

**Environmental Impact Study (EIS)  
&  
Headwater Assessment**

**819 County Road 23, Merrickville, ON**  
Part Lot GORE, Concession GORE  
Township of Wolford  
United Counties of Leeds and Grenville

**July 2022**

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## 1.0. Introduction

As requested by William Kollaard an Environmental Impact Study (EIS) and Headwater Assessment was completed to assess the environmental impacts and potential environmental constraints which may affect the proposed development within 819 County Road 23, Merrickville, ON.

### 1.1. Site Context

The entire property parcel is approximately 23.7 ha in size and the legal land description is Part of Lot Gore, Concession Gore, Township of Woford, United County of Leeds and Grenville. The proponent wishes to develop a 26 lot subdivision on two lots along County Road 23, just within the easterly limit of Merrickville-Woford. Three new dwelling lots are proposed to front onto the Counties road in addition to the new street. 23 lots will abut the internal road, 2 lots of which will accommodate existing dwellings (Appendix A; Figure 1).

Within the townships Zoning By-law No. 23-08 and official plan, the subject lands were designated as Rural. Within the townships official plan it's identified as Rural and Significant Woodland. Portions are designated on the United Counties of Leeds and Grenville Official Plan as Rural and Natural Heritage System. Additionally, the proposed development is located in Ecoregion 6E.

Through a background review, potential environmental constraints have been identified as; Natural Heritage System, Significant Woodland, Watercourses, and Potential Wetland.

Portions of the subject lands are located within one of the Rideau Valley Conservation Authority regulated areas. Additional permits may be required for works to be completed within the Rideau Valley Conservation Authority regulated areas.

The Provincial Policy Statement (PPS) states that natural heritage systems should be maintained, restored, or improved for the purpose of linkages between natural heritage features and areas. The PPS states that site development and alteration shall not be permitted in provincially significant wetlands in Ecoregion 6E and site development and alteration shall not be permitted in provincially significant woodlands in Ecoregion 6E unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Additionally, development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements

## 2.0. Methodology

This report is prepared in accordance with the Official Plan for the United Counties of Leeds and Grenville (2016) Section 4.2.14, with guidance from the Natural Heritage Reference Manual (OMNR, 2010). This EIS includes an assessment of the potential environmental constraints and the potential for Species at Risk.

A rapid headwater study (excluding fish sampling and amphibians surveys), at this location was the appropriate approach in determining the appropriate recommendations for the management of all

headwaters. Recommendations set out in the Evaluation, Classification and Management of Headwater Drainage Features Guidelines and Ontario Stream Assessment Protocol will be utilised.

Three daytime breeding bird surveys were conducted to assess the potential for species at risk (Table 1). Daytime surveys followed the Ontario Breeding Bird Atlas protocol (OBBA 2001) and included both point counts and incidental observations.

This EIS will provide the methodology to mitigate, as required, negative impacts on significant features and functions. Potential Species at Risk in the general area were identified from the Ministry of Natural Resources and Forestry databases, the Department of Fisheries and Ocean databases, the Ontario Breeding Bird Atlas, Ontario Reptile and Amphibian Atlas, iNaturalist and the Global Biodiversity Information Facility.

Colour aerial photography was used to assess the natural environment features in the general vicinity of the proposed building.

See Table 1 for a summary of field surveys of the site and adjacent lands. All surveys were completed by BCH Environmental (S.St.Pierre or C.Fontain)

TABLE 1: Summary of Field Surveys

DATE	TIME	AIR TEMP. (°C)	WIND (Beaufort Scale)	CLOUD COVER / PRECIPITATION
May 21, 2022	0700h-1400h	18	Gentle to Moderate Breeze	60% Cloud Cover
June 6, 2022	0700h-1030h	21	Light Breeze	Clear Skies
June 22, 2022	0730-0930h	20	Light Air	Clear Skies

The area was extensively walked and surveyed for significant natural areas, potential species at risk (butternut) and their associated habitat (bat tree cavity).

Observed plants were recorded for each individual community, the plants utilized in the descriptions are the most abundant specimens observed. A complete observed species list is provided in Appendix B. Plants that could not be identified in the field were collected for a more detailed examination. Nomenclature used in this report follows the Southern Ontario Vascular Plant List (Bradley, 2013) which aligns with the Integrated Taxonomic Information System (ITIS).

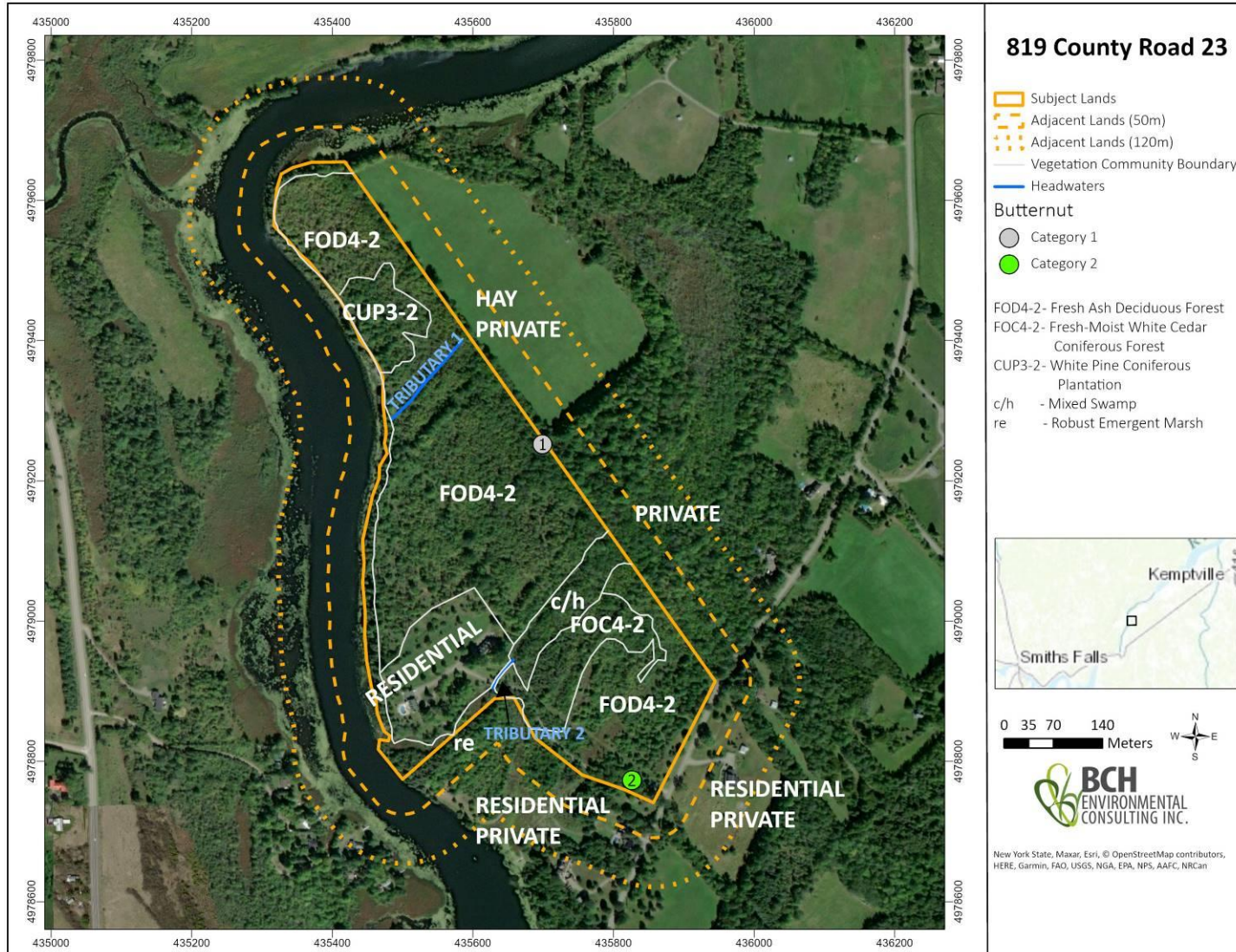
### 3.0. Field Surveys

A butternut survey was conducted along with a search for cavity trees by systematically moving through the subject lands and adjacent lands (discussed in section 4.3 and 4.4). Vegetation communities and Watercourses are described in section 3.1.

