Environmental Impact Study – South March Road Battery Energy Storage System (BESS)

Final Report

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1 Introduction

The proposed South March Road Battery Energy Storage System (BESS) project (the Project) is located off Marchurst Road, northwest Ottawa, Ontario on part of Concession 1 Lot 26 and Lot 27. The Project is anticipated to be approximately 250 MW, with a Project Development Area (PDA) of approximately 6.1 hectares (ha). The PDA encompasses any land, structure, and air space in, on or over which part of the Project is proposed and is described in this report as the Subject Property. The Study Area includes the Subject Property and larger Project Area plus adjacent lands within a 120-meter buffer (**Figure A1**, Appendix A).

This Environmental Impact Study (EIS) identifies natural heritage features and significant natural features within the Study Area, as well as potential environmental effects and mitigation measures to lessen potential impacts of the proposed development on environmental resources. This EIS report was prepared in accordance with applicable policies and regulations described in Section 2 and the City of Ottawa (the City) *Environmental Impact Study Guidelines* (City of Ottawa 2023).

2 Planning Policies

The following sections discuss the legislation and policy documents that establish the natural heritage context for the Study Area. The policy documents discussed below were used to scope effects assessment, assess the natural heritage features and functions within the Study Area, as well as to determine natural heritage constraints.

2.1 Municipal

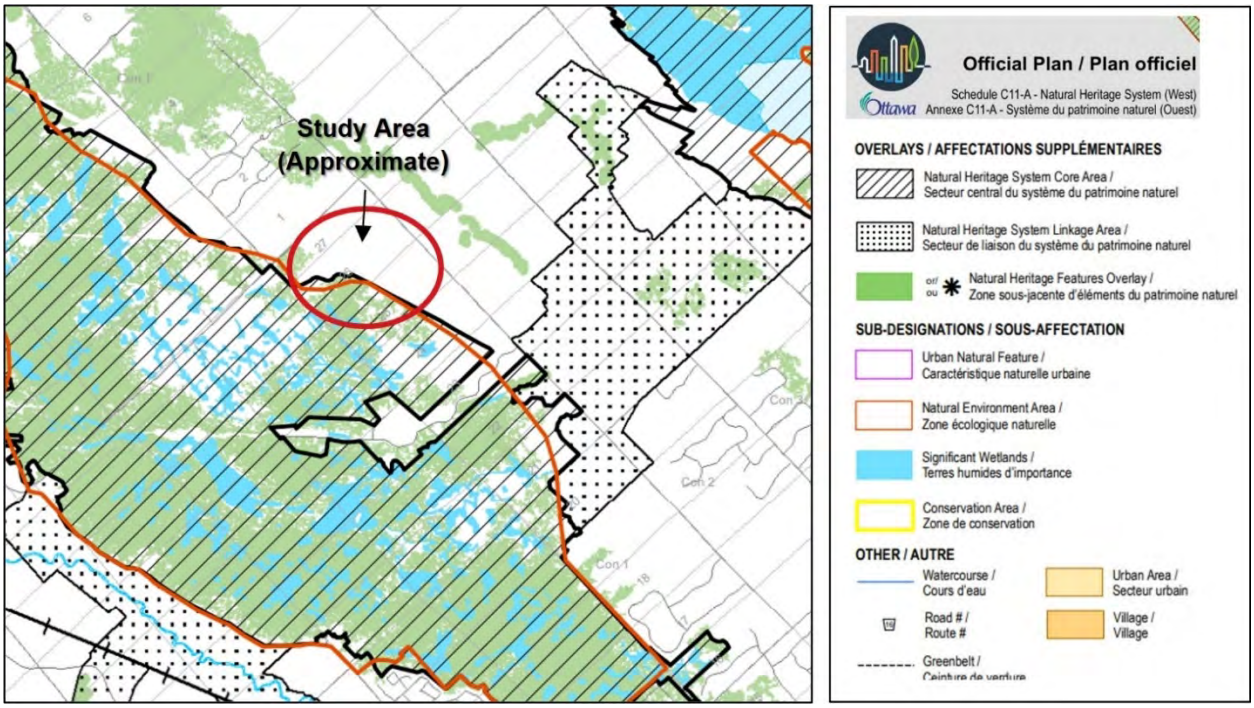
2.1.1 City of Ottawa Official Plan

The City of Ottawa *Official Plan* (OP) was adopted by Council on November 2021. Section 4.8.1 of the OP states that "*the Natural Heritage System and the features within it are subject to a higher standard of protection than features outside*" and defined natural heritage features as the following:

- Significant Wetlands
- Significant Woodlands
- Significant Valleylands
- Significant Wildlife Habitat
- habitat for endangered and threatened species (i.e., habitat of SAR)
- areas of natural and scientific interest (ANSI)
- urban natural features
- natural environment areas
- natural linkage features and corridors
- groundwater features
- surface water features, including fish habitat
- landform features

The Natural Heritage System (NHS) and Natural Heritage Features Overlays within the Study Area are shown on Figure 1 below, as replicated from Schedule C11-A of the City's OP.

Figure 1 NHS and Natural Heritage Feature Overlay in the Study Area (adapted from the OP)



Section 5.6.4.1 of the OP states that "*the City shall protect natural heritage features for their natural character and ecosystem services*" and that "*development or site alteration proposed in or adjacent to natural heritage features shall be supported by an environmental impact study prepared in accordance with the City's guidelines*." Further, "*development and site alteration shall have no negative impact on the Natural Heritage System and Natural Heritage Features*" and "*shall be consistent with the conclusions and recommendations of an approved environmental impact study*". As shown in **Figure 1**, a portion of the Study Area is within the NHS and Natural Heritage Features Overlay. The proposed development is not expected to encroach within these designated areas (**Figure A1, Appendix A**).

Section 13 of the OP defines surface water features as *"Water-related features on the earth's surface, including headwater drainage features, rivers, stream channels, drains, inland lakes, seepage areas, recharge/discharge areas, springs, wetlands and associated riparian lands that can be defined by their soil moisture, soil type, vegetation or topographic characteristics, including fish habitat."* Section 4.9.3 indicates that "*Where development or site alteration is proposed within or adjacent to headwater drainage features, and the proponent is requesting an exception to the minimum setback identified in Policy 2), the proposal and supporting studies must address the following to the satisfaction of the City: a) Evaluation and description of the project site, sensitivity of the headwater drainage features and sampling methods; b) Assessment and classification of hydrological function, riparian conditions, fish and fish habitat and terrestrial habitat; and c) Management recommendations regarding the need to protect, conserve, mitigate, maintain recharge or maintain/replicate terrestrial linkages of the headwater drainage features and a corresponding recommendation for an appropriate minimum setback.*

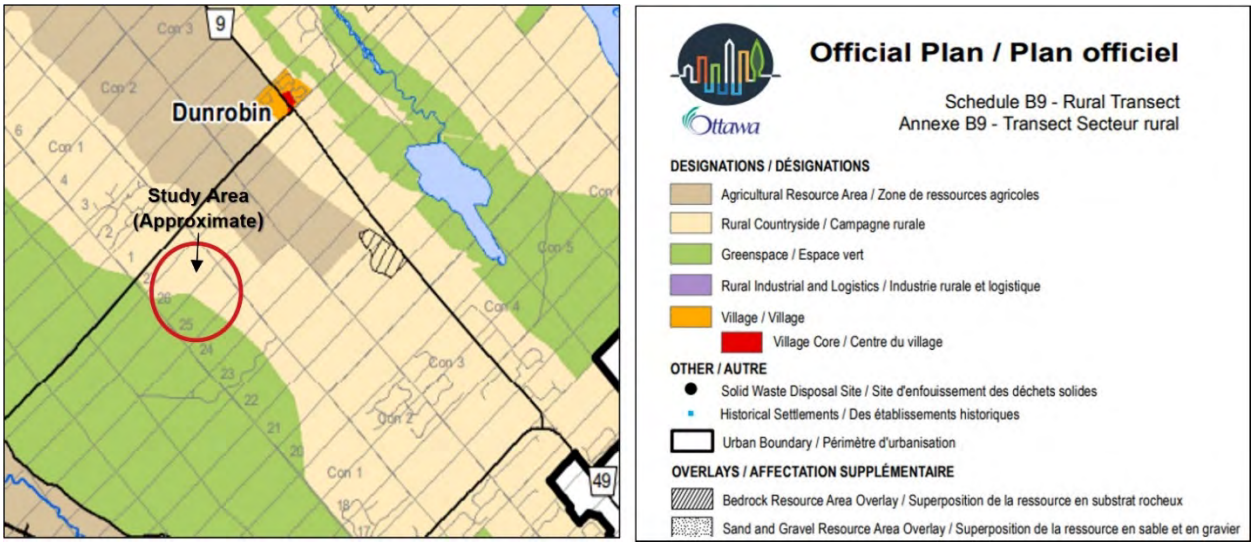
Section 4.9.3 of the OP addresses development limits and restrictions in and near surface water features.

Policy 4.9.3 6 f) ii states that management and minimum setback recommendations for non-significant wetlands greater than 0.5 ha in size shall be determined through an approved Environmental Impact Study, in consultation with the conservation authority and consistent with Policy 5) in Subsection 4.8.1, which state the City shall take a no net loss approach with respect to evaluated wetlands deemed not provincially significant and forest cover outside the urban area and designated villages.

Section 4.9.3, Policy 6 of the OP provides exception minimum setbacks, including activities that create or maintain infrastructure within the requirements of the environmental assessment process, a master servicing study or works subject to the Drainage Act.

Section 7 of the OP includes policies for the Greenspace designations, which are shown on Schedule B9 with sub-designations also shown on Schedule C11-A. Section 7.3 of the OP states that "*development and site alteration within 120 m of the boundary of a Significant Wetland must demonstrate no negative impacts on the natural features or their ecosystem services within the area*" and that "*development and site alteration within 120 m of the boundary of a Natural Environment Area must demonstrate no negative impacts on the natural features or their ecosystem services within the area*". As shown in **Figure 2**, the Study Area is within the Rural Countryside designation with a portion within Greenspace. The Greenspace designation overlaps areas within the NHS and Natural Heritage Feature Overlays (**Figure 1**).

Figure 2 Land Use Designations in the Study Area (adapted from the OP)



2.1.2 City of Ottawa Tree By-Law

The City's Tree Protection By-law (No. 2020-340) came into effect on January 1, 2021 (City of Ottawa 2020). The following trees are protected from injury or removal, except where a tree permit is obtained from the City:

- All City-owned trees throughout the urban and rural area.
- All trees 10 cm or more in diameter at breast height on private properties within the urban area that are subject to a Planning Act application for Site Plan, Plan of Subdivision, or Plan of Condominium.
- All trees 10 cm or more in diameter at breast height on private properties within the urban area that are over 1 hectare (ha) in size.
- All distinctive trees, which are trees 30 cm or more in diameter at breast height on private properties within the urban area that are 1 ha or less in size.

As the Study Area is located on private land within the rural area, a permit for injury or removal is not required.

2.2 Provincial

2.2.1 Provincial Policy Statement

The *Provincial Policy Statement, 2024* (PPS) was issued under Section 3 of the *Planning Act, 1990*; and came into effect October 20, 2024. The PPS provides the framework for provincial planning documents and regulating land use and development planning policies for specific geographic areas within Ontario.

The natural heritage provisions are outlined in Section 4.1 of the PPS with a focus on maintaining the diversity, ecological functions, and linkages of natural heritage features and areas, natural heritage systems, surface water and groundwater features over the long term. These provisions restrict development and site alteration in or adjacent to significant natural heritage features and areas (e.g., wetlands, woodlands, valleylands, wildlife habitat and areas of natural and scientific interest) unless it can be demonstrated that there will be no negative impacts on the features and their ecological functions. Additionally, these provisions apply to fish habitat and habitat of endangered and threatened species, except in accordance with provincial and federal requirements. The natural heritage policies are not intended to limit the ability of agricultural uses to continue.

2.2.2 Endangered Species Act

The *Endangered Species Act,* 2007 (ESA) applies to species that are designated as extirpated, endangered or threatened and listed on the Species at Risk in Ontario (SARO) List (*O.Reg. 230/08*). Species and general habitat protection apply to all species, except those designated as special concern, which are not afforded protection under the ESA. Species specific habitat protection is also given to those species with regulated habitat, as identified in *O.Reg. 832/21*. The ESA also includes specific exemptions from the provisions of the ESA under certain conditions under *O.Reg. 242/08* and *O. Reg. 830/21*. Exemptions and conditions vary by species, type of activity, the date the species was listed and the date the activity commenced. The province of Ontario has proposed replacing the existing ESA with the new *Species Conservation Act*, which may come into effect prior to construction of the Project. Consultation with MECP is ongoing and will continue to provide compliance with the applicable legislation.

2.2.3 Species Conservation Act (SCA)

The *Protect Ontario by Unleashing our Economy Act, 2025* (Bill 5) received Royal Assent on June 5, 2025, and as a result, the *Endangered Species Act, 2007* (ESA) was amended and will be in effect until such time as the *Species Conservation Act* (SCA) is proclaimed. Recent amendments to the ESA include:

- Revised habitat definition replaced the previous definition in the ESA, focused on core elements of habitat such as breeding, rearing, staging, wintering, and hibernation areas.
- Harass" was removed from the prohibitions.
- The government has discretion to add species to, or remove from, the Species at Risk in Ontario (SARO) List.
- The Species at Risk Conservation Fund will no longer accept funds and there will no longer be an option to pay a charge in lieu of overall benefit.
- Registration for activities authorized under current conditional exemptions will continue using the current registry system.
- Permits, agreements and associated conditions, entered into before the legislation was amended, will continue to apply continuing to use the previous definition of "habitat".
- Updated compliance and enforcement model to focus on collaborative resolution rather than legal action.

The SCA is anticipated to be enacting in the coming months and is proposed to use a "registration-first approach" with most activities covered by registration. Permits would still be required in some circumstances. Regulations under the SCA, which will provide details of the registration options, are currently under development.

2.2.4 Fish and Wildlife Conservation Act

The Ontario *Fish and Wildlife Conservation Act, 1997* (FWCA) provides protection of wildlife in Ontario including fish, furbearing mammals, game wildlife and specially protected wildlife through regulations for hunting, trapping, and fishing practices. Game and specially protected mammals, birds, reptiles, amphibians, and invertebrates are listed on Schedules 1-11 of the FWCA. Definitions provided for hunting include capturing or harassing wildlife and would include activities that collect or handle wildlife for inventories or other scientific purposes, or to relocate wildlife out of harm's way (e.g., during construction activities), including individuals and eggs. Sections 7 and 8 also provide protection for nest and eggs of specified bird species including raptors, and dens of bears and furbearing animals, and beaver damns. Under the FWCA, the Minister of Natural Resources (MNR) has the authority to authorize activities that would otherwise be prohibited such as the safe capture of wildlife and removal of nests, dens, and dams, and impose conditions on an authorization.

2.2.5 Conservation Authorities Act

The *Conservation Authorities Act, 1990*, was updated in late 2022 with the purpose to provide for the organization and delivery of programs and services that further the conservation, restoration, development, and management of natural resources in watersheds in Ontario.

The Project is within the Mississippi Valley Conservation Authority (MVCA) jurisdiction, which administers *Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits* under Section 28 of the *Conservation Authorities Act*. The proposed development will not include works within the regulated limits and therefore, a permit is not anticipated.

2.3 Federal

2.3.1 Species at Risk Act

The federal *Species at Risk Act, 2002* (SARA) includes provisions for the protection of species that are classified as extirpated, endangered and threatened on Schedule 1 of the Act. This includes protection of the species and their residence (e.g., nest, den) and critical habitat. Critical habitat is defined as those habitats necessary for the survival or recovery of a listed species, as identified in the recovery strategy or in an action plan for the species. While SARA applies to species on federal land, such as Canadian oceans and waterways, national parks, national wildlife areas, some migratory bird sanctuaries and First Nations reserve lands, it also applies to migratory birds protected under the *Migratory Birds Convention Act*, 1994 and fish, anywhere they occur. Under Section 73 of SARA, the competent minister may enter into an agreement or issue a permit authorizing an activity affecting a listed wildlife species, any part of its critical habitat, or the residences of its individuals and provided that the activity meets the following purposes:

1. The activity is scientific research relating to the conservation of the species and conducted by qualified persons.

2. The activity benefits the species or is required to enhance its chance of survival in the wild.
3. Affecting the species is incidental to the carrying out of the activity.

2.3.2 Migratory Birds Convention Act

The *Migratory Birds Convention Act*, 1994 (MBCA) affords protection and conservation to migratory bird populations, individuals, and their nests within all of Canada. Most bird species in Canada are afforded protection, except for a few families (e.g., cormorants, pelicans, grouse, quail, pheasants, ptarmigan, hawks, owls, eagles, falcons, kingfishers, and corvids). The MBCA is the enabling statute for the *Migratory Birds Regulations* (MBR), which were updated in May 2022 (MBR 2022). Section 6 of the MBR 2022 states that without the authorization of a permit, the disturbance, destruction, or taking of a nest, egg, nest shelter, eider duck shelter, or duck box of a migratory bird, or possession of a migratory bird, carcass, skin, nest, or egg of a migratory bird are prohibited. Under the MBR 2022, nests for 18 bird species (7 of which occur in Ontario) receive year-round protection for a prescribed length of time ranging from 24-36 months (Schedule 1), and all other nests of migratory birds are protected when they contain a live bird or viable egg (S. 5(2)(b)). If a nest of a species identified on Schedule 1 of the MBR 2022 is determined to be empty of live birds or viable eggs, then the nest can be registered under Environment and Climate Change Canada's (ECCC) Abandoned Nest Registry, at which point the prescribed period of inactivity begins.

2.3.3 Fisheries Act

The *Fisheries Act, 1985* (amended on August 28, 2019) is the main federal law governing fisheries in Canada and is administered by Fisheries and Oceans Canada (DFO). *The Fisheries Act* provides for the management and control of fisheries, the conservation and protection of fish, the protection of fish habitat and pollution prevention. Projects that may impact fish, fish habitat, aquatic species at risk (SAR) and aquatic invasive species may be subject to DFO review. The *Fisheries Act* prohibits causing the death of fish and the harmful alteration, disruption, or destruction (HADD) of fish habitat, unless authorized by the Minister of Fisheries, Oceans, and the Canadian Coast Guard. Conditions and circumstances for projects to be exempt from review are listed on DFO's Fish and Fish Habitat Protection Program web pages. Following guidance and criteria provided on DFO's website regarding mitigation, waterbody types and codes of practice, proponents determine whether their projects in or near water will require review by DFO. DFO review is requested through the submission of a 'Request for Review' (RfR) form. Following completion of their review, DFO can proceed in two ways: 1) issue a Letter of Advice indicating that the proposed work complies with the *Fisheries Act* or, 2) refer the project to the Regulatory Review Unit for site specific review. If the project can avoid impacts to fish and fish habitat, project approval is not required. If impacts that cause a HADD cannot be avoided, proponents must apply for a *Fisheries Act* Authorization and may be required to develop a habitat offsetting or compensation plan.

3 Study Approach

3.1 Background Review

The following information sources were reviewed for records of natural heritage features within the Study Area. The results are shown on **Figure A1, (Appendix A)** with a list of species provided in **Appendix B**.

- Geospatial Ontario environmental datasets (Ontario Geological Survey 2025)
- Natural Heritage Information Centre (NHIC; MNR 2025)
- City of Ottawa Official Plan (City of Ottawa 2022a)
- Mississippi Valley Conservation Authority Interactive Property Map (MVCA 2025)
- Ontario Reptile and Amphibian Atlas (ORAA; Ontario Nature 2020)
- Atlas of the Mammals of Ontario (AMO; Dobbyn 1994)
- Ontario Breeding Bird Atlas (OBBA; Cadman et al. 2007)
- Ontario Butterfly Atlas (OBA; Macnaughton et al. 2025)
- iNaturalist Online Observations (iNaturalist 2025)
- Fisheries and Oceans Canada Aquatic SAR Map (DFO 2025)

3.2 Field Studies

Stantec completed field investigations within the Study Area between October 2024 to July 2025. Field investigations included surveys during the active wildlife season (May – October) to record breeding birds, bats, remaining amphibian and turtle surveys, and targeted searches for Black Ash (*Fraxinus nigra*) and Butternut (*Juglans cinerea*). These investigations involved documenting existing conditions and verifying data collected during the background review, including assessments of candidate significant wildlife habitat (SWH), potential for species at risk (SAR), and other natural heritage features.

A summary of targeted field studies are provided in **Table 3-1** below, with study methods in the sections below. Photographic record from the field investigations is available in **Appendix BB**. All species documented during the field investigations are listed in **Appendix B**. Staff qualifications are provided in **Appendix J**.

Table 3-1 Summary of Field Investigations within the Study Area

Survey Type	Date and Time	Weather Conditions	Staff
Ecological Land Classification (ELC)	October 8 2024	• Temp: 1°C to 10°C • Cloud Cover: mix of overcast to sun • Precipitation: None • Wind: 16km/h WNW	Brennan Obermayer Bronwen Hennigar
Targeted SAR tree (Black Ash and Butternut) Surveys	June 30 2025	• Temp: 18°C to 30°C • Cloud Cover: mix of clear skies to overcast • Precipitation: None • Wind: 16km/h SSW	Bronwen Hennigar Matt Nixon
Aquatic Habitat Assessments	October 8 2024	• Temp: 1°C to 10°C • Cloud Cover: mix of overcast to sun • Precipitation: None • Wind: 16km/h WNW	Brennan Obermayer Bronwen Hennigar
	June 2 2025	• Temp: 5°C to 21°C • Cloud Cover: mix of sun to overcast • Precipitation: 24 hours before • Wind: 20 km/h W	Matt Nixon Dave Wood
Fish Community Assessment	June 2 2025	• Temp: 5°C to 21°C • Cloud Cover: mix of sun to overcast • Precipitation: 24 hours before • Wind: 20 km/h W	Matt Nixon Dave Wood
Breeding Birds and Turtle Surveys	May 21 2025	• Temp: 8°C to 14°C • Cloud Cover: Overcast • Precipitation: None • Wind: 22 km/h E	Alexis Richardson Bronwen Hennigar
	May 28 2025	• Temp: 9°C to 27°C • Cloud Cover: Mix of sun and clouds • Precipitation: None • Wind: 5 km/h N	

Survey Type	Date and Time	Weather Conditions	Staff
	June 4 2025	• Temp: 16°C to 30°C • Cloud Cover: Mix of sun and clouds • Precipitation: None • Wind: 20 km/h SSW	
	June 5 2025	• Temp: 19°C to 24°C • Cloud Cover: Overcast • Precipitation: None • Wind: 16 km/h WNW	
	June 10 2025	• Temp: 17°C to 24°C • Cloud Cover: Overcast • Precipitation: Yes • Wind: 21 km/h SSW	
	June 11 2025	• Temp: 12°C to 24°C • Cloud Cover: Overcast • Precipitation: 24 hours before • Wind: 17 km/h W	
Bat Acoustic Survey (Autonomous Recording Unit [ARU])	May 21 – June 30 2025	See Appendix D for complete weather details	Bronwen Hennigar Matt Nixon
Amphibian Call Survey (ARU)	April 17– June 29 2025	See Appendix D for complete weather details	Bronwen Hennigar Matt Nixon
Crepuscular Bird Survey (ARU)	June 15 – July 15 2025	See Appendix D for complete weather details	Bronwen Hennigar Matt Nixon
Turtle and Bat Habitat Assessment	June 11 2025	• Temp: 12°C to 24°C • Cloud Cover: Overcast • Precipitation: 24 hours before • Wind: 17 km/h W	Bronwen Hennigar

3.2.1 Aquatic Resources

An unnamed surface water feature (SWF) that was identified during the background data review as bisecting the Study Area was ground truthed (where access was available) during field work that was completed on October 8, 2024. An additional field investigation to characterize the aquatic habitats and fish community within the SWF was completed on June 2, 2025. The information was used to identify potential fish habitat constraints associated with the Study Area.

The unnamed SWF does not have a regulation limit identified under the MVCA.

The aquatic habitat assessment was based on qualitative and quantitative measurements and include documentation of instream cover, bank stability, substrates, and morphology, riparian zone habitat and overall fish habitat potential.

The fish community assessment was conducted using dip nets as water levels were not conducive to backpack electrofishing. Dip-netting was completed throughout the entire wetted channel where water levels allowed.

To complete the fish community assessment, a *License to Collect Fish for Scientific Purposes* under the *Fish and Wildlife Conservation Act* (1997) was obtained from the MNR (Authorization No. KEKI-2025-FWCA-00286).

No additional features were identified during the background data review.

3.2.2 Ecological Land Classification

Vegetation communities were generally characterized following the first approximation of the *Ecological Land Classification System for Southern Ontario* (Lee *et al.*, 1998). The second approximation of ELC (Lee, 2008) was also used when there was no code available for a specific community type in the first approximation.

Prior to undertaking field surveys, vegetation communities were mapped through aerial photograph interpretation, with polygons delineated using ArcGIS. The field inventories included verifying and refining the boundaries mapped during the desktop exercise. Additional data was collected related to disturbances and wildlife species presence within each of the polygons that could be field verified. The vegetation communities were also assessed to determine if candidate SWH was present (this includes rare vegetation community types). Field investigations for ELC were completed on August 8, 2024.

3.2.3 Amphibians

Amphibian call surveys were recorded using ARUs, following the timing and weather conditions outlined in the *Marsh Monitoring Program Participant's Handbook for Surveying Amphibians* (Birds Canada [BSC] and ECCC 2009). ARUs were deployed to record calls for at least ten survey nights with suitable weather during the peak breeding period in the early spring (late April), late spring (late May), and early summer (late June).

Four (4) amphibian ARUs were placed at the Study Area where the BESS is proposed across representative habitats (**Figure A3, Attachment A**). Later, a qualified biologist (one who has completed amphibian call analysis before) analyzed recorded calls to identify species. Survey results are summarized in **Section 4.6**.

3.2.4 Turtle Surveys

Turtle surveys were completed in accordance with the Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario (MNR 2015). Five (5) basking turtle surveys were completed during appropriate weather conditions (5-25°C and sunny), between late May and mid-June. Survey results are summarized in **Section 4.7**.

3.2.5 Breeding Bird Surveys

Three (3) rounds of diurnal breeding bird surveys were completed within the Study Area using a standard 10-minute point-count approach following a modified protocol based on *Instructions for Point Counts* (OBBA 2021). Surveys were completed during the peak breeding season (April 1 – August 31 [ECCC 2024]). Surveys were completed under suitable weather conditions (i.e., temperatures above 0C, wind less than 20 km/h, little to no precipitation). Breeding bird surveys were completed within the first five hours after sunrise, during peak bird vocalization and activity (OBBA 2021). All birds heard and observed were recorded during the surveys.

Eight breeding bird survey stations (**Figure A3, Appendix A**). were established at representative habitats to collect information on the bird species present within and adjacent to the Site.

3.2.6 Red-headed Woodpecker Surveys

Surveys for Red-headed Woodpecker (*Melanerpes erythrocephalus*) were completed concurrently with the breeding bird surveys. A three-minute survey for Red-headed Woodpeckers was completed immediately after the 10-minute point count at each breeding bird station. Red-headed Woodpecker calls were played through a portable speaker at each station followed by 3 minutes of silence to listen for potential adults within the Study Area.

3.2.7 Crepuscular Bird Surveys

Crepuscular bird surveys for Common Nighthawk (*Chordeiles minor*) and Eastern Whip-poor-will (*Antrostomus vociferus*) were completed simultaneously with the amphibian call surveys using the same ARUs. Recordings were captured between June 15th and July 15th 2025 as per the *Ontario Nightjar Survey Instruction Manual* (Hannah 2021). Common Nighthawk and Eastern Whip-poor-will were recorded as present or absent at each of the Amphibian ARU locations within the Study Area.

3.2.8 Bat Acoustic Surveys

Bat acoustic surveys were completed in June 2025 to assess SAR bat presence using 5 autonomous recording units (ARUs). The ARU models were Wildlife Acoustic's Mini Bat 4 and SM3 units. The ARUs were programmed to record 30 minutes before sunset to 30 minutes after sunrise and deployed for 10 good weather nights (no rain, temperatures above 10°C, wind less than 20 km/h).

The recordings were then analyzed using Wildlife Acoustic's Kaleidoscope Pro software through automatic identification. Recordings were verified by a qualified biologist familiar in bat calls. Bat species were confirmed through visual confirmation from spectrographs. The location of each bat ARU is shown in **Figure A3, Appendix A**.

3.2.9 Incidental Wildlife Observations and Habitat Features

Incidental wildlife observations and wildlife habitat features were documented during the field investigations and include any species observations outside of targeted surveys. This information was collected for inclusion in the SWH assessment. Wildlife habitat features that were documented included, but were not limited to, rock piles, stick nests or other nests of wildlife, burrows, evidence of wildlife such as scat, tracks, and predated nests, among others.

3.3 Significant Wildlife Habitat Assessment

A preliminary screening for confirmed and candidate SWH was completed for the Study Area following the *SWH Criteria Schedules for Ecoregion 6E* (MNRF 2015). The screening was completed based on vegetation communities identified during the site investigation, with results provided in **Section 4.11.3**.

The MNR provides specific guidance on identifying and assessing wildlife habitat in the Significant Wildlife Habitat (SWH) Criteria Schedules for Ecoregion 6E (MNRF 2015). Other guidance documents used as part of the SWH assessment included the SWHTG (MNR 2000) and Natural Heritage Reference Manual (NHRM; MNR 2010). The MNR recognizes five (5) main categories of wildlife habitat, each with several wildlife habitat types. The general definitions of these habitat types are provided below:

- **Seasonal Concentration Areas of Animals** – defined as "areas where animals occur in relatively high densities for the species at specific periods in their life cycles and/or in particular seasons" and areas that are "localized and relatively small in relation to the area of habitat used at other times of the year" (MNR 2010).
- **Rare Vegetation Communities** – defined as "areas that contain a provincially rare vegetation community and areas that contain a vegetation community that is rare within the planning area" (MNR 2010).
- **Specialized Habitat for Wildlife** – defined as "areas that support wildlife species that have highly specific habitat requirements, areas with high species and community diversity, and areas that provide habitat that greatly enhances species' survival" (MNR 2010).

- **Habitat for SOCC** – defined as "habitats of species that are designated at the national level as endangered or threatened by COSEWIC, which are not protected in regulation under Ontario's ESA, 2007; habitats of species listed as special concern under the ESA, 2007 on the SARO List (formerly referred to as "vulnerable" in the SWHTG); and habitats of species that are rare or substantially declining, or have a high percentage of their global population in Ontario" (MNR 2010). More specifically, species of conservation concern (SOCC) include:
  - **Globally rare species** – These species are assessed by NatureServe and assigned a global conservation status rank (G-rank) of G1 to G3.
  - **Nationally rare species** – These species are assessed by COSEWIC as extirpated, endangered, threatened, or special concern but not listed in SARA; species not protected under SARA including those designated as special concern on Schedule 1 (e.g., Monarch [*Danaus plexippus*]) or any of the listed species in Schedule 2 and Schedule 3; species on non-federal land listed on Schedule 1 of SARA, other than migratory birds and fish.
  - **Provincially rare species** – These species are designated and assessed under two categories: species listed as special concern on the SARO List, and species that are assigned a provincial sub-national conservation status rank of S1 to S3. There are species that can be found in both categories.
- **Animal Movement Corridors** – defined as "elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another" (MNR 2000).

3.4 Species at Risk Screening

This report considers species at risk (SAR) as those classified as extirpated, endangered or threatened and protected under the ESA and/or SARA, as defined below:

- Provincially protected species on the Species at Risk in Ontario (SARO) List under *Ontario Regulation 230/08*.
- Federally listed migratory birds and fish on Schedule 1 of SARA; these species are protected anywhere they occur, including non-federal lands. All other federally listed species are generally (except through an Order) only protected under SARA if they occur on federal lands.

A background review was completed to identify potential SAR previously recorded in proximity to the Study Area. All identified species were screened for habitat suitability, availability, and likelihood to occur within the Subject Property. The results of the screening are provided in **Section 4.12**.

4 Existing Conditions

4.1 Landforms, Soils and Geology

The physiographic landform in the Study Area comprises shallow till and tock ridges. This landform consists of shallow till deposits interspersed with exposed rock ridges, primarily shaped by glacial scouring. The thin soil layer, often comprising silty sand or sandy till, overlies bedrock, creating a rugged, uneven landscape with poor drainage and minimal soil development.

The physiographic region in the Study Area comprises the Ottawa Valley Clay Plains. The Ottawa Valley Clay Plains are characterized by flat to gently undulating terrain formed by the deposition of fine-textured sediments in glacial lakes. These clay plains feature poorly drained, compact soils, primarily consisting of clay and silt, which influence land use, vegetation, and drainage patterns in the region.

Surficial geology in the Study Area consists of fine-textured glaciomarine deposits, primarily silt and clay with minor sand and gravel components. Additionally, parts of the area are characterized by Precambrian bedrock and silty sand to sandy till deposits on Precambrian terrain, reflecting the area's glacial history and underlying geological diversity (City of Ottawa 2025).

4.2 Designated Areas

Designated Areas are defined by resource agencies, municipalities, the government and/or the public, through legislation, policies, or approved management plans, to have special or unique value. Such areas may have a variety of ecological, recreational, and/or aesthetic features and functions that are highly valued. Designated areas include provincial land use and environmental plan areas, national and provincial parks, designated federal wildlife/marine areas, Areas of Natural or Scientific Interest (ANSIs) and environmentally sensitive areas.

The western limit of the Study Area is within the NHS Core Area, as shown on Schedule C11-A of the City's OP (Figure 1), as well as the Carp Hills regional significant candidate life science ANSI from data obtained from GEO (**Figure A1, Appendix A**). These designated areas are within the City's Environmental Protection zoning. The proposed development is not expected to encroach within these areas.

4.3 Field Investigation Conditions

The weather, temperature, and conditions of the field investigations (October 2024, May - July 2025) are summarized in **Appendix F**.

4.4 Aquatic Resources

4.4.1 Surface Water and Groundwater

The Study Area is located within the Chaudiére Falls-Ottawa River Quatenary Watershed.

A high-level aquatic habitat assessment of a section of the unnamed SWF that bisects the Study Area was conducted concurrently with the ELC survey to document existing conditions within the Study Area (**Figure A3, Appendix A**) in 2024. A section of the unnamed SWF was not assessed in the northerly parcel, as cattle (*Bos taurus*) and a bull were present, and it was deemed a safety hazard. A more detailed aquatic habitat assessment was completed on June 2, 2025, and three reaches were assessed (**Figure A3, Appendix A**).

This unnamed SWF appears to originate from the Carp-Hills Wetland Complex – Swamp south of the Study Area. Within the Study Area, background information (GEO n.d.) identifies this watercourse as having a permanent flow regime and no assigned thermal regime. This SWF, when flowing, would flow in a northerly direction. Within the Study Area, the MVCA regulation mapping (MVCA 2024) does show this SWF but no associated regulation limit. The Carp-Hills Wetland Complex does have a regulation limit (MVCA 2025).

<u>Reach 1</u>

Reach 1 was assessed from the Study Area through the agricultural field to where aquatic habitat conditions changed (tile drain outlet location) (**Figure A3, Appendix A**).

Between the Project Area and Study Area the unnamed SWF was observed to flow overland from a beaver dam / beaver pond (**Photos 1-4, Appendix B**) for approximately 80 m to the agricultural field, then disappears underground within the agricultural field (**Photos 5-3, Appendix B**).

Within this assessed reach, the channel lacks definition, appearing to be an ephemeral feature with a low gradient that directs excess surface water from the swamp in a northerly direction. A tile drain was observed (Shown on **Figure A3, Appendix A**), indicating that the field may be tiled (or was historically), and the surface flow has the potential to be excess surface water that the tiles cannot handle. The assessed reach is located within an active agricultural field, and the SWF is consistently affected by normal farming procedures. At the time of the assessment in October 2024 and June 2025, a slow flow was identified within the SWF in Reach 1, with small pools of water being present in ruts created by farming equipment. The SWF was primarily grass/hay lined with no sorting of substrates being present. No aquatic habitat or in-stream features were identified in the assessed reach.

Reach 2

Reach 2 was assessed from the tile drain outlet to the online agricultural pond (**Figure A3, Appendix A**).

The unnamed SWF the runs along the northern side of the fence line (between the two parcels; **Photos 9-10, Appendix B**) before continuing in a northerly direction (**Photos 11-13, Appendix B**). Within this reach, the channel gains definition and limited flow was present, although limited through dense vegetation. The vegetation was primarily terrestrial grasses with limited early cattail (Typha) growth. No riffles, runs or pools were observed within this reach. Flow was observed to increase farther downstream / closer to where it outlets to the online agricultural pond.

As the property is an active pasture for cattle, the unnamed SWF is heavily degraded through farming practices and cattle trotting. Limited boulders were identified near the fence line. No aquatic habitat or in-stream features were identified in the assessed reach, which is likely ephemeral or intermittent.

Agricultural Pond

The unnamed SWF inlets to a small agricultural pond, as shown on **Figure A3, Appendix A**. The agricultural pond is online, with flow being present at the inlet and outlet (**Photos 14-17, Appendix B**). No flow was observed within the pond. In-pond vegetation was present and provided through Slender Naiad (*Najas flexilis*) and Water Plantain (*Alisma triviale*). Substrate within the pond were comprised of clay (60%), silt (20%), muck (10%) and detritus (10%).

The pond feature has been impacted by the presence of cattle and the banks were observed to have erosion, likely from the cattle.

Reach 3

Reach 3 was assessed from the agricultural pond outlet (**Photos 18-20, Appendix B**) to Marchurst Road (**Figure A3, Appendix A; Photo 21-22, Appendix B**).

The first section of this reach within the agricultural field was primarily slow sheet flow through dense terrestrial grasses and hummocks. The second section, where there was more natural surrounding land use had a more defined channel with limited sinuosity and substrate sorting. Limited in-stream cover is also provided in the second section of Reach 3. Morphology was sheet flow and runs with one bedrock cascade that was limiting fish passage and a pool. Substrates were comprised of clay (35%), gravel (20%), cobble (15%), sand (10%), muck (10%), and detritus (10%).

At Marchurst Road, a new HDPE round culvert is present, directing the channel under the Road. The unnamed SWF then runs immediately adjacent to the east side of Marchurst Road through a roadside ditch. This is different than what was indicated on background mapping (**Figure A1, Appendix A**).

Along the western side of Marchurst Road where the access road is proposed, a grass lined, undefined, roadside ditch is present. This ditch was not investigated during the aquatic habitat assessment as no feature was identified. Through review of google imagery, this section of the roadside ditch is contained between two existing access/laneways. No culverts are present under the existing access/laneways. A CSP round culvert is present within this section under Marchurst Road, likely to act as an equalization culvert. The roadside ditch on the adjacent side where the culvert is present is also a grass lined and undefined.

4.4.2 Fish Habitat

No fish community data were available for the unnamed SWF (GEO n.d.).

Fish community assessment was completed within the Study Area on June 2, 2025 using dip-nets.

No fish were captured within Reach 1, although Brook Stickleback (*Culea inconstans*) were observed within the beaver pond feature. As this reach is ephemeral with no channel definition, it would provide seasonal indirect fish habitat.

No fish were captured or observed within Reach 2. The majority of this reach would only provide seasonal indirect fish habitat. A small section (approximately 5 m in length) immediately upstream of the agricultural pond has the potential to provide seasonal direct fish habitat.

Brook Stickleback (**Photo 23, Appendix B**) were captured within the online agricultural pond. No other species of fish were captured or observed. Brook Stickleback are a common, native, baitfish with a coolwater thermal regime preference (Eakins 2025). The pond provides direct fish habitat and as it is connected to the unnamed SWF, it is not considered an artificial waterbody and the provisions within the *Fisheries Act* would be applicable.

Brook Stickleback were also captured within Reach 3, close to the pond outlet. Additional unidentifiable young-of-year baitfish were observed at the downstream end of the culvert under Marchurst Road. This reach provides seasonal direct fish habitat.

4.5 Vegetation Cover

The Study Area is within the rural landscape and includes a mix of agriculture and naturalized areas, including meadows, woodlands and wetlands. The proposed development is primarily located on agricultural land used for perennial cover crops (**Photo 24, Appendix B**) and pasture (**Photo 25, Appendix B**) with the access road encroaching within a woodland community (**Photo 26, Appendix B**), specifically Dry-Fresh Oak-Maple Deciduous Forest/ Oak-Red Maple-Pine Non-Calcareous Treed Rock Barren (FODM2-1/RBTB2-3). Wetlands are also present within the Study Area, including unevaluated wetlands (**Photo 27, Appendix B**) and the Carp Hills PSW. The majority of these wetlands are located west of the hydro corridor within the western portion of the Study Area. A summary of vegetation communities documented within the Study Area is provided in **Table 4-1** and shown on **Figure A2, Appendix A**.

Table 4-1 Vegetation Communities within the Study Area

ELC Code	Community Description	Project Development	Adjacent Lands
Constructed			
CVI_1 (Transportation)	Two lane road that runs along Marchurst Road.	No	Yes
CVI_4 (Power Generation)	Hydro corridor (**Photo 28, Appendix B**) running east-west across the Study Area. Additional species include: Willow sp, Trembling Aspen (*Populus tremuloide*s), Purple Loosestrife (*Lythrum salicaria*), Dark-green Bullrush (*Scirpus atrovirens*), Pearly Everlasting (*Anaphalis margaritacea*), Poison Ivy, Common Mulligan (*Verbascum thapsus*), Red Raspberry (*Rubus idaeus*), Wild Strawberry, Common Milkweed, Rock Polypody (*Polypodium virginianum),* Poverty Oat Grass (*Danthonia spicata*), Intermediate Woodfern (*Dryopteris intermedia*), Lichens (Ascomycetes sp.), Grasses (Poaceae sp.), Sedges (Carex sp), Mosses (Bryophytes sp.).	No	Yes
CVR_R (Rural Property)	Houses on rural residential property off Marchurst Road.	Yes	Yes
Agriculture			
OAGM2 (Perennial Cover Crops)	Agricultural fields that appear to be used for hay. Additional species include Red Clover (*Trifolium pratense*), Bedstraw (*Rubiaceae*), Cinquefoil (Potentilla sp.), Common Milkweed (*Asclepias syriaca*), Solidago sp., Rushes (Juncus sp.), Grasses (Poaceae sp), and Orchard Grass (*Dactylis glomerata*).	Yes	Yes
OAGM4 (Open Pasture)	Mixed grass species dominant cattle pasture. Area near fence line has sedges and rushes. Additional species include Apple trees (*Malus* sp.), Glossy Buckthorn, Red Clover, Fleabane (*Erigeron* sp.), Common Milkweed, Water Marigold (*Caltha palustris*), Common Dandelion (*Taraxacum officinale),* and Orchard Grass.	Yes	Yes
Meadow			
MEMM4 (Fresh-Moist Mixed Meadow Ecosite)	Mix of grasses (Poaceae sp) and broadleaf species.	No	Yes

ELC Code	Community Description	Project Development	Adjacent Lands
Woodland			
FODM2-1/ RBTB2-3 (Dry-Fresh Oak-Maple Deciduous Forest/ Oak-Red Maple-Pine Non-Calcareous Treed Rock Barren)	Freeman's Maple (*Acer freemanii*) is dominant in the canopy and sub-canopy. Trembling Aspen (*Populus tremuloides*) Northern Red Oak (*Quercus rubra*), Paper Birch (*Betula papyrifera*), and Butternut (*Juglans cinerea*) also in canopy. Sub-canopy is composed of Freeman's Maple, Trembling Aspen, and American Basswood (*Tilia americana*). Understory is dominated by Glossy Buckthorn (*Rhamnus frangula*), Staghorn Sumac (*Rhus typhina*), and Willows (*Salix* sp.). Additional species include: Green Ash (*Fraxinus pennsylvanica*), American Elm (*Ulmus americana*), Tatarian Honeysuckle (*Lonicera tatarica*), Juniper (*Juniperus communis*), Common Hawkweed (*Hieracium lachenalii*), Wild Blueberry (*Vaccinium angustifolium),* Wild Strawberry (*Fragaria vesca*), Flattop Goldenrod (*Euthamia graminifolia*), Red Clover (*Trifolium pratense*), New England Aster (*Symphyotrichum novae-angliae*), Solidago sp, Riverbank Grape (*Vitis riparia*), Wild Raspberry (*Rubus moluccanus*), Tufted Vetch (*Vicia cracca*), Chicory (*Cichorium intybus*), Northern Lady Fern (*Athyrium angustum),* Sensitive Fern (*Onoclea sensibilis*), Common Bracken Fern (*Pteridium aquilinum*), Reindeer Lichen (*Cladonia rangiferina*), Haircap Moss (*olytrichum Commune*), Rushes (Juncaceae sp.), Sedges (Cyperaceae sp.), Grasses (Poaceae sp.). Patchy to semi-open treed communities; understory plant cover patchy to continuous. Igneous and metamorphic rock, patchy soil development, treed rock barrens typically reflect greater accumulation of soil cover over the bedrock or more fracturing of bedrock to allow for root penetration; substrate depth <15 cm and viable; extremes in moisture and temperatures (**Photos 29-30, Appendix B**).	Yes	Yes
FODM4-7 (Dry-Fresh Red Maple Deciduous Forest)	Tree species associations that are either relatively uncommon or a result of disturbance or management. Moderately dry to fresh moisture regimes and often found on upper to middle slopes or tablelands. Canopy and sub-canopy species appear to be Freeman Maple, Trembling Aspen, Paper Birch, and Sugar Maple (*Acer saccharum*).	No	Yes

ELC Code	Community Description	Project Development	Adjacent Lands
FODM4-7/RBTB2-3 (Dry-Fresh Red Maple Deciduous Forest/ Oak-Maple-Pine Non-Calcareous Treed Rock Barren)	Canopy is composed of Red Maple (*Acer rubrum),* Trembling Aspen, Bur Oak (*Quercus macrocarpa),* Northern Red Oak. Sub-canopy dominated by Glossy Buckthorn, Trembling Aspen, Freeman's Maple, and Bur Oak. Understory is composed of Glossy Buckthorn, Common Buckthorn, and Trembling Aspen. Forest ground layer includes Mosses (Bryophyta sp.), Grasses (Poaceae sp.), Sedges (Cyperaceae sp.), and Common Bracken Fern (*Pteridium aquilinum*). Additional species include Eastern White Pine (*Pinus strobus*), American Basswood (*Tilia americana*), Trembling Aspen, Ironwood (*Ostrya virginiana*), Black Cherry (*Prunus serotina*), White Spruce (*Picea glauca*), Ground Ash (*Sorbus americana Marsh*), Beaked Hazelnut (*Corylus cornuta*), Red Clover (*Trifolium pratense*), Solidago sp., Poison Ivy (*Toxicodendron radicans*), Aster sp., Patridge Berry (*Mitchella repens*), Barren Strawberry (*Waldsteinia fragarioides*), Horsetail (*Equisetum* sp.), Gooseberry (Phyllanthaceae sp.), Pearly Everlasting (*Anaphalis margaritacea),* Intermediate Bellflower (*Campanula intercedens*), Intermediate Woodfern (*Dryopteris intermedia*). Patchy to semi-open treed communities; understory plant cover patchy to continuous. Igneous and metamorphic rock, patchy soil development, treed rock barrens typically reflect greater accumulation of soil cover over the bedrock or more fracturing of bedrock to allow for root penetration; substrate depth <15 cm and viable; extremes in moisture and temperatures (**Photos 31-32, Appendix B**).	No	Yes
WOD (Deciduous Woodland)	Deciduous tree species dominant and tree cover is >75%	No	Yes
Wetland			
SWTM3/SWTM5-8 (Willow Mineral Deciduous Thicket/ Non-native Mineral Deciduous Thicket Swamp)	Thicket swamp (**Photos 33-34, Appendix B**) is dominated by Willows (Salicaceae sp.) and Buckthorn (Rhamnaceae sp.) species. Mineral and peaty phase mineral substrates. Seasonal flooding can be apparent; substrates may be aerated by early to mid summer. Additional species include Green Ash (*Fraxinus pennsylvanica*), Purple Loosestrife (*Lythrum salicaria),* Spotted Joe Pye Weed (*Eutrochium maculatum),* Aster sp., Solidago sp., Smooth Brome (*Bromus inermis*), Grasses sp. (Poaceae sp.), Sedges sp. (Carex sp.).	No	Yes

4.6 Amphibians

Survey results for 2025 amphibian call counts are provided in **Table 4-2**.

