss sp*), Canada Wild-ginger (*Asarum canadense*),	Polygon: 6	6

ELC CODE	CLASSIFICATION	SOILS	AREA (HA)	VEGETATION	COMMENTS	APPENDIX D, PHOTO #
				Virginia Creeper, and Sedge species (*Carex sp*) with Grape species (*Vitis sp*), Grass species (*Grass sp*), Currant species (*Ribes sp*), Burdock species (*Arctium sp*), Nettle speicies (*Urtica sp*), Goldenrod species (*Solidago sp*), Eastern Marsh Fern (*Thelypteris palustris*), and Horsetail species (*Equisetum sp*) associates.		
MASM1-1	Cattail Mineral Shallow Marsh	Humic Soils (A Horizon); Silty Clay (B Horizon)	0.74	Narrow-leaved Cattail (*Typha angustifolia*) was the dominant ground cover species with Burreed species (*Sparganium sp*), Grass species (*Grass sp*), Sensitive Fern (*Onoclea sensibilis*), and Broad-leaved Arrowhead (*Sagittaria latifolia*) associates. Crack Willow (*Salix fragilis*) and Northern Red Maple (*Quercus rubra*) were the tree species observed.	Polygon: 7	7
TAGM5	Fencerow	N/A	0.21	Manitoba Maple (*Acer negundo*) was the dominant tree species observed with Green Ash (*Fraxinus pennsylvanica*), Bur Oak (*Quercus macrocarpa*), and Black Walnut (*Juglans nigra*) associates. Ground cover consisted of Virginia Creeper (*Parthenocissus quinquefolia*), Grass species (*Grass sp*), and Moss species (*Moss sp*).	Polygon: 8	8
CVR_3	Single Family Residential	Sand	1.02	Green Ash (*Fraxinus pennsylvanica*), Crack Willow (*Salix fragilis*), and Manitoba Maple (*Acer negundo*) were the tree species observed. Shrub cover consisted of Common Buckthorn (*Rhamnus cathartica*). Ground cover consisted of Virginia Creeper (*Parthenocissus quinquefolia*), Grape species (*Vitis sp*), Moss species (*Moss sp*), Grass species (*Grass sp*), Horsetail species (*Equisetum sp*), and Goldenrod species (*Solidago sp*).	Polygon: 9	9
SAM_1-5	Bur-reed Mixed Shallow Aquatic	N/A	0.31	Burreed species (*Sparganium sp*) was the dominant species observed with Reed Canary Grass (*Phalaris arundinacea*), Narrow-leaved Cattail (*Typha angustifolia*), and Grass species (*Grass sp*).	Polygon: 10	-

5.2.2 Wetlands

A few small pockets of cattail marsh were identified along the banks of the Rideau River within the Study Area during site investigations. As these wetland polygons are within RVCA's regulation limit, there will be no development in this area.

Therefore unevaluated wetlands are present within the Study Area, outside of the development limit.

5.2.3 Woodlands

The woodlands within the Study Area are small in area and do not contain any interior habitat. In addition, the trees within the woodland are relatively young and would not constitute mature stands of trees 80 years of age or older (see historical photos in **Section 2.0**).

Therefore there are no significant woodlands present within the Study Area.

5.2.4 Valleylands

Site visits identified valleylands along the banks of the Rideau River. According to the City of Ottawa's Official Plan, significant valleylands are defined as valleylands with slopes greater than 15% and a length of more than 50 m.

According to the Paterson Group Inc. (2010), the bank eastern bank of the Rideau River along this section has slopes greater than 15%. Therefore, this area is considered to be a significant valleyland.

Therefore the area adjacent to the Rideau River outside of the proposed development area is considered to be a significant valleyland.

5.2.5 Areas of Natural and Scientific Interest

There are no ANSIs present within the Study Area.

5.2.6 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 6** lists all bird species observed during breeding bird surveys in 2015. With the exception of Bobolink and Barn Swallow which are both listed as *Threatened* under the ESA, 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 ON PROPERTY	PROVINCIAL STATUS	OBSERVED/ HEARD	COMMENTS
No	*Agelaius phoeniceus*	Red-winged Blackbird	Confirmed	Common	S4	Observed/Heard	CP, P, Calls
Yes	*Carduelis tristis*	American Goldfinch	Possible	Rare	S5B	Heard	Flyover
No	*Carpodacus mexicanus*	House Finch	Possible	Rare	SNA	Heard	
Yes	*Dolichonyx oryzivorus*	Bobolink	Probable	Common	S4B	Observed/Heard	P, T, D
No	*Geothlypis trichas*	Common Yellowthroat	Possible	Sparse	S5B	Heard	
Yes	*Hirundo rustica*	Barn Swallow	Possible	Rare	S4B	Observed	Flyover
No	*Icterus galbula*	Baltimore Oriole	Possible	Sparse	S4B	Observed/Heard	
No	*Melospiza melodia*	Song Sparrow	Possible	Sparse	S5B	Heard	
Yes	*Passerculus sandwichensis*	Savannah Sparrow	Possible	Rare	S4B	Heard	
No	*Picoides villosus*	Hairy Woodpecker	Possible	Rare	S5	Observed/Heard	
No	*Quiscalus quiscula*	Common Grackle	Possible	Rare	S5B	Observed	Flyover
Yes	*Sayornis phoebe*	Eastern Phoebe	Possible	Rare	S5B	Heard	
Yes	*Setophaga pensylvanica*	Chestnut-sided Warbler	Possible	Rare	S5B	Heard	
No	*Setophaga petechia*	Yellow Warbler	Possible	Sparse	S5B	Heard	
No	*Spizella passerina*	Chipping Sparrow	Possible	Rare	S5B	Heard	
No	*Sturnus vulgaris*	European Starling	Possible	Sparse	SNA	Observed	Flyover
No	*Turdus migratorius*	American Robin	Possible	Sparse	S5B	Observed/Heard	
Yes	*Tyrannus tyrannus*	Eastern Kingbird	Possible	Rare	S4B	Heard	
No	*Vireo gilvus*	Warbling Vireo	Possible	Rare	S5B	Heard	

Notes:

Breeding Bird Codes from Breeding Bird Atlas of Ontario (Cadman *et al.* 2007)

Observed

X Species observed in its breeding season (no breeding evidence)

Possible

H Species observed in its breeding season in suitable nesting habitat

S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season

Probable

P Pair observed in suitable nesting habitat in nesting season

T Permanent territory presumed through registration of territorial song, or the occurrence of an adult bird, at the same place, in breeding habitat, on at least two days a week or more apart, during its breeding season.

D Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation

V Visiting probable nest site

A Agitated behaviour or anxiety calls of an adult

B Brood Patch on adult female or cloacal protuberance on adult male

N Nest-building or excavation of nest hole, except by a wren or a woodpecker

Confirmed

NB Nest-building or excavation of nest hole by a species other than a wren or a woodpecker

DD Distraction display or injury feigning

NU Used nest or egg shells found (occupied or laid within the period of the survey)

FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight

AE Adult leaving or entering nest sites in circumstances indicating occupied nest

FS Adult carrying fecal sac

CF Adult carrying food for young

NE Nest containing eggs

NY Nest with young seen or heard

Amphibian Breeding Habitat Survey

Potential amphibian breeding habitat was identified within woodland and wetland eco-sites along the Rideau River. Surveys were conducted from points in close proximity to each of the identified eco-sites. **Table 7** lists the three amphibian species observed within 100m of point counts during amphibian breeding surveys in 2015.

TABLE 7: AMPHIBIAN SPECIES OBSERVED

SCIENTIFIC NAME	COMMON NAME	NUMBER OF OBSERVATIONS	SARA	ESA 2007	S-RANK
Anaxyrus americanus	American Toad	Call Code 3	---	---	S5
Hyla versicolor	Gray Treefrog	Call Code 3	---	---	S5
Pseudacris crucifer	Spring Peeper	Call Code 3	---	---	S5

Each of the three species observed are common within the Ottawa area. In accordance with the Ecoregion 6E Criterion Schedule (MNRF 2015), the Study Area was considered under potential amphibian breeding wetland habitat, as the areas surveyed consist of wetland polygons. Breeding habitats must contain at least two of the listed frog species with at least 20 individuals (adults or egg masses) of each species; or at least two of the listed frog species with Call Code 3 in order for the habitat to be significant.

Both American Toad and Gray Treefrog are considered under amphibian breeding wetland habitat, and were each recorded with a Call Code of 3.

Therefore there is significant amphibian breeding wetland habitat along the Rideau River at the western boundary of the Study Area.

5.3 Species at Risk

No Whip-poor-wills were heard calling during the evening field surveys. According to the *General Habitat Description for the Eastern Whip-poor-will (Caprimulgus vociferous)* (MNRF 2013), Whip-poor-will habitat consists of a mix of open and half treed areas within large woodlands. Defended Whip-poor-will habitats are approximately 9 ha in size. Woodland habitat of this size is not present within the Study Area as the total amount of woodland within the Study Area is 6.4 ha and the polygons are non-contiguous and contain no interior habitat.

Therefore there is no suitable Whip-poor-will habitat present within the Study Area.

However, Bobolink, Barn Swallow, Butternut, and Blanding's Turtle were all observed within the Study Area during site investigations. In addition, suitable habitat for these species is

present within the Study Area within meadows, and within wetland areas and back bays along the Rideau River.

Suitable habitat for Bobolink is present within the Study Area in the form of hayfields and meadow (**Figure 5**). During breeding bird surveys conducted in 2015, a Bobolink pair was observed displaying nesting and territorial behaviours during breeding bird surveys, indicating Bobolink habitat.

