Site Investigation Report for the Proposed Anaerobic Digester at the Petawawa Wastewater Facility

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Prepared for:
Anaergia Inc.

Cambium Reference: 11757-002

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1.0 Introduction

The Town of Petawawa is pursuing a Renewable Energy Approval (REA) to construct and operate an anaerobic digester at the Petawawa Wastewater Facility. Cambium Inc. (Cambium) was retained by Anaergia Inc. to conduct aSite Investigation Report for the Proposed Anaerobic Digester at the Petawawa Wastewater Facility (Figure 1). A streamlined process is in place to coordinate legislative requirements set out by various ministries under the Green Energy Act. Applicants must meet the requirements outlined in Ontario Regulation 359/09 (i.e., the REA Regulation) under the Environmental Protection Act to receive an REA.

The REA process addresses natural heritage protection for renewable energy projects on private land and provincial Crown land in Ontario. Following the REA Regulation, the proposed bioenergy facility (i.e., anaerobic digester) is a renewable energy project that requires a Natural Heritage Assessment (NHA) (i.e., the Study).

1.1 Natural Heritage Assessment Process

Under the REA Regulation, applicable renewable energy projects undergo a Natural Heritage Assessment (NHA). Through the NHA (i.e., the Study), applicants identify any natural features at or near the proposed Project Location, follow procedures to determine if development prohibitions apply, and prepare an EIS where required. The NHA must be conducted following guidance provided by the Ministry of Natural Resources (MNR). Applicants submit NHA reports to MNR for review and written confirmation of approach. Similarly, applicants submit EIS Reports to MNR for review and written confirmation that the EIS was prepared following MNR guidance.

1.2 Description of the Proposed Renewable Energy Development

The Town of Petawawa has proposed to construct an anaerobic digester within the existing Wastewater Facility. The footprint of the proposed anaerobic digester and associated infrastructure is mostly within the existing fenced compound for the Wastewater Facility. The Natural Heritage Assessment for Renewable Energy Projects (NHAG) (MNR, 2012) defines the “Project Location” as “when used in relation to a renewable energy project, a part of land

and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposes to engage in the project." Figure 1 depicts the boundary of the Project Location, the 50 m setback, and the 120 m setback.

The *Endangered Species Act*, 2007 (ESA) protects endangered and threatened species and their habitats from harm or destruction. Habitat for endangered and threatened species is also afforded protection under provincial natural heritage policy; however, it is the landowner's responsibility to ensure that no harm to these species or their habitats occurs on their property. This Study includes a habitat-based screening for species of conservation concern to determine if the Site has suitable habitat for any provincially or federally listed species at risk (SAR).

Cambium has conducted this Study to provide an evaluation of reasonably anticipated ecological impacts, positive or negative, that may arise because of this proposed development to guide the decision-making process and address approval authority requirements.

1.3 Project Location

The Petawawa Wastewater Treatment Facility is located at 560 Abbie Lane, Petawawa, Ontario. The Project Locations is situated entirely within Ecoregion 5E of Ontario (Crins, Gray, Uhlig, & Wester, 2009). The anaerobic digester is proposed to be located within the existing developed lands of the Petawawa Wastewater Treatment Facility. The facility is located entirely on privately owned lands. The local municipality is the Town of Petawawa, and the upper-tier municipality is the County of Renfrew.

The Project Location, situated in Petawawa, is located entirely outside of:

- The jurisdiction of a Conservation Authority, local roads board and local services board.
- The Oak Ridges Moraine Conservation Plan Area.
- The Niagara Escarpment.
- The Growth Plan for the Greater Golden Horseshoe, and
- The Natural Heritage System of the Greenbelt Plan's Protected Countryside.

1.4 Purpose of the Site Investigation

The applicant must submit a Site Investigation Report to MNR for confirmation as outlined in Part IV, Section 28 of the REA Regulation. This report summarizes the results of the site investigation or alternative investigation and details the methods and procedures used. According to the Natural Heritage Assessment Guide (herein referenced as the "Guide") (Ministry of Natural Resources, 2012), a site investigation includes an investigation of the air, land, and water within the site investigation area to:

- verify whether the analysis of the Project Location undertaken through the records review is accurate, and make any necessary corrections to the determinations in the Records Review Report.
- determine whether any additional natural features exist within the site investigation area, other than those identified in the Records Review Report.
- determine the boundaries of any natural feature located within the site investigation area (identified through the Records Review Report or during site investigation); and
- determine the distance from the Project Location to the boundaries of any natural features.

1.5 Site Investigation Area

Under the REA Regulation, the site investigation area includes the entirety of the Project Location itself, including the lands, water, and air within 120 m of the Project Location boundary (Figure 1). Cambium extended the site investigations beyond the 120 m setbacks, within the property boundaries, to delineate natural heritage features, identify species and characterize habitats.

2.0 Technical Approach and Data Collection Methods

2.1 Background Information Review

Existing background information pertaining to the Site and surrounding landscape was compiled and reviewed and is provided under a separate cover within the Records Review Report (Cambium, 2021). Mapped natural heritage features located at and within 1000 m of the Project Location are detailed in the Records Review Report (Cambium, 2021).

2.1.1 Ministry Consultation

In early 2019, the Government of Ontario made changes to the regulating authority on matters related to SAR in the province. The Ministry of Environment, Conservation and Parks (MECP) is now responsible for administering the ESA and providing direction on potential compliance issues. MECP has prepared a guidance document titled *Client's Guide to Preliminary Screening for Species at Risk* (Ministry of the Environment, Conservation and Parks, 2019). This document aims to "help clients better understand their obligation to gather information and complete a preliminary screening for SAR before contacting the Ministry." This document was used to guide the SAR habitat-based screening for the Study.

2.2 Site Investigations

The site investigation program was developed through consultation with the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF) and following the Guide (Ministry of Natural Resources, 2012). Information gathered through the background information review was also used to guide the development of the site investigation program. The site investigations aimed to verify information acquired through existing documentation and gather additional site-specific information. The following sections detail the methodologies that were applied.

2.2.1 Ecological Land Classification and Vegetation Inventory

The Ecological Land Classification (ELC) system was used to classify vegetation communities on the Site. Vegetation communities at the Site were classified based on definitions of vegetation types outlined in the Ecosites of Ontario: Great Lakes to St. Lawrence Operational

Draft (Banton, et al., 2009). ELC units were initially delineated and classified by orthoimagery interpretation. Site investigations served to confirm the type and extent of communities on the Site through vegetation inventory and soil assessment with a hand auger. Where vegetation communities extend off the Site, classification is done through observation from property boundaries and publicly accessible lands.

2.2.2 Wetland Boundary Delineation

In Ontario, wetlands are mapped and evaluated under the Ontario Wetland Evaluation System (OWES) (Ontario Ministry of Natural Resources, 2013). Mapped evaluated wetlands have undergone extensive study and been assessed based on their form and function under four categories: Biological, Social, Hydrological, and Special Features (Ontario Ministry of Natural Resources, 2013). Evaluated wetlands that score high enough are deemed Provincially Significant Wetlands (PSW). The province also maps unevaluated wetlands. These mapped wetlands are approximate; as such, the Site Investigation was completed to confirm the presence and boundaries of wetlands.

The subject wetland was delineated following provincially approved methods outlined in the Ontario Wetland Evaluation System: Northern Manual, 1st Ed., Ver. 1.2 (Ontario Ministry of Natural Resources, 2013). Fieldwork was carried out by provincially certified Cambium staff.

The Site was visited during the early spring to document the extent of surface flooding at that time of year. This information was used to assist with the determination of wetland boundaries during the growing season.

Wetland boundaries were initially delineated and classified by orthoimagery interpretation. The presence and absence of wetlands on the Site were confirmed through site investigations during the growing season (late May through November). Wetland boundaries were determined using the 50% wetland vegetation rule. Where vegetation-based delineation was inconclusive, soil assessment with a hand auger was used to confirm wetland boundaries. Wetland boundaries on and adjacent to the Site were marked with a hand-held GPS unit in the field, where accessible.

2.2.3 Surface Water and Drainage Feature Mapping

Presence, location, boundary, and direction of flow were confirmed for all surface water features on and adjacent to the Site through visual investigation. Where feasible, the substrate type and cover features of surface water features were also noted. Indicators of surface drainage, including erosion of soils, gullies, and sediment deposition areas were observed and traced to identify sources of erosion. All watercourse and drainage feature crossings were recorded, and GPS marked in the field, including bridges, culverts, and bed-level crossings.

2.2.4 Aquatic Habitat Assessment

A roaming visual survey was completed to identify and map all aquatic features on the Site, including waterbodies, watercourses (permanent and intermittent), seeps, springs, and overland drainage paths. On-site features were characterized based on in-stream and riparian cover, channel structure/morphology, substrates, hydrologic measurements, and indicators of instability, thermal regime, and permanence of flow, where applicable. Definitions and technical criteria referenced in the Ontario Stream Assessment Protocol (Ministry of Natural Resources and Forestry, 2017) were applied to wadable streams. In addition, all identified aquatic features were assessed to determine their function as habitat for fish. Fish presence, specialized habitat features, and potential barriers to fish movement were documented. All feature crossings, including culverts and footbridges, were noted and georeferenced in the field.

2.2.5 Winter Raptor and Stick Nest Survey

The Project Location and adjacent areas containing canopy trees were visually inspected for large stick nests. Surveys were carried out on two occasions during the ‘leaf-off’ season, once in early May, prior to the emergence of foliage on the trees and again in November prior to snowfall. Cambium completed these surveys during “leaf-off” conditions in the spring of 2021 and again in the fall of 2021.

2.2.6 Breeding Bird Surveys

Two (2) breeding bird surveys were carried out during the peak breeding season between May 24, 2022, and July 10, 2022. Point counts will be completed using components of the Ontario Breeding Bird Atlas (OBBA) Guide for Participants (Ontario Breeding Bird Atlas, 2001) and the Forest Bird Monitoring Program (Cadman, Dewar, & Welsh, 1998) based on habitat characteristics. As outlined in the OBBA protocol, point counts are to be done between dawn and five (5) hours after dawn, when wind speed is low (<19 km/h) and in the absence of rain or thick fog. All species observations (visual and auditory) will be recorded during a five (5) minute period. Each species observed was classified and assigned a code based on the highest level of breeding evidence, as defined by the protocol: Confirmed, Probable, Possible or Observed.

2.2.7 Amphibian Breeding Surveys

The presence of frog and toad breeding habitat was determined using auditory surveys following the Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Bird Studies Canada, 2008). According to the protocol, three (3) amphibian surveys should be conducted between April and July, at least 15 days apart, to span all species' breeding seasons in an area. Air temperature is the primary factor in determining survey dates, as different species call when air and water temperatures reach certain levels; therefore, nighttime air temperature should be greater than 5°C for the first survey, greater than 10°C for the second survey and greater than 17°C for the third survey. Other weather conditions are also taken into consideration. Conditions are considered appropriate when wind speed is low (<19 km/h; Beaufort Wind Scale of 3 or lower) and there is light or no precipitation occurring (high humidity is ideal but heavier rain can impact the ability to hear and differentiate calls). Sample points are established during the first survey and re-visited during the following surveys. At each sample point, calls from all species are aurally surveyed for three minutes and noted to the greatest extent possible, on a 100 m semi-circular area in front of the sampling station using call intensity codes established by the protocol:

- Code 0: No calls heard
- Code 1: Calls can be counted individually (calls do not overlap)

- Code 2: Calls overlap, but numbers of individuals can be estimated
- Code 3: Calls overlap and are continuous (full chorus); therefore, a count estimate is unreliable

Recommended monitoring windows for the Site (located between the 43rd and 47th parallels) are 15 – 30th of April, 15 – 30th of May, and 15 – 30th of June. However, it is noted that the timing of amphibian surveys is less strictly tied to calendar dates and is directly related to temperatures influencing amphibian life processes.

2.2.8 Deer Wintering Habitat Survey

The MNRF is responsible for identifying deer wintering areas. Stratum 1 locations are the core wintering areas and include forests with greater than 60 percent canopy closure (conifer cover preferred). Stratum 2 areas include agricultural lands or deciduous/mixed forests where deer congregate before moving into the core area when winter conditions are more severe. Congregation areas are typically greater than 100 hectares, though conifer plantations less than 50 hectares may also be used. A travel corridor to the yard from the congregation area is required. To determine the significance of a congregation area, the MNDMRF conducts an assessment, typically during January or February when the snow depth is greater than 20 centimetres (cm), using techniques such as aerial, ground, or road surveys or a pellet count deer density survey. Also, since deer tend to re-use the same congregation areas yearly, local hunters, conservation officers, and foresters may know if a specific location is used as a wintering area.

Within an area mapped as Stratum 1 or Stratum 2, Site-specific information can be gathered through a Study to assess the wintering area quality, such as the extent and quality of conifer cover and estimated quantity of food available (Ministry of Natural Resources and Forestry, 2015). Deer wintering areas are identified and mapped as significant wildlife habitat (SWH) by the MNDMRF, and this mapping cannot be altered by a site-level Study.

2.2.9 Bat Maternity Roost Habitat Surveys

Bats present in Ontario typically require a snag or cavity tree for maternity roosting habitat. A snag or cavity tree is defined as a standing live or dead tree ≥25 cm diameter at breast height

(DBH), with cracks, crevices, hollows, cavities and loose or naturally exfoliating bark appropriate for bat roosting. High quality or significant wildlife habitat (SWH) is defined as woodlands with *greater than* 10 roost trees per hectare. To determine if suitable habitat for bats existed on/or adjacent to the Site, Cambium staff conducted a bat maternity roost survey using the methods detailed in the *Bat and Bat Habitats: Guidelines for Wind Power Projects* (Ontario Ministry of Natural Resources, 2011). The protocol requires that for sites with ≤10 ha of treed forest or swamp ELC community types, a minimum of ten randomly selected plots are to be surveyed, with an additional plot added per hectare, to a maximum of 35 plots for the project area. At each plot, the number of snag/cavity trees ≥25 cm DBH within a 12.6 m radius (0.05 ha) is to be recorded. A calculation is then made to determine the snag density and if the number of cavity trees found meets the criteria for maternity surveys.

2.2.10 Habitat-Based Wildlife Surveys

Given the scale of the proposed development, a habitat-based approach was used to assess potential impacts to wildlife, consistent with standard practice. General habitat information gathered through the site investigations was used to assess the connectivity of the Site with the surrounding landscape and evaluate the ecological significance of the local area. Cambium staff actively searched for features that may provide specialized habitat for wildlife. These searches included inspecting tree cavities, overturning logs, rocks, and debris, and scanning for scat, browse, sheds, fur, etc. Any evidence of breeding, forage, shelter, or nesting was noted. Species and habitat observations were documented and photographed.

2.3 Alternative Investigation

Under Part IV, Section 26(1.1) of the REA Regulation, an alternative investigation may be conducted if the applicant determines that it is not reasonable to visit a site (a part of air, land, or water within the site investigation area) to conduct a site investigation. The entirety of the Project Location and adjacent lands were reviewed during the site investigations. An alternative investigation was not required to verify the accuracy of the records review because Cambium staff had access to the entire property at the Wastewater Facility.

3.0 Qualifications of Staff Conducting the Site Investigations

Tyler Jamieson, B.Sc. (Hons), M.Sc. – Senior Technologist

Tyler Jamieson holds a Master of Environmental and Life Sciences and a Bachelor of Science (Honours) in Ecological Restoration from Trent University and an Ecological Restoration diploma from Fleming College. Mr. Jamieson is certified in the Ontario Wetland Evaluation System, the Ontario Benthos Biomonitoring Protocol, and holds a Class 2 Electrofishing Certification.

Mr. Jamieson is a senior member of Cambium's Natural Science group and regularly performs vegetation community and wildlife habitat assessments and assists in preparing technical reports. He has experience working in the field, including applying a range of Ministry-approved survey protocols. Mr. Jamieson also has considerable experience applying the Ecological Land Classification system in the field and has worked in a range of habitats, including wetlands, forests, and rare tallgrass prairie and savannah habitats. He has a diverse project portfolio that includes species at risk habitat investigations, including experience conducting surveys for grassland birds and Whip-poor-wills using Ministry-approved survey protocols. Mr. Jamieson also has experience conducting nest sweeps for large infrastructure construction projects in Ontario.