Table 4-2 Amphibian Call Count Survey Results

Station	Habitat	Date	Western Chorus Frog	American Toad	Species – Calling Level			
					Gray Treefrog	Green Frog	Northern Leopard Frog	Spring Peeper
AMP01	Pond between FODM2-1/ RBTB2-3 and OAGM2	April 17		1	3			3
		April 29			3			3
		May 14			2		1	3
		May 29			2			
		June 15				1		
		June 30				1		
AMP02	Swale in FODM2-1/ RBTB2-3	April 17						3*
		April 29						3*
		May 14					1*	3*
		May 29				1*		
		June 15			1*	1*		
		June 29						
AMP03	SWTM3/SWTM5-8	April 17						3
		April 29						3
		May 14						3
		May 29			1			
		June 15			1			
		June 29			1			
AMP04	FODM4-7/RBTB2-3	April 17						3
		April 29	1					3
		May 14	1		1			3
		May 29			1			
		June 15			1			
		June 29			2			

* Notes:

Calling from more than 100 m from the survey station.

Call activity levels: 1 – distinct number of calls; 2 – overlapping calls; full chorus

Eight species of calling amphibians were recorded on the Subject Property: Spring Peeper (*Pseudacris crucifer*), American Toad (*Anaxyrus americanus*), Gray Treefrog (*Dryophytes versicolor*), Northern Leopard Frog (*Lithobates pipiens*), Western Chorus Frog (*Pseudacris triseriata*), Green Frog (*Rana clamitans*), and incidentally: American Bullfrog (*Lithobates catesbeianus*) and Wood Frog (*Lithobates sylvaticus*).

Full choruses of frogs were detected at all four stations, however, calls at AMP02 were distant (no calls were detected within 100m of the station). Spring Peeper was the most abundant species heard calling in full chorus at each station. Station AMP01 had the highest diversity with four species observed during the calling surveys plus 1 incidental species (American Bullfrog).

One federal species at risk, Western Chorus Frog, was observed at Station AMP04 during the call survey, located more than 120m from the proposed Project, to the south on the opposite side of the hydro corridor. Western Chorus Frog was recorded incidentally at all four Amphibian Call stations.

4.7 Turtles

Turtle basking surveys were completed on May 28, June 4, 5, 10, and 11 2025. Two species were confirmed in the Study Area – Midland Painted Turtle (*Chrysemys picta*) and Blanding's Turtle (*Emydoidea blandingii*).

Two Midland Painted Turtles were observed basking in a pond between the FODM2-1/ RBTB2-3 and OAGM2. An additional three were observed in the SWTM3/SWTM5-8 to the south of the hydro corridor. Both features are more than 120m from the proposed project.

One (1) Blanding's Turtle (**Photo 35, Appendix B**) was observed basking in the SWTM3/SWTM5-8, more than 120m away from the proposed project (**Figure A3, Appendix A**).

4.8 Breeding Bird Survey Results

Forty-five (45) species were recorded during the breeding bird surveys across the eight point-count stations including 2 SAR species (Bobolink [*Dolichonyx oryzivorus*] and Eastern Meadowlark [*Sturnella magna])* and 3 SOCC species (Barn Swallow [*Hirundo rustica*] and Eastern Wood-pewee [*Contopus virens*], and Wood Thrush [*Hylocichla mustelina*]).

Bobolink and Eastern Meadowlark were recorded within the Project Footprint and within the Study Area. Barn Swallow and Eastern Wood-pewee were recorded within the Study Area, approximately 500m and 300m northeast of the Project Footprint. Wood Thrush was recorded approximately 300 m south of the Project Footprint.

Additional bird species recorded include: Alder Flycatcher (*Empidonax alnorum*), American Crow (*Corvus brachyrhynchos*), American Goldfinch (*Spinus tristis*), American Redstart (*Setophaga ruticilla*), American Robin (*Turdus migratorius*), Black-and-white Warbler (*Mniotilta varia*), Black-capped Chickadee (*Poecile atricapillus*), Blue Jay (*Cyanocitta cristata*), Brown Thrasher (*Toxostoma rufum*), Cedar Waxwing (*Bombycilla cedrorum*), Chestnut-sided Warbler (*Setophaga pensylvanica*), Clay-colored Sparrow (*Spizella pallida*), Common Grackle (*Quiscalus quiscula*), Common Yellowthroat (*Geothlypis trichas*), Downy Woodpecker (*Dryobates pubescens*), Eastern Kingbird (*Tyrannus tyrannus*), Field Sparrow (*Spizella pusilla*), Great-crested Flycatcher (*Myiarchus crinitus*), House Wren (*Troglodytes aedon*), Indigo Bunting (*Passerina cyanea*), Killdeer (*Charadrius vociferus*), Mallard (*Anas platyrhynchos*), Mourning Dove (*Zenaida macroura*), Nashville Warbler (*Leiothlypis ruficapilla*), Northern Cardinal (*Cardinalis cardinalis*), Northern Flicker (*Colaptes auratus*), Ovenbird (*Seiurus aurocapilla*), Red-breasted Nuthatch (*Sitta canadensis*), Red-eyed Vireo (*Vireo olivaceus*), Ruffed Grouse (*Bonasa umbellus*), Savannah Sparrow (*Passerculus sandwichensis*), Scarlet Tanager (*Piranga olivacea*), Song Sparrow (*Melospiza melodia*), Trumpeter Swan (*Cygnus buccinator*), Turkey Vulture (*Cathartes aura*), Veery (*Catharus fuscescens*), White-breasted Nuthatch (*Sitta carolinensis*), White-throated Sparrow (*Zonotrichia albicollis*), Yellow Warbler (*Setophaga petechia*).

4.9 Crepuscular Bird Survey Results

Common Nighthawk and Eastern Whip-poor-will were detected at all four ARU locations within the Study Area across the survey period (June 15 – July 15th). Both species were heard calling during the survey period while the territorial wing boom of the Common Nighthawk was also heard.

American Robin, American Woodcock (*Scolopax minor*), Alder Flycatcher, Barred Owl (*Strix varia*), Black-billed Cuckoo (*Coccyzus erythropthalmus*), Canada Goose (*Branta canadensis*), Common Gallinule (*Gallinula galeata*), Eastern Wood-pewee, Field Sparrow, Mallard, Ovenbird (*Seiurus aurocapilla*), Ring-billed Gull (*Larus delawarensis*), Sora (*Porzana carolina*), Song Sparrow, Turkey (*Meleagris gallopavo*), Veery, Wilson's Snipe (*Gallinago delicata*), and Yellow Warbler were also incidentally heard.

Incidental mammal species heard include American Black Bear (*Ursus americanus*), Coyote (*Canis latrans*), domestic cow (*Bos taurus*), domestic dog (*Canis familiaris*), and Eastern Cottontail (*Sylvilagus floridanus*).

4.10 Bat Acoustic Survey Results

Six (6) bat species were confirmed during the 2025 acoustic surveys: Big Brown Bat (*Eptesicus fuscus*), Eastern Red Bat (*Lasiurus borealis*), Hoary Bat (*Lasiurus cinereus*), Silver-haired Bat (*Lasionycteris noctivagans*), Little Brown Bat (*Myotis lucifugus*), and Tri-colored Bat (*Perimyotis subflavus*) across 40 days. ARU Bat 2 recorded for 30 days (versus 40 days) across 2 periods (**Table 4-3**) due to unknown recording error.

Big Brown Bats were the most frequently detected species with 5163 calls, followed by Silver-haired Bats (4381 calls). Big Brown Bats and Silver-haired Bats have echolocation calls that are similar and can be difficult to distinguish if the recordings are not high quality. The combined category of Big Brown Bat and Silver-haired Bat calls were detected 109 times. Eastern Red Bat was detected 89 times, while calls that were indistinguishable between Eastern Red Bat and Tri-colored Bat were detected once (1). Tri-colored Bat was detected once (1). Hoary Bat was detected 1728 times and Little Brown Myotis was detected 63 times. Calls that could only be identified as Myotis sp were detected 43 times. Some bat calls could only be identified only as ‘high frequency’ (approximately 52 calls) and ‘low frequency’ (approximately 1084 calls).

Table 4-3 Results of the Acoustic Bat Surveys

Station	Start Date	End Date	Number of Recording Nights	Big Brown Bat	Eastern Red-bat	Eastern Red-bat/ Tri-colored Bat	Hoary Bat	Silver-haired Bat	Big Brown Bat/ Silver-haired Bat	Little Brown Myotis	Myotis sp	Tri-colored Bat	LowF	HighF	NoID	Total
Bat-1	21-May-25	19-Jun-25	29	890	8	1	151	1083		10	11		140	1	360	2655
Bat-2	21-May-25	30-May-25	9	3388	73		1287	1340	73	23	14		397	26	1037	7658
	10-Jun-25	30-Jun-25	20													
Bat-3	21-May-25	20-Jun-25	30	362	1		114	370	6	7	3	1	140	8	135	1147
Bat-4	21-May-25	19-Jun-25	29	109			33	265	13	9	15		134	3	54	635
Bat-5	21-May-25	30-Jun-25	40	414	7		143	1323	17	14			273	14	468	2673

4.11 Significant Natural Heritage Features

4.11.1 Significant Wetlands

There are unevaluated wetlands and one PSW (Carp Hills wetland complex) within the Study Area; these wetlands are not within the Subject Property. All wetlands within the Study Area are characterized as swamp communities. The majority of these wetlands are located within the NHS Core Area, within the western extent of the Study Area. These wetlands are shown on **Figure A1, Appendix A**. As per Section 4.9.3 from the City of Ottawa's OP, a 30m setback will be established around wetland and aquatic features and lands within the setback shall remain in a naturally vegetated condition to protect the ecological function of surface water features from land-use impacts. As discussed in Section 6.3.1, an exemption to the setback will be applied in limited circumstances, where impacts to the surface water features can be mitigated.

4.11.2 Significant Woodlands

Significant woodlands may be included in the Natural Heritage Overlays mapping on Schedule C11-A of the City's OP (**Figure 1**) or can be evaluated through an EIS. The Study Area is within the Natural Heritage Overlays (which also encompasses the NHS) with the associated woodlands assumed to be significant. There are additional woodlands east of the hydro corridor that are not within the Natural Heritage Overlays or NHS but are also assumed to be significant based on findings in this EIS. The FODM2-1/RBTB2-3 has the potential to provide habitat for SOCC (see **Section 4.11.3.3)** and bat SAR (**Section 4.10**).

4.11.3 Significant Wildlife Habitat

The following sections include a summary of the SWH types within the Study Area. A full assessment of SWH is provided in Appendix C. There were no rare vegetation communities identified in the Study Area.

4.11.3.1 Seasonal Concentration Areas

- Bat Maternity Colony Habitat (Big Brown Bat and Silver-haired Bat):
  - All FOD, FOM, SWM, and SWD Ecosites: maternity colonies can be found in tree cavities and vegetation in mature deciduous or mixed forests with > 10/ha large diameter (> 25 cm DBH) trees in the early stages of decay.
  - Maternity colony habitat can be confirmed by > 10 Big Brown Bats and or > 5 Adult Female Silver-haired Bats (Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects").

- Turtle Wintering Areas (Midland Painted Turtle, Northern Map Turtle, Snapping Turtle, Blanding's Turtle):
  - ELC communities of SW and open water areas that are deep enough to be used as overwintering habitat.
  - For most turtles, wintering habitat is in the same general area as their core habitat. Water has to be deep enough not to freeze over and substrates need to be soft. Overwintering areas are lakes, wetlands, and water bodies with adequate Dissolved Oxygen.
  - Confirmation of turtle overwintering habitat includes the presence of 5 overwintering Midland Painted Turtles, one or more Northern Map Turtle or Snapping Turtle.
  - Field surveys confirmed presence of turtles in early spring and summer, suggesting overwintering. Two features are identified as SWH for Turtle Winter Area (**Photos 36-37, Appendix B**), however both are more than 120m from the proposed Project.

4.11.3.2 Specialized Habitats for Wildlife

- Colonially – Nesting Bird Breeding Habitat (Trees/Shrubs) (woodland; Great Blue Heron, Green Heron)
  - All ecosites associated with the ELC communities of SW.
  - Nests in live or dead standing trees in wetlands, lakes, islands and peninsulas. Shrubs and occasionally emergent vegetation may also be used.
  - Defining criteria should includes presence of 5 or more active nests of Great Blue Heron.
  - Potential to occur in the wetland complex to the southwest of the Project on the opposite side of the hydro corridor, more than 120m from the Project.
- Deer Yarding Areas
  - ELC Community Series providing a thermal cover component for a deer yard would include; FOM, FOC, SWM and SWC.
  - MNR determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual"
  - A Deer Wintering Area has been identified by MNR (Figure A1) in the forest/wetland complex to the southwest of the Study Area, more than 120m from the Project.
- Waterfowl Nesting Area
  - All ecosites associated with the marsh (MA) and swamp (SW)
  - A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur.
  - Potential for Waterfowl Nesting Areas to occur associated with the SWTM3/SWTM5-8.

- Woodland Raptor Nesting Habitat
  - All natural or conifer plantation woodland/forest stands >30ha with 10ha of interior habitat. Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers Hawk nest along forest edges sometimes on peninsulas or small off-shore islands.
  - Forest communities in the Study Area have the potential to support nesting raptors.
- Turtle Nesting Areas
- Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals.
- For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH.
- Suitable habitat observed in hydro corridor, more than 120m from Project.
- Amphibian Breeding Habitat (woodland; Eastern Newt, Blue-spotted Salamander, Spotted Salamander, Gray Treefrog, Spring Peeper, Western Chorus Frog, Wood Frog):
  - All ecosites associated with the ELC communities of: FOD, SWD, and OA.
  - Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.
  - Habitat criteria includes the presence of wetlands, pond, or woodlands pools (including vernal pools) >500 m2 (about 25 m diameter) within or adjacent (within 120 m) to a woodland (no minimum size).
  - Field studies confirmed presence of five species with full chorus of Spring Peepers calling. Each of the three areas of SWH for amphibian breeding are more than 120m from the Project.
- Woodland Area Sensitive Bird Breeding Habitat (Yellow-bellied Sapsucker, Red-breasted Nuthatch, Veery, Blue-headed Vireo, Northern Parula, Black-throated Green Warbler, Blackburnian Warbler, Black-throated Blue Warbler, Ovenbird, Scarlet Tanager, Winter Wren, Cerulean Warbler, Canada Warbler):
  - Habitat ecosite classes include FOD within the Study Area.
  - Habitat criteria includes habitat where interior forest breeding birds are breeding, typically large mature (>60 years old) forest stands or woodlots >30 ha, interior forest habitat at least 200 m from forest edge habitat (this size description only applies to the FODM4-7/RBTB2-3 community in the southwest section of the Study Area).
  - Defining criteria includes the presence of nesting or breeding pairs of 3 or more of the listed wildlife species, and or any site with breeding Cerulean Warblers or Canada Warbler.
  - Woodland in the Study Area have interior habitat more than 200m from the forest edge and have the potential to support Area Sensitive Bird Breeding Habitat.

4.11.3.3 Habitat for Species of Conservation Concern

- Special Concern and Provincially Rare (S1-S3) plant and animal species:
  - This includes all plan and animal occurrence within a 1 or 10 km grid:
    - See **Table 2, Appendix D** for an assessment of SOCC species which may occur in the Study Area.
  - Defining criteria includes assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present and easily identifiable.
  - The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs to be easily mapped and cover an important life stage component for a species (such as nesting or foraging habitat).

4.11.3.4 Animal Movement Corridor Candidate SWH

- Amphibian Movement Corridors (Eastern Newt, American Toad, Spotted Salamander, Four-toed Salamander, Blue-spotted Salamander, Gray Treefrog, Western Chorus Frog, Northern Leopard Frog, Pickerel Frog, Green Frog, Mink Frog, American Bullfrog):
  - Corridors may be found in all ecosites associated with water and determined based on identifying significant breeding habitat.
  - Habitat criteria for movement corridors are between breeding habitat and summer habitat.
  - Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH (see Amphibian Breeding Habitat-Wetland, above).
  - Defining criteria includes that field studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites.
  - Corridors should consist of native vegetation, with several layers of vegetation.
  - Corridors unbroken by roads, waterways, waterbodies, and undeveloped areas are most significant.
  - Corridors should have at least 15 m of vegetation on both sides of waterway or be up to 200 m wide of woodland habitat and with gaps <20 m.
  - Within the Study Area, wetland breeding habitat and upland forest habitat are directly connected, as such, no Amphibian Movement Corridors have been identified.

4.12 Species at Risk

4.12.1 SAR Grassland Birds

The background review identified several SAR with the potential to occur within the Study Area. The SAR screening is provided in **Appendix D** and summarized below and shown on **Figure A3, Appendix A**.

The presence of Bobolink (**Photo 38, Appendix B**) and Eastern Meadowlark was confirmed during the breeding bird surveys in the OAGM4 (pasture) and OAGM2 (hayfield) vegetation communities within the Project Area. The OAGM4 and OAGM2 vegetation communities provide suitable reproductive and foraging habitat for Bobolink and Eastern Meadowlark.

Eastern Meadowlark and Bobolink utilize agricultural areas such as hayfields, pastures, and meadows for nesting and rearing young between May 1 to July 31 (MECP 2021a). The NHIC (Ontario Geospatial 2023a), OBBA (Cadman et al. 2007), and iNaturalist (2024) have records of Eastern Meadowlark and Bobolink within 2 km of the Study Area.

4.12.2 SAR Bats

SAR bats (Eastern Red Bat, Hoary Bat, Little Brown Myotis, Silver-haired Bat, and Tri-colored Bat) were confirmed to be present in suitable reproductive and foraging habitat within the Project Area. Suitable foraging and reproductive habitat include forests (FODM2-1/RBTB2-3), woodlands (WOD) and swamp (SWTM3) vegetation communities. These areas contain large standing snags and mature trees (trees greater than 25 cm diameter at breast height [DBH]) that may act as suitable roost and maternity roosts for SAR bat species (MNR 2024).

A habitat assessment was completed in July 2025 for SAR bats **(Appendix G**).

4.12.3 Crepuscular Birds

Eastern Whip-poor-will presence was confirmed within the Project Area. Suitable reproductive and foraging habitat for Eastern Whip-poor-will is present in the form of deciduous forests with rocky outcrops (FODM2-1/RBTB2-3 and WOD vegetation communities). The NHIC (Ontario Geospatial 2023a), OBBA (Cadman et al. 2007), and iNaturalist (2024) have records of Eastern Whip-poor-will within a 2 km radius of the Study Area.

4.12.4 Blanding's Turtle

Field surveys confirmed the presence of 1 Blanding's Turtle within the Project Area. Suitable migration, basking, overwintering, and nesting habitat is present for Blanding's Turtles within the Project Area and Study Area.

A habitat assessment for Blanding's Turtle was completed in July 2025 based on the *Blanding's Turtle Recovery Strategy* (MECP 2019) and direction from MECP (Sarah Robbins per comms, July 28, 2025) based on recent changes to the habitat definition under the ESA. Full details are provided in **Appendix E**. Functional habitat is defined as habitat that meets the needs of the species (mating, nesting, thermoregulation, foraging, summer inactivity, and overwintering) throughout a home range which allows individuals to move between required resources (MECP 2019). Three areas within the Project Area were assessed for habitat suitability for Blanding's Turtle with findings recorded in Appendix D. The beaver pond within the swamp community (SWTM3/SWTM5-8) was confirmed as functional habitat for Blanding's Turtle. The pond located within the OAGM2 vegetation community was identified as having a medium suitability as being functional habitat for Blanding's Turtle while the pond within the pasture (OAGM4 community) was identified as low.

Blanding's Turtle may use the thicket wetland swamp (SWTM3/SWTM5-8) as corridor habitat for moving to and from the Provincially Significant wetland located south of the Study Area. Three unevaluated wetlands within the Project Area and 1 within the Study Area may provide suitable overwintering and foraging habitat. Blanding's Turtles may also attempt to nest within soft organic substrates found in the agricultural (OAGM2 and OAGM4) fields within the Project Area and Study Area.

While Blanding's Turtles may nest along the gravel shoulders of Marchurst Road and Thomas A. Dolan Parkway due to the presence of soft substrates, roads and road shoulders do not constitute suitable turtle nesting habitat (MECP 2021b). Unidentified eggshells were observed along the hydro corridor and sandy driveway off of Marchurst Road during the survey (**Photos 39-40, Appendix B**). These eggshells appear to be from a turtle a species (species unknown) and may have been predated upon earlier in the season. Records of Blanding's Turtles have been recorded in the NHIC (Ontario Geospatial 2023a), ORAA (2024), and iNaturalist (2024) within a 2 km radius of the Study Area, including records from 2024.

4.12.5 Black Ash

No Black Ash were observed during the 2025 field investigation surveys, including a targeted search within the Project Footprint. Black Ash can often be found growing along the edges of moist forests, hydro corridors, pastures, and swamps. The thicket swamp (SWTM5-8) and PSWs southwest of the Study Area may provide potentially suitable habitat for Black Ash as this vegetation community has moist soils and adequate sunlight. Black Ash have been recorded in iNaturalist within a 6 km radius of the Study Area (iNaturalist 2025). The Ontario Tree Atlas lists Black Ash as occurring within the Ottawa region (MNR 2025).

4.12.6 Butternut

During the ELC survey, twenty (20) mature Butternut (**Photos 41-42, Appendix A**) were located within the Project Area (**Figure A3, Appendix A**). Suitable habitat for Butternut was confirmed within the Project Area in the form of moist, well-drained soils within the deciduous forest and forest edge (FODM2-1/RBTB2-3) vegetation communities. Butternut is associated with deciduous forests where sunlight is plentiful such as in forest openings or along edges. Butternut require moist but well-drained soils, such as those along floodplains, ravines, and waterways. The maple and oak deciduous forest habitat provide

suitable habitat for Butternut to carry out its life processes. Butternut were assessed for health based on the *MNRF's Butternut Health Assessor's Field Guide* (2015). Only 1 tree was categorized as 'retainable' while the rest were identified as non-retainable (complete results are provided in **Appendix F**). The two Butternut trees within the proposed Project Footprint access route (Butternut 13 and Butternut 19) appeared dead and decaying.

4.13 Surface Water Feature

The SWF within the site has limited value and function. The SWF does not meet the definition of a watercourse, as per the *Conservation Authorities Act* 2024 which defines it as:

> "*a defined channel, having a bed and banks, sides, in which a flow of water regularly or continuously occurs*."

The SWF does meet the definition of a HDF which is defined within Credit Valley Conservation (CVC) and Toronto and Region Conservation Authority's (TRCA) Headwater Drainage Feature Guidelines (2014; subsequently referred to as "the HDF Guideline") as:

> *"non-permanently flowing drainage features that may not have defined beds or banks; they are first-order and zero-order intermittent and ephemeral channels, swales and connected headwater wetlands, but do not include rills or furrows".*

As the drainage feature within the site could be classified as an HDF, a rapid assessment following the HDF Guidelines has been completed. The guidelines typically employ a multiple survey approach to inform the evaluation, classification and management.

The unnamed SWF within the Study Area was not investigated during all seasons and as such, the hydrological functions have been based on the field investigations that did occur. The SWF is undefined through reach 1 and has limited definition with a large amount of terrestrial grasses within the feature through reach 2. Reach 2 feeds into an online pond. The hydrological function of this feature is considered to be contributing (ephemeral) or valued (intermittent). The SWF has been heavily impacted by farming practices. The on-line pond was likely created to provide a source or irrigation or water for livestock. Riparian habitat for the SWF within the Project Footprint is open pasture and perennial cover crops, which provides limited riparian functions. No direct fish habitat is present within the Project Footprint but may provide contributing functions to downstream habitat within the on-line pond and further downstream. No terrestrial habitat (limited function), as per the HDF guidelines, is associated with the HDF in the Project Footprint. Based on the existing conditions and the HDF guidelines, the management recommendation for this Unnamed SWF would be Mitigation. Management recommendations for mitigation are that the SWF must remain open, the hydroperiod must be maintained, connection to downstream must be maintained, and the function of the SWF must be replicated.

Section 4.9.3 of the OP provides policy direction on minimum setbacks for SWFs. For the realigned Unnamed SWF the minimum setback as per the OP would be 30 m from the top of bank. This setback, or constraint, is shown on **Figure A4, Appendix A.** Exceptions to minimum setbacks established using the OP may be considered for HDFs and other circumstances as described in Section 4.9.3, policies 6, 7, and 8 of the OP.

4.14 Fish Habitat

Fish habitat, as defined in the federal *Fisheries Act*, are those parts of the environment on which fish depend, directly or indirectly, to carry out their life processes. Fish SOCC are provided general habitat protections and are protected under this Act.

Fish habitat is provided within the unnamed SWF and online agricultural pond. Upstream of the pond the unnamed SWF provides seasonal indirect fish habitat. The pond provides direct fish habitat, and the downstream reach provides seasonal direct fish habitat. As such the provisions with the *Fisheries Act* may apply pending the proposed works.

No fish habitat is present along the western edge of Marchurst Road where the access road is proposed.

4.15 Natural Heritage Feature Summary

A summary of natural heritage features within the Study Area are summarized in **Table 4-4**.

Table 4-4 Summary of Natural Heritage Features

Natural Heritage Feature	Project Footprint	Study Area
Natural Heritage System, including cores and linkages	No	Yes (Core Area; Figure 1)
Natural Environment Areas	No	Yes (Figure 1)
Significant Wetlands	No	Yes (Figure A1, Appendix A)
Areas of Natural and Scientific Interest (Earth or Life Science)	No	Yes (regional candidate life science ANSI; Figure A1, Appendix A)
Habitat of SAR	Potential (Bobolink / Eastern Meadowlark)	Potential (Bobolink/Eastern Meadowlark, bats, Blanding's turtle)
Significant Woodlands	Yes (assumed)	Yes (assumed)
Significant Valleylands	No	No
Significant Wildlife Habitat	Yes (access road through woodland)	Potential (woodlands and wetland habitats)
Surface and Groundwater Features	Yes (SWF	Yes (SWF)
Fish habitat	Yes (indirect and direct)	Yes

5 Project Description

Brookfield Renewable Power Inc. (BRPI) is developing a 250 MW lithium iron phosphate Battery Energy Storage System (BESS) located at 2555 and 2625 Marchurst Road in Ottawa, Ontario. The site will consist of an access road connecting to Marchurst Road, 256 BESS containers capable of 1,000 MWh of energy storage, a 230 kV circuit connection and a 230 kV substation which will be fed by six (6) battery collector circuits. The detailed Site Plan is provided in Appendix K.

5.1 Design Considerations and Siting Rationale

The Project design was based on environmental, technical and engineering considerations. Alternatives were evaluated to reduce impacts to sensitive features while maintaining contractual and legal requirements.

5.1.1 Project Site Selection

Originally, the Project was intended to be fully hosted at 2555 Marchurst Road; however, preliminary studies identified cultural heritage and environmental constraints, such as SWH and SAR (turtles, bats, Butternut) and unevaluated wetlands. To mitigate these impacts, an additional property was leased at 2625 Marchurst Road, shifting the Project onto primarily mixed pasture lands. The southeast portion of the site was also moved back to maintain a 10 m setback from the significant woodland.

5.1.2 Access Road Placement

The proposed access road is required to maintain connectivity to 2555 Marchurst Road, which is the registered Point of Interconnection (POI) under existing contractual and legal requirements. The location through the woodland was carefully considered, including the possibility of routing the road slightly to the north and outside of the significant woodland, SWH and SAR habitat. Originally, 2555 Marchurst was to fully host the project, the additional property was leased to mitigate the natural and cultural heritage impact after preliminary studies were conducted. Specifically, 2625 Marchurst allowed for the Project to be shifted onto primarily mixed pasture and avoided several Butternut trees, unevaluated wetlands, potential turtle habitat and SAR bat habitat. The access road route on 2555 Marchurst Road was selected is in an area with exposed bedrock and primarily shrubs with the least number of mature trees. The selected alignment allowed for the shortest distance to site and was able to avoid several Butternut directly south of the access road, unevaluated wetlands, SWH and SAR such as turtles and bats (e.g., Eastern Small-footed Myotis).

5.2 Project Components and Activities

The following sections outline key Project components and activities during each of the Project phases. The site plan is provided in **Figure 4, Appendix A**.

The facility will include:

- 256 BESS containers, each weighing approximately 45,000 kg, installed on helical piles, concrete piers, gravel pads, or slab foundations.
- Main Power Transformer (MPT), within the substation to step up voltage from 34.5 kV to 230 kV for grid interconnection.
- Power Conversion Systems (PCS) and Medium Voltage Transformers (MVTs) to convert DC to AC and step up voltage.
- Underground electrical infrastructure, including 2/0 to 1500 kcmil cabling, conduits, grounding conductors, and termination kits.
- Low-voltage AC/DC wiring and auxiliary systems for each container.
- Fiber optic and copper communication cabling, supporting SCADA and IESO integration.
- A stormwater management system, including retention ponds and site grading.
- Access roads, gravel surfacing, and compacted subgrades.

5.2.1 Site Preparation

Prior to site clearing, all environmental mitigation, erosion and sediment control in the anticipated work area will be implemented. The potential risks and protective measures are further discussed in Section 6.1 (Potential Environmental Effects) and Section 6.2 (Mitigation and Protective Measures).

Site preparation will begin with tree and vegetation clearing which will commence in late 2025 and Q1 2026 for the entire developable area. The works will occur outside of the active season for breeding birds and bats. The anticipated tree clearing area is approximately 0.2 ha (0.6 acres), primarily along the access road. Tree clearing and site preparation will involve equipment such as feller bunchers, mulchers, excavators, skidders, and log loaders, etc.

Site preparation will include the realignment of the SWF which will commence in late 2025 and Q1. The new channel/ditch will be constructed offline and in the dry. Connection with the upstream and downstream locations will occur during the appropriate timing window.

Civil works will commence in late Q1 to Q3 2026 once site clearing is complete. This will include excavation, filling and grading, topsoil stripping and stockpiling, subgrade and gravel compaction, and final gravel surfacing. Road bedding will also be installed during this phase through the placement of granular material along the alignment of the access road.

5.2.2 Construction

The construction stage involves installation of major Project components. This will include construction of the foundations to support the BESS containers, installation of underground utilities, development of the substation and associated electrical systems, and construction of the stormwater management system. Additional works such as fencing, noise barriers will also be installed. Additional details are available in the Preliminary Construction Management Plan – South March BESS (Brookfield Renewable Partners 2025), prepared under separate cover.

5.2.2.1 Civil Works

Civil works will extend from late Q1 to Q3 2026 and includes including the installation of permanent access road, topsoil stripping, grading, stormwater management, trenching, and gravel surfacing. The laydown area will be established and site trailers will be mobilized. Standard heavy civil activities and equipment anticipated on site including excavators, loaders, hauling equipment, etc.

Delivery and installation of major equipment, including BESS containers, Main Power Transformer, HV Circuit Breakers, and associated equipment will commence in Q2 2026. The offloading of equipment will primarily be conducted with a crawler crane, boom trucks, telehandlers, etc. Offloading equipment will be on site only as needed, using pre-established delivery dates to minimize equipment on site.

5.2.2.1.1 Foundations and Noise Barriers

Foundation works will include the installation of helical piles, followed by the construction of gravel pads and slab foundations to support the BESS containers and associated equipment.

5.2.2.1.2 Underground Utilities

Underground utilities will be installed through cable and conduit trenching, followed by backfilling and compaction.

Installation of fire protection system, including fire hydrants, piping, and approximately 85,000L water holding tank.

5.2.2.1.3 Transmission Line and Substation

The project will interconnect the 250 MW BESS facility to the Hydro One (HONI) C3S 230 kV T-Line that runs parallel to 2625 and 2555 Marchurst Road, at the rear of the property.

Construction of the 230 kV substation will extend from Q2 2026 to Q1 2027, including grading, pouring concrete foundations, installing conduit and cabling, erecting steel structures, constructing the overhead bus, placing electrical equipment, and completing gravel surfacing.

5.2.2.1.4 Stormwater Management

Stormwater Management (SWM) measures will include culvert installation within the BESS project area to convey the stormwater to the new stormwater pond that will be excavated in the northwest portion of the Project. A swale will be constructed from the SWM pond outlet to the ROW/.

Realignment of the Unnamed SWF will also occur, involving the infilling of an approximately 200 m² portion of thSWF, and construction of a grass lined diversion ditch designed with 2:1 side slopes and a bottom width of approximately 1 m.

5.2.2.1.5 Fencing and Noise Barriers

Perimeter security fencing will be installed around the substation. An earthen berm will be installed as well as noise walls along the east side of each BESS container.

5.2.3 Post-Construction Restoration and Landscaping

Post-construction activities are anticipated to commence in Q3 2027. Site construction trailers and most construction equipment will be demobilized and the property surrounding the facility will be graded, seeded, and planted as per the Landscaping Plan.

Following completion of construction, site rehabilitation and landscaping activities will commence. This includes vegetation plantings in areas temporarily disturbed by construction, as well as vegetation screening. Reclamation and landscaping activities will commence in Q3 2027 for the fall planting window (August-September).

Trees that are removed will be quantified and incorporated into a rehabilitation plan currently being developed for the South March BESS property. The plan will include an anticipated 2-to-1 replacement ratio, meaning two trees will be planted for everyone removed.

5.2.4 Operations and Maintenance

5.2.4.1 Commissioning

Commissioning will occur between Q1 to Q3 2027 and consists of two phases: cold commissioning and hot commissioning. Cold commissioning of the facility will begin after mechanical completion, where all connections, equipment and wiring have been installed. Cold commissioning uses a 1000 kVA diesel generator to power the BESS container auxiliary panel and completes all checks and balances for the BESS containers prior to commencing hot commissioning. These include lighting, sensitive alarms, the fire annunciator panels, communication panels and other ancillary services.

Hot commissioning consists of fine-tuning the programming of the PCS, synchronizing the BESS containers and verifying integrity of the 34.5 kV electrical system. Hot commissioning will commence only when backfeed power is received from Hydro One. Final capacity testing is then completed with the IESO leading to COD.

5.2.4.2 Site Operations and Maintenance

Site operations and maintenance will include:

- Daily site operations to be completed remotely. One full-time dedicated operations manager will be responsible for daily operations, working from a local office nearby.
- Weekly grounds maintenance, such as grass cutting and snow removal to be completed as needed.
- Monthly visual inspections of the BESS site and substation
- Semi-annual / annual BESS and substation maintenance, including cleaning, detailed site inspections, fluid checks/replacements, mechanical operations (start/stop generator, manual operation of equipment to verify function), general maintenance and upgrades.

5.3 Project Schedule

The anticipated Project schedule is summarized in Table 5-1 by Project phase and associated key activities. Overall, site works are scheduled to commence in Q1 2026, with COD anticipated in Q3 2027.

Table 5-1 Summary of Project Schedule

Project Phase	Activity	Schedule
Site Preparation	• Implementation of environmental mitigation measures (e.g., erosion and sediment controls, etc.) • Clearing and grubbing	Q4 2025 – Q1 2026
Construction	• Civil works, including the installation of permanent access road, topsoil stripping, grading, stormwater management, trenching, and gravel surfacing • Establish Laydown area and mobilize site trailers • Installation of fire protection system, including fire hydrants, piping, and approximately 85,000L water holding tank. • Stormwater Management (SWM) Pond installation including the earthworks, liner installation, watercourse redirection, and diversion ditches • Installation of perimeter fence, sound wall, and earth berm	Late Q1 to Q3 2026
	• Construction of the 230 kV substation, including grading, foundations, cabling, steelwork, and commissioning • Delivery and installation of major equipment, including BESS containers, Main Power Transformer, HV Circuit Breakers, and associated equipment • Offloading equipment	Q2 2026 – Q1 2027
Commissioning	• Cold and hot commissioning • Final capacity testing with IESO leading to COD	Q1 to Q3 2027

Project Phase	Activity	Schedule
Post-Construction Restoration	• Demobilization of site construction trailers and equipment • Vegetation plantings and landscaping	Q3 2027
Operations and Maintenance	• Daily site operations to be completed remotely by one full-time staff working out of a local office nearby • Weekly grounds maintenance, as needed (grass cutting, snow removal) • Monthly visual inspection of BESS site and substation • Semi-annual and annual BESS and substation maintenance, inspections, upgrades, as needed	Q3 2027 until decommissioning

6 Effects Assessment

6.1 Potential Environmental Effects

6.1.1 Construction

6.1.1.1 Permanent and Temporary Habitat Loss

Potential impacts to vegetation and vegetation communities during construction include:

- Direct loss of vegetation (6.86 ha), primarily agricultural land (6.5 ha) with some encroachment of woodland (0.36 ha). No wetland habitat will be removed by the Project.
- Direct loss of approximately 400 m (~200 m^2 area) of indirect fish habitat where existing SWF will be realigned.
  - New vegetated diversion ditch to be approximately 550 m in length.
- The primary mitigation measures employed during design of the Project was avoidance. The Project Footprint was largely sited in active agricultural lands that so not contain do not contain SWH. However, encroachment into SWH for the proposed access road could not be avoided. The proposed access road is required to maintain connectivity to 2555 Marchurst Road, which is the registered Point of Interconnection (POI) under existing contractual and legal requirements. The location through the woodland was carefully considered, including the possibility of routing the road slightly to the north and outside of the significant woodland, SWH and SAR habitat. Originally, 2555 Marchurst was to fully host the project, the additional property was leased to mitigate the natural and cultural heritage impact after preliminary studies were conducted. Specifically, 2625 Marchurst allowed for the Project to be shifted onto primarily mixed pasture and avoided several Butternut trees, unevaluated wetlands, potential turtle habitat and SAR bat habitat.
- The access road route on 2555 Marchurst Road was selected is in an area with exposed bedrock and primarily shrubs with the least number of mature trees. The selected alignment allowed for the shortest distance to site and was able to avoid several Butternut directly south of the access road, unevaluated wetlands, SWH and SAR such as turtles and bats (e.g., Eastern Small-footed Myotis).
- Active agricultural fields provide habitat for Eastern Meadowlark and Bobolink (Species at Risk). Mitigation and permitting associated with species at risk are discussed below.
- Direct loss of pollinator and Monarch habitat within the fields overlapping the Project Footprint. However, given the small section of pollinator and Monarch habitat proposed for removal, The Project is not anticipated to affect the availability of pollinator and Monarch habitat within the local landscape, nor result in changes to insect diversity and abundance.

- The woodland encroachment is associated with the access road and overlaps with potential SWH (Bat Maternity Colony Habitat, Woodland Raptor Nesting Habitat, Woodland Area Sensitive Bird Breeding Habitat and Habitat for Species of Conservation Concern). However, given the relatively small, linear strip, of woodland removal, the Project is not anticipated to affect the availability, form or function of SWH to wildlife in the local landscape, nor result in changes to species diversity or abundance. Further, the road design has been routed to an area of the woodland that has open exposed bedrock, shrubs and the least number of mature trees. A discussion on route selection is provided in Section 5.1.2.
- Other SWH identified in the Study Area (Turtle Wintering Areas, Colonially – Nesting Bird Breeding Habitat, Deer Yarding Areas, Waterfowl Nesting Area, Turtle Nesting Areas and Amphibian Breeding Habitat [woodland]) occur more than 120m from the proposed Project and are not anticipated to be impacted.
- Within temporary disturbed areas, soil compaction which can affect growing conditions if replanting is proposed in those areas following construction.
- Injury to trees outside of the construction limits if the proposed works occur within the root zones.
- Exposure of soils from vegetation clearing, grubbing and grading can result in sediment runoff discharging into nearby terrestrial and aquatic communities.

6.1.1.2 Habitat Alteration, Disruption and Avoidance

- Edge effects to habitats where vegetation that was previously sheltered is now exposed (e.g., trees in woodland that are part of the new edge may be susceptible to windthrow).
- Damage to vegetation due to fugitive dust suppression, salt spray effects, sedimentation, and accidental spills (e.g., fuel, oil, other hazardous materials).
- Changes to community structure due to the introduction and spread of invasive species including Phragmites.
- Construction activities, such as grading can alter community structure, affect species composition and habitat quality due to changes in moisture regime, flow volume, rates, and water quality if natural drainage pathways are not maintained.
- Construction noise, vibration and increased human presence can result in disruption and avoidance of habitat. Construction noise may result in habitat avoidance or disturbance to individuals where interference with vocalizations could disrupt breeding and other natural processes.
- Temporary loss of or access to existing wildlife corridors/movement pathways during construction works.

6.1.1.3 Injury and Incidental Take

- Collisions with vehicles, machinery, or physical barriers may occur if wildlife are able to access the construction limits (e.g., improper design or installation of exclusionary measures). Bats may also be susceptible to injury and/or incidental take, particularly if habitat is removed while being occupied.
- Light pollution, including temporary and permanent lighting may cause disorientation or attract birds and bats to the area due to increased foraging potential which may result in injury or incidental take of individuals through collisions with vehicles or physical barriers.
- Migratory birds' nests and eggs are susceptible to incidental take during construction activities, especially during vegetation removal.
- Snake hibernaculum has the potential to be incidentally discovered during construction, particularly in areas where there are rock piles, bedrock outcrops, housing foundations, wetlands and woodlands.

6.1.1.4 Potential Impacts to Surface Water Features

The proposed BESS plan involves a realignment of the Unnamed SWF within the southern portion of the Project Area. Potential impacts may result from the change in the overall surface flow and water quality. The realignment will involve the removal of approximately 200 m^2 area (400 m length X 0.5 m maximum width) of existing ephemeral / intermittent. The proposed length of the realigned SWF is approximately 535 m in length. The proposed vegetated diversion ditch to convey the SWF will have a 2:1 side slope and bottom width of approximately 1 m. The proposed vegetated diversion ditch will function in the same capacity as the existing SWF, conveying water to the online agricultural pond.

The proposed realignment of the SWF meets the mitigation management recommendations as summarized in the HDF guidelines (CVC and TRCA 2014). Furthermore, in accordance with Section 4.9.3 policy 2 c) of the OP, a 30 metres setback between the maximum point to which water can rise within the new channel before spilling across the adjacent land, and the Project has been established. As discussed in Section 6.2 below, lands within the 30m setback will be maintained in their naturally vegetated state, and those lands disturbed for creation of the new channel will be restored and enhanced, to the greatest extent possible, with native species and shall avoid non-native invasive species.

The SWM system will result in a change to the drainage pattern within the facility. Stormwater from the facility will be conveyed through culverts on the BESS project site to a new SWM pond. The SWM pond will outlet to a swale feature that goes to the Marchurst Road ROW. The swale will continue to have vegetated cover within 30 m.

The SWM design criteria should be based on the guidelines outlined in the MECP, formerly the Ministry of Environment (MOE) "Stormwater Management Planning and Design Manual" (MOE 2003).

A 1 m by 0.4 m culvert is proposed to be installed along Marchurst Road for the access road into the BESS project area. The culvert is being installed where there is currently no SWF, only a grass lined roadside ditch that is bounded by two other existing access/laneways. No impacts to SWF are anticipated through the addition of the culvert and access road.

An unevaluated wetland occurs to east of the proposed Project, along the access road. No encroachment into the wetland is proposed. However, the unevaluated wetland will have a reduced setback as per the OP, Section 4.9.3, policy 6 (b) which indicate that site alteration or development is permitted within the minimum setback for activities that create or maintain infrastructure within the requirements of the environmental assessment act. The reduced setback from the unevaluated wetland will be 2.5 m from the proposed access road. The reduced setback is not anticipated to result in a negative impact to the feature. The unevaluated wetland does not provide fish habitat or directly contribute to SWH (identified SWH are associated with the woodland community). The presence of the access road, with limited daily traffic during operation, is not expected to pose a barrier to wildlife movement or affect existing terrestrial linkages in the local landscape. As such, the reduced setback is intended to maintain the form and function of the unevaluated wetland. Mitigation measure to protect wildlife and plant list in the unevaluated wetland are provided below in **Section 6.2**.

6.1.1.5 Potential Indirect Impacts to Fish and Aquatic Habitat

The unnamed SWF (which can also be considered an HDF) indirectly support fish and fish habitat seasonally upstream of the online agricultural pond.

The proposed BESS plan involves a realignment of the Unnamed SWF within the southern portion of the Project Area. Potential impacts to fish habitat can be identified as indirect changes to fish habitat that may occur downstream and may occur long-term.

As indirect fish habitat has the potential to be impacted by the proposed works, further review by Fisheries and Oceans Canada (DFO) should be for compliance with the *Fisheries Act*. Fish habitat under the *Fisheries Act* means *water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas.*

The Fish and Fish Habitat Protection Program of DFO provides Pathway of Effects (PoE) diagrams that assist with identifying project risks to fish and fish habitat, inform avoidance and mitigation measures that are needed to manage risks, and describe potential harmful impacts that may occur if risks are not avoided or mitigated. The PoE's were reviewed in determining the potential indirect impacts to fish and fish habitat and mitigation measures are further discussed in **Section 6.2.1.6**.

The realignment will involve the removal of approximately 200 m^2 area (400 m length X 0.5 m maximum width) of existing indirect seasonal fish habitat. The proposed length of the realigned SWF is approximately 535 m in length. The proposed vegetated diversion ditch to convey the SWF will have a 2:1 side slope and bottom width of approximately 1 m. The proposed vegetated diversion ditch will function in the same capacity as the existing SWF, conveying water to the online agricultural pond, which supports fish.

Residual effects provided are based on the following changes to fish habitat:

- Destruction (200 m^2): Permanent removal/infilling of 400 m length of the unnamed SWF.
- Alteration (~10 m^2): Two small sections where alteration occurring (realignment overlaps with existing). The habitat alterations are not harmful alterations, as the areas will continue to provide indirect seasonal habitat for use by fish.
- New Habitat (~535 m^2): New habitat is based on the length and bottom width of the new vegetated diversion ditch.

The infilling of the existing unnamed SWF will remove the existing food supply (although it is expected to be limited contribution given that the feature is seasonal). Food supply in the new diversion ditch will be altered temporarily until the vegetation becomes established, then the new habitat will function in the same manner as the existing.

Despite the implementation of mitigation measures and the realignment creating new habitat that will function in the same manner as the existing, the realignment has the potential to result harmful alteration, disruption or destruction (HADD) of fish habitat; therefore a Request for Review form should be submitted to DFO. Based on the existing conditions and proposed works, it is anticipated that the review would result in DFO issuing a Letter of Advice.

A high-level assessment was carried out to determine the presence of fish and fish habitat and identify whether the proposed BESS development has the potential to impact aquatic habitat. As it is unknown whether the unnamed SWF is connected to a fish bearing waterbody downstream of the Project Area, and there will be works in-water, consultation with DFO through a Request for Review should be further evaluated as the detail design progresses. Additional field investigations should be undertaken to further

6.1.1.6 Operation

There could be potential risks of off-site contamination to surface water, groundwater and other natural heritage features should a fire occur. However, these risks are considered unlikely through implementation of appropriate mitigation measures.

The potential for collisions between wildlife and vehicles on the access road may occur through the operational phase of the Project. Light pollution from permanent site lighting has the potential to disorient birds during migration or attract bats to the area due to increased foraging potential.

During operation, Project acoustic emissions may result in changes to habitat use, in particular wildlife that communicate or attract mates through vocalization (e.g., birds, amphibians). Although some birds may habituate to human-made noise and human presence associated with predictable or consistent sounds of day-to-day operations (Steidl and Anthony 2000).