One Barn Swallow was observed as a flyover during breeding bird surveys. A desktop review of the area did not identify any barns within 200m of the Study Area as the surrounding area mainly consists of new-build residential properties. However, the Strandherd Bridge is located just north of the site which may provide Barn Swallow nesting habitat.

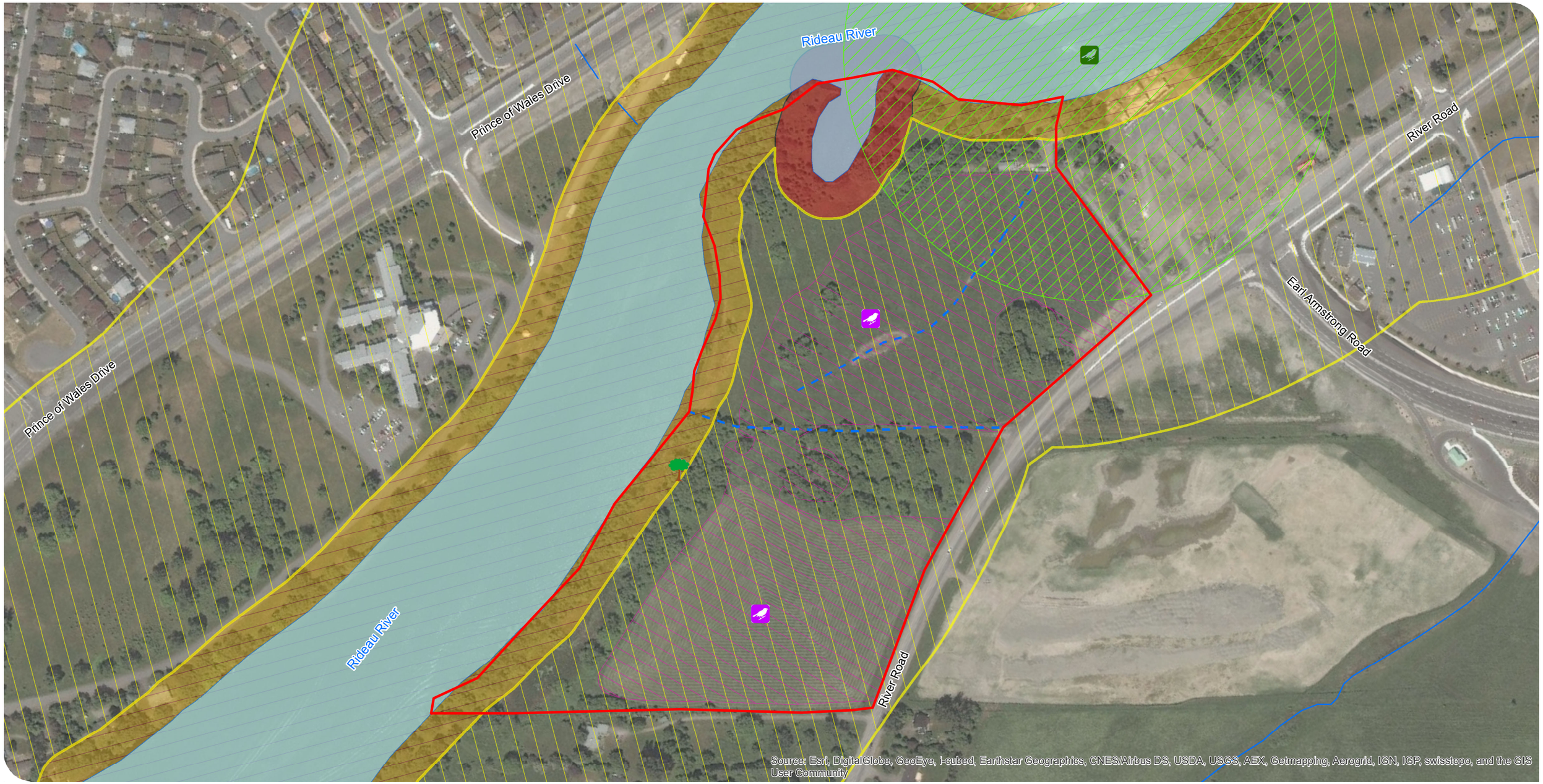
Wildlife trail cameras set within the back bay area along the Rideau River captured a Blanding's Turtle in early October of 2014 (see ***Appendix G***). Therefore, overwintering habitat for Blanding's Turtle may be located within this area connected to the Rideau River.

In addition, one Butternut tree was identified within a woodland area outside of the proposed development area (**Figure 5**).

Therefore based on survey results and MNRF general habitat description and habitat categorization; there is habitat for Bobolink, potential Category 3 Barn Swallow Habitat, and Category 2 and 3 Blanding's Turtle habitat within the proposed area of development. **Butternut was observed outside of the proposed development area .**

The MNRF will be contacted to discuss next steps for Species at Risk within the Study Area to ensure that the development does not contravene the ESA (2007). This will likely involve registering Bobolink and Barn Swallow by submitting a Notice of Activity for each species, and permitting under Sections 9 and 10 of the ESA for Blanding's Turtle.

See ***Appendix F*** for a detailed screening of Species at Risk identified in **Table 3**.



RIVERSIDE SOUTH DEVELOPMENT CORPORATION

Phase 12
Proposed Residential Development

Figure 5:
Species at Risk

Legend

- Boundary of Study Area
- Ephemeral Headwater Streams
- Waterbodies (MNR LIO)
- Potential Barn Swallow Nest Location (Under Bridge)
- Butternut Tree
- Bobolink Observation

Species at Risk Constraints

- Bobolink - Category 3 Habitat
- Potential Barn Swallow - Category 3 Habitat
- Blandings Turtle - Category 1 Habitat
- Blandings Turtle - Category 2 Habitat
- Blandings Turtle - Category 3 Habitat

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MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

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

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Meters

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PROJECT: 14-9919 STATUS: DRAFT DATE: 5/17/2016

5.4 Trees

A Tree Inventory was conducted in conjunction with ELC survey to evaluate potential impacts to trees within the Study Area. All trees identified are considered common to the Ottawa area and none were considered at risk. **Table 8** below outlines the tree species that were identified within the Study Area. **Figure 6** illustrates the location of trees within the Study Area.

TABLE 8: TREE SPECIES WITHIN THE STUDY AREA

SCIENTIFIC NAME	COMMON NAME	NOTES
Acer negundo	Manitoba Maple (Boxelder)	Found within proposed development area
Acer rubrum	Red Maple	Found within proposed development area
Acer saccharinum	Silver Maple	Found within proposed development area
Acer x freemanii	Freeman's Maple	Found within proposed development area
Betula papyrifera	Paper Birch	Found within valleylands, outside proposed development area
Fraxinus pennsylvanica	Green Ash	Found within proposed development area
Juglans cinerea	Butternut	Found within valleylands, outside proposed development area
Juglans nigra	Black Walnut	Found within proposed development area
Pinus sylvestris	Scotch Pine	Found within valleylands, outside proposed development area
Populus balsamifera	Balsam Poplar	Found within valleylands, outside proposed development area
Quercus macrocarpa	Bur Oak	Found within proposed development area
Quercus rubra	Northern Red Oak	Found within valleylands, outside proposed development area
Salix fragilis	Crack Willow	Found within valleylands, outside proposed development area
Salix sp	Willow Species	Found within valleylands, outside proposed development area
Tilia americana	American Basswood	Found within proposed development area
Thuja occidentalis	Eastern White Cedar	Found within proposed development area
Ulmus americana	American Elm	Found within valleylands, outside proposed development area

The Study Area contains several forest stands characterized by mature trees with an overall health as "Good". One Species at Risk tree (Butternut) was observed within the Study Area, but outside the proposed development area.

RIVERSIDE SOUTH DEVELOPMENT CORPORATION

Phase 12
Proposed Residential Development

Figure 6:
Tree Inventory

Legend

- Boundary of Study Area
- Ephemeral Headwater Streams
- Waterbodies (MNR LIO)

Treed Areas and Distinctive Trees

- Forest (8.46 ha)
- Woodland (2.47 ha)
- Fencerow (6.04 ha)
- Boxelder
- Crack Willow
- Basswood
- Freeman's Maple

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MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

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

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Meters

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PROJECT: 14-9919 STATUS: DRAFT DATE: 5/17/2016

5.5 Incidental Wildlife

Incidental wildlife species observed in the property are listed in **Table 10** below. With the exception of Blanding's Turtle which is a Species at Risk, the incidental; 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			
Anas platyrhynchos	Mallard	Visitor	Visual observation/Wildlife Camera
Ardea herodias	Great Blue Heron	Visitor	Visual observation
Corvus brachyrhynchos	American Crow	Resident	Visual Observation
Poecile atricapillus	Black-capped Chickadee	Resident	Visual observation
Sitta canadensis	Red-breasted Nuthatch	Resident	Visual observation
Turdus migratorius	American Robin	Resident	Visual observation
MAMMALS			
Castor canadensis	Beaver	Resident	Wildlife Camera
Sciurus carolinensis	Eastern Gray Squirrel	Resident	Visual observation
Tamiasciurus hudsonicus	Red Squirrel	Resident	Visual observation
HERPTILES			
Emydoidea blandingii	Blanding's Turtle	Resident	Wildlife Camera
Lithobates pipiens	Northern Leopard Frog	Resident	Heard

A number of incidental wildlife observations were made within the Study Area. One of the species observed, Blanding's Turtle is considered a Species at Risk.

6.0 Impact Assessment and Mitigation

The following sections outline general measures that should be considered to mitigate impacts associated with the development of the property (**Figure 7**). This includes both construction related mitigation measures and mitigation measures to address impacts related to impacts associated with the occupation of the development.

Setbacks from watercourses and natural heritage features shown on **Figure 7** were determined based on policies and related guidance documents outlined in **Table 1**.