Ernie Silhanek, Dipl. F&W Tech - Sr. Ecologist /Technical Specialist

Mr. Silhanek is a Senior Ecologist with Cambium. He has been an avid birder for over 30 years, actively utilizing e-Bird since October 2013 to document his sightings based on breeding bird surveys conducted as part of his consulting experience and personal travels abroad. He has participated in many Bird Studies Canada and Environment Canada monitoring programs, such as the Breeding Bird Survey, Marsh Monitoring Survey, Project Feeder Watch, and Christmas Bird Counts. He is familiar with and regularly applies standardized bird sampling protocols, including species at risk specific protocols developed by the Ministry of Natural Resources and Forestry (MNRF), such as those for Eastern Whip-poor-will, Chimney Swift, Bobolink, and Eastern Meadowlark. Mr. Silhanek has over 35 years of experience and expertise in terrestrial and wetland ecosystems, resources management, Species at Risk, regulations and legislative knowledge, official plans and provincial policies

related to the environmental field. He is a certified wetland evaluator and certified in conducting vegetation inventories using the Southern Ontario Ecological Land Classification (ELC) system and Forest Ecosystem Classification (FEC) system.

Mr. Silhanek has experience conducting biological inventories, including identification of flora and fauna of Ontario (specializing in Lichens), Species at Risk, fungi, birds, mammals, herptiles, fish, terrestrial and aquatic invertebrates, wildlife habitat enhancement techniques and restoration. As a Terrestrial and Wetland Biologist, he has completed and co-authored over 150 environmental reports consisting of Species at Risk screening reports, Environmental Impact Studies, Natural Heritage Evaluations and Natural Environment Level 1 & 2 Technical Reports and completed over 200 biophysical inventories. He has an excellent understanding of the legislative and permitting frameworks and environmental assessment requirements necessary to guide clients through their process of approvals.

Cody Johnson, Diploma Environmental Technician - Environmental Technician

Cody Johnson has an Environmental Technician diploma and five (5) years of experience providing environmental services. Mr. Johnson's experience includes amphibian surveys, tree inventories, fish identification, raptor stick nest surveys and other biological inventories. Cody regularly provides support for Cambium's Natural Science group for site investigations and reporting.

4.0 Characterization of Natural Features and Functions

Data acquired through the background information review and site investigations are summarized in the following sections. Based on the information gathered, an assessment of significance has been completed to identify protected natural heritage features on and adjacent to the Project Location.

The following site investigations were carried out on the Site and are summarized in Table 1. Representative Site photos are included in Appendix A, and survey stations/areas are shown on Figure 1.

Table 1 Summary of Site Investigations

Date	Time On Site	Weather	Observer	Activities
2021-05-06	1300-2200	11° C, Wind: 1, Noise: 1, Cloud: 80%	Ernie Silhanek	Ecological Land Classification Amphibian Breeding Survey (#1) Bat Maternity Roost Habitat Surveys Winter Raptor and Stick Nest Surveys Habitat Based Wildlife Surveys
2021-06-03	2130-2230	18° C, Wind: 0, Noise: 2, Cloud: 0%	Cody Johnson	Amphibian Breeding Survey (#2)
2021-06-11	2130-2230	16° C, Wind: 0, Noise: 2, Cloud: 50%	Cody Johnson	Amphibian Breeding Survey (#3)
2021-10-07	1030-1600	20° C, Sunny	Tyler Jamieson	Ecological Land Classification Aquatic Habitat Assessment Surface Water and Drainage Feature Mapping Habitat Based Wildlife Surveys
2021-10-08	0830-1300	21° C, Sunny	Tyler Jamieson	Ecological Land Classification

Date	Time On Site	Weather	Observer	Activities
				Aquatic Habitat Assessment Surface Water and Drainage Feature Mapping Habitat Based Wildlife Surveys
2021-11-16	1100-1300	16° C, Wind: 1, Noise: 1, Cloud: 100% Light Snow	Tyler Jamieson	Bat Maternity Roost Habitat Surveys Winter Raptor and Stick Nest Surveys Habitat Based Wildlife Surveys
2022-06-10	0630-0745	15° C Cloud 20% Wind 1 Noise 1	Keegan McKitterick	Breeding Bird Survey
2022-06-24	0630-0745	16° C Cloud 100% Wind 0 Noise 1	Keegan McKitterick	Breeding Bird Survey

Notes:

Wind speed is reported as a Beaufort Wind Scale value (0 = 0-2 kph, 1 = 3-5 kph, 2 = 6-11 kph, 3= 12-19 kph, 4 = 20-30 kph, 5 = 31-39 kph, 6 = 40-50 kph).

Noise is reported based on background noise levels: Index 0 – no appreciable effect, 1 – slightly affecting sampling, 2 – moderately affecting sampling, 3 – seriously affecting sampling, 4 – profoundly affecting sampling.

4.1 Landscape Position and Topography

The Site is located within the Ontario Shield Ecozone: Georgian Bay Ecoregion 5E, which is in south-central Ontario, extending southeast from Lake Superior to the central portion of the Ottawa River valley in the east, including Parry Sound, Perth, North Bay, Sudbury, and Sault Ste. Marie. This ecoregion is characterized by frequently exposed bedrock, shallow soils, and mixed forests representing the Great Lakes – St. Lawrence Forest Region (Lee, et al., 1998).

The Project Location is within a lowland area approximately 250 m west of the Ottawa River. Most of the Project Location and surrounding areas are relatively flat with little topographical relief. Lands north of the Project Location had a rolling topography. A steep slope was observed west of the Project Location along County Road 25 (i.e., Laurentian Drive). In

general, the general topography descends gradually to the east, towards the shore of the Ottawa River.

4.2 Vegetation Communities

The vegetation communities on the Site are summarized in Table 2 and are mapped on Figure 1. A list of identified species and representative photos for each community are provided in Appendix A.

Table 2 Vegetation Communities

No.	ELC Code	Community Description	Community Type	S - Rank
1	G057Tt	Dry To Fresh, Coarse: Oak Hardwood	Terrestrial	S5
2	G131Tt	Maple Hardwood Swamp	Wetland	S5
3	G149N	Organic Shallow Marsh	Wetland	S5
4	G133Tt	Hardwood Swamp	Wetland	S5
5	G135S	Organic Thicket Swamp	Wetland	S5
6	G057Tt	Dry To Fresh, Coarse: Oak Hardwood	Terrestrial	S5
7	G134S	Mineral Thicket Swamp	Wetland	S5
8	G131Tt	Maple Hardwood Swamp	Wetland	S5
9	G130Tt	Intolerant Hardwood Swamp	Wetland	S5
10	G054Tt	Dry to Fresh, Coarse: White Pine Mixedwood	Terrestrial	S5
11	G029	Dry, Sandy: Field	Terrestrial	S5
12	G134S	Mineral Thicket Swamp	Wetland	S5
13	G057Tt	Dry To Fresh, Coarse: Oak Hardwood Forest	Terrestrial	S5
14	G058Tt	Dry to Fresh, Coarse: Maple Hardwood	Terrestrial	S5
15	N/A	Sewage and Water Treatment Plant	Terrestrial	N/A

The wastewater treatment plant and associated infrastructure occupy the entire Project Location. The Project Location includes wastewater infrastructure, parking areas, roadways, and buildings (Community 15). The grounds are maintained within the boundaries of the Project Location (Figure 1). A chain-link fence provides a physical separation between the Project Location and adjacent areas. The grounds within the facility consist of mowed lawn and are routinely maintained.

Lands near the Project Location, within 120 m, include cultural and natural vegetation communities. Cultural vegetation communities were created when the Wastewater Facility was constructed and are maintained by periodic mowing. A dry field community (G029), approximately 2.1 ha, is located east of the Project Location. The G029 community is mowed as a part of routine maintenance activities at the Wastewater Facility. A roadway extends from Abbie Lane to access the property to the south. A power line corridor has been cleared and maintained west of Project Location and east of Laurentian Drive.

Natural vegetation communities near the Project Location, within 120 m, are primarily forested, with a few areas of open swamp and marsh. The Ottawa River is located approximately 250 m east of the Project Location.

A search for butternut (*Juglans cinerea*; provincially endangered) was completed as part of the vegetation survey; no butternut was identified. A search was completed for *Cyperus houghtonii* during the site investigation. The species was determined to be absent from the Project Location and the 120 m setbacks. **No rare vegetation communities or rare vascular plants were observed at or within 120 of the Project Location.**

4.3 Significant Woodlands

Parts of southern Ontario have been altered from a predominantly forested landscape to one dominated by various agricultural, industrial and urban uses. This has resulted in up to 70% of the original woodland cover being lost in some areas (Ministry of Natural Resources, 2010). Section 2.1.5 of the Provincial Policy Statement specifies that development and site alteration shall not be permitted in significant woodlands in Ecoregions 6E and 7E unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological

functions (Ministry of Municipal Affairs and Housing, 2020). The Natural Heritage Reference Manual clarifies that the consistent application of the PPS includes the protection of significant woodlands south and east of the Canadian Shield (i.e., within Ecoregions 6E and 7E) (Ministry of Natural Resources, 2010). Following provincial policy, Ecoregion 5E does not contain significant woodlands. Therefore, as the Project Location and 120 m setbacks are located entirely within Ecoregion 5E, significant woodlands are not present.

4.4 Wetland Delineation

No wetlands were identified within the boundaries of the Project Location. The site investigation determined that wetlands present within the 50 m and 120 m setbacks were more extensive than provincial mapping indicated (Ministry of Natural Resources and Forestry, 2018). Provincial mapping did not designate the wetlands as Provincially Significant Wetlands (PSW).

Provincial mapping indicates the presence of two areas of mapped unevaluated wetland adjacent to the Project Location, at the northeastern and northwestern corners of the property. Site investigations revealed the presence of three areas of wetland adjacent to the Project Location, consisting of eight vegetation communities. These wetlands were distinguished from the surrounding plant communities based on the dominance of wetland vegetation (>50% relative cover), the presence of hydric soils (Soil Moisture Regime ≥5), topography (depression, shoreline), and the presence of standing water.

The wetland in the west of the Project Location consisted of a combination of Organic Shallow Marsh, Hardwood Swamp, and Organic Thicket Swamp (Communities 3, 4, 5; Table 2). Community 3 consisted of two areas of cattail (*Typha spp.*) marsh with standing water and saturated soils. It is noted that most of the powerline corridor consisted of marshland. Community 4 was located in the margins of Community 3 and consisted of Eastern White Cedar, Red Maple, Black Ash, and Speckled Alder. Additional species included Common Labrador Tea, Common Winterberry, Sheep Laurel, and Sensitive Fern. Soils were soft and spongey, with an organic (Of/m) horizon that extended to a depth of 60 cm. The moisture regime was Moderately Wet (7) (Heck, et al., 2017). The water table was also observed at the

soil surface. Community 5 was dominated by Speckled Alder, with little tree cover. Soils were moist with water observed at the soil's surface.

The wetland located south of the Project Location consisted of Hardwood Swamp communities (Communities 2, 8, and 9; Table 2). Where the wetland meets the shore of the Ottawa River, it transitions into a shrub-dominated thicket swamp (Community 12; Table 2). Community 2 was a deciduous swamp dominated by Red Maple, with Black Ash, Silver Maple, Common Winterberry, and Sensitive Fern associates. Community 2 transitioned into Community 9, which had a similar species assemblage but was dominated by Trembling Aspen. Silver Maple shared dominance with Red Maple in Community 8, with White Elm, Red Ash, and Sensitive fern associates. Soils consisted of a silty loam horizon that extended to a depth of 20 cm over silty fine sand. Mottles were observed at a depth of 20 cm. The soil moisture regime was Moist (5) (Heck, et al., 2017). Community 12 consisted of a band of shrub cover along the shore of the Ottawa River. The dominant species was Sweet Gale, with Cattails, Purple Loosestrife, Reed Canary Grass, and Sensitive Fern associates.

Communities 8 and 12 were also identified in the wetland located northeast of the Project Location on adjacent lands. This wetland area was separated from the wetland to the south by an area of Hardwood Forest (Community 13; Table 2). Soils were consistent with those observed in the wetland to the south and consisted of a silty loam horizon that extended to a depth of 22 cm over silty fine sand. Mottles were observed at a depth of 22 cm. The moisture regime was determined to be Moist (5) (Heck, et al., 2017). The wetland also included an area of thicket swamp (Community 7; Table 2). Shrub cover was sporadic in the thicket swamp but relatively dense in some locations, exceeding an overall cover of 25%. Species included Willow shrub species (*Salix spp.*), with cattails, Reed Canary Grass, Bullrush, and Sensitive Fern.

No rare vegetation communities or plant species were observed within or adjacent to the wetland habitats. No species at risk (SAR) plants were observed at or within 120 m of the Project Location.

4.5 Surface Water and Drainage Features

A mapped unnamed watercourse, located north of the Project Location, was confirmed during the site investigations. This small permanent watercourse is a tributary of the Ottawa River. This is the only watercourse located within 120 m of the Project Location. The watercourse does not flow through the Project Location but rather flows north of the 50 m and 120 m setbacks (Figure 1). The watercourse enters the property from the northwest, joining with the wetland area west of Abbie Lane. The watercourse flows east, across Abbie Lane via a culvert (twin 1.25 m corrugated steel pipe [CSP]). The watercourse then flows through another culvert (0.7 m corrugated plastic pipe) before flowing east into the wetland (Community 7) at the northeast property boundary before exiting the property. The watercourse then flows north through private property and meets the Ottawa River.

The watercourse was observed to contain flowing water during all Site visits. The watercourse channel was well defined. Substrates were well-sorted and sandy with infrequent deposits of organic detritus. Several areas of coarse woody debris and debris dams were noted along the extent of the channel. Wetland species were identified along the watercourse banks, including Speckled Alder, Sensitive Fern, Spotted Joe Pye Weed, and Spotted Jewelweed. Sorted substrates and the presence of wetland vegetation indicates intermittent or permanent flowing conditions within the watercourse.

Channel dimensions, hydraulic measurements and water quality measurements were collected at three points along the watercourse during the October site investigation, as shown in Figure 1 and summarized in Table 3.

Table 3 Aquatic Habitat Assessment Measurements

Parameter	Aquatic Survey Point 1	Aquatic Survey Point 2	Aquatic Survey Point 3
Bank-Full Width (cm)	270	609	210
Bank-Full Depth (cm)	39	83	54
Wetted Width (cm)	150	142	110
Wetted Depth (cm)	17	26	22
Hydraulic Head (cm)	3	2	2
Temperature (°C)	10.5	10.6	10.6
Dissolved Oxygen (mg/L)	9.05	9.99	10.37
Conductivity (µS/cm)	476.0	498.8	497.5
pH	6.48	6.19	6.32

Three drainage features were identified at the Site, as shown on Figure 1. Standing water was observed in all the drainage features during site investigations; however, no flow was observed. Some wetland vegetation was observed in these features; however, no sorting of substrates was observed. It is likely that flow only occurs in these features during rain events or during the spring freshet. The site investigations confirmed that the drainage features on and adjacent to the Project Location are constructed features and are not considered natural heritage features. All three of the drainage features were determined to not be suitable for fish habitat.

Drainage feature 1 (DF1) was identified along the south side of Abbie Lane within 50 m of the Project Location. This roadside drainage ditch directed flows northwest towards a culvert (60 cm CSP) that conveys flow across Abbie Lane, where it converges with the unnamed watercourse on the property.

Drainage feature 2 (DF2) is a drainage ditch along the southern boundary of Project Location and within the 50 m setbacks. Drainage within this feature is directed east towards the Ottawa River. This ditch follows the southern boundary of the Wastewater Facility footprint before entering the dry field (Community 11) to the east of the plant. A constructed crossing was observed on this drainage feature within Community 11, with flows being directed under the

crossing within a concrete pipe culvert. The drainage feature exits Community 11 via a culvert where it enters Community 13. Beyond this point, the drainage feature becomes indistinguishable. Flow towards the Ottawa River likely occurs as sheet flow during high rain events or spring freshet.

Drainage feature 3 (DF3) was identified within the boundaries of the Project Location. This feature also directs drainage towards the east, where it converges with DF2.

4.6 Aquatic Habitat

The thermal regime of both the unnamed watercourse and the Ottawa River is classified as coldwater according to the current Aquatic Resource Area Summary data from Land Inventory Ontario (Government of Ontario, 2015).

One Aquatic Resource Survey Point for the unnamed watercourse is present at the Abbie Lane culvert crossing, on lands within the 120 m setbacks to the Project Location. The subject survey point was collected in July of 2017 by an environmental consulting company (Government of Ontario, 2015). The following species were found at this location:

- Common Shiner (*Luxilus cornutus*)
- Northern Pike (*Esox lucius*)
- Northern Redbelly Dace (*Chrosomus eos*)

In-channel substrates in the watercourse were dominated by fines (sand). Several areas of coarse woody debris and debris dams provide a moderate amount of in-water cover. No in-water vegetation was observed. Riparian vegetation consisted of wetland species, as detailed above in Section 4.5. Most of the watercourse is located within Community 6, within the 50 m and 120 m setbacks. The trees within this community provide a high amount of overhead cover for the channel. No barriers to fish passage were documented within the watercourse. The watercourse and the upstream wetlands (in the western portion of the site) likely provide suitable fish habitat for various species.