6.2 Mitigation and Protective Measures

6.2.1 Construction

6.2.1.1 Vegetation and Vegetation Communities

The following mitigation measures and opportunities are provided to address potential impacts to vegetation and vegetation communities during construction, particularly related to the access road which will encroach within a woodland community:

- The boundaries of the project limits, vegetation clearing and retention zones within the project limits, and natural areas adjacent to the project limits, shall be clearly delineated in plans/drawings and in the field.
- Vegetation removals shall be reduced to the extent feasible and limited to the construction footprint. Review opportunities to reduce grading limits for all areas of vegetation removal.
- Install tree protection fencing along the dripline to protect the root zone of trees adjacent to the work zone and project limits.
- Utilize appropriate vegetation clearing techniques and minimize clearing, grubbing and grading to only includes areas necessary to complete the works.
- Vegetation removals shall adhere to the applicable timing windows. Generally, time vegetation removal to occur between November 1 to April 14 which will accommodate most species, unless otherwise specified for specific species, locations or as dictated through permits or approvals.
- Install surface protection measures to minimize soil compaction, particularly in areas where post-construction plantings are proposed.
- Implement dust control measures for the suppression of fugitive dust.
- In the case of unexpected vegetation removal or accidental damage to trees, vegetation shall be replaced and/or restored.
- Implement invasive species management, including vehicle washing, to address the potential for introduction of invasive species to the site (Halloran, Anderson, and Tassie.2013)
- Trees/shrubs that are felled within areas where active construction is being undertaken should be mulched or relocated to natural areas as soon as possible, especially during the breeding bird season to prevent birds from nesting and snakes from seeking refuge.
- Temporarily disturbed areas shall be restored and vegetated to pre-construction conditions or better.
- Vegetation plantings shall include seed mixes that are appropriate for the area, and include a mix of native species, that are appropriate to the site and conditions.

- The seed mix shall also include nectaring wildflower species (such as Black-eyed Susan [*Rudbeckia hirta*], Canada Goldenrod (*Solidago canadensis*), Purple-stemmed Aster [*Symphyotrichum puniceum*], Swamp Milkweed [*Asclepias incarnata*], Wild Bergamot [*Monarda fistulosa*], Wild Strawberry, Spotted Joe-Pye Weed [*Eutrochium maculatum*], Raspberry [Rosaceae spp.]) that may serve as pollinator habitat, including Common Milkweed to support habitat for Monarch. Exact seed mix may vary depending on species availability.

6.2.1.2 Erosion and Sediment Control

- Develop and implement an Erosion and Sediment Control (ESC) Plan prior to construction to protect sensitive natural heritage features.
- The ESC Plan shall capture measures related to vegetation communities, natural areas, and wildlife habitat.
- Maintain vegetative buffers and retain natural vegetation to the extent feasible, to help control erosion.
- Timing of vegetation removal shall consider rainfall and other weather conditions that could increase the likelihood of erosion and sedimentation.
- Minimize the extent and duration of exposed soil and cover areas to suppress dust and prevent sedimentation due to wind and rainfall erosion.
- Re-vegetate disturbed areas as soon as possible to help re-stabilize soils Vegetation plantings shall include a seed mix that is appropriate to the area and similar to or better than pre-construction conditions.
- Selection of ESC measures shall be appropriate for the site and extent of disturbance, and potential impacts to wildlife, such as entanglement. For example, measures that contain plastic or wire mesh or netting shall not be used, and fully biodegradable options shall be implemented wherever feasible (e.g. erosion control blankets made from coconut fiber, fibre rolls, etc.). Placement of silt fencing shall not create a barrier to movement and wildlife should be redirected to areas where there is safe passage and access to habitat.
- ESC measures shall be installed prior to vegetation removal and remain in place until vegetation has become established and soils re-stabilized.
- Remove non-biodegradable ESC materials, where approved, once site is stabilized.
- ESC measures shall be inspected to confirm they are installed in accordance with manufacturer's instructions and maintained so that controls are working effectively and per design. A monitoring log shall be maintained and include any corrective actions taken and additional recommendations to maintain compliance.

6.2.1.3 Earth and Excess Material, Waste, Refueling, Spills

- Management and placement of earth, excess soil and stockpiles shall be suitably planned so it does not result in the discharge of contaminants into the natural environment or promote use by wildlife (e.g. bird nesting).
- Stockpiles shall not be placed within wetland areas, 30 m of natural areas, adjacent to woodland edges, in sites where it would interfere with natural drainage patterns.
- The placement of earth, excess soil and stockpiles shall not negatively impact drainage patterns within the project limits or negatively impact drainage patterns of adjacent natural features.
- Waste resulting from construction shall be removed from the site and disposed of at an appropriate facility. This includes packaging (bags, wraps, boxes, ties, etc.), waste materials (excess fill, cement, grout, asphalt, or other substances), and ESC structures (silt fencing, flow checks, etc.) once permanent vegetation has established and ESC measures are no longer required.
- Develop and implement a Spill Prevention and Response Contingency Plan that includes measures for preventing, addressing, and reporting potential spills, in accordance with all applicable regulations, permits, and guidelines.
- On-site hazardous materials, vehicle maintenance and refueling activities shall be properly stored and located at least 30 m away from wetlands, and other sensitive natural features.
- All on-site materials shall be self-contained, maintained according to manufacturer's instructions, and disposed of appropriately.
- Spill kits shall always be kept on-site and accessible at all times.
- Control all activities, including equipment maintenance and re-fueling, to prevent entry of petroleum products or other deleterious substances, including any debris, waste, rubble, or concrete material, into the natural environment.
- Re-fueling stations shall be located away from the identified natural areas.

6.2.1.4 Wildlife and Wildlife Habitat

6.2.1.4.1 Migratory Birds

- Vegetation removal within 'complex habitats' (e.g., woodlands, thickets, tall grasslands, wetlands, and areas where risk of disturbance to breeding birds and active nests are high) should be scheduled outside of the active breeding bird season. However, if works are needed in 'complex habitat' and unless otherwise specified (i.e., through a permit or contract document), a Qualified Biologist shall complete a nest sweep. The active season for migratory birds is April 15 to August 31.
- If vegetation removal within 'simple habitats' (e.g., developed areas, manicured grass) or other activities that could impact birds is required during the active breeding period, prior to undertaking the proposed works a search for nests shall be completed by staff trained in conducting nest sweeps.

- Nest searches shall be completed within 24-48 hours or immediately prior to the proposed works.
- If an active nest is found within the work area at any time (including times outside of the typical nesting season), construction in the vicinity must cease until the young birds have fledged or the nest is otherwise abandoned.
- A setback from the nest (e.g., 30 m) shall be identified by a Qualified Biologist and the area demarcated so that work does not occur within the setback limits. A Qualified Biologist shall be consulted to determine the appropriate setback limits.
- Avoid construction during night-time, to the extent possible, in particular during the spring (April/May) and fall (September/October) migration periods. Where lighting of the construction site is unavoidable, direct lighting downwards and towards the construction area, away from adjacent natural areas.

6.2.1.4.2 Wildlife Encounters, Safe Handling and Relocation

Minimizing risk of wildlife encounters as well as implementing appropriate protocols during unavoidable wildlife encounters is critical to mitigate direct impacts (i.e., injury and incidental take) to wildlife. These measures include:

- Implement speed limits (40km/hr or less) and internal access road during construction to reduce the risk of wildlife collision.
- If wildlife is encountered during construction, whenever possible, work shall be temporarily suspended until the species is out of harm's way. If relocation is necessary, the species shall be handled and transported following the Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders (Ontario Ministry of Natural Resources (MNR) 2013).
- Wildlife shall not be harmed or harassed.
- Inspect equipment and brush piles for wildlife prior to movement of equipment.
- If bird nests are documented within the construction limits, the mitigation measures identified for migratory birds shall be implemented.
- Wildlife shall be relocated within 50 m of the capture location toward the direction they were heading and outside of the construction zone, where possible, or as otherwise specified by permits.
- Injured wildlife (including endangered and threatened species) shall be transported to an authorized wildlife rehabilitator by trained staff or Qualified Biologist.
- If a snake hibernaculum is incidentally discovered, all work must cease, and a Qualified Biologist shall be contacted to discuss mitigation options.
- If overwintering turtles or snakes are disturbed by construction activities, work shall cease and a Qualified Biologist shall be contacted to discuss mitigation measures. Overwintering turtles and snakes shall not be relocated.
- Immediately upon observation of an actively nesting turtle, personnel and vehicles shall clear the area within the turtle's line of sight as much as possible to allow the female to finish laying. Startling a nesting female could lead to abandonment of the partially laid nest before the eggs are concealed.

If potential turtle nest sites (i.e., areas of fresh digging in loose gravel or sandy material) are found within the work areas, all work in that area shall cease. The nests shall be left undisturbed, flagged and a setback applied to protect against construction activities. If avoidance is not possible, egg salvage may be completed by a Qualified Biologist.

A complete list of mitigation measures for general wildlife is outlined in *Protocol for Wildlife during Construction* (City of Ottawa 2022b).

6.2.1.4.3 Habitat of SAR

- Time vegetation removal activities to occur between October 1 to March 31, which is outside of the active period for bats, or as authorized by MECP.
- Potential cavity trees to be retained shall be identified and their root zone protected by clearly demarcating vegetation clearing/construction limits within the dripline.
- Construction activities within 30 m of known cavity trees shall be restricted to daylight hours when possible.
- Clearing vegetation in agricultural fields outside of the Eastern Meadowlark and Bobolink breeding season (May through July).
- Install reptile exclusion fence between Project Construction Activities and suitable turtle habitat during the turtle active season (April though October).
- MECP consultation is ongoing regarding potential impacts to species and risk habitat and permitting requirements. The Project will comply with applicable species at risk legislation during construction and operation.

6.2.1.5 Environmental Training and Monitoring

- Wildlife protocols shall be developed, and staff training shall be implemented to educate workers of potential wildlife occurrences, including SWH and habitat of SAR, and measures to take in the event of potential encounters. Preventative measures to minimize encounters, injury, and incidental take shall also be provided (e.g., timing restrictions, visual inspections, etc.).
- Monitoring shall occur so that mitigation and contingency measures are implemented, and performance objectives are being met. A construction monitoring log shall be maintained so that any deficiencies and corrective actions are documented.
- Environmental monitoring during construction shall include, but not be limited to:
  - Regular inspections of sensitive features so that setbacks are adhered to and that damage/alteration to the demarcations of these features is addressed.
  - Required monitoring activities so that spills and sediment releases are prevented or addressed quickly and effectively.
  - Visual inspections and wildlife monitoring shall be required where exclusionary measures have been installed and where wildlife activity has been noted.

  - Inspection of turtle exclusion fencing shall occur daily during the turtle active period (April 1 to October 31) and shall be conducted by an Environmental Monitor or a worker who is trained and given the responsibility.
  - Monitoring during construction of environmental features to confirm works are carried out in accordance with the design and specifications, including, but not limited to, construction of wildlife passages, wildlife fencing, landscaping, and restoration, nesting preventative measures, compensation structures, etc.
- Specialized environmental monitoring programs shall be developed and implemented as it relates to rehabilitation and enhancement and any permitting or approvals required for the Project.

6.2.1.6 Fish and Aquatic Habitat

The following mitigation measures and opportunities are provided to minimize potential indirect impacts to aquatic habitats. These are in addition to the measures outlined in **Sections 6.2.1.2** and **6.2.1.3**.

- Include a combination of passive and active riparian restoration techniques.
- Consider fencing off cattle from unnamed SWF.
- Follow the Pathways of Effects outlined by DFO to identify and implement appropriate mitigation measures.
- Follow timing windows for work in or around water (timing window assumed to be no in-water works allowed from March 15 to July 15 of any given year):
  - Timing window does not apply if feature is dry.
- If flow present when works occurring, flow must be maintained during construction works.
- Complete the diversion ditch offline and connect to existing channel during in-water timing windows (or when feature is dry).
- Lands within the 30m setback to the new channel will be retained in a naturally vegetated condition. Natural vegetation that is disturbed during the creation of the new channel will be restored and enhanced, to the greatest extent possible, with native species and shall avoid non-native invasive species.
- SWF should be monitored regularly during all phases of work.
- Develop and implement a Salt management plan.
- Design and implement an erosion and sediment control plan to reduce the risk of the entry of sediment to fish habitat.
- Design and implement restoration plans.
- Schedule the work to allow time for restoration measures to become established during the growing season.

6.2.2 Operation

The following mitigation measures have been identified to lessen potential impacts due to fire and off-site contamination:

- Comply with key safety standards, including Underwriters Laboratories (UL) 9540, UL 9540A, and National Fire Protection Association (NFPA) 855.
- Develop and implement a Fire Protection and Explosion Mitigation and Management Plan.
- Develop and implement a Spill Prevention and Response Contingency Plan for operation of the Project.
- Implement speed limits (40km/hr or less) and internal access road to reduce the risk of wildlife collision.
- Implement acoustic mitigation to reduce background noise levels for wildlife. An Acoustic Assessment Report is to be prepared under a separate cover to provide acoustic mitigation recommendations.
- The Project should consider the effects of light trespass (light pollution) on adjacent natural habitats. The City of Toronto's Best Practices for Effective Lighting (City of Toronto 2017) and the City of Guelph Lighting Guidelines for Lighting Plans (LEA Consulting 2019) provide guidance on effective techniques and light fixtures for reducing light trespass.

6.3 Net Environmental Impacts

With mitigation and protective measures in place, the proposed development is not anticipated to result in net negative impacts to the form or function of significant natural heritage features within the Study Area. A discussion of each significant natural heritage feature is provided below.

6.3.1 Unevaluated Wetlands, Provincially Significant Wetlands, and Surface Water Features

Both provincially significant and unevaluated wetlands were identified within the Study Area. The City's OP provides protections for non-significant wetlands. The Project Footprint will be able to maintain a 30 m setback from the significant wetlands. No net loss or negative impacts are anticipated to the form or function of the significant wetlands within the Study Area.

The Project Footprint overlaps with the Reach 2 water feature (**Figure A3, Appendix A**), resulting in the realignment of a section. The newly aligned SWF (diversion ditch) will maintain the 30m setback as per Section 4.9.3 policy 2 c) of the OP. The proposed realignment of the SWF meets the mitigation management recommendations as summarized in the HDF guidelines (CVC and TRCA 2014) and the form and function of the SWF will be maintained. As the existing SWF is degraded through the cattle field, the realignment of the feature may result in a positive impact to the feature.

The Project Footprint associated with the access road overlaps a roadside drainage ditch. No SWF is present in this location, and the installation of the culvert is not anticipated to occur within setbacks to SWF.

An unevaluated wetland occurs to east of the proposed Project, along the access road. No encroachment into the wetland is proposed. However, the unevaluated wetland will have a reduced setback of 2.5m. The reduced setback is not anticipated to result in a negative impact to the feature. The unevaluated wetland does not provide fish habitat or directly contribute to SWH (identified SWH are associated with the woodland community). The presence of the access road, with limited daily traffic during operation, is not expected to pose a barrier to wildlife movement or affect existing terrestrial linkages in the local landscape. As such, the reduced setback is intended to maintain the form and function of the unevaluated wetland.

6.3.2 Significant Woodlands

Significant woodlands have been identified within the Study Area. According to the *Significant Woodlands Guidelines for Identification, Evaluation, and Impact Assessment* (City of Ottawa 2022b), significant woodlands in rural areas are those meeting any one of the criteria in the *Natural Heritage Reference Manual*, as assessed in a sub-watershed planning context and applied in accordance with Council-approved guidelines, where such guidelines exist. Criteria from the *Natural Heritage Reference Manual* and an assessment of net impacts to the form and function of the significant woodlands are summarized in **Table 6-1** below.

Table 6-1 Summary of Net Impacts to form and function of Significant Woodlands

Criteria	Sub-criteria	Net Impacts
1 Size	Woodland Size	In the Ottawa West Planning Area, woodlands of 50 ha or larger are considered significant (City of Ottawa 2022a). The woodlands within the Study Area are part of a continuous patch of approximately 80 ha (and extending beyond the Study Area) in size. Removal of approximately 0.39 ha of forest habitat is proposed, which is less than 1% of forest cover within the Study Area.
Ecological Functions	Woodland Interior	Woodlands in the Planning Area are significant if they contain more than 8 ha of interior habitat. The Project Footprint access cuts through the eastern portion of the Study Area, where approximately 13 ha of forest is located (within the Study Area). The access route will remove 0.34 ha of forest, which is approximately 2-3% of the forest habitat in this eastern portion of the Study Area. The entire forest habitat will still meet the significant woodlands criteria.

Criteria	Sub-criteria	Net Impacts
	Proximity to other natural heritage features	Significant and non-significant wetlands, SWH, and SWF overlap with the significant woodlands in the Study Area. No negative impacts to the significant and non-significant wetlands are anticipated. Negative impacts to direct seasonal fish habitat may occur as the Project Footprint overlaps the SWF Reach 2, which may cumulative affect SWF Reach 3.
	Ecological linkages	The placement of the Project Footprint does not interfere with linkages between the significant woodland and other natural heritage features.
	Water protections	The proposed Project is not anticipated to affect water protections within the significant woodland.
	Woodland diversity	The proposed Project is not anticipated to result in a change in species diversity within the significant woodland. **Section 6.2.1.4** provide further discussion on SWH and SAR.
Uncommon Characteristics	Unique species composition	Woodlands within the Study Area were not identified as uncommon in terms of species composition or cover type.
	Provincially significant vegetation	One (1) provincially significant tree species (Butternut) was identified within the Study Area, including within the Project Footprint. Approximately 20 Butternut trees were identified within 50 m of the Project Footprint. Authorization under applicable provincial species at risk legislation will be obtained for butternuts which may be impacted by the access road construction.
	Rare, uncommon, or restricted plant species	Approximately 20 Butternut trees were identified within 10 m of the proposed access route within the Project Footprint. Butternut were not identified anywhere else within the Study Area. The Significant Provincial Wetland to the southwest of the Study Area (but outside the Project Footprint) was identified as suitable habitat for Black Ash. No Black Ash were found within the Project Footprint or identified within the Study Area.
	Old woodlands	There are several (more than 10/ ha) Sugar Maples, Red/ Freeman's Maples, Red Oak, and Eastern White Pine that are estimated to be greater than 100 years old and having at least a 50 cm diameter at breast height (DBH).

Criteria	Sub-criteria	Net Impacts
		No old growth trees with a DBH of 50 cm or greater will be removed during vegetation and clearing activities.
Economical and Social Values	High productivity of economically viable products	The Study Area is located on private property and is not known to provide economically valuable wood products.
	High value in special services, such as air-quality improvement or recreation.	The Study Area is on private property and is not known to provide recreational opportunities with the City or with the MVCA.
	Important identified appreciation, education, cultural or historical value.	The Study Area is located on private property is not known to be affiliated with an educational institution or have educational value.

Based on the assessment provided in **Table 6-1**, net negative impacts to the significant woodlands are expected to be isolated to the proposed access route within the Project Footprint. The primary mitigation measures employed during design of the Project was avoidance, as the Project Footprint was largely sited in active agricultural lands that so not contain do not contain SWH. However, encroachment into significant woodland for the proposed access road could not be avoided. The access road to the BESS from Marchurst Road is expected to remove approximately 0.34 ha of forest and is less than 1% of forest cover within the greater Study Area. The selected alignment allowed for the shortest distance to site and was able to avoid several Butternut directly south of the access road, unevaluated wetlands, SWH and SAR such as turtles and bats (e.g., Eastern Small-footed Myotis).

Evolugen will work collaboratively with the City and the MVCA on tree replacement and watershed plans. A rehabilitation plan is being developed to plant at 2:1 trees on the South March BESS property to compensate for tree loss. Natural snow fencing will be incorporated into the design (if necessary) using cedar, spruce or related coniferous trees.

6.3.3 Significant Wildlife Habitat

Table 6-2 provides a summary of net impacts to SWH, after mitigation and protective measures.

Table 6-2 Summary of Net Impacts to form and function of Significant Wildlife Habitat

Type	Significant Wildlife Habitat	Net Impacts
Seasonal Concentration Areas	Woodland Bat Maternity Colonies (confirmed), woodland habitat	Individual bats regularly move between roosts during the maternity season, requiring a diversity of roosting opportunities in the local landscape. As such, individual roost trees are less important to bats compared to maintaining a variety of roost trees across the landscape. The proposed Project is estimated to remove 1% of the woodland feature. The amount of woodland being removed is expected to have a negligible impact on the availability of roosting opportunities in the SWH patch. No net negative impacts are anticipated.
	Turtle Wintering Area	As suitable sites were not identified within the Project Footprint itself, direct impacts to turtle wintering habitat are not anticipated. With mitigations in place, including those for vegetation clearing, wildlife exclusion and wildlife encounters, no net negative impacts to turtle winter areas are anticipated.
	Colony Nesting Birds	The swamp ecosites associated with possible colonial nesting bird habitat was not identified within the Project Footprint itself. Direct impacts to potential colonial nesting bird habitat is not anticipated. Mitigations relating to vegetation clearing and wildlife encounters/exclusions will be utilized to achieve no net negative impacts to potential colonial nesting bird habitat.
	Deer Yard Area	ELC communities associated with FOM (mixed forest), FOC (coniferous forest), SWM (swamp), and SWC (coniferous swamp) are associated with potential deer yarding areas. The Project Footprint is proposed to remove 1% of forest cover within the Study Area, and it is anticipated that net negative impacts to potential deer yarding area habitat will be limited. Mitigations relating to vegetation clearing, wildlife encounters/ exclusions will be utilized to achieve a no net negative impact to deer within the Study Area.
	Deer Winter Congregation Area	The MNR has identified deer wintering area habitat in the forest/ wetland complex to the southwest of the Study Area, located approximately 120 m from the Project Footprint. No net negative impacts are anticipated to the deer winter congregation area habitat outside the Study Area/ Project Footprint.

Type	Significant Wildlife Habitat	Net Impacts
Specialized Habitat for Wildlife	Waterfowl Nesting Area	All ecosites associated with marsh (MA) and swamp (SW) could be potential waterfowl nesting area habitat. The swamp habitat within the Study Area occurs outside the Project Footprint and no net negative impacts are anticipated.
	Woodland Raptor Nesting Habitat	Woodland and forests stands greater than 30 ha with 10 ha of interior habitat are considered potential woodland raptor nesting habitat. The forest community south and southwest within the Study Area has the potential support nesting raptors. However, these forested areas occur outside the Project Footprint. No net negative impacts are anticipated to potential woodland raptor nesting habitat.
	Turtle Nesting Area	Nesting habitat was observed within 100 m of the Project Footprint and within the hydro corridor. The presence of turtle eggs (species unknown) on sandy and organic substrates indicates that turtles may nest within the Study Area. The Project Footprint is outside these potential turtle nesting areas and no net negative impacts are anticipated to turtle nesting habitat. Mitigation measures including vegetation clearing, wildlife exclusion/ encounters will be utilized to ensure turtles and turtle habitat are protected from Project related activities.
	Amphibian Breeding Habitat	All ecosites associated with FOD (deciduous forest), SWD (deciduous swamp), and OA (open water) are associated with potential amphibian breeding habitat. Each of the three areas of SWH for amphibian breeding is located more than 120 m from the Project Footprint. No net negative impacts are anticipated to potential amphibian breeding habitat within the Study Areas. Mitigation measures including vegetation clearing, wildlife exclusion/ encounters will be utilized to ensure amphibians and amphibian habitat are protected from Project related activities.
	Woodland Area- Sensitive Bird Breeding Habitat	Ecosites FOD within the Study Area are associated as being potential woodland area sensitive bird breeding habitat. Woodlands within the Study Area with interior habitat more than 200 m from the forest edge are located within the south and southwest of the Study Area. This area lies outside the Project Footprint and no net negative impacts are anticipated to woodland area sensitive bird breeding habitat. Mitigation measures including vegetation clearing, wildlife exclusion/ encounters will be utilized to ensure nesting birds and respective habitat are protected from Project related activities.

Type	Significant Wildlife Habitat	Net Impacts
Special Concern and Rare Wildlife Species	Monarch (confirmed): Suitable habitat is present within the Study Area, including patches of Common Milkweed (Monarch reproductive habitat) and nectaring wildflowers that act as pollinator habitat.	Areas of Common Milkweed and pollinator habitat (nectaring wild flowers) overlap with the Project Footprint. These overlapping areas are small (less than 1%) of the total Study Area. The majority of Monarch and pollinator habitat fall outside the Project Footprint (**Figure A3, Appendix A**). With mitigation measures in place, including those relating to vegetation removal and wildlife encounters/ exclusion, direct impacts to Monarch are anticipated to be limited.
	Barn Swallow (Confirmed) suitable foraging habitat (but not nesting habitat) is present within the Study Area, including those overlapping with the Study Area.	Barn Swallow were confirmed to fly over the agricultural hayfields in 2025. Barn Swallow may use the hayfield and open spaces within the Study Area as foraging habitat, but there is no nesting habitat within the Project Footprint. Therefore, it is anticipated that net negative impacts to Barn Swallow are limited to the removal of potential foraging habitat within the Project Footprint. Direct impacts for Barn Swallow are not anticipated from Project Activities.
	Common Nighthawk (confirmed): Suitable habitat is present and Common Nighthawk were confirmed to occur during the breeding bird season within the Study Area. No suitable nesting habitat is located within the Project Footprint.	Common Nighthawk was confirmed within the Study Area during the 2025 field season. However, the Project Footprint does not overlap potential Common Nighthawk nesting habitat. Net negative impacts to Common Nighthawk are not anticipated.
	Eastern Wood-pewee (confirmed): Suitable habitat is present and Eastern Wood-pewee was confirmed during the breeding bird surveys in 2025 within the Study Area. Suitable nesting habitat may overlap with forested portions of the access route within the Project Footprint.	The relatively small amount of forest removal (less than 1% within the Study Area) wis not anticipated to impact the overall size and structure of the forest habitat within the Study Area. It is anticipated that breeding habitat for Eastern Wood-pewee habitat will not be negatively impacted by Project Activities. Mitigations regarding vegetation clearing and wildlife encounters/ exclusions will be utilized to protect potentially nesting Eastern Wood-pewee.
	Midland Painted Turtle (confirmed): Midland Painted Turtle habitat is present within the Study Area. Habitat is restricted to ponds, swamps, and wetlands within the Study Area. One pond within the pasture is located less than 50 m from the Project Footprint.	Habitat for Midland Painted Turtle falls outside the Project Footprint and no net negative impacts are anticipated to turtles. One (1) pond that may be suitable turtle habitat is located within 50 m of the Project Footprint. However, with mitigation measures relating to vegetation clearing and wildlife exclusion/ encounters in place during Project Activities, no net negative impacts are anticipated.

Type	Significant Wildlife Habitat	Net Impacts
	Western Chorus Frog (confirmed): Western Chorus Frog was confirmed within the Study Area during the 2025 field surveys. Suitable habitat for Western Chorus Frog does not overlap with the Project Footprint.	Habitat for Western Chorus Frog falls outside the Project Footprint. No net negative impacts are anticipated to Western Chorus Frog habitat. Mitigation measures relating to vegetation clearing and wildlife exclusion/ encounters will be utilized to protect nearby Western Chorus Frogs.

6.3.4 Species at Risk

The results of the field studies identified the presence of SAR within the Project Footprint. **Table 6-3** provides a summary of net impacts to SAR, after mitigation and protective measures.

Table 6-3 Summary of Net Impacts to form and function of Species at Risk

Species	Net Impacts
Bats (Little Brown Myotis, Eastern Red Bat, Eastern Small-footed Myotis, Hoary Bat, Northern Myotis, Silver-haired Bat and Tri-colored Bat): Woodland habitat	Individual bats regularly move between roosts during the maternity season, requiring a diversity of roosting opportunities within the local landscape. As such, individual roost trees are less important to bats compared to maintaining a variety of roost trees across the landscape. The proposed Project Footprint would remove approximately 1% of the forest habitat within the Study Area and is expected to have negligible impacts on the availability of roosting opportunities for SAR bats. As such, no net negative impacts are anticipated.
Black Ash: swamp habitat	Black Ash were not identified within the Project Footprint. However, Black Ash may occur in the swamps and wetlands within the Study Area. The proposed Project Footprint is not anticipated to affect Black Ash or its respective habitat. No net negative impacts to Black Ash habitat is anticipated.
Blanding's Turtle: wetlands, ponds, and upland forests.	Blanding's Turtle has been confirmed to occur within the Study Area. The Project Footprint does not overlap with Blanding's Turtle habitat but a pond feature within the pasture is less than 50 m from the Project Footprint. It is unlikely Blanding's Turtle would use this pond feature in the pasture but Blanding's Turtle are a mobile turtle species and there is potential for encounters with individual during Project Activities. However, with mitigation measures in place, including those for vegetation clearing, wildlife exclusion and wildlife encounters, no net negative impacts to Blanding's Turtles are anticipated.

Species	Net Impacts
Bobolink: Hayfield and Pasture	Bobolink have been observed across the Study Area, including within the proposed Project Footprint. The Project footprint overlaps breeding and foraging habitat for Bobolink, which will result in the loss of such habitat. However, the overall net loss across the Study Area and greater Carp Highlands landscape is negligible as the surrounding area is predominantly agricultural. Net negative impacts to Bobolink are anticipated to be minimal. Direct harm to Bobolink is not anticipated through mitigation measures relating to vegetation clearing and wildlife encounters/ exclusion measures.
Butternut: woodlands	Twenty (20) Butternut trees were identified within 40 m of the Project Footprint. Butternut Trees #19 and #13 are within the Project Footprint (access route) from Marchurst Road to the proposed BESS. All trees are described as Category 1 (non-retainable) trees except for tree#19 which is a young sapling and described as Category 2 (retainable). The proposed Project Footprint access route will remove the two dead Butternut trees. The net negative impact to the surrounding Butternut population from the removal of these two trees is anticipated to be negligible since bother are dead. Mitigation measures relating to the protection of SAR (Butternut) trees and vegetation clearing will be utilized to protect the remaining Butternut trees nearby the Project Footprint.
Eastern Meadowlarks: hayfield and pasture	Eastern Meadowlark were confirmed within the Study Area, including the Project Footprint during field surveys in 2025. The Project Footprint overlaps with suitable Eastern Meadowlark nesting and foraging habitat. Net impacts to existing Eastern Meadowlark habitat across the Study Area and surrounding Carp Highlands is negligible as the area is predominantly agricultural. Net negative impacts to Eastern Meadowlark are anticipated to be minimal and direct harm to individual birds will be mitigated through measures relating to vegetation clearing and wildlife exclusion/ encounters.
Eastern Whip-poor-will: woodlands and hydro corridor	Eastern Whip-poor-will was confirmed during the 2025 field surveys within the Study Area. The proposed Project Footprint does not overlap with Eastern Whip-poor-will nesting habitat within the Study Area. Net negative impacts are not anticipated to Eastern Whip-poor-will or their respective habitat.
Golden-winged Warbler: hydro corridor, swamps, wetlands, and successional habitat	Golden-winged Warbler was not confirmed within the Study Area during the 2025 field surveys. However, suitable habitat may be present in the Study Area within the hydro corridor, wetlands, swamps, and areas with successional vegetation surrounded by mature forest.

Species	Net Impacts
	The proposed Project Footprint does not overlap suitable Golden-winged Warbler habitat and net negative impacts are not anticipated.
Red-headed Woodpecker: woodlands	No Red-headed Woodpeckers were confirmed within the Study Area during the 2025 field surveys. However, suitable habitat for Red-headed Woodpeckers is present within the Study Area (woodlands with mature trees). The Project Footprint overlaps with a portion of the forested habitat between Marchurst Road and the hayfield where the BESS is proposed to be located. This portion of forest to be removed is 1% of the forest habitat within the Study Area and net impacts to Red-headed Woodpecker are negligible. The majority of the forest habitat within the Study Area will remain intact. Direct harm to individual birds will be mitigated through vegetation clearing and wildlife exclusion/ encounter related measures to protect birds.
Wood Thrush: woodlands	Wood Thrush was confirmed 300 m south of the Project Footprint within the forested habitat. The proposed Project Footprint does not overlap with Wood Thrush habitat and net negative impacts are not anticipated.

Overall, the net negative impacts to SAR are anticipated to be negligible for construction of the Project. Direct impacts to Butternut will consist of the removal of two dead Category 1 trees. Loss of breeding habitat is also anticipated for Bobolink and Eastern Meadowlark. Evolugen is in consultation with MECP to ensure required authorizations are in place under provincial Species at Risk legislation.

6.3.5 Summary of Net Effects

Feature	Impact	Mitigation	Net Effect
Unevaluated Wetlands	No wetland habitat is proposed to be removed by the Project	The wetland within the woodland near the proposed access route for the Project will be granted a 3 m setback.	No net negative impacts are anticipated for this unevaluated wetland within the woodland.
Significant Woodlands	Encroachment of 0.36 ha due to the access road.	Vegetation and tree removal will be limited to the construction footprint. Tree protection fencing will be installed along the dripline to protect the root zone. Tree protection fencing will be installed. Dust and contamination measures will be implemented. Temporarily disturbed areas will be restored and vegetated to pre-construction conditions or better.	Net negative impacts will be limited to woodland within the Project Footprint access route. Tree compensation will be at 2:1 tree compensation and natural species (such as cedar, spruce, or similar will be used if natural snow/wind breaks are needed). Vegetation and tree clearing will avoid old growth (trees greater than 50 cm DBH) trees within the proposed construction area.

Feature	Impact	Mitigation	Net Effect
Significant Wildlife Habitat	Direct loss of habitat for the following SOCC species: Eastern Wood-pewee and Monarch. Loss of woodland is associated with potential Bat Maternity Colony Habitat, Woodland Raptor Nesting Habitat, and Woodland Area Sensitive Bird Breeding Habitat.	Temporary disturbed areas will be restored to their pre-construction state. Vegetation plantings will include native flora species that are appropriate for the site conditions. The seed mix will contain native nectaring flora that can be utilized as pollinator and Monarch habitat. Pre-clearing nest sweeps for birds will occur prior to vegetation removal by a qualified biologist or outside the active breeding bird season (April 15 – August 31). All pre-clearing nest sweeps will occur within 24-48 hours of vegetation removal. Identified nests will be given a 30 m buffer (or as specified by a qualified biologist) so that clearing activities do not occur within the setback limits. Construction activities will be avoided where possible during the night while birds migrate (April/May – September/October). Construction activities will be avoided where possible at night during the active bat pup rearing season (May to late July).	Net negative impacts will be limited to the portion of woodland within the proposed Project Footprint access route. Direct harm to wildlife species will be avoided through mitigation measures (nest sweeps, avoiding species specific sensitive timing windows). Net negative impacts to wildlife habitat across the greater Study Area are anticipated not anticipated.
Surface Water Features	Realignment of SWF will result in direct loss of approximately 200 m^2 portion of existing SWF. Minimum setbacks as per the OP not able to be met.	New Habitat creation of ~535 m^2 for aligned channel habitat to accommodate the proposed project footprint area.	No negative net effects anticipated as the hydrology of the feature will be maintained and the feature connects downstream before direct fish habitat was identified. The feature functions will be improved in the realigned section as cattle have degraded the existing feature. The newly aligned SWF (diversion ditch) will also have a reduced setback as per the OP, Section 4.9.3, policy 6 (b) which indicates that site alteration or development is permitted within the minimum setback for activities that create or maintain infrastructure within the requirements of the environmental assessment act.

Feature	Impact	Mitigation	Net Effect
Fish and Fish Habitat	Direct loss of approximately 400 m (~ 200 m^2 area) of indirect fish habitat	New Habitat creation of ~535 m^2 for aligned channel habitat to accommodate the proposed project footprint area.	No negative net effects anticipated as the seasonal indirect fish habitat will be maintained through the new alignment.
SAR	Direct loss of primarily agricultural land (6.5 ha), which provides habitat for Bobolink and Eastern Meadowlark. Direct loss of woodlands, which provides habitat for Little Brown Myotis, Eastern Small-footed, Eastern Red Bat, Hoary Bat, Northern Myotis, Silver-haired Bat, and Tri-colored Bat, Butternut, Blanding's Turtle (upland habitat) and Red-headed Woodpecker.	Temporary disturbed areas will be restored to their pre-construction state. Vegetation plantings will include native flora species that are appropriate for the site conditions. The seed mix will contain native nectaring flora that can be utilized as pollinator and Monarch habitat. Pre-clearing nest sweeps for birds will occur prior to vegetation removal by a qualified biologist or outside the active breeding bird season (April 15 – August 31). Pre-clearing visual surveys for roosting bats will occur during the active bat season (April 1 – November 30) within 24-48 hours of vegetation or tree removal. Rocket style bat boxes may be placed in compensation of removing bat roosting habitat. All pre-clearing nest sweeps will occur within 24-48 hours of vegetation removal. Identified nests will be given a 30 m buffer (or as specified by a qualified biologist) so that clearing activities do not occur within the setback limits. Compensation for the removal of Butternut will consist of replanting trees and or compensation towards Butternut habitat. Implement speed limit zones to reduce the likelihood of turtle and animal mortality. Wildlife shall not be harmed or harassed. Discovery of a snake hibernaculum, turtle nesting activity, and turtle wintering activity	Net negative impacts to SAR are anticipated to be minimal. Loss of Bobolink and Eastern Meadowlark habitat is anticipated to be minimal from the Project Footprint in comparison to the great Study Area. Direct harm to SAR species can be avoided through mitigation measures while compensation measures (such as the replanting of Butternut trees or contributing to Butternut habitat) will be completed.

Feature	Impact	Mitigation	Net Effect
		will require construction work to be stopped. Reptile exclusion fence will be installed around the project limits. Monitoring shall occur to maintain mitigation measures (See **Section 6.2.1.4** for all wildlife mitigation and monitoring measures).	

7 Authorization Requirements

The following table (**Table 7-1**) outlines relevant environmental legislation and potential permits, approvals or compliance measures anticipated for the Project.

Table 7-1 Summary of Potential Authorizations That May be Required for the Project

Legislation	Approval Type	Species/Features	Notes
Endangered Species Act/ Species Conservation Act (SCA)	Permit/ Registration	• Bats (Woodlands) • Blanding's Turtle • Bobolink/Eastern Meadowlark • Butternut	Consultation with MECP is ongoing
Conservation Authorities Act, O.Reg. 41/24	Permit	• Works within the regulated areas	Consult with MVCA to determine if a permit is required.
Migratory Birds Convention Act (MBCA) – general	Compliance	• Adhere to timing windows and avoid vegetation removals between April 15 to August 31, where feasible	Nest sweeps can be completed if removals required during active period (April 15 to August 31).
MBCA – Migratory Birds Regulations (Schedule 1 species)	Permit or 36 month Waiting Period	• Pileated Woodpecker	A Pileated Woodpecker nesting cavity was observed within the Study Area, but not within the Project Footprint. If Pileated Woodpecker is observed within the Project Footprint, then confirm there are no Pileated Woodpecker nests. If present, confirmation of active use is required. A permit or 36 month waiting period may apply where removal is not permitted.
Species at Risk Act (SARA)	Compliance	• Migratory birds	Avoidance through timing windows (same as MBCA).
Fisheries Act	Request for Review / Letter of Advice	• Unnamed SWF	As indirect fish habitat is being infilled for the realignment of the diversion ditch, DFO review is recommended.

* ESA may be replaced by the Species Conservation Act prior to construction of the Project. Regardless, the Project will comply with all applicable species at risk legislation during construction and operation.

8 Summary of Conclusion

This report was prepared to document natural features that require consideration through the municipal application process and may pose constraints to development, including features that are protected by the City of Ottawa's OP (City of Ottawa 2022a) and other relevant legislation and policy.

The proposed Project Activity will have direct impacts to the woodlands, pasture and hay fields, SWFs, and wildlife habitat within the Project Footprint. The Project Activities will primarily affect the hayfield and pasture community, while the proposed access route will part of the existing woodland. The woodland has been identified as significant woodland by the City of Ottawa. The Study Area is part of the City's Natural Environment and Greenspace Overlay mapping in the City's OP (**Figure 1**). However, the Project Footprint is proposed outside of these overlay boundaries.

The portion of significant woodland proposed for removal for the Project Footprint provides ecological functions such as SWH for bat maternity colonies and Species of Special Concern (Eastern Wood-pewee) and habitat for SAR bats. This access route through the significant woodlands is also anticipated to remove two (2) Butternut trees (dead, identified as Category 1 trees) and is within 50 m of the remaining 18 Butternut trees.

The hayfield and pasture provide habitat for 2 SAR birds (Bobolink and Eastern Meadowlark) and 2 SOCC species (Barn Swallow and Monarch) and the proposed BESS will result in the direct loss of habitat for these SAR and SOCC species. One SWF (Reach 2) and subsequent impacts to the connecting SWFs (Reach 1 and Reach 3) will result from Project Activities, leading to indirect impacts to seasonal fish habitat.

Indirect impacts on adjacent lands may include hydrological changes, habitat edge effects, and potential disturbance to candidate SWH for habitat of SOCC (Monarch, Eastern Wood-pewee, Common Nighthawk, and Western Chorus Frog) and SAR (e.g., bats, Black Ash, Butternut, Blanding's Turtle, Eastern Whip-poor-will, Golden-winged Warbler, Red-headed Woodpecker, and Wood Thrush).

Net negative impacts to the remaining SWH within surrounding woodland (deer yard area, deer winter congregation area, woodland raptor nesting habitat ,and turtle nesting area), hayfield, pasture, wetlands, and swamps (turtle wintering area, colony nesting birds, waterfowl nesting area, amphibian breeding habitat, and woodland area sensitive bird breeding habitat) are habitat for SOCC species (Common Nighthawk, Western Chorus Frog, and Midland Painted Turtle) are not anticipated as these are located 200 m or more outside the Project Footprint. However, animals are unpredictable and may enter the Project Footprint when traveling to and from various habitats.

To mitigate potential effects, the following recommendations are proposed:

No Net Loss of Woodland: Evolugen will work collaboratively with the City and the MVCA to achieve a no net loss and employ available mechanisms as per the policy, which may include land use planning, development processes, acquisition and conservation of land and voluntarily, private land conservation.

Reduce Habitat Disturbance: Implement site-specific measures to reduce noise, light pollution, and human activity to wildlife during and post-construction.

Wildlife Monitoring: Conduct regular monitoring to assess wildlife movement and habitat use, adjusting mitigation measures as needed.

Vegetation Management: Follow appropriate vegetation removal and management strategies to prevent the spread or establishment of invasive species. Restore disturbed areas using native plant species and seed mixes appropriate to the site conditions and enhance wildlife habitat such as nectaring wildflowers and habitat for pollinator species and Monarch.

Operational Safety: Compliance with key safety standards and the implementation of fire protection, explosion mitigation, and emergency response plans.

Permitting and Authorizations: Consultation with MECP is underway to determine permit requirements related to bats, Butternut, Bobolink, and Eastern Meadowlark. Compensation may include tree re-plantings, installation of artificial roost structures (e.g., rocket style bat boxes), re-planting Butternut, and/or compensation for Bobolink and Eastern Meadowlark habitat.

As detailed in **Section 6**, it is the professional opinion of Stantec that with mitigation and protective measures in place, no net negative impacts are anticipated to the significant wetlands, significant woodlands, SWH, SWF, and habitat SAR that occur within the Study Area.