#### 3.1. Existing Conditions

The subject lands consisted mostly of forest with some wetland, a residence and mowed lawn. Similar to the subject lands, the adjacent lands consisted of forest, with cultural meadow (hay field) and residential areas.

FIGURE 1: SUBJECT LANDS



### 3.1.1. Fresh Ash Deciduous Forest (FOD4-2)

This community makes up a large portion of the subject lands. Tree composition and size was highly variable throughout. This location was highly disturbed by human activity (trails and evidence of past clearing activities). The average tree diameter was highly variable ranging from 10cm to 30cm. This was a deciduous forest with deciduous trees providing an average of 90% cover, and coniferous trees providing an average of 10% cover. The canopy and sub-canopy varied in dominance. The canopy (8-10m tall; 5-60% cover) was dominated by green ash followed by white ash. The sub-canopy (6m tall; 50-90% cover) was dominated by ash (green and white) followed by apple, common buckthorn and hawthorn. The understory (1-3m tall; 60-80% cover) was overdeveloped and consisted of prickly-ash, apple, common buckthorn, ash and nannyberry. The ground layer provided 60 % cover and included grasses, sedges, hickory regeneration, and asters. Within the eastern edge of this community along the property line there are large oaks and maples (50-90cm DBH). The occasional single and clump of coniferous tree are present throughout (white pine and white cedar). Some small areas within the northern portion of this community lack the canopy and sub-canopy layers, and are dominated by apple, common buckthorn, prickly-ash, ash and hawthorn.



Photo 1: Fresh Ash Deciduous Forest (May 21, 2022)



Photo 2: Fresh Ash Deciduous Forest (May 21, 2022)



Photo 3: Fresh Ash Deciduous Forest (June 6, 2022)

### 3.1.2. Fresh-Moist White Cedar Coniferous Forest (FOC4-2)

This community is present within the southern portion of the subject lands, and is an upland transitional area between the swamp and forest. The average tree diameter was 10cm to 20cm. This was a coniferous forest. The canopy was the dominant layer. The canopy (8m tall; 75-95% cover) was consisted of white cedar with the very occasional white birch, and green ash. There was no sub canopy or understory. The ground layer provided 20-40% cover and included grasses, sedges, sensitive fern.

Due to the presence of cedar, green ash and sensitive fern this community was suspect of being potentially a wetland, soil samples were taken to determine the moisture regime to aid with the decision making. The moisture regime within the forest was Moderately Moist (4). The Ontario Wetland Evaluation System (OMNR 2014) classifies wetlands as those areas with hydric soils, which have a Moisture Regime of 6 or higher, and nearly hydric soils, which have a Moisture Regime of 5. Under this classification this community did not contain hydric, or nearly hydric soil. The moisture regime of the forest community was Moderately Moist (4) which under the Ontario Wetland Evaluation System is not considered wetland.



Photo 4: Fresh-Moist White Cedar Coniferous Forest (May 21, 2022)

### 3.1.3. White Pine Coniferous Plantation (CUP3-2)

An unmaintained overgrown white pine plantation was present within the northern western portion of the subject lands. The average tree diameter was 30cm. Tree cover consisted of white pine. There was prickly-ash and green ash present in clumps within this community. The ground layer included grasses, sedges and asters.



Photo 5: White Pine Coniferous Plantation (May 21, 2022)

#### 3.1.4. Mixed Swamp (c/h)

This swamp is present within the southern portion of the subject lands. The average tree diameter was 10-20cm. This wetland presented three forms: deciduous tree (black ash, green ash and American elm), coniferous tree (white cedar, and tamarack), and herbaceous plant (sensitive fern, marsh marigold, spotted jewel-weed, and horsetails). Water was present, no defined channel was present, fish habitat is possible within this swamp but highly unlikely (see section 3.7.1.2), and turtle habitat is fairly unlikely as water lacked suitable depth and tree cover limits basking opportunity.



Photo 6: Mixed Swamp (May 21, 2022)

### 3.1.5. Robust Emergent Marsh (re)

This marsh is present within the southern portion of the subject lands directly across the driveway from the mixed swamp and adjacent to the Rideau River. This wetland presented two forms: robust emergent (broad-leaved cattail) and herbaceous plant (sensitive fern, marsh marigold, spotted jewel-weed, and horsetails). Shrubs are present along the edges of this marsh (red-osier dogwood and willows). Water was present, fish habitat is possible within this marsh but highly unlikely, and turtle habitat is fairly unlikely as water lacked suitable depth and the area is choked with cattail.



Photo 7: Robust Emergent Marsh (May 21, 2022)

### 3.1.6. Rideau River Shoreline

The Rideau River bordered the western and northern portions of the subject lands. The majority of the shoreline consisted of a steep (40-80°) 3-5m drop. The river banks exhibited signs of active erosion throughout (undercutting/failing). The banks were for the most part fully treed (white cedar, bur oak and white pine), with a thick understory (prickly-ash, common buckthorn, and apple) with some more bare areas (Photo 8). Rideau River supports a multitude of aquatic species such as fish and turtles.



Photo 8: Rideau River Shoreline (May 21, 2022)

#### 3.1.7. Tributary to the Rideau River

Two very small tributaries to the Rideau River were located within the subject lands (Figure 1). The first was located within the northern portion and will be referred to as tributary 1, the second acted as a link between the mixed swamp and robust emergent marsh with the driveway crossing it.

##### 3.1.7.1. Tributary 1

This unnamed watercourse is situated within the forested area of the subject lands. It flows in a west direction into the Rideau River. Tributary 1 was approximately 160 m in length. The channel was man-made and confined with a straight pattern. There is a drop at the mouth with no defined banks making upstream movement for fish very unlikely. Additionally, during all site visits the downstream portions of this tributary were dry which prevents fish movement in these areas. This can be attributed to two “crossings” that have trapped some water between them and poor grading. These crossings are just slightly built-up areas (soils or rock), so that vehicles can access. The first is located approximately 10m from the Rideau River. Upstream of the first crossing the average channel width was 1.7m and the average bankfull height 16cm. Substrate consisted of fines, no in-water cover was present.

During the May 21, 2022 visit, the average wetted width and water depth was 0.8m and 4cm (range: 1-10cm), respectively. It should be noted that the downstream end was dry but water was present upstream of the first crossing. The hydrological flow habitat consisted of standing water.

During the June 6, 2022 visit the entire tributary was dry.

During the June 22, 2022 visit, the average wetted width and water depth was 0.8m and 3cm (range: 1-8cm), respectively. It should be noted that the downstream end was dry. The hydrological flow habitat consisted of standing water.



Photo 9: Tributary 1 Downstream end where it enters the Rideau River – Steep Drop, No Defined Banks (May 21, 2022)



Photo 10: Tributary 1 Downstream end looking upstream at “crossing” - No Defined Banks (May 21, 2022)



Photo 11: Tributary 1 looking upstream from mid tributary at the second “crossing” - No Defined Banks (May 21, 2022)



Photo 12: Tributary 1 water trapped due to the “crossings” and poor grading (May 21, 2022)



Photo 12: Tributary 1 - Dry (June 6, 2022)



Photo 13: Tributary 1 water trapped due to the “crossings” and poor grading (June 22, 2022)

### 3.1.7.2. Tributary 2

This unnamed watercourse is situated within the southern portion of the subject lands, and links the swamp to the marsh. It is apparent that the construction of this tributary was done to allow for the driveway crossing. Additionally, there is a second crossing at the upstream end. It flows in a west direction into the Rideau River. Tributary 2 was approximately 46 m in length. The channel was man-made and confined with a straight pattern. The average width was 2.1m and the average bankfull height 20cm. Substrate consisted of fines, in-water cover consisted of vegetation (cattails and reed canary grass). This very short tributary is not expected to represent fish habitat, access would be through the choked cattail marsh to get into the tributary then into the swamp with limited habitat. Most likely use for fish would be movement into the swamp but highly unlikely. Tributary 2 has very limited connection potential to the Rideau River, the choked cattail marsh is downstream.