The bank of the Ottawa River, located beyond the 120 m setbacks to the Project Location, consisted of a thicket swamp (Community 12). Shrubs dominated the riparian vegetation, with

Sweet Gale as the primary species present. Substrates within the thicket swamp consisted of organics. Nearshore substrates consisted of fines (sand) with sparse boulders. Water depth was less than 2 m within 10 m of the bank. Sparse areas of in-water vegetation were documented, providing limited in-water cover.

The bank of the Ottawa River adjacent to Community 13, beyond the 120 m setbacks to the Project Location, consisted primarily of large boulders, with a steep drop in elevation (1 - 1.5 m) to the water's edge. Substrates along this section of the bank were not visible due to water depth. No in-water vegetation was observed.

All three of the drainage features were determined to not be suitable for fish habitat. The culvert conveying flows from DF1 to the watercourse is perched, with a perch height of approximately 1 m, which likely acts as a barrier to fish passage upstream. DF2 and DF3 are similarly inaccessible to fish as the downstream portion of DF2 is undefined, with no obvious connection to the Ottawa River. Sheet flow likely carries water through Community 11 during high precipitation events.

4.7 Wildlife Survey Results

As the Project Location is an existing developed commercial facility and is located within the Petawawa settlement area with residential developments located to the north, wildlife habitat was limited on the Site and adjacent lands. Several common bird species were observed incidentally, including Song Sparrow (*Melospiza melodia*), Chipping Sparrow (*Spizella passerine*), Eastern Phoebe (*Sayornis phoebe*), American Robin (*Turdus migratorius*), American Crow (*Corvus brachyrhynchos*), Hairy Woodpecker (*Leuconotopicus villosus*), Northern Flicker (*Colaptes auratus*), Red-winged Blackbird (*Agelaius phoeniceus*), Yellow-bellied Sapsucker (*Sphyrapicus varius*), Black-capped Chickadee (*Poecile atricapillus*) and Ring-billed Gull (*Larus delawarensis*).

Incidental observations of other species included one Common Garter Snake (*Thamnophis sirtalis*) on October 8, 2021. No other snake species were observed while conducting site investigations. No turtle species or turtle eggs were observed on the Site due to the lack of open water and suitable nesting habitat for turtles.

Mammal species observed while conducting site investigations included two White-tailed Deer (*Odocoileus virginianus*) and a black phase Eastern Gray Squirrel (*Sciurus carolinensis*).

4.7.1 Birds

Breeding bird surveys were completed on June 10, 2022 and June 24, 2022. Bird species with probable or confirmed breeding at the Project Location include Red-eyed Vireo, Veery, American Goldfinch, Baltimore Oriole, Common Yellowthroat, Mourning Dove, Eastern Phoebe, American Robin, and House Wren. No species at risk (SAR) birds were observed with probable or confirmed breeding on or adjacent to the Project Location.

4.7.2 Amphibians

Amphibian breeding surveys were completed, and a total of two species were identified adjacent to the Project Location, beyond the 120 m setbacks. Marsh Monitoring Points (MMP) are shown on Figure 1. Amphibian breeding survey results are shown in Table 4. The Project Location lacks amphibian breeding habitats, and no amphibian species were observed calling from the Project Location. Gray Tree Frog and Wood Frog were identified calling within and beyond the 120 m setbacks, but none had call level codes of 3. Therefore, site investigations determined that Significant Wildlife Habitat (SWH) for Amphibian Breeding Habitat (Woodland and Wetlands) is not present at the Project Location or within the 120 m setbacks. None of the amphibian species observed are listed as federal or provincial SAR.

Table 4 Summary of Amphibian Survey Results

Sample Point	Survey Direction	Species	Maximum Call Intensity	# of Individuals	Inside or Outside 100 m Sample Plot
1	E	(None)	-	-	-
	W	Gray Tree frog	1	1	Outside
		Wood Frog	1	1	Outside
2	E	(None)	-	-	-
	W	Gray Tree frog	1	1	Outside
3	E	Gray Tree frog	1	3	Outside
	W	(None)	-	-	-
4	E	Gray Tree frog	2	7	Both
	W	Gray Tree frog	1	1	Inside

Notes: "-" indicates no calls heard

4.8 Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) guidance documents produced by the MNRF were used as a guide to identify and confirm SWH on the Site (MNR, 2000). The Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (Ministry of Natural Resources and Forestry, 2015) apply to the Natural Heritage Assessment process. Information gathered during the background review, and site investigations were compared to SWH criteria to identify SWH at the Site (Appendix D). Based on observations made during the site investigations and the ELC classifications described in Section 4.2, the Site does not meet the criteria for designation as SWH. Details on species of conservation concern and their protected habitats are provided in Section 4.8.2.

4.8.1 Deer Wintering Habitat (Stratum I and II)

The Records Review Report prepared by Cambium identified mapped Deer Wintering Habitat area (unidentified as Stratum I or II) overlaps the Site according to the 'Schedule B, Map 4-Natural Heritage Features of County of Renfrew's Official Plan' (approved March 26, 2020). An update under Official Plan Amendment 31 for the County of Renfrew revised 'Schedule B, Map 4-Natural Heritage Features' to remove Deer Wintering Areas (approved August 19,

2021). Thus, the County of Renfrew's Official Plan no longer identifies deer wintering areas at the Project Location or within 120 m.

Regardless of the OP update, Cambium reviewed the Project Location and adjacent lands for deer wintering areas. Communities providing appropriate habitat include mixed and coniferous forest and swamp communities. Additional communities include mixed and coniferous plantations, cultural thickets, and deciduous communities dominated by Birch and Poplar species. None of these communities were identified within or adjacent to the Project Location. In addition, the fenced perimeter of the property would prevent deer from accessing the Project Location.

Site investigations concluded that there was no evidence of habitat usage by deer. No deer beds or pellet groups were observed. Adjacent woodland areas lacked the Eastern Hemlock 60% canopy cover to provide thermal cover for deer. No traditional travel or movement corridors were identified, suggesting any deer observed in the areas are incidental.

Several shrub species identified in the woodland communities (e.g., Hobblebush, Smooth Serviceberry and Striped Maple) are suitable for deer foraging, and two female deer were observed within Community 14 during the November 14, 2021, site investigations. However, there was no evidence of intensive browse on these shrubs that would indicate the presence of large congregations of deer in the area. Deer wintering habitat is considered absent from the Project Location and within the 120 m setbacks.

4.8.2 Candidate Bat Maternity Roost Habitat

A total of 24 plots (1.2 ha total) were surveyed in the treed communities within and beyond the 120 m setbacks to the Project Location. A total of 12 suitable trees were observed during the surveys. The number of potential bat maternity roost trees observed at the Site was then divided by the Site's total area. The density of candidate bat maternity roost trees was 10 trees/ha. The Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E state that maternity colonies are located in mature deciduous or mixed forests with greater than 10/ha large diameter wildlife trees. As no forested areas are located within the Project Location, Candidate Bat Maternity Roost Habitat is absent from the Project Location. As the adjacent lands in the woodland communities did not contain more than 10/ha large diameter wildlife

trees, the adjacent lands do not meet the criteria for candidate bat maternity habitat (Ministry of Natural Resources and Forestry, 2015). Thus, Candidate Bat Maternity Roost Habitat is not present at or within 120 m of the Project Location.

4.9 Species of Conservation Concern

A list of species of conservation concern, including species at risk, with potential to occur in the general vicinity of the Project Location, has been compiled based on known species' ranges, habitat requirements, and review of background information sources (as listed in Section 2.1. In addition, the list has been augmented with direct field observations from the current study, as detailed in the previous sections. Cambium has employed a habitat-based screening, supplemented with targeted field surveys when necessary, to identify suitable habitat for species located on or adjacent to the Site. A detailed habitat suitability analysis is provided in Appendix C, and a discussion of the results is provided below.

4.9.1 Endangered and Threatened Species

Critical Habitat for Hickorynut mussel was identified in the Ottawa River (Fisheries and Oceans Canada, 2018). Hickorynut mussels live on the sandy beds in large, wide, deep rivers – usually more than two or three metres deep – with a moderate to strong current. Mussels filter water to find food, such as bacteria and algae. The streams and drainage channels on the Site do not provide suitable habitat for this species. Thus, no Critical Habitat for aquatic SAR is found at the Project Location or within 120 m setbacks.

Barn Swallows are listed as threatened both federally and provincially. They require open habitats, including grassy fields, pastures, agricultural crops, shorelines, cottage areas, wetlands, or sub-artic tundras, which are also in close association with human populations as this swallow typically nests inside man-made structures such as abandoned barns or other buildings with sufficient openings or road culverts. Structures within the Project Location were examined for evidence of Barn Swallow nests, and none were observed. Community 11, adjacent to the Project Location, offers potential foraging habitat for this species. No Barn Swallows were observed during field visits.

Bobolink are listed federally and provincially as threatened. They utilize tall, grassy meadows, hayfields, and croplands for foraging and tend to nest in forage crops (hayfields and pastures). Community 11 consists of an open meadow area that is mowed frequently throughout the growing season. Regular mowing prevents grasses from getting tall enough to allow nesting for grassland birds. Therefore, Community 11 does not provide suitable nesting habitat for Bobolinks and the species is considered absent from the Project Location and within the 120 m setbacks.

Eastern Meadowlark are listed federally and provincially as threatened. They build their nests on the ground, camouflaged and woven with long grasses, as found in pasture and hayfield, orchard, shrubby field, and other open area habitats. As Community 11 is frequently mowed, it does not provide suitable nesting habitat for this species. Thus, Eastern Meadowlark is considered absent from the Project Location and the 120 m setbacks.

The Eastern Whip-poor-will is threatened both federally and provincially. It uses habitats with a mix of open and forested areas, and its breeding is dependent on forest structure being semi-open or with patchy clearings. There is no suitable nesting habitat on or adjacent to the Project Location. Eastern Whip-poor-will is considered absent from the Project Location and within the 120 m setbacks.

The Project location and lands within the 120 m setbacks contain woodlands, as noted in Section 4.2. As noted in Section 4.8.2, Candidate Bat Maternity Roost Habitat is not present at or within 120 m of the Project Location.

Black Ash is currently listed as endangered under Ontario's Endangered Species Act, but it has not been listed on Schedule 1 of the Species at Risk Act. Under O. Reg. 23/22, general prohibitions against adversely impacting the species and its habitat under the Endangered Species Act will not be in force until January 26, 2024. Black Ash was confirmed to be present within the Project Location, outside of the fenced area. The project activities are not anticipated to result in negative impacts to this species or its habitat. As this SAR does not receive species or habitat protection under the ESA, impacts to this species will not be discussed further in this report.

No other Threatened or Endangered species or their habitat were identified on or adjacent to the Project Location.

4.9.2 Special Concern Species

The Canada Warbler uses various forest types as habitat but is most abundant in moist, mixed forests with a well-developed, dense shrub layer. Nests are usually located on or near the ground on mossy logs and along stream banks. The surrounding woodland communities may provide suitable habitat. Breeding Bird Surveys conducted in 2022 did not observe Canada Warbler at the Project Location and it is considered absent from the Project Location.

The Eastern Wood-pewee lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests with little understorey vegetation, as available in the surrounding woodland communities adjacent to the Site. Breeding Bird Surveys conducted in 2022 did not observe Eastern Wood-pewee at the Project Location and it is considered absent from the Project Location.

The Evening Grosbeak is often found in flocks, particularly during the winter months. Their preferred habitat is thick coniferous forest. They are generally found in open, mature mixed forests dominated by Firs, White Spruce, or Trembling Aspen during their breeding season. Adjacent woodland communities may provide suitable habitat for this species. Breeding Bird Surveys conducted in 2022 did not observe this species at the Project Location and it is considered absent from the Project Location.

The Grasshopper Sparrow inhabits open grasslands and prairies, or pastures and hayfields, with well-drained soil that are sparsely vegetated, such as found in Community 11. The frequent mowing of Community 11 makes it unsuitable habitat for Grasshopper Sparrow. Breeding Bird Surveys conducted in 2022 did not observe this species at the Project Location and it is considered absent from the Project Location.

The Olive-sided Flycatcher prefers open areas along natural mature forest edges, forest edges near natural openings such as rivers or swamps, human-made openings, or burned forest openings with numbers of dead trees. Breeding habitat usually consists of coniferous or mixed forests adjacent to rivers or wetlands, in Ontario often nesting in White and Black Spruce, Jack

Pine, and Balsam Fir. Woodland communities within the setbacks (i.e., 120 m) may provide suitable habitat for this species. Breeding Bird Surveys conducted in 2022 did not observe this species at the Project Location and it is considered absent from the Project Location.

Wood Thrush uses deciduous and mixed forests with moist stands of trees, moderate understories, shade, and abundant leaf litter, as found in the surrounding forested communities. Breeding Bird Surveys conducted in 2022 did not observe this species at the Project Location and it is considered absent from the Project Location.

The Northern Map Turtle lives in larger lakes and rivers, requiring high water quality to support their primary prey species: molluscs. This species can often be seen in large groups basking together on rocks and logs. In the winter, the Northern Map Turtle can be found hibernating on the bottom of slow-moving rivers. This species may find suitable habitat in the Ottawa River located to the east of the Site. However, no suitable habitat is present for this species within the Project Location or the adjacent setbacks. Northern Map Turtle was not observed during the site investigations.

The Snapping Turtle is found in shallow water with soft mud and leaf litter but travel to gravel or sandy embankments/beaches to lay eggs. Communities adjacent to the Ottawa River may provide suitable nesting opportunities for this species. However, no suitable habitat is present for this species within the Project Location or the adjacent setbacks. Snapping Turtle was not observed during site visits.

The Eastern Ribbonsnake is usually found close to water as they are strong swimmers, often fleeing predators by diving into shallow water. The Project Location is located outside of the range of this species (Ontario Nature, 2018). Thus, Eastern Ribbonsnake is considered absent from the Project Location and 120 m setbacks.

The Monarch Butterfly uses a variety of habitats with wildflowers, including habitats such as Community 11, but requires milkweed plants as a food source for their caterpillars. No Monarch Butterflies were observed during site investigations on or adjacent to the Project Location.

4.10 Significant Areas of Natural and Scientific Interest

Areas of Natural and Scientific Interest (ANSI) are natural heritage features identified by the MNDMNRF. There are two types of ANSIs: Life Science and Earth Science. ANSIs represent important natural features that are not found in protected areas. The Natural Heritage Reference Manual provides the following definitions for ANSIs (Ministry of Natural Resources, 2010):

> Life science ANSIs are significant representative segments of Ontario's biodiversity and natural landscapes, including specific types of forests, valleys, prairies, savannahs, alvars and wetlands, their native plants and animals, and their supporting environments. They contain relatively undisturbed vegetation and landforms and their associated species and communities. Provincially significant life science ANSIs include the most significant and best examples of the natural heritage features in the province, and many will correspond to other significant features and areas such as wetlands, valleylands and woodlands. Earth science ANSIs are geological in nature, consist of some of the most significant representative examples of the bedrock, fossils, and landforms in Ontario, and include examples of ongoing geological processes.

The records review yielded a record for the Petawawa Terrace (Life Science ANSI), located approximately 475 m south of the Project Location. There are no Earth Science or Life Science ANSI at or within 120 m of the Project Location.

4.11 Natural Features in Provincial Plan Areas

The Project Location is not located within a provincial plan area. The site investigation confirmed the absence of savannahs, sand barrens, tallgrass prairies or alvars on and within 120 m of the Project Location.

4.12 Provincial Parks and Conservation Reserves

The site investigation confirms that no Provincial Parks or Conservation Reserves are located on or within 120 metres of the Project Location. The Petawawa Terrace Provincial Park (Nature Class Reserve) is located approximately 475 metres south of the Project Location.

5.0 Summary of Revisions and Updates to the Records Review Report

The following section provides a summary of the site investigation and any updates to the records review report:

- Candidate Significant Wildlife Habitat.
    - Candidate Bat Maternity Roosting habitat is not present at or within 120 m of the Project Location.
    - Rare Vegetation: Habitat for rare vegetation (*Cyperus houghtonii*) is absent at and within 120 m of the Project Location.
    - Habitat of seasonal concentration of animals—Deer Wintering Area: The County of Renfrew's Official Plan was updated and removed Deer Wintering Areas from Schedule B, Map 4-Natural Heritage Features. The site investigations established deer wintering areas were absent within the Project Location and 120 m setbacks.
- Wetland: The site investigations confirmed the boundaries of wetlands at and within the 120 m setback from the Project Location. It was determined that wetlands were more extensive than provincial mapping indicated. The wetlands were not mapped as PSW. No PSWs are present within or adjacent to the Project Location.
- Woodlands: Significant woodlands are not present at or within 120 m of the Project Location.
- Watercourse: A coldwater tributary of the Ottawa River / Allumette Lake is present within the 50 m and 120 m setbacks.