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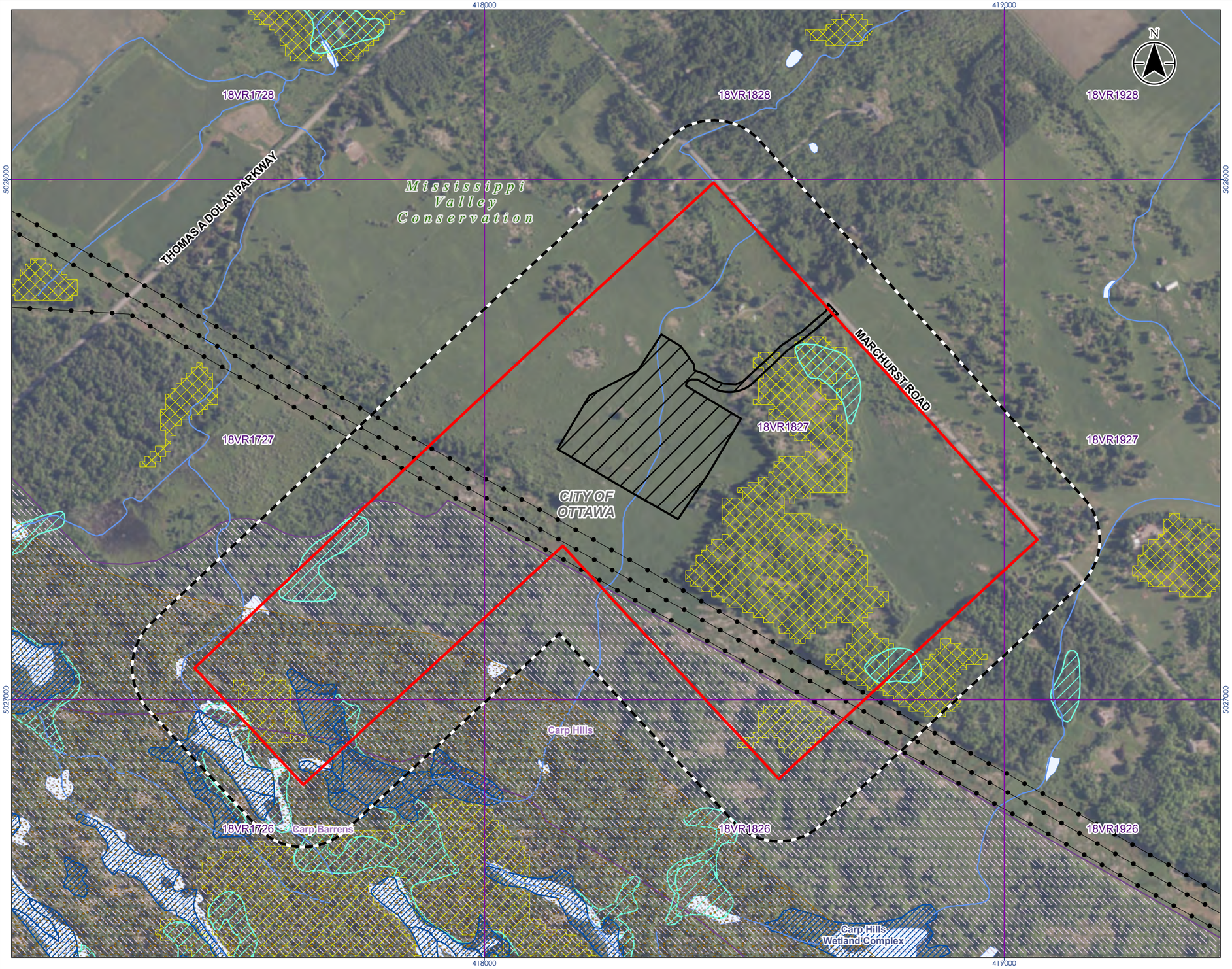
Appendices

Appendix A Figures



Stantec

Legend

- Project Area
- Project Footprint
- Study Area (120 m)
- Hydro Line
- Watercourse (Permanent)
- Candidate ANSI, Life Science
- Overwintering Area
- Significant Woodland
- Waterbody
- Wetland, Provincially Significant
- Wetland, Unevaluated
- 1 km UTM Grid

0 100 200 m

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Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
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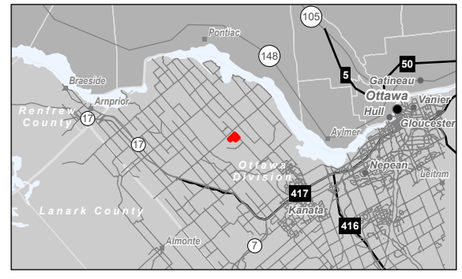


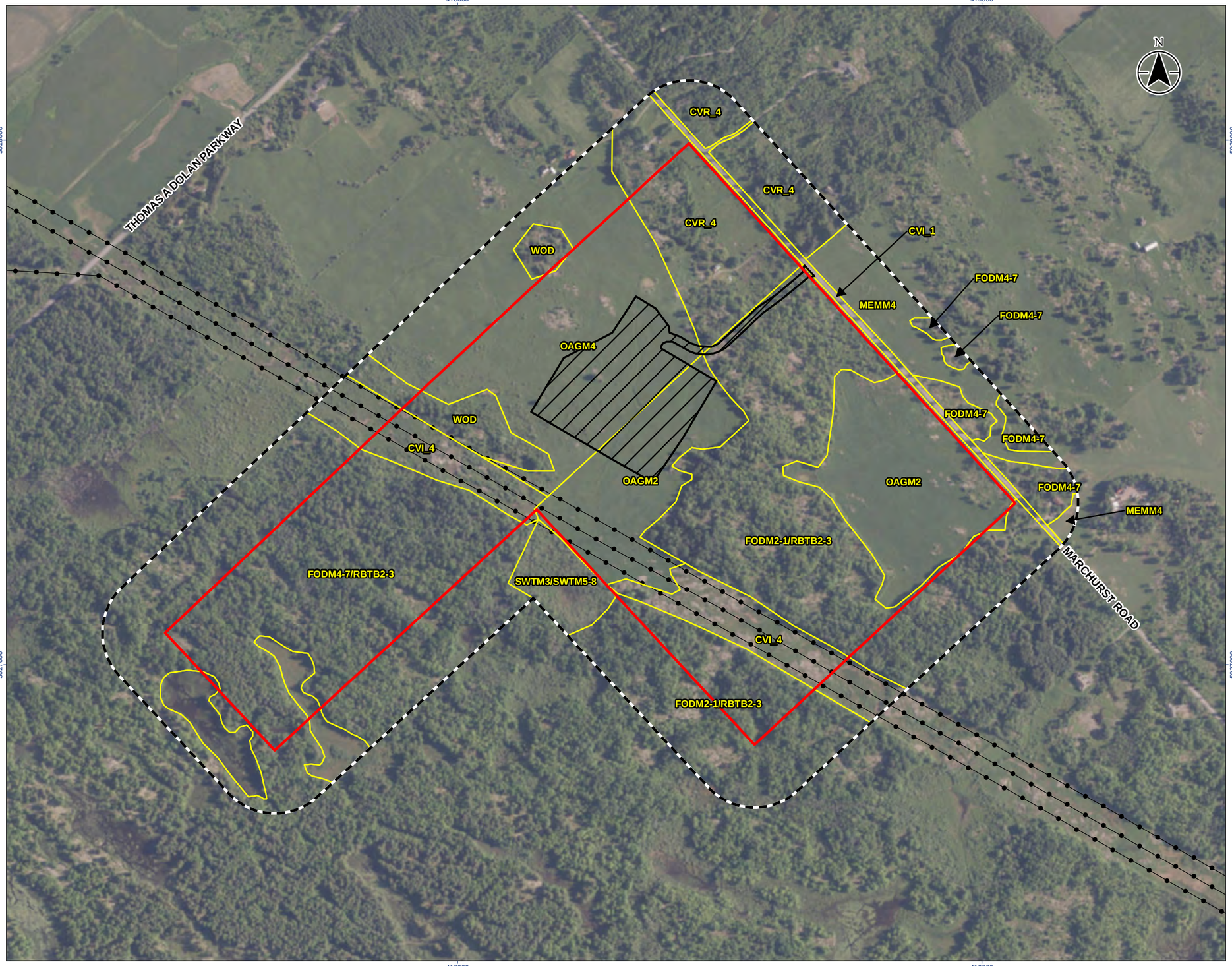
Project Location
City of Ottawa

160930481 REV2
Prepared by BF on 2025-03-28
Technical Review by AW on 2025-02-11

Client/Project
Evolugen
Evolugen Battery Energy Storage System (South March Location)

Figure No.
A1

Title
Background Data



Stantec

Legend

- Project Area
- Project Footprint
- Study Area (120 m)
- Existing Hydro Line
- Ecological Land Classfication Boundary

ELC Description

- CVI_1 (Transportation)
- CVI_4 (Power Generation)
- CVR_4 (Rural Property)
- FODM2-1 (Dry – Fresh Oak – Red Maple Deciduous Forest Type), RBTB2-3 (Oak – Red Maple – Pine Non-Calcareous Treed Rock Barren Type)
- FODM4-7 (Dry - Fresh Red Maple Deciduous Forest Type)
- FODM4-7 (Dry - Fresh Red Maple Deciduous Forest Type), RBTB2-3 (Oak – Red Maple – Pine Non-Calcareous Treed Rock Barren Type)
- MEMM4 (Fresh - Moist Mixed Meadow Ecosite)
- OAGM2 (Perennial Cover Crops)
- OAGM4 (Open Pasture)
- SWTM3 (Willow Mineral Deciduous Thicket Swamp Ecosite), SWTM5-8 (Non-native Mineral Deciduous Thicket Swamp Type)
- WOD (Deciduous Woodland)

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Notes

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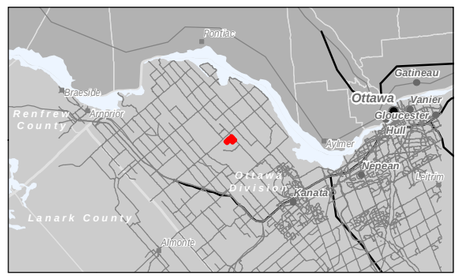


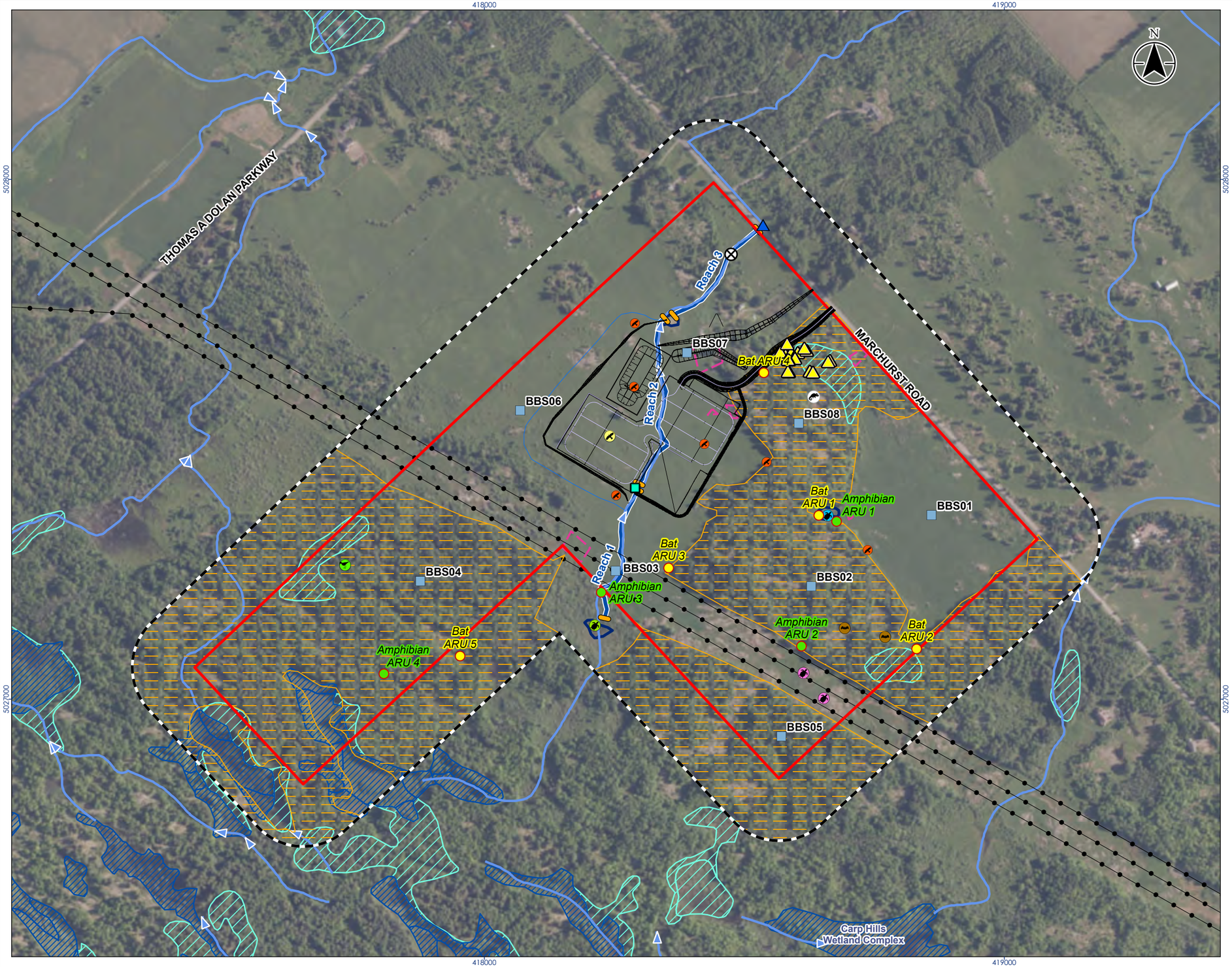
Project Location
City of Ottawa

160930481 REV3
Prepared by BF on 2025-03-24

Client/Project
Evolugen
Evolugen Battery Energy Storage System (South March Location)

Figure No.
A2

Title
Ecological Land Classification: South March



Stantec

Legend

- Project Area
- Study Area (120 m)

Project Components

- Alignment
- Grading Limit
- Realigned Channel (Approximate)
- Amphibian ARU Location
- Bat ARU Location
- Barrier to Fish Passage
- Culvert
- Breeding Bird Survey Station
- Tile Drain
- Existing Hydro Line
- Reach
- Watercourse (Ephemeral or Intermittent)
- Wetland, Provincially Significant
- Wetland, Unevaluated

Species and Habitat Features

- Butternut
- Bobolink
- Blanding's Turtle
- Eastern Meadowlark
- Potential Eastern Small-footed Bat Roost Habitat
- Potential Pileated Woodpecker Nesting Cavity Tree
- Predated Turtle Eggs
- Reptile Eggs
- Turtle Habitat
- Turtle Habitat
- Potential Bat SAR Habitat
- Potential Pollinator Habitat

0 100 200 m

1:7,500 (At original document size of 11x17)

Notes

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4. Watercourses shown in this figure have been modified based on field investigations.
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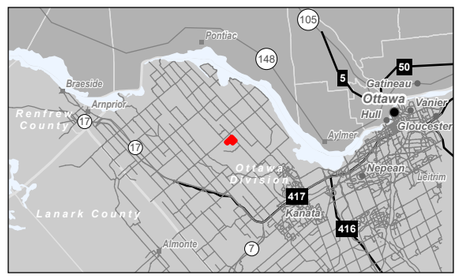

Project Location
City of Ottawa

160930481 REV3
Prepared by BF on 2025-10-07

Client/Project
Evolugen
Evolugen Battery Energy Storage System (South March Location)

Figure No.
A3

Title
Terrestrial and Aquatic Habitat

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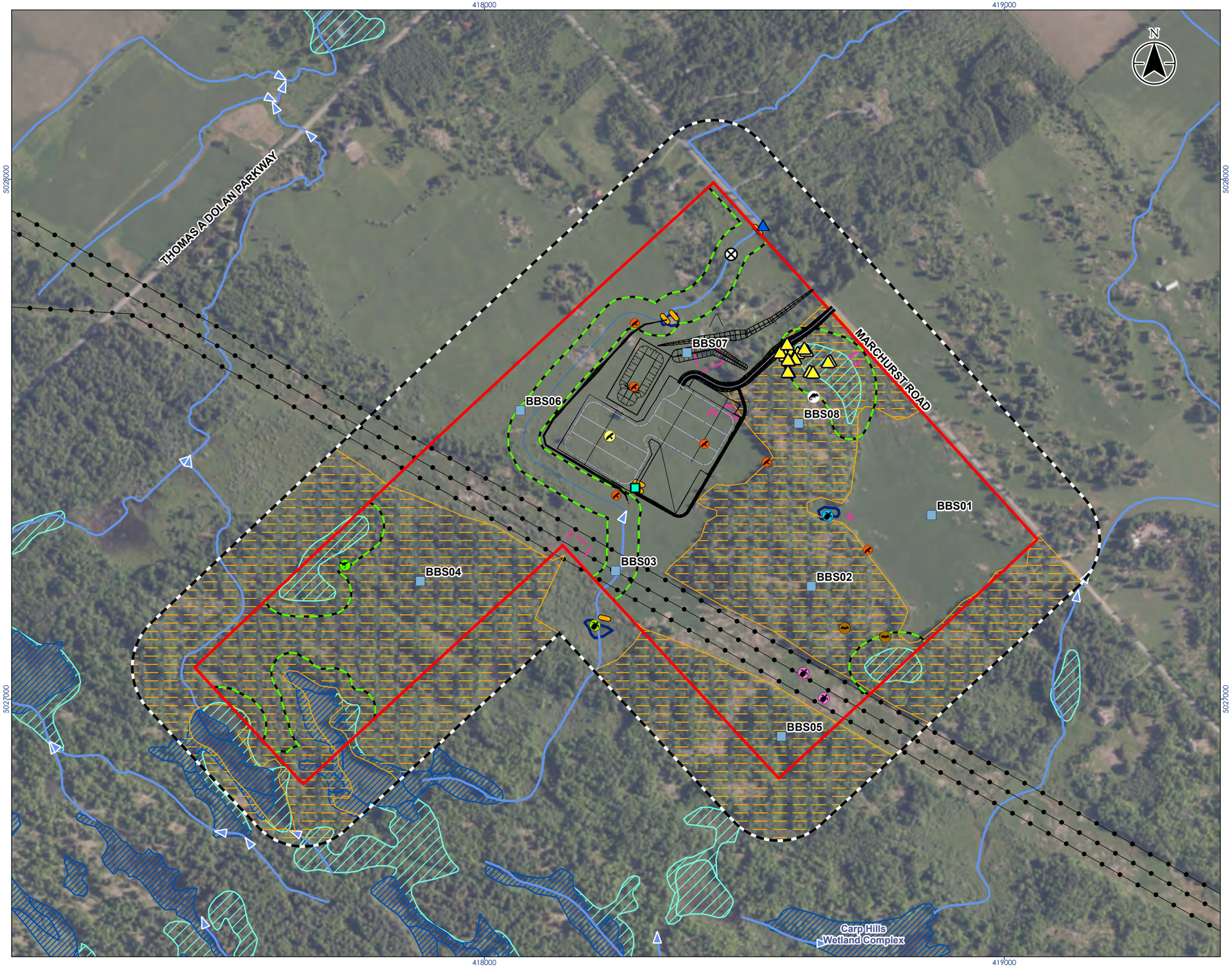


Stantec

Legend

- Project Area
- Study Area (120 m)

Project Components

- Alignment
- Grading Limit
- Realigned Channel (Approximate)
- Barrier to Fish Passage
- Culvert
- Tile Drain
- Existing Hydro Line
- Watercourse (Ephemeral or Intermittent)
- Surface Water Feature Setback (30 m)
- Wetland, Provincially Significant
- Wetland, Unevaluated

Species and Habitat Features

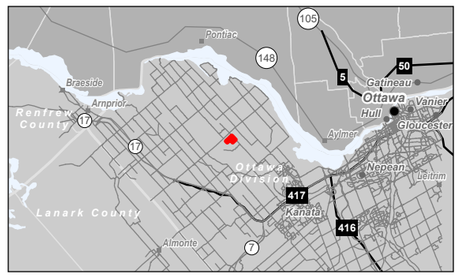
- Butternut
- Bobolink
- Blanding's Turtle
- Eastern Meadowlark
- Potential Eastern Small-footed Bat Roost Habitat
- Potential Pileated Woodpecker Nesting Cavity Tree
- Predated Turtle Eggs
- Reptile Eggs
- Turtle Habitat
- Turtle Habitat
- Potential Bat SAR Habitat
- Potential Pollinator Habitat

0 100 200 m

1:7,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Contains information licensed under the Open Government Licence – Ontario, and the Open Government Licence - Canada, accessed 2025.
3. This figure contains parcel data provided by First Base Solutions®, 2025.
4. Watercourses shown in this figure have been modified based on field investigations.
5. Orthoimagery © City of Ottawa, 2025. Imagery Date, 2022.



Project Location
City of Ottawa

160930481 REV3
Prepared by BF on 2025-10-07

Client/Project
Evolugen
Evolugen Battery Energy Storage System (South March Location)

Figure No.
A4

Title
Project Site Plan and Surface Water Feature Setbacks

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Appendix B Photolog

Photo 1: Facing down at unnamed stream originating from the swamp southwest of Reach 1, June 3 2025.

Photo 2: Facing southwest at unnamed stream originating from the swamp southwest of Reach 1, June 3 2025.

Photo 3: Facing down at unnamed stream originating from the swamp southwest of Reach 1, June 3 2025.

Photo 4: Facing southwest at unnamed stream originating from the swamp southwest of Reach 1, June 3 2025.

Photo 5: Facing northwest at existing conditions of Reach 1, May 28 2025.

Photo 6: Facing down at existing conditions of Reach 1, October 8, 2024.

Photo 7: Facing south at existing conditions of Reach 1, June 3 2025.

Photo 8: Facing down at existing conditions of Reach 1, June 3 2025.

Photo 9: Facing south at existing conditions of Reach 2, June 3 2025.

Photo 10: Facing southeast at existing conditions of Reach 2, June 3 2025.

Photo 11: Facing east at existing conditions of Reach 2, June 3 2025.

Photo 12: Facing down at existing conditions of Reach 2 and metal culvert, June 3 2025.

Photo 13: Facing down at existing conditions at Reach 02, June 3, 2025.

Photo 14: Facing east at existing conditions at agricultural pond within pasture, June 3, 2025.

Photo 15: Facing north at existing conditions at agricultural pond within pasture, June 3, 2025.

Photo 16: Facing northeast at existing conditions at agricultural pond within pasture, June 3, 2025.

Photo 17: Facing down at existing conditions at agricultural pond within pasture, June 3, 2025.

Photo 18: Facing north at existing conditions at Reach 3, June 3, 2025.

Photo 19: Facing down at existing conditions at Reach 3, June 3, 2025.

Photo 20: Facing down at existing conditions at Reach 3, June 3, 2025.

Photo 21: Facing north at existing conditions at Reach 3 and culvert at Marchurst Road, June 3, 2025.

Photo 22: Facing south at existing conditions at Reach 3, June 3, 2025.

Photo 23: Facing down at Brook Stickleback (*Culaea inconstans*) June 3, 2025.

Photo 24: Facing east at existing conditions at hayfield, October 8, 2024.

Photo 25: Facing north at existing conditions within cattle pasture, June 10, 2025.

Photo 26: Facing southwest at existing conditions in Dry-Fresh Oak-Maple Deciduous Forest/ Oak-Red Maple-Pine Non-Calcareous Treed Rock Barren, October 8, 2024.

Photo 27: Facing north at existing conditions within wetland, June 30, 2025.

Photo 28: Facing north at existing conditions with hydro corridor, October 8, 2024.

Photo 29: Facing north at existing conditions within Dry-Fresh Oak-Maple Deciduous Forest/ Oak-Red Maple-Pine Non-Calcareous Treed Rock Barren, October 8, 2024.

Photo 30: Facing west at existing conditions with within Dry-Fresh Oak-Maple Deciduous Forest/ Oak-Red Maple-Pine Non-Calcareous Treed Rock Barren, June 10, 2025.

Photo 31: Facing west at existing conditions within Dry-Fresh Red Maple Deciduous Forest/ Oak-Maple-Pine Non-Calcareous Treed Rock Barren, October 8, 2024.

Photo 32: Facing south at existing conditions within Dry-Fresh Red Maple Deciduous Forest/ Oak-Maple-Pine Non-Calcareous Treed Rock Barren, October 8, 2024.

Photo 33: Facing northwest at existing conditions within Willow Mineral Deciduous Thicket/ Non-native Mineral Deciduous Thicket Swamp, June 5, 2025.

Photo 34: Facing south at existing conditions within Willow Mineral Deciduous Thicket/ Non-native Mineral Deciduous Thicket Swamp, October 8, 2024.

Photo 35: Facing west at large mature Blanding's Turtle (*Emydoidea blandingii*), June 11, 2025.

Photo 36: Facing south at existing conditions at turtle pond between agricultural hay field and Dry-Fresh Oak-Maple Deciduous Forest/ Oak-Red Maple-Pine Non-Calcareous Treed Rock Barren, June 11 2025.

Photo 37: Facing southeast at existing conditions at beaver pond June 11, 2025.

Photo 38: Facing Bobolink (*Dolichonyx oryzivorus*) between cattle pasture and hayfield, May 28, 2025.

Photo 39: Facing down at unknown predated turtle eggs on October 8, 2024.

Photo 40: Facing down at unknown turtle eggs on June 30, 2025.

Photo 41: Facing up at Butternut (*Juglans cinerea*) tree 03, June 11, 2025.

Photo 42: Facing up at Butternut Tree 01, October 8, 2024.

Appendix C Species List

Appendix C: Species List

Species		SAR Status		Conservation Rank and Rarity Status			
Common Name	Scientific Name	Provincial (ESA, 2007)	National (SARA)	National (COSEWIC)	Global (G-rank)	Provincial (S-rank)	Source
AMPHIBIANS							
American Bullfrog	*Lithobates catesbeianus*				G5	S4	ORAA
American Toad	*Bufo americanus*				G5	S5	ORAA
Blue-spotted Salamander	*Ambystoma laterale*				GNA	S4	ORAA
Eastern Red-backed Salamander	*Plethodon cinereus*				G5	S5	ORAA
Gray Treefrog	*Hyla versicolor*				G5	S5	ORAA
Green Frog	*Rana clamitans*				G5	S5	ORAA
Northern Leopard Frog	*Rana pipiens*				G5	S5	ORAA
Red-spotted Newt	*Notophthalmus viridescens viridescens*				G5T5	S5	ORAA
Spring Peeper	*Pseudacris crucifer*				G5	S5	ORAA
Wood Frog	*Lithobates sylvaticus*				G5	S5	ORAA
Western Chorus Frog	*Pseudacris maculata* pop. 1		THR	THR	G5TNRQ	S4	ORAA
REPTILES							ORAA
Blanding's Turtle	*Emydoidea blandingii*	THR	END, Schedule 1	END	G4	S3	NHIC, ORAA
Eastern Gartersnake	*Thamnophis sirtalis*				G5T5	S5	ORAA
Eastern Milksnake	*Lampropeltis triangulum*		SC, Schedule 1	SC	G5	S4	NHIC, ORAA
Midland Painted Turtle	*Chrysemys picta marginata*		SC, Schedule 1	SC	G5T5	S4	ORAA
Northern Map Turtle	*Graptemys geographica*	SC	SC, Schedule 1	SC	G5	S3	ORAA
Northern Watersnake	*Nerodia sipedon*				G5T5	S5	
Red-bellied Snake	*Storeria occipitomaculata*				G5	S5	ORAA
Smooth Greensnake	*Opheodrys vernalis*				G5	S4	
Snapping Turtle	*Chelydra serpentina*	SC	SC, Schedule 1	SC	G5	S4	ORAA
MAMMALS							
Beaver	*Castor canadensis*				G5	S5	AMO
Big Brown Bat	*Eptesicus fuscus*				G5	S4	AMO
Coyote	*Canis latrans*				G5	S5	AMO
Eastern Chipmunk	*Tamias striatus*				G5	S5	AMO
Eastern Cottontail	*Sylvilagus floridanus*				G5	S5	AMO
Eastern Grey Squirrel	*Sciurus carolinensis*				G5	S5	AMO
Eastern Red Bat	*Lasiurus borealis*	END		END	G3G4	S4	AMO
Eastern Small-footed Myotis	*Myotis leibii*	END			G4	S2S3	AMO
Hoary Bat	*Lasiurus cinereus*	END		END	G3G4	S4	AMO
Little Brown Myotis	*Myotis lucifugus*	END	END, Schedule 1	END	G3G4	S3	AMO
Northern Short-tailed Shrew	*Blarina brevicauda*				G5	S5	AMO
Northern Myotis	*Myotis septentrionalis*	END	END, Schedule 1	END	G2G3	S3	AMO
Raccoon	*Procyon lotor*				G5	S5	AMO
Red Squirrel	*Tamiasciurus hudsonicus*				G5	S5	AMO
Silver-haired Bat	Lasionycteris noctivagans	END		END	G3G4	S4	AMO
Tri-colored Bat	*Perimyotis subflavus*	END	END, Schedule 1	END	G3G4	S3?	AMO
White-tailed deer	*Odocoileus virginianus*				G5	S5	AMO
BIRDS							
Alder Flycatcher	*Empidonax alnorum*				G5	S5B	OBBA
American Bittern	*Botaurus lentiginosus*				G5	S5B	OBBA
American Crow	*Corvus brachyrhynchos*				G5	S5	OBBA
American Goldfinch	*Spinus tristis*				G5	S5	OBBA
American Goshawk	*Accipiter atricapillus*				G5	S4	OBBA
American Kestrel	*Falco sparverius*				G5	S4	OBBA
American Redstart	*Setophaga ruticilla*				G5	S5B	OBBA
American Robin	*Turdus migratorius*				G5	S5	OBBA
American Woodcock	*Scolopax minor*				G5	S4B	OBBA
Baltimore Oriole	*Icterus galbula*				G5	S4B	OBBA
Bank Swallow	*Riparia riparia*	THR	THR, Schedule 1	THR	G5	S4B	OBBA
Barn Swallow	*Hirundo rustica*	SC	THR, Schedule 1	SC	G5	S4B	NHIC, OBBA
Barred Owl	*Strix varia*				G5	S5	OBBA
Belted Kingfisher	*Megaceryle alcyon*				G5	S5B,S4N	OBBA
Black-and-white Warbler	*Mniotilta varia*				G5	S5B	OBBA
Black-billed Cuckoo	*Coccyzus erythropthalmus*				G5	S4S5B	OBBA
Blackburnian Warbler	*Setophaga fusca*				G5	S5B	OBBA
Black-capped Chickadee	*Poecile atricapillus*				G5	S5	OBBA
Black-throated Green Warbler	*Setophaga virens*				G5	S5B	OBBA
Blue Jay	*Cyanocitta cristata*				G5	S5	OBBA
Blue-headed Vireo	*Vireo solitarius*				G5	S5B	OBBA
Blue-winged Warbler	*Vermivora cyanoptera*				G5	S4B	OBBA
Bobolink	*Dolichonyx oryzivorus*	THR	THR, Schedule 1	SC	G5	S4B	NHIC, OBBA
Broad-winged Hawk	*Buteo platypterus*				G5	S5B	OBBA
Brown Creeper	*Certhia americana*				G5	S5	OBBA
Brown Thrasher	*Toxostoma rufum*				G5	S4B	OBBA
Brown-headed Cowbird	*Molothrus ater*				G5	S5	OBBA

Appendix C: Species List

Species		SAR Status		Conservation Rank and Rarity Status			
Common Name	Scientific Name	Provincial (ESA, 2007)	National (SARA)	National (COSEWIC)	Global (G-rank)	Provincial (S-rank)	Source
Canada Goose	*Branta canadensis*				G5	S5	OBBA
Canada Warbler	*Cardellina canadensis*	SC	THR, Schedule 1	SC	G5	S5B	OBBA
Cape May Warbler	*Setophaga tigrina*				G5	S5B	OBBA
Cedar Waxwing	*Bombycilla cedrorum*				G5	S5	OBBA
Chestnut-sided Warbler	*Setophaga pensylvanica*				G5	S5B	OBBA
Chimney Swift	*Chaetura pelagica*	THR	THR, Schedule 1	THR	G4G5	S3B	OBBA
Chipping Sparrow	*Spizella passerina*				G5	S5B,S3N	OBBA
Cliff Swallow	*Petrochelidon pyrrhonota*				G5	S4S5B	OBBA
Common Grackle	*Quiscalus quiscula*				G5	S5	OBBA
Common Nighthawk	*Chordeiles minor*	SC	SC, Schedule 1	SC	G5	S4B	NHIC, OBBA
Common Raven	*Corvus corax*				G5	S5	OBBA
Common Yellowthroat	*Geothlypis trichas*				G5	S5B,S3N	OBBA
Cooper's Hawk	*Accipiter cooperii*				G5	S4	OBBA
Dark-eyed Junco	*Junco hyemalis*				G5	S5	OBBA
Downy Woodpecker	*Dryobates pubescens*				G5	S5	OBBA
Eastern Bluebird	*Sialia sialis*				G5	S5B,S4N	OBBA
Eastern Kingbird	*Tyrannus tyrannus*				G5	S4B	OBBA
Eastern Meadowlark	*Sturnella magna*	THR	THR, Schedule 1	THR	G5	S4B,S3N	NHIC, OBBA
Eastern Phoebe	*Sayornis phoebe*				G5	S5B	OBBA
Eastern Towhee	*Pipilo erythrophthalmus*				G5	S4B,S3N	OBBA
Eastern Whip-poor-will	*Antrostomus vociferus*	THR	THR, Schedule 1	SC	G5	S4B	NHIC, OBBA
Eastern Wood-Pewee	*Contopus virens*	SC	SC, Schedule 1	SC	G5	S4B	NHIC, OBBA
European Starling	*Sturnus vulgaris*				G5	SNA	OBBA
Evening Grosbeak	*Coccothraustes vespertinus*	SC	SC, Schedule 1	SC	G5	S4	OBBA
Field Sparrow	*Spizella pusilla*				G5	S4B,S3N	OBBA
Golden-crowned Kinglet	*Regulus satrapa*				G5	S5	OBBA
Golden-winged Warbler	*Vermivora chrysoptera*	SC	THR, Schedule 1	THR	G4	S3B	NHIC, OBBA, iNaturalist
Grasshopper Sparrow	*Ammodramus savannarum*	SC		SC	G5	S4B	NHIC
Gray Catbird	*Dumetella carolinensis*				G5	S5B,S3N	OBBA
Great Blue Heron (+)	*Ardea herodias*				G5	S4	OBBA
Great Crested Flycatcher	*Myiarchus crinitus*				G5	S5B	OBBA
Great Egret (+)	*Ardea alba*				G5	S2B,S3M	OBBA
Great Horned Owl	*Bubo virginianus*				G5	S4	OBBA
Green Heron (+)	*Butorides virescens*				G5	S4B	OBBA
Hairy Woodpecker	*Dryobates villosus*				G5	S5	OBBA
Hermit Thrush	*Catharus guttatus*				G5	S5B,S4N	OBBA
Hooded Merganser	*Lophodytes cucullatus*				G5	S5	OBBA
Horned Lark	*Eremophila alpestris*				G5	S4	OBBA
House Finch	*Haemorhous mexicanus*				G5	SNA	OBBA
House Sparrow	*Passer domesticus*				G5	SNA	OBBA
House Wren	*Troglodytes aedon*				G5	S5B	OBBA
Indigo Bunting	*Passerina cyanea*				G5	S5B	OBBA
Killdeer	*Charadrius vociferus*				G5	S4B	OBBA
Least Bittern	*Botaurus exilis*	THR	THR, Schedule 1	THR	G4	S4B	NHIC, OBBA
Least Flycatcher	*Empidonax minimus*				G5	S5B	OBBA
Magnolia Warbler	*Setophaga magnolia*				G5	S5B	OBBA
Mallard	*Anas platyrhynchos*				G5	S5	OBBA
Marsh Wren	*Cistothorus palustris*				G5	S4B,S3N	OBBA
Merlin	*Falco columbarius*				G5	S5	OBBA
Mourning Dove	*Zenaida macroura*				G5	S5	OBBA
Mourning Warbler	*Geothlypis philadelphia*				G5	S5B	OBBA
Nashville Warbler	*Leiothlypis ruficapilla*				G5	S5B	OBBA
Northern Cardinal	*Cardinalis cardinalis*				G5	S5	OBBA
Northern Flicker	*Colaptes auratus*				G5	S5	OBBA
Northern Harrier	*Circus hudsonius*				G5	S5B,S4N	OBBA
Northern Saw-whet Owl	*Aegolius acadicus*				G5	S5	OBBA
Northern Waterthrush	*Parkesia noveboracensis*				G5	S5B	OBBA
Ovenbird	*Seiurus aurocapilla*				G5	S5B	OBBA
Pileated Woodpecker (+)	*Dryocopus pileatus*				G5	S5	OBBA
Pine Siskin	*Spinus pinus*				G5	S5	OBBA
Pine Warbler	*Setophaga pinus*				G5	S5B,S3N	OBBA
Purple Finch	*Haemorhous purpureus*				G5	S5	OBBA
Purple Martin	*Progne subis*				G5	S3B	OBBA
Red-breasted Nuthatch	*Sitta canadensis*				G5	S5	OBBA
Red-eyed Vireo	*Vireo olivaceus*				G5	S5B	OBBA
Red-headed Woodpecker	*Melanerpes erythrocephalus*	END	END, Schedule 1	END	G5	S3	NHIC, OBBA
Red-shouldered Hawk	*Buteo lineatus*				G5	S4B,S2N	OBBA
Red-tailed Hawk	*Buteo jamaicensis*				G5	S5	OBBA
Red-winged Blackbird	*Agelaius phoeniceus*				G5	S5	OBBA
Ring-billed Gull	*Larus delawarensis*				G5	S5	OBBA
Rock Pigeon	*Columba livia*				G5	SNA	OBBA
Rose-breasted Grosbeak	*Pheucticus ludovicianus*				G5	S5B	OBBA
Ruby-throated Hummingbird	*Archilochus colubris*				G5	S5B	OBBA
Ruffed Grouse	*Bonasa umbellus*				G5	S5	OBBA

Species		SAR Status		Conservation Rank and Rarity Status			
Common Name	Scientific Name	Provincial (ESA, 2007)	National (SARA)	National (COSEWIC)	Global (G-rank)	Provincial (S-rank)	Source
Sandhill Crane	*Antigone canadensis*				G5	S5B,S3N	OBBA
Savannah Sparrow	*Passerculus sandwichensis*				G5	S5B,S3N	OBBA
Scarlet Tanager	*Piranga olivacea*				G5	S5B	OBBA
Sedge Wren	*Cistothorus stellaris*				G5	S4B	OBBA
Sharp-shinned Hawk	*Accipiter striatus*				G5	S5	OBBA
Song Sparrow	*Melospiza melodia*				G5	S5	OBBA
Spotted Sandpiper	*Actitis macularius*				G5	S5B	OBBA
Swamp Sparrow	*Melospiza georgiana*				G5	S5B,S4N	OBBA
Tree Swallow	*Tachycineta bicolor*				G5	S4S5B	OBBA
Trumpeter Swan	*Cygnus buccinator*				G4	S4	OBBA
Turkey Vulture	*Cathartes aura*				G5	S5B,S3N	OBBA
Upland Sandpiper	*Bartramia longicauda*				G5	S2B	NHIC
Veery	*Catharus fuscescens*				G5	S5B	OBBA
Vesper Sparrow	*Pooecetes gramineus*				G5	S4B	OBBA
Virginia Rail	*Rallus limicola*				G5	S4S5B	OBBA
Warbling Vireo	*Vireo gilvus*				G5	S5B	OBBA
White-breasted Nuthatch	*Sitta carolinensis*				G5	S5	OBBA
White-throated Sparrow	*Zonotrichia albicollis*				G5	S5	OBBA
Wild Turkey	*Meleagris gallopavo*				G5	S5	OBBA
Willow Flycatcher	*Empidonax traillii*				G5	S4B	OBBA
Wilson's Snipe	*Gallinago delicata*				G5	S5B	OBBA
Wood Duck	*Aix sponsa*				G5	S5B,S3N	OBBA
Wood Thrush	*Hylocichla mustelina*	SC	THR, Schedule 1	THR	G4	S4B	NHIC, OBBA
Yellow Warbler	*Setophaga petechia*				G5	S5B	OBBA
Yellow-bellied Flycatcher	*Empidonax flaviventris*				G5	S5B	OBBA
Yellow-bellied Sapsucker	*Sphyrapicus varius*				G5	S5B,S3N	OBBA
Yellow-billed Cuckoo	*Coccyzus americanus*				G5	S4B	OBBA
Yellow-rumped Warbler	*Setophaga coronata*				G5	S5B,S4N	OBBA
INVERTEBRATES							
Acadian Hairstreak	*Satyrium acadica*				G5	S4	OBA
American Copper	*Lycaena hypophlaeas*				G5	S5	OBA
American Lady	*Vanessa virginiensis*				G5	S5	OBA
Aphrodite Fritillary	*Speyeria aphrodite*				G5	S5	OBA
Appalachian Brown	*Lethe appalachia*				G5	S4	OBA
Arctic Skipper	*Carterocephalus mandan*				G5	S5	OBA
Baltimore Checkerspot	*Euphydryas phaeton*				G4	S4	OBA
Banded Hairstreak	*Satyrium calanus*				G5	S4	OBA
Black Swallowtail	*Papilio polyxenes*				G5	S5	OBA
Broad-winged Skipper	*Poanes viator*				G5	S4	OBA
Bronze Copper	*Lycaena hyllus*				G5	S5	OBA
Brown Elfin	*Callophrys augustinus*				G5	S5	OBA
Cabbage White	*Pieris rapae*				G5	SNA	OBA
Canadian Tiger Swallowtail	*Papilio canadensis*				G5	S5	OBA
Chryxus Arctic	*Oeneis chryxus*				G5	S5	OBA
Clouded Sulphur	*Colias philodice*				G5	S5	OBA
Columbine Duskywing	*Erynnis lucilius*				G3	S4	OBA
Common Ringlet	*Coenonympha california*				G5	S5	OBA
Common Roadside Skipper	*Amblyscirtes vialis*				G5	S4	OBA
Common Wood-Nymph	*Cercyonis pegala*				G5	S5	OBA
Compton Tortoiseshell	*Nymphalis l-album*				G5	S5	OBA
Coral Hairstreak	*Satyrium titus*				G5	S5	OBA
Crossline Skipper	*Polites origenes*				G5?	S4	OBA
Delaware Skipper	*Anatrytone logan*				G5	S4	OBA
Dion Skipper	*Euphyes dion*				G5	S4	OBA
Dreamy Duskywing	*Erynnis icelus*				G5	S5	OBA
Dun Skipper	*Euphyes vestris*				G5	S5	OBA
Eastern Comma	*Polygonia comma*				G5	S5	OBA
Eastern Giant Swallowtail	*Heraclides cresphontes*				G5	S4	OBA
Eastern Pine Elfin	*Callophrys niphon*				G5	S5	OBA
Eastern Tailed Blue	*Cupido comyntas*				G5	S5	OBA
European Skipper	*Thymelicus lineola*				G5	SNA	OBA
Eyed Brown	*Lethe eurydice*				G5	S5	OBA
Gray Comma	*Polygonia progne*				G5	S5	OBA
Great Spangled Fritillary	*Speyeria cybele*				G5	S5	OBA
Harvester	*Feniseca tarquinius*				G5	S4	OBA
Henry's Elfin	*Callophrys henrici*				G5	S4	OBA
Hobomok Skipper	*Poanes hobomok*				G5	S5	OBA
Indian Skipper	*Hesperia sassacus*				G5	S4	OBA
Juvenal's Duskywing	*Erynnis juvenalis*				G5	S5	OBA
Least Skipper	*Ancyloxypha numitor*				G5	S5	OBA
Leonard's Skipper	*Hesperia leonardus*				G4	S4	OBA
Little Wood-Satyr	*Megisto cymela*				G5	S5	OBA
Long Dash Skipper	*Polites mystic*				G5	S5	OBA

Species		SAR Status		Conservation Rank and Rarity Status			
Common Name	**Scientific Name**	**Provincial (ESA, 2007)**	**National (SARA)**	**National (COSEWIC)**	**Global (G-rank)**	**Provincial (S-rank)**	**Source**
Meadow Fritillary	*Boloria bellona*				G5	S5	OBA
Milbert's Tortoiseshell	*Aglais milberti*				G5	S5	OBA
Monarch	*Danaus plexippus*	SC	END, Schedule 1	END	G4	S2N, S4B	OBA
Mourning Cloak	*Nymphalis antiopa*				G5	S5	OBA
Mustard White	*Pieris oleracea*				G5	S4	OBA
Northern Azure	*Celastrina lucia*				G5	S5	OBA
Northern Broken-Dash	*Wallengrenia egeremet*				G5	S5	OBA
Northern Cloudywing	*Thorybes pylades*				G5	S5	OBA
Northern Crescent	*Phyciodes cocyta*				G5	S5	OBA
Northern Pearly-Eye	*Lethe anthedon*				G5	S5	OBA
Orange Sulphur	*Colias eurytheme*				G4G5	S5	OBA
Painted Lady	*Vanessa cardui*				G4G5	S5B	OBA
Pearl Crescent	*Phyciodes tharos*				G4G5	S4	OBA
Peck's Skipper	*Polites peckius*				G5	S5	OBA
Question Mark	*Polygonia interrogationis*				G5	S5	OBA
Red Admiral	*Vanessa atalanta*				G5	S5B	OBA
Silver-bordered Fritillary	*Boloria myrina*				G5?	S5	OBA
Silver-spotted Skipper	*Epargyreus clarus*				G5	S4	OBA
Silvery Blue	*Glaucopsyche lygdamus*				G5	S5	OBA
Silvery Checkerspot	*Chlosyne nycteis*				G5	S5	OBA
Striped Hairstreak	*Satyrium liparops*				G5	S5	OBA
Tawny Crescent	*Phyciodes batesii*				G3G4	S4	OBA
Tawny-edged Skipper	*Polites themistocles*				G5	S5	OBA
Viceroy	*Limenitis archippus*				G5	S5	OBA
White Admiral	*Limenitis arthemis arthemis*				G5T5	S5	OBA
Wild Indigo Duskywing	*Erynnis baptisiae*				G5	S4	OBA
PLANTS							
Butternut	*Juglans cinerea*	END	END, Schedule 1	END	G3	S2?	Stantec field observation

Definitions, Acronyms and Symbols

(+) = Migratory Birds Regulations (MBR 2022) Schedule 1 Species

Species of Conservation Concern (SOCC)

Species at Risk (SAR)

OBBA, ORAA, OBA 10km^2 Map Squares: 18VR12

NHIC 1km^2 Map Squares: 18VR1726 & 27, 18VR1826, 27 & 28, 18VR1927

Global G-rank

G1: Critically Imperiled (at very high risk of extinction)
G2: Imperiled (at high risk of extinction)
G3: Vulnerable (at moderate risk of extinction)
G4: Apparently Secure (Uncommon but not rare)
G5: Secure (common, widespread and abundant)
G#G#: Range Rank (range of uncertainty about the status of a taxon or ecosystem type)
GU: Unrankable (currently unrankable due to lack of information)
GNR: Unranked (global rank not yet assessed)
GNA: Not Applicable (species is not a suitable target for conservation activities)
T: Denotes that the rank applies to a subspecies or variety
B: Breeding
N: Non-breeding

Provincial S-rank

S1: Critically Imperiled (i.e. fewer than 5 occurrences in the nation and/or province)
S2: Imperiled (i.e. fewer than 20 occurrences in the nation and/or province)
S3: Vulnerable (i.e. 20-80 occurrences in the nation and/or province)
S4: Apparently Secure (uncommon, but not rare in the nation and/or province)
S5: Secure (common, widespread and abundant in the nation and/or province)
SNA: Not Applicable (species is not a suitable target for conservation activities)
SHB: Breeding is not confirmed in Ontario
S#S#: Range Rank (range of uncertainty about the status of the species or community)
S#?: Rank is Uncertain
S?: Not Ranked Yet
B: Breeding migrants/vagrants
M: Migrant species occurring regularly on migration
N: Non-breeding migrants/vagrants

COSEWIC: Committee on the Status of Endangered Wildlife in Canada
ESA: Endangered Species Act
SARA: Species at Risk Act
SARO: Species at Risk in Ontario

SARA or ESA designaqtion

END - Endangered
THR - Threatened
SC - Special Concern

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Appendix D Significant Wildlife Habitat Assessment