During the May 21, 2022 visit, the average wetted width and water depth was 1.2m and 17cm (range: 10-25cm), respectively. The hydrological flow habitat consisted of substantial flow.

During the June 6, 2022 visit, the average wetted width and water depth was 1.2m and 19cm (range: 1-35cm), respectively. The hydrological flow habitat consisted of substantial flow.

During the June 22, 2022 visit, the average wetted width and water depth was 1.4m and 10cm (range: 4-21cm), respectively. The hydrological flow habitat consisted of substantial flow.



Photo 14: Tributary 2 looking at the downstream end with the driveway crossing (May 21, 2022)



Photo 15: Tributary 2 looking at the upstream end with the crossing (May 21, 2022)



Photo 16: Tributary 2 (May 21, 2022)



Photo 17: Tributary 2 (June 6, 2022)



Photo 18: Tributary 2 (June 22, 2022)

#### 4.0. Potential Species at Risk

The Make a Map: Natural Heritage online database (OMNRF) was reviewed on May 11, 2022. This database provides sightings of provincially tracked species including Threatened and Endangered species covered by the 2008 Endangered Species Act in 1 km squares across most of Ontario. A search was conducted on the site and adjacent lands (18VQ3678, 18VQ3478, 18VQ3578 and 18VQ3479). The following species were identified for these squares:

- Least Bittern (Threatened)
- Eastern Meadowlark (Threatened)
- Bobolink (Threatened)
- Wood Thrush (Special Concern)
- Butternut (Endangered)
- Eastern Musk Turtle (Special Concern)
- Snapping Turtle (Special Concern)

The Ontario Breeding Bird Atlas provides a searchable database in the form of a 10km square grid. A query revealed the following Species at Risk and species of special concern identified within the 10km square that encompasses the site and adjacent lands (18VQ37):

- Black Tern (Special Concern)
- Common Nighthawk (Special Concern)
- Whip-poor-will (Threatened)
- Chimney Swift (Threatened)
- Eastern Wood-Pewee (Special Concern)
- Bank Swallow (Threatened)
- Barn Swallow (Threatened)
- Wood Thrush (Special Concern)
- Bobolink (Threatened)
- Eastern Meadowlark (Threatened)

Similar to the Ontario Breeding Bird Atlas, the Ontario Reptile and Amphibian Atlas provides a searchable database in the form of a 10km square grid. A query revealed the following species of special concern was identified within the 10km square that encompasses the subject lands and adjacent lands (18VQ37):

- Blanding's Turtle (Threatened)
- Eastern Musk Turtle (Special Concern)
- Northern Map Turtle (Special Concern)
- Snapping Turtle (Special Concern)

iNaturalist and the Global Biodiversity Information Facility provides a searchable database. A query revealed the following Species at Risk in the vicinity of the Subject Lands:

- Snapping Turtle (Special Concern)

The Department of Fisheries and Oceans provide species at risk sightings via their online map tool. A query found no results in the vicinity of the site.

In addition to the above potential Species at Risk, other endangered and threatened species may potentially occur in the general area:

- Little Brown Myotis (Endangered)
- Northern Myotis (Endangered)
- Tri-coloured Bat (Endangered)
- Black Ash (Endangered)

#### 4.1. Turtles and Reptiles

Eastern musk turtles, northern map turtles, and snapping turtles are all designated as special concern under the Ontario Endangered Species Act (ESA). The habitat of species of special concern is not regulated under the Ontario ESA. Blanding's turtles have been designated as threatened and their habitat is provincially regulated.

Blanding's turtles are often observed within clear water eutrophic wetlands and have a strong site fidelity but may use several connected water bodies during the active season. Blanding's turtles were identified as occurring within the 10km search area (Ontario Reptile and Amphibian Atlas). This EIS recognizes the Rideau River (wetlands present within the subject lands are swamp and don't represent turtle habitat) in the vicinity of the subject lands contains suitable Blanding's Turtle habitat (no targeted turtle sampling was conducted).

The Ontario Ministry of Natural Resources developed the general habitat description for the Blanding's Turtle (habitat provincially regulated), dividing habitat into three categories:

- **Category 1:** the nest and the area within 30 m or overwintering sites and the area within 30 m. Suitable nesting habitat occurs in sun-exposed areas with low vegetation cover and loose soils. They may overwinter in permanent or temporary waterbodies (young are also known to hibernate terrestrially), with the reported water depth varying from 0 to >100 cm and often show a high site fidelity. No evidence of this habitat was noted, and so Category 1 habitat is not considered to be present on or adjacent to the subject lands.
- **Category 2:** the wetland complex that extends up to 2 km from an occurrence, and the area within 30 m around those suitable wetlands or waterbodies. As noted, Blanding's turtle was documented within 10 km of the subject lands. For the purpose of this report, the Rideau River will be considered to be Category 2 habitat. All proposed operations will be moved outside of the Category 2 habitat (Figure 2).
- **Category 3:** the area between 30m and 250m around suitable wetlands or waterbodies identified in Category 2, within 2 km of an occurrence. As demonstrated in figure 2, the subject lands are within 250m of the Category 2 habitat, therefore portions of these lands will be considered Category 3 habitat. Category 3 habitat provides essential movement corridors of up to 500m

between wetlands, a function which is essential for carrying out life processes associated with the Category 1 and 2 habitats.

The subject lands occur within Category 3 Blanding's turtle habitat. Clearing within Category 3 habitat present within the subject lands is not anticipated to affect turtle movements given the distance from the wetland. The most likely location for turtles would be the river, and possibly from the marsh to the swamp, which is anticipated to be unaffected (all development is to occur more than 30m from the river, and swamp).

No direct impacts on turtles are anticipated, indirect impacts on these species as a result of the proposed can be mitigated provided the mitigation measures in this report are implemented.

#### 4.2. Birds

Black tern, common nighthawk, Eastern wood-pewee, and wood thrush are designated special concern under the Ontario Endangered Species Act (ESA). The habitat of species of special concern is not regulated under the Ontario ESA. Black terns nests in large freshwater marshes of at least 20 hectares with emergent vegetation interspersed with open water but will use smaller wetlands with the same features (Burke 2012). This habitat was not present within the subject lands. Common Nighthawk breeds in a range of open and partially open habitats, including forest openings and post-fire habitats, prairies, bogs, and rocky or sandy natural habitats, as well as disturbed areas. It is also found in settled areas that meet its habitat needs, those with open areas for foraging and bare or short-cropped surfaces for nesting (COSEWIC 2018). This habitat was not present within the subject lands. The eastern wood-pewee is mostly associated with the mid-canopy layer of forest clearings and edges of deciduous and mixed forests (COSEWIC 2012a). The eastern wood-pewee was not heard calling during all three breeding bird surveys and is not considered to be present. The wood thrush nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers (COSEWIC 2012b). This type of habitat was not present

Least bittern. Whip-poor-will, chimney swift, bank swallow, barn swallow, bobolink, and eastern meadowlark are designated as threatened under the Ontario Endangered Species Act (ESA). Least bittern require emergent marshes (usually cattail) with stable water levels and interspersed areas of open water for breeding (COSEWIC 2009a). Emergent Marsh habitat was limited to some portions of the shoreline, therefore least bittern is not anticipated to be using the site. Eastern whip-poor-will avoids both wide-open spaces and closed canopy forests. Semi-open forests or patchy forests with clearings, such as barrens or forests that are regenerating following major disturbances are preferred. Areas with little ground cover are also preferred (COSEWIC 2009b). This habitat was not present. Chimney swift are aerial foragers, associated with water where insects are abundant and urban and rural areas where chimneys are available for nesting and roosting (COSEWIC 2007). No suitable chimneys were observed for this species use. Bank swallow are generally associated with sand-silt vertical banks (COSWIC 2013a). Portions of the banks of the Rideau River may be potential habitat, no bank swallows were observed during the breeding bird surveys. Barn swallow nest sites are commonly found along the interior or exterior of building structures, under bridges and wharves, and in road culverts (Heagy et al. 2014.). No barn swallow or barn swallow nests were observed. Although nesting structures were present (house, garage and camper), no nests were observed.