6.1 Aquatic Environment

Although there is no fish habitat present within the site, 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 have been identified and evaluated as part of the HDF Assessment (***Appendix C***) and are summarized below.

The mitigation has been incorporated into the design of the site to ensure there are no impacts to the storage capacity of the watershed (i.e., stormwater management, enhancement of existing water features etc.).

6.1.1 Impacts

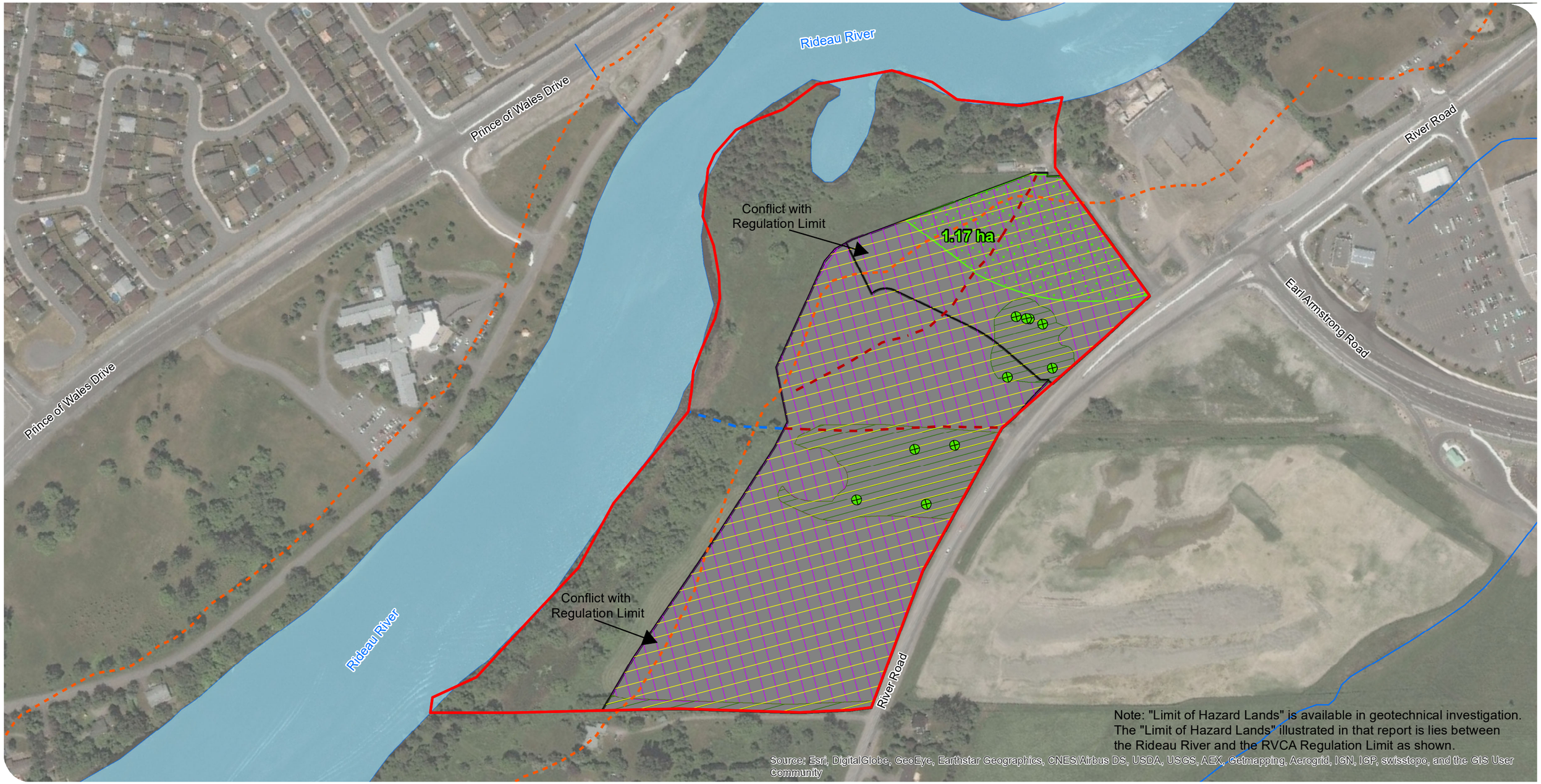
Potential impacts, or loss of functions as identified in HDF Assessment, may include the following where features are being removed:

- Loss of HDFs with limited functions (minimal flow);
- Reduction in seasonal water flow into the Rideau River and water storage potential within the Study Area; and,
- Reduction in water quality within the Study Area and within the Rideau River.

6.1.2 Mitigation

Mitigation during construction

- Limit of development shall be:
    - Revised to reflect the RVCA regulation limit illustrated in **Figure 7**, **or**;
    - Maintained with prior agreement with the RVCA.
- 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;



RIVERSIDE SOUTH DEVELOPMENT CORPORATION

Phase 12
Proposed Residential Development

Figure 7:
Environmental Impacts

Legend

- Boundary of Study Area
- Development Area
- Waterbody (MNRF)

Impacts & Constraints

- Large Tree to be Removed
- Removed Treed Habitat (1.5 ha)
- RVCA Regulation Limit (geoOttawa)
- Removed Headwater Drainage Feature
- Loss of Cagegory 3 Blandings Turtle Habitat (8.7 ha)
- Potential Loss of Cagegory 3 Barn Swallow Habitat (1.17 ha)
- Loss of Bobolink & Eastern Meadowlark Habitat (8.2 ha)

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MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

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

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PROJECT: 14-9919 STATUS: DRAFT DATE: 2016-07-27

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- 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 the Rideau River;
- A spill response plan should be developed and implemented as 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 and stormwater management plan which maintain pre-development surface water flows to adjacent lands (quantity, quality, infiltrations, conveyance patterns, and seasonality of water flow).

6.2 Natural Heritage Features

6.2.1 Vegetation Communities

The following are the potential impacts and recommended mitigation measures to avoid impacts to adjacent terrestrial vegetation communities associated with the clearing of the forest communities within the Study Area.

6.2.1.1 Impacts

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

- Loss of 9.7 ha of terrestrial communities (**Figure 5**). This includes;
    - 8.2 ha of Cropland; and,
    - 1.5 ha of Woodland.
- Accidental damage or loss of trees as a result of site alteration or construction activities;
- Erosion and sedimentation into adjacent vegetation communities; and,
- Loss of native diversity due to increased presence of non-native invasive species after development.

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:
    - Revised to reflect the RVCA regulation limit illustrated in **Figure 7**, **or**;
    - Maintained with prior agreement with the RVCA.

- 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;
- 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

- The *'Riverside South Living on History's Doorstep: Homeowners Handbook'* should be provided to new homeowners. This document lists of locally appropriate native species for use in landscaping, along with information on the negative impacts of non-native species.

6.2.2 Significant Natural Heritage Features

A significant valleyland is located along the western limit of development. The following are potential impacts and recommended mitigation measures to avoid impacts to the significant valleyland within the Study Area.

6.2.2.1 Impacts

Although no development will encroach on this feature, there is potential for negative impacts, including the following:

- Erosion and sedimentation into the feature;
- Encroachment into feature during construction;
- Loss of native biodiversity due to increased presence of non-native species after development; and,
- Degradation resulting from increased recreational usage, illicit dumping and encroachment by residential landowners into natural areas and setbacks or buffers following development.

6.2.2.2 Mitigation

Mitigation during construction

- Limit of development shall be:
  - Revised to reflect the RVCA regulation limit illustrated in **Figure 7**, **or**;
  - Maintained with prior agreement with the RVCA.
- Standard duty silt fencing (OPSD 219.110) and/ or other equivalent erosion and sediment controls 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 the Rideau River;
- A spill response plan should be developed and implemented as required; and,
- If dewatering is required, use of silt socks, dewatering ponds, etc. 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.

Mitigation during occupation

- Provide Owner Awareness Package to all new residents, to encourage responsible stewardship of the natural features.

6.3 Species at Risk

The following are potential impacts and recommended mitigation measures to avoid impacts to potential Species at Risk habitat within the Study Area.

6.3.1 Impacts

Potential impacts to Species at Risk within the development area include the following:

- Loss of approximately 8.2 ha of Bobolink habitat;
- Loss of 1.17 ha of Category 3 Barn Swallow Habitat;
- Encroachment into Category 2 and 3 Blanding's Turtle Habitat; and,
- 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 Species at Risk 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 Species at Risk is observed, the MNRF will be contacted as soon as possible to provide further direction if impacts are anticipated.

6.4 Trees

A review of the proposed site plan indicates that a number of mature trees will likely be removed to accommodate the proposed development. In general, trees within the Study Area are healthy specimens.

6.4.1 Impacts

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

- Reduction in the number of specimen trees within the 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 mature trees and otherwise retainable trees. Mitigation requirements outlined by the City of Ottawa only apply to Distinctive Trees within the Urban Area and should be applied to all retainable trees where possible. These mitigation measures include the following:

- A tree protection fence should be constructed around all 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.

TREE PROTECTION FENCE

- 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.

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 into the proposed development.
- Planted trees should only include species that are consistent with the City of Ottawa's TCR Guidelines.
- All Green 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.
- The trees outside of the proposed development area are not anticipated to be impacted.

6.5 Incidental Wildlife

Since most species 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 the *'Riverside South Living on History's Doorstep: Homeowners Handbook'* to all new residents living adjacent to the Mosquito Creek valley lands. This information could include;
    - Information about local flora and fauna;
    - Information about how to protect wildlife from pets; and,
    - Contact information for local organizations .

