

Environmental Impact Statement for Barrhaven Conservancy Phase I

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1.0 INTRODUCTION

This report is an Environmental Impact Statement (EIS) written by Kilgour & Associates Ltd. (KAL) on behalf of Barrhaven Conservancy East Inc. (BCE) in support of their proposed development of Phase I of their property located between Strandherd Road and the Jock River along Borrisokane Road in Ottawa. The Phase I Barrhaven Conservancy development will be located on land parcels at 3285 Borrisokane Road (herein the site). There are several triggers for this EIS including: 1) the presence of potential habitat for species at risk (SAR) including Blanding's Turtle (*Emydoidea blandingii*), Barn Swallow (*Hirundo rustica*), and Bobolink (*Dolichonyx oryzivorus*), and 2) the potential for fish and fish habitat within the drains crossing the site.

The site is composed almost entirely of active agricultural areas partitioned by tree hedgerows. This EIS provides information on existing conditions at the site and on adjacent lands. It also includes a tree inventory for the site, providing a Tree Consecration Report (TCR), as a component of study. The presence of the drains on the property, which connect to Jock River to the south, were fully described and evaluated through a Headwater Drainage Features Assessment (HDFA – KAL, 2017) to assess aquatic habitat characteristics and fish communities.

2.0 PROPERTY INFORMATION

The Phase I Barrhaven Conservancy site covers approximately 8.69 ha of the 3285 Borrisokane Road property parcel (Nepean PIN: 045950057). This parcel occurs to the east of Borrisokane between Strandherd Road and the Jock River. The site currently occurs within the Developmental Reserve Zone (DR).

The Jock River is located about 175 m to the south of the site. Currently, a small portion of the site is within the 100-year floodplain for the Jock River (Figure 1); however, this floodplain zone is under review and is anticipated to be reduced by way of a City of Ottawa Official Plan Amendment.

The property has historically been used for agricultural activities as indicated in geoOttawa (Ottawa, 2017a) aerial photography from 1976, and still is used for this purpose. The Fraser-Clarke Drain municipal drain crosses the site. A stormwater management pond is located approximately 50 m to the east of the site, and another drain, the Burnett Drain, is located > 350 m beyond the eastern end of the site.

3.0 SITE AND THE NATURAL ENVIRONMENT

3.1 Methodology and Area of Detailed Assessment

Colour digital aerial photographs from geoOttawa (Ottawa, 2017a) and Google Earth were used to initially identify natural environment features on the broader site through a desktop review. Ontario Base Map (OBM), geoOttawa, and Ottawa OP Schedule L layers (Ottawa, 2007) were used to demarcate surface water, potential wetland areas, and other natural heritage system features and were overlaid on the aerial photographs to aid interpretation.

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

- Natural Heritage Information Centre (NHIC, 2017);
- Rideau Valley Conservation Authority (RVCA, 2017);
- Species at Risk Public Registry (Canada, 2017);
- Ontario Species at Risk List (MNRF, 2017);
- Breeding Bird Atlas of Ontario (OBBA) (Cadman *et al.* 2007);
- Bat Conservation International species profiles (BCI, 2017); and,
- Reptiles and Amphibians of Ontario (Ontario Nature, 2017).

During numerous field visits, KAL biologists surveyed for potential SAR presence and habitat for SAR to occur on site, and identified and described other natural heritage features.

3.2 Landform, Soils and Geology

The property is located within the Ottawa Valley Clay Plains which are composed of areas of Champlain Sea deposits, glacial deposits and drumlins, glaciofluvial deposits, shallow and exposed bedrock, and peat and muck from wetlands (Schut and Wilson, 1987). On a more local scale, the property occurs within the Piperville, North Gower and Dalhousie associations.

The Piperville association is a group of soils developed in slightly acid to neutral, moderately coarse to medium-textured, marine, estuarine, and fluvial materials, and are composed of Gleyed Melanic Brunisols, Orthic Humic Gleysols, and Rego Gleysols (Schut and Wilson, 1987). These soils are dominantly poorly drained Orthic Humic Gleysols found on level to very gently sloping topography (between 0% to 2%).

The Dalhousie association consists of soils developed in fine-textured, modified marine materials with soils profiles that include Gleyed Orthic Melanic Brunisols, Orthic Humic Gleysols, and Rego Gleysols (Schut and Wilson, 1987). These soils are dominantly poorly drained Orthic Humic Gleysols found on level to very gently sloping topography (between 0% and 2%).

The North Gower association is made up of soils developed in moderately fine-textured, modified marine parent materials, and includes Humic Gleysols, Rego Gleysols, and Gleyed Gray Brown Luvisols soil profiles (Schut and Wilson, 1987). These soils are poorly drained Orthic Humic Gleysols found on level to very gently sloping topography (between 0% and 2%).

The property is mostly flat with a few small lower lying areas throughout, though it generally slopes gently near the Fraser-Clarke Drain to allow sheet flow runoff.

There are no rocky outcrops on the site and no Earth Science Areas or Natural and Scientific Interest as designated by the Ministry of Natural Resources identified in OP Schedule K (Ottawa, 2014).

3.3 Surface Water, Groundwater and Fish Habitat

The site and adjacent lands lie within the Jock River watershed in the Jock River-Barrhaven Catchment subwatershed (SWS) (RVCA, 2010). The Jock River flows eastward to the Rideau River approximately 175 m (at its closest point) south of the property. One main Municipal drain occurs on the property that connects to the Jock River: the Fraser-Clarke Drain. There is also an agricultural drain on the site.