FIGURE 2: SPECIES AT RISK



Bobolink and eastern meadowlark are associated with native and non-native larger grassland habitats such as hayfields (COSEWIC 2010, and COSEWIC 2011). No hayfields or other suitable habitat were identified within the subject lands. Suitable bobolink and meadowlark habitat has been identified within the adjacent lands immediately east of the property. This area is a hay/grass agricultural meadow. Bobolink and Meadowlark habitat categorization is divided into three:

Category 1- Nest and the area within 10 m of the nest

Category 2- The area between 10 m and 60 m of the nest or centre of approximated defended territory

Category 3- The area of continuous suitable habitat between 60 m and 300 m of the nest or approximated centre of defended territory.

There is no Category 1,2 or 3 habitat within the subject lands. All three are present within the adjacent lands. The proposed development will not negatively impact the bobolink/meadowlark habitat.

Additionally a breeding bird survey was conducted within this property (3 visits; table 1), a pair of nesting bobolinks were observed within the above mentioned hay field (Figure 2). Additional birds observed nesting or displaying nesting behaviours include: common grackle, American robin, ovenbird, blue jay, black-capped chickadee, phoebe, red-eyed vireo, chipping sparrow, veery and common yellowthroat.

#### 4.3. Mammals

Little brown Myotis, northern Myotis, and tri-coloured bat are designated endangered under the Ontario Endangered Species Act (ESA). All three species overwinter in hibernacula. Maternity colonies are established by females in the summer, often in buildings or large-diameter trees with suitable cavities (COSEWIC 2013b). No caves, bedrock fissures, mining shafts, abandoned buildings, or other features which may function as bat hibernacula habitat were noted on the site. No suitable cavity trees that may be used for summer maternal colonies by bats were observed within the subject lands.

#### 4.4. Vegetation

Butternut (designated as endangered by the ESA) tends to reach greatest abundance in rich well-drained mesic loams in floodplains, streambanks, terraces and ravine slopes, but can occur in a wide range of other situations (COSEWIC 2017). Two butternut trees were observed and assessed during the May 21, 2022 visit ("leaf-on" season. One butternut was Category 1 and the other Category 2. Butternut is protected under the Endangered Species Act, 2007 (ESA) from being killed, harmed, or removed. You are eligible to remove any Category 1 tree without registration or permitting but only after waiting 30 days after submitting the BHA report to MECP. The Category 2 tree will be registered and regulations followed before work around the tree is conducted.

Black ash (designated as endangered by the ESA) occurs most frequently in floodplain forests, basin, seepage and lacustrine swamp forests, shoreline forest margins, and fens (COSEWIC 2017). The ministry temporarily suspended protections for Black Ash for a period of two years from the time the species was added to the Species at Risk in Ontario List (Ontario Regulation 230/08). During this time, proponents will not need to seek authorizations for activities that impact Black Ash and its habitat. Black ash is present within the subject lands primarily within the swamp, which will be retained and protected.

#### 4.5. Species at Risk Summary

In summary, based on the habitat present within the buildable area and the field visits, butternut is the only Species at Risk present. Additional to butternut the most likely Species at Risk would be Blanding’s turtle. Indirect impacts on these species as a result of the proposed development can be mitigated provided the mitigation measures in this report are properly implemented.

#### 5.0. Natural Heritage Features

A Natural Heritage Features have been identified in accordance with the direction of the Provincial Policy Statement. Its intent is to reinforce the conservation, restoration, and enhancement of identified natural heritage features and areas and promote the overall diversity and interconnectivity of natural heritage features and areas.

A refined search identified the following Natural Heritage Features (discussion below): Significant Woodland and Potential Wetland.

#### 5.1. Significant Woodland

The significance of woodlands has been evaluated using the criteria in the Natural Heritage Reference Manual (OMNR, 2010) by The Ministry of Natural Resources and Forestry (MNRF).

The woodland within the subject lands is part of a larger woodland that totals approximately 544ha in size. Clearing for this project would result in the removal of 15.1ha. The significance of this woodland was evaluated using the criteria in the Natural Heritage Reference Manual (OMNR, 2010). The PPS does not permit development in significant woodlands south and east of the Canadian Shield unless it has been demonstrated that there will be no negative impacts on the natural features or the ecological functions. Woodlands are significant if they meet the criteria presented in the NHRM: size, ecological function, uncommon characteristics, and economical and social functional values.

If the woodland meets any one of these criteria then it could be deemed to be significant. Table 2 demonstrates the factors determining significance pre and post construction as per the NHRM.

Within the portion proposed to be removed there were no seasonal concentration areas of animals, rare vegetative communities, raptor overwintering sites, caves, or suitable tree cavities.

TABLE 2: WOODLAND ANALYSIS

CRITERIA		PRE CONSTRUCTION	POST CONSTRUCTION	DISCUSSION
WOODLAND SIZE		MEETS THE CRITERIA		The woodland size is 544ha before clearing and 528.9 ha after clearing therefore meets this criteria.
ECOLOGICAL FUNCTION CRITERIA	Woodland Interior	MEETS THE CRITERIA		Woodland interior is 203.9ha before potential clearing and 199.2ha after potential clearing therefore meets this criteria.

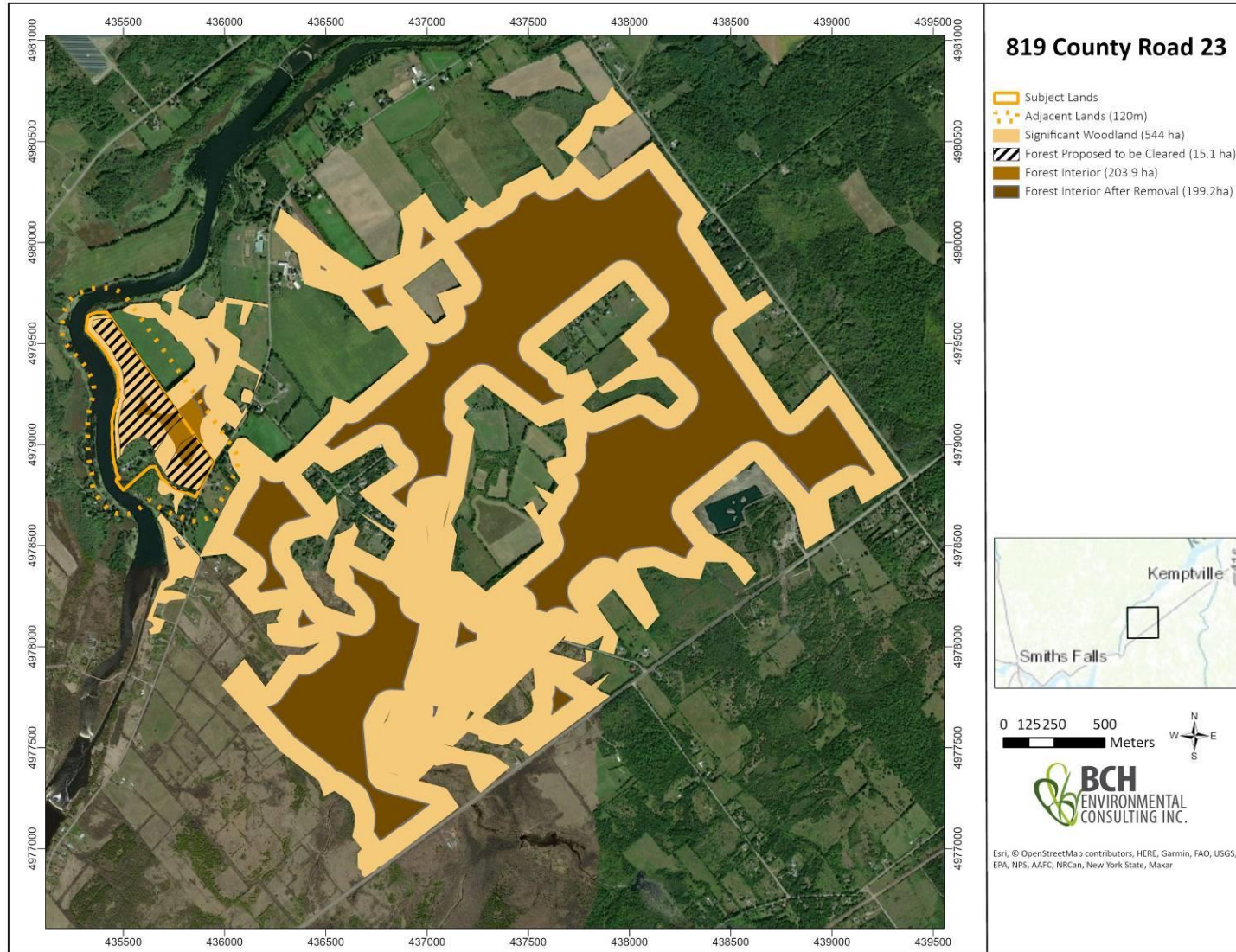
CRITERIA	PRE CONSTRUCTION	POST CONSTRUCTION	DISCUSSION
Proximity to other woodlands or other habitats	MEETS THE CRITERIA		Outside of the development area this woodland connects with watercourses and wetlands and they are likely receiving ecological benefit from the woodland. Rideau River is adjacent and likely benefiting for the woodland
Linkages	MEETS THE CRITERIA		Woodland is located within a defined natural heritage system.
Water protection	MEETS THE CRITERIA		Portions of this woodland are within a highly vulnerable aquifer.
Woodland diversity	DOES NOT MEET THE CRITERIA		Within the subject lands this forest did not contain any declining natural communities or a high variety of native diversity through composition or terrain.
<b>UNCOMMON CHARACTERISTICS CRITERIA</b>	DOES NOT MEET THE CRITERIA		Within the subject lands there are no uncommon species composition, cover type, age or structure.
<b>ECONOMIC AND SOCIAL FUNCTIONAL VALUES CRITERIA</b>	DOES NOT MEET THE CRITERIA		Within the subject lands the woodlands did not have high economic or social values through particular site characteristics or deliberate management.