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Seasonal Concentration Areas of Animals				
Waterfowl Stopover and Staging Areas (Terrestrial)	American Black Duck; Wood Duck; Green-winged Teal; Blue-winged Teal; Mallard; Northern Pintail; Northern Shoveler; American Wigeon; Gadwall	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Candidate SWH Criteria • Fields with sheet water during Spring (mid March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH. Confirmed SWH Criteria Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects.” • Any mixed species aggregations of 100 or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependant on local site conditions and adjacent land use is the significant wildlife habitat. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates).	**Not identified** – Suitable habitat is not considered present within the Study Area.
Waterfowl Stopover and Staging Areas (Aquatic)	Canada Goose; Cackling Goose; Snow Goose; American Black Duck; Northern Pintail; Northern Shoveler; American Wigeon; Gadwall; Green-winged Teal; Blue-winged Teal; Hooded Merganser; Common Merganser; Lesser Scaup; Greater Scaup; Long-tailed Duck; Surf Scoter; White-winged Scoter; Black Scoter; Ring-necked Duck; Common Goldeneye; Bufflehead; Redhead; Red-breasted Merganser; Brant; Canvasback; Ruddy Duck	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7	Candidate SWH Criteria • Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water) Confirmed SWH Criteria Studies carried out and verified presence of: • Aggregations of 100 or more individuals of listed species for 7 days, results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH • The combined area of the ELC ecosites and a 100m radius area is the SWH • Wetland area and shorelines associated with sites identified within the SWHTG Appendix K are significant wildlife habitat. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded).	**Not identified** – Suitable habitat is not considered present within the Study Area.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Shorebird Migratory Stopover Area	Greater Yellowlegs; Lesser Yellowlegs; Marbled Godwit; Hudsonian Godwit; Black-bellied Plover; American Golden-Plover; Semipalmated Plover; Solitary Sandpiper; Spotted Sandpiper; Semipalmated Sandpiper; Pectoral Sandpiper; White-rumped Sandpiper; Baird's Sandpiper; Least Sandpiper; Purple Sandpiper; Stilt Sandpiper ; Short-billed Dowitcher; Red-necked Phalarope ; Whimbrel; Ruddy Turnstone; Sanderling; Dunlin	BBO1, BBO2, BBS1, BBS2, BBT1, BBT2, SDO1, SDS2, SDT1, MAM1, MAM2, MAM3, MAM4, MAM5	Candidate SWH Criteria • Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Storm water retention ponds and sewage lagoons are not considered SWH. Confirmed SWH Criteria Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24 hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC ecosites plus a 100m radius area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"	**Not identified** – Suitable habitat is not considered present within the Study Area.
Raptor Wintering Area	Rough-legged Hawk, Red-tailed Hawk, Northern Harrier, American Kestrel, Snowy Owl Special Concern: Short-eared Owl	Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW.	Candidate SWH Criteria • The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. • Raptor wintering sites need to be > 20 ha with a combination of forest and upland • Least disturbed sites, idle/fallow or lightly grazed field/meadow with adjacent woodlands Confirmed SWH Criteria Studies confirm the use of these habitats by: • One or more Short-eared Owls or; • At least 10 individuals and two spp. of the listed spp. • To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"	**Not identified** – Suitable habitat open habitat (CUM, CUT, CUS or CUW) not identified in Study Area.
Bat Hibernacula	Big Brown Bat; Tri-coloured Bat/Eastern Pipistrelle; Eastern Small-footed Myotis Endangered (ESA, 2007) Little Brown Myotis Northern Myotis	Bat Hibernacula may be found in these ecosites: CCR1, CCR2, CCA1, CCA2 Note: buildings are not considered to be SWH	Candidate SWH Criteria • Hibernacula may be found in abandoned caves, horizontal mine shafts (adits), abandoned underground foundations and areas of limestone bedrock with solution channels known as Karsts. The locations and site characteristics of bat hibernacula are relatively poorly known. Confirmed SWH Criteria • All sites with confirmed hibernating bats are SWH. • The area includes 1000m radius around the entrance of the hibernaculum. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Guideline for Wind Power Projects Potential Impacts to Bats and Bat Habitats" • If a SWH is determined for Bat Hibernacula then Movement Corridors are to be considered	**Not identified** – Suitable habitat is not considered present within the Study Area.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Bat Maternity Colonies	Big Brown Bat; Silver-haired Bat Endangered (ESA, 2007) Little Brown Myotis Northern Myotis	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD, FOM	Candidate SWH Criteria • Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • Maternal colonies can be found in tree cavities, vegetation and often in buildings (although buildings are not considered SWH). Note: Maternity roosts are not found in caves and mines in Ontario. • Maternity colonies located in Mature (dominant trees > 80yrs old) deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees. • Female Bats prefer wildlife trees (snags) of decay class 1 or 2 or class 2-4, can be living or with bark mostly intact. • Northern Myotis prefer contiguous tracts of older forest cover for foraging and roosting in snags and trees • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred Confirmed SWH Criteria Maternity colonies with confirmed use by: • >20 Northern Myotis • >10 Big Brown Bats • >20 Little Brown Myotis • >5 Adult female Silver-haired Bats • The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colony. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Guideline for Wind Power Projects Potential Impacts to Bats and Bat Habitats"	**CANDIDATE** – The woodland communities in the Study Area have the potential to support roosting bats. Habitat for bats will be discussed under SAR as all bats, except Big Brown Bat are now listed under the ESA. Targeted studies is recommended to confirm habitat use within the Subject Property and determine permitting requirements under the ESA.
Turtle Wintering Areas	Midland Painted Turtle Special Concern (ESA, 2007) Northern Map Turtle Snapping Turtle	Snapping and Midland Painted turtles, ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	Candidate SWH Criteria • For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. Confirmed SWH Criteria • Presence of 5 or more over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sep. – Oct) or spring (Mar. - April). Congregation of turtles is more common where wintering areas are limited and therefore significant.	**CONFIRMED (Adjacent Lands only)** – Field studies found Midland Painted Turtle in pond east of FODM2-1/ RBTB2-3 and in SWTM3/SWTM5-8. Both features more than 120m from the Project.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Reptile Hibernaculum	Eastern Gartersnake, Northern Watersnake, Northern Red-bellied Snake, Northern Brownsnake, Smooth Green Snake, Northern Ring-necked Snake Special Concern (ESA, 2007) Milksnake Eastern Ribbonsnake Five-lined Skink	For all snakes, habitat may be found in any ecosite in central Ontario other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. The existence of rock piles or slopes, stone fences, and crumbling foundations assist in identifying candidate SWH. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1, FOC3	Candidate SWH Criteria • For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. • Five-lined Skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures. Confirmed SWH Criteria Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (e.g. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). • Note: If there are Special Concern species present then the site is SWH. • Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. As such, the feature in which the hibernacula is located plus a 30 m radius buffer is the SWH. • Presence of any active hibernaculum for skink is significant. The ELC Ecosite polygon containing the skink hibernacula is the SWH.	**Not identified** – Suitable habitat features not identified in the Study Area.
Colonially – Nesting Bird Breeding Habitat (Bank and Cliff)	Bank Swallow; Cliff Swallow; Northern Rough-winged Swallow.	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles (Bank Swallow and N. Rough-winged Swallow). Cliff faces, bridge abutments, silos, barns (Cliff Swallows). Habitat found in the following ecosites: CUM1, CUT1, CUS1, BLO1, BLS1, BLT1, CLO1, CLS1, CLT1	Candidate SWH Criteria • Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, and soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. Confirmed SWH Criteria Studies confirming: • Presence of 1 or more nesting sites with 8 or more cliff swallow pairs or 50 bank swallow pairs and rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests • Field surveys to observe and count swallow nests are to be completed during the breeding season (May-July). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	**Not identified** – Suitable habitat is not considered present within the Study Area.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Colonially – Nesting Bird Breeding Habitat (Trees/Shrubs)	Great Blue Heron; Black-crowned Night Heron, Great Egret, Green Heron	SWM2, SWM3, SWM5, SWM6, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7, FET1	Candidate SWH Criteria • Nests in live or dead standing trees in wetlands, lakes, islands and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. Confirmed SWH Criteria Studies confirming: • Presence of 5 or more active nests of Great Blue Heron • The edge of the colony and a minimum 300m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH • Confirmation of active heronries must be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells	**CANDIDATE (Adjacent Lands only)** – Suitable habitat has the potential to occur within the Study Area, particularly the NHS lands west of the Subject Property where wetlands are present.
Colonially – Nesting Bird Breeding Habitat (Ground)	Herring Gull; Great Black-backed Gull; Ring-billed Gull; Little Gull; Common Tern; Caspian Tern; Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6; MAS1 – 3; CUM CUT; CUS	Candidate SWH Criteria • Nesting colonies of gulls and terns are on islands or peninsulas (natural or artificial) associated with open water or in marshy areas, lakes or large rivers (two-lined on a 1:50,000 NTS map). • Brewers Blackbird colonies are found loosely on the ground or in low bushes in close proximity to streams and irrigation ditches within farmlands. Confirmed SWH Criteria Studies confirming: • Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull and Great Black-backed Gull is significant • The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"	**Not identified** – Suitable habitat is not considered present within the Study Area.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Migratory Butterfly Stopover Areas	Painted Lady, White Admiral Special Concern Monarch	Combination of ELC Community Series; need to have present one Community Series from each land class: Field: CUM, CUT, CUS Forest: FOC, FOD, FOM, CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	Candidate SWH Criteria • A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes Confirmed SWH Criteria • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. • MUD of >5000 **or** >3000 with the presence of Painted Ladies or White Admiral's is to be considered significant	**ABSENT** – The Project is not within 5 km of Lake Ontario.
Landbird Migratory Stopover Areas	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD	Candidate SWH Criteria • Woodlots need to be >10 ha in size and within 5 km of Lake Ontario • Woodlands <2km from Lake Ontario are more significant • Sites have a variety of habitats; forest, grassland and wetland complexes • The largest sites are more significant • Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5km of Lake Ontario are Candidate SWH Confirmed SWH Criteria • Use of the woodlot by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr./May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects	**ABSENT** – The Project is not within 5 km of Lake Ontario.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Deer Yarding Areas	White-tailed Deer	Note: OMNR to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include; FOM, FOC, SWM and SWC. Or these ELC Ecosites; CUP2, CUP3, FOD3,CUT	<u>Candidate SWH Criteria</u> • Deer wintering areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within Stratum II and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60% • OMNR determines deer yards following methods outlined in “Selected Wildlife and Habitat Features: Inventory Manual" • Woodlots with high densities of deer due to artificial feeding are not significant <u>Confirmed SWH Criteria</u> No Studies Required. • Generally, there will be a history of traditional use of the yard by deer, although deer do move to other areas over the course of time if conditions in the yard change or due to societal impacts (i.e. artificial deer feeding). There may be circumstances where deer have recently moved to new areas. • Deer Yards are mapped by OMNR District offices. Locations of Core (Stratum 1) and Stratum 2 deer yards considered significant by OMNR will be available at local MNR offices. • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNR will complete these field investigations. • If a SWH is determined for Deer Wintering Area or if a proposed development is within a Stratum II yarding area then Movement Corridors are to be considered	**CONFIRMED (Adjacent Lands only) –** Stratum I deer yarding is present on the opposite side of the hydro corridor, more than 120m from the Project.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Deer Winter Congregation Areas	White-tailed Deer	All Forested Ecosites with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD Conifer plantations much smaller than 50 ha may also be used.	Candidate SWH Criteria • Woodlots need to be >100 ha in size. • Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha • Woodlots with high densities of deer due to artificial feeding are not significant Confirmed SWH Criteria No Studies Required. • Deer management is an MNR responsibility, deer winter congregation areas considered significant will be mapped by MNR • Use of the woodlot by white-tailed deer will be determined by MNR, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNR • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques , ground or road surveys or a pellet count deer density survey.	**CANDIDATE (Adjacent Lands only) –** Stratum I deer yarding is present within the Study Area in the NHS, west of the Subject Property. Deer congregation areas may be present in these areas. The Project is not expected to impact habitat.
Rare Vegetation Communities				
Cliffs and Talus Slopes	N/A	Any ELC Ecosite within Community Series: TAO, CLO, TAS, CLS, TAT, CLT	Candidate SWH Criteria • A Cliff is vertical to near vertical bedrock >3m in height. • A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris • Most cliff and talus slopes occur along the Niagara Escarpment. Confirmed SWH Criteria • Confirm any ELC Vegetation Type for Cliffs or Talus Slopes	**Not identified** – Suitable habitat is not considered present within the Study Area.
Sand Barren	N/A	ELC Ecosites: SBO1, SBS1, SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	Candidate SWH Criteria • Any sand barren area, no minimum size. • Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%. Confirmed SWH Criteria • Sand Barrens containing any characteristic plant species should be considered significant. • ELC Ecosite Area for the sand barren is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)	**Not identified** – Suitable habitat is not considered present within the Study Area.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Alvar	*Carex crawei* *Panicum philadelphicum* *Eleocharis compressa* *Scutellaria parvula* *Trichostema brachiatum*	ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2	Candidate SWH Criteria • An Alvar site > 0.5 ha in size • An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars may be complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover. Confirmed SWH Criteria • Field studies identify one or more of the 6E Plant Indicator species • Site must not be dominated by exotic or introduced species (< 50%). The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses	**Not identified** – Suitable habitat is not considered present within the Study Area.
Old Growth Forest	N/A	Forest Community Series: FOD, FOC, FOM	Candidate SWH Criteria • Stands 30 ha or greater in size or with at least 10 ha interior habitat assuming 100 m buffer at edge of forest • Old Growth forests are characterized by exhibiting the greatest number of old-growth characteristics, such as mature forest with large trees that has been undisturbed. Heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris. Confirmed SWH Criteria Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat • The stand will have experienced no recognizable forestry activities • The area of Forest Ecosites combined to make up the stand is the SWH	**Not identified** – Suitable habitat is not considered present within the Study Area.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Savannah	N/A	TPS1, TPS2, TPW1, TPW2, CUS2	Candidate SWH Criteria • No minimum size to site though remnant sites such as railway right of ways are not considered to be SWH • Site must be restored or a natural site • A Savannah is related to tallgrass prairie, but includes trees, which vary from 25 – 60% canopy cover. The open areas between the trees are dominated by prairie species, while forest species are found beneath the tree canopy. Confirmed SWH Criteria • Field studies confirm one or more of the Savannah indicator species listed in SWHTG Appendix N should be present. • Note: Savannah plant spp. list from Ecoregion 6E should be used • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species.	**Not identified** – Suitable habitat is not considered present within the Study Area.
Tallgrass Prairie	N/A	TPO1, TPO2	Candidate SWH Criteria • No minimum size to site. • Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. • Tallgrass Prairie is an open vegetation with less than < 25% tree cover, and dominated by prairie species, including grasses. Confirmed SWH Criteria • Field studies confirm one or more of the Tallgrass Prairie Indicator Species listed (used Eco-Region 6E in Appendix N) is a SWH. • Area of the ELC Ecosite is the SWH. • Site must not be dominated (e.g < 50%) by exotic or introduced species.	**Not identified** – Suitable habitat is not considered present within the Study Area.
Other Rare Vegetation Communities	N/A	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Candidate SWH Criteria • Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps. • ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M. • The OMNR/NHIC will have up to date listing for rare vegetation communities. Confirmed SWH Criteria • Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG • Area of the ELC Vegetation Type polygon is the SWH.	**Not identified** – Suitable habitat is not considered present within the Study Area.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Specialized Habitat for Wildlife				
Waterfowl Nesting Area	American Black Duck, Northern Pintail, Northern Shoveler Gadwall, Blue-winged Teal, Green-winged Teal, Wood Duck, Hooded Merganser, Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 , MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4 Note: includes adjacency to Provincially Significant Wetlands (PSWs).	Candidate SWH Criteria • A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. • Upland areas should be at least 120 m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks, and Hooded Mergansers utilize large diameter trees (> 40 cm) in woodlands for cavity nest sites. Confirmed SWH Criteria Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or; • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest.	**CANDIDATE (Adjacent Lands only)** – Suitable habitat has the potential to occur within the Study Area within the NHS, west of the Subject Property where wetlands are present. The Project is note expected to impact habitat.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Osprey Special Concern (ESA, 2007) Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	Candidate SWH Criteria • Nests are associated with lakes, ponds, rivers or wetlands along treed shorelines, islands, or on structures over water. • Osprey nests are usually at the top of a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects such as telephone or hydro poles will not normally be considered as SWH, however the OMNR District retains discretion regarding significance of constructed nesting platforms. Confirmed SWH Criteria Studies confirm: • One or more active Osprey or Bald Eagle nests in an area. • Considered SWH if the nest has been used or suspected of use within the past 5 years; unless documented that the nest and other associated nests in the nesting area have been unoccupied within the past 3 consecutive years by Osprey or Bald Eagle: • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is important • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"	**Not identified** – Suitable habitat is not considered present within the Study Area as there are no large lakes or rivers present.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Woodland Raptor Nesting Habitat	Northern Goshawk, Cooper's Hawk, Sharp-shinned Hawk, Red-shouldered Hawk, Barred Owl, Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	Candidate SWH Criteria • All natural or conifer plantation woodland/forest stands >30ha with 10ha of interior habitat. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers Hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest may be in close proximity to old nest. Confirmed SWH Criteria Studies confirm: • Presence of 1 or more occupied nests from species list is considered significant. • Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha of suitable habitat is the SWH. • Barred Owl – A 200m radius around the nest is the SWH. • Broad-winged Hawk, Coopers Hawk, Great Horned Owl, Red-tailed Hawk – A 100m radius around the nest is the SWH. • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area.	**CANDIDATE** – Suitable habitat has the potential to occur within the Study Area in the woodland and swamp communities, particularly on adjacent lands within the NHS west of the Subject Property. Targeted studies are recommended to confirm habitat use within the Subject Property where tree clearing may be required.
Turtle Nesting Areas	Painted Turtle Special Concern (ESA, 2007) Northern Map Turtle Snapping Turtle **Rationale;** These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites: MAM2, MAM3, MAM4, MAM5, MAM6, MAM1, MAM2, MAM3, SAS1, SAM1, SAF1, BOO1, FEO1	Candidate SWH Criteria • Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Confirmed SWH Criteria Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles is a SWH. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH. • Travel routes from wetland to nesting area are to be considered within the SWH. • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. • Any confirmed active skink nest site and a 30 m radius around it is significant • Field investigations should be conducted in prime nesting season typically late spring to early summer.	**Candidate (Adjacent Lands only)**– Suitable habitat observed in hydro corridor, more than 120m from Project.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Seeps and Springs	Selected wildlife species that utilize this feature: Wild Turkey, Ruffed Grouse, Spruce Grouse, White-tailed Deer, Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Candidate SWH Criteria • Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species Confirmed SWH Criteria Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of ELC forest ecosite containing the seeps/springs is the SWH. The protection of the function of the feature considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat	**Not identified** – Suitable habitat is not considered present within the Study Area.
Amphibian Breeding Habitat (Woodland)	Eastern Newt, Blue-spotted Salamander, Spotted Salamander, Four-toed Salamander, Northern Two-lined Salamander, Spring Peeper, Wood Frog, American Toad	All forested, ELC Ecosites; The wetland breeding ponds (including vernal pools) may be permanent or seasonal, large or small in size and could be located within or adjacent to the woodland.	Candidate SWH Criteria • Presence of a wetland, lake or pond of area >500m^2 (about 25m diameter) within or adjacent (within 120m) to a woodland (no minimum size). The wetland, lake or pond and surrounding forest, would be the Candidate SWH. Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Pools need to be present until mid-July to be used as breeding habitat. • Breeding pools within the woodland or the shortest distance from forest habitat are more significant because of reduced risk to migrating amphibians and more likely to be used. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat Confirmed SWH Criteria Studies confirm; • Presence of breeding population of 1 or more of the listed species with at least 20 individuals (adults, juveniles, eggs/larval masses) • The habitat is the woodland (ELC polygons) and wetland (ELC polygons) combined. A travel corridor connecting the woodland and wetland polygons is to be included within the habitat. • An observational study to determine breeding/larval stages will be required during the spring (Apr-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland	**CONFIRMED** – Field studies confirmed presence of five species with full chorus of Spring Peepers calling. Each of the three areas of SWH for amphibian breeding are more than 120m from the Project.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Amphibian Breeding Habitat (Wetlands)	Eastern Newt, American Toad, Spotted Salamander, Four-toed Salamander, Blue-spotted Salamander, Gray Treefrog, Western Chorus Frog, Northern Leopard Frog, Pickerel Frog, Green Frog, Mink Frog, Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA.	Candidate SWH Criteria • Wetlands and pools (including vernal pools) >500m^2 (about 25m diameter) isolated from woodlands (>120m), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. Confirmed SWH Criteria Studies confirm: • Presence of breeding population of 1or more of the listed salamander species or 3 or more of the listed frog or toad species with at least 20 breeding individuals (adults, juveniles, eggs/larval masses) or Wetland with confirmed breeding Bullfrogs is significant. • The ELC ecosite area and the shoreline are the SWH. • Surveys to confirm breeding to be completed during spring (Apr to June) when amphibians are migrating, calling and breeding within the wetland habitats. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Amphibian Movement Corridors are to be considered (see Table 3.10, Animal Movement Corridors).	**Not identified** – Suitable open marsh habitat is not considered present within the Study Area.
Woodland Area- Sensitive Bird Breeding Habitat	Yellow-bellied Sapsucker, Red-breasted Nuthatch, Veery, Blue-headed Vireo, Northern Parula, Black-throated Green Warbler, Blackburnian Warbler, Black-throated Blue Warbler, Ovenbird, Scarlet Tanager, Winter Wren Special Concern: Cerulean Warbler, Canada Warbler	All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD	Candidate SWH Criteria • Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha • Interior forest habitat is at least 100 m from forest edge habitat. Confirmed SWH Criteria Field Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	**CANDIDATE** – Suitable habitat has the potential to occur within the Study Area in the woodland and swamp communities, particularly on adjacent lands within the NHS west of the Subject Property. Targeted studies are recommended to confirm habitat use within the Subject Property where tree clearing may be required.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Habitat of Species of Conservation Concern (SOCC)				
Marsh Bird Breeding Habitat	American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon, Sandhill Crane, Green Heron, Trumpeter Swan Special Concern (O. Reg. 230/08) Yellow Rail Black Tern	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, FEO1, BOO1 For Green Heron: All SW, MA and CUM1 sites.	Candidate SWH Criteria • Nesting occurs in wetlands. • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Confirmed SWH Criteria Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren **or** 1 pair of Sandhill Cranes; **or** breeding by any combination of 5 or more of the listed species. • Note: any wetland with breeding of 1 or more Trumpeter Swans, Black Terns, Green Heron or Yellow Rail is SWH • Area of the ELC ecosite is the SWH • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	**Not identified** – Suitable habitat is not considered present within the Study Area.
Open Country Bird Breeding Habitat	Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow Common Spp: Eastern Meadowlark, American Kestrel, Northern Harrier, Savannah Sparrow **Special Concern** Short-eared Owl	CUM1, CUM2	Candidate SWH Criteria • Large grasslands areas (includes natural and cultural fields and meadows) >30 ha. Field/meadow not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years). • Field/meadow sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. • The indicator bird species are area sensitive requiring larger field/meadow areas than the common Field/meadow species. Confirmed SWH Criteria Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owls is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	**Not identified** – Suitable habitat is not considered present within the Study Area.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Shrub/Early Successional Bird Breeding Habitat	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher **Special Concern**: Yellow-breasted Chat Golden-winged Warbler	CUT1, CUT2, CUS1, CUS2, CUW1, CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species	<u>Candidate SWH Criteria</u> • Large field areas succeeding to shrub and thicket habitats>10 ha in size. Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years). • Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. • Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. <u>Confirmed SWH Criteria</u> Field Studies confirm: • Presence of nesting or breeding of 1 indicator species and at least 2 of the common species. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as SWH. • The area of the SWH is the contiguous ELC ecosite area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	**Not identified** – Suitable habitat is not considered present within the Study Area.
Terrestrial Crayfish	Chimney or Digger Crayfish; (Fallicambarus fodiens) Devil Crawfish or Meadow Crayfish; (Cambarus Diogenes)	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3	<u>Candidate SWH Criteria</u> • Meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Construct burrows in marsh, mudflats, meadow the ground can’t be to moist. Can often be found far from water. <u>Confirmed SWH Criteria</u> Studies Confirm: • Presence of 1 or more individuals of species listed or there chimneys (burrows) in suitable marsh meadow or terrestrial sites. • The area of the ELC polygon is the SWH. • Surveys should be done in adult breeding season (April to late June) and in late summer-early August in nearby temporary or permanent water for juveniles.	**Not identified** – Suitable habitat is not considered present within the Study Area.

Appendix C: Significant Wildlife Habitat Screening for the Study Area

Habitat Type	Indicator Species	ELC Ecosite Code	Habitat Criteria	Assessment Details
Special Concern and Rare Wildlife Species	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO). Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy	Candidate SWH Criteria • When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or rare species; linking candidate habitat on the site to ELC Ecosites needs to be completed. Confirmed SWH Criteria Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • Habitat form and function needs to be assessed from the assessment of vegetation types and an area of significant habitat that protects the rare or special concern species identified. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH; this must be delineated through detailed field studies.	**CANDIDATE** – Suitable habitat is present for species of conservation concern. See Appendix C, Table 2.
Animal Movement Corridors				
Amphibian Movement Corridors	Eastern Newt, Blue-spotted Salamander, Spotted Salamander, Gray Treefrog, Spring Peeper, Western Chorus Frog, Wood Frog	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species	Candidate SWH Criteria • Movement corridors between breeding habitat and summer habitat. • Movement corridors must be determined when Amphibian Breeding Habitat (Wetland) is confirmed as SWH Confirmed SWH Criteria • Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, roadless area, no gaps such as fields, waterways or bodies, and undeveloped areas are most significant • Corridors should be at least 200m wide with gaps <20m and if following riparian area with at least 15m of vegetation on both sides of waterway. Shorter corridors are more significant than longer corridors; however amphibians must be able to get to and from their summer and breeding habitat	**Not identified** – Suitable habitat is not considered present within the Study Area. Breeding and upland habitat well connected.
Deer Movement Corridors	White tailed-deer	Corridors may be found in all treed ecosites.	Candidate SWH Criteria • Movement corridor must be determined when Deer Winter Habitat is confirmed as SWH is confirmed to be present. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). • Corridors will be multi-functional (i.e., utilized by other mammal species). Confirmed SWH Criteria • Studies must be conducted at the time of year when deer or moose are moving to mineral licks or feeding areas (May – July). • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas • Corridors should be at least 200m wide with gaps <20m and if following riparian area with at minimum of 15m of vegetation cover on both sides of the waterway. Shorter corridors are more significant than longer corridors, however cervids must be able to get to and from their habitat.	**Not identified** – Suitable habitat is not considered present within the Study Area.

Appendix E Species at Risk Screening

SAR ASSESSMENT

Species		SAR Status				
Common Name	Scientific Name	Provincial (ESA, 2007)	National (SARA)	Source	Habitat	Assessment
REPTILES						
Blanding's Turtle	*Emydoidea blandingii*	THR	END, Schedule 1	NHIC, ORAA	Found in wetlands, such as ponds, lakes, and marshes. This species prefers shallow, slow-moving waters with soft, muddy bottoms and plenty of vegetation for shelter.	**Confirmed** - Suitable habitat is present within the Study Area but not within the Subject Property except for transient movement.
MAMMALS						
Eastern Red Bat	*Lasiurus borealis*	END	END	AMO	Forage in open areas, forested and non-forested habitats, including both deciduous and coniferous forests. Maternity roosts tend to be large diameter and tall, exceeding the forest canopy. Saplings have been used for roosting by males. Roosts by hanging from branches and using several trees during the breeding season with high inter-annual roosting area fidelity. Migratory species that overwinter in the southern United States. (COSEWIC 2023).	**Confirmed -** Suitable habitat is present within the Study Area in all woodland communities. The Project may impact habitat of this species. Targeted studies have confirmed habtiat and is ESA permit is required.
Eastern Small-footed Myotis	*Myotis leibii*	END		AMO	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius; Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices, and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark.	**Potential -** Suitable habitat is present within the Study Area in all woodland communities, particularly in areas of rock outcrops (if present). The Project may impact habitat of this species. Targeted studies have confirmed habtiat and is ESA permit is required.
Hoary Bat	*Lasiurus cinereus*	END	END	AMO	Forage in open areas, wetlands, open/patchy treed areas, open fields and grasslands. This species will use both deciduous and coniferous forests, with maternity roosts tending to be large diameter and tall, exceeding the forest canopy. Roosts by hanging from branches and using several trees during the breeding season with high inter-annual roosting area fidelity. Migratory species that overwinter in the southern United States. (COSEWIC 2023).	**Confirmed -** Suitable habitat is present within the Study Area in all woodland communities. The Project may impact habitat of this species. Targeted studies have confirmed habtiat and is ESA permit is required.
Little Brown Myotis	*Myotis lucifugus*	END	END, Schedule 1	AMO	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges (MNRF, 2000). Roosts in crevices and cavities in dead or dying trees, or sometimes beneath naturally loose bark on species like Shagbark Hickory (MNRF, 2017).	**Confirmed -** Suitable habitat is present within the Study Area in all woodland communities. The Project may impact habitat of this species. Targeted studies have confirmed habtiat and is ESA permit is required.
Northern Myotis	*Myotis septentrionalis*	END	END, Schedule 1	AMO	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy (MNRF, 2000)	**Potential -** Suitable habitat is present within the Study Area in all woodland communities. The Project may impact habitat of this species. Targeted studies have confirmed habtiat and is ESA permit is required.
Silver-haired Bat	Lasionycteris noctivagans	END	END	AMO	Forage along the edge of forests, forest openings, including young and old forests and edge of forests. Roost in tree cavities or under exfoliating bark. Migratory species that overwinters in the United States, southeastern British Columbia and occasionally the Great Lakes region (COSEWIC 2023).	**Confirmed -** Suitable habitat is present within the Study Area in all woodland communities. The Project may impact habitat of this species. Targeted studies have confirmed habtiat and is ESA permit is required.
Tri-colored Bat	*Perimyotis subflavus*	END	END, Schedule 1	AMO	Open woods near water; roosts in trees, cliff crevices, buildings or caves; hibernates in damp, draft-free, warm caves, mines, or rock crevices (MNRF, 2000). Prefers roosts in foliage within or below the canopy, mostly in oak species but also sometimes in maples. Clusters of dead or dying leaves on live branches are preferred (MNRF, 2017).	**Confirmed -** Suitable habitat is present within the Study Area in all woodland communities. The Project may impact habitat of this species. Targeted studies have confirmed habtiat and is ESA permit is required.
BIRDS						
Bank Swallow	*Riparia riparia*	THR	THR, Schedule 1	OBBA	The Bank Swallow is ranked as S4B (apparently secure breeding status) in Ontario and is designated provincially as threatened (June 2014). This species receives general habitat protection under the ESA (2007). The Bank Swallow excavate nests in exposed earth banks along watercourses and lakeshores, roadsides, stockpiles of soil, and the sides of sand and gravel pits. Single nests may occur, although colonies are typical and range from two to several thousand. Adjacent grasslands and watercourses are used for foraging habitat (Cadman et al., 2007).	**Unlikely** - Suitable habitat is considered absent within the Study Area.
Barn Swallow	*Hirundo rustica*	SC	THR, Schedule 1	NHIC, OBBA	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. They prefer unpainted, rough-cut wood as mud does not adhere as well to smooth surfaces.	**Confirmed -** Suitable habitat is present in the Study Area but considered absent in the Subject Property. Nesting habitat is limited to building structures. The Project is not expected to have a direct impact this species or its habitat.
Bobolink	*Dolichonyx oryzivorus*	THR	THR, Schedule 1	NHIC, OBBA	Bobolink nest primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures. Preferred ground cover species include grasses such as Timothy and Kentucky bluegrass and forbs such as clover and dandelion (COSEWIC 2022). Bobolink is an area-sensitive species, with reported lower reproductive success in small habitat fragments (COSEWIC 2022).	**Confirmed** - Suitable habitat is present in the Study Area. The agricultural lands wihtin the Subject Property have the potential to support habitat. The Project may impact habitat of this species. Targeted studies have confirmed habtiat and is ESA permit is required.
Canada Warbler	*Cardellina canadensis*	SC	THR, Schedule 1	OBBA	Inhabit moist, mixed woodlands with dense understory, often near wetlands, streams, or bogs. They prefer forested areas with abundant shrubs and mossy ground cover for nesting.	**Unlikely** - Suitable habitat is considered absent within the Study Area due to lack of mixed forests.
Chimney Swift	*Chaetura pelagica*	THR	THR, Schedule 1	OBBA	Urban specialists that nest and roost in chimneys or other vertical structures. Historically, they used hollow trees in old-growth forests, but now they are most commonly found in areas with human-made structures.	**Potential** - Suitable habitat may be present in the Study Area if chimneys are present; habitat is considered absent in the Subject Property as structures are not present. The Project is not expected to have a direct impact this species or its habitat.
Eastern Meadowlark	*Sturnella magna*	THR	THR, Schedule 1	NHIC, OBBA	Meadowlarks are ground nesting birds (Harrison, 1975), which are often associated with human-modified habitats where they sing from prominent perches such as roadside wires, trees, and fenceposts. As a grassland species, the Eastern Meadowlark typically occurs in meadows, hayfields and pastures. The Eastern Meadowlark is generally tolerant of habitat with an early succession of trees or shrubs.	**Confirmed -** Suitable habitat is present in the Study Area. The agricultural lands wihtin the Subject Property have the potential to support habitat. The Project may impact habitat of this species. Targeted studies have confirmed habtiat and is ESA permit is required.

Species		SAR Status				
Common Name	**Scientific Name**	**Provincial (ESA, 2007)**	**National (SARA)**	**Source**	**Habitat**	**Assessment**
Eastern Whip-poor-will	*Antrostomus vociferus*	SC	THR, Schedule 1	NHIC, OBBA	Inhabit open woodlands, forest edges, and rocky or sandy clearings. They nest directly on the ground, often choosing sites with sparse vegetation and good camouflage, close to areas for nocturnal insect foraging.	**Confirmed -** Suitable reproductive and foraging habitat for Eastern Whip-poor-will is present within the Study Area in the form of deciduous forests with rocky outcrops (FODM2-1/RBTB2-3 and WOD vegetation communities) Impacts to this species can be minimized through adherence to timing windows to comply with the MBCA and SARA. .
Golden-winged Warbler	*Vermivora chrysoptera*	SC	THR, Schedule 1	NHIC, OBBA, iNaturalist	Breeds in successional scrub habitat surrounding by mature forests, including upland communities, swamps and marshes (COSEWIC 2006).	**Potential -** Suitable habitat is present within the Study Area, including the Subject Property. Impacts to this species can be minimized through adherence to timing windows to comply with the MBCA and SARA. This species is not preotected under the ESA and therefore, a permit would not be required.
Least Bittern	*Botaurus exilis*	THR	THR, Schedule 1	NHIC, OBBA	Found in dense, shallow wetlands with tall vegetation like cattails or reeds. This species prefers quiet, protected areas with shallow water and plenty of cover.	**Unlikely** - Suitable habitat is considered absent within the Study Area due to lakc of marsh communities.
Red-headed Woodpecker	*Melanerpes erythrocephalus*	END	END, Schedule 1	NHIC, OBBA	Found in open woodlands, savannas, and areas with scattered trees. This species prefers habitats with a mix of mature trees and open spaces, such as forest edges, grasslands, or agricultural fields, where it can find food and nesting sites.	**Potential** - Suitable habitat is present within the Study Area, including the Subject Property within the woodland community. Targeted surveys for breeding birds did not confirm Red-headed Woodpecker within the Study Area. Suitable habitat within the WOD communities was confirmed.
Wood Thrush	*Hylocichla mustelina*	SC	THR, Schedule 1	NHIC, OBBA	Prefers moist deciduous or mixed second-growth forests with dense undergrowth and tall trees for perching (COSEWIC, 2012).	**Confirmed -** Suitable habitat is present within the Study Area, including the Subject Property. Impacts to this species can be minimized through adherence to timing windows to comply with the MBCA and SARA. This species is not preotected under the ESA and therefore, a permit would not be required.
PLANTS						
Butternut	*Juglans cinerea*	END	END, Schedule 1	Stantec field observation	Butternut typically grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges	**Confirmed** - Twenty (20) Butternut were identified within the Study Area, all within 200 m or less of Marchurst Road within the FODM2-1/ RBTB2-3 (Dry-Fresh Oak-Maple Deciduous Forest/ Oak-Red Maple-Pine Non-Calcareous Treed Rock Barren (Figure A3, Appendix A). The Project is expected to impact these individuals. A permit under the ESA is required.

Definitions, Acronyms and Symbols

ESA: Endangered Species Act

SARA: Species at Risk Act

SARA or ESA designation

EXT - Extinct

END - Endangered

THR - Threatened

SC - Special Concern

NAR - Not at Risk

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Appendix F Weather Data

Appendix F: Weather Data

Longitude (x)	Latitude (y)	Station Name	Climate ID	Date/Time	Year	Month	Day	Data Quality
-75.72	45.38	OTTAWA CDA	6105976	10/1/2024	2024	10	01	†
-75.72	45.38	OTTAWA CDA	6105976	10/2/2024	2024	10	02	†
-75.72	45.38	OTTAWA CDA	6105976	10/3/2024	2024	10	03	†
-75.72	45.38	OTTAWA CDA	6105976	10/4/2024	2024	10	04	†
-75.72	45.38	OTTAWA CDA	6105976	10/5/2024	2024	10	05	†
-75.72	45.38	OTTAWA CDA	6105976	10/6/2024	2024	10	06	†
-75.72	45.38	OTTAWA CDA	6105976	10/7/2024	2024	10	07	†
-75.72	45.38	OTTAWA CDA	6105976	10/8/2024	2024	10	08	†
-75.72	45.38	OTTAWA CDA	6105976	10/9/2024	2024	10	09	†
-75.72	45.38	OTTAWA CDA	6105976	10/10/2024	2024	10	10	†
-75.72	45.38	OTTAWA CDA	6105976	10/11/2024	2024	10	11	†
-75.72	45.38	OTTAWA CDA	6105976	10/12/2024	2024	10	12	†
-75.72	45.38	OTTAWA CDA	6105976	10/13/2024	2024	10	13	†
-75.72	45.38	OTTAWA CDA	6105976	10/14/2024	2024	10	14	†
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-75.72	45.38	OTTAWA CDA	6105976	10/17/2024	2024	10	17	†
-75.72	45.38	OTTAWA CDA	6105976	10/18/2024	2024	10	18	†
-75.72	45.38	OTTAWA CDA	6105976	10/19/2024	2024	10	19	†
-75.72	45.38	OTTAWA CDA	6105976	10/20/2024	2024	10	20	†
-75.72	45.38	OTTAWA CDA	6105976	10/21/2024	2024	10	21	†
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-75.72	45.38	OTTAWA CDA	6105976	4/3/2025	2025	04	03	†
-75.72	45.38	OTTAWA CDA	6105976	4/4/2025	2025	04	04	†
-75.72	45.38	OTTAWA CDA	6105976	4/5/2025	2025	04	05	†
-75.72	45.38	OTTAWA CDA	6105976	4/6/2025	2025	04	06	†
-75.72	45.38	OTTAWA CDA	6105976	4/7/2025	2025	04	07	†
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-75.72	45.38	OTTAWA CDA	6105976	5/3/2025	2025	05	03	†
-75.72	45.38	OTTAWA CDA	6105976	5/4/2025	2025	05	04	†
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-75.72	45.38	OTTAWA CDA	6105976	6/8/2025	2025	06	08	†
-75.72	45.38	OTTAWA CDA	6105976	6/9/2025	2025	06	09	†
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-75.72	45.38	OTTAWA CDA	6105976	6/29/2025	2025	06	29	†
-75.72	45.38	OTTAWA CDA	6105976	6/30/2025	2025	06	30	†
-75.72	45.38	OTTAWA CDA	6105976	7/1/2025	2025	07	01	†
-75.72	45.38	OTTAWA CDA	6105976	7/2/2025	2025	07	02	†
-75.72	45.38	OTTAWA CDA	6105976	7/3/2025	2025	07	03	†
-75.72	45.38	OTTAWA CDA	6105976	7/4/2025	2025	07	04	†
-75.72	45.38	OTTAWA CDA	6105976	7/5/2025	2025	07	05	†
-75.72	45.38	OTTAWA CDA	6105976	7/6/2025	2025	07	06	†
-75.72	45.38	OTTAWA CDA	6105976	7/7/2025	2025	07	07	†
-75.72	45.38	OTTAWA CDA	6105976	7/8/2025	2025	07	08	†
-75.72	45.38	OTTAWA CDA	6105976	7/9/2025	2025	07	09	†
-75.72	45.38	OTTAWA CDA	6105976	7/10/2025	2025	07	10	†
-75.72	45.38	OTTAWA CDA	6105976	7/11/2025	2025	07	11	
-75.72	45.38	OTTAWA CDA	6105976	7/12/2025	2025	07	12	†
-75.72	45.38	OTTAWA CDA	6105976	7/13/2025	2025	07	13	†
-75.72	45.38	OTTAWA CDA	6105976	7/14/2025	2025	07	14	†
-75.72	45.38	OTTAWA CDA	6105976	7/15/2025	2025	07	15	
-75.72	45.38	OTTAWA CDA	6105976	7/16/2025	2025	07	16	†
-75.72	45.38	OTTAWA CDA	6105976	7/17/2025	2025	07	17	†
-75.72	45.38	OTTAWA CDA	6105976	7/18/2025	2025	07	18	†
-75.72	45.38	OTTAWA CDA	6105976	7/19/2025	2025	07	19	†
-75.72	45.38	OTTAWA CDA	6105976	7/20/2025	2025	07	20	†
-75.72	45.38	OTTAWA CDA	6105976	7/21/2025	2025	07	21	†
-75.72	45.38	OTTAWA CDA	6105976	7/22/2025	2025	07	22	†
-75.72	45.38	OTTAWA CDA	6105976	7/23/2025	2025	07	23	†
-75.72	45.38	OTTAWA CDA	6105976	7/24/2025	2025	07	24	†
-75.72	45.38	OTTAWA CDA	6105976	7/25/2025	2025	07	25	†
-75.72	45.38	OTTAWA CDA	6105976	7/26/2025	2025	07	26	†
-75.72	45.38	OTTAWA CDA	6105976	7/27/2025	2025	07	27	†
-75.72	45.38	OTTAWA CDA	6105976	7/28/2025	2025	07	28	†
-75.72	45.38	OTTAWA CDA	6105976	7/29/2025	2025	07	29	†
-75.72	45.38	OTTAWA CDA	6105976	7/30/2025	2025	07	30	†
-75.72	45.38	OTTAWA CDA	6105976	7/31/2025	2025	07	31	†

Appendix F: Weather Data

Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Mean Temp Flag
24.5		11.5		18	
17.5		13		15.3	
21.5		5.5		13.5	
21.5		7.5		14.5	
18		6.5		12.3	
21		4		12.5	
14.5		8.5		11.5	
15		1		8	
10.5		3.5		7	
13.5		4		8.8	
19		3.5		11.3	
13.5		7		10.3	
12		4		8	
11.5		4		7.8	
9.5		4.5		7	
11.5		3		7.3	
15.5		-0.5		7.5	
18.5		1		9.8	
20.5		-0.5		10	
21.5		3.5		12.5	
25		11		18	
24.5		9.5		17	
21.5		11		16.3	
10.5		4		7.3	
10.5		-2		4.3	
11		4.5		7.8	
7.5		0		3.8	
7		-4		1.5	
11.5		0		5.8	
22.5		7		14.8	
24.5		13.5		19	
1.5		-4		-1.3	
6		-7		-0.5	
19		-3.5		7.8	
11		1		6	
4		1.5		2.8	
7		2.5		4.8	
8.5		-3.5		2.5	
-2.5		-7		-4.8	
3		-9		-3	
6.5		-7		-0.3	
5		0		2.5	
12		4		8	
17		0		8.5	
16.5		0		8.3	
12		3		7.5	
7		-0.5		3.3	
10		-1		4.5	
14.5		-2		6.3	
20.5		7.5		14	
12		1		6.5	

Appendix F: Weather Data

Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Mean Temp Flag
12		-0.5		5.8	
11		6		8.5	
14.5		2		8.3	
18.5		2.5		10.5	
17		8.5		12.8	
9.5		8		8.8	
18.5		2.5		10.5	
22		5		13.5	
25		8.5		16.8	
10		-1		4.5	
16.5		0		8.3	
20.5		8		14.3	
16		7		11.5	
21.5		7		14.3	
21.5		10		15.8	
22.5		13		17.8	
19		11.5		15.3	
13		5.5		9.3	
14.5		6		10.3	
23		7		15	
18		2.5		10.3	
26		6.5		16.3	
28		11.5		19.8	
26		12.5		19.3	
23.5		16.5		20	
28		12.5		20.3	
22.5		15		18.8	
17		10		13.5	
13		5		9	
15		2.5		8.8	
14.5		8		11.3	
12		7.5		9.8	
12		6.5		9.3	
14		6		10	
20.5		7		13.8	
24.5		8.5		16.5	
26		7.5		16.8	
27.5		8.5		18	
19		14		16.5	
24		12.5		18.3	
15.5		7.5		11.5	
14		7		10.5	
21.5		7		14.3	
26		7.5		16.8	
30.5		13		21.8	
24		19.5		21.8	
26.5		12		19.3	
25.5		18		21.8	
24.5		11.5		18	
20		16		18	
24		17		20.5	

Appendix F: Weather Data

Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Mean Temp Flag
24.5		12.5		18.5	
19.5		15		17.3	
19		7.5		13.3	
22		8.5		15.3	
24.5		9		16.8	
28		9		18.5	
26.5		17		21.8	
30		19.5		24.8	
27		21		24	
22.5		14		18.3	
27		11		19	
30.5		19		24.8	
36		21		28.5	
34		25		29.5	
27.5		21.5		24.5	
20.5		17		18.8	
24.5		13		18.8	
29.5		15.5		22.5	
26.5		17.5		22	
30.5		15		22.8	
30.5		22		26.3	
29.5		19		24.3	
24.5		18		21.3	
25.5		13		19.3	
29		14		21.5	
33		21		27	
21.5		19		20.3	
33.5		17.5		25.5	
29		16.5		22.8	
28		17		22.5	
32			M		M
29			M		M
30		22		26	
33		20		26.5	
28.5		22		25.3	
27.5		12.5		20	
26.5		14		20.3	
26		17		21.5	
24		14		19	
23.5		10		16.8	
28		11		19.5	
33		14		23.5	
29		22		25.5	
31		15.5		23.3	
31		19		25	
33.5		18		25.8	
30		22		26	
27.5		18.5		23	
23.5		16		19.8	

Heat Deg Days (°C)	Heat Deg Days Flag	Cool Deg Days (°C)	Cool Deg Days Flag	Total Rain (mm)
0		0		9.6
2.7		0		0.8
4.5		0		0
3.5		0		0
5.7		0		0
5.5		0		8.6
6.5		0		0
10		0		1
11		0		0.4
9.2		0		0
6.7		0		1.4
7.7		0		0
10		0		0
10.2		0		0
11		0		1.2
10.7		0		0
10.5		0		0
8.2		0		0
8		0		0
5.5		0		0
0		0		0
1		0		0
1.7		0		0
10.7		0		0
13.7		0		0
10.2		0		0
14.2		0		0
16.5		0		0
12.2		0		21
3.2		0		0
0		1		12
19.3		0		0
18.5		0		0
10.2		0		0
12		0		0
15.2		0		11
13.2		0		0
15.5		0		0
22.8		0		0
21		0		0
18.3		0		3.2
15.5		0		0.8
10		0		0
9.5		0		0
9.7		0		0
10.5		0		1.8
14.7		0		0
13.5		0		0
11.7		0		10.2
4		0		0
11.5		0		0

Heat Deg Days (°C)	Heat Deg Days Flag	Cool Deg Days (°C)	Cool Deg Days Flag	Total Rain (mm)
12.2		0		5
9.5		0		0
9.7		0		0
7.5		0		1.4
5.2		0		1.8
9.2		0		17.6
7.5		0		0
4.5		0		0
1.2		0		18.2
13.5		0		2
9.7		0		6.4
3.7		0		0
6.5		0		0
3.7		0		0
2.2		0		7
0.2		0		0.6
2.7		0		4.6
8.7		0		0
7.7		0		0
3		0		0
7.7		0		0
1.7		0		0
0		1.8		0
0		1.3		1.2
0		2		0
0		2.3		0
0		0.8		8
4.5		0		0.6
9		0		0
9.2		0		0
6.7		0		2.4
8.2		0		2.6
8.7		0		3.6
8		0		0.4
4.2		0		1.6
1.5		0		0
1.2		0		0
0		0		2.2
1.5		0		7.2
0		0.3		25.4
6.5		0		7.2
7.5		0		0.4
3.7		0		0
1.2		0		0
0		3.8		0.6
0		3.8		0
0		1.3		0
0		3.8		0
0		0		1.4
0		0		18.8
0		2.5		0

Heat Deg Days (°C)	Heat Deg Days Flag	Cool Deg Days (°C)	Cool Deg Days Flag	Total Rain (mm)
0		0.5		0.4
0.7		0		0
4.7		0		0
2.7		0		0
1.2		0		0
0		0.5		0
0		3.8		0
0		6.8		0
0		6		6.6
0		0.3		0
0		1		12.2
0		6.8		0
0		10.5		0
0		11.5		0
0		6.5		0
0		0.8		0
0		0.8		25
0		4.5		8.6
0		4		0
0		4.8		1.8
0		8.3		0
0		6.3		2
0		3.3		2.2
0		1.3		0
0		3.5		0
0		9		22
0		2.3		3.2
0		7.5		0
0		4.8		0
0		4.5		0
	M		M	0.4
	M		M	12.4
0		8		0
0		8.5		2.6
0		7.3		6.4
0		2		0
0		2.3		4.6
0		3.5		2.6
0		1		0
1.2		0		0
0		1.5		0
0		5.5		6
0		7.5		0
0		5.3		0
0		7		0
0		7.8		0
0		8		0
0		5		0
0		1.8		0

Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag
	0		9.6	
	0		0.8	
T	0		0	T
	0		0	
	0		0	
	0		8.6	
T	0		0	T
	0		1	
	0		0.4	
	0		0	
	0		1.4	
	0		0	
	0		0	
	0		0	
	0		1.2	
T	0		0	T
T	0		0	T
T	0		0	T
	0		0	
	0		0	
	0		0	
	0		0	
T	0		0	T
T	0		0	T
	0		0	
T	0		0	T
T	0		0	T
	0		0	
	0		21	
T	0		0	T
	0		12	
	0		0	
	0		0	
	0		0	
	0		0	
	0		11	
	0		0	
	10		7.8	
	3		2.2	
	0		0	
	0		3.2	
	0		0.8	
	0		0	
	0		0	
	0		0	
	0		1.8	
	0		0	
	0		0	
	0		10.2	
	0		0	
	0		0	

Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag
	0	T	5	
	0		0	
	0		0	
	0		1.4	
	0		1.8	
	0		17.6	
T	0		0	T
	0		0	
	0		18.2	
	0		2	
	0		6.4	
	0		0	
	0		0	
	0		0	
	0		7	
	0		0.6	
	0		4.6	
T	0		0	T
	0		0	
	0		0	
	0		0	
	0		0	
	0		0	
	0		1.2	
	0		0	
	0		0	
	0		8	
	0		0.6	
	0		0	
	0		0	
	0		2.4	
	0		2.6	
	0		3.6	
	0		0.4	
	0		1.6	
	0		0	
	0		0	
	0		2.2	
	0		7.2	
	0		25.4	
	0		7.2	
	0		0.4	
	0		0	
	0		0	
	0		0.6	
	0		0	
	0		0	
	0		0	
	0		1.4	
	0		18.8	
	0		0	

Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag
	0		0.4	
	0		0	
	0		0	
	0		0	
	0		0	
	0		0	
	0		0	
T	0		0	T
	0		6.6	
	0		0	
	0		12.2	
	0		0	
	0		0	
	0		0	
	0		0	
	0		0	
	0		25	
	0		8.6	
	0		0	
	0		1.8	
	0		0	
	0		2	
	0		2.2	
	0		0	
	0		0	
	0		22	
	0		3.2	
	0		0	
	0		0	
	0		0	
	0		0.4	
	0		12.4	
	0		0	
	0		2.6	
	0		6.4	
	0		0	
	0		4.6	
	0		2.6	
	0		0	
	0		0	
	0		0	
	0		6	
	0		0	
	0		0	
	0		0	
	0		0	
	0		0	
	0		0	
	0		0	

Snow on Grnd (cm)	Snow on Grnd Flag	Dir of Max Gust (10s deg)	Dir of Max Gust Flag
0			
0			
0			
0			
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0			
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0			
0			
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0			
0			

Snow on Grnd (cm)	Snow on Grnd Flag	Dir of Max Gust (10s deg)	Dir of Max Gust Flag
0			
0			
0			
0			
0			
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0			
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Appendix F: Weather Data

Snow on Grnd (cm)	Snow on Grnd Flag	Dir of Max Gust (10s deg)	Dir of Max Gust Flag
0			
0			
0			
0			
0			
0			
0			
0			
0			
0			
0			
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Spd of Max Gust (km/h)	Spd of Max Gust Flag

Spd of Max Gust (km/h)	Spd of Max Gust Flag

Spd of Max Gust (km/h)	Spd of Max Gust Flag

Appendix G Bat Habitat Assessment

Appendix G: Evolugen Fitzroy (Marchurst Road, Kanata) Location Bat Habitat Assessment, June 13 2025

Species	Habitat Description	Suitable Habitat Features Present	Life Cycle Activities	Likelihood of Occurrence	Species Observed	Habitat Suitability
Silver-haired Bat	Upland deciduous forests, open agricultural areas, mixed forests, rocky outcrops, hydro corridors, and wetlands	• Trees with loose bark • Trees with cavities • Decaying Trees • Coniferous Trees • Deciduous Trees • Riparian Zones	• Roosting • Reproduction • Foraging • Stopover	**High**	• **Confirmed**	Upland and mixed forest habitat provides suitable roosting and reproductive habitat as large mature trees (> 25 cm at diameter at breast height [DBH]) are present. Trees with cavities, loose bark, standing snags, and trees in decay are present that provide suitable roosting and stopover habitat. Large open areas (forest edges, fields, pasture, and wetlands) provide suitable foraging habitat.
Eastern Red Bat	Upland deciduous forests, open agricultural areas, mixed forests, rocky outcrops, hydro corridors, and wetlands	• Deciduous Forest • Coniferous Forests • Tree foliage • Shrub foliage • Trees exceeding the height of the surrounding canopy • Open areas • Aquatic habitats • Forest edges	• Roosting • Reproduction • Foraging • Stopover	**High**	• **Confirmed**	Upland and mixed forest habitat provides suitable roosting and reproductive habitat as large mature trees (> 25 cm DBH) are present. Trees with cavities, loose bark, standing snags, and trees in decay are present that provide suitable roosting and stopover habitat. Large open areas (forest edges, fields, pasture, and wetlands) provide suitable foraging habitat.
Hoary Bat	Upland deciduous forests, open agricultural areas, mixed forests, rocky outcrops, hydro corridors, and wetlands	• Deciduous Forest • Coniferous Forest • Open areas • Aquatic Areas • Forest edges	• Roosting • Reproduction • Foraging • Stopover	**High**	• **Confirmed**	Upland and mixed forest habitat provides suitable roosting and reproductive habitat as large mature trees (> 25 cm DBH) are present. Trees with cavities, loose bark, standing snags, and trees in decay are present that provide suitable roosting and stopover habitat. Large open areas (forest edges, fields, pasture, and wetlands) provide suitable foraging habitat.