7.0 Cumulative Impacts

As this RSDC Phase 12 Development is a part of a rapidly expanding area, cumulative impacts must also be considered in the context of the local environment. Since the RSDC Phase 12 Development Study Area had been 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.

8.0 Summary and Conclusions

This report outlines the environmental impacts associated with the construction and long-term occupation of the RSDC Phase 12 Development, located 708 River Road, 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.

Given that the Rideau River floodplain will be protected following this development, few substantive impacts are likely to occur as a result of the proposed development of this property. These impacts include the removal of mature trees and forest habitat, loss of local native vegetation, loss of HDFs, and loss of habitat for birds and other native wildlife.

The mitigation 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.

The MNRF will be contacted to discuss next steps for Species at Risk within the Study Area to ensure that the development does not contravene the ESA (2007). This will likely involve registering Bobolink and Barn Swallow by submitting a Notice of Activity for each species, and permitting under Sections 9 and 10 of the ESA for Blanding's Turtle.

It is our opinion that the proposed RSDC Phase 12 Development, located at 708 River Road, can be accepted with the condition that;

- **All Species at Risk permitting requirements will be fulfilled to the satisfaction of the MNRF; and,**
- **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; Whitney Moore, Michael Seabert, Kevin Robinson, and Jonathan Harris. Resumes of key staff are included in ***Appendix A***.

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

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Appendix A

MNRF Information Request

DILLON CONSULTING

Ministry of Natural Resources

Kemptville District
P.O. Box2002
10 Campus Drive
Kemptville, ONK0G 1J0

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

Ministère des Richesses naturelles

District de Kemptville
CP 2002
10 Campus Drive
Kemptville, ONK0G 1J0

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

Thu. Oct 2, 2014

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 at 708 River Rd (Riverside South- Phase 12)
Site Address:
Our File No. 2014_GLO-2804

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:

- Unevaluated Wetland (Not evaluated per OWES)

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.

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, over-wintering 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:

- Butternut (END)

- Barn Swallow (THR)
- Blanding's Turtle (THR)
- Bobolink (THR)
- Eastern Meadowlark (THR)
- 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)
- Eastern Musk Turtle (SC)
- 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:

- Snapping Turtle (SC)
- Eastern Musk Turtle (SC)
- Milksnake (SC)
- Monarch (SC)
- Short-eared Owl (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: Fri. Oct 2, 2015

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. There 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

Curricula 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.

EDUCATION

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

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, nose 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.

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.

EDUCATION

M.Sc., Biology, Lakehead University, 2007

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

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.

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 km^2.

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 C

Headwater Drainage Features Assessment

DILLON CONSULTING

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RIVERSIDE SOUTH DEVELOPMENT CORPORATION

Headwater Drainage Features Assessment Report

Phase 12

Final – September 2016

September 2016 – 14-9919

Table of Contents

1.0 Purpose

Dillon Consulting Limited (Dillon) was retained by Riverside South Development Corporation (RSDC) to undertake a Headwater Drainage Feature (HDF) Assessment of a property located at 708 River Road, in the City of Ottawa, Ontario (the "Study Area")(**Figure 1**). This report was prepared to support the development application by RSDC and supplements the required Environmental Impact Study (EIS).

1.1 Scope

This report evaluates and classifies potential on-site HDFs following the *Evaluation, Classification, and Management of Headwater Drainage Features Guidelines* developed by the Toronto Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC) in 2014, hereafter referred to as the "Guidance Document". These guidelines were adopted in spring 2015 by the Rideau Valley Conservation Authority (RVCA) for application to projects within RVCA jurisdiction. The evaluation also includes recommendations for post-development management strategies which are consistent with the Guidance Document for each of the classified HDFs, as applicable.

1.2 General Description of Site

The Study Area is located in the City of Ottawa, Ontario at 708 River Road. It is legally described as Part Lot 20 and 21, Concession 1, in the City of Ottawa. The area is primarily comprised of agricultural fields (row crop) with patches of forest and treed hedgerows.

1.3 Development Concept

The City of Ottawa has designated this land as Development Reserve Zone (DR) in the Official Plan (OP). Riverside is proposing to develop this site for residential use featuring single family homes and residential townhomes.

RIVERSIDE SOUTH DEVELOPMENT CORPORATION

Phase 12
Proposed Residential Development

Figure 1:
Study Area

Legend

- Boundary of Study Area
- Waterbodies (MNR LIO)
- Wetlands (MNR LIO)
- Watercourse
- Wooded Area (MNR LIO)
- City of Ottawa Natural Heritage Area

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

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

N W E S

0 100 200 400 600 800
Meters

FILE LOCATION: FILE LOCATION:
Path: F:\ArcGIS_Working\149919\MXD\Headwaters\Ph12_Fig1_Study Area.mxd

PROJECT: 14-9919 STATUS: DRAFT DATE: 5/17/2016

2.0 Methodology

This study used a combination of desktop methods and field studies to identify potential impacts of the proposed development activities potential HDFs. The HDF Assessment was conducted using the methods outlined in the Guidance Document. The Dillon biologists who completed the HDF assessment component of the field work received training by a Conservation Authority in the HDF assessment protocol prior to the start of field studies.

2.1 Secondary Source Background Review

Background information was examined to help determine what features are present and where sampling should occur. Documents were also reviewed for fisheries information and other information relating to this catchment area relevant to the HDF Assessment.

Background resources searched included the following:

- Ministry of Natural Resources and Forestry (MNRF)
  - Land Information Ontario (LIO)
- City of Ottawa
  - Google Earth layers
  - Official Plan mapping (GeoOttawa)
- Rideau Valley Conservation Authority (RVCA)
  - *Lower Rideau Subwatershed Report* (2012)
    - *Rideau River-Hogs Back Catchment*
- Niblett Environmental Associates Inc. (NEA)
  - *Riverside South Community Design Plan Fisheries Compensation Plan (2007)*
- Fisheries and Oceans Canada
  - Aquatic Species at Risk Mapping
- ArcGIS
- Google Earth satellite/ aerial photo interpretation

Based on this information, sample locations were determined and are presented in **Figure 2**.

RIVERSIDE SOUTH DEVELOPMENT CORPORATION

Phase 12
Proposed Residential Development

Figure 2:
Sampling Locations

Boundary of Study Area
Waterbodies (MNR LIO)
Ephemeral Headwater Streams
Sampling Location (FIeld Visit #1)

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

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

N W E S

0 0.03 0.06 0.12 0.18 0.24
Kilometers

FILE LOCATION: FILE LOCATION:
Path: F:\ArcGIS_Working\149919\MXD\Headwaters\Ph12_Fig2_Sampling.mxd

PROJECT: 14-9919 STATUS: DRAFT DATE: 5/17/2016

2.2 Field Sampling

The assessment was conducted following the 'Standard Methods' as defined by the Guidance Document. This included various site visits throughout the spring and summer of 2015 as detailed in **Table 1**. Ecological Land Classification (ELC) was also completed by Dillon in 2014. Survey dates and weather conditions for each site visit are listed in **Table 1**.

TABLE 1: SITE VISIT DATES AND WEATHER CONDITIONS

DATE (2015)	TIME	PERSONNEL	WEATHER CONDITIONS	AIR TEMP (°C)*	PURPOSE
APRIL 28	08:00	W. MOORE K. MCLEAN	SUNNY, CLEAR	12.5	HDF SITE VISIT #1
MAY 7	20:45	K. ROBINSON	MOSTLY CLEAR	18.3	AMPHIBIAN SURVEY #1
MAY 27	21:00	K. ROBINSON	MOSTLY CLEAR WITH LIGHT CLOUD COVER	23.1	AMPHIBIAN SURVEY #2
JUNE 24	21:30	K. ROBINSON W. MOORE	MOSTLY CLEAR WITH LIGHT CLOUD COVER	18.8	AMPHIBIAN SURVEY #3
JULY 3	14:00	W. MOORE B. GOTTFRIED	SUNNY	16.9	ELECTROFISHING
JULY 28	13:30	W. MOORE K. ROBINSON	SUNNY	25.3	HDF SITE VISIT #2

*Mean daily temperatures as reported from Ottawa Macdonald-Cartier International Airport (Environment Canada)

The first headwaters site visit occurred April 28th of 2015 and the second headwaters site visit occurred on July 28th of 2015. Three amphibian surveys were also conducted following the Marsh Monitoring Protocol. No precipitation occurred on any of the survey dates.

The site was walked to inventory and assess any watercourses present within the property boundaries during the first site visit. The purpose of the second site visit was to confirm features surveyed during the first assessment and evaluate if surface flow was present in order to determine the hydroperiod. Field data was collected regarding the flow, channel form, aquatic habitat, and vegetation of potential HDFs within the Study Area.

These assessments were completed within defined channel segments, based on modifiers within the reach (i.e., culverts, changes in flow type or vegetation). Photos of each HDF segment are included in ***Appendix A.***

2.2 Field Sampling

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These assessments were completed within defined channel segments, based on modifiers within the reach (i.e., culverts, changes in flow type or vegetation). Photos of each HDF segment are included in ***Appendix A.***

2.3 Classification

Using the information collected in the Evaluation phase (both desktop and field observations) the following attributes of the HDFs were classified:

1. Hydrology
2. Riparian Habitat
3. Fish and Fish Habitat
4. Terrestrial Habitat

3.0 Evaluation

The following sections detail the results of the background review and site assessments for the Study Area.

3.1 Secondary Sources

General Conditions

The Study Area lies within the Lower Rideau Subwatershed, which is part of the larger Rideau River Watershed. There are six catchment areas that form the Lower Rideau Subwatershed and the Study Area lies within the Rideau River-Hogs Back catchment area. The site drains directly into the Rideau River.