The Barrhaven Catchment provides fish habitat to 40 fish species (RVCA, 2010). Although, very few of these species are likely to be found within the drains on the property, and only one (Bridle Shiner [*Notropis bifrenatus*]) is designated as SAR in Ontario (Ontario, 2017).

No Provincially Significant Wetlands or undesignated wetlands were indicated on the site by the City, RVCA, or MNRF mapping. A portion of the site occurs within the 100-year floodplain boundary for the Jock River, yet it remained mostly dry this year, despite Ottawa experiencing high amounts of rainfall.

Headwater drainage feature assessment (HDFA) of the site was completed by KAL in 2017 (KAL, 2017). The HDFA followed the Ontario Stream Assessment Protocol (OSAP) methodologies for descriptions of flow conditions, riparian vegetation and site features that are important components of habitat (headwater sampling protocol OSAP S4.M10), and included an electrofishing survey to describe fish and fish habitat (OSAP S4.M10). OSAP investigations of HDFs were conducted by KAL biologists on April 7, electrofishing surveys were conducted on May 4, and a final survey was performed on July 5, 2017.

The HDFA identified two surface water features on the site. Of these, one feature was classified as a small agricultural drain. These features contained flowing water during the spring and early summer but were held mostly standing water in July.

Fraser-Clarke Drain

The section of the Municipal Fraser-Clarke Drain that flows eastwards along the southern border of the property is approximately 570 m. The Fraser-Clarke Drain confluent with the Jock River about 450 m further downstream. Both banks of the reaches flow through cropped land. Instream vegetation consists of grasses and cattails.

The substrate consisted of silt and clay. Woody debris and submergent vegetation are present in patches, especially within the hedgerow in the downstream section of the reach. The reach was flooded in April with slow flow. In May and July, the reach was characterized by interstitial flow. Eleven fish were observed in this reach; eight Common Shiners (*Luxilus cornutus*), two Banded Killifish (*Fundulus diaphanus*), and one Creek Chub (*Semotilus atromaculatus*). American Toads (*Anaxyrus americanus*), Gray Treefrogs (*Hyla versicolor*), Green Frogs (*Rana clamitans*) and Northern Leopard Frogs (*Lithobates pipiens*), and a Snapping Turtle (*Chelydra serpentina*) was observed.

Agricultural Drain

A 230 m agricultural drain runs south-east through cropped land on the near the eastern border of the property before its confluence with the Fraser-Clarke Drain. Instream vegetation consists of grasses and both banks are dominated by grasses with the occasional shrub and tree.

The substrate there consists of silt and clay. Woody debris is somewhat abundant while submergent vegetation is absent. The reach was fast flowing in April, but had only low levels of standing water in May and July. No fish, frogs, or turtles were observed in this reach.

3.4 Vegetation and Land Cover

The Barrhaven Catchment SWS land cover is primarily composed of settlements and crop and pasture lands (38% and 22%, respectively) (RVCA 2010). Roads comprise 13% of the area with woodlands (10%), sand and gravel (9%), grassland (5%), water (2%), and wetlands (1%), accounting for the remainder of the area.

The site itself is current composed primarily of agricultural lands. Air photos from 1976 indicate the site was previously used for agricultural activities with narrow bands of hedgerows present between fields in some areas (Ottawa, 2017a). The site appears to have the same composition as today except that the hedgerows now contain more trees than in 1976. These hedgerows are primarily composed of deciduous trees species, including: Butternut (*Juglans cinerea*), Manitoba Maple (*Acer negundo*), Crack Willow (*Salix fragilis*), Green Ash (*Fraxinus pennsylvanica*), Bur Oak (*Quercus macrocarpa*), White Elm (*Ulmus laevis*), and Silver Maple (*Acer saccharinum*).

3.4.1 Site Land Cover

A vegetation community assessment and ELC survey was completed at the site on June 27, 2017. The site consists of cultivated cropland bordered by narrow hedgerows containing drainage channels. Many of the trees within the hedgerows on site were apparent in the 1976 air photos (geoOttawa, 2017), and larger trees are still abundant within these hedgerows today. Site land cover is described here through ELC (Lee et al., 1998).

The most abundant habitat type on site was open agriculture (OAG) (Figure 1). Observed crops on site were primarily corn. The majority of these areas were dry, but a few lowland areas held water during spring freshet and immediately after precipitation events.

The Fraser-Clarke Drain to the east contains small patches of Ash Mineral Deciduous Swamp (SWD2) and Willow Mineral Deciduous Thicket (SWT2) (Figure 1). The Ash Mineral Deciduous Swamp patches are composed of mainly Green Ash and Manitoba Maple, with subordinate species of Bur Oak, Crack Willow, and Silver Maple. Green Ash, Bur Oak, and Silver Maple were the largest trees observed and were between 70 and 105 cm DBH. Many of the large trees showed dieback and there were many large Green Ash snags present. The SWT2 patches contained willow shrubs and Manitoba Maple along with grass and forb species. This area also contained a few Butternut saplings (Figure 1).

3.4.2 Site Trees

The tree inventory survey was performed on June 27, 2017, and all trees on site were identified to species and diameter at breast height (DBH) was recorded (Table 1; Figure 1). Habitat classification based on ELC categories was completed on the property (Section 3.4.1) and locations of large potential specimen trees were recorded.