Appendix G: Evolugen Fitzroy (Marchurst Road, Kanata) Location Bat Habitat Assessment, June 13 2025

Species	Habitat Description	Suitable Habitat Features Present	Life Cycle Activities	Likelihood of Occurrence	Species Observed	Habitat Suitability
Little Brown Myotis	Upland deciduous forests, open agricultural areas, mixed forests, rocky outcrops, hydro corridors, and wetlands	• Rock crevices • Trees with loose bark • Trees with cavities • Dead and decaying Trees • Open areas • Forest edges	• Roosting • Reproduction • Foraging • Wintering	**High**	• **Confirmed**	Upland and mixed forest habitat provides suitable roosting and reproductive habitat as large mature trees (> 25 cm DBH) are present. Trees with cavities, loose bark, standing snags, and trees in decay are present that provide suitable roosting and wintering habitat. Large open areas (forest edges, fields, pasture, and wetlands) provide suitable foraging habitat.
Northern Myotis	Upland deciduous forests, open agricultural areas, mixed forests, rocky outcrops, hydro corridors, and wetlands	• Trees with loose bark • Trees with cavities • Dead and decaying Trees • Open areas • Forest edges	• Roosting • Reproduction • Foraging	**High**	• Could not confirm	Upland and mixed forest habitat provides suitable roosting and reproductive habitat as large mature trees (> 25 cm DBH) are present. Trees with cavities, loose bark, standing snags, and trees in decay are present that provide suitable roosting habitat. Large open areas (forest edges, fields, pasture, and wetlands) provide suitable foraging habitat. Northern Myotis prefer caves and abandoned mines to overwinter in, which are absent at the Site.
Tri-colored Bat	Upland deciduous forests, open agricultural areas, mixed forests, rocky outcrops, hydro corridors, and wetlands	• Dead leaf clusters on broken branches • Dense clusters of live foliage • Coniferous forests • Deciduous forest • Riparian areas	• Roosting • Reproduction • Foraging	**High**	• **Confirmed (1 call confirmed)**	Upland and mixed forest habitat provides suitable roosting and reproductive habitat as large mature trees (> 25 cm DBH) are present. Trees with cavities, loose bark, standing snags, and trees in decay are present that provide suitable roosting habitat. Large open areas (forest edges, fields, pasture, and wetlands) provide suitable foraging habitat. Tri-colored Bat prefer caves and abandoned mines to overwinter in, which are absent at the Site.

Appendix G: Evolugen Fitzroy (Marchurst Road, Kanata) Location Bat Habitat Assessment, June 13 2025

Species	Habitat Description	Suitable Habitat Features Present	Life Cycle Activities	Likelihood of Occurrence	Species Observed	Habitat Suitability
Eastern Small-footed Bat	Upland deciduous forests, open agricultural areas, mixed forests, rocky outcrops, hydro corridors, and wetlands	• Rocky crevices • Open and rocky areas • Forests • Aquatic Habitat	• Roosting • Reproduction • Foraging	**Medium - High**	• Could not confirm	Little is known regarding the habitat preferences of the Eastern Small-footed Bat. Eastern Small-footed Bats prefer rocky areas nearby and/or within deciduous forests. These habitat features are present within the upland deciduous forests, mixed forests, and along the hydro corridor at the Site. Forests, forest edges, and aquatic habitats provide suitable foraging habitat. Dead and decaying trees along with rocky crevices and outcrops provide suitable reproductive habitat.

Appendix H Significant Wildlife Habitat Assessment

Appendix H: Evolugen Fitzroy (Marchurst Road, Kanata) Location Blanding's Turtle Habitat Assessment, June 13 2025

Turtle Pond	Habitat Description	Suitable Habitat Features Present	Life Cycle Activities	Likelihood of Occurrence	Species Observed	Habitat Suitability
Turtle Pond #1	Located in the northeast area of the Site, this pond appears manmade. The turtle pond is approximately 15-20 m long and 5-6 m wide. The pond is situated along a farm pathway through deciduous upland forest and opens to a large hayfield. Cattails, sedges, rushes, pondweed, and duckweed were observed at the pond. The pond appeared to be 40 cm to 0.5 m deep (visual estimate).	**Aquatic:** • Permanent shallow water (pond) • Presence of static water • Presence of aquatic vegetation • Presence of basking sites (rocks and around pond) • Soft organic substrates (where exposed) **Terrestrial:** • Rocky outcrops (within 100 – 200 m) • Trails • Presence of shrubs and grasses (within 50 – 100 m) • Upland forest (within 50 – 100 m)	• Thermoregulation • Foraging • Summer inactivity • Overwintering • Nesting	Nesting: low Overwintering: low Functional Habitat: **present** Unsuitable Habitat: **present**	• Midland Painted Turtle	**Medium:** Manmade ponds and agricultural fields (hay fields) that are actively used are not considered suitable habitat for Blanding's turtle and may act as an ecological trap. However, the manmade pond may provide adequate basking and foraging habitat. It is unknown if the pond freezes solid over the winter. Turtles may be use this pond as overwintering habitat if suitable. One Midland Painted Turtle was observed basking within the pond. Some organic soils are exposed along the pond, trail system, and within the agricultural field but chances of nesting are likely low due to farm activity. Summer inactivity habitat is present in the form of upland deciduous forests.
Turtle Pond #2	This feature is a beaver pond located approximately 52 m south of the construction footprint within the southwest potion of the Site. The pond is surrounded by dense shrubs (alders, dogwood, raspeberry, and buckthorn). Cattails and lillypads are present along the pond and submerged vegetation is visible (could not ID due to clarity of the water).	**Aquatic:** • Beaver regulated wetland • Static water • Soft organic substrates • Presence of emergent, floating and submerged vegetation • Presence of basking sites (hummocks, shoreline, logs) • Connection to larger wetland complex **Terrestrial:** • Rocky outcrops (approximately 200-500 m away) • Trails (100 – 200 m away) • Deciduous upland forests • Presence of shrubs and grasses (100 m – 200 m away)	• Thermoregulation • Foraging • Summer inactivity • Overwintering • Mating • Movement	Nesting: low Overwintering: **Medium** Functional Habitat: **present** Unsuitable Habitat: **present**	• **Blanding's Turtle** • Midland Painted Turtle	**Confirmed:** One (1) large mature **Blanding's Turtle** and 1 Midland Painted Turtle were confirmed basking on a tussock mound within the beaver pond. The beaver pond is part of a larger wetland complex that may act as a movement corridor for turtles. Turtles may use the beaver pond for basking, foraging, mating, and possibly overwintering if deep enough (could not confirm depth). Blanding's Turtle may also nest within the nearby hydro corridor (200 – 400 m away) but these areas may act as ecological traps. Turtle eggs have been found within the hydro corridor but species and/or likelihood of the predation could not be confirmed. Summer inactivity habitat is also present in the form of upland deciduous forests (50 – 100 m away).

Appendix H: Evolugen Fitzroy (Marchurst Road, Kanata) Location Blanding's Turtle Habitat Assessment, June 13 2025

Turtle Pond	Habitat Description	Suitable Habitat Features Present	Life Cycle Activities	Likelihood of Occurrence	Species Observed	Habitat Suitability
Turtle Pond #3	This pond appears manmade and is approximately 10-15 m long and 5-7 m wide. The pond (located within a cattle pasture) appears shallow, has a large amount of algae and aquatic vegetation. The edges of the pond are eroded from cattle activity and appear to have clay/silty soils.	**Aquatic:** • Shallow water • Static water • Presence of submerged and floating vegetation • Soft organic substrates **Terrestrial:** • Presence of shrubs and grasses • Upland forests	• Thermoregulation • Foraging • Summer inactivity	Nesting: low Overwintering: low Functional Habitat: **present** Unsuitable Habitat: **present**	• No turtle observations	**Low:** The turtle pond in the cattle pasture lacks suitable basking areas. Turtles may bask outside the pond or along the eroded edges but connection to other ponds and suitable shelter seems unlikely. Pond appears shallow in depth but could not confirm. Grazing from cattle may create adequate grassland and shrubland but activity may also deter turtles. Summer inactivity habitat is present in the form of upland deciduous forests (100 – 200 m away).

Appendix I Butternut Health Assessment

BHA Tree Analysis (version: December 2013)

This table is to be completed by a designated Butternut Health Assessor (BHA).

BHA Report #	1	Assessment Date(s)	2025	Total # Butternut Trees in BHA Report	1
BHA ID #		BHA Name	Bronwen Hennigar		
Landowner / Client Name			Evolugen		
Property Location			18T 428701 5017014		

input field data										automatic calculations from field data						Categories: 1: non-retainable, 2: retainable, 3: archivable				
			# bole cankers				# root flare (RF) cankers													
			sooty (S) (will be assigned 2.5 cm per canker)		open (O) (will be assigned 5 cm per canker)															
Tree #	Live Crown %	Tree dbh (cm)	S <2 m	S >2 m	O <2 m	O >2 m	RF S	RF O	<40 m from cankered tree? (Y or N)	**Circ.** (cm) = Pi x dbh	total **bole canker width** (sooty x 2.5 + open x 5)	total **RF canker width** (sooty x 2.5 + open x 5)	bole canker **%** of circ.	RF canker **%** of circ.	total bole & root canker % of 2xCirc	LC% >/= 50 & BC% = 0	LC% >70 & BRC % <20	LC % >70 & BC % <20	**Preliminary tree call**	**FINAL TREE CALL** a Cat 2, dbh>20cm <40m from a Cat 1
										Circ (cm)	**BC** (cm)	**RC** (cm)	**BC%**	**RC%**	**BRC%**					
1	35	34	5	6	1	0	0	2	y	106.8	32.5	10.0	**30.4**	**9.4**	**19.9**	1	1	1	**1**	**1**
2	50	32	6	2	0	0	2	2	y	100.5	20.0	15.0	**19.9**	**14.9**	**17.4**	1	1	1	**1**	**1**
3	50	36	5	3	0	0	4	2	y	113	20.0	20.0	**17.7**	**17.7**	**17.7**	1	1	1	**1**	**1**
4	0	20	6	9	0	0	3	0	y	62.8	37.5	7.5	**59.7**	**11.9**	**35.8**	1	1	1	**1**	**1**
5	0	23	11	6	0	0	5	0	y	72.22	42.5	12.5	**58.8**	**17.3**	**38.1**	1	1	1	**1**	**1**
6	0	8	0		0	0		0	y	25.12	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**
7	30	16	6	3	1	0	4	1	y	50.24	27.5	15.0	**54.7**	**29.9**	**42.3**	1	1	1	**1**	**1**
8	0	26	7	8	0		3	0	y	81.64	37.5	7.5	**45.9**	**9.2**	**27.6**	1	1	1	**1**	**1**
9	0	26	6	7	1	0	3	0	y	81.64	37.5	7.5	**45.9**	**9.2**	**27.6**	1	1	1	**1**	**1**
10	10	13	5	10	0	0	4	0	y	40.82	37.5	10.0	**91.9**	**24.5**	**58.2**	1	1	1	**1**	**1**
11	0	12	9	5	0	0	3	0	y	37.68	35.0	7.5	**92.9**	**19.9**	**56.4**	1	1	1	**1**	**1**
12	15	29	13	7	0	0	8	0	y	91.06	50.0	20.0	**54.9**	**22.0**	**38.4**	1	1	1	**1**	**1**
13	0	55	8	20	0	0	5	5	y	172.7	70.0	37.5	**40.5**	**21.7**	**31.1**	1	1	1	**1**	**1**
14	0	32	12	9	0	0	8	0	y	100.5	52.5	20.0	**52.2**	**19.9**	**36.1**	1	1	1	**1**	**1**
15	0	20	4	6	0	0		0	y	62.8	25.0	0.0	**39.8**	**0.0**	**19.9**	1	1	1	**1**	**1**
16	35	20	5	2	0	0		0	y	62.8	17.5	0.0	**27.9**	**0.0**	**13.9**	1	1	1	**1**	**1**
17	0	14	3	7	0	0		0	y	43.96	25.0	0.0	**56.9**	**0.0**	**28.4**	1	1	1	**1**	**1**
18	100	1	0	0	0	0		0	y	3.14	0.0	0.0	**0.0**	**0.0**	**0.0**	2	2	2	**2**	**2**
19	0	10	0	4	0	0		0	y	31.4	10.0	0.0	**31.8**	**0.0**	**15.9**	1	1	1	**1**	**1**
20	0	43							y	135	0.0	0.0	**0.0**	**0.0**	**0.0**	1	1	1	**1**	**1**

Appendix J CVs

Andrew Taylor B.Sc.

Senior Ecologist

23 years of experience · Waterloo, Ontario

Andrew is a knowledgeable terrestrial ecologist and project manager who has served as an expert witness at Boards and Tribunals, including the Environmental Review Tribunal. As a senior ecologist, Andrew provides technical guidance and advice on projects in a wide variety of sector, including energy, transportation, oils and gas, aggregate and community development. These projects involve implementing natural heritage policies of applicable federal, provincial and municipal legislation and guidelines, where he maintains excellent working relationships with agencies. Andrew has extensive experience with the policies, field studies and permitting requirements pertaining to species at risk though both Ontario's Endangered Species Act and the federal Species at Risk Act.

Andrew has strong technical skills and is knowledgeable in the ecology of vascular plants, birds, mammals (including bats), butterflies, dragonflies, breeding amphibians (calling frogs and toads), breeding salamanders (adult and egg studies) and reptiles. He is skilled at assessing wildlife habitat, applying Ecological Land Classification (ELC) and delineating wetland boundaries. Andrew is also a certified Butternut Health Assessor.

Andrew's breadth of experience positions him to understand the potential for impacts to natural heritage features and wildlife from development activities and to develop mitigation and rehabilitation initiatives to minimize the net impacts to the environment and project design. This experience and knowledge of policy allows Andrew to navigate complex projects through various approvals at all levels of government in a wide range of sectors.

EDUCATION

B.Sc. (Hons), University of Guelph / Environmental Toxicology, Guelph, Ontario, Canada, 2001

CERTIFICATIONS & TRAINING

Certificate #032, Ontario Ministry of Natural Resources / Butternut Health Assessor, Hamilton, Ontario, Canada, 2009

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification System for Southern Ontario, Turkey Point, Ontario, Canada, 2006

PROJECT EXPERIENCE

RENEWABLE ENERGY

Environmental Approvals, Multiple Projects | Various Sites, Ontario | Terrestrial Ecologist

Approvals for wind and solar power project were obtained in Ontario through various approval processes including: • Environmental Screening Reports/Environmental Review Reports in compliance with the Ministry of the Environment's Guide to Environmental Assessment Requirements for Electricity Projects • Canadian Environmental Assessment Act (CEAA). • Green Energy Act and O. Reg. 359/09 under the Environmental Protection Act with guidance obtained from the Draft Natural Heritage Assessment Guide for Renewable Energy Projects (MNR, 2010). Technical guidance was also provided to wind power project approvals in New Brunswick Manitoba, Saskatchewan and Alberta. Andrew's involvement included pre-construction study design, coordinating and conducting monitoring for avian and other wildlife species, including targeted surveys for species at risk. Avian studies included breeding grassland and forest birds, wintering raptors and migratory surveys for waterfowl, raptors, passerines and shorebirds. Andrew conducted and coordinated acoustic bat surveys including data collection, species identification, data analysis and reporting, and co-authoring technical reports. He has also been instrumental in obtaining Endangered Species Act approvals for many projects. Andrew partaken in extensive in public and First Nations consultation on renewable energy projects. He has also appeared as an expert witness at several renewable energy Environmental Review Tribunals. ESA.

Post-construction Monitoring Programs | Multiple Projects, Various Sites | Terrestrial Ecologist

Post-construction monitoring of renewable energy projects is performed to assess the direct impacts to birds and bats and indirect impacts to breeding, migrating and wintering wildlife. The purpose of post-construction monitoring programs is to verify predictions of the pre-construction assessment and, if necessary, implement appropriate measures to mitigate adverse effects. Andrew has coordinated and conducted monitoring field studies including assessment of disturbance to grassland, forest and wetland breeding birds, staging waterfowl and shorebirds, tundra swans and wintering raptors and co-authored or authored the post-construction monitoring reports for many projects in Ontario. Andrew has also contributed to post-construction monitoring programs in Manitoba. Andrew's extensive post-construction experience includes over 20 projects with a combined capacity of over 1000 turbines and almost 2000MW of renewable power.

ELECTRICAL POWER DISTRIBUTION

Stratford Distribution Station | Stratford, Ontario | Terrestrial Ecologist

Coordination of tree management plan and species at risk assessment.

Bruce Creek x Sarnia Scott TS B3N Line Protection Project | Sarnia, Ontario | Terrestrial Ecologist

Senior ecologist and technical advisory on species at risk and implementation of Species at Risk Act permit.

Midtown Electricity Infrastructure Renewal Project | Toronto, Ontario | Terrestrial Ecologist

Senior ecologist coordinating species at risk inventories and permitting requirements.

Clarington Transformer Station | Durham, Ontario | Terrestrial Ecologist

Senior ecologist and advisory role on wildlife habitat and species at risk impact assessment.

Huycke Island Electrical Distribution Submarine Cable Replacement | Trent Hills, Ontario | Terrestrial Ecologist

Senior ecologist and advisory role on impact assessment of wildlife habitat and species at risk.

Bruce to Milton Transmission Reinforcement Project | Multiple Sites, Ontario | Terrestrial Ecologist

Terrestrial surveys related for species at risk protected under the provincial Endangered Species Act (2007).

Coote's Paradise Transmission Reinforcement Project | Hamilton, Ontario | Terrestrial Ecologist

Terrestrial surveys included vegetation community assessments, floral inventory, with emphasis on species at risk.

ENVIRONMENTAL

Étude écologique de 142 hectares de milieux naturels | Ville de Saint-Lazare | Saint-Lazare, QC | 21-04/22-02 | Spécialiste des chiroptères

OIL & GAS

Hamilton to Milton Natural Gas Pipeline | Various Sites, Ontario | 2014-present | Terrestrial Ecologist

Terrestrial surveys included vegetation community assessments and floral inventory, with emphasis on species at risk.

Energy East Pipeline | TransCanada | Various Sites, Ontario | 2012-present | Terrestrial Ecologist

Senior ecologist and advisory role on impact assessment of wildlife habitat and species at risk for project spanning across Ontario through four ecoregions. Consultation with Ontario Ministry of Natural Resources regarding species at risk including, but not limited to, Woodland Caribou.

Parkway West Compressor Station | Halton, Ontario | 2012-2014 | Terrestrial Ecologist

Senior ecologist and advisory role on impact assessment of wildlife habitat and species at risk.

Dow Moore, Corunna and Seckerton Pipeline Project | Lambton County, Ontario | Terrestrial Ecologist

Species at risk habitat assessment and inventory. Study design and development in conjunction with local Ontario Ministry of Natural Resources district for several species protected under the Endangered Species Act.

Genesis Pipeline Extension Project | Sarnia, Ontario | 2014 | Terrestrial Ecologist

Senior ecologist and advisory role on impact assessment of wildlife habitat and species at risk.

Brantford Take-off to Kirkwall Valve Site Pipeline Project | Hamilton, Ontario | 2013-2015 | Terrestrial Ecologist

Senior ecologist and advisory role on impact assessment of wildlife habitat and species at risk.

Bickford to Dawn Pipeline Project | Chatham, Ontario | Terrestrial Ecologist

Terrestrial surveys included vegetation community assessments, floral inventory and species at risk habitat assessments. Study design and development in conjunction with local Ontario Ministry of Natural Resources district for Eastern Foxsnake, including a SAR 17b permit application.

TRANSPORTATION PLANNING

City of Toronto Fort York Pedestrian Footbridge | Toronto, Ontario | Terrestrial Ecologist

Coordinated Natural Sciences component of project including assessment of potential impacts, with an emphasis on species at risk.

Natural Science Reports Related to MTO Highway Improvement Works | Various Sites, Ontario | Terrestrial Ecologist

Produced numerous Natural Sciences reports related to highway improvement works. Where required, Fisheries Act authorization was obtained and Fish Habitat Compensation Plans were developed. Potential impacts to terrestrial vegetation, wetlands and wildlife were described for more than 20 projects.

** denotes projects completed with other firms*

CN Milton Logistics Hub | Milton, Ontario | Terrestrial Ecologist

Natural Heritage lead on the Canadian Environmental Assessment Act approvals, with a focus in affects to migratory birds and species at risk.

AGGREGATE SERVICES

Neubauer Pit | Town of Puslinch, Ontario | Terrestrial Ecologist

Natural environment field inventories with emphasis on Species at Risk (SAR).

Dufferin Aggregates Acton Quarry Extension | Acton, Ontario | Terrestrial Ecologist

The extension of the existing Acton Quarry is proposed to meet the need for additional close-to-market aggregate resources of high quality Amabel Dolostone. Andrew has conducted extensive ecological field surveys and habitat assessments for breeding birds, amphibians and mammals with specific emphasis on Species at Risk (SAR).

St. Marys Cement Flamborough Quarry | Hamilton, Ontario | 2005-2008 | Ecologist

Identification and impact assessment of natural heritage features, compensation and management plan for Species at Risk (Butternut), water balance to maintain provincially significant wetland, salamander habitat and migration study, assessment of provincially significant woodland and significant wildlife habitat, environmental impacts of transportation.

Bromberg Pit | Ayr, Ontario | Terrestrial Ecologist

Natural environment field inventories with emphasis on Species at Risk (SAR).

CBM Olszowka Pit | Burford, Ontario | Terrestrial Ecologist

Senior advice and guidance, including species at risk permitting and development of mitigation and compensation measures for Blanding's Turtle.

RESIDENTIAL DEVELOPMENT

Activa Waterloo East | Waterloo, Ontario | 2006-2008 | Terrestrial Ecologist

Terrestrial and Aquatic Monitoring Program - monitoring of vegetation communities, changes in species composition and disturbance levels were undertaken, interpreted and reported. Directed monitoring of benthic invertebrate communities.

Kortright East Development | Guelph, Ontario | 2006-2008 | Project Manager / Ecologist

Environmental Implementation Report. Vegetation buffers, wildlife corridor, tree conservation plan, planning and design of invasive species removal, design of compliance and performance monitoring program.

Crates Marina | Keswick, Ontario | 2006 | Project Manager / Ecologist

Environmental policies, approvals and design. Identification of natural heritage features and sensitive species.

Fourteen Mile Creek Development | Oakville, Ontario | 2006 | Terrestrial Ecologist

Natural Heritage Monitoring Program Director - directed monitoring program of vegetation communities, change in species composition, avian wildlife, aquatic Species at Risk, benthic invertebrate communities, hydrogeology, geomorphology and erosion.

Southeast Sutton Development Area Plan | Sutton, Ontario | 2008 | Project Manager / Ecologist

Environmental policies, approval and design. Identification of natural heritage features and constraints for Development Area Plan. Plan of Subdivision forest buffers, mitigation of impacts to forest resources, sensitive vegetation and Species at Risk. Participation in Ontario Municipal Board discussions.

NATURAL SCIENCES & HERITAGE RESOURCES

Joint Panel Review: Marathon Palladium Project | Generation PGM Inc. | Marathon, Ontario, Canada | 2020-present | Technical Lead, Terrestrial Ecosystems

Providing technical advice and guidance for the environmental assessment for the Joint Review Panel (JRP) Federal-Provincial Environmental Assessment (EA) for the proposed Marathon Palladium Project, an open pit platinum group metal and copper mine located north of Marathon Ontario.

Rice Lake Plains Joint Initiative* | Northumberland County, Ontario | Terrestrial Ecologist

Tallgrass prairie research program. Identification and detailed cataloging of remnant tallgrass prairie sites, landowner liaison and education, development of tallgrass prairie management plans, reporting of findings.

Environmental DNA (eDNA) Research Project | Guelph, Ontario

Collaborated with the University of Guelph to validate an innovative field technique which identifies the presence of wildlife by detecting traces amounts of DNA shed by organisms into their environment. The field trial focused on a species at risk (Jefferson Salamander) using a new technology that allows for sample collection, DNA extraction and analysis in the field.

Alderville First Nations Black Oak Savannah* | Alderville, Ontario | Terrestrial Ecologist

Tallgrass prairie and black oak savannah research program. Technical reporting. Vegetation monitoring, tallgrass prairie reconstruction, wildlife monitoring, Species at Risk reintroduction.

** denotes projects completed with other firms*

Martine Esraelian BSc, ISA Arborist, CAN-CISEC

Terrestrial Biologist

20 years of experience · Stoney Creek, Ontario

EDUCATION

Bachelors of Science, Trent University / Environmental Science and Conservation Biology, Trent University/Peterborough, Ontario, Canada, 2006

Diploma, Sir Sandford Fleming College/Ecosystem Management Technician, Sir Sandford Fleming College/Lyndsay, Ontario, Canada, 2000

CERTIFICATIONS & TRAINING

Ontario Wetland Evaluation System, Ontario Ministry of Natural Resources and Forestry, North Bay, Ontario, Canada, 2011

Ecological Land Classification (ELC) for Southern Ontario, Ontario Ministry of Natural Resources and Forestry, Niagara Falls, Ontario, Canada, 2008

Canadian Certified Inspector of Sediment and Erosion Control (CAN 0394) , Ecopliant Environment, Toronto Region Conservation Authority/Toronto, Ontario, Canada, 2016

Butternut Health Assessor (BHA #160), Ministry of the Environment, Conservation and Parks, Ancaster, Ontario, Canada, 2019

Tree Risk Assessment Qualification, International Society of Aboriculture, Burlington, Ontario, Canada, 2021

ISA Certified Arborist, International Society of Aboriculture, Toronto, Ontario, Canada, 2019

Standard First Aid & CPR, Canadian Red Cross, St. Catharines, Ontario, Canada, 2022

PROJECT EXPERIENCE

MUNICIPAL

Whiteoak Dingman Secondary Plan* | City of London | London, Ontario, Canada | 2019 | Terrestrial Biologist

Completed ecological studies and a subject lands status report in support of the Whiteoak Dingman Secondary Plan and in accordance with the policies in The London Plan and the 1989 Official Plan. Martine was responsible for characterizing and evaluating significance of natural features using criteria developed by the City and industry standards, along with requirements of the Official Plan. Updates to the Official Plan natural feature designations were also outlined, including rationales for any updates to the existing natural heritage mapping in the Official Plan. A full wetland evaluation was also completed as part of the assessment. Other tasks included updating the report to address agency and stakeholder comments and presenting the results to City Council and the Environmental and Ecological Planning Advisory Committee.

South Bear Brook Wetland Evaluation* | City of Ottawa | Ottawa, Ontario, Canada | 2021 | Terrestrial Biologist

Completed a formal wetland evaluation for the South Bear Brook Wetland Complex in the City of Ottawa. The need for the wetland evaluation was triggered by the approval of Ottawa City Council of new urban lands in a portion of the area bounded by Leitrim Road, Farmers Way, 9th Line Road and Ramsayville Road. The project included undertaking background reviews, field investigations and preparing the wetland evaluation record.

** denotes projects completed with other firms*

PRELIMINARY AND DETAILED DESIGN

Long Point Causeway Rehabilitation and Causeway Bridge Replacement* | Norfolk County | Ontario, Canada | 2019 | Terrestrial Biologist

The scope of work included providing detailed design for rehabilitation of Long Point Causeway from Lakeshore Road to Erie Boulevard and replacement of the Long Point Causeway Bridge over Big Creek. The scope of work included widening the Causeway with two 3.5m wide lanes, 1.5m wide paved shoulders to accommodate active transportation, and 1.0m wide gravel shoulders; replacing the existing timber pile bridge with a new precast hollow-core concrete girder bridge shifted to the west of the existing bridge; providing environmental services, including permitting and approvals; and overseeing stakeholder engagement. Since the project site was located within a UNESCO biosphere reserve and Ramsar site and was also a designated globally significant Important Bird Area by Bird Life International, extensive consultation was required to mitigate impacts to species at risk and the natural environment on both provincial and federal lands. This included Endangered Species Act, 2007 permit (human health and safety), registration for Barn Swallow under the Endangered Species Act, 2007, Species at Risk permit (terrestrial species), Species at Risk Act Compliant Fisheries Act Authorization (Emergency Circumstances), National Wildlife Area Permit, and Approval under the Navigable Waters Act. Significant compensation and offsetting was required for federal wetlands under the Federal Policy on Wetland Conservation, installation of bat boxes and Barn Swallow cups, habitat compensation for turtles and fish and installation of permanent wildlife fencing for turtles and Eastern Foxsnake. The follow

Wenige Expressway Bridge and Highbury Avenue Rehabilitation Design* | City of London | London, Ontario, Canada | Terrestrial Biologist

The scope of work included providing preliminary and detailed design and tendering services for rehabilitation of the Wenige Expressway Bridge and detailed design services for rehabilitation of Highbury Avenue pavement and related corridor infrastructure.

Mud Creek Detailed Design* | City of London | London, Ontario, Canada | Terrestrial Biologist

The scope of work completing the detailed design phase of the Mud Creek Municipal Class Environmental Assessment and support for species at risk permitting and developing a compensation strategy for the project.

Peel and Gladstone Avenues Reconstruction* | City of Toronto | Toronto, Ontario, Canada | Arborist

The scope of work included providing detailed design and inspection services for the reconstruction of Peel Avenue and Gladstone Avenue (Queen Street West to Peel Avenue) in Toronto, as part of the 2021 Capital Works Program. The environmental component including completing a tree inventory and arborist report.

Downsview Transmission Watermain and Keele Pump Station Upgrade* | City of Toronto | Toronto, Ontario, Canada | Terrestrial Biologist

The scope of work included completing the preliminary and detailed design for the Downsview Transmission Watermain, from Keele Pumping Station to Sheppard Avenue West, along with upgrades to the Keele Pumping Station. The environmental component including a preparing an environmental impact study and arborist report.

Langstaff Road Detailed Design from Keele Street to Dufferin Street* | York Region | Vaughan, Ontario, Canada | Terrestrial Biologist

The scope of work included preparing the detailed design for the widening of Langstaff Road from Keele Street to Dufferin Street in the City of Vaughan. This includes widening Langstaff Road from two to four lanes, with widening of the Bowes Bridge over the West Don River from two to six lanes. The corridor will feature sidewalks and cycle tracks on both sides of the corridor. As part of the detailed design, an Arborist Report, Tree Inventory and Protection Plan were completed.

Detailed Design Services for an Active Transportation Pathway on Bayview Avenue from Bloomington Road to Bayview Park Lane / Dariole Drive* | York Region | Richmond Hill, Ontario, Canada | Terrestrial Biologist

The scope of work included preparing a detailed design and tender package for a 2.90-km active transportation pathway as part of the Lake-to-Lake Cycling Route and Walking Trail on Bayview Avenue between Bloomington Road and Bayview Park Lane/Dariole Drive in the City of Richmond Hill. The 3-metre-wide asphalt multi-use path (MUP) is proposed to be constructed along the west side of Bayview Avenue within the regional road allowance. As part of the detailed design, an Arborist Report, Tree Inventory and Protection Plan were completed.

PUBLIC PRIVATE PARTNERSHIP (P3)

Highway 17 Twinning, Public-Private Partnership (P3) Ready Package and Owner's Engineer (4017-E-0023)* | Ministry of Transporation Ontario - East | Renfrew, Ontario, Canada | Terrestrial Biologist

Provided preliminary design and Owner's Engineer services for the twinning of Highway 17 from 0.3 km west of Miller/Anderson Road to 2.6 km west of Bruce Street to provide two through-lanes in each direction separated by a median of varying width. The MTO is progressing with a P3-Ready package to deliver stages 3 and 4 of the Highway 17 twinning between Arnprior and Renfrew as identified in the Transportation Environmental Study Report (TESR) and Preliminary Design Report (PDR), prepared in 2003 and 2004, respectively. The PDR recommends three interchanges and mainline structures at three crossings (two rail crossings and one over the Bonnechere River). Martine was the lead terrestrial biologist responsible for completing fieldwork to document vegetation communities, species at risk, and significant wildlife habitat and to identify opportunities for habitat enhancements, particularly for species at risk. Completed road ecology studies, such as road mortality surveys and a wildlife corridor crossing assessment to identify potential ecopassage locations, wildlife fencing, and other mitigation measures to allow safe passage across the highway. Prepared the existing conditions and impact assessment reports, wildlife corridor crossing assessment, and various deliverables to progress species at risk permitting and environmental protection throughout the corridor. Martine was involved in agency consultation to support the permitting process.

ENVIRONMENTAL ASSESSMENTS – MINING

Vale Victor Mine* | Vale | Greater Sudbury, Ontario, Canada | Terrestrial Biologist

The scope of work included preparing the feasibility studies, developing an environmental assessment, and permitting strategy for the Vale Victor Mine to comply with requirements under the federal Canadian Environmental Assessment Act (CEAA). Martine was the terrestrial biologist responsible for undertaking a provincial and federal regulatory review and preparing permitting work plans. A gap analysis for various environmental factors, including a terrestrial baseline field program was also completed and work plans developed to assist the client in preparing the Request for Proposal.

KGHM Victoria Mine Project* | Greater Sudbury, Ontario, Canada | Terrestrial Biologist

Martine was responsible for completing an environmental constraints assessment for the proposed waste rock storage location for the KGHM Victoria Mine Project. The constraints assessment included a desktop review of background studies completed for the Project and site investigation to document existing conditions. A report was prepared identifying the environmental implications and considerations. Provided support in preparing the CEAA Project Description Report and was responsible for preparing an environmental effects assessment related to the terrestrial environment (vegetation, wetlands, wildlife, and wildlife habitat).

ENVIRONMENTAL ASSESSMENTS – OIL AND GAS

Greenbush and Willow Oil and Gas Project Proposals (OGP)* | Burgess Canadian Resources Inc. | Hudson Bay, Saskatchewan, Canada | Terrestrial Biologist

Responsible for preparing the Oil and Gas Project Proposals (OGP) for ten sites for the Greenbush Project and 14 sites for the Willow project. Also completed the terrestrial field studies in support of the environmental assessments.

Bahrain LNG Project* | Teekay LNG Operating LLC | Muharraq, Muharraq Governorate, Bahrain | Terrestrial Biologist

The scope of work included the preparation of the Environmental Impact Assessment (EIA) Addendum and various environmental social action plans to meet International Finance Corporation (IFC) performance standards. Martine was responsible for assisting in preparing the EIA Addendum, along with preparing the Marine Biological Environment and Ecosystem Services impact assessments and Biodiversity Action Plan. Martine was also responsible for completing an audit of the EPC Contractor on the construction and environmental management systems and project commitments.

Burnwell Transloading Facility* | Superior Gas Liquids | Fort Erie, Ontario, Canada | Terrestrial Biologist

The scope of work included assisting Superior Gas Liquids with the planned expansion of a propane transloading facility in the town of Fort Erie, Ontario. As part of this assessment, terrestrial site investigations were completed to characterize vegetation communities following the Ecological Land Classification system and document potential wildlife habitats, including those of species at risk. A breeding bird survey was completed in 2015 in order to document any occurrences of Yellow-breasted Chat, a species listed on the Species at Risk in Ontario List, within suitable habitat on the property. The scope of work included complete environmental studies to determine the feasibility of expanding the transloading facility to adjacent lands. Martine was responsible for completing a field assessment to document vegetation communities following the ELC system and a full wetland evaluation following the OWES protocol.

Fergus Ecological Assessment* | Suncor Energy | Terrestrial Biologist

The scope of working included an ecological assessment to identify natural heritage features and environmental constraints within 120 m of the Project site, located at 390 St. David Street North and 115 St. George Street East, Fergus, Ontario. This included a screening for species at risk (SAR) and determining whether permits under the Endangered Species Act, 2007 (ESA) or Species at Risk Act (SARA) are required. Martine was responsible for the site assessment and preparing the ecological assessment.

** denotes projects completed with other firms*

POWER RENEWABLE ENERGY, SOLAR

REA Solar Projects* | German Solar Corp. | Southwestern, ON | Terrestrial Biologist

The scope of work included completing Renewable Energy Approvals (REA) for 23 <500 kW ground-mount solar projects along a 40-km abandoned rail corridor in southwestern Ontario. Terrestrial studies included wildlife habitat assessments, vegetation community characterization, wetland assessments, rare plant surveys, amphibian call surveys, salamander visual encounter surveys (VES), turtle nesting surveys, snake VES, monarch and monarch habitat surveys. A pollinator habitat enhancement program and planting plan was also prepared.

EASR Solar Projects* | German Solar Corp. | Temiskaming Shores, Ontario, Canada | Terrestrial Biologist

The scope of work included completing a constraints assessment for several solar facilities (<500 kW) to ensure compliance and eligibility under the Environmental Activity and Sector Registry (EASR) approval process.

Solar Spirt 4 Project* | Blue Earth Renewable Incorporated | Belleville, Ontario, Canada | Terrestrial Biologist

The scope of work included completing amphibian monitoring as part of the two-year post-construction monitoring requirements outlined in the Renewable Energy Approval (REA). Fieldwork includes egg mass and anuran surveys. Monitoring results are documented in an annual memorandum.

REA Solar Projects* | Northland Power Inc. | Ontario, Canada | Terrestrial Biologist

The scope of work included completing a constraints assessments and Renewable Energy Approvals (REA) for thirteen 10-MW ground-mount solar facilities in southern and northern Ontario. Terrestrial field studies included vegetation community characterization and mapping, scoped wetland evaluations, reptile and amphibian surveys, species at risk surveys, bat habitat assessments, wildlife habitat assessments and butternut health assessments. Completion of permits and compensation under the Endangered Species Act (ESA), 2007, for the removal of Eastern Meadowlark and Bobolink habitat, Barn Swallow habitat and removal of Butternut. Post-construction environmental monitoring (erosion and sediment control, contamination), amphibian monitoring and Barn Swallow habitat monitoring have also been completed for some of the projects.

REA Solar Projects* | SunEdison Canada | Ontario, Canada | Terrestrial Biologist

The scope of work included completing constraints assessments and Renewable Energy Approvals (REA) for eight 10-MW ground-mount solar facilities. Terrestrial field studies included vegetation community characterization and mapping, scoped wetland evaluations, reptile and amphibian surveys, species at risk surveys, bat habitat assessments and wildlife habitat assessments. Completion of a permit under the Endangered Species Act (ESA), 2007 for the removal of Bobolink habitat and associated compensation plan was also completed which included facilitating agreements with the conservation authority. Also provided recommendations for compensation for tree removal within a significant woodland. Post-construction environmental monitoring (erosion and sediment control, contamination) was also completed for the Solar Spirit 4 Solar Project.

REA Solar Projects* | Recurrent Energy | Ontario, Canada | Terrestrial Biologist

The scope of work included completing constraints assessments and Renewable Energy Approvals (REA) for twenty 3.5 to 10-MW ground-mount solar facilities, as well as Phase 1 Environmental Site Assessments. Terrestrial field studies included vegetation community characterization and mapping, scoped wetland evaluations, reptile and amphibian surveys, species at risk surveys, bat habitat assessments and wildlife habitat assessments. Completion of permits and compensation under the Endangered Species Act (ESA), 2007, for the removal of Bobolink habitat. Also assisted with the provision of compensation habitat for the Golden-winged Warbler, reviewed proposed locations for compensation, provided a habitat maintenance plan and conducted annual habitat monitoring. The scope of work also included providing technical advice on tree planting as compensation for tree removal for three projects. This work has included facilitating agreements with proposed landowners and preparing planting plans.

REA Solar Projects* | Canadian Solar Solutions Inc. | Ontario, Canada | Terrestrial Biologist

The scope of work included completing constraints assessments and Renewable Energy Approvals (REA) for fourteen 10-MW ground-mount solar projects. Terrestrial field studies included vegetation community characterization and mapping, scoped wetland evaluations, reptile and amphibian surveys, SAR surveys, bat habitat assessments, and wildlife habitat assessments. Completed permit application under the Ontario Endangered Species Act (2007) to enable the removal of Bobolink habitat. Provided technical advice to the client with respect to suitability of proposed compensation locations and facilitated agreements with various conservation authorities (e.g. Quinte Conservation Authority and Cataraqui Region Conservation Authority) providing the alternate habitats. Recommendations for compensation for tree removal within significant woodlands were also provided to the client.

REA Solar Projects* | Effisolar Energy Corp. | Ontario, Canada | Terrestrial Biologist

The scope of work included completing Renewable Energy Approvals (REA) for two 10-MW solar facilities. Terrestrial field studies included vegetation community characterization and mapping, scoped wetland evaluations, reptile and amphibian surveys, species at risk surveys, bat habitat assessments, wildlife habitat assessments and a Butternut health assessment for over 200 Butternut. A permit under the Endangered Species Act (ESA), 2007 was also completed for the removal of Butternut and a Butternut planting plan was prepared.

Brockville Solar Projects* | GDF Suez | Brockville, Ontario, Canada | Terrestrial Biologist

The scope of work included completing Renewable Energy Approvals (REA) for a 10-MW ground-mount solar facility. Terrestrial field studies included vegetation community characterization and mapping, scoped wetland evaluations, reptile and amphibian surveys, species at risk surveys, bat habitat assessments and wildlife habitat assessments. Completion of a permit under the Endangered Species Act (ESA), 2007, for the removal of Butternut was also completed, as well as the development of a butternut planting plan.

Sunningdale1 Solar Project* | EDF Renewable Services | Ontario, Canada | Terrestrial Biologist

The scope of work included completing 5-year post-construction amphibian and reptile monitoring for a 10-MW solar project as part of the requirements set out in the REA. Terrestrial monitoring included egg mass surveys, anuran call surveys, and turtle nest surveys. A monitoring report was prepared each year and submitted to the Ministry of Natural Resources and Forestry (MNRF).

Forfar Solar Project* | Moose Power | Forfar, Ontario, Canada | Terrestrial Biologist

The scope of work included completing a constraints assessment to ensure compliance and eligibility under the Environmental Activity & Sector Registry (EASR) program for a 500 kW solar facility. Conducted a site assessment for a Phase I Environmental Site Assessment and targeted species at risk surveys for gray ratsnake.

Canadian Solar and Group IV Due Diligence* | Potentia Solar Inc. | Southern, ON | Terrestrial Biologist

The scope of work included undertaking an Independent Engineer Review and due diligence study seven solar projects in southern Ontario.

Independent Engineer Review of Alderville First Nation Solar Project* | Stonebridge Financial Corp. | Roseneath, Ontario, Canada | Terrestrial Biologist

The scope of work included undertaking an Independent Engineer Review and due diligence study of the operations phase of the Alderville First Nation Solar Project.

POWER RENEWABLE ENERGY, WIND

Ernestown Wind Park* | Horizon Legacy Energy Corporation | Ernestown, Ontario, Canada | Terrestrial Biologist

The scope of work included natural heritage assessment reports for a proposed wind farm under the Renewable Energy Approval (REA) process. Terrestrial field work included completing a scoped wetland evaluation, following the Ontario Wetland Evaluation System (OWES) protocol for southern Ontario.

South Kent Wind Park* | Pattern Energy | Chatham, Ontario, Canada | Terrestrial Biologist

The scope of work included completing Conducted reconnaissance - level site visits as part of a Phase I Environmental Site Assessment (ESA) for more than 50 properties in support of the 270-MW wind project.

Grand Renewable Wind Project* | Samsung Renewable Energy Inc. | Ontario, Canada | Terrestrial Biologist

The scope of work included preparing the Environmental Management Plan for the proposed Grand Renewable Wind Project.

POWER RENEWABLE ENERGY, HYDRO

Kagiano Lake Dam Rehabilitation and Manitou and High Falls Projects* | Ojibways of Pic River First Nation | Manitouwadge, Ontario, Canada | Terrestrial Biologist

The scope of work included preparing a provincial Class Environmental Assessment for greenfield Kagiano Lake Dam Rehabilitation Project and Manitou and High Falls hydroelectric projects in northern Ontario. Work includes environmental baseline studies/impact assessment/monitoring, agency, public and First Peoples consultation for the purposes of obtaining various approvals including Ministry of Natural Resources and Forestry Lakes and Rivers Improvement Act Approvals, among others. Assisted with preparing the Environmental Impact Assessment reports to assess potential project effects and recommend appropriate mitigation measures for multiple hydroelectric projects. Martine was the terrestrial biologist responsible for preparing the terrestrial reporting and completing terrestrial baseline field investigations that included vegetation community and habitat mapping, vegetation and wildlife surveys (specifically, breeding bird surveys, incidental wildlife observations, and targeted species at risk surveys for Eastern Whip poor will).

** denotes projects completed with other firms*

Kapuskasing River Environmental Assessment* | Xeneca Power | Kapuskasing, Ontario, Canada | Terrestrial Biologist

The scope of work included completing a provincial Class Environmental Assessment for three greenfield hydroelectric facilities located in northern Ontario. Work to date has included aquatic and terrestrial field investigations, impact assessment and agency consultation. Completed terrestrial field investigations for the proposed hydro facilities at Cedar Rapids, Clouston Rapids and Buchan Falls sites. Field studies included vegetation, wildlife, and species at risk surveys. A field report was prepared to document the results of the field investigations. Assisted with preparing the EA and associated mapping related to the terrestrial environment.

Gull Bay First Nation Stabilization Project* | Ontario Power Generation | Gull Bay, Ontario, Canada | Terrestrial Biologist

The scope of work included environmental and engineering support, including the completion of a Provincial Class Environmental Assessment for Ministry of Natural Resources Resource Stewardship and Facility Development Projects. Completed terrestrial and aquatic surveys in support of the permitting and approval process for shoreline stabilization works and potential road upgrades. Fieldwork included: gill netting, wetland characterization and delineation, vegetation community mapping, wildlife habitat, and species at risk assessments.