The Rideau River-Hogs Back catchment drains an area of 38 km^2 which makes up 4.9% of the Lower Rideau Subwatershed and 0.9% of the Rideau Valley Watershed (RVCA). A summary of information from the *Lower Rideau Subwatershed Report* (RVCA 2012) is included below:

- *The catchment contains many tributaries, including Nepean, Hunt Club, Black Rapids, Barrhaven, Mosquito and Mud Creeks, as well as the Jock River;*
- *This reach is under shoreline development pressure and is intensively used for boating;*
- *Dominant land cover is settlement (44%), followed by crop and pastureland (23%), woodland (13%), transportation (11%), water (6%), grassland (2%) and wetland (1%);*
- *Contains a warm/cool water recreational and baitfish fishery with 40 fish species;*
- *Riparian buffer is comprised of woodland (33%), settlement (30%), crop and pastureland (29%), transportation (6%), wetland (2%) and grassland (1%);*
- *Water quality rating along the Rideau River is fair at the Strandherd Bridge, directly north of the Study Area; and,*
- *Woodland cover has increased by 2.4% over a 6 year period.*

Fisheries Resources

As mentioned above, the overall characterization of the Rideau River-Hogs Back catchment in the subwatershed study is cool/warm water recreational and baitfish fishery with over 40 species observed. These species are listed in **Table 2**.

TABLE 2: FISH SPECIES RECORDED WITHIN THE RIDEAU RIVER-HOGS BACK CATCHMENT

SCIENTIFIC NAME	COMMON NAME	SRANK[1]	SARA[2]	ESA[3]
FUNDULUS DIAPHANUS	BANDED KILLIFISH	S5	---	---
POMOXIS NIGROMACULATUS	BLACK CRAPPIE	S4	---	---
NOTROPIS HETERODON	BLACKCHIN SHINER	S4	---	---
NOTROPIS HETEROLEPIS	BLACKNOSE SHINER	S5	---	---
LEPOMIS MACROCHIRUS	BLUEGILL	S5	---	---
PIMEPHALES NOTATUS	BLUNTNOSE MINNOW	S5	---	---
LABIDESTHES SICCULUS	BROOK SILVERSIDE	S4	---	---
CULAEA INCONSTANS	BROOK STICKLEBACK	S5	---	---
AMEIURUS NEBULOSUS	BROWN BULLHEAD	S5	---	---
UMBRA LIMI	CENTRAL MUDMINNOW	S5	---	---
ICTALURUS PUNCTATUS	CHANNEL CATFISH	S4	---	---
CYPRINUS CARPIO	COMMON CARP	SNA	---	---
LUXILUS CORNUTUS	COMMON SHINER	S5	---	---
HYBOGNATHUS REGIUS	EASTERN SILVERY MINNOW	S2	---	---
NOTROPIS ATHERINOIDES	EMERALD SHINER	S5	---	---
SEMOTILUS CORPORALIS	FALLFISH	S4	---	---
NOTEMIGONUS CRYSOLEUCAS	GOLDEN SHINER	S5	---	---
ETHEOSTOMA NIGRUM	JOHNNY DARTER	S5	---	---
MICROPTERUS SALMOIDES	LARGEMOUTH BASS	S5	---	---
PERCINA CAPRODES	LOGPERCH	S5	---	---
NOTROPIS VOLUCELLUS	MIMIC SHINER	S5	---	---
COTTUS BAIRDI	MOTTLED SCULPIN	S5	---	---
ESOX MASQUINONGY	MUSKELLUNGE	S4	---	---
ESOX LUCIUS	NORTHERN PIKE	S5	---	---
LEPOMIS GIBBOSUS	PUMPKINSEED	S5	---	---
AMBLOPLITES RUPESTRIS	ROCK BASS	S5	---	---
MOXOSTOMA MACROLEPIDOTUM	SHORTHEAD REDHORSE SUCKER	S5	---	---
MOXOSTOMA ANISURUM	SILVER REDHORSE SUCKER	S4	---	---
MICROPTERUS DOLOMIEU	SMALLMOUTH BASS	S5	---	---
NOTROPIS HUDSONIUS	SPOTTAIL SHINER	S5	---	---
NOTURUS GYRINUS	TADPOLE MADTOM	S4	---	---
ETHEOSTOMA OLMSTEDI	TESSELLATED DARTER	S4	---	---
ESOX MASQUINONGY X ESOX LUCIUS	TIGER MUSKELLUNGE	---	---	---
SANDER VITREUS VITREUS	WALLEYE	S5	---	---
CATOSTOMUS COMMERSONI	WHITE SUCKER	S5	---	---
AMEIURUS NATALIS	YELLOW BULLHEAD	S4	---	---
PERCA FLAVESCENS	YELLOW PERCH	S5	---	---

[1] Provincial (Subnational) Rank; [2]Federal *Species at Risk Act*; [3]Ontario *Endangered Species Act* (2007).

The *Lower Rideau Subwatershed Report* (2012) classifies the Rideau River as fair on the water quality scale within this section of the river. This suggests this reach of the river as well as its tributaries may provide suitable habitat for a wide variety of fish species. No aquatic Species at Risk (fish or mussels) have been identified within the Rideau River-Hogs Back catchment in the *Lower Rideau Subwatershed Report* (2012), although one Species of Conservation Concern was identified; Eastern Silvery Minnow (S2). In addition, no Species at Risk were identified within the Rideau River-Hogs Back catchment in available DFO mapping. Further, the NHIC database was searched as a cross-reference exercise, and likewise did not contain records of aquatic Species at Risk within the general vicinity of the Study Area, but did contain a record for Greater Redhorse, a Species of Conservation Concern (S3).

Previous Studies

NEA conducted a study of the tributaries in Riverside South as part of the Riverside South Community Design Plan Fisheries Compensation Plan (2007). The results of the study indicated that tributaries that were to be 'filled' or left in a 'natural state'. Based on this, and correspondence from the RVCA (Jennifer Lamoureux personal communication June 18, 2016), any tributaries within Riverside South mapped as "filled" can be assessed as either "Mitigation" or "No Management Required". Other tributaries shown as being left in a natural state can be assessed based on the results of the HDF assessment.

3.2 Field Observations

Two tributaries to the Rideau River are present within the Study Area.

Note that tributaries were assessed in segments based on modifiers within the channels but have been grouped for evaluation purposes. Results of the HDF Assessment are detailed in **Table 3**. Photo documentation taken during surveys has been included in ***Appendix A***.

The naming of the tributaries is consistent with nomenclature used in mapping created by Niblett Environmental Associates Inc. (NEA) in 2007, and used in the *Riverside South Community Design Plan Fisheries Compensation Plan* (NEA 2010). For those that were not included in NEA mapping, tributary names were created to follow a similar format, or to make them distinguishable from other tributaries within Riverside South.

Tributary 12-1

Within the northern section of the Study Area, Tributary 1 flows north near the centre of the Study Area before entering a residential property and draining into the Rideau River (**Figure 2**). The tributary originates within a gully, or depression in an agricultural field, and collects overland flow from spring thaw and rain events. At the northern boundary of the Study Area,

the channel crosses a chain link fence and enters a residential property located on the Rideau River.

During the first site visit Tributary 1 was observed to have minimal flow with downstream segments flowing but upstream segments stagnant. At RID001-03 where the pond was located, flow ran in both directions out of the pond downstream towards RID001-02, and into RID001-04. This is because the slope of the property drops on either side of the feature toward the Rideau River and so overflow from the ponding area is collecting within the swale at RID001-04. The majority of the flow out of the pond is directed 'downstream' through RID001-02 and RID001-01.

During subsequent site visits conducted in July, the tributary was completely dry and tilled up.

Tributary 12-2

Tributary 2 bisects the Study Area by crossing the property in an east-west direction, from River Road to the Rideau River (**Figure 2**). This tributary originates as a roadside ditch at River Road and travels along what appeared to be a former laneway across the Study Area, within a ditch consisting of shrubs and large boulders. The tributary then conveys flow down slope toward the river, and enters a wooded area where the channel was observed to be less defined with flow becoming more diffuse.

During the first site visit this tributary was observed conveying water from roadside ditches along River Road across the Study Area to the Rideau River. During subsequent site visits conducted in July, this tributary was completely dry and overgrown with meadow grasses and shrubs.