Tree ages were not specifically determined, however, the 1976 geoOttawa air photo shows treed hedgerows and tree patches. However, some of the trees on site were not visible in the 1976 air photo and were less than 40 years old. A few larger and older trees, however, that were part of the hedgerows were also identified on the site. The trees on site generally appeared to be healthy except as otherwise noted within Table 1.

Table 1. Results of tree inventory surveys of Barrhaven Conservancy Phase I in 2017

Tree Number	Common Name	Quantity	Diameter at breast height	Comments
24	Basswood	1 (MS)	45 - 50	multi-stem
24	Green Ash	1	73	much dieback
25	Butternut	4	<10	saplings
26	Butternut	1	<10	sapling
27	Butternut	1	<10	sapling
28	Green Ash	~60	10 - 50	dieback, many snags @ 50 - 70 cm
29	Butternut	1	<10	sapling
30	Green Ash	1	~75	much dieback
31	Bur Oak	1*	~70	healthy
32	Green Ash	1 (DS)*	55 - 65	double-stem
33	Green Ash	1	~65	mostly dead
34	Green Ash	1	79	mostly dead
35	Silver Maple	1*	105	healthy with cavities

* = Notable tree

Ecological Significance of Site Trees and Site Woodlands

Only two trees on site were flagged as being both large (i.e. > 50 cm DBH) and in mostly good health. These trees include a Silver Maple and a Bur Oak. There were also many large Green Ash on the site but most of them showed some signs of dieback suggesting infestation with Emerald Ash Borer (EAB; *Agrilus planipennis*).

Overall, the trees on site are unlikely to provide much wildlife habitat. The linear composition of treed areas on site and lack of diverse foraging habitats make these areas unattractive to most bird and mammal species. There was also a lack of cavity trees on site for potential bat roosting. The primary function of trees on site was to act as windbreaks between cultivated fields and corridors for agricultural and municipal drains.

Four butternut saplings were observed in the cultural thicket and near the Fraser Clarke Drain. These were all marked with white flagging tape and are included in Figure 1.

3.5 Wildlife

Field surveys were completed at the site in 2017 to assess general wildlife and SAR use of the site. These surveys included basking turtle surveys, amphibian calling surveys, and breeding bird surveys (Figure 1).

3.5.1 Amphibians

Methods

Three rounds of amphibian surveys were performed on the site. The surveys followed the protocols set forth by the Marsh Monitoring Program (Bird Studies Canada, 2003). Three surveys were completed to identify early, mid, and, late season breeding amphibian species in April, May, and June; respectfully. Survey were completed on nights of calm weather with temperatures above 5°C, 10°C, and 17°C for each of the three respective survey periods. Surveys began a half hour after sunset and finished by midnight with a five-minute recording period at each survey station. Amphibian species were recorded at each point along with estimated distance from observers, abundance code, estimate of individuals, and estimated direction.

Results

Amphibian surveys were performed on April 26, May 24, and June 28, 2017. Two stations were surveyed in wetland and aquatic habitats (Figure 1). Weather characteristics for the surveys are presented in Table 2. No SAR amphibians were observed on site during the field visits.

Table 2. Results of amphibian surveys of Barrhaven Conservancy Phase I in 2017

Date	Temperature (°C)	Weather conditions	Wind speed (km/hr)
26-Apr-17	13	Clear	16 - 19
24-May-17	18	Mostly cloudy	10 - 13
28-Jun-17	15*	Mostly clear	8 - 9

* Temperatures had been >17°C for several consecutive nights prior to the survey

Small numbers of amphibians were observed at both survey stations. Both survey stations were in a combination of cultivated cropland and drains. American Toads were heard at both stations, while Green Frogs and Northern Leopard Frogs were heard at one station. Specifically, frogs were found associated with the municipal drains, as indicated in Section 3.3.1.

3.5.2 Turtles

Methods

Five rounds of turtle surveys were performed on the site in May and June, 2017. Specific basking surveys were completed at two survey stations at the site (Figure 1). Basking surveys followed the protocols detailed in the Blanding's Turtle Survey Protocols (MNRF, 2015). Each drain between survey station was slowly walked from shore while scanning ahead with binoculars. Other features that held water at the time of the surveys were also generally walked to search for turtles there.

Surveys were completed on days with little to no cloud cover and temperatures of at least 10°C, and overcast days with temperatures of at least 15°C. These surveys involved stopping at points along wetland and surface water features and scanning with binoculars. All turtles observed on site were recorded including incidental observation while traveling between survey stations and during other field surveys.

Results

Basking surveys were completed on May 10, 16, and 24, and June 1 and 15, 2017. Weather conditions during field surveys are presented in Table 3. Only Snapping Turtles were observed on the site. No SAR turtles were observed on the site or on adjacent lands during field surveys of the site.

Table 3. Weather conditions during basking turtle surveys at Barrhaven Conservancy Phase I in 2017.

Date	Temperature (°C)	Cloud Cover (%)	Weather Conditions	Wind Speed (km/hr)	Species observed
10-May-17	13	40 – 60	Mostly sunny with some cloud	4 - 9	Snapping Turtle
16-May-17	20	90 – 100	Cloudy	10 - 17	Snapping Turtle
24-May-17	18 - 22	5 – 10	Clear	2 - 12	None
1-Jun-17	14 - 15	60	Mainly Clear	23 - 31	None
15-Jun-17	20 - 22	60 – 80	Clear	5 - 14	None

3.5.3 Birds

Methods

Three rounds of breeding bird surveys were completed on site in 2017. Breeding bird surveys (BBS) followed guidelines from Bird Studies Canada (Bird Studies Canada, 2001). The period for BBS in the Ottawa regions begins on May 24 and ends on July 10, and each BBS round was a minimum of 10 days apart. Typically, only two rounds of BBS are required, but when there is potential for SAR birds to be present the MNRF requests a third round be completed.