Shikwamkwa Replacement Dam Project* | Brookfield Power | White River, Ontario, Canada | Terrestrial Biologist

Federal environmental screening and MNR Class EA (Category B) for replacement of a 38-m high dam with a crest length of 425 m, including social and cultural assessments. Completed a wetland habitat assessment in the expanded reservoir area as part of a 5 year monitoring plan. The survey involved characterizing and mapping wetland communities for comparison to those documented during the baseline studies, to confirm the predicted changes as outlined in the EIA. Prepared the environmental post construction monitoring report and GIS figures showing the wetland communities.

Namakan River High Falls Hydro Project* | Gemini Power | Rainy River, Ontario, Canada | Terrestrial Biologist

Environmental assessment to meet provincial Class EA and federal legislation for a proposed hydroelectric greenfield facility. Work to date has included aquatic and terrestrial field investigations, liaison with agencies and preliminary environmental assessment services. Completed reconnaissance level baseline studies of the terrestrial environment and prepared a terrestrial field study report. Also assisted in the preparation of the EA report.

Gitchi Animki Hydroelectric Project* | Regional Power | White River, Ontario, Canada | Terrestrial Biologist

Combined federal and provincial environmental screening for the construction of two hydroelectric facilities having installed capacities of 8.5 MW and 9.99 MW, on the White River, Ontario. Completed preliminary Eastern Whip poor will habitat mapping surrounding the White River Hydro Project. This included a desktop review of satellite imagery and Forest Resource Inventory (FRI) mapping, ground truthing, and aerial surveys to verify FRI data.

Timiskaming Ontario Dam Replacement* | Public Works and Government Services Canada | Ontario, Canada | Terrestrial Biologist

Preparation of a Federal Environmental Effects Evaluation under Section 67 of Canadian Environmental Assessment Act (CEAA) 2012, and Provincial Ministry of Transportation (MTO) Class environmental assessment (EA) to assess the potential effects and required mitigation measures associated with replacement of the Ontario portion of the Timiskaming dam on the Ottawa River. Assisted with preparation of the Federal Environmental Effects Evaluation under Section 67 of the Canadian Environmental Assessment Act (2012), and Provincial Ministry of Transportation Class EA to assess potential effects and required mitigation measures for the project. Terrestrial field studies included ELC and mapping, amphibian call surveys, breeding bird and reptile surveys and species at risk assessments.

Trenton Lock 1 Hydro Project* | Hydromega Services Inc | Trenton, ON | Terrestrial Biologist

The scope of work included the preparation of the Environmental Impact Analysis (EIA) for the Trenton Lock 1 Hydroelectric Project located in Quinte West, Ontario in accordance with the Guide to Parks Canada Environmental Impact Analysis Process (2015). As part of the EIA, terrestrial baseline studies were also completed and included: breeding bird and crepuscular surveys, vegetation characterization surveys, bat habitat surveys, bat exit/entry surveys, snake visual encounter surveys, amphibian breeding surveys, and turtle visual encounter and nesting surveys. Targeted species at risk surveys included Blanding’s Turtle, Eastern Musk Turtle, Snapping Turtle, Eastern Whip-poor-will and Common Nighthawk and bats. Assisted with developing the baseline terrestrial field program and completing field studies that included: characterizing vegetation communities (ELC), bat habitat assessment, breeding bird surveys, reptile and amphibian surveys, and targeted species at risk surveys for Blanding's Turtle, Eastern Musk Turtle, Eastern Ribbonsnake, Eastern Whip poor will, and Common Nighthawk. Also involved in completing the terrestrial field report and EIA.

** denotes projects completed with other firms*

Scott Falls Reservoir Project* | New Brunswick Department of Transportation and Infrastructure | Saint John, New Brunswick, Canada | Terrestrial Biologist

Baseline documentation and evaluation of upland, shoreline and wetland habitats for cross-referencing to sensitive and species at risk habitat preferences as well as input into the impact assessment due to dam removal. Duties include wetland evaluation and boundary delineation, vegetation communities type and usage classifications. Completed baseline terrestrial studies, such as vegetation community mapping, wetland assessment and general wildlife habitat assessments.

NATURAL RESOURCE SERVICES

Sir Adam Beck 1 Generating Station Power Canal* | Ontario Power Generation | Niagara Falls, Ontario, Canada | Terrestrial Biologist

The scope of work included terrestrial baseline studies for a 13.7 km corridor for the Sir Adam Beck 1 (SAB1) Power Canal where refurbishment works are proposed. Baseline studies include vegetation community mapping and characterization, rare plant surveys, wildlife, wildlife habitat and species at risk assessments. Completed a desktop study and preliminary terrestrial field surveys as part of proposed refurbishment activities along the Canal. A report outlining the results of the desktop study and field investigations was prepared identifying potential constraints of the project and recommendations for additional studies to ensure regulatory compliance. Field studies included characterizing vegetation communities following the ELC protocol, incidental wildlife observations and a screening-level assessment of wildlife habitat following MNRF guidelines.

Natural Sciences Services Retainer No. 3* | Ministry of Transportation Ontario - West | Southwestern, Ontario | Terrestrial Biologist

Under Retainer Agreement #3016-E-0013, the scope of work included preparing various environmental services for more than 40 assignments, including conducting terrestrial field investigations, preparing condition and impact assessments, conducting aquatic habitat and fish community surveys, and obtaining permits and approvals under the Fisheries Act and Endangered Species Act, 2007. Martine was responsible for conducting terrestrial field studies and species-at-risk permitting and preparing mitigation plans, existing conditions and impact assessment reports, and special provision documents. Responsibilities included designing and implementing wildlife monitoring programs that involved installing temporary exclusionary fencing to confirm hibernacula, using wildlife cameras and coverboards, surveying ecopassages, providing permanent wildlife fencing, and performing other road ecology studies. Also worked with the client to develop coordinated and streamlined data collection using ArcGIS Online.

Hwy 24 Ecopassage and Wildlife Fence Monitoring (3016-E-0013)* | Ministry of Transportation Ontario - West | Brant, Ontario, Canada | Terrestrial Biologist

Under Retainer Agreement #3016-E-0013, the scope of work included monitoring the effectiveness of one artificial turtle nest site, seven recently constructed ecopassages, wildlife fencing and an escape ramp at various locations along Highway 24 extending approximately 4.7 km from Blue Lake Road to Glen Morris Road in the County of Brant. The work also included regular road mortality surveys and identifying any adjustments, repairs and maintenance requirements. Martine assisted with analyzing data and completing a comparative analysis between pre- and post-mitigation measures from data collected between 2013 to 2020. The data was analyzed to determine efficacy of measures, identify areas for improvements and provide recommendations for additional mitigation measures.

Highway 3 Widening Advance Work Eastern Foxsnake Hibernacula Surveys (3016-E-0010)* | Ministry of Transporation Ontario - West | Essex, Ontario, Canada | Terrestrial Biologist

The scope of work included completing spring emergent surveys to identify the presence or absence of eastern foxsnake or other species at risk at the Essex Outlet Drain and four additional culverts within the proposed Highway 3 widening from Windsor to Leamington. This included obtaining all relevant environmental site assessment approvals and permits. Martine was responsible for the methodology development, study design, installation, monitoring, and senior oversight. Oversaw permitting and agency consultation and assisted with preparing and reviewing the monitoring report and the Terrestrial Ecosystem Assessment Report Technical Update Memorandum.

Highway 401 from Queen Street Overpass and McDougall Drain, Assignment 23 (GWP 3034-19-00)* | Ministry of Transporation Ontario - West | Essex, Ontario, Canada | Terrestrial Biologist

Under Retainer Agreement #3016-E-0013, the scope of work included providing oversight and technical advice for the installation of exclusionary fencing and coverboards for eastern foxsnake within the construction limits. This included twice-weekly monitoring to inspect fencing and coverboards to determine the potential for hibernacula and, if present, any implications for construction. The results were documented in a monitoring report along with any recommended mitigation measures or permitting requirements. Martine was lead biologist undertaking all activities for the project.

Highway 17 Species-at-Risk Surveys, Work Order No. 15 (4017-E-0023)* | Ministry of Transporation Ontario - East | Renfrew, Ontario, Canada | Terrestrial Biologist

The scope of work included targeted species-at-risk surveys along Highway 17, from Miller/Anderson Road and 3 km west of Bruce Street, to support future expansion works. Specific surveys included bats acoustic monitoring, targeted Bobolink and Eastern Meadowlark survey, and Butternut Tree survey. While completing these field surveys, turtle mortalities were recorded as well. Martine was responsible for the terrestrial components of the project, which spanned 16 km. Work included the design and completion of field studies to target species at risk, rare species, vegetation inventories and community characterization, breeding bird surveys, turtle visual encounter and basking surveys, bat acoustic surveys, and road mortality surveys. Also assisted with preparing the existing conditions and impact assessment reports, providing recommendations to minimize impacts to natural heritage features, and identifying any permitting requirements.

Highway 17 Biophysical Assessments (4017-E-0023)* | Ministry of Transporation Ontario - East | Renfrew, Ontario, Canada | Terrestrial Biologist

The scope of work included undertaking fisheries and terrestrial assessments for Phases 3 & 4 of the Highway 17 twinning, from a two-lane controlled access highway to a full freeway configuration. Field studies included spring, summer, and fall biophysical investigations and environmental inventories for 16.3 km along the existing Highway 17 corridor, from 0.5km west of Miller Road westerly to 3.0 km west of Bruce Street near the Town of Renfrew, to address the limits of the twinning. Deliverables for the project included a terrestrial and species at risk (SAR) habitat existing conditions report and a fish and fish habitat existing conditions report to evaluate the potential impacts on the existing environment for the study area. Martine was responsible for the terrestrial ecology components of the project, including completing fieldwork, significant wildlife habitat assessments, and species-at-risk screening and preparing the natural science existing conditions and impact assessment reports.

Highway 17 Phragmites Survey and Invasive Species Identification, Work Order No. 18 (5017-E-0023, GWP 5180-13-00)* | Ministry of Transporation Ontario - Northeast | Sault Ste. Marie, Ontario, Canada | Terrestrial Biologist

The scope of work included providing engineering and environmental services, as well as providing contract documentation updates, administration, project management, and quality control checking; performing fieldwork and collecting data; identifying phragmites and creating reports; and attending meetings with the Garden River First Nation regarding two rehabilitation projects on Highway 17 in Sault Ste. Marie. The scope of work built of previous assignments (Work Order No. 3 and No. 6). Martine was responsible for mapping native and invasive Phragmites along Highway 17 and preparing the mapping and memo documenting the results, including recommendations for mitigation and treatment for the invasive stands.

Darlington Bank Swallow Monitoring Project* | E.S. Fox Limited | Darlington, ON | Terrestrial Biologist

The Darlington New Nuclear Plant required the removal of Bank Swallow habitat along the northern shoreline of Lake Ontario. In support of the Endangered Species Act permit, the scope of work included developing and carrying out a Bank Swallow Monitoring Plan. The plan included monitoring the existing Bank Swallow population and at various artificial nest habitat structures. Hatch also provided support in the design, location and annual maintenance of a pilot artificial nest habitat structure. Martine was responsible for Bank Swallow monitoring and preparing the monitoring reports.

Hilton Falls Diversion Structure* | Conservation Halton | Terrestrial Biologist

Class EA and detailed design for upgrades to existing diversion dyke to prevent overtopping during PMF. Completed a baseline environmental inventory to document existing conditions and characterize vegetation communities. A field report was prepared outlining the findings and identifying any potential effects of the project.

Bronson Bulkhead Replacement Project* | Ottawa Energy | Halton Hills, Ontario, Canada | Terrestrial Biologist

Completed a reconnaissance level site assessment to verify the presence/absence of species at risk, specifically barn swallow, butternut, pale bellied frost lichen, and flooded jellyskin. Prepared a field study report and GIS figures discussing the results of the baseline studies, including recommended mitigation measures and additional future species at risk surveys to be completed.

TRANSPORTATION & INFRASTRUCTURE

Highway 400 Improvements, Simcoe Road 88 Interchange Improvements (GWP 2331-16-00) | MTO | Bradford West Gwillimbury, Ontario, Canada | Terrestrial Biologist

Terrestrial Biologist providing support with preparation of the Terrestrial Ecosystems Existing Conditions and Impact Assessment Report.

Highway 3 Twinning, Highway 4 Widening and Talbotville Bypass | MTO | Talbotville, Ontario, Canada | 2023 | Terrestrial Biologist

Terrestrial Biologist providing support with preparation of the Terrestrial Existing Conditions and Impact Assessment Report and permitting applications for species at risk bat habitat.

** denotes projects completed with other firms*

Highway 403/Rest Acres Road Interchange* | Ministry of Transporation Ontario - West | Brant, Ontario, Canada | Terrestrial Biologist

The scope of work included providing the detailed design, environmental assessment, and construction contract preparation and completion for the Highway 403/Rest Acres Road Interchange. Martine was responsible for providing senior-level support for the environmental scope of work, which includes existing conditions characterization, vegetation communities, invasive and noxious species, significant wildlife habitat assessment, species-at-risk screening, and a migratory bird survey on structures, and the preparation of a terrestrial existing conditions and impact assessment report.

Highway 401 Reconstruction from 1.4 km West of Elgin Road 20 to 3.7 km West of Highway 4 Engineering Services during Construction* | Ministry of Transporation Ontario - West | London, Ontario, Canada | Terrestrial Biologist

The scope of work included provided the design for reconstruction of a 10 km long section of Highway 401 near the city of London, Ontario. The reconstructed section was a four-lane rural divided freeway through Elgin County, representing a vital transportation link between the cities of Windsor and London. This design-build project involved reconstructing both the eastbound and westbound lanes of Highway 401 so that future widening into the median could easily be accommodated and included completing work at eight structures (bridges and culverts) and improving roadside safety, electrical, drainage infrastructure, and highway signs within the project limits. The scope also included providing engineering services during construction. Martine was responsible for completing a bat habitat assessment and bird nest survey for tree removal proposed during the active bat and breeding bird window. Also prepared a memo that included recommended mitigation measures to ensure regulatory compliance.

Large-Value Retainer, Commercial Vehicle Inspection Facility Redevelopment, Work Order No. 1 (3017-E-0007)* | Ministry of Transporation Ontario - West | Sarnia, Ontario, Canada | Terrestrial Biologist

The scope of work included the detailed design for repurposing the former Sarnia North commercial vehicle inspection facility to a location for overnight parking for trucks, including providing 8 to 12 spots. This included preparing the contract package, including contract drawings, documents, and quantity sheets, as final deliverables for the design-bid-build project. Martine was responsible for completing an environmental summary report to identify any constraints and provide input to design, along with identifying potential impacts and mitigation measures in support of the design and contract documents.

Highway 7A Resurfacing and Structure Rehabilitation (2017-E-0012, GWP 2436-15-00, Contract 2019-2017)* | Ministry of Transporation Ontario - Central | Port Perry, Ontario, Canada | Terrestrial Biologist

The scope of work included providing design services for rehabilitation of Highway 7A from the Port Perry Plaza (east of Carnegie Street) to the North Junction Durham Road 57 for 10 km, along with rehabilitation of five structures and replacement of two centreline culverts. This assignment involved detailed design, contract preparation, and design support services during tendering and construction for the project. Martine provided senior support to the terrestrial ecology components of the project and input to contract documents.

Highway 401 Expansion from the Credit River to Regional Road 25* | Ministry of Transporation Ontario - Central | Toronto, Ontario, Canada | Terrestrial Biologist

The project was part of a fully integrated design-build joint venture. The scope of work included lead design and joint development and construction for widening 18 km of Highway 401 from 6 lanes to 10 to 12 lanes to facilitate high-occupancy vehicle median lanes. The expansion is from the Credit River in Mississauga to Regional Road 25 in Milton, Ontario. The scope of services on this multimillion-dollar highway expansion project includes complete highway and structures design, project financing, construction services, demolition of existing structures, environmental services, public consultation and education, and permitting and approvals. Martine served as plant, avian, wildlife, and species-at-risk biologist for the project, providing input to design, reviewing drawings, and preparing various management plans related to the terrestrial discipline. Was involved in the development and implementation of design and mitigation measures related to plants and wildlife, particularly ecopassages and species at risk and applying as-needed adaptive management strategies during constructions. Also involved in preparing training resources and protocols, conducting environmental training, completing bird nest sweeps, and performing other monitoring tasks.

One Contract Package for Seven Culverts (GWP 2148-20-00; Contract No. 2021-2021)* | Ministry of Transporation Ontario - Central | Simcoe, York and Durham Regions, ON | Terrestrial Biologist

The scope of work included undertaking a Class C Environmental Assessment, detailed design and preparation of a contract package for construction of the relining or replacement of seven non-structural culverts along Highway 400 in Simcoe Region, Highway 9 in York Region, and Highway 12 in Durham Region. The rehabilitation or replacement strategy considered hydraulics, traffic impacts, environmental constraints, design life, and construction costs. The replacement methodology considered the fill height and risks associated with trenchless construction methods. The scope also included assessing roadside safety, signage, and pavement marking upgrades at each culvert location. Martine provided senior support for the terrestrial ecology components of the project, including reviewing the existing conditions and impact assessment report and identifying appropriate mitigation measures to minimize impacts to natural features.

Welland River Twin Bridge Replacement and Structural Culvert Rehabilitation Design-Build (GWP 2430-15-00)* | Ministry of Transporation Ontario - Central | St. Catharines, Ontario, Canada | Terrestrial Biologist

The scope of work included providing project management and detailed design services, including structural, highway, drainage, and electrical engineering; environmental services; traffic management; and advanced traffic management and intelligent transportation system services. The structural scope included staged replacement of the existing Welland River Twin Bridges with a new slab-on-steel girder composite structure and rehabilitation of three structural culverts. Considerations for durability, constructability, and aesthetics were included in the design, with the intention of minimizing maintenance requirements over the 75-year design service life of the new structure. Engineering services were provided to the contractor during construction, including providing construction support and liaison, providing compliance coordination, reviewing shop drawings, performing inspections at construction hold points, and producing as-built drawings. Martine was responsible for providing terrestrial input for the project, including performing fieldwork such as bird nest sweeps and environmental construction monitoring in advance of vegetation clearing. Also prepared a turtle monitoring plan for the project.

Freeman Interchange* | Ministry of Transporation Ontario - Central | Sarnia, Ontario, Canada | Terrestrial Biologist

The scope of work included undertaking the Detail Design and Class Environmental Assessment (EA) study for the rehabilitation of two bridges (Sites #10-320 and 10-321) at the Freeman Interchange in the City of Burlington, Ontario. The two bridges are situated on the shared ramp from the Toronto-bound Queen Elizabeth Way (QEW) to Highway 407 Express Toll Route (ETR) and westbound Highway 403. Proposed rehabilitation work to be completed under this assignment includes pavement rehabilitation on the ramp from the Toronto-bound QEW to Highway 407ETR and Highway 403 West, as well as repair/reconstruction of various sections of the barrier wall, minor drainage improvements, sign and pavement marking upgrades, and minor electrical work including conversion of underpass lighting to Light Emitting Diode. Martine was responsible for preparing the existing conditions and impact assessment report and providing input to design and the Class EA study.

Highway 148 Detailed Design and Class Environmental Assessment Study (4017-E-0023)* | Ministry of Transporation Ontario - East | Renfrew, Ontario, Canada | Terrestrial Biologist

The scope of work included providing detailed design and a Class Environmental Assessment study along Highway 148 from Pembroke to Greenwood Road in Renfrew County. This “Group B” project involves preparing Design and Construction Reports (DCRs) and the detailed design of pavement rehabilitation to address poor pavement performance as well as intersection and operational improvements, pedestrian and cycling safety improvements, highway drainage improvements and widening to accommodate a two-way left-turn lane. The storm sewer invert investigation for this assignment was done under Work Order 21. Martine provided senior support for the terrestrial ecology components of the project, including reviewing the existing conditions and impact assessment report and identifying appropriate mitigation measures to minimize impacts to natural features.

Patrol Yard at Highway 35 (4017-E-0023)* | Ministry of Transporation Ontario - East | Kawartha Lakes, Ontario, Canada | Terrestrial Biologist

The scope of work included providing preliminary design and an environmental assessment for a new patrol yard to service the Highway 135 corridor, to be located in Fenelon Township in the city of Kawartha Lakes. Work entailed obtaining approvals and preparing a design-build-ready report and a transportation environmental study report. This assignment included a constraints assessment for various sites and detailed field studies being completed for the shortlisted sites 2B and 3B. This included an assessment on bat habitat suitability (Leaf-On and Leaf-Off Maternity Roost and Snag Density Surveys) in order to support the environmental field work evaluation required at one shortlisted site alternative for the construction of a new maintenance patrol yard to service the Highway 35 corridor. Martine was responsible for the terrestrial ecology components of the project and for providing senior oversight, including assisting with the constraints analysis in selecting a preferred location, preparing and reviewing the existing conditions and impact assessment report, and identifying appropriate mitigation measures.

Drainage Study on Highway 638, Work Order No. 21 (5017-E-0023)* | Ministry of Transporation Ontario - Northeast | Plummer, Ontario, Canada | Terrestrial Biologist

The scope of work included providing engineering design on retainer for highway, environmental, pavement, bridge, drainage, hydrology, electrical, foundation, traffic engineering, surveying, and legal services. The scope also included completing risk assessments, contract preparation, site investigations, field testing, and fisheries assessments, for numerous culvert replacements and bridge rehabilitation projects on several highways throughout Northern Ontario. Work Order No. 21 involves providing field investigations and analyses to complete the hydrology and drainage design, providing recommendations for two drainage sites, and replacing one deep-fill culvert along Highway 638. Martine is responsible for the terrestrial ecology components of the project, including completing fieldwork and species-at-risk screening and preparing the natural science existing conditions and impact assessment report.

Culverts on Brooks Road, Work Order No.16 (5017-E-0023)* | Ministry of Transporation Ontario - Northeast | Sault Ste. Marie, Ontario, Canada | Terrestrial Biologist

The scope of work included providing the detailed design and contract tender package for replacement of a centreline culvert under Brooks Road off Highway 556 in the Sault Ste. Marie area and existing culvert storm pipes on property downstream from the drain into Upper Island Lake. Martine was responsible for the terrestrial ecology components of the project, including fieldwork to assess existing conditions, assess significant wildlife habitat and habitat for species at risk, and perform a tree inventory. Responsible for identifying potential environmental constraints and permitting requirements and preparing an existing conditions and impact assessment memo. Also provides input to the design to minimize impacts to the natural environment.

Highway 17 Eastbound and Westbound Lane Rehabilitation, Work Order No. 6 (GWP 5522-15-00, Contract 2020-5163 and GWP 5180-13-00)* | Ministry of Transporation Ontario - Northeast | Sault Ste. Marie, Ontario, Canada | Terrestrial Biologist

Work Order No. 6 involved rehabilitation of Highway 17, including existing pavement through the project corridor, cold in-place recycled expanded asphalt mix (CIREAM) to a depth of 90mm, remediation of nine PDAs, electrical upgrades, and high-pressure sodium luminaire upgrades to LED illumination at various intersections. Martine was responsible for the terrestrial components of the project, including performing field studies to document existing conditions and characterize vegetation communities, wildlife, and wildlife habitat. Prepared the existing conditions and impact assessment reports and provided recommendations to minimize impacts to natural heritage features.

Replacement of Three Bridges in the Cochrane Area (GWP 5267-11-00, Contract 2020-5157 and GWP 5284-19-00, Contract 2020-5116)* | Ministry of Transporation Ontario - Northeast | Cochrane, Ontario, Canada | Terrestrial Biologist

The scope of work included providing detailed design, contract preparation, and design support during tendering and construction for replacing three structures (Deception Creek Bridge (Site 39E-169) and Smith Creek Bridge (Site 39E-014) on Highway 668 and Gilles Creek Bridge (Site 39E-006) on Highway 579) near Cochrane. Martine was responsible for the terrestrial ecology components of the project, including completing fieldwork and species-at-risk screening and preparing the natural science existing conditions report and impact assessment.

Highway 17 Canadian Pacific Railway Overhead Bridge Rehabilitation, Work Order No. 19 (5017-E-0023, GWP 5168-17-00)* | Ministry of Transporation Ontario - Northeast | Hagar, Ontario, Canada | Terrestrial Biologist

Work Order No. 19 included providing detailed design, contract preparation, and design support during tendering and construction for rehabilitation of the Canadian Pacific Railway overhead bridge (Site No. 46X-0068/B0) over Highway 17 in Hagar Township. Martine is responsible for the terrestrial ecology components, including updating the existing conditions and impact assessment report and completing fieldwork to document existing conditions, species-at-risk habitat, and birds nesting on the Canadian Pacific Railway bridge and to map any native or invasive Phragmites within the project limits.

** denotes projects completed with other firms*

Highway 17 Canadian Pacific Railway Overhead Bridge and Veuve River Bridge Rehabilitation* | Ministry of Transporation Ontario - Northeast | Markstay-Warren, Ontario, Canada | Terrestrial Biologist

The scope of work included Total Project Management and Group B Class Environmental Assessment study for rehabilitation of two bridges: the Canadian Pacific Railway Overhead Bridge and the Veuve River Bridge on Highway 17 east of Sudbury. The scope of work included preparing a transportation environmental study report to assess the detour route and the staging alternatives for the project. Martine was responsible for the terrestrial ecology components of the projects, including completing significant wildlife habitat assessments and species-at-risk screening and preparing a natural science existing conditions report and an impact assessment.

TRANSIT/RAIL SYSTEMS

Regional Express Rail Capital Delivery Program Package 1 Technical Advisory Services* | Metrolinx | Toronto, Ontario, Canada | Terrestrial Biologist

The scope of work included technical advisory services for the expansion and improvement of the Greater Toronto and Hamilton Area GO Transit system as part of the Regional Express Rail Program. Package 1 involved overseeing all underway and planned design-bid-build, design-build, and design-build-finance projects and includes active capital projects at existing stations. The scope include also included conducting studies, preparing concept designs, and providing preliminary engineering, procurement support, and construction management services. The Regional Express Rail's goal is to deliver capital works and state-of-good-repair works to transform the GO Transit system to two-way, all-day electrified service. Martine was responsible for the terrestrial ecology and arborist components of the project, including completing vegetation, tree inventories, wildlife, and targeted species-at-risk studies. Completed the existing conditions and impact assessment reports and arborist reports and provided input into the design to minimize impacts to the natural environment.

Regional Express Rail Capital Delivery Program Package 2 Technical Advisory Services* | Metrolinx | Toronto, Ontario, Canada | Terrestrial Biologist

Parsons serves as technical advisor for expanding and improving the Greater Toronto and Hamilton Area GO Transit system as part of the Regional Express Rail Program. Package 2 involves developing a design-build-finance contract for system-wide station and parking upgrades and includes off-corridor works at stations. Parsons is responsible for performing studies, developing concept designs, and providing preliminary engineering, procurement support, and construction management services. The Regional Express Rail's goal is to deliver both capital works and state-of-good-repair works to transform the GO Transit system to two-way, all-day electrified service. Martine was responsible for the terrestrial ecology and arborist components of the projects, including completing vegetation, tree inventories, wildlife, and targeted species-at-risk studies. Completed the existing conditions and impact assessment reports and arborist reports and provided input into the design to minimize impacts to the natural environment.

Eglinton West Light Rail Transit Extension | Metrolinx | Toronto, Ontario, Canada

The Eglinton West Light Rail Transit Extension project is a multimillion-dollar, approximately 9.4 km long light rail extension running west along Eglinton Avenue from Mount Dennis Station to the Toronto Pearson International Airport, including eight underground stations. The line is a direct extension of the Eglinton Crosstown Light Rail Transit, which consists of 19 km of light rail alignment from Kennedy Road in Scarborough to Mount Dennis Station in Toronto. The scope of work included interim technical advisory services for planning, design, and preparation of an early tunnel works contract. Martine was responsible for the terrestrial ecology and arborist components of the project, including completing vegetation, tree inventories, wildlife, and targeted species-at-risk studies; completing the existing conditions and impact assessment reports and arborist reports; and providing input into the design to minimize impacts to the natural environment.

Existing Stations Renovations* | Metrolinx | Toronto, Ontario, Canada | Terrestrial Biologist

The scope of work included undertaking environmental and design studies for the Existing Stations Renovations (ESR) at 34 GO stations. These renovation works include a wide range of modifications to the existing stations to improve passenger experience and bring the stations up to date with the latest Metrolinx standards. Martine was responsible for leading the natural heritage and arborist studies for all of the GO stations, including assisting in field studies and senior review of the natural heritage reports and arborist reports.

RENEWABLE ENERGY

Sustainable Aviation Fuels Processing Facility* | Confidential | Port Colborne, Ontario, Canada | Terrestrial Biologist

Provided regulatory and permitting advice for a proposed sustainable aviation fuels facility on federal land. Completed baseline terrestrial studies and provided support in completing the Project Description and Environmental Effects Evaluation Form for Transport Canada.

Ammonia Plant and Hydrogen Facility | Carlsun Energy | Goderich, Ontario, Canada | Terrestrial Biologist

Provided regulatory and permitting advice for a proposed ammonia facility and hydrogen plant. This included baseline terrestrial field studies and existing conditions report to support municipal requirements for rezoning.

Nairn Centre Biomass Cogen Project* | Hydromega | Greater Sudbury, Ontario, Canada | Terrestrial Biologist

The scope of work included completing the first phase of Renewable Energy Approval (REA) Services prior to IESO's contract award under the Large Renewable Procurement RFP (LRP 1 RFP) in 2016 in support of a Class 1 Thermal Treatment facility of up to 12-MW in the Township of Nairn and Hyman, near Sudbury, Ontario. Services included preparation of the Project Description Report, natural heritage and water body site investigations. Martine was responsible for undertaking field investigations and preparing the natural heritage and water body assessment reports.

OIL AND GAS PIPELINES

Integrity Digs* | Trans-Northern Pipelines | Ontario, Canada | Terrestrial Biologist

The scope of work included preparing environmental protection plans in support of integrity digs throughout southern Ontario. Martine was also involved in completing terrestrial field studies to verify environmental constraints and completing pre-dig bird nest surveys.

CONTRACT ADMINISTRATION

Long Point Causeway Rehabilitation and Causeway Bridge Replacement | Norfolk County | Ontario, Canada | Terrestrial Biologist

The scope of work included providing contract administration, supervision, and inspection services for rehabilitation of Long Point Causeway from Lakeshore Road to Erie Boulevard and replacement of the Long Point Causeway Bridge over Big Creek. Services include providing contract administration, preparing progress payment certificates, performing on-site supervision and inspections, and producing as-built drawings.

Grimsby Water Treatment Plant Laneway Upgrades and Meter and Valve Replacements* | Regional Municipality of Niagara | Grimsby, Ontario, Canada | Terrestrial Biologist

The scope of work included upgrading the existing laneway at the water treatment plant, modify the sludge loading area, and replace various valves and meters. This included providing engineering services, pre-tender activities and support during tendering, contract administration, construction inspection, and warranty period services. Martine was responsible for providing input on the environmental requirements for the project, including compliance related to species at risk.

South Boundary Road and Franklin Boulevard Extension* | Region of Waterloo | Brantford, Ontario, Canada | Terrestrial Biologist

The scope of work included providing detailed design and contract administration services for the South Boundary Road corridor from Water Street (Highway 24) to the Franklin Boulevard Extension. Following detailed design, Parsons provided contract administration services for Phase 1A, finalized the issued-for-tender documents, and then provided contract administration and inspection services during Phase 1B. The project included grading, sewer, and roadwork for the new South Boundary Road and Franklin Boulevard extension, including roundabouts at the intersections with the Franklin Extension and at Highway 24 which involved a watermain crossing. Work also included construction of a new structure over Cheese Factory Road, several precast culvert crossings, and a multiuse path for pedestrians and cyclists.

Highway 401 Grand River Bridge Replacement, Contract 2020-3001 (3019-C-0532)* | Ministry of Transporation Ontario - West | Cambridge, Ontario, Canada | Terrestrial Biologist

The scope of work included providing construction contract administration services for replacement of the Highway 401 Grand River Bridge to accommodate the ultimate widening of Highway 401. The existing twin Highway 401 Grand River Bridge is 237m long over six spans that were constructed in 1959 with structural steel girders with five piers (three piers in Grand River) on spread footings with each bridge carrying three lanes of traffic. The new twin Highway 401 Grand River Bridge will have a four-span steel plate girder structure with a total length of 225m, with each of the twin structures carrying four lanes of traffic with two in-water piers placed in the Grand River. This project also includes rehabilitation of the Highway 401 and King Street Overpass, localized widening of Highway 401, reconfiguration of ramps at the King Street Interchange, reconstruction of the median barrier wall, reconstruction of a storm sewer, and an extension of the high-mast lighting from Highway 8 to Homer Watson Boulevard. Martine was responsible for environmental monitoring related to terrestrial resources, such as bird nest surveys prior to vegetation removal, and providing input on mitigation measures during construction.

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT STUDIES

Adelaide Street North Widening Environmental Assessmen* | City of London | London, Ontario, Canada | 2019 | Terrestrial Biologist

The scope of work included completing a Schedule C Municipal Class Environmental Assessment study to identify future transportation deficiencies and to develop the recommendations for widening Adelaide Street North and intersection improvements to meet the goals of the City's Transportation Master Plan. This included identifying any problems or opportunities, evaluating road improvement alternatives, providing alternative design concepts for the preferred solution, and preparing a final environmental study report.

Oak Park Road Extension Environmental Assessment* | City of Brantford | Brantford, Ontario, Canada | 2021 | Terrestrial Biologist

The scope of work included completing a Schedule C Municipal Class Environmental Assessment study for the extension of Oak Park Road in the city of Brantford. The study is examining the creation of a new, approximately 4 km long roadway, including a major crossing of the Grand River.

Montrose Road and Lyons Creek Road/Biggar Road, Environmental Assessment and Detailed Transportation Assessment | Regional Municipality of Niagara | Niagara Falls, Ontario, Canada | 2021 | Terrestrial Biologist

The scope of work included completing a Schedule C Municipal Class Environmental Assessment study, a detailed transportation assessment, detailed design, and contract document preparation to identify suitable transportation and municipal infrastructure service improvements in the study area (Montrose Road and Lyons Creek Road/Biggar Road), in accordance with the Region's transportation master plan and future growth plan. The project included consultation with the Ministry of Environment, Conservation and Parks (MECP) for species at risk concerns related to bats, Bobolink and mussels, and permits from the Niagara Peninsula Conservation Authority (NPCA).

Highway 404 North District Water Supply Pressure District 7 Municipal Class Environmental Assessment Study* | City of Markham | Markham, Ontario, Canada | Terrestrial Biologist

The scope of work included completing a Schedule B Municipal Class Environmental Assessment study for this water supply pressure district. The environmental assessment involves reviewing and assessing alternatives for a short-term solution for providing a secondary watermain connection between the Richmond Hill and Markham water networks across Highway 404 to provide redundancy and system security to the City of Markham's Pressure District 7 service area east of Highway 404. The scope also included developing a preliminary design, including one public open house; completing natural heritage, archaeology, geotechnical, subsurface utility, topographic survey, and hydraulic assessments; preparing a project file report; and obtaining approvals in principle from technical agencies.

Denison Street Extension Municipal Class Environmental Assessment | City of Markham | Markham, Ontario, Canada | Terrestrial Biologist

The scope of work included completing a Schedule C Municipal Class Environmental Assessment study for an extension of Denison Street east of Kirkham Drive. The study reviewed and assessed the requirements for network connectivity and corridor improvements in the southeast area of Markham. The 2014 Denison Street Extension Feasibility Study reviewed three alternatives to extend Denison Street from its existing terminus (approximately 1 km east of Markham Road) to either Steeles Avenue or Ninth Line/Donald Cousens Parkway.

Ken Whillans Drive Extension Class Environmental Assessment* | City of Brampton | Brampton, Ontario, Canada | 2021 | Terrestrial Biologist

The scope of work included preparing a Municipal Class Environmental Assessment study for extension of Ken Whillans Drive to south of Church Street. This included a needs assessment for the extension to provide safe muti-modal connectivity with consideration for flood mitigation alternatives, existing flood conditions, safe egress under flood conditions, and the City's urban design master plan study for downtown Brampton.

Improvements to Williams Parkway from Dixie Road to Torbram Road Municipal Class Environmental Assessment Study* | City of Brampton | Brampton, Ontario, Canada | Terrestrial Biologist

The scope of work included completing a Schedule "A+" Municipal Class Environmental Assessment study for improvements to the Williams Parkway from Dixie Road to Torbram Road in the Regional Municipality of Peel. The proposed Williams Parkway Improvements are recommended to be completed by 2041 in the City of Brampton's (2015) Transportation Master Plan (TMP) to address the need for additional capacity and connectivity in the road network.

Dufferin Street Schedule C Municipal Class EA* | City of Vaughan | 2018 | Terrestrial Biologist

The scope of work included completing a Schedule C Municipal Class Environmental Assessment to identify improvements to Dufferin Street between Langstaff Road and Teston Road in the City of Vaughan, Ontario. The study involved determining the need for road improvements and identifying a Preferred Design Concept to best address transportation deficiencies and facilitate improvements to the section of Dufferin Street between Langstaff Road and Teston Road.

One River Master Plan Class EA* | City of London | London, Ontario, Canada | Terrestrial Biologist

The goal of the One River EA was to develop a strategy for the Thames River that would provide guidance that reflect the current and future vision of the Springbank Dam, the Forks of the Thames and the river corridor itself within the City of London. The scope of work included detailed environmental field investigations and assessments throughout the study area, with a focus on characterizing the current conditions at Springbank Dam and The Forks and to assess the proposed alternatives. Extensive public, First Nations, and stakeholder consultation was also completed.

EMPLOYMENT HISTORY

Regional Municipality of Niagara
Environmental Technician
2005 - 2006 · 1 year(s)

Ministry of Natural Resources and Forestry
Species at Risk Technician
2007 - 2008 · 1 year(s)

Colville Consulting Inc.
Terrestrial Biologist
2008 - 2010 · 2 years

Hatch Ltd
Terrestrial Biologist
2010 - 2018 · 8 years

Matrix Solutions Inc.
Terrestrial Biologist
2018 - 2019 · 1 year(s)

Parsons Inc.
Ecology Lead
2019 - 2022 · 4 years

Vertex Professional Services Ltd.
Planning Ecologist
2022 - 2023 · 1 year(s)

PUBLICATIONS & WHITEPAPERS

Esraelian, M. *Migratory Birds, Article. Ontario Arborist*, 2022, pp. 10-13.

Gina K MacVeigh F.W.T.

Senior Fisheries Biologist

19 years of experience · Waterloo, Ontario

Gina is a Senior Fisheries Biologist and Freshwater Mussel Specialist with over 19 years of diverse expertise in aquatic and fisheries biology, of which 15 years are in consulting working within a variety of sectors. She routinely conducts biological monitoring studies with high regard for study design, quality field techniques, data analysis, and reporting. Gina specializes in Species at Risk fish and mussels, fish community assessments, aquatic habitat assessments, freshwater mussel surveys and relocations, and field collection methods for fish and benthic invertebrates. She is considered to be a leading mussel consultant in Ontario with extensive experience working in Ontario. Through her experience she has become well versed in applicable policies and legislation as they relate to aquatic and terrestrial species and their habitat. She has successfully secured permits under the Fisheries Act, Species at Risk Act, and Endangered Species Act, as well as has registered projects under Ontario regulation 242/08. She has managed and worked on a large number of Species at Risk Assessments, Environmental Assessments, Environmental Impact Studies, Sub-watershed Studies, Renewable Energy Assessments, and other natural heritage assessments/characterizations. Gina has been responsible for implementing the conditions outlined in both provincial and federal permits, including the reporting requirements. Gina is currently registered under the Ontario Ministry of Transportation (MTO) RAQ's for Fisheries Assessment Specialist and is considered a Species at Risk Specialist.

EDUCATION

Diploma, Environmental Technician, Sir Sandford Fleming College, ON, Canada, 2007

Diploma, Fish and Wildlife Technician, Sir Sandford Fleming College, ON, Canada, 2006

CERTIFICATIONS & TRAINING

Certificate, Class 2 Backpack Electrofishing (Internal Course), Waterloo, ON, Canada, 2022

Training, St. John Ambulance, Standard First Aid & CPR/AED Level C, Owen Sound, ON, Canada, 2024

Certificate, VOI Training Group, Environmental Field Procedures for Works In and About Water Practitioner (EFPP), Waterloo, ON, Canada, 2021

Certificate, TRCA/CVC, Assessing Headwater Drainage Features Workshop, Toronto, ON, Canada, 2018

Certificates, Trout Unlimited, Aquatic Renewal System Rehabilition Workshops 1,2,3,4,5, Guelph, ON, Canada, 2014

Certificate, Royal Ontario Museum, Cyprinid (Minnow) Identification Workshop , Guelph, ON, Canada, 2014

Certificate, MTO/DFO/OMNR, Fisheries Protocol Training for Fisheries Specialists, Woodbridge, ON, Canada, 2012

Certificate #13/OSHA/014, MNRF/TRCA, Ontario Stream Assessment Protocol, Toronto, ON, Canada, 2013

Certificate, Environmental Project Management & Sustainability Solutions, Project Management Essentials Course, Waterloo, ON, Canada, 2013

Training Course, Fisheries and Oceans Canada, Ontario Freshwater Mussel ID Workshop, Burlington, ON, Canada, 2012

Certificate, Argo, Argo Safe Operation Course, Waterloo, ON, Canada, 2012

Certification, Vancouver Island University, Environmental Monitoring for Construction Projects, Vancouver Island, BC, Canada, 2011

Training Course, Fleming College, Wilderness Survival Part 1, Lindsay, ON, Canada, 2011

Certificate, Ontario Benthos Biomonitoring Network, Turkey Point, ON, Canada, 2009

Cerificate, Royal Ontario Museum, Identification of Ontario Fishes, Toronto, ON, Canada, 2009

Certificate, Royal Ontario Museum, Species at Risk Fishes Identification, Toronto, ON, Canada, 2009

Canada Safety Council - ATV Training Course, Winnipeg, MB, Canada, 2006

Canadian Power & Sail Squadrons, Pleasure Craft Operators Card, St. Thomas, ON, Canada, 2004

PROJECT EXPERIENCE

FISHERIES AND PERMITTING

Delsey SWM Pond SAR/ESA Permitting and Mussel Relocation* | City of Hamilton | Hamilton, Ontario, Canada | Project Manager/Senior Aquatic Biologist

The City of Hamilton requested assistance with permitting once a SAR mussel was found during cleanout activities of a SWM Pond. Gina was the project manager and was responsible for obtaining the proper permits to allow for work to resume. Permits included a Health and Safety Permit under the ESA and a SARA Permit. Gina was also responsible for leading the required mussel relocation and subsequent monitoring, and the reporting requirements outlined under the various permits.

Pelee Island Big Marsh Drain SAR Mussel Relocations * | Township of Pelee | Ontario, Canada | Project Manager / Aquatic Biologist

Gina led the permitting process for the Drain cleanout works on Pelee Island. Permitting included registering the activities under O.Reg 242/08 s.23.9 for a SAR mussel. A mitigation plan was prepared and implemented by Gina and her team, which involved searching the spoils for the SAR mussel. A SARA compliant Fisheries Act Authorization was also obtained for this work to occur. Multiple sections of Drains on the Island have been cleaned out, with SAR mussels being found in some of them.

Argyle Street Bridge, Grand River Mussel Relocation & Monitoring (MTO Contract 3019-C-0668)* | Dufferin / MTO | Caledonia, Ontario, Canada | Project Manager / Aquatic Biologist

Gina led a large team of biologists to complete the conditions of the Species at Risk permitting as it related to mussels. This included preparing a tagging and tracking plan, completing the mussel relocations and monitoring events following the Protocol, and the required reporting and agency correspondence. The mussel relocation was completed within the overall prescribed search area, SAR relocation area, and two control areas which had been previously identified during the detail design stage. Mussel density calculations were provided to agency staff at the end of each day when activities were occurring. A total of 180,022 live mussels of all sizes/age classes were collected, representing 22 species (live) and an additional 4 species (shells). Gina was also responsible for the 1-month, 1-year, and 2-year monitoring events and required reporting.

Concession 5 Bridge, Canard River SAR Fish and Mussel Activities* | FRONT Construction / Town of Amherstburg | Amherstburg, Ontario, Canada | Project Manager / Aquatic Biologist

In support of the Bridge replacement, Gina obtained the required permits, as well as implemented the requirements of the permits. For this bridge location there was multiple SAR fish and a SAR mussel. Permitting included registering the activities under O.Reg 242/08 s. 23.18, obtaining a Letter of Advice under the Fisheries Act, and obtaining a SARA permit. Gina led the mussel relocation activities, which also involved directing divers, and managed the fish relocation efforts. Gina prepared the mussel relocation and 1-month monitoring summary reporting for this project.

McCurdy Bridge Replacement, Saugeen River, Aquatic SAR Habitat Assessment, Permitting, Mussel Relocation and Monitoring* | County of Bruce | Walkerton, Ontario, Canada | Aquatic Biologist

Gina was involved in the project from the Class EA stage completing aquatic habitat assessments through to permitting and implementing the conditions of the permits. She discussed with agencies permitting requirements and worked on a multi-disciplinary team to obtain an ESA Permit, SARA Permit and Fisheries Act Authorization. Gina led the mussel relocation and monitoring efforts for this project, as well as prepared the reporting.

Bear Creek Rokeby Line SAR Screening for Class EA* | B.M. Ross and Associates / Township of Enniskillen | Enniskillen, Ontario, Canada | Project Manager/ Aquatic Biologist

Gina was the lead aquatic biologist and project manager for this project. This included completing a SAR screening, that focused on mussel habitat that may have been present within the study area. Gina led the field work, as well as prepared the reporting that was inputted into the Environmental Screening Report.

Holt Line Bridge Works, North Sydenham River, Permitting and Mussel Relocation* | BM Ross / Municipality of Chatham-Kent | Ontario, Canada | Aquatic Biologist / Project Manager

The project location crossed the North Sydenham River which is considered habitat for multiple SAR fish and mussels. Gina was involved in this project since the Class EA stage. She led discussions with agencies regarding the permitting requirements and obtained a SARA permit and Letter of Advice from DFO, as well as provided the mitigation measures so that the project could be registered under O. Reg 242/08. Gina scheduled the works and supervised the divers completing the mussel relocation. A summary report was prepared, but as no SAR mussels were found, no further monitoring was required.

Minto Drains - Redside Dace Mitigation Plans* | Township of Minto | Minto, Ontario, Canada | Project Manager / Aquatic Biologist

Team was retained to correspond with the agencies to determine if permitting was required, and if it was to assist in obtaining it. Gina led this project and prepared a Mitigation Plan so that the Drainage works could be registered under O. Reg 242/08. Gina prepared the RfR and obtained a SARA compliant Letter of Advice for the works to proceed. Once permits were obtained, Gina worked with the contractor to complete a fish salvage to ensure no impacts to Redside Dace.

Farewell Creek Design Build* | Durham Region | Durham, Ontario, Canada | Project Manager / Aquatic Biologist

Gina was the project manager for this project. This involved preparing an updated Natural Environment brief based on the detail design, obtaining the required permits (registering works under O.Reg 242/08 and submitting and RfR). The review from DFO resulted in a Letter of Advice being issued for the realignment of the creek. Gina also worked with the contractor to schedule the required fish relocations and subsequent reporting.

Blind Line Bridge Replacement SAR Screening, Permitting and Relocations* | B.M. Ross and Associates / Township of Morris-Turnberry | Ontario, Canada | Project Manager/ Aquatic Biologist

Gina led the SAR screening and subsequent reporting for this project. Permitting included registration under the ESA, as well as a Letter of Advice from DFO. Gina also led the mussel relocation within the prescribed work areas.

Teeswater River Bridge Replacement, Bruce Road 3 SAR Screening and Relocations* | B.M. Ross / Bruce County | Paisley, Ontario, Canada | Project Manager/ Aquatic Biologist

Gina worked with the engineering firm (BM Ross) to complete a species at risk screening to inform permitting and input into the Class EA. During construction, Gina lead the fish and mussel relocations to allow for the removal of the existing bridge, and for the causeways into the river. Gina worked with the contractors, Looby Construction Inc for the scheduling and completion of the mussel and fish works.