Table 5 summarizes the natural heritage features confirmed at or near the Project Location during the site investigations.

Table 5 Determination of Natural Heritage Features At and Near the Project Location

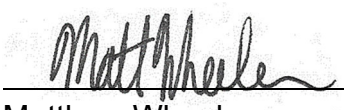
Specified Natural Heritage Features Following Section 38(1) of O. Reg. 359/09	At the Project Location (Yes/No)	Near the Project Location (Yes/No)
Is the Project Location in a provincially significant southern wetland or within 120 m of this feature type?	No	No. No provincially mapped PSWs are present near the Project Location. Wetlands are present within the 50 m and 120 m setbacks from the Project Location and require determination of significance.
Is the Project Location in a provincially significant coastal wetland or within 120 m of this feature type?	No	No
Is the Project Location in or within 50 metres of an Area of Natural and Scientific Interest (Earth Science)?	No	No
Is the Project Location in or within 120 metres of an Area of Natural and Scientific Interest (Life Science)?	No	No
Is the Project Location in or within 120 metres of a significant woodland?	No	No
Is the Project Location in or within 120 metres of significant wildlife habitat?	No	No.
Is the Project Location in or within 120 metres of a Provincial Park?	No	No
Is the Project Location in or within 120 metres of a Conservation Reserve?	No	No
Are other natural features located at or near the Project Location?	No	Yes. A permanent coldwater tributary of the Ottawa River is located north of the Project Location within the 50 m setback.

6.0 Closing

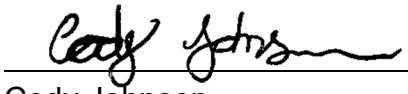
This Site Investigation report has been prepared in accordance with the NHA process and in support of a Renewable Energy Approval submission. Additional reports will be prepared as required to meet the NHA process to determine if development prohibitions apply. Where required, an impact assessment will be conducted, and mitigation measures will be recommended to prevent negative impacts to natural heritage features.

Respectfully submitted,

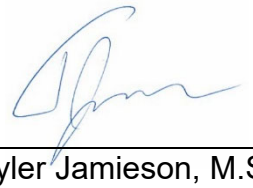
Cambium Inc.



Matthew Wheeler
Project Manager/Senior Ecologist



Cody Johnson
Technician



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8.0 Glossary of Terms

ANSI: Area of Natural and Scientific Interest
ARA: Aquatic Resources Area
ARA: Aggregate Resources Act
AS: Agricultural System
ATK: Aboriginal Traditional Knowledge
BMA: Bear Management Area
BMP: Best Management Practice
CA: Conservation Authority
CEAA: Canadian Environmental Assessment Act/Agency
CFA: Canadian Forestry Association
CFIP: Community Fisheries Involvement Program
CFS: Canadian Forestry Service
CHU: Critical Habitat Unit
CH: Cultural Heritage
CLI: Canada Land Inventory
CLU: Crown Land Use
COSSARO: Committee on the Status of Species at Risk in Ontario
CR: Conservation Reserve
CWIP: Community Wildlife Involvement Program
CWS: Canadian Wildlife Service
DFO: Fisheries and Oceans Canada
EA: Environmental Assessment
EAA: Environmental Assessment Act
EAB: Emerald Ash Borer
EBR: Environmental Bill of Rights
EIA: Environmental Impact Assessment
EIS: Environmental Impact Study/Statement
ELC: Ecological Land Classification System
ELUP: Ecological Land Use Plan
END: Endangered species
EPA: Environmental Protection Act
ER: Environmental Registry
ESA: Endangered Species Act (2007)
ESA: Environmentally Sensitive Area
ESC: Erosion and Sediment Control
F&W: Fish and Wildlife
GIS: Geographic Information System
GLSL: Great Lakes – St. Lawrence
GPGGH: Growth Plan for the Greater Golden Horseshoe
GPS: Global Positioning System
HSA: Habitat Suitability Analysis
HIS: Habitat Suitability Index
KHA: Key Hydrologic Areas
KHF: Key Hydrologic Features
KNHF: Key Natural Heritage Features
LCFSP: Licence to Collect Fish for Scientific Purposes
LIO: Land Information Ontario
LRIA: Lake and Rivers Improvement Act
LUP: Land Use Permit or Plan
MA: Management Area
MAFA: Moose Aquatic Feeding Area
MCEA: Municipal Class Environmental Assessment
MECP: Ontario Ministry of Environment, Conservation and Parks
MNDMRF: Ontario Ministry of Natural Resources and Forestry
NER: Natural Environment Report
NHIC: Natural Heritage Information Centre
NHIS: Natural Heritage Information System
NHS: Natural Heritage System
OBM: Ontario Base Map
OFIS: Ontario Fisheries Information System
OLI: Ontario Land Inventory
OMAFRA: Ontario Ministry of Agriculture, Food and Rural Affairs
OWES: Ontario Wetland Evaluation System
PPS: Provincial Policy Statement (2014)
PSW: Provincially Significant Wetland
RLUP: Regional Land Use Plan
RMP: Regional Management Plan
R.P.F.: Registered Professional Forester
SAR: Species at Risk
SARO: Species at Risk in Ontario
SC: Special Concern species
SWH: Significant Wildlife Habitat

FA: Fisheries Act (Federal)
FEC: Forest Ecosystem Classification
FMP: Forest Management Plan
FRI: Forest Resources Inventory
FWCA: Fish and Wildlife Conservation Act
GGH: Greater Golden Horseshoe
GHP: General Habitat Protection
SWM: Stormwater Management
THR: Threatened species
TOR: Terms of Reference
TPP: Tree Preservation Plan
WIA: Woodlands Improvement Act
WMU: Wildlife Management Unit

Appended Figures

SITE INVESTIGATION REPORT

ANAERGIA INC.
Petawawa Waste Water Facility
Petawawa, Ontario

LEGEND

- Aquatic Survey Point (AS)
- Amphibian Survey Station (MMP)
- Bat Maternity Roost Survey Plot Points
- Existing Road
- Footbridge
- Culvert
- Field Verified Wetland Boundary
- Watercourse
- Drainage Feature (DF)
- Major Road
- Minor Road
- Vegetation Communities
- Wetland
- 50m Buffer
- 120m Buffer
- Project Location

Notes:
- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources and Forestry or the Ontario Government).
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.

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SITE NATURAL HERITAGE FEATURES

Project No.:	11757-002	Date: / Rev.:	November 2021 / Janaury 2023
Scale:	1:4,500	Projection:	NAD 1983 UTM Zone 17N
Created by:	DJL	Checked by:	MW
Figure:	1		

O:\GIS\MXDs\11700-11799\11757-002 JDM Designworks - NHE - Petawawa STP\2021-11 23 FIG 1 - Site Natural Heritage Features.mxd

Appendix A
Vegetation Species List

VEGETATION COMMUNITY CLASSIFICATION: G057Tt

COMMUNITY #: 1

LOCATION: Petawawa

COORDINATES: 45.9007632, -77.251325

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Balsam Fir	Abies balsamea	Pinaceae	-3	5			S5
Black Cherry	Prunus serotina var. serotina	Rosaceae	3	3			S5
Bracken Fern	Pteridium aquilinum	Dennstaedtiaceae	3	2			S5
Bunchberry	Cornus canadensis	Cornaceae	0	7			S5
Canada Fly Honeysuckle	Lonicera canadensis	Caprifoliaceae	3	6			S5
Common Winterberry	Ilex verticillata	Aquifoliaceae	-3	5			S5
Early Lowbush Blueberry	Vaccinium angustifolium	Ericaceae	3	6			S5
Eastern Teaberry	Gaultheria procumbens	Ericaceae	3	6			S5
Eastern White Pine	Pinus strobus	Pinaceae	3	4			S5
Goldthread	Coptis trifolia	Ranunculaceae	-3	7			S5
Hobblebush	Viburnum lantanoides	Caprifoliaceae	0	8			S5
Northern Red Oak	Quercus rubra	Fagaceae	3	6			S5
Northern Starflower	Lysimachia borealis	Primulaceae	0	6			S5
Paper Birch	Betula papyrifera	Betulaceae	3	2			S5
Partridgeberry	Mitchella repens	Rubiaceae	3	6			S5
Red Maple	Acer rubrum	Aceraceae	0	4			S5
Royal Fern	Osmunda regalis var. spectabilis	Osmundaceae	-5	7			S5
Sheep Laurel	Kalmia angustifolia var. angustifolia	Ericaceae	0	9			S5
Smooth Serviceberry	Amelanchier laevis	Rosaceae	5	5			S5
Striped Maple	Acer pensylvanicum	Aceraceae	3	7			S4

NOTES: Red Maple dominates with Red Oak, and white pine

VEGETATION COMMUNITY CLASSIFICATION: G057Tt

COMMUNITY #: 1

LOCATION: Petawawa

COORDINATES: 45.9007632, -77.251325

PROJECT NUMBER: 11757-001

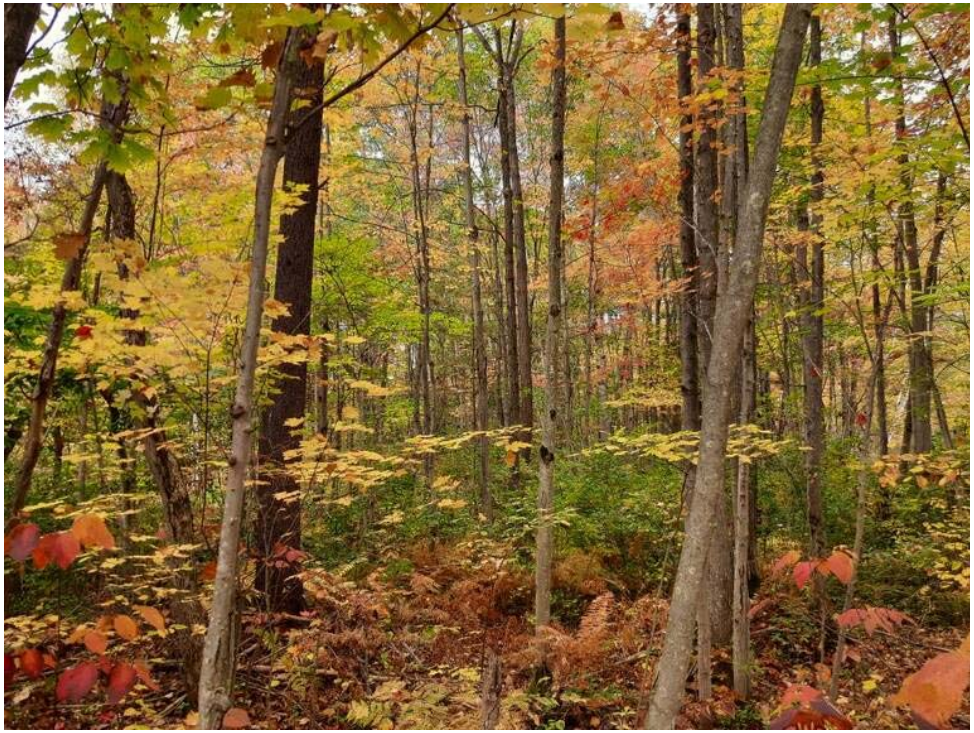
DATE: October 07, 2021

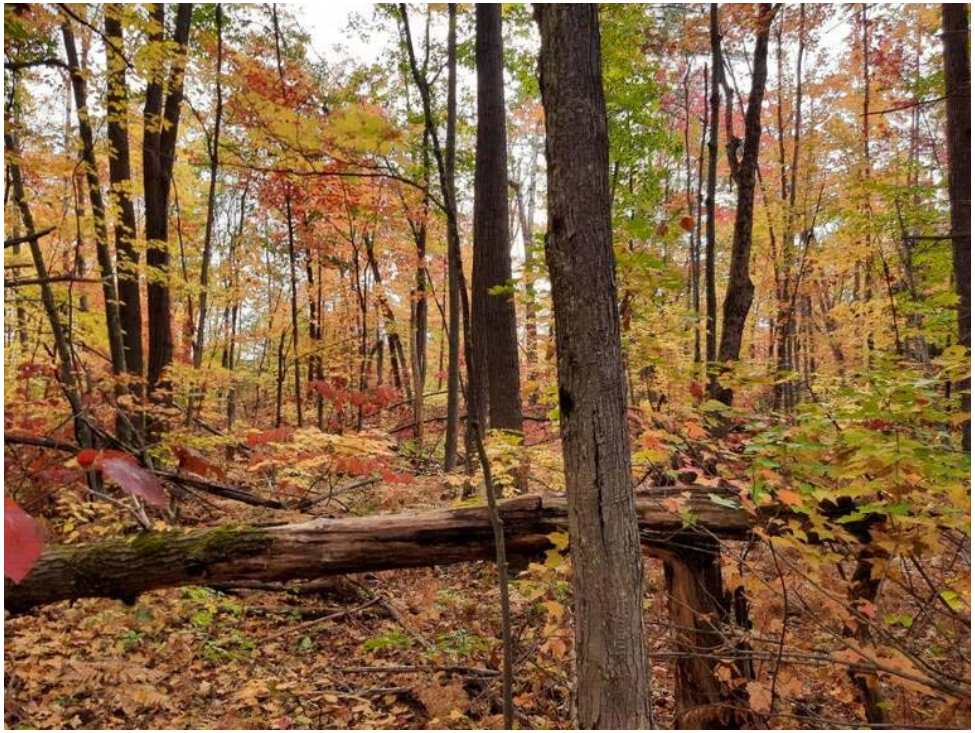
PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:





VEGETATION COMMUNITY CLASSIFICATION: G131Tt

COMMUNITY #: 2

LOCATION: Petawawa

COORDINATES: 45.9001771, -77.2508693

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Balsam Fir	Abies balsamea	Pinaceae	-3	5			S5
Black Ash	Fraxinus nigra	Oleaceae	-3	7			S3
Broad-leaved Cattail	Typha latifolia	Typhaceae	-5	1			S5
Common Winterberry	Ilex verticillata	Aquifoliaceae	-3	5			S5
Dwarf Raspberry	Rubus pubescens	Rosaceae	-3	4			S5
Goldthread	Coptis trifolia	Ranunculaceae	-3	7			S5
Ostrich Fern	Matteuccia struthiopteris	Dryopteridaceae	0	5			S5
Red Maple	Acer rubrum	Aceraceae	0	4			S5
Rough-stemmed Goldenrod	Solidago rugosa	Asteraceae	0	4			S5
Royal Fern	Osmunda regalis var. spectabilis	Osmundaceae	-5	7			S5
Sensitive Fern	Onoclea sensibilis	Dryopteridaceae	-3	4			S5
Silver Maple	Acer saccharinum	Aceraceae	-3	5			S5
Tamarack	Larix laricina	Pinaceae	-3	7			S5
Wild Raisin	Viburnum nudum var. cassinoides	Caprifoliaceae	-3	7			S5
Yellow Birch	Betula alleghaniensis	Betulaceae	0	6			S5

NOTES: Red Maple with Black Ash

VEGETATION COMMUNITY CLASSIFICATION: G131Tt

COMMUNITY #: 2

LOCATION: Petawawa

COORDINATES: 45.9001771, -77.2508693

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: G149N

COMMUNITY #: 3

LOCATION: Petawawa

COORDINATES: 45.8988373, -77.2512003

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Bebb's Willow	Salix bebbiana	Salicaceae	-3	4			S5
Common Winterberry	Ilex verticillata	Aquifoliaceae	-3	5			S5
Narrow-leaved Cattail	Typha angustifolia	Typhaceae	-5				SNA
Purple Loosestrife	Lythrum salicaria	Lythraceae	-5				SNA
Sheep Laurel	Kalmia angustifolia var. angustifolia	Ericaceae	0	9			S5
Speckled Alder	Alnus incana ssp. rugosa	Betulaceae	-3	6			S5

NOTES: Cattail dominated.