As per the criteria set out in the NHRM this woodland should be considered significant, furthermore the woodland retains this designation of significant even after construction is completed. This woodlands significance was established from the following criteria: size, woodland interior, proximity to other habitats, linkages, and water protection. After removal (15.1ha), the woodland (528.9 ha after removal) still meets the criteria for significance (Table 2). There are no significant features within the development area.

Although this woodland has been classified as significant, it is important to note that this was attributed to the size, woodland interior, and proximity to other habitats, linkages and water protection. Removal of 15.1 ha of the forest at the identified location in the northwest corner of the overall woodlands will not negatively impact, as defined in the Provincial Policy Statement, this feature or its ecological functions. Woodland significance is retained.

Indirect impacts on this woodland as a result of the proposed development can be mitigated provided the mitigation measures in this report are properly implemented.

FIGURE 3: WOODLAND



## 5.2. Rideau River, Unevaluated Wetlands and Fish Habitat

The river and wetlands have been taken into account while establishing building envelopes, a 30m setback has been established and all development and site alterations will be outside of said setback. No impact to the wetland or Rideau River is anticipated. Tributary 2 can be utilised by fish to migrate from the marsh to the swamp (although unlikely), works in this area will be limited to enhancement to the existing crossing. No negative impacts to the wetlands, river, or fish habitat are anticipated. Mitigation measures provided below will limit the potential for indirect impacts on the wetland, river and fish habitat.

## 5.3. Significant Wildlife Habitat

The potential for significant wildlife habitat was assessed using the guidance in OMNR (2010) and MNRF (2015). Potential components which may lead to a designation of significant wildlife habitat include seasonal concentration areas of animals, rare vegetation communities or specialized habitat for wildlife, habitat for species of conservation concern, and animal movement corridors. No rare vegetative communities, raptor overwintering sites, old growth forest, valley, or caves were located within the subject or adjacent lands. No habitat for species of conservation concern was present (see section 4.0)

No significant wildlife habitat has been identified within the development area. No identified significant wildlife habitat or species at risk habitat will be negatively impacted.

There was nothing regarding the characteristic within the development area to warrant significance. Prescribed mitigation measures in section 9.0 will limit the potential for indirect impacts.

## 6.0. Headwater Drainage Features Assessment

### 6.1.1. Classification

#### 6.1.1.1. Hydrology Classification

The flow is classified based on the amounts recorded during the three visits. These are summarized in Table 3 (as per OSAP S4.M10).

TABLE 3: HYDROLOGY CLASSIFICATION

Tributary #	Definition of Flow Influence	Flow Condition	Types of Headwater Drainage Features	Hydrology Classification
1	May 21, 2022	Standing Water (2)	Channelized (2)	Limited
	June 6, 2022	Dry (1)		
	June 22, 2022	Standing Water (2)		
2	May 21, 2022	Surface Flow Minimal (4)	Channelized (2)	Contributing
	June 6, 2022	Surface Flow Minimal (4))		
	June 22, 2022	Surface Flow Minimal (4)		

The amount of rainfall recorded in the seven days preceding each station visit is summarized in Table 4 to provide context to Tables 3.

TABLE 4: Rainfall Recorded in the Seven Days Preceding Each Station Visit.

Date	Cumulative Amount of Rain (7 Day Before Site Visit)*
May 21, 2022	74.3 mm
June 6, 2022	15.0 mm
June 22, 2022	17.2 mm

\*taken from Environment Canada

### 6.1.1.2. Riparian Classification

The riparian habitat is classified based on the width and type of vegetation on the banks. These are summarized in Table 5.

TABLE 5: Riparian Classification

Station #	OSAP S4.M10 Code	Riparian Classification
1	6 (Forest)	Important Functions
2	2 (Lawn)	Contributing Functions

### 6.1.1.3. Fish and Fish Habitat Classification

Tributary 1 is classified as having a contributing function as regards to fish habitat, meaning allochthonous transport through feature to downstream habitat. This feature was dry during the second visit, and with the poor downstream connection it is extremely unlikely fish can utilise this tributary

Tributary 2 is classified as having valued functions in regards to fish habitat, meaning suitable habitat identified for feeding, cover and refuge although this is very limited. This feature had water during all the visits.

### 6.1.1.4. Terrestrial Habitat Classification

This is more of a classification of amphibian habitat than of the terrestrial habitat. Based on the field visits Tributary 1 provides no amphibian value. The guidelines would give this a Limited Function. This tributary only has water present for the short periods after rain events, no pools or wetland habitat was available.

Tributaries 2 receives Important Function Classification. However this is inappropriate for the quality of habitat found. This is strictly due to it linking upstream (swamp) and downstream (marsh) habitats.

### 6.1.1.5. Management Recommendations

The options for management recommendations are grouped into six categories: protection, conservation, mitigation, maintain recharge, maintain/ replicate terrestrial linkage, and no management required.

Utilising the guideline and the data collected at each tributary the management recommendations are: No Management Required for Tributary 1, and Conservation for Tributary 2 (Table 6).

Conservation refers to having to :

- Maintain, relocate, and/or enhance drainage feature and its riparian zone corridor;
- If catchment drainage has been previously removed or will be removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage), as feasible;
- Maintain or replace on-site flows using mitigation measures and/or wetland creation, if necessary;
- Maintain or replace external flows,
- Use natural channel design techniques to maintain or enhance overall productivity of the reach;
- Drainage feature must connect to downstream.

The proponent is proposing the removal of Tributary 1, while preserving Tributary 2. As demonstrated by this headwater analysis, no management is required for the removal of Tributary 1, while the functions of Tributary 2 are to be preserved (see above). At Tributary 2 the only work being suggested are enhancements to the current crossing, which will have no negative impacts as long as mitigation measures provided are followed.