TABLE 3: DETAILS OF SITE ASSESSMENTS

DRAINAGE FEATURE	SITE VISIT	DATE OF FIELD WORK	FLOW ASSESSMENT	VEGETATION ASSESSMENT		CHANNEL FORM				SEDIMENT TRANSPORT		COMMENTS	PHOTO REFERENCES
			FLOW INFLUENCE (FI)/ CONDITION (FC)/ TYPE (FT)	RIPARIAN	TERRESTRIAL	AVERAGE WETTED WIDTH (m)	AVERAGE DEPTH (m)	AVERAGE BANKFULL WIDTH (m)	SUBSTRATES	SEDIMENT TRANS.	SEDIMENT DEP.		
TRIBUTARY 12-1													
RID001-01	1	28-Apr-15	**Flow observed** FI: Baseflow (3) FC: Subs. Flow (5) FT: Defined Natural Channel (2)	Meadow (4)	Meadow (4)	0.23	0.01	0.28	Si, Sa	Rills, Instream Bank Erosion	Substantial	- Natural channel/ rill running through gully in agricultural field conveying overflow from standing water within field - Flows through chain link fence into a culvert or spillway beneath residential driveway before outletting at the Rideau River (barrier to fish migration)	1, 2
	2	28-Jul-15	No flow observed during 2nd site assessment.									- Channel dry and not evident- entire field tilled.	5
RID001-02	1	28-Apr-15	**Flow observed** FI: Base flow (3) FC: Standing Water (2) FT: Swale (7)	Meadow (4)	Meadow (4)	3.77	0.05	N/A	Si, Sa	Sheet Erosion	Minimal	- Swale upstream of RID001-01	3, 4
	2	28-Jul-15	No flow observed during 2nd site assessment.									- Channel dry and not evident- entire field tilled.	5
RID001-03	1	28-Apr-15	**Flow observed** FI: Base flow (3) FC: Standing Water (2) FT: Pond (9)	Meadow (4)	Meadow (4)	15	0.23	20	Si, Sa	Sheet Erosion	Moderate	- Pond within agricultural field upstream of RID001-02 - Contained wetland/pond vegetation and amphibians (frogs) - Exists due to slope of surrounding land - No amphibians heard within this tributary during amphibian surveys (feature was dry and grown with meadow grass during last amphibian survey)	6, 7
	2	28-Jul-15	No flow observed during 2nd site assessment.									- Pond dry and not evident- entire field tilled.	11
RID001-04	1	28-Apr-15	**Flow observed** FI: Base flow (3) FC: Standing Water (2) FT: Swale (7)	Meadow (4)	Meadow (4)	0.7	0.90	N/A	Si, Sa	Sheet Erosion	Moderate	- Swale/ pooled water upstream of pond, no flow - There is a rill running through an area of mowed grass travelling down the slope from this feature to the Rideau River. This rill was dry at the time and likely conveys overflow from the field during rain events and Spring freshet (similar to RID001-01)- can be seen on aerials	8, 9, 10
	2	28-Jul-15	No flow observed during 2nd site assessment.									- Dry and not evident- entire field tilled up	11
TRIBUTARY 12-2													
RID002-01	1	28-Apr-15	**Flow observed** FI: Base flow (3) FC: Minimal Flow (4) FT: Channelized (2)	Scrubland (5)	Meadow (4)	0.24	0.04	0.66	Si, Sa	Instream Bank Erosion	Substantial	- Channel flowing down slope within an old fencerow towards the river - Banks are heavily eroded - At the bottom of slope, the channel opens up and water flows overland within a wooded are into the River - No amphibians recorded in this tributary during amphibian surveys	12, 14
	2	28-Jul-15	No flow observed during 2nd site assessment.									- Channel dry and overgrown with scrubland vegetation	13, 15
RID002-02	1	28-Apr-15	**Flow observed** FI: Base flow (3) FC: Standing Water (2) FT: Channelized (2)	Scrubland (5)	Meadow (4)	---	---	2.59	Si, Sa	Instream Bank Erosion	Minimal	- Difficult to take measurements due to dead meadow grass and cattails - Upstream side of ditch running along old laneway meets a section of boulders where the slope begins down to RID002-01	16, 18
	2	28-Jul-15	No flow observed during 2nd site assessment.									- Channel dry and overgrown with dense meadow grasses	17, 19

*Clay= Cl, Silt= Si, Sand= Sa; **Minimal= <5mm, Moderate= 5-30 mm, Substantial= 31-80 mm, Extensive= >80 mm

4.0 Classification

The condition of the tributaries are described above in **Section 3.2** and summarized in **Table 3**. Based on the observations made during site visits, the features have been classified and subsequently, management recommendations have been made for each branch according to the Guidance Document , as well as the previous study completed by NEA (2007) and personal communication with the RVCA (June 2016)(see **Table 4**). The management recommendations listed below have also been depicted on **Figure 3**.

Within the Study Area, both Tributary 1 and Tributary 2 have been classified as having Limited Function, with a recommendation of No Management Required.

Tributary 12-1: Limited Functions (No Management Required)

Tributary 12-1 has been classified as having Limited Function with a management recommendation of "No Management Required"; as this tributary only collects flow from the slope of the field and has little flowing water in the spring. In addition, there is no direct surface connectivity to the Rideau River, and a fish passage barrier exists downstream at the residential property. Further, this feature does not have any riparian or terrestrial function as it is located within an agricultural field and is tilled and planted.

Tributary 12-2: Limited Functions (No Management Required)

Tributary 12-2 has been classified as having Limited Function with a management recommendation of "No Management Required". This tributary originates as a roadside ditch at River Road and runs within an old ditch down toward the Rideau River with no direct channel connection.

TABLE 4: CLASSIFICATION SUMMARY

Feature and Segment	STEP 1		STEP 2	STEP 3	STEP 4	Results per Segment	Management Recommendation Based on Guidance Document	Overall Management Recommendation Based on NEA, 2007
	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat			
TRIBUTARY 12-1								
RID001-01	Contributing Function: Ephemeral	Chain link fence crossing onto residential property downstream, agricultural field	Limited Function: Agricultural, tilled	Contributing Function: Mainly for transport of allochthonous materials to downstream fish bearing reaches	Limited Function: No terrestrial habitat present	No Management Required: Limited Functions	**NO MANAGEMENT REQUIRED**	**NO MANAGEMENT REQUIRED**
RID001-02	Recharge Function: Standing Water	Agricultural field	Limited Function: Agricultural, tilled	Contributing Function: Mainly for transport of allochthonous materials to downstream fish bearing reaches	Limited Function: No terrestrial habitat present	No Management Required: Limited Functions		
RID001-03	Recharge Function: Standing Water	Agricultural field	Limited Function: Agricultural, tilled	Contributing Function: Mainly for transport of allochthonous materials to downstream fish bearing reaches	Limited Function: No terrestrial habitat present	No Management Required: Limited Functions		
RID001-04	Recharge Function: Standing Water	Agricultural field	Limited Function: Agricultural, tilled	Contributing Function: Mainly for transport of allochthonous materials to downstream fish bearing reaches	Limited Function: No terrestrial habitat present	No Management Required: Limited Functions		
TRIBUTARY 12-2								
RID002-01	Contributing Function: Ephemeral	N/A	Valued: Meadow/ Scrubland	Limited Function: No fish habitat present due to lack of connection to river.	Limited Function: No terrestrial habitat present	No Management Required: Limited Functions	**NO MANAGEMENT REQUIRED**	**NO MANAGEMENT REQUIRED**
RID002-02	Recharge Function: Standing Water	N/A	Valued: Meadow/ Scrubland	Limited Function: No fish habitat present due to lack of connection to river.	Limited Function: No terrestrial habitat present	No Management Required: Limited Functions		

RIVERSIDE SOUTH DEVELOPMENT CORPORATION

Phase 12
Proposed Residential Development

Figure 3:
Management Recommendations

Legend

- Boundary of Study Area
- Development Area
- Waterbodies (MNR LIO)

Management Recomendations

- No Management Required

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MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

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

N W E S

0 25 50 100 150 200
Meters

FILE LOCATION: FILE LOCATION:
Path: F:\ArcGIS_Working\149919\MXD\Headwaters\Ph12_Fig3_Managment.mxd

PROJECT: 14-9919 STATUS: DRAFT DATE: 5/17/2016

5.0 Management Recommendations

In accordance with the Guidance Document, the following management recommendations are available for HDFs classified as Limited Function:

No Management Required (Limited Functions) (***Tributary 12-1 and Tributary 12-2***)

- *This feature has been field verified to confirm that no functions associated with HDFs are present on the ground and there is no connection downstream.*

6.0 Conclusion

As a result of the HDF Assessment completed at the property at 708 River Road, management recommendations were determined based on classification of HDFs within the Study Area. The results are detailed in **Table 4** and **Figure 3**. Since both tributaries have been classified as having Limited Function with No Management Required, these features should not impede development of this property.

Appendix A

Site Photos

RIVERSIDE SOUTH DEVELOPMENT CORPORATION

Phase 12
Proposed Residential Development

Figure A:
Headwater Photo Locations

Legend

- Boundary of Study Area
- Headwater Drainage Feature
- Waterbodies (MNR LIO)

Field Observations

- Photo Location

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

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

N W E S

0 25 50 100 150 200
Meters

FILE LOCATION: FILE LOCATION:
Path: F:\ArcGIS_Working\149919\MXD\Headwaters\Ph12_FigA_Photos.mxd

PROJECT: 14-9919 STATUS: DRAFT DATE: 5/17/2016

TRIBUTARY 12-1	
Photo 1 April 28, 2015 Notes: Tributary 12-1 Site Visit #1 RID001-01 Looking upstream	
Photo 2 April 28, 2015 Notes: Tributary 12-1 Site Visit #1 RID001-01 Looking downstream where stream enters residential property	

Photo 3 April 28, 2015 Notes: Tributary 12-1 Site Visit #1 RID001-02 Looking upstream	
Photo 4 April 28, 2015 Notes: Tributary 12-1 Site Visit #1 RID001-02 Looking downstream	

Photo 5 July 28, 2015 Notes: Tributary 12-1 Site Visit #2 RID001-01/RID001-02 Looking downstream showing entire feature dry and tilled	
Photo 6 April 28, 2015 Notes: Tributary 12-1 Site Visit #1 RID001-03 Looking upstream at pond area	

Photo 7 April 28, 2015 Notes: Tributary 12-1 Site Visit #1 RID001-03 Looking downstream at pond area	
Photo 8 April 28, 2015 Notes: Tributary 12-1 Site Visit #1 RID001-04 Looking upstream	

Photo 9 April 28, 2015 Notes: Tributary 12-1 Site Visit #1 RID001-04 Looking upstream	
Photo 10 April 28, 2015 Notes: Tributary 12-1 Site Visit #1 Rill toward wetland at the river at the upstream end of Tributary 1 (slopes down toward river, likely conveys overflow)	