The surveys were conducted on calm weather days with no precipitation from one half hour before sunrise until 10:00 am. Surveys were five minutes in duration with a two-minute habituation period preceding the surveys. All birds seen and heard were recorded along with their associated breeding codes, and the estimated distance from the observer.

Results

Three rounds of BBS were completed at the site on June 14 and 27, and July 5, 2017. Breeding bird surveys were completed at two survey stations that covered all habitats on site. These were completed on calm weather days with light wind (less than 3 on the Beaufort scale) and no precipitation.

Overall, 18 bird species were observed on site during the three rounds of surveys (Table 4). One listed species, Barn Swallow (*Hirundo rustica*), is listed as threatened under the *Endangered Species Act* (ESA) (Ontario, 2007) and *Species at Risk Act* (SARA) (Canada, 2002) and was observed around the stormwater

management ponds to the north-east of the site during the BBS. No Barn Swallow nesting however, was found anywhere on site. Barn Swallow nesting appears to be limited to the 416 overpass located > 2 km to the west, and in buildings > 200 m north of the site. The Borrisokane Road Bridge, located approximately 1 km south-west of the property, provides some nesting potential though no Barn Swallows were observed here. Red-winged Blackbirds (*Agelaius phoeniceus*) were the most abundant species on site followed by Song Sparrows (*Melospiza melodia*) and Savannah Sparrows (*Passerculus sandwichensis*).

Most of the birds observed on site were common species and have a high likelihood of breeding on site. Birds classified with a moderate likelihood of breeding are common breeders in the area, but only a limited amount of preferred breeding habitat was observed on site. Birds classified with a low likelihood of breeding may breed in the local area but no preferred breeding habitat was observed on site.

Table 4. Breeding Birds Observed during field surveys at Barrhaven Conservancy Phase I site, in 2017.

Common Name	Scientific Name	Likelihood of Breeding	Common Name	Scientific Name	Likelihood of Breeding
American Crow	<i>Corvus brachyrhynchos</i>	Moderate	Northern Flicker	<i>Colaptes auratus</i>	High
American Goldfinch	<i>Spinus tristis</i>	High	Red-winged Blackbird	<i>Agelaius phoeniceus</i>	High
American Redstart	<i>Setophaga ruticilla</i>	Moderate	Ring-billed Gull	<i>Larus delawarensis</i>	Low
American Robin	<i>Turdus migratorius</i>	High	Savannah Sparrow	<i>Passerculus sandwichensis</i>	High
Black-capped Chickadee	<i>Poecile atricapillus</i>	High	Swamp Sparrow	<i>Melospiza georgiana</i>	High
Chipping Sparrow	<i>Spizella passerina</i>	Moderate	Turkey Vulture	<i>Cathartes aura</i>	Low
Common Yellowthroat	<i>Geothlypis trichas</i>	High	Warbling Vireo	<i>Vireo gilvus</i>	Moderate
Gray Catbird	<i>Dumetella carolinensis</i>	High	White-breasted Nuthatch	<i>Sitta carolinensis</i>	Moderate
Killdeer	<i>Charadrius vociferus</i>	High	Yellow Warbler	<i>Setophaga petechia</i>	High

* Listed as threatened under the ESA (2007).

3.6 Species at Risk Habitat

At this time, no reply to our SAR information request for the property has been received. Our internal background information review, which relies on information previous stated in Section 3.1, and our experience in identification of SAR habitat and natural heritage features, indicated a potential for 16 SAR listed under ESA (Ontario, 2007) and SARA (Canada, 2002) to occur on or in proximity to the property.

These SAR include Bank Swallow (*Riparia riparia*), Barn Swallow, Blanding's Turtle (*Emydoidea blandingii*), Bobolink (*Dolichonyx oryzivorus*), Butternut, Eastern Meadowlark (*Sturnella magna*), Bridle Shiner (*Notropis bifrenatus*), Eastern Musk Turtle (*Sternotherus odoratus*), Eastern Wood-pewee (*Contopus virens*), Monarch (*Danaus plexippus*), Snapping Turtle, Little Brown Myotis (*Myotis lucifugus*), Eastern

Small-footed Myotis (*Myotis leibii*), Northern Long-eared Myotis (*Myotis septentrionalis*), Tri-colored Bat (*Perimyotis subflavus*), and Wood Thrush (*Hylocichla mustelina*).

For full due diligence, Table 5 indicates the habitat requirements of these SAR plus others SAR potentially present within the broader area and whether the property may provide significant habitat. The list also includes additional entries for species under consideration for listing within the next two years.