Table 6: Evaluation, Classification and Management Summary

<b>Tributary #</b>	<b>Hydrology Classification</b>	<b>Riparian Classification</b>	<b>Fish and Fish Habitat Classification</b>	<b>Terrestrial Habitat Classification</b>	<b>Management Recommendations</b>
1	Limited Function	Important Functions	Contributing Function	Limited Function	No Management Required
2	Contributing Function	Contributing Functions	Valued Functions	Important Functions	Conservation

## 7.0. Tree Protection

Tree removal will occur as needed within the developable area, a reasonable effort will be made to retain as many trees as feasible. Potential impacts during construction of the proposed buildings and associated removal of trees and other vegetation include impacts on wildlife, increased erosion and release of sediments and other potential contaminants from truck traffic and construction activity, harm to wildlife remaining in the work area during construction, and impacts associated with an increase in noise, dust, and light.

Removal of tree cover within the building envelope is not anticipated to result in significant negative impacts to the environmental features and functions of the general area. Any tree in the vicinity of works but not slated for removal will have its critical roots zone protected by temporary fencing (snow fencing) to ensure it is not affected.

Prescribed mitigation measures in section 8.0 will limit the potential for indirect impacts.

## 8.0. Development Constraints and Cumulative Impacts

No significant constraints, regulatory requirements, or buffer requirements have been identified in relation to Significant Woodland. Development will be limited to the development area.

Rideau River, Wetlands and Potential Fish Habitat: Have been taken into account - while establishing developable area the design incorporated a 30m wetland setback.

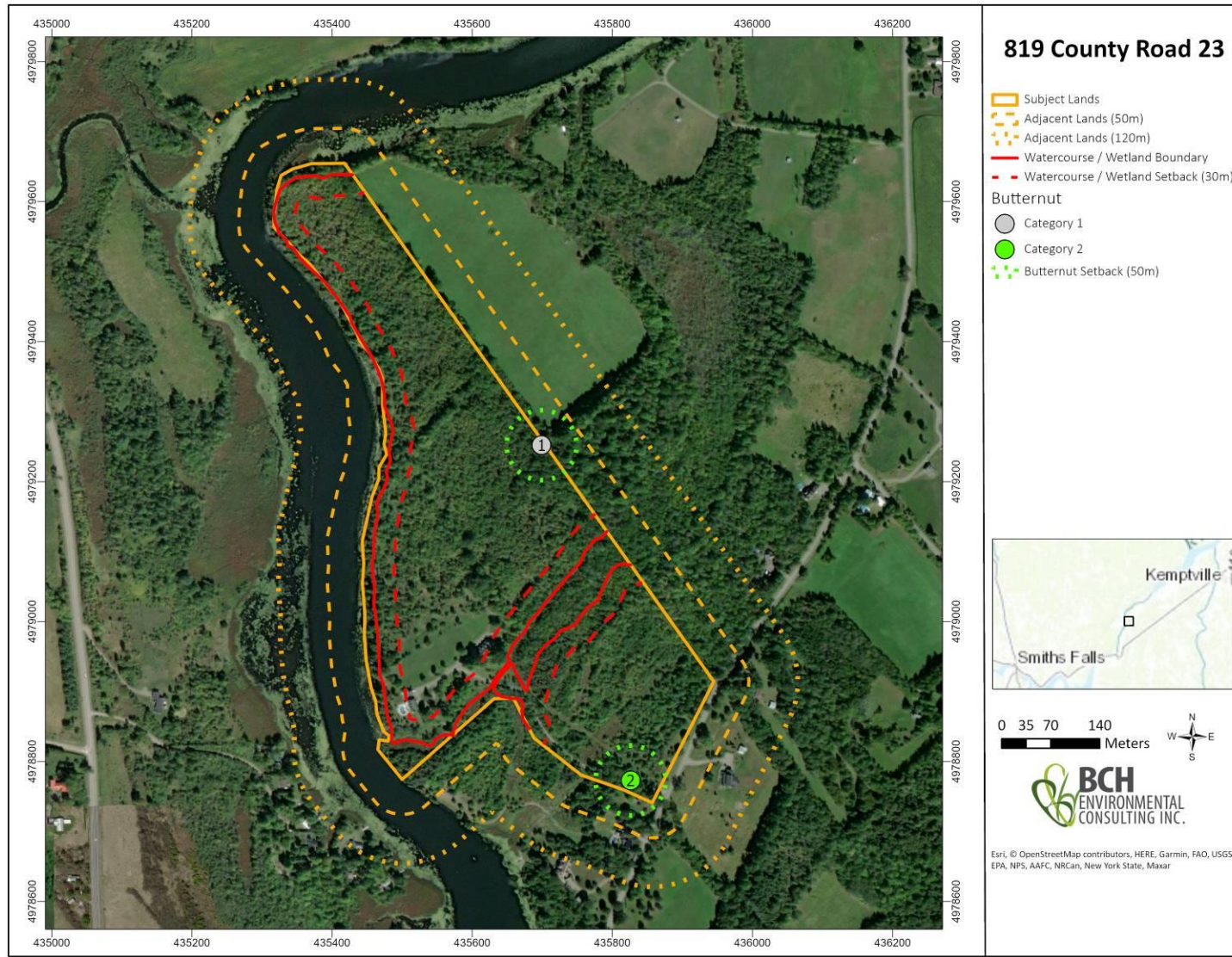
Blanding's Turtle: Category 2 habitat has been identified within the wetland leaving the remainder of the subject lands as category 3 habitat. See section 4.1 for further discussion. Indirect impacts on the turtles as a result of the proposed development can be mitigated provided the mitigation measures in this report are properly implemented.

The Canadian Environmental Assessment Agency (CEAA) defines cumulative effects as..."the effects on the environment caused by an action in combination with other past, present, and future human actions..." They occur when two or more project-related environmental effects, or two or more independent projects, combine to produce an augmented effect. These cumulative effects may be positive or negative.

Outside of the significant woodland, there are no significant natural heritage features within the development area (wetlands and the river are protected by 30m setback. Cumulative impact to the woodland consist of a slow chipping away at the significant woodland. Although this proposed development and presumably the ones that came before it did not impact the significance of the woodland, continual development will put its significance at risk. Where there is opportunity to preserve the woodland by means of wetland and watercourse setbacks and strategic severances this should be accomplished. The forested areas within the setback and the wetland will be preserve, along with the larger trees along the eastern property line.

With proper implementation of the mitigation measures described in this report it is anticipated that the construction of the proposed development will not increase the potential for cumulative effects in the general landscape.

FIGURE 4: CONSTRAINTS



## 9.0. Recommendations and Conclusion

This study's recommendations are intended to mitigate potential negative impacts due to the proposed creation of residential development and should be implemented through a development agreement between the owners and the municipality in order to control development of the site. Properly implemented controls within this agreement are deemed sufficient to mitigate the potential impacts of the proposed development.

- 1- The edge of the 30 m buffer from the wetland and river will be clearly marked on drawings and in the field and protected by a barrier (i.e. sediment or snow fencing) to prevent machinery from accidentally removing vegetation from this area.
- 2- No changes to the natural vegetation within the buffer is permitted.
- 3- Any stock piles of soil or fill material will be stored 30 m from the edge of the wetland and river and protected by silt fencing.
- 4- No work will occur until the appropriate sediment and erosion control measures have been properly implemented through a sediment and erosion control plan developed by the contractor. It will be designed to prevent the movement of suspended sediments outside of the work area. At a minimum, they will include the following items and steps:
  - a. Properly installed sediment fencing along the edge of the work area to contain any particles which may enter the wetland or river. Fencing will be installed on the edge of the work area.
  - b. Monitoring of sedimentation outside of the sediment fencing will occur throughout the day. Additional monitoring during rain events will be needed.
  - c. The contractor will be responsible to ensure that the measures chosen are appropriate for the site and are functioning as intended.
- 5- Should dust particles be created during construction they will be suppressed using the appropriate method (i.e. water spraying).
- 6- There will be no use of herbicides in clearing of vegetation.
- 7- Additional materials (i.e. rip-rap, filter cloth and silt fencing) should be readily available in case they are needed promptly for erosion and/or sediment control.
- 8- The sediment fencing will not be removed until the terrestrial vegetation has become re-established.
- 9- All lands outside of the proposed development area are to be maintained in a natural vegetated state.
- 10- The extent of any vegetation removal within the development area is to be minimized where possible.
- 11- All rules governing septic systems and wells must be followed and be kept in good operational order.
- 12- Municipal by-laws and provincial regulations for noise will be followed.
- 13- To protect breeding birds, no tree or shrub removal should occur between April 15<sup>th</sup> and August 15<sup>th</sup>, unless a breeding bird survey is completed by a qualified biologist within five days of the woody vegetation removal and identifies no nesting activity.