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: G133Tt

COMMUNITY #: 4

LOCATION: Petawawa

COORDINATES: 45.8988373, -77.2512003

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Black Ash	Fraxinus nigra	Oleaceae	-3	7			S3
Broad-leaved Cattail	Typha latifolia	Typhaceae	-5	1			S5
Bunchberry	Cornus canadensis	Cornaceae	0	7			S5
Common Labrador Tea	Rhododendron groenlandicum	Ericaceae	-5	9			S5
Common Winterberry	Ilex verticillata	Aquifoliaceae	-3	5			S5
Dwarf Raspberry	Rubus pubescens	Rosaceae	-3	4			S5
Early Lowbush Blueberry	Vaccinium angustifolium	Ericaceae	3	6			S5
Eastern White Cedar	Thuja occidentalis	Cupressaceae	-3	4			S5
Eastern White Pine	Pinus strobus	Pinaceae	3	4			S5
Fringed Sedge	Carex crinita var. crinita	Cyperaceae	-5	6			S5
Northern Red Oak	Quercus rubra	Fagaceae	3	6			S5
Ostrich Fern	Matteuccia struthiopteris	Dryopteridaceae	0	5			S5
Paper Birch	Betula papyrifera	Betulaceae	3	2			S5
Purple-stemmed Aster	Symphyotrichum puniceum var. puniceum	Asteraceae	-5	6			S5
Red Maple	Acer rubrum	Aceraceae	0	4			S5
Sensitive Fern	Onoclea sensibilis	Dryopteridaceae	-3	4			S5
Sheep Laurel	Kalmia angustifolia var. angustifolia	Ericaceae	0	9			S5
Speckled Alder	Alnus incana ssp. rugosa	Betulaceae	-3	6			S5
White Spruce	Picea glauca	Pinaceae	3	6			S5
Wild Raisin	Viburnum nudum var. cassinoides	Caprifoliaceae	-3	7			S5

NOTES: Cedar with red maple mixed swamp. Deep organic soils.

VEGETATION COMMUNITY CLASSIFICATION: G133Tt

COMMUNITY #: 4

LOCATION: Petawawa

COORDINATES: 45.8988373, -77.2512003

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: G135S

COMMUNITY #: 5

LOCATION: Petawawa

COORDINATES: 45.9009507, -77.2540686

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Common Winterberry	Ilex verticillata	Aquifoliaceae	-3	5			S5
Ostrich Fern	Matteuccia struthiopteris	Dryopteridaceae	0	5			S5
Paper Birch	Betula papyrifera	Betulaceae	3	2			S5
Purple Loosestrife	Lythrum salicaria	Lythraceae	-5				SNA
Red Maple	Acer rubrum	Aceraceae	0	4			S5
Royal Fern	Osmunda regalis var. spectabilis	Osmundaceae	-5	7			S5
Sheep Laurel	Kalmia angustifolia var. angustifolia	Ericaceae	0	9			S5
Speckled Alder	Alnus incana ssp. rugosa	Betulaceae	-3	6			S5
Wild Raisin	Viburnum nudum var. cassinoides	Caprifoliaceae	-3	7			S5

NOTES: Alder Thicket Swamp.

VEGETATION COMMUNITY CLASSIFICATION: G135S

COMMUNITY #: 5

LOCATION: Petawawa

COORDINATES: 45.9009507, -77.2540686

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: G057Tt

COMMUNITY #: 6

LOCATION: Petawawa

COORDINATES: 45.9015445, -77.2503477

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Allegheny Blackberry	Rubus allegheniensis	Rosaceae	3	2			S5
Alternate-leaved Dogwood	Cornus alternifolia	Cornaceae	3	6			S5
Arrow-leaved Aster	Symphyotrichum urophyllum	Asteraceae	5	6			S4
Black Cherry	Prunus serotina var. serotina	Rosaceae	3	3			S5
Bracken Fern	Pteridium aquilinum	Dennstaedtiaceae	3	2			S5
Downy Arrowwood	Viburnum rafinesqueanum	Caprifoliaceae	5	7			S5
Early Lowbush Blueberry	Vaccinium angustifolium	Ericaceae	3	6			S5
Eastern White Pine	Pinus strobus	Pinaceae	3	4			S5
Large-leaved Aster	Eurybia macrophylla	Asteraceae	5	5			S5
Large-toothed Aspen	Populus grandidentata	Salicaceae	5	5			S5
Northern Red Oak	Quercus rubra	Fagaceae	3	6			S5
Ostrich Fern	Matteuccia struthiopteris	Dryopteridaceae	0	5			S5
Paper Birch	Betula papyrifera	Betulaceae	3	2			S5
Red Maple	Acer rubrum	Aceraceae	0	4			S5
Smooth Serviceberry	Amelanchier laevis	Rosaceae	5	5			S5
Spinulose Wood Fern	Dryopteris carthusiana	Dryopteridaceae	-3	5			S5
Striped Maple	Acer pensylvanicum	Aceraceae	3	7			S4
Wild Sarsaparilla	Aralia nudicaulis	Araliaceae	3	4			S5
Yellow Birch	Betula alleghaniensis	Betulaceae	0	6			S5

NOTES: Red oak dominant

VEGETATION COMMUNITY CLASSIFICATION: G057Tt

COMMUNITY #: 6

LOCATION: Petawawa

COORDINATES: 45.9015445, -77.2503477

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: G134S

COMMUNITY #: 7

LOCATION: Petawawa

COORDINATES: 45.9024917, -77.2485734

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Bebb's Willow	Salix bebbiana	Salicaceae	-3	4			S5
Bittersweet Nightshade	Solanum dulcamara	Solanaceae	0				SNA
Broad-leaved Cattail	Typha latifolia	Typhaceae	-5	1			S5
Common Winterberry	Ilex verticillata	Aquifoliaceae	-3	5			S5
Common Woolly Bulrush	Scirpus cyperinus	Cyperaceae	-5	4			S5
Crack Willow	Salix euxina	Salicaceae	0				SNA
Paper Birch	Betula papyrifera	Betulaceae	3	2			S5
Red Ash	Fraxinus pennsylvanica	Oleaceae	-3	3			S4
Reed Canarygrass	Phalaris arundinacea var. arundinacea	Poaceae	-3	0			S5
Sensitive Fern	Onoclea sensibilis	Dryopteridaceae	-3	4			S5
Speckled Alder	Alnus incana ssp. rugosa	Betulaceae	-3	6			S5
Sweet Gale	Myrica gale	Myricaceae	-5	6			S5
White Meadowsweet	Spiraea alba var. alba	Rosaceae	-3	3			S5

NOTES: Willow thicket swamp.

VEGETATION COMMUNITY CLASSIFICATION: G134S

COMMUNITY #: 7

LOCATION: Petawawa

COORDINATES: 45.9024917, -77.2485734

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: G131Tt

COMMUNITY #: 8

LOCATION: Petawawa

COORDINATES: 45.8250303, -77.1233251

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
(Acer rubrum X Acer saccharinum)	Acer x freemanii	Aceraceae	-5	6			SNA
Black Chokeberry	Aronia melanocarpa	Rosaceae	-3	7			S5
Red Ash	Fraxinus pennsylvanica	Oleaceae	-3	3			S4
Red Maple	Acer rubrum	Aceraceae	0	4			S5
Royal Fern	Osmunda regalis var. spectabilis	Osmundaceae	-5	7			S5
Sensitive Fern	Onoclea sensibilis	Dryopteridaceae	-3	4			S5
Silver Maple	Acer saccharinum	Aceraceae	-3	5			S5
White Elm	Ulmus americana	Ulmaceae	-3	3			S5

NOTES: Red Maple shares dominance with Silver Maple. Black Ash associate.

VEGETATION COMMUNITY CLASSIFICATION: G131Tt

COMMUNITY #: 8

LOCATION: Petawawa

COORDINATES: 45.8250303, -77.1233251

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: G130Tt

COMMUNITY #: 9

LOCATION: Petawawa

COORDINATES: 45.9002215, -77.2473958

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Black Ash	Fraxinus nigra	Oleaceae	-3	7			S3
Common Winterberry	Ilex verticillata	Aquifoliaceae	-3	5			S5
Paper Birch	Betula papyrifera	Betulaceae	3	2			S5
Red Ash	Fraxinus pennsylvanica	Oleaceae	-3	3			S4
Red Maple	Acer rubrum	Aceraceae	0	4			S5
Royal Fern	Osmunda regalis var. spectabilis	Osmundaceae	-5	7			S5
Sensitive Fern	Onoclea sensibilis	Dryopteridaceae	-3	4			S5
Trembling Aspen	Populus tremuloides	Salicaceae	0	2			S5

NOTES: Trembling Aspen with Red Maple and Black Ash.

VEGETATION COMMUNITY CLASSIFICATION: G130Tt

COMMUNITY #: 9

LOCATION: Petawawa

COORDINATES: 45.9002215, -77.2473958

PROJECT NUMBER: 11757-001

DATE: October 07, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: G054Tt

COMMUNITY #: 10

LOCATION: Petawawa

COORDINATES: 45.900785, -77.2522373

PROJECT NUMBER: 11757-001

DATE: October 08, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Bracken Fern	Pteridium aquilinum	Dennstaedtiaceae	3	2			S5
Early Lowbush Blueberry	Vaccinium angustifolium	Ericaceae	3	6			S5
Eastern Teaberry	Gaultheria procumbens	Ericaceae	3	6			S5
Eastern White Pine	Pinus strobus	Pinaceae	3	4			S5
Northern Red Oak	Quercus rubra	Fagaceae	3	6			S5
Paper Birch	Betula papyrifera	Betulaceae	3	2			S5
Red Maple	Acer rubrum	Aceraceae	0	4			S5
Smooth Serviceberry	Amelanchier laevis	Rosaceae	5	5			S5

NOTES: Red Oak with White Pine.

VEGETATION COMMUNITY CLASSIFICATION: G054Tt

COMMUNITY #: 10

LOCATION: Petawawa

COORDINATES: 45.900785, -77.2522373

PROJECT NUMBER: 11757-001

DATE: October 08, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: G029N

COMMUNITY #: 11

LOCATION: Petawawa

COORDINATES: 45.8978009, -77.2648342

PROJECT NUMBER: 11757-001

DATE: October 08, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Alfalfa	Medicago sativa ssp. sativa	Fabaceae	5				SNA
Allegheny Blackberry	Rubus allegheniensis	Rosaceae	3	2			S5
Black-eyed Susan	Rudbeckia hirta var. pulcherrima	Asteraceae	3	0			S5
Bladder Campion	Silene vulgaris	Caryophyllaceae	5				SNA
Common Milkweed	Asclepias syriaca	Apocynaceae	5	0			S5
Common Mullein	Verbascum thapsus ssp. thapsus	Scrophulariaceae	5				SNA
Common Viper's Bugloss	Echium vulgare	Boraginaceae	5				SNA
European Reed	Phragmites australis ssp. australis	Poaceae	-3				SNA
Paper Birch	Betula papyrifera	Betulaceae	3	2			S5
Rabbit's-foot Clover	Trifolium arvense	Fabaceae	5				SNA
Red Clover	Trifolium pratense	Fabaceae	3				SNA
Red Raspberry	Rubus idaeus	Rosaceae	3	2			S5
Smooth Brome	Bromus inermis	Poaceae	5				SNA
Sweet-fern	Comptonia peregrina	Myricaceae	5	7			S5
Tall Goldenrod	Solidago altissima	Asteraceae	3	1			S5
Trembling Aspen	Populus tremuloides	Salicaceae	0	2			S5
Tufted Vetch	Vicia cracca	Fabaceae	5				SNA
Wild Carrot	Daucus carota	Apiaceae	5				SNA

NOTES: Cultural Meadow. Being mowed at the time of the survey. Contains old lagoons with phrag.

VEGETATION COMMUNITY CLASSIFICATION: G029N

COMMUNITY #: 11

LOCATION: Petawawa

COORDINATES: 45.8978009, -77.2648342

PROJECT NUMBER: 11757-001

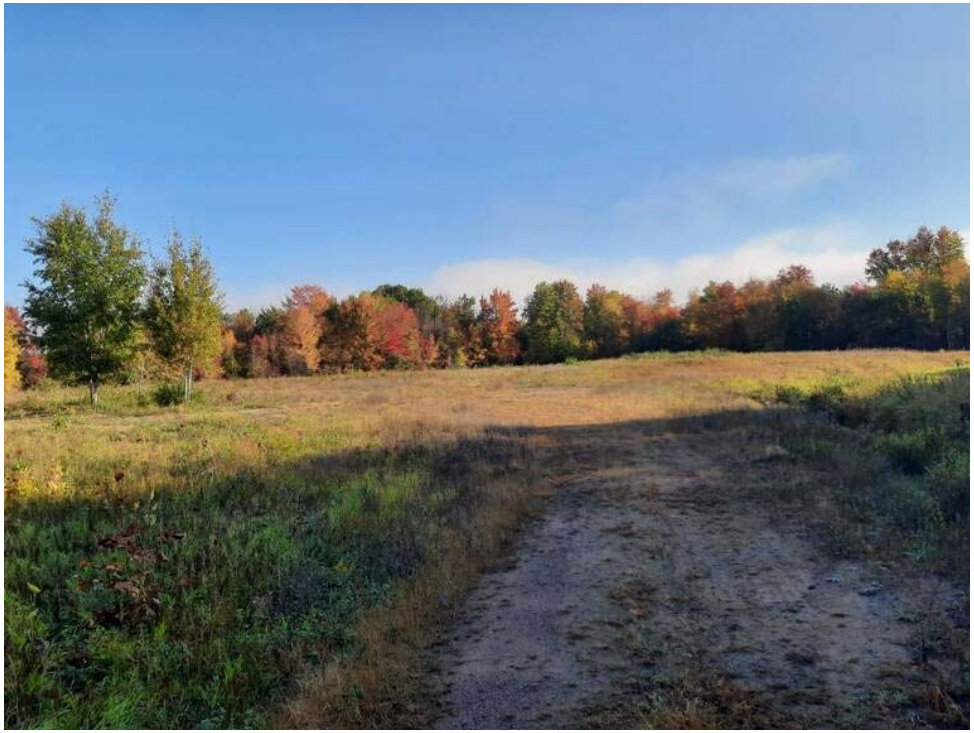
DATE: October 08, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:



VEGETATION COMMUNITY CLASSIFICATION: G134S

COMMUNITY #: 12

LOCATION: Petawawa

COORDINATES: 45.8249445, -77.122574

PROJECT NUMBER: 11757-001

DATE: October 08, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Broad-leaved Cattail	Typha latifolia	Typhaceae	-5	1			S5
Purple Loosestrife	Lythrum salicaria	Lythraceae	-5				SNA
Reed Canarygrass	Phalaris arundinacea var. arundinacea	Poaceae	-3	0			S5
Royal Fern	Osmunda regalis var. spectabilis	Osmundaceae	-5	7			S5
Sensitive Fern	Onoclea sensibilis	Dryopteridaceae	-3	4			S5
Silver Maple	Acer saccharinum	Aceraceae	-3	5			S5
Sweet Gale	Myrica gale	Myricaceae	-5	6			S5

NOTES: Sweet Gale dominates.

VEGETATION COMMUNITY CLASSIFICATION: G134S

COMMUNITY #: 12

LOCATION: Petawawa

COORDINATES: 45.8249445, -77.122574

PROJECT NUMBER: 11757-001

DATE: October 08, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: G057Tt

COMMUNITY #: 13

LOCATION: Petawawa

COORDINATES: 45.8134611, -77.1222953

PROJECT NUMBER: 11757-001

DATE: October 08, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Black Cherry	Prunus serotina var. serotina	Rosaceae	3	3			S5
Climbing Bittersweet	Celastrus scandens	Celastraceae	3	3			S5
Common Milkweed	Asclepias syriaca	Apocynaceae	5	0			S5
Common Self-heal	Prunella vulgaris ssp. vulgaris	Lamiaceae	0				SNA
Common Yarrow	Achillea millefolium	Asteraceae	3				SNA
Eastern White Pine	Pinus strobus	Pinaceae	3	4			S5
Northern Red Oak	Quercus rubra	Fagaceae	3	6			S5
Paper Birch	Betula papyrifera	Betulaceae	3	2			S5
Red Ash	Fraxinus pennsylvanica	Oleaceae	-3	3			S4
Red Maple	Acer rubrum	Aceraceae	0	4			S5
Red Raspberry	Rubus idaeus	Rosaceae	3	2			S5
Rough-stemmed Goldenrod	Solidago rugosa	Asteraceae	0	4			S5
Smooth Serviceberry	Amelanchier laevis	Rosaceae	5	5			S5
Virginia Clematis	Clematis virginiana	Ranunculaceae	0	3			S5

NOTES: Patch of deciduous fores at base of slope. Extends around edge of facility. Similar to Community 1.