Table 5. Species-at-risk with the potential to occur to on the Barrhaven Conservancy site in 2017

Species Name	Provincial (ESA) Status	Habitat Requirement	Habitat on Site	Project Concerns Associated with Habitat on Site
Birds				
Bank Swallow (<i>Riparia riparia</i>)	Threatened	Colonial nester; burrows in eroding silt or sand banks, sand pit walls, and other similar habitats	No nesting habitat observed on or adjacent to Site, but may forage in open habitats nearby.	Negligible potential for presence. Not a concern.
Barn Swallow (<i>Hirundo rustica</i>)	Threatened	Species prefers to nest on manmade structures such as bridges, barns, and buildings near open terrestrial and aquatic habitats where it forages.	Borrisokane Road Bridge may provide nesting areas, and the mix of agricultural land and surface water provide suitable forage adjacent to the site.	Barn Swallow presence was limited to the SWMP to the north-east. Occasional foraging runs by birds may cross onto the site from peripheral areas. No site nesting was observed.
Bobolink (<i>Dolichonyx oryzivorus</i>)	Threatened	Periodically mown, dry meadow for nesting. Habitat (meadow) should be > 10 ha, and preferably > 30 ha before bobolink are attracted to the site. Not near tall trees.	No suitable habitat on site. Potential within the neighbouring agricultural fields if allowed to go fallow, though active agricultural areas do not constitute habitat.	Negligible potential for presence. Not a concern.
Eastern Meadowlark (<i>Sturnella magna</i>)	Threatened	Prefers grasslands and pastures >5 ha in area with moderately tall grasses (25 to 50 cm) and abundant litter cover. High proportion of grasses to forbs and shrubs (<35% forbs and shrubs).	No suitable habitat on site. Potential within the neighbouring agricultural fields if allowed to go fallow, though active agricultural areas do not constitute habitat.	Negligible potential for presence. Not a concern.
Eastern Wood-pewee (<i>Contopus virens</i>)	Special Concern	Prefers mature and intermediate-aged deciduous and mixed forest with an open understory. Often nests and forages near open areas and forest edges.	Deciduous forest habitat on site is limited to hedgerows. These areas are unlikely to provide preferable nesting habitat to this species.	Negligible potential for presence. Not a concern.
Wood Thrush (<i>Hylocichla mustelina</i>)	Special Concern	Moist deciduous hardwood or mixed forests with trees >16 m in height, a closed canopy (>70%), moderate sub-canopy and shrub layer, fairly open forest floor, and moist soil.	Deciduous forest habitat on site is limited to hedgerows. These areas are unlikely to provide preferable nesting habitat to this species.	Negligible potential for presence. Not a concern.
Butterflies				
Monarch (<i>Danaus plexippus</i>)	Special Concern*	Caterpillars require Milkweed species and are confined to meadow and open areas where it grows, while adults feed on nectar in a variety of habitats.	Species may use milkweed species associated the edge of the hedgerows on site for nectaring.	The species is not currently protected under the ESA. The agricultural composition of the site is unlikely to provide habitat for Monarchs; therefore, this species is not a concern.
Fish				
Bridle Shiner (<i>Notropis bifrenatus</i>)	Special Concern*	Clear warm waters in stream and occasionally lakes with abundant submerged aquatic vegetation and bottom composed of silt and/or sand.	Likely in the Jock River south of the site and may use drainage channels on site during spring flooding. Was not observed during fish surveys of the site.	The species is not currently protected under the ESA.
Mammals				
Little Brown Myotis (<i>Myotis lucifuga</i>)	Endangered	Widespread, roosting in trees and buildings. Hibernate in caves or abandoned mines.	Although there were large snags and cavity trees on site, the linear composition of the treed areas are unlikely to be attractive as roosting areas. No hibernation habitat.	Negligible potential for presence. Not a concern.
Northern Long-eared Myotis	Endangered	Associated with boreal forests, choosing to roost under loose bark and in the cavities of	No suitable roosting or hibernation habitat was observed on site.	Negligible potential for presence. Not a concern.

Species Name	Provincial (ESA) Status	Habitat Requirement	Habitat on Site	Project Concerns Associated with Habitat on Site
(<i>Myotis septentrionalis</i>)		trees. Hibernates in caves or abandoned mines.		
Eastern Small-footed Myotis (<i>Myotis leibii</i>)	Endangered	Species roosts in a range of habitats including under rocks, rocky outcroppings, buildings, under bridges, caves, mines, and hollow trees. Hibernates in smaller caves subject to air movement.	No suitable roosting or hibernation habitat was observed on site.	Negligible potential for presence. Not a concern.
Tri-colored Bat (<i>Pipistrellus subflavus</i>)	Endangered	Prefers to roost in trees on old forests but sometimes uses buildings. Forage over water courses or open fields with large trees nearby. They never forage in deep woods. Hibernates in caves or abandoned mines.	Although there were large trees on site, the linear composition of the treed areas is unlikely to be attractive as roosting areas. No hibernation habitat.	Negligible potential for presence. Not a concern.
Turtles				
Blanding's Turtle (<i>Emydoidea blandingii</i>)	Threatened	Species prefers shallow water usually in large wetlands or shallow lakes with high abundance of emergent vegetation.	The drains on site do not present suitable habitat for this species, but species may occur on site due to proximity to Jock River.	Low potential for presence. The nearest nesting site was recorded at over 2 km from the site. No turtles were observed within any of the headwater features, but the Jock River does provide potential habitat.
Eastern Musk turtle (<i>Sternotherus odoratus</i>)	Special Concern*	Lakes, Rivers, and ponds with slow-moving water and soft mud bottoms. Often inhabits shallow water.	No overwintering habitat is found on site. Species is likely to be found in Jock River, but rarely travels more than 45 m from water for nesting.	Negligible potential for presence. Not a concern.
Snapping Turtle (<i>Chelydra serpentina</i>)	Special Concern*	Freshwater habitat characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation.	Species may use drainage channels on the site for travel and nesting. Was observed on site in Fraser-Clarke Municipal Drain during surveys.	Species was observed within the Fraser-Clarke Municipal Drain during field surveys. The species is not afforded habitat protection under the ESA.
Vascular Plants				
Butternut (<i>Juglans cinerea</i>)	Endangered	Variable but typically on well-drained soils.	The majority of the site is cultivated land, but suitable habitat may be present along the unnamed drainage channels on the site.	Four saplings were observed on site along the hedgerows. These few trees are too small to constitute archivable trees and can therefore be handled through a site registration process if a BHA finds them to be retainable.