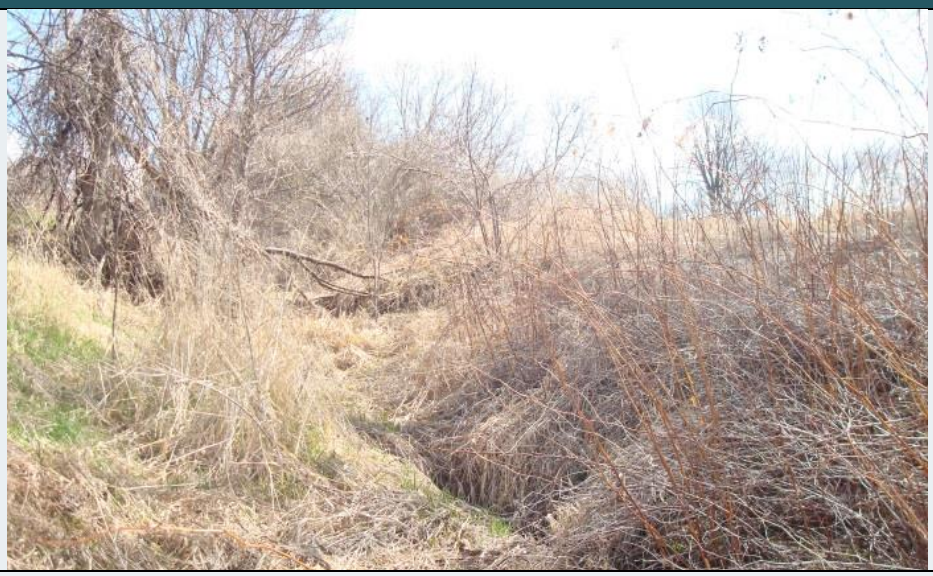
Photo 11 July 28, 2015 Notes: Tributary 12-1 Site Visit #2 RID001-03/RID001-04 Looking across the field showing entire feature is dry and tilled.	
TRIBUTARY 12-2	
Photo 12 April 28, 2015 Notes: Tributary 12-2 Site Visit #1 RID002-01 Looking upstream	

Photo 13 July 28, 2015 Notes: Tributary 12-2 Site Visit #2 RID002-01 Looking upstream	
Photo 14 April 28, 2015 Notes: Tributary 12-2 Site Visit #1 RID002-01 Looking downstream	
Photo 15 July 28, 2015 Notes: Tributary 12-2 Site Visit #2 RID002-01 Looking downstream	

Photo 16 April 28, 2015 Notes: Tributary 12-2 Site Visit #1 RID002-02 Looking upstream	
Photo 17 July 28, 2015 Notes: Tributary 12-2 Site Visit #2 RID002-02 Looking upstream	
Photo 18 April 28, 2015 Notes: Tributary 12-2 Site Visit #1 RID002-02 Looking downstream	

Photo 19 July 28, 2015 Notes: Tributary 12-2 Site Visit #2 RID002-02 Looking downstream	

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http://nhic.mnr.gov.on.ca/. Accessed July 2015. Ontario Ministry of Natural Resources and Forestry. Natural Heritage Information Centre Database.

Significant Wildlife Habitat Ecoregion 6E Criterion Schedule. 41pp. Ontario Minitry of Natural Resources and Forestry, 2012.

Lower Rideau Subwatershed Report. Rideau Valley Conservation Authority, 2012.

Appendix D

Site Photos

Ecological Land Classification Photos	
Photo 1 September 30, 2014 Notes: Annual Row Crops (OAGM1)	
Photo 2 October 1, 2014 Notes: Fresh – Moist Forb Meadow (MEFM4)	

Photo 3 October 2, 2014 Notes: Dry – Fresh Graminoid Meadow (MEGM3)	
Photo 4 October 1, 2014 Notes: Reed Canary Grass Graminoid Meadow (MEGM3-8)	

Photo 5 September 30, 2014 Notes: Fresh – Moist Graminoid Meadow (MEGM4)	
Photo 6 September 30, 2014 Notes: Open Graminoid Meadow (MEGM4-1)	

Photo 7 October 2, 2014 Notes: Dry – Fresh Oak Tallgrass Deciduous Woodland (WODM)	
Photo 8 October 2, 2014 Notes: Dry – Fresh White Cedar Coniferous Forest (FOCM2-2)	

Photo 9 October 2, 2014 Notes: Dry – Fresh White Cedar Mixed Forest (FOMM4)	
Photo 10 October 1, 2014 Notes: Dry – Fresh Sugar Maple Deciduous Forest (FODM5)	

Photo 11 October 1, 2014 Notes: Fresh – Moist Lowland Deciduous Forest (FODM7)	
Photo 12 October 1, 2014 Notes: Fresh – Moist Green Ash-Hardwood Lowland Deciduous Forest (FODM7-2)	

Photo 13 October 1, 2014 Notes: Fresh – Moist Willow Lowland Deciduous Forest (FODM7-3)	
Photo 14 October 2, 2014 Notes: Deciduous Thicket (THD)	

Photo 15 October 2, 2014 Notes: Fencerow (TAGM5)	

Appendix E

Vegetation Inventory

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Scientific Name	Common Name	Srank	Coefficient Conservation	Coefficient Wetness
Acer negundo	Manitoba Maple	S5	0	-2
Acer rubrum	Red Maple	S5	4	0
Acer saccharinum	Silver Maple	S5	5	-3
Acer x freemanii	Freeman's Maple	SNA	---	---
Achillea millefolium	Common Yarrow	SE	---	3
Ambrosia artemisiifolia	Annual Ragweed	S5	0	3
Arctium sp	Burdock Species	---	---	---
Asarum canadense	Canada Wild-ginger	S5	6	5
Asclepias sp	Milkweed Species	---	---	---
Asclepias syriaca	Common Milkweed	S5	0	5
Betula papyrifera	Paper Birch	S5	2	2
Carex sp	Sedge Species	---	---	---
Cirsium arvense	Canada Thistle	SNA	---	3
Dactylis glomerata	Orchard Grass	SNA	---	3
Daucus carota	Wild Carrot	SNA	---	5
Dryopteris sp	Wood Fern Species	---	---	---
Equisetum sp	Horsetail Species	---	---	---
Fraxinus pennsylvanica	Green Ash	S4	3	-3
Grass sp	Grass Species	---	---	---
Juglans cinerea	Butternut	S3?	6	2
Juglans nigra	Black Walnut	S4	5	3
Juniperus communis	Ground Juniper	S5	4	3
Linaria vulgaris	Butter-and-eggs	SNA	---	5
Lonicera sp	Honeysuckle Species	---	---	---
Lysimachia nummularia	Creeping Jennie	SNA	---	-4
Moss sp	Moss Species	---	---	---
Onoclea sensibilis	Sensitive Fern	S5	4	-3
Parthenocissus quinquefolia	Virginia Creeper	S4?	6	1
Phalaris arundinacea	Reed Canary Grass	S5	0	-4
Phleum pratense	Common Timothy	SNA	---	3
Pinus sylvestris	Scotch Pine	SNA	---	5
Poa pratensis ssp. *pratensis*	Kentucky Bluegrass	S5	0	1
Populus balsamifera	Balsam Poplar	S5	4	-3
Quercus macrocarpa	Bur Oak	S5	5	1
Quercus rubra	Northern Red Oak	S5	6	3

Scientific Name	Common Name	Srank	Coefficient Conservation	Coefficient Wetness
Rhamnus cathartica	Common Buckthorn	SNA	---	3
Rhus hirta	Staghorn Sumac	S5	1	5
Ribes sp	Currant Species	---	---	---
Sagittaria latifolia	Broad-leaved Arrowhead	S5	4	-5
Salix fragilis	Crack Willow	S4?	---	-1
Salix sp	Willow Species	---	---	---
Salix x fragilis	(Salix alba X Salix euxina)	SNA	---	---
Solidago sp	Goldenrod Species	---	---	---
Sparganium sp	Burreed Species	---	---	---
Symphyotrichum novae-angliae	New England Aster	S5	2	-3
Symphyotrichum puniceum var. *puniceum*	Swamp Aster	S5	6	-5
Symphyotrichum sp	Aster Species	---	---	---
Taraxacum officinale	Common Dandelion	SNA	---	3
Thelypteris palustris	Eastern Marsh Fern	S5	5	-4
Thuja occidentalis	Eastern White Cedar	S5	4	-3
Tilia americana	American Basswood	S5	4	3
Trifolium sp	Clover Species	---	---	---
Typha angustifolia	Narrow-leaved Cattail	SNA	3	-5
Ulmus americana	American Elm	S5	3	-2
Urtica sp	Nettle Species	---	---	---
Vicia sp	Vetch Species	---	---	---
Vitis sp	Grape Species	---	---	---