VEGETATION COMMUNITY CLASSIFICATION: G057Tt

COMMUNITY #: 13

LOCATION: Petawawa

COORDINATES: 45.8134611, -77.1222953

PROJECT NUMBER: 11757-001

DATE: October 08, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: G058Tt

COMMUNITY #: 14

LOCATION: Petawawa

COORDINATES: 45.898416, -77.253745

PROJECT NUMBER: 11757-001

DATE: October 08, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Balsam Fir	Abies balsamea	Pinaceae	-3	5			S5
Balsam Poplar	Populus balsamifera	Salicaceae	-3	4			S5
Downy Arrowwood	Viburnum rafinesqueanum	Caprifoliaceae	5	7			S5
Hobblebush	Viburnum lantanoides	Caprifoliaceae	0	8			S5
Paper Birch	Betula papyrifera	Betulaceae	3	2			S5
Red Maple	Acer rubrum	Aceraceae	0	4			S5
Spinulose Wood Fern	Dryopteris carthusiana	Dryopteridaceae	-3	5			S5
Striped Maple	Acer pensylvanicum	Aceraceae	3	7			S4
Wild Sarsaparilla	Aralia nudicaulis	Araliaceae	3	4			S5
Yellow Birch	Betula alleghaniensis	Betulaceae	0	6			S5

NOTES: On steep slope. Red Maple dominates.

VEGETATION COMMUNITY CLASSIFICATION: G058Tt

COMMUNITY #: 14

LOCATION: Petawawa

COORDINATES: 45.898416, -77.253745

PROJECT NUMBER: 11757-001

DATE: October 08, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

Appendix B
Bird Species List

VEGETATION COMMUNITY CLASSIFICATION: FOD & marsh LOCATION: Petawawa COORDINATES: POINT COUNT #: 1

PROJECT NUMBER: 11757-002 DATES: June 10, 2022 June 24, 2022 PROJECT MANAGER: Matthew Wheeler FIELD STAFF: Keegan McKitterick

FIELD SHEET – Bird Species List

June 10, 2022

Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
Alder Flycatcher	*Empidonax alnorum*	Tyrannidae			S5B	S
American Goldfinch	*Spinus tristis*	Fringillidae			S5B	S
American Redstart	*Setophaga ruticilla*	Parulidae			S5B	S
Mourning Warbler	*Geothlypis philadelphia*	Parulidae			S4B	S
Red-eyed Vireo	*Vireo olivaceus*	Vireonidae			S5B	S
Veery	*Catharus fuscescens*	Turdidae			S4B	S
Yellow Warbler	*Setophaga petechia*	Parulidae			S5B	S

June 24, 2022

Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
American Crow	*Corvus brachyrhynchos*	Corvidae			S5B	X
American Goldfinch	*Spinus tristis*	Fringillidae			S5B	H
Baltimore Oriole	*Icterus galbula*	Icteridae			S4B	S
Black-and-white Warbler	*Mniotilta varia*	Parulidae			S5B	S
Black-capped Chickadee	*Poecile atricapillus*	Paridae			S5	S
Black-throated Blue Warbler	*Setophaga caerulescens*	Parulidae			S5B	S
Common Yellowthroat	*Geothlypis trichas*	Parulidae			S5B	S
Great Crested Flycatcher	*Myiarchus crinitus*	Tyrannidae			S4B	S
Least Flycatcher	*Empidonax minimus*	Tyrannidae			S4B	S
Northern Cardinal	*Cardinalis cardinalis*	Cardinalidae			S5	S
Northern Flicker	*Colaptes auratus*	Picidae			S4B	H
Red-eyed Vireo	*Vireo olivaceus*	Vireonidae			S5B	T
Red-winged Blackbird	*Agelaius phoeniceus*	Icteridae			S4	S
Veery	*Catharus fuscescens*	Turdidae			S4B	T
White-throated Sparrow	*Zonotrichia albicollis*	Passerellidae			S5B	S

VEGETATION COMMUNITY CLASSIFICATION: FOD & marsh | LOCATION: Petawawa | COORDINATES: | POINT COUNT #: 1

PROJECT NUMBER: 11757-002 | DATES: June 10, 2022 – June 24, 2022 | PROJECT MANAGER: Matthew Wheeler | FIELD STAFF: Keegan McKitterick

FIELD SHEET – Bird Species List

X = Species observed in its breeding season (no breeding evidence)
H = Species observed in its breeding season in suitable nesting habitat
S= Singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat
P= Pair observed in their breeding season in suitable nesting habitat
T= Permanent territory presumed through registration of territorial song on at least 2 days, a week apart, at the same place
D= Courtship or display between a male and a female or 2 males, including courtship feeding or copulation
V= Visiting probable nest site
X = Species observed in its breeding season (no breeding evidence)
CF= Adult carrying food for young
NE= Nest containing eggs

A = Agitated behaviour or anxiety calls of an adult
B= Brood patch on adult female or cloacal protuberance on adult male
N= Nest-building or excavation of nest hole
DD= Distraction display or injury feigning
NU= Used nest or egg shell found (occupied or laid within the period of study)
FY= Recently fledged young or downy young, including young incapable to sustain flight
AE= Adults leaving or entering nest site in circumstances indicating occupied nest
FS= Adult carrying faecal sac
NY= Nest with young seen or heard

Shaded cells indicate probable or confirmed breeding by the species within the vegetation community.

NOTES: June 10: 15°C, cloud cover: 20%, wind: 1, noise: 1.
June 24: 16°C, cloud cover: 100%, wind: 0, noise: 1.

VEGETATION COMMUNITY CLASSIFICATION: FOM & SWD LOCATION: Petawawa COORDINATES: POINT COUNT #: 2

PROJECT NUMBER: 11757-002 DATES: June 10, 2022 June 24, 2022 PROJECT MANAGER: Matthew Wheeler FIELD STAFF: Keegan McKitterick

FIELD SHEET – Bird Species List

June 10, 2022

Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
Baltimore Oriole	*Icterus galbula*	Icteridae			S4B	S
Brown Thrasher	*Toxostoma rufum*	Mimidae			S4B	S
Chestnut-sided Warbler	*Setophaga pensylvanica*	Parulidae			S5B	S
Common Yellowthroat	*Geothlypis trichas*	Parulidae			S5B	S
Connecticut Warbler	*Oporornis agilis*	Parulidae			S4B	S
Eastern Kingbird	*Tyrannus tyrannus*	Tyrannidae			S4B	S
Eastern Phoebe	*Sayornis phoebe*	Tyrannidae			S5B	S
Great Crested Flycatcher	*Myiarchus crinitus*	Tyrannidae			S4B	S
Indigo Bunting	*Passerina cyanea*	Cardinalidae			S4B	S

June 24, 2022

Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
American Goldfinch	*Spinus tristis*	Fringillidae			S5B	P
American Redstart	*Setophaga ruticilla*	Parulidae			S5B	S
Baltimore Oriole	*Icterus galbula*	Icteridae			S4B	T
Common Grackle	*Quiscalus quiscula*	Icteridae			S5B	X
Common Yellowthroat	*Geothlypis trichas*	Parulidae			S5B	T
Downy Woodpecker	*Picoides pubescens*	Picidae			S5	S
Gray Catbird	*Dumetella carolinensis*	Mimidae			S4B	S
Killdeer	*Charadrius vociferus*	Charadriidae			S5B,S5N	S
Least Flycatcher	*Empidonax minimus*	Tyrannidae			S4B	S
Mourning Dove	*Zenaida macroura*	Columbidae			S5	P
Veery	*Catharus fuscescens*	Turdidae			S4B	S

VEGETATION COMMUNITY CLASSIFICATION: FOM & SWD | LOCATION: Petawawa | COORDINATES: | POINT COUNT #: 2

PROJECT NUMBER: 11757-002 | DATES: June 10, 2022 June 24, 2022 | PROJECT MANAGER: Matthew Wheeler | FIELD STAFF: Keegan McKitterick

FIELD SHEET – Bird Species List

X = Species observed in its breeding season (no breeding evidence)
H = Species observed in its breeding season in suitable nesting habitat
S= Singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat
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T= Permanent territory presumed through registration of territorial song on at least 2 days, a week apart, at the same place
D= Courtship or display between a male and a female or 2 males, including courtship feeding or copulation
V= Visiting probable nest site
X = Species observed in its breeding season (no breeding evidence)
CF= Adult carrying food for young
NE= Nest containing eggs

A = Agitated behaviour or anxiety calls of an adult
B= Brood patch on adult female or cloacal protuberance on adult male
N= Nest-building or excavation of nest hole
DD= Distraction display or injury feigning
NU= Used nest or egg shell found (occupied or laid within the period of study)
FY= Recently fledged young or downy young, including young incapable to sustain flight
AE= Adults leaving or entering nest site in circumstances indicating occupied nest
FS= Adult carrying faecal sac
NY= Nest with young seen or heard

Shaded cells indicate probable or confirmed breeding by the species within the vegetation community.

NOTES: edge of the property.
June 10: 16°C, cloud cover: 20%, wind: 1, noise:1.
Jun 24: 17°C, cloud cover: 100%, wind: 0, noise: 1.

VEGETATION COMMUNITY CLASSIFICATION: FOD | LOCATION: Petawawa | COORDINATES: | POINT COUNT #: 3

PROJECT NUMBER: 11757-002 | DATES: June 10, 2022 – June 24, 2022 | PROJECT MANAGER: Matthew Wheeler | FIELD STAFF: Keegan McKitterick

FIELD SHEET – Bird Species List

June 10, 2022

Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
Cape May Warbler	*Setophaga tigrina*	Parulidae			S5B	S
Common Yellowthroat	*Geothlypis trichas*	Parulidae			S5B	S
Eastern Phoebe	*Sayornis phoebe*	Tyrannidae			S5B	S
Mourning Dove	*Zenaida macroura*	Columbidae			S5	P
Red-eyed Vireo	*Vireo olivaceus*	Vireonidae			S5B	S
Warbling Vireo	*Vireo gilvus*	Vireonidae			S5B	S

June 24, 2022

Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
American Redstart	*Setophaga ruticilla*	Parulidae			S5B	S
American Robin	*Turdus migratorius*	Turdidae			S5B	P
Blue Jay	*Cyanocitta cristata*	Corvidae			S5	X
Eastern Kingbird	*Tyrannus tyrannus*	Tyrannidae			S4B	S
Eastern Phoebe	*Sayornis phoebe*	Tyrannidae			S5B	T
Mourning Dove	*Zenaida macroura*	Columbidae			S5	P
Red-eyed Vireo	*Vireo olivaceus*	Vireonidae			S5B	T
Red-winged Blackbird	*Agelaius phoeniceus*	Icteridae			S4	S
Veery	*Catharus fuscescens*	Turdidae			S4B	S
White-throated Sparrow	*Zonotrichia albicollis*	Passerellidae			S5B	S

X = Species observed in its breeding season (no breeding evidence)
H = Species observed in its breeding season in suitable nesting habitat
S= Singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat
P= Pair observed in their breeding season in suitable nesting habitat
T= Permanent territory presumed through registration of territorial song on at least 2 days, a week apart, at the same place
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V= Visiting probable nest site
X = Species observed in its breeding season (no breeding evidence)
CF= Adult carrying food for young
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N= Nest-building or excavation of nest hole
DD= Distraction display or injury feigning
NU= Used nest or egg shell found (occupied or laid within the period of study)
FY= Recently fledged young or downy young, including young incapable to sustain flight
AE= Adults leaving or entering nest site in circumstances indicating occupied nest
FS= Adult carrying faecal sac
NY= Nest with young seen or heard

VEGETATION COMMUNITY CLASSIFICATION: FOD | LOCATION: Petawawa | COORDINATES: | POINT COUNT #: 3

PROJECT NUMBER: 11757-002 | DATES: June 10, 2022 – June 24, 2022 | PROJECT MANAGER: Matthew Wheeler | FIELD STAFF: Keegan McKitterick

FIELD SHEET – Bird Species List

Shaded cells indicate probable or confirmed breeding by the species within the vegetation community.

NOTES: edge of FOD.
June 10: 17°C, cloud cover: 20%, wind: 1, noise: 1.
June 24: 18°C, cloud cover: 100%, wind: 0, noise: 2.

VEGETATION COMMUNITY CLASSIFICATION: Water treatment system/ forest | LOCATION: Petawawa | COORDINATES: | POINT COUNT #: 4

PROJECT NUMBER: 11757-002 | DATES: June 10, 2022 June 24, 2022 | PROJECT MANAGER: Matthew Wheeler | FIELD STAFF: Keegan McKitterick

FIELD SHEET – Bird Species List

June 10, 2022

Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
American Goldfinch	*Spinus tristis*	Fringillidae			S5B	S
American Robin	*Turdus migratorius*	Turdidae			S5B	S
House Wren	*Troglodytes aedon*	Troglodytidae			S5B	S
Song Sparrow	*Melospiza melodia*	Passerellidae			S5B	S
Veery	*Catharus fuscescens*	Turdidae			S4B	S

June 24, 2022

Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
American Crow	*Corvus brachyrhynchos*	Corvidae			S5B	X
American Goldfinch	*Spinus tristis*	Fringillidae			S5B	T
American Robin	*Turdus migratorius*	Turdidae			S5B	T
Baltimore Oriole	*Icterus galbula*	Icteridae			S4B	S
Black-capped Chickadee	*Poecile atricapillus*	Paridae			S5	S
Common Yellowthroat	*Geothlypis trichas*	Parulidae			S5B	S
Eastern Kingbird	*Tyrannus tyrannus*	Tyrannidae			S4B	S
European Starling	*Sturnus vulgaris*	Sturnidae			SNA	S
Great Crested Flycatcher	*Myiarchus crinitus*	Tyrannidae			S4B	S
House Wren	*Troglodytes aedon*	Troglodytidae			S5B	T
Red-eyed Vireo	*Vireo olivaceus*	Vireonidae			S5B	S
Red-winged Blackbird	*Agelaius phoeniceus*	Icteridae			S4	S
White-throated Sparrow	*Zonotrichia albicollis*	Passerellidae			S5B	S

VEGETATION COMMUNITY CLASSIFICATION:	Water treatment system/ forest	LOCATION:	Petawawa	COORDINATES:		POINT COUNT #:	4
PROJECT NUMBER:	11757-002	DATES:	June 10, 2022 June 24, 2022	PROJECT MANAGER:	Matthew Wheeler	FIELD STAFF:	Keegan McKitterick

FIELD SHEET – Bird Species List

X = Species observed in its breeding season (no breeding evidence)
H = Species observed in its breeding season in suitable nesting habitat
S= Singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat
P= Pair observed in their breeding season in suitable nesting habitat
T= Permanent territory presumed through registration of territorial song on at least 2 days, a week apart, at the same place
D= Courtship or display between a male and a female or 2 males, including courtship feeding or copulation
V= Visiting probable nest site
X = Species observed in its breeding season (no breeding evidence)
CF= Adult carrying food for young
NE= Nest containing eggs

A = Agitated behaviour or anxiety calls of an adult
B= Brood patch on adult female or cloacal protuberance on adult male
N= Nest-building or excavation of nest hole
DD= Distraction display or injury feigning
NU= Used nest or egg shell found (occupied or laid within the period of study)
FY= Recently fledged young or downy young, including young incapable to sustain flight
AE= Adults leaving or entering nest site in circumstances indicating occupied nest
FS= Adult carrying faecal sac
NY= Nest with young seen or heard

Shaded cells indicate probable or confirmed breeding by the species within the vegetation community.

NOTES: June 10: 17°C, cloud cover: 20%, wind: 1, noise; 1.
June 24: 18°C, cloud cover; 100%, wind: 0, noise: 2.