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

■ Species occurring or potentially having habitat on site.

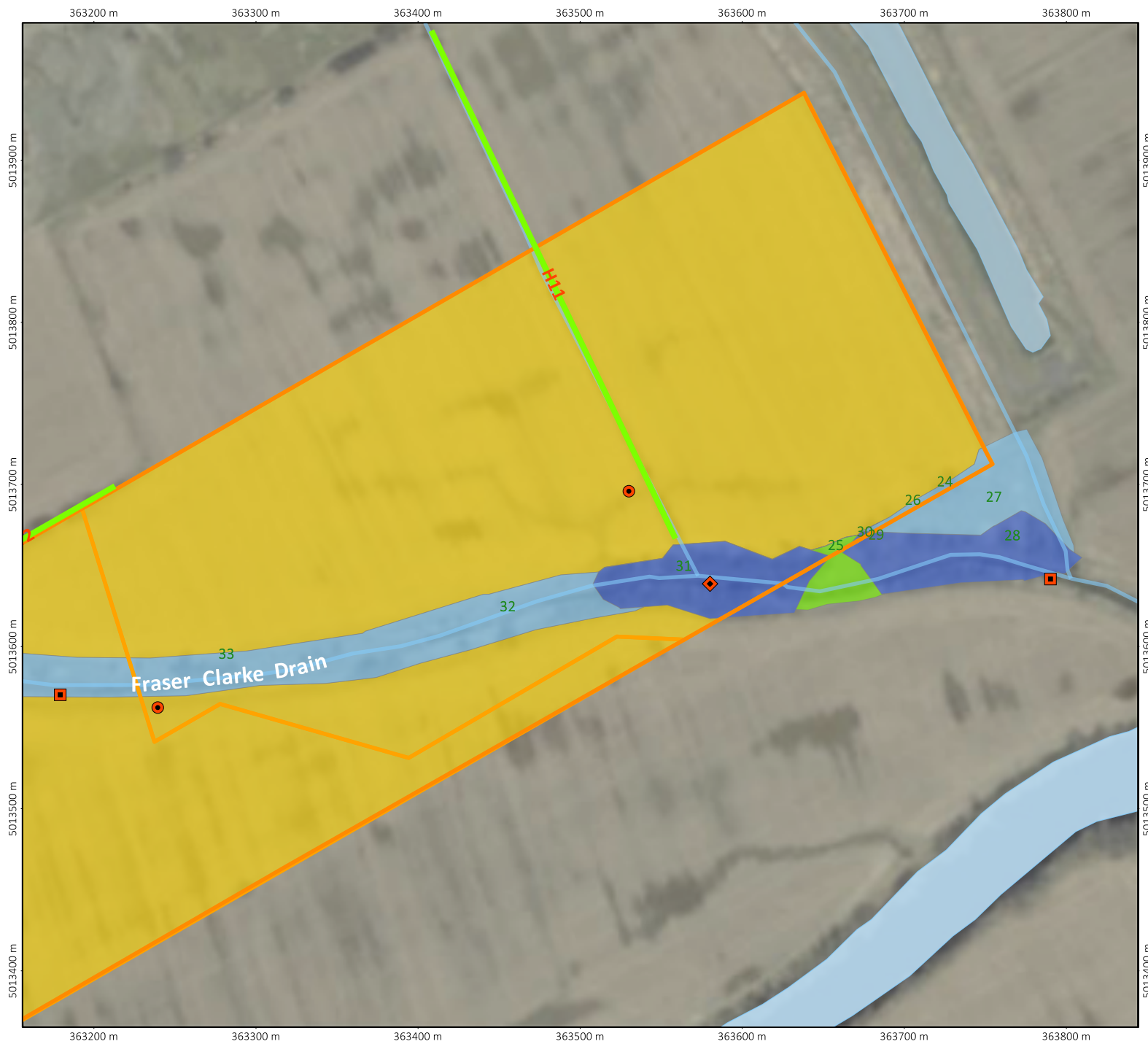


Figure 1: Results of Barrhaven Conservancy ecological land classification, tree survey, and survey station locations.

Legend

Site Boundary

ELC

CUT1

FOD3

Farmyard

MAM2

OAG

SWD2

SWT2

Trees

Tree Number

Hedgerow

Wildlife Surveys

Bird Station

Frog Station

Turtle Station

N

0 100 m

Project: CAIV 626 ELC
Created By: TH
Checked By: AF
MTM Zone 9
(NAD 83)
Printed on: 2017-10-02



3.7 Other Natural Heritage Features

There are no Provincially or Locally Significant Wetlands, “wetlands found in association with Significant Woodlands”, Significant Valleylands, Significant Wildlife Habitats or Life Science Areas of Natural and Scientific Interest on or adjacent to the site (Figure 1). The nearest Provincially Significant Wetland is over 3 km to the northwest and is part of the Stoney Swamp Wetland Complex. Small Significant Woodland patches may exist along the Jock River corridor adjacent to the site, but are > 120 m from the site property line.