- 14- With regard to turtles, clearing of vegetation should be undertaken between October 15th and April 15th, which is outside of the more active season for turtles.
- 15- Construction staff is to be made aware of the characteristics of turtles (especially Blanding's Turtle) and in the event that these and/or any Species at Risk (SAR) are encountered during site clearing, work in the area will be stopped immediately. Measures will be undertaken to ensure the animal is not harmed and the project biologist and the Ministry of the Environment, Conservation and Parks contacted to discuss how to proceed.
- 16- Any tree in the vicinity of works but not slated for removal will have its critical roots zone protected by sturdy temporary fencing at least 1.3 metres in height installed from the tree trunk to a distance of ten times the retained tree's diameter where possible.
- 17- No grading, heavy machinery traffic, stockpiling of material, machinery maintenance and refueling, or other activities that may cause soil compaction are to occur within three metres of the critical root zone of the trees to be protected.
- 18- The root system, trunk, or branches of the trees to be protected are to be protected and not damaged. If any roots of trees to be retained are exposed during site alterations, the roots shall be immediately reburied with soil or covered with filter cloth, burlap or woodchips and kept moist until the roots can be buried permanently. A covering of plastic should be used to retain moisture during an extended period when watering may not be possible. Any roots that must be cut are to be cut cleanly to facilitate healing and as far from the tree as possible. Overhanging branches from protected trees that may be damaged during construction are to be pruned by a qualified arborist prior to construction.
- 19- Exhaust fumes from all equipment during construction will not be directed towards the canopy of the adjacent protected trees.
- 20- To discourage wildlife from entering the work areas during construction, the site should be kept clear of food wastes and other garbage. Proper drainage should be provided to avoid accumulation of standing water, which could attract amphibians, birds, and other wildlife to the work areas.
- 21- The contractor will have a spill kit on-hand at all times in case of spills or other accidents;
- 22- The extent of exposed soils is to be kept to a minimum at all times. Revegetation of exposed, non-developed areas is to be achieved as soon as possible;
- 23- Enhancements to Tributary 2 will have a small in-water component.
  - a. All work is to occur during the in-water work window (July 1<sup>st</sup> until March 14<sup>th</sup>, inclusive).
  - b. Sediment and erosion control measures will be installed prior to the clearing of vegetation within 30 m of a watercourse.
  - c. Where possible, all work in-water will also be completed during periods of low flow or dry period.
  - d. Work area is required to be isolated, pumped dry, fish salvaged before construction begins. If flow is present at the time of construction it must be maintained to the downstream reaches.
  - e. In-water work will require an RVCA permit and may require permit from DFO and MNRF
- 24- The Category 2 Butternut will be protected with a 25 m buffer or an authorization under the Ontario ESA will be obtained for its removal or harm and associated compensation.



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To conclude this EIS, it is the professional opinion of the author that with proper implementation and maintenance of the mitigation measures (see above), the proposed development will not negatively impact, as defined in the Provincial Policy Statement, any natural heritage features present, or any habitat of species at risk.

Thank you for the opportunity to work with you. If you have any questions or comments please do not hesitate to contact our office.

A handwritten signature in black ink, appearing to read "S. St. Pierre".

Shaun St.Pierre, B.Sc. Biology

A handwritten signature in black ink, appearing to read "Cody Fontaine".

Cody Fontaine, Wildlife Technologist

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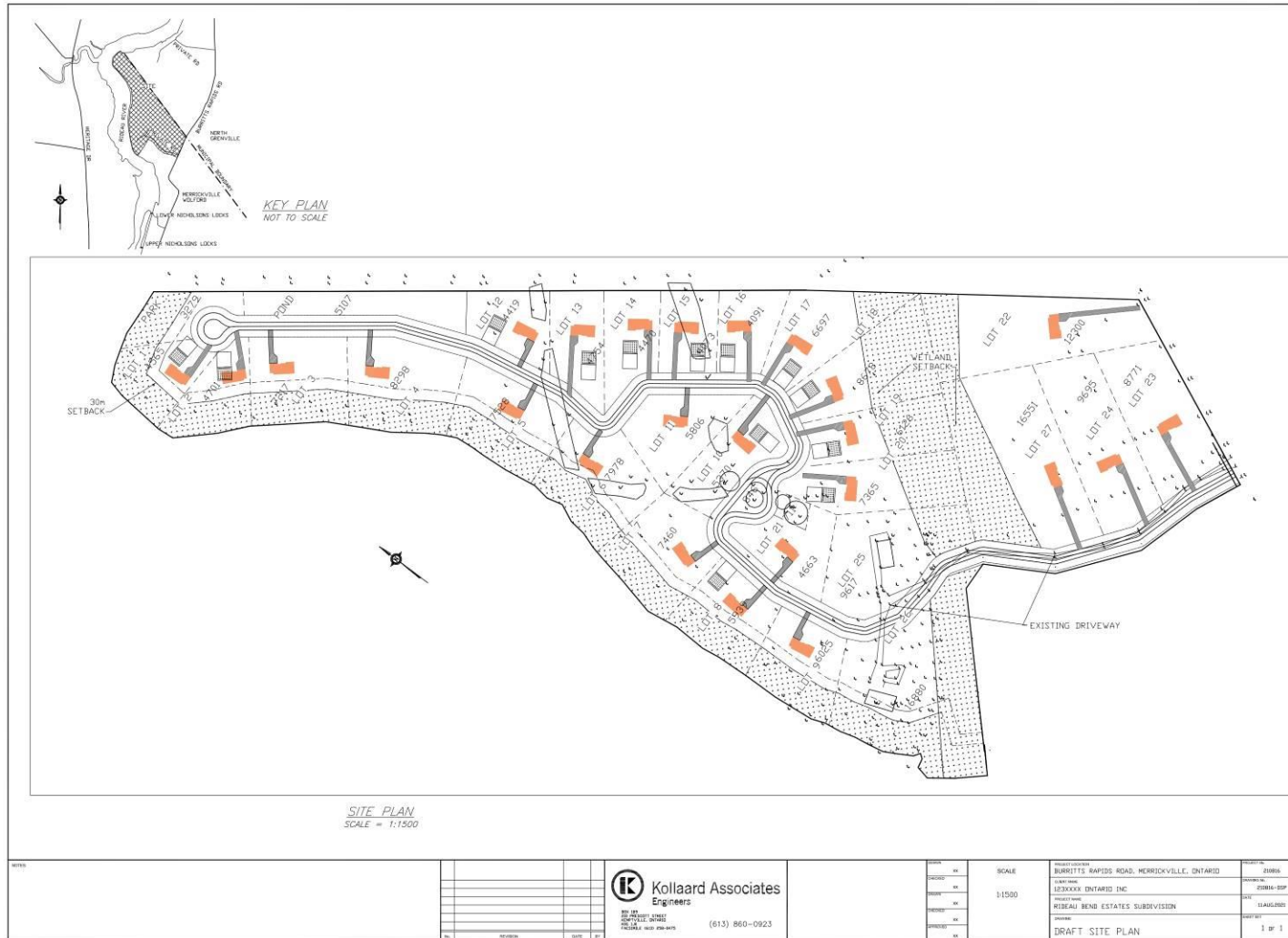
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APPENDIX A: SITE PLAN