Appendix F

Species Screening Table

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

SCIENTFIC NAME	COMMON NAME	GENERAL HABITAT ACCORDING TO THE MNRF SIGNIFICANT WILDLIFE HABITAT TECHNICAL GUIDE	CONSERVATION STATUS			SOURCE	POTENTIAL FOR HABITAT WITHIN STUDY AREA	RATIONALE	DEVELOPMENT IMPLICATIONS & IMPACTS
			Federal (*SARA*)	Provincial (*ESA, 2007*)	S-Rank				
SPECIES OF CONSERVATION CONCERN									
BIRDS									
Chlidonias niger	Black Tern	Wetlands, coastal or inland marshes; large cattail marshes, marshy edges of rivers, lakes or ponds, wet open fens, wet meadows; returns to the same area to nest each year in loose colonies. Must have shallow water and areas of open water near nests and required marshes >20 ha in size.	---	SC	S3B	MNRF	No	There are no wetlands within or adjacent to the Study Area large enough to support this habitat. The only areas of marsh within the site are along the Rideau River and are too small to support suitable habitat for this species.	No- species and/ or habitat not affected
Contopus virens	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	Although there are woodlands located within the Study Area, they are small and total only 3.37 ha of non-contiguous woodland. Therefore, the woodland habitat is would not be large enough to support forest breeding birds which require more expansive tracts of forest.	No- species and/ or habitat not affected
Ammodramus savannarum	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 hayfield, there is some suitable habitat present, but not enough to meet the requirements for this species. Further, this species prefers well drained grassland, and areas within the hayfields hold water in the spring.	No- species and/ or habitat not affected
Falco peregrinus	Peregrine Falcon	Rock cliffs, crags, especially situated near water; tall buildings in urban centres; threatened by chemical contamination; reintroduction efforts have been attempted in numerous locations throughout Ontario.	THR	SC	S2S3B, ZN	MNRF	No	There are no rock cliffs, or tall buildings located within the Study Area. Further, this area is currently an agricultural area whereas this species prefers urban centres.	No- species and/ or habitat not affected
Asio flammeus	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	The Study Area does not contain any tracts of meadow or grassland large enough to support habitat for this species.	No- species and/ or habitat not affected
Hylocichla mustelina	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 the woodlands within the Study Area are small non-contiguous, this type of habitat is not present.	No- species and/ or habitat not affected
Coturnicops noveboracensis	Yellow Rail	Large, freshwater or brackish grass and sedge marshes with dense vegetation including bulrushes, horsetails, and grasses.	SC	SC	S4B	MNRF	No	No large areas of marsh habitat are present within the Study Area. The only marsh areas are located along the banks of the Rideau River and are small in size. Further, this area is not proposed for development.	No- species and/ or habitat not affected

SCIENTFIC NAME	COMMON NAME	GENERAL HABITAT ACCORDING TO THE MNRF SIGNIFICANT WILDLIFE HABITAT TECHNICAL GUIDE	CONSERVATION STATUS			SOURCE	POTENTIAL FOR HABITAT WITHIN STUDY AREA	RATIONALE	DEVELOPMENT IMPLICATIONS & IMPACTS
			Federal (*SARA*)	Provincial (*ESA, 2007*)	S-Rank				
HERPETOZOA									
Lampropeltis triangulum	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	---	S3	MNRF, ON	Yes	No potential snake hibernacula were identified through ELC surveys or other field work in 2015. Although this species may occur within the area, there are no specific features to support significant wildlife habitat for this species within the Study Area.	No- species and/ or habitat not affected
Sternotherus odoratus	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	No	The Rideau River is located along the eastern border of the Study Area; however, there is no direct connection to watercourses within the Study Area and no development is proposed within the floodplain of the river.	No- species and/ or habitat not affected
Thamnophis sauritus septentrionalis	Eastern Ribbonsnake	Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows, grassy marshes or sphagnum bogs; borders of ponds, lakes or streams; hibernates in groups.	SC	SC	S3	MNRF	No	There are no shallow permanent waters within the Study Area. The Study Area is located on the Rideau River, which is a large, flowing, water body. Further, the floodplain of the Rideau River is not proposed for development.	No- species and/ or habitat not affected
Graptemys geographica	Northern Map Turtle	Large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites; may nest at some distance from water; home ranges 30 -70 ha and require aquatic corridors for movement.	SC	SC	S3	MNRF, ON	No	This species may be found along the banks of the Rideau River. Since the floodplain of the river is not proposed for development, no impacts to this species are anticipated.	No- species and/ or habitat not affected
Chelydra serpentina	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	Mosquito Creek and its valleylands may provide suitable habitat for this species early in the year, however, as there will be at least a 30 m setback from Mosquito Creek and the valleylands will not be encroached on, this species should not be affected by the proposed development.	No- species and/ or habitat not affected
Pseudacris triseriata 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	Yes	There are drainage ditches with meadow located within the Study Area and a small area of unevaluated wetland to the south of the Study Area.	Yes- Studies to confirm if this species is present.
LEPIDOPTERA									
Danaus plexippus	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 (majority of the Study Area is hayfield), suitable habitat for this species is not present. Further, since this site is not within 5 km of Lake	No- species and/ or habitat not affected

SCIENTFIC NAME	COMMON NAME	GENERAL HABITAT ACCORDING TO THE MNRF SIGNIFICANT WILDLIFE HABITAT TECHNICAL GUIDE	CONSERVATION STATUS			SOURCE	POTENTIAL FOR HABITAT WITHIN STUDY AREA	RATIONALE	DEVELOPMENT IMPLICATIONS & IMPACTS
			Federal (*SARA*)	Provincial (*ESA, 2007*)	S-Rank				
								Ontario, it cannot be considered as significant wildlife habitat for migratory butterflies.	
ODONATA									
Stylurus notatus	Elusive Clubtail	Large rivers and large lakes with sandy bottoms, sometimes also with silt and gravel.	---	---	S2	NHIC	No	Although the Study Area is located on the Rideau River, there will be at least a 30 m setback from from the river and the valleylands will not be encroached on. Therefore this species should not be affected by the proposed development.	No- species and/ or habitat not affected
SPECIES AT RISK									
VASCULAR PLANTS									
Juglans cinerea	Butternut	Mixed deciduous forests.	END	END	S3?	MNRF	Yes	Butternut trees may be found within woodlands in the Study Area.	Yes- Studies to confirm if this species is present.
Platanthera leucophaea	Eastern Prairie Fringed Orchid	Fens, wet meadows, marshes and prairies.	END	END	S2	MNRF	Yes	There are no fens, marshes, or prairies located within the Study Area. This species can also be found in roadside ditches and meadows.	Yes- Studies to confirm if this species is present.
BIRDS									
Riparia riparia	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 valleylands located within the Study Area adjacent to the Rideau River; however the banks of the valley are stable and well vegetated. Since this species requires area of loose, eroding material for nesting, suitable habitat is not present on site.	No- species and/ or habitat not affected
Hirundo rustica	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	No	No barns or structures suitable for Barn Swallow nesting identified within 300 m of the site.	No- species and/ or habitat not affected
Dolichonyx oryzivorus	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	Yes	There are no expansive grasslands >30 ha within the Study Area. However, there are hayfields and meadow within the Study Area totalling 9.46 ha which could provide nesting habitat for this species.	Yes- Studies to confirm if this species is present.

SCIENTFIC NAME	COMMON NAME	GENERAL HABITAT ACCORDING TO THE MNRF SIGNIFICANT WILDLIFE HABITAT TECHNICAL GUIDE	CONSERVATION STATUS			SOURCE	POTENTIAL FOR HABITAT WITHIN STUDY AREA	RATIONALE	DEVELOPMENT IMPLICATIONS & IMPACTS
			Federal (*SARA*)	Provincial (*ESA, 2007*)	S-Rank				
Chaetura pelagica	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.	No- species and/ or habitat not affected
Sturnella magna	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	Yes	There are no expansive grasslands >30 ha within the Study Area. However, there are hayfields and meadow within the Study Area totalling 9.46 ha which could provide nesting habitat for this species.	Yes- Studies to confirm if this species is present.
Ixobrychus exilis	Least Bittern	Deep marshes, swamps, bogs; marshy borders of lakes, ponds, streams, ditches; dense emergent vegetation of cattail, bulrush, sedge; nests in cattails; intolerant of loss of habitat and human disturbance.	THR	THR	S4B	MNRF	No	There are only small areas of marsh located along the Rideau River and therefore this habitat would be too small for this species. Further, the flood plain of the Rideau River is not proposed for development and marsh areas will be protected.	No- species and/ or habitat not affected
Lanius ludovicianus	Loggerhead Shrike	Grazed pasture, marginal farmland with scattered hawthorn shrubs, hedgerows; fence posts, wires and associated low-lying wetland; located on core areas of limestone plain adjacent to the Canadian Shield. Requires at least 25 ha of suitable habitat.	END	END	S2B, SZN	MNRF	No	There are no areas of grazed pasture, or low-lying wetland to provide suitable habitat for this species. The Study Area is primarily agricultural (hayfield) with deciduous hedgerows.	No- species and/ or habitat not affected
Caprimulgus vociferus	Whip-poor-will	Dry, open deciduous woodlands of small to medium trees; oak or beech with lots of clearings and shaded leaf litter; wooded edges, forest clearing with little herbaceous growth; pine plantations; associated with >100 ha forests.	---	THR	S4B	MNRF	No	As this species is associated with large deciduous woodlands >100 ha in size, suitable habitat for this species would not be found within the Study Area.	No- species and/ or habitat not likely affected, but species surveys will be conducted at the request of the City of Ottawa.
MAMMALS									
Myotis lucifugus	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 woodlands located within the Study Area, however Distinctive Trees within the site were sparse and few snag trees were observed. No bats were observed during amphibian or nightjar surveys within the Study Area.	No- species and/ or habitat not affected
HERPETOZOA									
Emydoidea blandingii	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	Yes	There are a couple of small marsh areas along the banks of the Rideau River within the Study Area. The Rideau River is large, flowing, water body and does not have an abundance of aquatic vegetation or good areas for basking. However, there is a back bay area within the Study Area which may provide suitable habitat for this species. The floodplain of the Rideau River will be	Yes- Studies to confirm if this species is present.

SCIENTFIC NAME	COMMON NAME	GENERAL HABITAT ACCORDING TO THE MNRF SIGNIFICANT WILDLIFE HABITAT TECHNICAL GUIDE	CONSERVATION STATUS			SOURCE	POTENTIAL FOR HABITAT WITHIN STUDY AREA	RATIONALE	DEVELOPMENT IMPLICATIONS & IMPACTS
			Federal (*SARA*)	Provincial (*ESA, 2007*)	S-Rank				
								protected and no development is proposed in this area, however, the Study Area may still be within Blanding's Turtle Category 2 or 3 habitat if presence is confirmed along the Rideau River.	