Appendix C

Species of Conservation Concern Screening

APPENDIX: Species of Conservation Concern - Renfrew County

COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Birds								
Bald Eagle	Haliaeetus leucocephalus	No Status	SC	S2N,S4B	The Bald Eagle is a bird of prey with a white head, neck and tail, a massive bright yellow beak, powerful legs, and a wingspan of over 2 m. It nests in a variety of habitats and forest types, almost always near a major lake or river where they do most of their hunting. These nests are usually on islands in freshwater lakes or in large trees such as the pine and poplar. During the winter, they may also be found near open bodies of water that do not freeze (1).	Field studies confirmed the absence of Bald Eagle and their nest within the Project Location.	Known to occur in the general area	No further consideration required
Bank Swallow	Riparia riparia	THR	THR	S4B	The Bank Swallow is a small songbird of around 12 cm long with a distinctive dark breast band, that flies with quick and erratic wingbeats (1). It nests in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. This can include banks of rivers and lakes, bluffs, active sand and gravel pits, road cuts and stockpiles of soils. However, they prefer sand-silt substrates for excavating their nest burrows. They often use large wetlands as communal nocturnal roosts post-breeding or during wintering periods (2).	Field studies confirmed the absence of Bank Swallow nesting habitat and Bank Swallow within the Project Location.	Known to occur in the general area	No further consideration required
Barn Swallow	Hirundo rustica	THR	THR	S4B	The Barn Swallow is a mid-sized songbird with steel-blue backs and wings, glossy in males, and a line of white spots across its upper tail. It lives in a variety of open habitats for foraging, such as grassy fields, pastures, certain agricultural crops, shorelines, cottage areas, wetlands, or subarctic tundra (2). They prefer to nest within human made structures such as barns, bridges, and culverts. Barn Swallow nests are cup-shaped and made of mud, typically attached to horizontal beams or vertical walls underneath an overhang (1).	Field studies confirmed the absence of Barn Swallow and it's habitat within the Project Location.	Known to occur in the general area	No further consideration required
Black Tern	Chlidonias niger	No Status	SC	S3B	The Black Tern is a small waterbird with a forked tail, straight pointed bill, slender shape, and black head during breeding season. It builds floating nests in loose colonies in shallow marshes, with a preference for cattails. They breed primarily in the marshes along the edges of the Great Lakes, but may also use wetlands further north if suitable (1).	Field studies confirmed the absence of Black Ternand its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Bobolink	Dolichonyx oryzivorus	THR	THR	S4B	The Bobolink is a mid-sized songbird of tan colour with black stripes, except for males during summer breeding season who are black with a white back and yellow collar. It prefers tall, grassy meadows, hayfields and some croplands, and feeds (largely on insects) on the ground in dense grasses (1). It tends to nest in forage crops: hayfields and pastures dominated by species including clover, bluegrass, and broadleaf plants (2).	Field studies confirmed the absence of Bobolink and their habitat within the Project Location.	Known to occur in the general area	No further consideration required

Canada Warbler	Cardellina canadensis	THR	SC	S4B	The Canada Warbler is a small songbird with bright yellow underparts and bluish-grey back and tail (1). It can be found in a variety of forest types, but is most abundant in moist, mixed forests with a well-developed, dense shrub layer. Nests are usually located on or near the ground on mossy logs, and along stream banks (3).	Field studies confirmed the absence of Canada Warbler and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Cerulean Warbler	Setophaga cerulea	END	THR	S3B	The Cerulean Warbler, a small songbird, is blue-green with white eyebrows and two prominent white wing bars (1). It requires relatively large tracts of mature deciduous forest (>100 ha), and nests in older, second-growth deciduous forests. During breeding season, it is found in relatively large tracts of mature deciduous forests that feature large, tall trees and an open understorey (4).	Field studies confirmed the absence of Cerulean Warbler and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Chimney Swift	Chaetura pelagica	THR	THR	S4B,S4N	The Chimney Swift is a small bird, between 12 and 14 cm, with a brown, cigar-shaped body, slender wings, and an erratic flight pattern. Prior to settlement, the Chimney Swift would mainly nest in cave walls and hollow trees. Now, it is found mostly near urban and suburban areas where the presence of chimneys or other manmade structures provide nesting and roosting habitat. They also tend to stay in habitat close to the water (1).	Field studies confirmed the absence of Chimeney Swift and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Common Nighthawk	Chordeiles minor	THR	SC	S4B	The Common Nighthawk is a medium-sized bird with long, pointed wings, a long tail with a notch, and and large eyes. Its plumage of dark brown with black and white specks blends with its roost site. It is typically found in open areas such as gravel beaches, rock outcrops and burned woodlands, that have little to no ground vegetation. This species can also be found in highly disturbed locations such as clear cuts, mine tailing areas, cultivated fields, urban parks, gravel roads, and orchards (1).	Field studies confirmed the absence of Common Nighthawk habitat within the Project Location.	Known to occur in the general area	No further consideration required
Eastern Meadowlark	Sturnella magna	THR	THR	S4B	The Eastern Meadowlark is a medium-sized migratory songbird with a bright yellow throat and belly, a black V shape on its chest, and a pointed bill. It prefers pastures and hayfields, but is also found to breed in orchards, shrubby fields, human-use areas such as airports and roadsides, or other open areas. The Eastern Meadowlark can nest from early May to mid-August, in nests that are built on the ground and well-camouflaged with a roof woven from grasses (1).	Field studies confirmed the absence of Eastern Meadowlark and its habitat within the Project Location.	Known to occur in the general area	No further consideration required

Eastern Whip-poor-will	Antrostomus vociferus	THR	THR	S4B	The Eastern Whip-poor-will is a medium-sized bird with mottled brown and grey feathers to blend in with its surroundings, a large flattened head, and small bill. They are usually found in areas with a mix of open and forested areas such as patchy forests with clearings, forests that are regenerating after major disturbances, savannahs, open woodlands or openings in more mature forests. Breeding habitat is dependent on forest structure rather than composition, although common tree associations are pine and oak, and it nests directly on the forest floor (2). The species prefers to nest in semi-open or patchy forests with clearings as it forages in open areas and uses forested areas for roosting (1).	Field studies confirmed the absence of Eastern Whip-poor-will habitat within the Project Location.	Known to occur in the general area	No further consideration required
Eastern Wood-Pewee	Contopus virens	SC	SC	S4B	The Eastern Wood-pewee is a species of 'flycatcher', a bird that eats flying insects. It grows to approximately 15 cm, has greyish-olive upper parts and pale bars on its wings. This species lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It prefers intermediate-age forest stands with little understory vegetation (1). It typically creates nests on tree branches 2-12 m in height (2).	Field studies confirmed the absence of Eastern Wood-pewee and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Evening Grosbeak	Coccothraustes vespertinus	No Status	SC	S4B	The Evening Grosbeak is a large songbird with a thick greenish bill. It is a social bird that is often found in flocks, particularly during the winter months. Their preferred habitat is thick coniferous forest. During their breeding season, they are generally found in open, mature mixed forests dominated by Firs, White Spruce, or Trembling Aspen (1).	Field studies confirmed the absence of Evening Grosbeak and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Golden Winged Warbler	Vermivora chrysoptera	THR	SC	S4B	The Golden-winged Warbler is a small songbird with distinctive yellow wing patches and patches behind their eyes. It inhabits early successional habitat of old fields and favour areas where trees are spread out or forest edges to use for perching, singing, and searching for food. They seem to prefer regeneration zones with young shrub growth, surrounded by mature forest, locations that have recently been disturbed, such as field edges, hydro or utility right-of-ways, or logged areas for their breeding sites; often frequenting clusters of herbaceous plants and low bushes (1).	Field studies confirmed the absence of Golden Winged Warbler and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Grasshopper Sparrow	Ammodramus savannarum	SC	SC	S4B	The Grasshopper Sparrow is a small songbird with a streaked back, a white stripe down the center of its crown, a flattish head, and a conical beak. It inhabits open grasslands and prairies with well-drained soil, preferring areas that are sparsely vegetated. It will also nest in hayfields and pastures, as well as alvars and occasionally grain crops such as barley (1).	Field studies confirmed the absence of Grasshopper Sparrow and its habitat within the Project Location.	Known to occur in the general area	No further consideration required

Least Bittern	Ixobrychus exilis	THR	THR	S4B	The Least Bittern is a small member of the heron family, reaching around 30 cm in length. It has brown and beige plumage with chestnut patches on its wings (1). The species nests in marshes (> 5 - 10 ha) and swamps dominated by emergent vegetation, preferably cattails, interspersed with patches of woody vegetation and open water. They require dense vegetation and open water with stable levels within 10 m for nesting, and access to clear, open water for foraging (4).	Field studies confirmed the absence of Least Bittern and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Olive-sided Flycatcher	Contopus cooperi	THR	SC	S4B	The Olive-sided Flycatcher is a medium-sized songbird with olive colouring, often seen perching on top of tall trees waiting to catch their prey. It prefers open areas along natural mature forest edges, forest edges near natural openings such as rivers or swamps, human-made openings, or burned forest openings with numbers of dead trees. Breeding habitat usually consists of coniferous or mixed forests adjacent to rivers or wetlands, in Ontario often nesting in White and Black Spruce, Jack Pine, and Balsam Fir (1).	Field studies confirmed the absence of Olive-sided Flycatcher and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Red-headed Woodpecker	Melanerpes erythrocephalus	THR	SC	S4B	The Red-headed Woodpecker is a mid-sized bird, at around 20 cm long, with a vivid red head, neck and breast as well a strong bill. The species can be found in open woodland and woodland edges, often near man-made landscapes such as parks, golf courses and cemeteries. These areas must contain a large number of dead trees for perching and nesting (1).	Field studies confirmed the absence of Red-headed Woodpecker and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Rusty Blackbird	Euphagus carolinus	SC	SC	S4B	The Rusty Blackbird, a medium-sized songbird with pale, yellow eyes and a slender black bill, has recently been listed as special concern both federally and provincially. The species breeds in habitats dominated by coniferous forest with wetlands nearby including bogs, marshes, and beaver ponds. In Ontario, their breeding range is found in the Hudson Bay Lowlands and northern Boreal Shield ecozones. During the winter, it can be found in wet woodlands, swamps, and pond edges plus often foraging in agricultural lands (1).	Field studies confirmed the absence of Rusty Blackbird and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Short-eared owl	Asio flammeus	SC	SC	S2N,S4B	The Short-eared Owl has a large round head with small tufts of feathers, long wings, a short tail, and cryptic colouring of brown streaks. This species is found in scattered pockets across the province where suitable open habitat, including grasslands, tundra, peat bogs and marsh, can be found in sufficient quantities. Adults build nests on the ground in grassy areas and occasionally agriultural fields (1). The main factor influencing their choice in habitat is believed to be an abundance of their food source, primarily rodents and other small mammals (2).	Field studies confirmed the absence of Short-eared Owl and its habitat within the Project Location.	Known to occur in the general area	No further consideration required

Wood Thrush	Hylocichla mustelina	THR	SC	S4B	The Wood Thrush is a medium-sized songbird of around 20 cm with rusty brown coloured upper parts and white underparts with large dark spots. It breeds in deciduous and mixed forests with moderate understories, shade and abundant leaf litter where it forages for food, including larval and adult insects as well as plant material. They prefer moist stands of trees with well-developed undergrowth and tall trees for perches (1).	Field studies confirmed the absence of Wood Thursh and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Fish								
American Eel	Anguilla rostrata	No Status	END	S1?	The American Eel is a long, slender bodied fish, with one long fin extending down the back and around the tail, and two small pectoral fins. It has thick lips, and a protruding lower jaw that extends out above the upper jaw. At the juvenile stage, they swim up the St. Lawrence River to reach Lake Ontario and connected tributaries where they will remain for 8 to 23 years before migrating back to their spawning grounds. In Ontario, the American eel prefers mud, sand or gravel substrates during the juvenile stage when they reside primarily in the benthic zone of waterbodies. More mature eels are able to thrive in most environments provided there is available cover during daylight hours, and the habitat is accessible (2).	No suitable habitat is present within the Project Location for American Eel. It may utilize sections of the Ottawa River for portions of its lifecycle.	Known to occur in the general area	No further consideration required
Lake Sturgeon	Acipenser fulvescens	No Status	END	S2	The Lake Sturgeon, a large freshwater fish, has an extended snout with four whisker-like organs hanging near the mouth and is dark to light brown or grey on its back and sides with a lighter belly. In Ontario, this fish is found in the rivers of the Hudson Bay Basin, the Great Lakes basin, and their connecting waterways. Lake Sturgeon's live almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand or gravel and are usually found at depths of 5 to 20 m. They spawn in relatively shallow, fast-flowing water or if available deeper water habitat as well (1).	No suitable habitat is present within the Project Location for Lake Sturgeon. It may utilize sections of the Ottawa River for portions of its lifecycle.	Known to occur in the general area	No further consideration required
River redhorse	Moxostoma carinatum	SC	SC	S2	The River Redhorse is large and thick-bodied, growing up to 80 cm, with a flat-topped head and prominent snout. Its tail fin is tinted red, its belly is white, its back is brown or olive coloured, and its sides are yellowish green or coppery. It can be found in medium to large sized rivers with substantial flows. Adult River Redhorses migrate in spring from deeper, slower moving pools to shallow riffle-run habitats with coarse substrate and faster flow (1).	No suitable habitat is present within the Project Location for River Redhorse. It may utilize sections of the Ottawa River for portions of its lifecycle.	Known to occur in the general area	No further consideration required
Herptiles								

Blanding's Turtle	Emydoidea blandingii	THR	THR	S3	Blanding's Turtles are identifiable by their bright yellow throat and chin and domed shell. They spend the majority of their life cycle in the aquatic environment, usually in large wetlands or shallow lakes with high densities of water plants (1). These turtles prefer shallow, nutrient rich water with organic sediment and dense vegetation. They use terrestrial sites for travel between habitat patches and to lay clutches of eggs, often going hundreds of meters from their nearest water body. Blanding's Turtles nest in dry coniferous and mixed forest habitats, as well as fields and roadsides (2). From late October until the end of April, they hibernate in the mud at the bottom of permanent water bodies (1).	The willow thicket and treed swamp communities within the Project Location lack standing water to support biophysical needs of Blanding's Turtle. Overwintering habitat for this species is not present on Site due to the insufficient water depth to support overwintering requirements. Thus, the Project Location does not contain suitable habitat for the life processes of this species.	Known to occur in the general area	No further consideration required
Eastern Musk Turtle	Sternotherus odoratus	SC	SC	S3	The Eastern Musk Turtle is small with a narrow carapace, a dark brown body and two light stripes on each side of their head (5). It is a small freshwater turtle found primarily in slow moving water bodies with abundant emergent vegetation and mucky bottoms along the southern edge of the Canadian Shield within which they burrow into overwinter. Nesting sites vary, but must be close to the water and exposed to direct sunlight (1).	The Project Location lacks suitable habitat for the life processes of this species.	Known to occur in the general area	No further consideration required
Northern Map Turtle	Graptemys geographica	SC	SC	S3	The Northern Map Turtle is a medium sized turtle identified by its carapace's map contour-like patterning. It lives in larger lakes and rivers, requiring high water quality to support their primary prey species: molluscs. This species can often be seen in large groups basking together on rocks and logs. In the winter, the Northern Map Turtle can be found hibernating on the bottom of slow-moving rivers (1).	The Project Location lacks suitable habitat for the life processes of this species. Map Turtle could utilize habitat within the Ottawa River.	Known to occur in the general area	No further consideration required

Snapping Turtle	Chelydra serpentina	SC	SC	S3	The Snapping Turtle, with its large serrated carapace, small plastron, and spiked tail, is Canada's largest freshwater turtle (5). It spends the majority of its life in water, preferring shallow water with soft mud and leaf litter, and will travel upland to gravel or sandy embankments, roadsides, along railway lines or beaches to lay their eggs (1).	The Project Location lacks suitable habitat for the life processes of this species. Snapping Turtle could utilize habitat within the Ottawa River.	Known to occur in the general area	No further consideration required
Spiny Softshell	Apalone spinifera	END	END	S2	The Spiny Softshell can be easily distinguished since it is the province's only turtle with a flexible, leathery carapace. These turtles have long snouts, a yellow strip outlined in back along the head, an olive-grey or brown carapace, and may reach a size of up to 40 cm in length. They are typically found in rivers with soft bottoms, aquatic vegetation, and sandbars, but may also be found in lakes or impoundments. They nest in gravelly or sandy areas (5).	No suitable habitat is present for this species within the Project Location.	Known to occur in the general area	No further consideration required
Spotted Turtle	Clemmys guttata	END	END	S2	The Spotted Turtle is named after the distinct yellow spots on its carapace. The species is semi-aquatic and prefers ponds, marshes, bogs and even ditches with slow-moving, unpolluted water and an abundant supply of aquatic vegetation. This species usually hibernates in wetlands or seasonally wet areas with structures such as overhanging banks, hummocks, tree roots, or aquatic animal burrows (1).	No suitable habitat is present for this species within the Project Location.	Known to occur in the general area	No further consideration required
Wood Turtle	Glyptemys insculpta	THR	END	S2	The Wood Turtle has orange coloured front legs, neck and chin and a sculpted carapace with raised, pyramidal scutes (5). They prefer clear rivers and streams that have moderate current, and sandy or gravelly substrates. This species spends more time on land than other turtle species including in meadows, swamps and fields. Wooded areas are an essential habitat component, and the species uses aquatic habitats for hibernation and mating. Nesting occurs in areas with sandy soil and abundant light (1).	Field studies confirmed this species and its habitat is absent within the Project Location.	Known to occur in the general area	No further consideration required
Eastern Milksnake	Lampropeltis triangulum	SC	NAR	S4	The Eastern Milksnake's colouration is grey or tan with reddish alternating blotches otlines in black along its back and sides (5). It has recently been delisted from being a species at risk in Ontario (1). This species tends to use open habitats such as rocky outcrops, fields and forest edges. The preferred prey of milksnakes are mice, small rodents, and ground nesting birds which are amply found in and surrounding agricultural outbuildings. The milksnake is secretive and is not likely to be encountered during the day or at night while hunting (5).	Field studies confirmed this species and its habitat was absent within the Project Location.	Known to occur in the general area	No further consideration required