4.0 PROJECT DESCRIPTION

The Phase I development will be entirely residential with a mix of single family detached homes, townhomes, and medium density residential, including 0.47 ha of park space and a ~ 65 m wide corridor (channel width plus 30 m riparian buffer on each side) along the Fraser-Clarke Drain (Figure 2). The Barrhaven Conservancy community will be build-out over (likely) eight phases, progressing generally from east to west. Future commercial areas (not part of this EIS) are anticipated to be developed eventually to the north of the residential area along Strandherd Rd., supporting this community. Ground works are expected to begin in Phase 1 in early in 2018 with the first house sale there by the end of that year. Final house construction in Phase 8 is anticipated to be completed by 2028.



5.0 IMPACT ASSESSMENT

5.1 Impacts to Surface Water Features

The Fraser-Clarke Drain will be protected within a corridor maintaining setback distances of 30 m from high water mark to development areas. The remaining small agricultural drain will be removed, though its functionality will be incorporated into the stormwater management plan for the site as per the recommendations of the HDFA. We do not predict any impacts to surface water features during site development.

5.2 Impacts to Trees/ Significant Woodlands

Trees on site are located along the drains and in hedgerows. Trees along the municipal drain will be retained within the 30 m buffer that surrounds these features. The remaining hedgerows, however, will be removed during site development. Riparian forest areas along the Jock River are not predicted to be impacted by the project given the large separation of these features from development areas.

No unique treed habitats or tree species were observed on site. All trees present on site are represented throughout the Ottawa region and in adjacent habitats. Many of the largest trees on site were showing dieback (Green Ash).

Trees within hedgerows on the site outside the municipal drain corridors will be removed during project development to accommodate site grading. A tree planting plan, however, will be created as part of the landscape plan for the area, ensuring a net increase in the number trees on site (the vast majority of the site is currently treeless). Additional mitigation measures to protect retained trees will be implemented on site during project development (as per Section 6.2).

5.3 Impacts to Species at Risk

Three SAR were observed on or adjacent to the site during field surveys in 2017: Barn Swallow, Butternut, and Snapping Turtle. Barn Swallow were only using the stormwater management pond to the north-east of the site as a foraging area and were not observed nesting on site. The MNRF General Habitat Guidelines for Barn Swallow (MNRF, 2015) protects three categories of habitat for the species.

- Category one – nest or nesting colony has low tolerance to alteration.
- Category two – the areas within 5 m of the nest and has a moderate tolerance to alteration.
- Category three – the area between 5 m and 200 m and has the highest tolerance to alteration.

Areas beyond 200 from nesting sites are not protected. The nesting sites for Barn Swallow include the Highway 416 overpass to the west, and various commercial and industrial buildings to the north that are > 200 m from the site. The Borrisokane Road Bridge could potentially support Barn Swallows, but this bridge is about 1 km away from the site and none were found to occur. Therefore, we predict no impacts to Barn Swallow from site development.

Butternut were observed on site within the shrubland habitat along the Fraser-Clarke Drain. In total, there were only four Butternut saplings on site and all of them were less than 10 cm DBH. Therefore, no Butternuts on site can possibly be deemed archivable under Ontario Regulation 242/08. At this time, there are no conditions on site that could disallow a site registration for the species and no further oversight from the MNFR is required to complete the process. The site therefore can, and will, be registered with the MNFR prior to site development to ensure no impacts to the species. Site registration will oblige the BCE to provide compensation through the planting of Butternut. Therefore, we predict no impacts to these species from site development.

The primary habitat of Snapping Turtle is the Jock River to the south, though they use the municipal drainage channel crossing the property to move between the Jock River and other areas upstream. The development of the site is not predicted to alter the municipal drainage channel on site in which Snapping Turtles were observed. A 30 m habitat buffer will be applied to this drain that will allow for continued use by this species. Therefore, we predict no impacts to Snapping Turtle from site development.

5.4 Impacts to Wildlife

The agricultural composition of the site makes it unlikely to support a large and diverse wildlife community. Moreover, the linear nature of the hedgerow does not provide cover for most wildlife species. The only areas on site providing potentially significant frog habitats is the Fraser-Clark drain, which is being fully retained within corridors of sufficient width to maintain frog breeding space.

Wildlife species common to the Ottawa area were observed on site during the field surveys. These species are likely to use the adjacent site to the same extent and will likely remain on site in the habitat buffer along the municipal drain. The riparian forest along the Jock River acts as a wildlife corridor, and this area will remain in place during and after site development. Mitigation measures will be implemented to protect wildlife species during site development, and therefore we predict no impacts to wildlife species during site development.

6.0 MITIGATIONS

6.1 Mitigations for Surface Water Features

The two surface water features on site consist of a municipal drain and a small agricultural drain (KAL, 2017). The agricultural drain will be removed during project development. Agricultural drains are typically wet in the spring but are generally dry by early to mid-summer. The Fraser-Clarke Drain crosses the site and connects to the Jock River to the South. This feature is not predicted to be altered by the project and a 30 m buffer shall be applied to it. However, it still has the potential to be indirectly impacted by sediment deposition from surface water flow from the site.

Silt curtains will be installed along the site boundary where surface water runoff has the potential to impact this feature. Silt curtains will also be installed where there is potential for surface water runoff to leave the site. Lastly, surface water runoff and sediment flows from the site will be monitored during project development until site contouring and stormwater management features are completed.