Palmertson WWTP SAR Mussel Survey* | Hutchinson Environmental Services | Palmerston, Ontario, Canada | Project Manager/ Aquatic Biologist

A presence/absence visual survey for SAR mussels and broad habitat assessment was completed within the Little Maitland River and a small Tributary. This survey was completed in response to evaluating chloride effects on mussels. Gina completed the survey as well as prepared the reporting.

Saltfleet Wetland Characterization and Creation Projects * | Hamilton Conservation Authority | Hamilton, Ontario, Canada | Project Manager/ Aquatic Biologist

Gina was the lead aquatic biologist for these two projects where the goal was to create new wetlands for storage. Gina completed the fish and fish habitat assessments using OSAP and modified OSAP. She led the aquatic reporting component, including the effects assessment, and subsequent RfR submissions.

Devil's Punchbowl Wetland Creation Project* | Hamilton Conservation Authority | Hamilton, Ontario, Canada | Project Manager/ Aquatic Biologist

Gina was the lead aquatic biologist for these two projects where the goal was to create new wetlands for storage. Gina completed the fish and fish habitat assessments using OSAP and modified OSAP. She provided input into the draft EIS.

Cedar Springs Culvert Replacement* | Water's Edge / City of Burlington | Burlington, Ontario, Canada | Project Manager

Gina was the lead aquatic biologist for this project. She was responsible for completing the fisheries assessment, as well as scheduling terrestrial field work. She also prepared the Natural Environment memo, which identified the permitting requirements for the works.

North Cambridge Business Park* | MTE / City of Cambridge | Cambridge, Ontario, Canada | Project Manager/ Aquatic Biologist

Gina provided monitoring as it related to the letter of Advice for ESC measures in or around water. This included providing field fit advice, recommendations for improvements, and completing fish relocations prior to de-watering. She was responsible for reporting based on the monitoring.

Longs Creek Bridge Structures, Kent Line and Esterville Road* | B.M. Ross and Associates / Municipality of Chatham-Kent | Ontario, Canada | Project Manager/ Aquatic Biologist

Gina provided the engineering firm the prescribed search area requirements based on where the rip-rap was proposed to be placed. She scheduled the staff and divers to complete the mussel relocation works and was the lead identifier on the project. She completed the required reporting to satisfy the permitting agencies.

Reid Bridge and Old Reid Bridge SAR Screening and Relocations* | B.M. Ross and Associates / County of Bruce | Ontario, Canada | Project Manager/ Aquatic Biologist

Gina was the lead aquatic biologist and project manager for this project. This included completing a SAR screening and the bridge where in-water rehab work was occurring, as well as the old bridge that was being removed. Gina and team completed the fish and mussel relocations prior to the in-water activities, as well as the subsequent reporting to satisfy the permitting requirements.

** denotes projects completed with other firms*

Gatineau River Mussel Habitat Survey* | Landowner | Gatineau, Quebec, Canada | Project Manager/ Aquatic Biologist

Gina was the lead aquatic biologist and project manager for this project. She prepared a scope of work that was approved by the agencies. Once approved she led the divers on completing a habitat assessment in an area where there was potential for SAR mussels. The results of the field survey were written up and provided to the agencies, which determined further permitting requirements.

ENVIRONMENTAL ASSESSMENTS – HIGHWAYS AND INFRASTRUCTURE

MTO Highway 4 Widening and Talbotville Bypass (GWP 3042-22-00) | Ministry of Transportation Ontario | Talbotville, ON | 2024 - Pres | Senior Fisheries Biologist / Fisheries Assessment Specialist

Gina was the Senior Fisheries Biologist/Fisheries Assessment Specialist for this project through the Detail Design stage. The MTO had retained Stantec to complete the Preliminary Design, Detail Design and Class Environmental Assessment Study (Class EA) for improvements to Highway 3 from Highway 4 in the Township of Southwold to Centennial Avenue in the City of St. Thomas. Gina prepared the Fisheries Impact Assessment Report, which provided supporting documentation for the Talbotville Bypass and Highway 4 Widening and reviewed potential impacts of the highway project on fish and fish habitat, proposed mitigation measures, residual effects of the project and the likelihood of causing death of fish or the harmful alteration, disruption or destruction (HADD) of fish habitat. The report was completed in accordance with the MTO/DFO/MNRF Fisheries Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings (the Protocol) (MTO 2020a) and the Interim Environmental Guide for Fisheries (MTO 2020b) (the Fish Guide). Based on the proposed impacts to fish and fish habitat, Gina prepared and submitted a Request for Review form to Fisheries and Oceans Canada (DFO). Through discussions and a site visit, the DFO ultimately issued a Letter of Advice.

MTO Hwy 401 Mallorytown to Brockville Preliminary Design (GWP 4011-22-00) | Ministry of Transportation Ontario | 2024 - pres | Senior Fisheries Biologist / Fisheries Assessment Specialist

Gina is the Senior Fisheries Biologist/Fisheries Assessment Specialist for this project. The MTO had retained Stantec to undertake a Preliminary Design, and Class Environmental Assessment (Class EA) Study for the replacement and rehabilitation of six bridges and four structural culverts on Highway 401, and to identify the future Highway 401 footprint for an interim six lanes and ultimate eight lanes. Gina was the task manager for the Fish and Fish Habitat scope of this project. This included scheduling the field work, corresponding with agencies, and preparing the Fish and Fish Habitat Existing Conditions Report. Gina provided constraints and opportunities, as well as design considerations to the overall project team. Once the technically preferred alternative design is prepared, Gina will lead the Preliminary Impact Assessment and prepare the associated documentation.

MTO Hwy 401 and Lauzon Parkway Interchange Preliminary Design (GWP 3028-23-00) | Ministry of Transportation Ontario | Windsor, Ontario, Canada | 2024 - pres | Senior Fisheries Biologist / Fisheries Assessment Specialist

Gina was the Senior Fisheries Biologist/Fisheries Assessment Specialist for this project. The MTO had retained Stantec to complete the Preliminary Design and Class Environmental Assessment Study (Class EA) for a new interchange on Highway 401 for the future connection at the Lauzon Parkway in Windsor, Ontario. Gina was the task manager for the Fish and Fish Habitat scope of this project. This included scheduling the field work, corresponding with agencies, and preparing the Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report. The preliminary impact assessment was based on the recommended plan for the study area and included a list of potential impacts to fish and fish habitat at watercourses that had been identified as fish habitat.

MTO Highway 401 and Bloomfield Road Interchange Improvements – Seventh Line West Realignment Advanced Contract (GWP 3033-24-00) | Ministry of Transportation Ontario | Ontario, Canada | 2024 - pres | Senior Fisheries Biologist / Fisheries Assessment Specialist

Gina is the Senior Fisheries Biologist/Fisheries Assessment Specialist for this project. The MTO had retained Stantec to complete Detail Design and Class Environmental Assessment (Class EA) for improvements to the Highway 401 and Bloomfield Road Interchange (GWP) 3117 18-00. As part of this project, the Seventh Line West Realignment was broken out into an advanced contract (GWP 3033-24-00). Based on the detail design for the advance contract, Gina completed the fisheries assessment for work locations identified as fish habitat and within 30 m of locations identified as fish habitat. Pathways of Effects (POEs) for land-based activities within 30 m of Moody and Early Drain and Flook and Hinton Drain were applied to determine residual effects and with the implementation of mitigation measures, permanent residual effects are not expected to occur; therefore, there is low risk of the death of fish or the HADD of fish habitat due to the work and a Project Notification Package was prepared. Additional works are to be completed for the main contract once the detail design has progressed.

MTO Highway 400 North Canal Overpass Detail Design Updates (GWP-2005-11-00) | Ministry of Transportation Ontario | Bradford West Gwillimbury, Ontario, Canada | 2024 - Pres | Senior Fisheries Biologist / Fisheries Assessment Specialist

Gina was the Senior Fisheries Biologist/Fisheries Assessment Specialist for this project. The MTO had retained Stantec to complete the detail design updates for the Highway 400 North Canal Overpass Structure Replacements. Gina prepared the Fisheries Existing Conditions and Impact Assessment Report Addendum, which included reviewing the previously completed reports in 2019 and 2021 to consider fish and fish habitat natural environmental impacts and mitigation measures pertaining to the proposed replacement of the Highway 400 North Canal bridges and the lining of the Holland (Schomberg) River culvert. She also prepared MTO Project Notification Form Packages for both locations as per Step 5 of the MTO Fisheries Protocol.

MTO Highway 3 Big Otter Creek Slope Failure (Agreement 3019-E-0009) | Ministry of Transportation Ontario | Tillsonburg, Ontario, Canada | 2024 | Senior Fisheries Biologist/ Fisheries Assessment Specialist

Gina was the Senior Fisheries Biologist/Fisheries Assessment Specialist for this project. The MTO had retained Stantec to deliver the detail design and Class EA for an engineered surface runoff management solution to address the recent washouts at the embankments of the bridge structure crossing Big Otter Creek on Highway 3 near Tillsonburg. Gina prepared the Fisheries Existing Conditions and Impact Assessment report, which included describing the fish and fish habitat features, assessing the habitat for Species at Risk potential, evaluating the impacts of the proposed work and recommending mitigation measures. She also prepared a MTO Project Notification Form as per Step 5 of the MTO Fisheries Protocol.

MTO Highway 400 / Simcoe Road 88 Interchange Improvements (GWP-2331-16-00) | Ministry of Transportation Ontario | Bradford West Gwillimbury, Ontario, Canada | 2022 - Pres | Senior Fisheries Biologist / Fisheries Assessment Specialist

Gina was the Senior Fisheries Biologist/Fisheries Assessment Specialist for this project. The MTO had retained Stantec to complete the detail design and Class EA for Highway 400 Improvements. Gina updated and prepared impact assessment documentation for the Fisheries Existing Conditions and Impact Assessment Report. Gina completed the Fisheries Impact Assessment and prepared a DFO Request for Review, and obtained a Letter of Advice for the works.

MTO Highway 3 Pavement Rehabilitation (GWP 3122-18-00 & GWP 3121-18-00) | Ministry of Transportation Ontario | Dunnville, Ontario, Canada | 2024 - Pres | Senior Fisheries Biologist / Fisheries Assessment Specialist

Gina was the Senior Fisheries Biologist/Fisheries Assessment Specialist for a portion of this project. The MTO had retained Stantec to complete the detail design and Class EA for rehabilitation of two sections of Highway 3 near the community of Dunnville in Haldimand County. Gina prepared the Fish and Fish Habitat Impact Assessment Addendum for works associated with a non-structural culvert and prepared the Project Notification Form.

Graham Creek - Fisheries Contract Specialist Services (Agreement 2019-E-0023)* | Ministry of Transportation Ontario | Newtonville, Ontario, Canada | Fisheries Contract Specialist

Gina provided Fisheries Contract Specialist services for the culvert and realignment works. This included completing a weekly and bi-weekly inspection, identifying ESC issues to be remedied, and ensuring general compliance with permits.

** denotes projects completed with other firms*

MTO Lynde Creek Culvert Works (Agreement 2019-E-0023) - Fisheries Contract Specialist Services* | Ministry of Transportation Ontario | Clarington, Ontario, Canada

Gina provided Fisheries Contract Specialist services for the culvert and realignment works. This included completing a weekly and bi-weekly inspection, identifying ESC issues to be remedied, and ensuring general compliance with permits.

MTO Hwy 400 ESA Post Construction Monitoring (Agreement 2019-E-0023) - Fisheries Contract Specialist Services* | Ministry of Transportation Ontario | King City, Ontario, Canada | Fisheries Contract Specialist

Gina provided Fisheries Contract Specialist services for this assignment. Sites along the Highway 400 required assessment to determine if the overall benefit measures implemented for Redside Dace were performing as per the requirements in the ESA Permit.

MTO Longwood Channel and Cascade Outfall Rehabilitation (GWP-2054-14-00)* | AECOM / MTO | Hamilton, Ontario, Canada | Project Manager/ Aquatic Biologist

Gina was an aquatic biologist on the file and assisted in the field work and reporting for the Fish and Fish Habitat Existing Conditions Report and the Fish and Fish Habitat Impact Assessment Report.

ENVIRONMENTAL IMPACT ASSESSMENTS AND PERMITTING

Arthur Street Widening Class EA* | Region of Waterloo | Waterloo, Ontario, Canada | Project Manager/ Aquatic Biologist

Gina was the project manager for the natural environment component of this project while at NRSI. She prepared the fieldwork plan and oversaw the field work (terrestrial and aquatic). Gina completed the spring fish community and habitat assessments for the watercourse crossing locations utilizing the MTO field forms. Gina led the mussel habitat assessment within the Conestogo River.

North Halton Coordinated Class EA* | HDR / Halton Region | Ontario, Canada | Project Manager/ Aquatic Biologist

Gina was the lead aquatic biologist on this project. She identified the work plan, as well as implemented it for the aquatic scope. She completed the fish habitat assessments following the MTO field forms at multiple watercourse crossings along James Parkway, Steeles Avenue, and RR25. She provided input to the constraints mapping, including potential areas where SAR were present.

Fairway Road Widening Class EA* | Ontario, Canada | Project Manager/ Aquatic Biologist

Gina served as the Project Manager and lead aquatic biologist for this project. She was responsible for ensuring the field work was completed (both terrestrial and aquatic), Natural Environment Technical report writing, project QA/QC, agency and client liaison, and general project coordination.

Blandford-Blenheim Bridge Class EA* | Township of Blandford-Blenheim | Ontario, Canada | Project Manage / Aquatic Biologist

Gina was the project manager for this project. This included ensuring that field work was completed, including conducting a mussel habitat assessment, as well as terrestrial surveys. She was then responsible for ensuring the reporting was completed and providing input to the overall team to assist in determining the preferred alternative. Through Detailed Design, Gina was responsible for obtaining the ESA and the SARA Permit, as well as implementing the conditions. This included completing a fish and mussel relocation, and subsequent monitoring.

North Cambridge Business Park, Freeport SWMP Rehabilitation and Interim Sanitary Pumping Station Class EA* | City of Cambridge | Cambridge, Ontario, Canada | Aquatic Biologist

Gina was part of a team to complete detailed characterization of existing features, subsequent reporting, and to use the detailed information to complete the analysis of significance and sensitivity of natural features. This information was used to evaluate several alternative road alignments, pumping station locations, force main route alignments, and scenarios for rehabilitating Freeport Creek SWM Pond from a natural heritage perspective. Gina was the lead aquatic biologist on this project, assisting with the original fisheries assessment, input into the reporting, and she obtained the DFO Letter of Advice. Once project works began, Gina assisted in completing the conditions of the permits (i.e. fish salvage, construction monitoring, etc.).

Ottawa Street (Alpine Road to Fischer-Hallman Road) Reconstruction Class EA* | Region of Waterloo | Waterloo, Ontario, Canada | Project Manager / Aquatic Biologist

Gina served as the Project Manager and lead aquatic biologist for this project. She was responsible for ensuring the field work was completed (both terrestrial and aquatic), Natural Environment Technical report writing, project QA/QC, agency and client liaison, and general project coordination.

Clark Boulevard Extension and Eastern Avenue Improvements Schedule C Class EA* | City of Brampton | Brampton, Ontario, Canada | Aquatic Biologist

Gina was part of the overall project team that was retained by the City of Brampton to complete the Natural Environment component of the project. Gina provided aquatic input into the Natural Environment Assessment Report, evaluation of alternatives, and prepared the impact assessment based on the preferred alternative as it related to fish and fish habitat.

Belfountain Transportation Corridor Class EA & DD, Peel Region* | Peel Region | Belfountain, Ontario, Canada | Aquatic Biologist

Gina was the lead aquatic biologist for the project team. This included completing field assessments (habitat and fish community) and reporting for the Natural heritage Assessment. Once a preferred alternative was chosen, Gina completed the impact assessment as it related to fish and fish habitat. During Detailed Design, Gina prepared the request for review for submission to DFO and received a Letter of Advice for the activities.

Regional Municipality of Waterloo Airport Extension Detailed Design* | Region of Waterloo | Waterloo, Ontario, Canada | Aquatic Biologist

Gina assisted with the RMOW Master Plan characterization of aquatic habitats and reporting. During Detailed Design, Gina worked with the overall project team to prepare the Request for Review and obtain a Letter of Advice. She worked with the fluvial team to ensure the realignment of the drainage feature would function and continue to provide fish habitat.

INDEPENDENT PEER REVIEW

Natural Heritage Peer Review – Environmental Impact Study, Camp 30 Development | Municipality of Clarington | Bowmanville, Ontario, Canada | 2025 | Senior Fish Biologist

Retained by the Municipality to conduct natural heritage peer review services to support the municipal review of the development application associated with the property known as Camp 30, Bowmanville ON. Prepared a technical letter providing comments on the EIS pertaining to conformity to the applicable policy documents, including the Fisheries Act, Species at Risk Act, Endangered Species Act, Durham Regional Official Plan, Municipality of Clarington Official Plan, and the Provincial Planning Statement. As the file is at the Ontario land Tribunal, additional support tasks have also been undertaken, as well as participation in the mediation. Gina's role focused on reviewing the EIS relating to watercourses, fish and fish habitat, and effects to these features.

Natural Heritage Peer Review - Environmental Impact Study, Bluewater Shores Trailer Park * | Huron County | Ontario, Canada | 2023 | Senior Aquatic Biologist

A peer review assignment under the natural heritage peer review roster. Prepared a technical letter providing comments on the EIS pertaining to conformity to the applicable policy documents, including the Fisheries Act, Species at Risk Act, Endangered Species Act, Official Plans, and the Provincial Planning Statement. As the file is at the Ontario land Tribunal, additional support tasks have also been undertaken, as well as participation in the mediation. Gina's role focused on reviewing the EIS relating to watercourses, fish and fish habitat, and effects to these features, primarily at the proposed crossing locations.

POWER RENEWABLE ENERGY, HYDRO

The Chute, Ivanhoe River Hydroelectric Generating Station Project* | Xeneca Power Development | Timmins, ON

Environmental assessment to meet provincial Class EA and federal legislation for a proposed hydroelectric facility. Scope included aquatic and terrestrial field investigations, liaison with agencies and preliminary environmental assessment reporting. Gina was responsible for planning and executing portions of the field studies, as well as assisting in the reporting. Field surveys included aquatic habitat identification, walleye spawning, and fish community sampling.

Four Slide Falls, Serpent River Hydroelectric Generating Station Project* | Sudbury, ON

Environmental assessment to meet provincial Class EA and federal legislation for a proposed hydroelectric facility. Scope included aquatic and terrestrial field investigations, liaison with agencies and preliminary environmental assessment reporting. Gina was responsible for planning and executing portions of the field studies, as well as assisting in the reporting. Field surveys included aquatic habitat identification, walleye spawning, fish community sampling, and water quality sampling.

Wanatango Falls, Frederick House River Hydroelectric Generating Station Project* | Xeneca Power Development Inc. | Iroquois Falls, ON

Environmental Assessment to meet provincial Class EA and federal legislation for a proposed hydroelectric facility. Scope included aquatic and terrestrial field investigations, liaison with agencies and preliminary environmental assessment reporting. Gina was responsible for planning and executing portions of the field studies, as well as assisting in the reporting. Field surveys included aquatic habitat identification, walleye spawning, fish community sampling, benthic invertebrate surveys, and water quality sampling.

Okikendawt Hydroelectric and Transmission Line Project* | Dokis First Nations / Hydromega Services Inc. | Dokis, ON

Environmental Assessment for the Okikendawt hydroelectric development project and the 32.5 km transmission line. Gina's role was to schedule and assist in the field investigations associated with the proposed transmission line routes, as well as provide input in the reporting. Gina also assisted with fish and mussel relocations when construction works were happening at the dam.

POWER RENEWABLE ENERGY, WIND

Belle River Wind Project Water Body Assessment* | SP Belle River Wind, LP | Belle River, ON | Aquatic Biologst

Scope of work included a detailed review of available background resources to identify any water bodies within the project location, followed by preparation of a Records Review Report. Site investigations were also conducted to identify and characterize the water bodies within 120 m of the project location. Site investigations were conducted to confirm the presence/absence of water bodies identified during the records review, determine any required corrections from the records review, and document any additional new water bodies. A Water Body Assessment report was then completed in accordance with the REA Regulations. Gina was the lead aquatic biologist, responsible for completing the records review, conducting the site investigations, review and analysis of the field data and completing the reporting.

Bornish Wind Energy Centre Water Body Site Investigation Report* | GL Garrad Hassan/ NextEra Energy Canada | North Middlesex, ON

Scope of work included a detailed review of available background resources to identify any water bodies within the project location, followed by preparation of a Records Review Report. Site investigations were also conducted to identify and characterize the water bodies within 120 m of the project location. Site investigations were conducted to confirm the presence/absence of water bodies identified during the records review, determine any required corrections from the records review, and document any additional new water bodies. A Water Body Assessment report was then completed in accordance with the REA Regulations. Gina was the lead aquatic biologist, responsible for completing the records review, conducting the site investigations, review and analysis of the field data and completing the reporting.

Armow Wind Project Water Body Environmental Impact Study* | SP Armow Wind Ontario LP / Pattern Renewable Holdings | Kincardine ON

Scope of work included a detailed review of available background resources to identify any water bodies within the project location, followed by preparation of a Records Review Report. Site investigations were also conducted to identify and characterize the water bodies within 120 m of the project location. Site investigations were conducted to confirm the presence/absence of water bodies identified during the records review, determine any required corrections from the records review, and document any additional new water bodies. A Water Body Assessment report was then completed in accordance with the REA Regulations. Gina was an aquatic biologist, assisting with the records review, review and analysis of the field data and assisting the reporting.

South Kent Wind Project Water Body Assessment* | Chatham-Kent, ON

Scope of work included a completing the Records Review Report, Site Investigation Report, and Water body Assessment Report for the proposed 270 MV wind energy generating facility. The reports and work were completed in accordance with the Renewable Energy Approval regulations. Gina was the responsible for updating several of the water body reports, as well as completed site investigations and providing input to the Water body Environmental Impact Study report.

Nation Rise Wind Farm Project* | Township of North Stormont, ON

Scope of work included a completing the Records Review Report, Site Investigation Report, and Water body Assessment Report for the proposed 100 MV wind energy generating facility with up to 34 wind turbines. The reports and work were completed in accordance with the Renewable Energy Approval regulations. Gina was the responsible for updating and providing limited input into the reporting, as well as scheduling site investigations.

Sumac Ridge Wind Farm Project*

Scope of work included a completing the Records Review Report, Site Investigation Report, and Water body Assessment Report for the proposed wind energy generating facility. The reports and work were completed in accordance with the Renewable Energy Approval regulations. Gina was the responsible for completing the site investigations, review and analysis of field data and reporting components.

North Kent Wind Project *

Scope of work included a completing the Records Review Report, Site Investigation Report, and Water body Assessment Report for the proposed 100 MV wind energy generating facility for up to 36 turbine. The reports and work were completed in accordance with the Renewable Energy Approval regulations. Gina was the responsible for updating several of the water body reports, as well as completed site investigations and providing input to the Water body Environmental Impact Study report.

ENVIRONMENTAL IMPACT STATEMENTS

Slo Pitch Road EIS* | Landowner | Dorchester, Ontario, Canada | Project Manager / Aquatic Biologist

Gina was the project manager for this scoped EIS. Gina was responsible for preparing the work plan, terms of reference, scheduling the field assessments, and completing the reporting. A constraints map was prepared for the client which outlined the significant/sensitive areas to help inform the development concept.

Forest View Subdivision Development Assessment Report* | Sifton Properties Ltd. | Mount Brydges, Ontario, Canada | Project Manager / Aquatic Biologist

Gina was the project manager for this project. She ensured that the project components were completed, from the Terms of Reference to scheduling field work, and ensuring the report was completed. She worked with the client and overall project team to prepare a feasible development concept and responded to agency comments on the report. Gina also managed the draft plan conditions that related to the natural environment, which included annual anuran monitoring and preparing a homeowners brochure.

Forest Trails Estates EIS* | Pattyn Landscaping | Parkhill, Ontario, Canada | Project Manager / Aquatic Biologist

Gina was the project manager for this project, ensuring that the work plan was implemented. This included completing background reviews, preparing a terms of reference for approval by the relevant agencies, scheduling field work, and preparing the report with input from others. Project included a watercourse which a new crossing would be required.

North Street Petrolia NETR and EIS* | Goldleaf Properties | Petrolia, Ontario, Canada | Project Manager / Aquatic Biologist

Gina was project manager for this EIS project. This site was adjacent to a river with multiple aquatic SAR, as well as had to have considerations for terrestrial bird SAR. Gina prepared the terms of reference, scheduled field work, and prepared the Natural Environment Characterization Report with input from other team members. A constraints map was also prepared and provided to the client to assist in developing the concept plan.

Chesterfield Ave Enironmental Impact Statement* | London, Ontario, Canada | Project Manager/ Aquatic Biologist

Gina was the project manager for this EIS project. She ensured that project components, including the TPP, were completed. Gina conducted the aquatic habitat assessment for the project. A Subject Lands Status Report was prepared and submitted, followed by the EIS.

Nairn Trails EIS* | Landowner | Nairn, Ontario, Canada | Project Manager/ Aquatic Biologist

Gina was the lead aquatic biologist for this EIS. She completed the field work with assistance from others, as well as provided input into the report. She evaluated the potential impacts to adjacent watercourses which has multiple aquatic SAR present.

COMMUNITY INVOLVEMENT

Advisory Member, Fleming College, Fish and Wildlife Program Advisory Member, Lindsay, ON, Canada 2012-present

EMPLOYMENT HISTORY

Stantec
Senior Fisheries Biologist
Since 2024 · 1 year(s)

Natural Resource Solutions Inc.
Aquatic Biologist/ Project Manager
2009 - 2024 · 14.5 years

Upper Thames River Conservation Authority
Aquatic Biology Assistant
2008 - 2009 · 1 year(s)

Lake Ontario Management Unit, MNRF
Great Lakes Fisheries Technician
2008 - 2008 · 0.5 years

Fisheries and Oceans Canada, Experimental Lakes Area
Limnological Sampling Assistant
2006 - 2007 · 1 year(s)

Harkness Fisheries Research Lab, MNRF
Fisheries Technician Assistant
2004 - 2005 · 1 year(s)

Ministry of Natural Resources and Forestry
Wetland Restoration Assistant
2003 - 2004 · 0.5 years

** denotes projects completed with other firms*

PUBLICATIONS & WHITEPAPERS

MacVeigh, G. 2013. Recovery Strategy for the Cutlip Minnow (Exoglossum maxillingua) in Ontario. Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vi + 31pp., 2013.

Mackie, G. G. MacVeigh, A. Schiedel. 2014. Best Management Guidance Document for Restoring, Creating, and Enhancing Habitat for Riverine Species at Risk Fish and Mussel Populations in Ontario. Prepared for the Ontario Ministry of Natural Resources and Forestry. Peterborough, Ontario. , 2014.

Catry, S., G. MacVeigh and J. Linton. 2024. DRAFT Recovery Strategy for the Purple Wartyback (Cyclonaias tuberculata) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ministry of the Environment, Conservation and Parks, Peterborough, Ontario. v + 31 pp. , 2024.

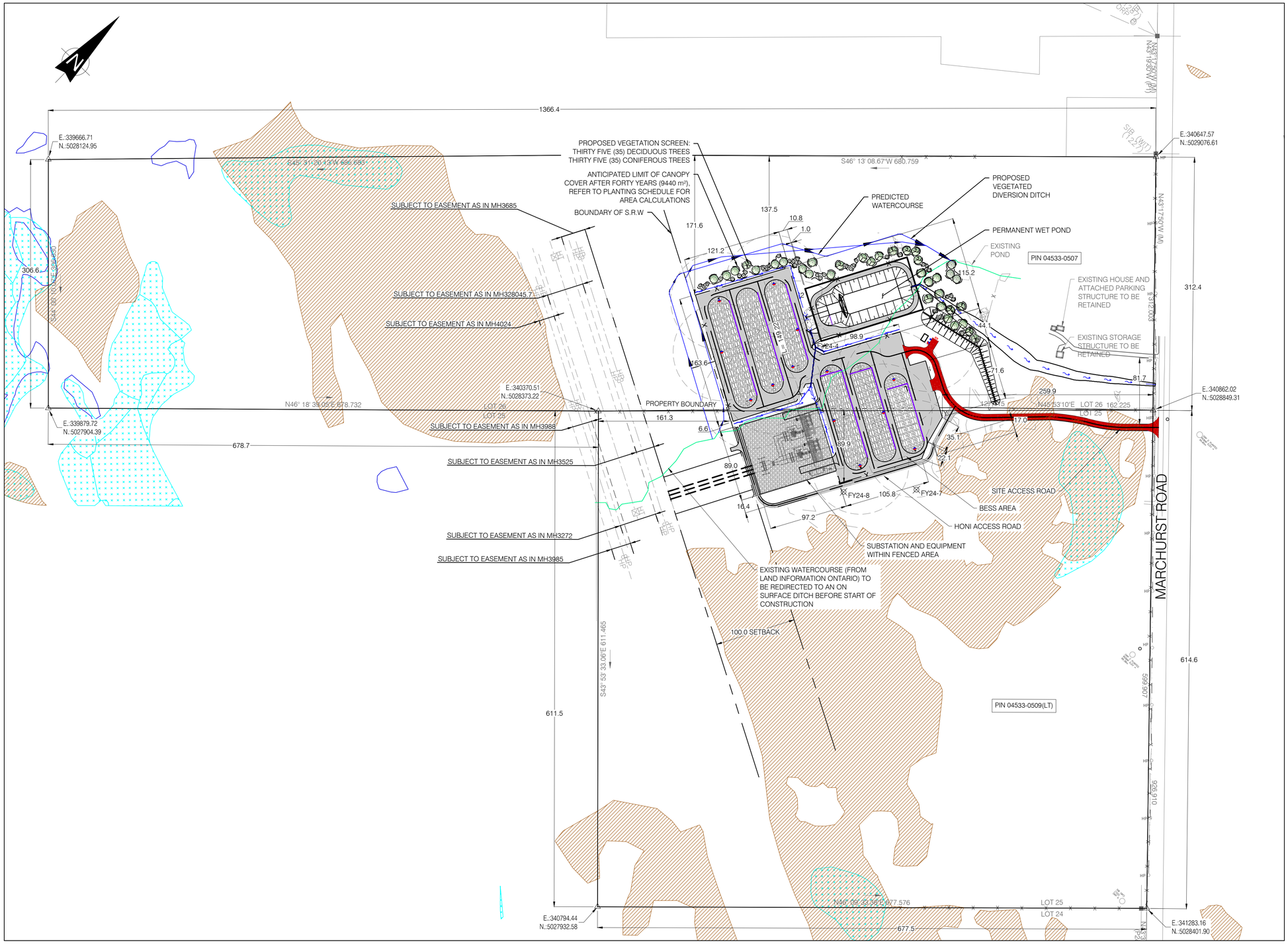
PRESENTATIONS

Guiding Habitat Improvements for at Risk Fish and Mussels. *Latornell Conservation Symposium*, 2014.

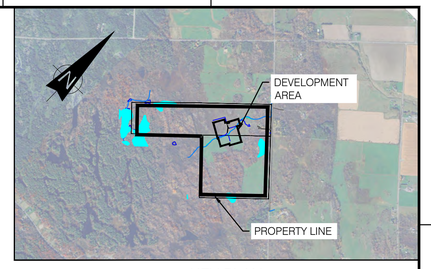
Outcomes of the Mussel Relocations and Monitoring Events (Consultants Perspective). *Canadian Freshwater Mollusc Research Meetiong/Conference*, 2017.

Big Marsh Drain Project - Lessons Learned. *Drainage Engineers Conference*, 2021.

Appendix K Site Plan



PLAN VIEW
SCALE 1:2500



KEY PLAN
SCALE: N.T.S.

NOTES:

1. PROJECT COORDINATES ARE SET IN NAD83(CSRS) / MTM ZONE 9 - EPSG:2952.
2. SITE SURVEY PROVIDED BY TULLOCK GEOMATCICS INC, ISSUED MARCH 11, 2025, SURVEY FILE #241451.
3. ALL REQUIRED PERMITS MUST BE IN PLACE BEFORE START OF CONSTRUCTION.
4. BATTERY ARRANGEMENT IS PER SOUTH MARCH BESS - 250 MW 230 kV - 34.5 kV SUBSTATION BESS LAYOUT - SUNGROW, 7154023-300000-47-D20-0001-02.DWG.
5. FOR LOCATION OF THE PROPOSED UNDERGROUND UTILITIES SEE SITE SERVING PLAN 7154023-100000-41-D20-0003.DWG
6. FOR CLEARING AND GRUBBING BOUNDARIES, REFER TO EROSION AND SEDIMENT CONTROL - CLEARING AND GRUBBING PLAN ON DRAWING NO. 7514023-100000-41-D70-0001-01.
7. CONTRACTOR TO REVIEW THE PRELIMINARY GEOTECHNICAL REPORT PREPARED BY HATCH DATED 2025-02-28, FILE H375142-0000-2A0-230-0001 BEFORE STARTING CONSTRUCTION.
8. THE ENTIRE DEVELOPMENT AREA WILL BE COVERED BY AN IMPERVIOUS LINER TO PROTECT THE UNDERGROUND WATER FROM ANY CONTAMINATION THAT MAY LEAK FROM THE BATTERIES AND TRANSFORMERS.

ELEVATION NOTES:

1. ELEVATIONS SHOWN HEREON ARE GEODETIC, ARE REFERRED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928 (CGVD28) AND ARE DERIVED FROM VERTICAL CONTROL MONUMENT 001198US21 USING REAL TIME KINEMATIC (RTK) GNSS OBSERVATIONS HAVING AN ELEVATION OF 89.209m.

BENCHMARK NOTES:

1. SITE BENCHMARKS ARE REBAR ORP C HAVING AN ELEVATION OF 99.38m AND REBAR ORP D HAVING AN ELEVATION OF 94.80m AS SHOWN ON THE FACE OF THE PLAN.

LEGEND:

- HP EXISTING HYDRO POLE
- BESS
- MV TRANSFORMER
- BESS (AUGMENTATION)
- MV TRANSFORMER (AUGMENTATION)
- DISTRIBUTION PANELS
- EXISTING HOUSE
- EXISTING FENCE
- PROPOSED FENCE
- OFFSET LINE
- EXISTING TRANSMISSION LINE
- PROPERTY LINE
- EXISTING WATERCOURSE (LAND INFORMATION ONTARIO)
- PROPOSED 4.5m NOISE WALL
- WETLAND (LAND INFORMATION ONTARIO)
- WATERBODIES (LAND INFORMATION ONTARIO)
- WOODED AREA (LAND INFORMATION ONTARIO)
- PROPOSED DITCH
- PROPOSED GRAVEL SURFACE AREA
- PROPOSED INSULATING STONE SURFACE AREA
- PROPOSED VEGETATED DIVERSION DITCH
- PROPOSED CULVERT
- PROPOSED REGISTERED FIRE ROUTE

SCALE 1:2500 50 25 0 50 100 150 200 250 m

FOR PERMITTING
NOT TO BE USED FOR CONSTRUCTION

REV	DESCRIPTION	PREPARED BY	CHECKED BY	DATE
AD	FOR PERMITTING	E. AMELI	M. SHAHRAKI	2025-10-07
AC	FOR PERMITTING	E. AMELI	M. SHAHRAKI	2025-07-03
AB	FOR PERMITTING	E. AMELI	M. SHAHRAKI	2025-06-19
AA	FOR COMMENTS	E. AMELI	M. SHAHRAKI	2025-04-29

REFERENCE DRAWINGS: 7154023-402000-47-D20-0001 — SOUTH MARCH BESS-250 MW 230kV-34.5 kV SUBSTATION

SEAL:

CLIENT: Evolugen by Brookfield Renewable

PROJECT: SOUTH MARCH
2555 AND 2625 MARCHURST RD, OTTAWA

TITLE: SITE PLAN
SHEET 1

PREPARED BY: E. AMELI	DRAFTED BY: D.JAMES
CHECKED BY: E. AMELI	APPROVED BY: M.SHAHRAKI
SCALE: 1:2500	DATE: 2025-04-29

DRAWING No.: 7154023-100000-41-D20-0001-01 | SHEET: 01 | SIZE: A1 | REV. AD

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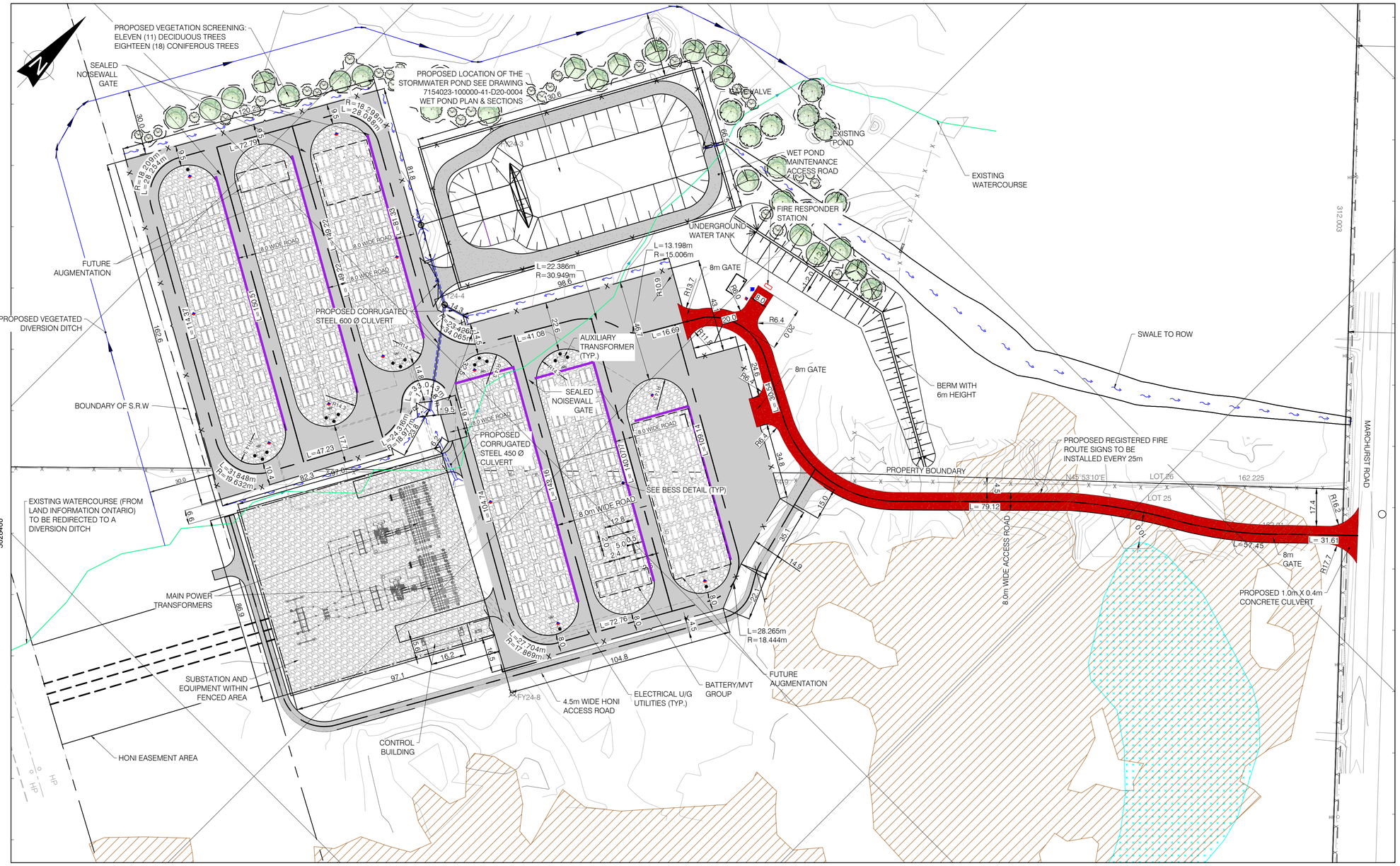
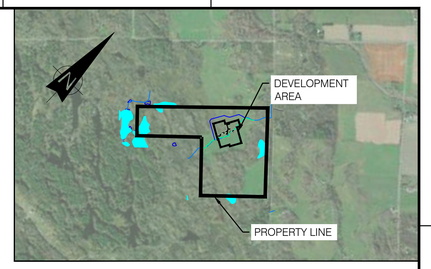


PLAN VIEW
SCALE 1:1000



KEY PLAN
SCALE: N.T.S.

NOTES:

ADDRESS: 2555 AND 2625 MARCHURST RD, DUNROBIN, ON

LEGAL DESCRIPTION: CON 1 LOT 25 AND 26

PROPERTY AREA: 2555 MARCHURST RD - 41.86 ha
2625 MARCHURST RD - 42.56 ha

1. PROJECT COORDINATES ARE SET IN HORIZONTAL DATUM: MTM_NAD83 (CSRS)_ZONE 9, VERTICAL DATUM: EPSG: 2952
2. ROAD DIMENSIONS AND TURNING RADIUS HAVE BEEN DESIGNED TO ACCOMMODATE A TRIDEM DRIVE TRACTOR SEMITRAILER TRUCK, THE LTM 1300 6.2 OUTRIGGER CRANE, AND THE LR 1200 SX CRAWLER CRANE. REVIEW OF ACCESS FOR DELIVERY AND INSTALLATION OF EQUIPMENT/STRUCTURES IS THE RESPONSIBILITY OF THE CONTRACTOR.
3. THE VEHICLE USED TO PERFORM THE SIMULATION IS PUMPER FIRE TRUCK
OVERALL LENGTH= 13.081m
OVERALL WIDTH= 2.54m
COUNTER-STEERING DELAY= 5SEC
MAXIMUM WHEEL ANGLE 45.00°
4. BATTERY ARRANGEMENT IS PER 7154023-300000-47-D20-0001-02.DWG.
5. CONTRACT DESIGN DRAWINGS SHALL BE READ IN CONJUNCTION WITH PROJECT SPECIFICATIONS, STANDARD DRAWINGS AND THE GEOTECHNICAL REPORT.
6. CONTRACTOR TO REVIEW THE PRELIMINARY GEOTECHNICAL REPORT PREPARED BY HATCH DATED 2025-02-28, FILE H375142-0000-2A0-230-0001 BEFORE STARTING CONSTRUCTION.
7. THE ENTIRE DEVELOPMENT AREA WILL BE COVERED BY AN IMPERVIOUS GEOMEMBRANE TO PROTECT THE UNDERGROUND WATER FROM ANY CONTAMINATION THAT MAY LEAK FROM THE BATTERIES AND TRANSFORMERS.

LEGEND:

- GATE VALVE
- CATCHBASIN WITH FILTER
- DRAFT FIRE HYDRANT
- REMOTE FIREHYDRANT
- LIGHT STANDARD
- PROPOSED MANHOLE
- CATCH BASIN MANHOLE
- EXISTING HYDRO POLE
- UNDERGROUND UTILITY MARKER
- TERMINAL BOX
- ANCHOR
- BOLLARD
- VENT
- EXISTING BOREHOLE
- AUXILIARY TRANSFORMER
- DISTRIBUTION PANELS
- EXISTING FENCE
- PROPOSED FENCE
- STORM PIPE
- WATER LINE
- OFFSET LINE
- EXISTING TRANSMISSION LINE
- PROPOSED 4.5m NOISE WALL
- PROPERTY LINE
- EXISTING WATERCOURSE (LAND INFORMATION ONTARIO)
- WETLAND (LAND INFORMATION ONTARIO)
- WOODED AREA (LAND INFORMATION ONTARIO)
- PROPOSED DITCH
- PROPOSED GRAVEL SURFACE AREA
- PROPOSED REGISTERED FIRE ROUTE
- PROPOSED INSULATING STONE SURFACE AREA
- PROPOSED VEGETATED DIVERSION DITCH
- PROPOSED CULVERT
- BATTERY/MVT GROUP

SITE STATISTICS		
DESCRIPTION	UNITS	QUANTITY
BATTERY COUNT	UNIT	256
MEDIUM VOLTAGE TRANSFORMER COUNT	UNIT	64
CONTROL BUILDING AREA	m^2	91.43
SUBSTATION AREA	m^2	8,433
PAD GRAVEL SURFACE	m^2	23,405
ROAD GRAVEL SURFACE	m^2	24,764

ELEVATION NOTES:

1. ELEVATIONS SHOWN HEREON ARE GEODETIC, ARE REFERRED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928 (CGVD28) AND ARE DERIVED FROM VERTICAL CONTROL MONUMENT 0011988U521 USING REAL TIME KINEMATIC (RTK) GNSS OBSERVATIONS HAVING AN ELEVATION OF 89.209m.

BENCHMARK NOTES:

1. SITE BENCHMARKS ARE REBAR ORP C HAVING AN ELEVATION OF 99.38m AND REBAR ORP D HAVING AN ELEVATION OF 94.80m AS SHOWN ON THE FACE OF THE PLAN.

OWNER AND CONSULTANTS

COMPANIES	PROJECT SCOPE	ADDRESS
EVOLUGEN	PROJECT DEVELOPER	41 RUE VICTORIA, GATINEAU, QC J8X 2A1
BBA	CIVIL ENGINEERING	20 CARLSON CT SUITE 100, ETOBICOKE, ON M9W 7K6
STANTEC	PLANNING, LANDSCAPE PLANS	1331 CLYDE AVE. #300, OTTAWA, ON K2C 3G4
HATCH	GEOTECHNICAL, HYDROGEOLOGY	2800 SPEAKMAN DR. MISSISSAUGA, ON L5K 2R7
TULLOCH GEOMATICS INC.	SURVEYOR	900 MORRISON DR. SUITE 208, OTTAWA ON K2H 8K7

ZONING COMPARISON CHART

RU-ZONE	REQUIRED	PROVIDED 2555 MARCHURST	PROVIDED 2625 MARCHURST
LOT AREA (MINIMUM)	0.8 ha	41.86 ha	42.56 ha
LOT WIDTH (MINIMUM)	50m	614.7m	312.5m
FRONT YARD (MINIMUM)	50m	253.8m	264.4m
INTERIOR SIDE YARD (MINIMUM)	5m	141.2m	293.5m
REAR YARD (MINIMUM)	10m	161.3m	797.8m
LOT COVERAGE (MAXIMUM)	20%	5%	9%
MINIMUM PARKING SPACES	0.8 PER 100m^2 OF GROSS FLOOR AREA	3m	3m
MAX BUILDING HEIGHT	12m	0m	0m

SCALE 1:1000 — 20 10 0 20 40 60 80 100 m

FOR PERMITTING
NOT TO BE USED FOR CONSTRUCTION

REV	DESCRIPTION	PREPARED BY	CHECKED BY	DATE
AH	FOR PERMITTING	E. AMELI	M. SHAHRAKI	2025-10-07
AG	FOR COMMENTS	E. AMELI	M. SHAHRAKI	2025-09-29
AF	FOR COMMENTS	E. AMELI	M. SHAHRAKI	2025-09-16
AE	FOR PERMITTING	E. AMELI	M. SHAHRAKI	2025-07-09
AD	FOR PERMITTING	E. AMELI	M. SHAHRAKI	2025-07-03
AC	FOR COMMENTS	E. AMELI	M. SHAHRAKI	2025-06-26
AB	FOR PERMITTING	E. AMELI	M. SHAHRAKI	2025-06-19
AA	FOR COMMENTS	E. AMELI	M. SHAHRAKI	2025-04-29

REVISIONS

DRAWING No.	DESCRIPTION
7154023-402000-47-D20-0001	SOUTH MARCH BESS-250 MW 230kV-34.5 kV SUBSTATION

REFERENCE DRAWINGS

SEAL:

CLIENT: Evolugen by Brookfield Renewable

PROJECT: SOUTH MARCH
2555 AND 2625 MARCHURST RD, OTTAWA

TITLE: SITE PLAN
SHEET 2

PREPARED BY:	DRAFTED BY:
E. AMELI	D.JAMES
CHECKED BY:	APPROVED BY:
E. AMELI	M.SHAHRAKI
SCALE: 1:1000	DATE: 2024-04-29

DRAWING No.: 7154023-100000-41-D20-0001 | SHEET: 02 | SIZE: A1 | REV. AG

BY:KOKOLAKIS, DANIEL
PRINTED:2025-10-08 12:13:59 PM

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