## APPENDIX B: OBSERVED SPECIES LIST

COMMON NAME	SCIENTIFIC NAME	SRANK	SARA STATUS	SARO STATUS	COEFF. CONSERVATISM
Field Horsetail	<i>Equisetum arvense</i>	S5			0
Common Lady Fern	<i>Athyrium filix-femina</i>	S5			4
Ostrich Fern	<i>Matteuccia struthiopteris</i>	S5			5
Sensitive Fern	<i>Onoclea sensibilis</i>	S5			4
Tamarack	<i>Larix laricina</i>	S5			7
White Spruce	<i>Picea glauca</i>	S5			6
Eastern White Pine	<i>Pinus strobus</i>	S5			4
Eastern White Cedar	<i>Thuja occidentalis</i>	S5			4
Broad-leaved Cattail	<i>Typha latifolia</i>	S5			1
Lake Sedge	<i>Carex lacustris</i>	S5			5
Orchard Grass	<i>Dactylis glomerata</i>	SNA			
Large Barnyard Grass	<i>Echinochloa crus-galli</i>	SNA			
Reed Canary Grass	<i>Phalaris arundinacea</i>	S5			0
Bladder Sedge	<i>Carex intumescens</i>	S5			6
Awl-fruited Sedge	<i>Carex stipata</i>	S5			3
Blue Bead-lily	<i>Clintonia borealis</i>	S5			7
Large-toothed Aspen	<i>Populus grandidentata</i>	S5			5
Trembling Aspen	<i>Populus tremuloides</i>	S5			2
Golden Weeping Willow	<i>Salix x sepulcralis</i>	SNA			
Bitternut Hickory	<i>Carya cordiformis</i>	S5			6
Butternut	<i>Juglans cinerea</i>	S2?	END	END	6
Black Walnut	<i>Juglans nigra</i>	S4?			5
White Birch	<i>Betula papyrifera</i>	S5			2
Gray Birch	<i>Betula populifolia</i>	S4			5
White Oak	<i>Quercus alba</i>	S5			6
Bur Oak	<i>Quercus macrocarpa</i>	S5			5
American Elm	<i>Ulmus americana</i>	S5			3
White Baneberry	<i>Actaea pachypoda</i>	S5			6
Yellow Marsh Marigold	<i>Caltha palustris</i>	S5			5
Tall Buttercup	<i>Ranunculus acris</i>	SNA			
Garlic Mustard	<i>Alliaria petiolata</i>	SNA			
Wild Black Currant	<i>Ribes americanum</i>	S5			4
Hawthorns	<i>Crataegus sp.</i>				
Common Strawberry	<i>Fragaria virginiana</i>	S5			2
White Avens	<i>Geum canadense</i>	S5			3
Apple	<i>Malus sp.</i>				

COMMON NAME	SCIENTIFIC NAME	SRANK	SARA STATUS	SARO STATUS	COEFF. CONSERVATISM
Black Cherry	<i>Prunus serotina</i>	S5			3
Choke Cherry	<i>Prunus virginiana</i>	S5			2
Black Raspberry	<i>Rubus occidentalis</i>	S5			2
Goldenrods	<i>Solidago sp.</i>				
Canada Goldenrod	<i>Solidago canadensis</i>	S5			1
Wild Red Raspberry	<i>Rubus idaeus ssp. strigosus</i>	S5			2
Common Crown-vetch	<i>Securigera varia</i>	SNA			
Black Medic	<i>Medicago lupulina</i>	SNA			
Red Clover	<i>Trifolium pratense</i>	SNA			
White Clover	<i>Trifolium repens</i>	SNA			
Common Prickly-ash	<i>Zanthoxylum americanum</i>	S5			3
Common Lilac	<i>Syringa vulgaris</i>	SNA			
Staghorn Sumac	<i>Rhus hirta</i>	S5			1
Manitoba Maple	<i>Acer negundo</i>	S5			0
Sugar Maple	<i>Acer saccharum</i>	S5			4
Black Maple	<i>Acer nigrum</i>	S4?			7
Spotted Jewelweed	<i>Impatiens capensis</i>	S5			4
Common Buckthorn	<i>Rhamnus cathartica</i>	SNA			
Glossy Buckthorn	<i>Frangula alnus</i>	SNA			
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	S4?			6
Riverbank Grape	<i>Vitis riparia</i>	S5			0
American Basswood	<i>Tilia americana var. americana</i>	S5			4
Purple Loosestrife	<i>Lythrum salicaria</i>	SNA			
Wild Sarsaparilla	<i>Aralia nudicaulis</i>	S5			4
Alternate-leaved Dogwood	<i>Cornus alternifolia</i>	S5			6
Gray Dogwood	<i>Cornus racemosa</i>	S5			2
Red-osier Dogwood	<i>Cornus sericea</i>	S5			2
White Ash	<i>Fraxinus americana</i>	S4			4
Black Ash	<i>Fraxinus nigra</i>	S4		END	7
Green Ash	<i>Fraxinus pennsylvanica</i>	S4			3
Virginia Waterleaf	<i>Hydrophyllum virginianum</i>	S5			6
Spearmint	<i>Mentha spicata</i>	SNA			
Catalpa	<i>Catalpa sp.</i>				
Common Plantain	<i>Plantago major</i>	SNA			
Tatarian Honeysuckle	<i>Lonicera tatarica</i>	SNA			
Nannyberry	<i>Viburnum lentago</i>	S5			4
Common Yarrow	<i>Achillea millefolium</i>	SNA			
Daisy Fleabane	<i>Erigeron strigosus</i>	S5			4

COMMON NAME	SCIENTIFIC NAME	SRANK	SARA STATUS	SARO STATUS	COEFF. CONSERVATISM
Spotted Joe Pye Weed	<i>Eutrochium maculatum</i>	S5			3
Oxeye Daisy	<i>Leucanthemum vulgare</i>	SNA			
Early Goldenrod	<i>Solidago juncea</i>	S5			3
Rough-stemmed Goldenrod	<i>Solidago rugosa</i>	S5			4
Common Sow-thistle	<i>Sonchus oleraceus</i>	SNA			
Common Dandelion	<i>Taraxacum officinale</i>	SNA			
Colts Foot	<i>Tussilago farfara</i>	SNA			
Tall Goldenrod	<i>Solidago altissima</i> spp. <i>Altissima</i>	S5			1
Canada Goldenrod	<i>Solidago canadensis</i> var. <i>canadensis</i>	S5			1
Spotted Joe Pye Weed	<i>Eutrochium maculatum</i> var. <i>maculatum</i>	S5			3
Hawthorn sp.	<i>Crataegus</i> sp.				
Sedges					
Fescues	<i>Festuca</i> sp.				
Willows	<i>Salix</i> sp.				
Canada Enchanter's Nightshade	<i>Circaea canadensis</i> ssp. <i>canadensis</i>	S5			2
Grasses					
Osprey	<i>Pandion haliaetus</i>	S5B			
Ruffed Grouse	<i>Bonasa umbellus</i>	S4			
Killdeer	<i>Charadrius vociferus</i>	S5B, S5N			
Mourning Dove	<i>Zenaida macroura</i>	S5			
Belted Kingfisher	<i>Ceryle alcyon</i>	S4B			
Eastern Phoebe	<i>Sayornis phoebe</i>	S5B			
Red-eyed Vireo	<i>Vireo olivaceus</i>	S5B			
Blue Jay	<i>Cyanocitta cristata</i>	S5			
American Crow	<i>Corvus brachyrhynchos</i>	S5B			
Black-capped Chickadee	<i>Poecile atricapilla</i>	S5			
White-breasted Nuthatch	<i>Sitta carolinensis</i>	S5			
Veery	<i>Catharus fuscescens</i>	S4B			
American Robin	<i>Turdus migratorius</i>	S5B			
European Starling	<i>Sturnus vulgaris</i>	SNA			
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	S5B			
Ovenbird	<i>Seiurus aurocapillus</i>	S4B			
Common Yellowthroat	<i>Geothlypis trichas</i>	S5B			
Chipping Sparrow	<i>Spizella passerina</i>	S5B			
Song Sparrow	<i>Melospiza melodia</i>	S5B			
Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	THR	THR	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	S4			
Common Grackle	<i>Quiscalus quiscula</i>	S5B			
Baltimore Oriole	<i>Icterus galbula</i>	S4B			
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	S5			