6.2 Mitigations for Trees

Please note that this report does not constitute permission to remove any trees from the site. Removal of trees can only be undertaken upon the issuance of a tree removal permit from the City of Ottawa. This report may be used to support the application for that permit and to advise mitigation measures imposed by the permit. Accordingly, to minimize impact to the remaining trees on the property, the following protection measures are indicated as necessary during construction:

- Tree removal on site should be limited to that which is necessary to accommodate site construction.
- To minimize impact to remaining trees during future site development:
 - Erect a fence beyond the critical root zone (CRZ, i.e. 10 x the trunk diameter) of trees. The fence should be highly visible (e.g. orange construction fence) and paired with erosion control fencing. Pruning of branches is recommended in areas of potential conflict with construction equipment;
 - Do not place any material or equipment within the CRZ of the tree;
 - Do not attach any signs, notices or posters to any tree;
 - Do not raise or lower the existing grade within the CRZ without approval;
 - Tunnel or bore when digging within the CRZ of a tree;
 - Do not damage the root system, trunk or branches of any tree; and
 - Ensure that exhaust fumes from all equipment are NOT directed towards any tree's canopy.
- The *Migratory Bird Convention Act* (Canada, 1994) protects the nests and young of migratory breeding birds in Canada. The City of Ottawa guidelines require no clearing of trees or vegetation between April 1 and August 15, unless a qualified biologist has determined that no nesting is occurring within 5 days prior to the clearing (Ottawa, 2017c).

As part of the Community Development Plan for the project a full landscape plan will be created for the area, which will include a tree planting plan. This will suggest the number of trees to be planted on site and the preferred species. This will also include setback distances for trees from residential properties, streets, sidewalks, and other infrastructure. The landscape plan must call for residential areas to be planted with a tree density equivalent to at least one tree per lot using appropriate native tree species as per City guidelines. Trees however, may be located along streets rather than necessarily planting on each lot directly. Additional trees are to be planted around the new storm water management ponds. Further tree planting is also likely within the landscaping plans for the future school, apartment and commercial blocks, though these are not included in Phase I and specific planting details are beyond BCE's purview as these areas will be developed by and to the specifications of the future land owners.

Where planting along wet areas (i.e. along drain corridors) is required, tree species such as Silver or Red Maple (*Acer rubrum*) are recommended over the current mix of trees (primarily ash and elm species, which are rapidly diminishing in health due to Emerald Ash Borer [EAB] and Dutch Elm's Disease [DED]). Burr Oak could be considered where spacing allows for future showcase trees.

6.3 Mitigations for Species at Risk

Barn Swallows and Snapping Turtles are not predicted to be impacted by site development and general wildlife mitigation measures will be sufficient to protect these species. A Butternut Health Assessment (BHA) for the area will be submitted to the MNRF prior to commencing any work potentially impacting those trees on site. The MNRF reserves a period of 30 days to review the BHA, after which the site will be registered. With fewer than 10 Butternuts on site and no possibility of archivable trees (all are too small), no level of permitting can be required by the MNRF beyond site registration. Upon site registration, Butternut will no longer be subject to the ESA and will not be considered a SAR.

Site Registration will oblige BCE to plant new Butternut saplings at either another location on the site or off-site within the region within one year, as well as to implement and follow a detailed tending program for those trees for two years, and to submit records of the trees and their care to the MNRF annually for that same period. This Butternut compensation can, and will most likely, be contracted out to the Rideau Valley Conservation Foundation, which manages and runs such programs on mass.

6.4 Mitigations for Wildlife

There are no Significant Wildlife Habitats on site. Common wildlife species however, were observed on site during the field visit. The following mitigation measures shall be implemented during construction of the project on site:

- Areas shall not be cleared during sensitive time of the year for wildlife, unless mitigation measures are implemented and/or the habitat has been inspected by a qualified biologist.
- Site clearing should begin at the north (i.e. from the direction of Strandherd Drive) and proceed southward to drive any wildlife towards available habitat.
- Do not harm, feed, or unnecessarily harass wildlife.
- Food wastes and other garbage – effective mitigation measures include waste control (prevent littering); keeping all trash secured in wildlife-proof containers, and prompt removal from the site (especially in warm weather).
- Drive slowly and avoid hitting wildlife where possible.
- Shelter – effective mitigation measures include covering or containing piles of soil, fill, brush, rocks and other loose materials; capping ends of pipes where necessary to keep wildlife out; ensuring that trailers, bins, boxes, and vacant buildings are secured at the end of each work day to prevent access by wildlife.
- Checking the work site (including previously cleared areas) for wildlife, prior to beginning work each day;

- Inspecting protective fencing or other installed measures daily and after each rain event to ensure their integrity and continued function; and,
- Monitoring construction activities to ensure compliance with the project-specific protocol (where applicable) or any other requirements.

7.0 SUMMARY AND RECOMMENDATIONS

It is our professional opinion that there will be no impacts to natural heritage features or wildlife species from the proposed project. Three species at risk were observed on or adjacent to the site during field surreys in 2017, but no impacts are anticipated to Barn Swallows or Snapping Turtles under the project. Four Butternut were observed on site, but all of them were less than 10 cm in diameter and they are therefore not archivable. Site registration and planting of compensation Butternut will be undertaken to replace these trees. Mitigation measures shall be implemented on site to protect surface water features, retained trees and area wildlife generally.

Regards,
KILGOUR & ASSOCIATES LTD.



Terry Hams, MSc.
Ecologist



Anthony Francis, PhD.
Senior Ecologist/Project Manager

**Appendix A
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Appendix B
Qualifications of Report Author

Anthony Francis, PhD

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

Terry Hams M.Sc.

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