Eastern Ribbonsnake	Thamnophis sauritus	SC	SC	S4	The Eastern Ribbonsnake is slender with three bright yellow stripes running down its back and sides and a white crescent in front of each eye. This snake is usually found close to water as they are strong swimmers, often fleeing predators by diving into shallow water. It prefers wetland habitats where its prey species, frogs and small fish, are abundant. Over winter, they congregate in underground burrows or rock crevices to hibernate (1).	Field studies confirmed this species and its habitat was absent within the Project Location.	Known to occur in the general area	No further consideration required
Western Chorus Frog	Pseudacris triseriata	THR	-	S3	The Western Chorus Frog is small with a dark stripe running through its eye and a light stripe underneath (5). It is primarily a lowland terrestrial species that requires access to terrestrial and aquatic habitats in close proximity to one another. Relying on marshes and wooded wetlands adjacent to forested habitats, this species also requires isolated, predator free pools for breeding. Temporary pools, such as vernal pools in wooded areas, are preferred. This species hibernates terrestrially in a variety of environments, including leaf litter, wood debris, and vacant animal burrows (2).	Field studies confirmed this species and its habitat was absent within the Project Location.	Known to occur in the general area	No further consideration required
Invertebrates								
Bogbean Buckmoth	Hemileuca sp	END	END	S1	The Bogbean Buckmoth has forewings between 26 and 36 mm long, dark wings with a thick white band, and a black body with a white collar and markings on its thorax and abdomen. The species' larvae are mostly black with red-orange branched spines along their backs. The Bogbean Buckmoth lives only in open, chalky, low shrub fens with large amounts of the wetland plant bogbean (1).	Field studies confirmed this species and its habitat was absent within the Project Location.	Known to occur in the general area	No further consideration required
Monarch Butterfly	Danaus plexippus	SC	SC	S2N,S4B	The Monarch is an orange and black butterfly with small white spots and a wingspan of around 10 cm. It relies on milkweed plants as a food source for growing caterpillars, but the adult butterflies forage in diverse habitats for nectar from wildflowers (1).	Field studies confirmed this species and its habitat was absent within the Project Location.	Known to occur in the general area	No further consideration required
Hickorynut	Obovaria olivaria	END	END	S1?	The Hickorynut is a freshwater mussel usually smaller than 75 mm in size. It has an oval hinged shell and has gree, yellowish, or brown colouring becoming darker with age. The Hickorynut can be found on sandy beds in large, deep rivers with moderate to strong currents (1).	DFO Aquatic SAR mapping states no critical habitat is present for SAR on or adjacent to the Project Location. The Ottawa River may provide habitat for Hickorynut but no habitat for this species is present within the Project Location.	Known to occur in the general area	No further consideration required
Mammals								

Algonquin Wolf	Canis lycaon	SC	THR	S4	Formerly called the Eastern Wolf, this canine was recently renamed the Algonquin Wolf. In the southern portion of the province, this species prefers deciduous and mixed forest landscapes while their northern range include mixed and coniferous forests. It is most prevalent in areas with abundant prey species which include Beaver, White-tailed Deer and Moose. Dens sites are usually found in coniferous forests with easily excavated soil types like sand and close to a permanent water source (1).	Field studies confirmed the absence of this species and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Eastern Small-footed Myotis	Myotis leibii	No Status	END	S2S3	The Eastern Small-footed Myotis has fur with black roots and shiny brown tips as well as very small feet. In the spring and summer, the Eastern Small-footed Myotis will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. They change their roosting locations daily and hunt at night for insects. They hibernate in winter, often in caves and abandoned mines choosing colder and drier sites than other similar bats (1).	Field studies confirmed that woodlands within the Project Location do not have sufficient density of snag and/or cavity trees to support roosting habitat for SAR bats.	Known to occur in the general area	No further consideration required
Little Brown Myotis	Myotis lucifugus	END	END	S4	The Little Brown Myotis has glossy brown fur and a fleshy projection covering the entrance to its ears. This species roosts in trees and buildings, often selecting attics, abandoned buildings and barns for summer colonies where they can raise their young. Little Brown Bats hibernate from October/November to March/April, most often in caves or abandoned mines that are humid and remain above freezing (1).	Field studies confirmed that woodlands within the Project Location do not have sufficient density of snag and/or cavity trees to support roosting habitat for SAR bats.	Known to occur in the general area	No further consideration required
Northern Myotis	Myotis septentrionalis	END	END	S3	The Northern Myotis has dull yellow-brown fur with pale bellies and long, rounded ears. This species is found in boreal forests, roosting under loose bark and in the cavities of trees. These bats hibernate from October/November to March/April, most often in caves or abandoned mines (1).	Field studies confirmed that woodlands within the Project Location do not have sufficient density of snag and/or cavity trees to support roosting habitat for SAR bats.	Known to occur in the general area	No further consideration required

Tri-colored Bat	Perimyotis subflavus	END	END	S3?	The Tri-colored Bat is small, with pale brown with orange-red forearms, muzzle, and ears. It is named for the black, yellow, and brown hairs on its back. It is considered rare in this region of Ontario which is at the northernmost limit of the natural range. These bats prefer to nest in foliage, tree cavities and woodpecker holes, but are occasionally found in buildings; though this is not their preferred habitat. Winter hibernation takes place in caves, mines and deep crevices. Tri-colored Bats prefer an open forest habitat type in proximity to water (6).	Field studies confirmed that woodlands within the Project Location do not have sufficient density of snag and/or cavity trees to support roosting habitat for SAR bats.	Known to occur in the general area	No further consideration required
Trees, plants, fungi and lichens								
Black Ash	Fraxinus nigra	THR	No status	-	The Black Ash is a smaller-sized tree with a narrow crown, light grey and scaly bark, and green, oval leaflets on a central stalk. It grows everywhere in Ontario except for the Far north, preferring moist climates and soils such as swampy woodlands or bogs (1).	Black Ash was observed within the Project area but outside of the fenced area. This species does not currently receive species or habitat protection under the Endangered Species Act (ESA), following O. Reg. 23/22. As such, no further consideration are required under the ESA.	Incidental observation on-site	No further consideration required
Butternut	Juglans cinerea	END	END	S2?	The Butternut is a medium sized tree reaching 30 m in height. It has large compound leaves with 11 to 17 leaflets. The fruit is oval, fuzzy and sticky. In Ontario, the Butternut prefers moist, well-drained soil, often along streams, or occasionally well-drained gravel sites. It grows alone or in small groups in deciduous forests (1).	Field studies confirmed the absence of this species and its habitat within the Project Location.	Known to occur in the general area	No further consideration required
Pale-bellied Frost Lichen	Physconia subpallida	END	END	S3	The Pale-bellied Frost Lichen resembles a light dusting of frost on a dark tree trunk. This species is found throughout eastern North America, growing in wooded areas rich in hardwood species, such as White Ash, Hop Hornbeam (Ironwood), Black Walnut, and American Elm. It is also common to find this species growing on fenceposts or boulders within or near these wooded areas (1).	Field studies confirmed the absence of this species and its habitat within the Project Location.	Known to occur in the general area	No further consideration required

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Appendix D

Significant Wildlife Habitat Assessment

CAMBIUM

APPENDIX: Significant Wildlife Habitat Screening for 5E

SWH Type	Indicator Species	Habitat Descriptions & Criteria for Candidate SWH	SWH	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Seasonal Concentration Areas of Animals						
Waterfowl Stopover and Staging Areas (Terrestrial)	American Black Duck, American Wigeon, Blue-winged Teal, Gadwall, Green-winged Teal, Mallard, Northern Pintail, Northern Shoveler, Wood Duck	Meadow, Thicket, or Agricultural Field WITH spring flooding/sheet water (Mar-May) AND size potential to support 100+ individuals AND potential established/recurring annual use Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects Results: 100+ individuals	Ecosite + 100-300m radius	Field studies did not observe a waterfowl stopover at or adjacent to the Project Location.	Known to occur in the general area.	No further consideration required
Waterfowl Stopover and Staging Area (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, Ruddy Duck, Red-breasted Merganser, Brant, Canvasback, Ruddy Duck	Marsh, Swamp, Shallow Aquatic, Open Aquatic, reservoires managed as wetland/ lake/ pond, and agricultural fields WITH spring sheet water (Mar-May) AND size potential to support 100+ indiv. for 7+ days EXCLUDES storm water management and sewage treatment ponds *Rare: typically only a few locations per EcoDistrict Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects Results: 100+ individuals for 7+ days	Ecosite + 100m radius	No spring sheet water.	Known to occur in the general area.	No further consideration required
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	Beach/Bar, Sand Dune, Meadow Marsh, Shorelines (including seasonally flooded, muddy, unvegetated shoreline habitats) WITH size potential to support 100+ Whimbrel OR 3+ species for 1000+ use days EXCLUDES storm water management and sewage treatment ponds Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects Results to Confirm: 3+ species and 1000+ shorebird use days (#birds x #days) OR 100+ Whimbrel for at least 3 yrs (stops for <24 hrs)	Ecosite + 100m radius	No suitable seasonally unvegetated shoreline habitats, etc.	Known to occur in the general area.	No further consideration required
Raptor Wintering Area	Hawks: Rough-legged Hawk Owls: Long-eared Owl (5E), Boreal Owl (5E), Northern Saw-whet Owl (5E), Short-eared Owl	COMBINATION of Forest AND Field, Meadow, Thicket, Savannah, or Woodland WITH size of 20+ha OR 15+ha in areas with less disturbance *Fields should be wind swept with limited snow accumulation / depth Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects Results: 1+ Short-eared Owls OR 10+ individuals of 2+ listed hawk/owl species AND used regularly (at least 20 days out of 3 in 5 years)	Not specified in Criteria Schedules	No	Known to occur in the general area.	No further consideration required
Bat Hibernacula	Big Brown Bat, Tri-coloured Bat	Caves, Crevices, Karsts *EXCLUDES buildings and active mines Survey: Bats and Bat Habitats: Guidelines for Wind Power Projects during peak swarming period (Aug. – Sept.) Results: all sites with confirmed hibernacula are SWH	Entrance + 1000m radius for wind farms OR + 200m radius for other projects	No suitable hibernacula feature present on or adjacent to the project location.	Known to occur in the general area.	No further consideration required
Bat Maternity Colonies	Big Brown Bat, Silver-haired Bat	Deciduous or Mixed Forests and Swamps WITH >10/ha cavity trees WITH 25+ cm DBH *Trees in lesser decay categories (1-3) preferred *EXCLUDES Coniferous Forests and Swamps, buildings, caves, crevices, and mines Survey: Bats and Bat Habitats: Guidelines for Wind Power Projects Results: >10 Big Brown Bats OR >5 Adult Female Silverhaired Bats	Entire woodland, Ecosite or Ecoelement containing the maternity colonies	No. No woodlands are present within the Project Location. The lands adjacent to the project location did not contain >10/ha large diameter wildlife trees.	Known to occur in the general area.	Woodlands do not represent candidate SWH for Bat Maternity colony.
Turtle Wintering Area	Midland Painted Turtle, Snapping Turtle	*Swamp, Marsh, Shallow Aquatic, Open Aquatic, Open Fen, Open Bog WITH soft mud substrates AND enough depth to maintain free water beneath ice *EXCLUDES storm water management and sewage treatment ponds Survey: look for basking on warm, sunny days in spring (Mar-May) or fall (Sept-Oct) Results: 5+ Painted Turtles OR 1+ Snapping Turtle	Ecosite	No. Insufficient free water water beneath ice.	Known to occur in the general area.	No further consideration required
	Northern Map Turtle	Open Aquatic, including deeper rivers or streams and lakes WITH current AND soft mud substrates AND enough depth to maintain free water beneath ice *EXCLUDES storm water management and sewage treatment ponds Survey: look for basking on warm, sunny days in spring (Mar-May) or fall (Sept-Oct) Results: 1+ Northern Map Turtle	Ecosite OR in stream/river, the pool where overwintering occurs	No. Insufficient free water water beneath ice.	Known to occur in the general area.	No further consideration required

SWH Type	Indicator Species	Habitat Descriptions & Criteria for Candidate SWH	SWH	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Reptile Hibernaculum	Eastern Gartersnake, Eastern Ribbonsnake, Milksnake, Northern Brownsnake, Northern Red-bellied Snake, Northern Ring-necked, Northern Watersnake, Smooth Green Snake	Talus, Rock Barren, Crevice, Cave, Alvar or certain Wetlands (conifer/shrub swamps/swales, poor fens, depressions in bedrock terrain with sparse trees/shrubs and sphagnum or sedge hummocks) WITH openings below frost line: broken/fissured bedrock, rock piles or slopes, old stone fences, or abandoned crumbling foundations Survey: Look near potential hibernacula on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct) Results: 5+ individuals of a species OR any number snakes from of 2 or more species	Feature containing hibernacula + 30 m radius	No suitable habitat is present on or adjacent to the project location.	Known to occur in the general area.	No further consideration required
	Five-lined Skink	Mixed Forests, Deciduous Forest, or Coniferous Forest dominated by Pine/Hemlock WITH rock outcrop openings providing cover rock overlaying granite bedrock with fissures. Survey: Look for individuals near potential hibernacula on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct) Results: All sites with active Skink hibernacula are SWH	Feature containing hibernacula +30 m radius	No suitable habitat is present on or adjacent to the project location.	Known to occur in the general area.	No further consideration required
Colonially-nesting Bird Breeding Habitat (Bank and Cliff)	Cliff Swallow, Northern Rough-winged Swallow	Eroding banks, sandy hills/piles, pits, steep slopes, cliff faces WITH size to support 8+ nests EXCLUDES: all man-made structures (bridge abutments, silos, barns, etc.) AND recently (2 years) disturbed soil (berms, embankments, stock piles, aggregate operations) Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects during breeding Results: 1+ nesting site with 8+ swallow pairs	Peripheral nests + 50m radius	Bank and cliff habitat not present at Project Location or adjacent lands.	Known to occur in the general area.	No further consideration required
Colonially-nesting Bird Breeding Habitat (Tree/Shrubs)	Black-crowned Night Heron, Great Blue Heron	Mixed Swamp (excluding those dominated by Cedar) or Treed Fen, Lake shorelines/ islands/ peninsulas WITH size to support 5+ nests *Nests are typically 11-15 m above ground near top of live or dead standing trees; occassionally in shrubs and emergents Survey: nesting (Apr-Aug) OR evidence (e.g. fresh guano, dead young, eggshells) Results: 5+ active nests	Edge of the colony + 300+m radius OR extent of the ecosite OR any island <15ha	Breeding bird surveys did not document confirmed breeding for these species.	Known to occur in the general area.	No further consideration required
Colonially-nesting Bird Breeding Habitat (Ground)	Caspian Tern, Common Tern, Great Black-backed Gull, Herring Gull, Little Gull, Ring-billed Gull	*Rocky island or peninsula in lake or large river WITH Meadow Marsh, Shallow Marsh, Shallow Aquatic, or Open Aquatic Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects, during active nesting (May-Jun) Results: 25+ active Herring Gull or Ring-billed Gull nests OR 5+ active Common Tern nests OR 2+ active Caspian Tern nests OR 1+ active Little Gull or Great Black-backed Gull nest	Edge of the colony + 150+m radius OR the ecosites containing the colony OR any island <3ha	Not observed present during field investigations.	Known to occur in the general area.	No further consideration required
	Brewer's Blackbird	Cultural Meadow, Thicket, Savannah, Fields, Pastures AND close to watercourse/ditch Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects during nesting (May-Jun) Results: 5+ pairs	Edge of the colony + 150+m radius OR the ecosites containing the colony OR any island <3ha	Not observed present during field investigations.	Known to occur in the general area.	No further consideration required
Deer Yarding Areas	White-tailed Deer	Stratum I (Core): Coniferous Forest or Swamp WITH 60+% canopy cover by Pine, Hemlock, Cedar, or Spruce Stratum II (typically surrounds Stratum I): Mixed or Deciduous Forest or Swamp WITH plenty of browse (esp. those dominated by Poplar or Birch); can include agricultural fields *applies to geographies where deer are constrained by snow depth of 40+cm for 60+days *EXCLUDES woodlots with high densities of deer due to artificial feeding	Determined by MNRF If present, consider Movement Corridors	No. The field surveys determined Deer Yarding Areas are not present within the Project Location.	Known to occur in the general area.	No further consideration required

SWH Type	Indicator Species	Habitat Descriptions & Criteria for Candidate SWH	SWH	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Rare Vegetation Communities						
Cliffs and Talus Slopes	Rock Tripe Lichen, ferns, Saxifraga paniculata	Cliff (near vertical bedrock 3+m tall) OR Talus slope (coarse rock rubble at base of cliff) Survey: ELC and vegetation inventory Results: lichen Umbilicaria spp AND 3+ other indicator sp (Polypodium virginianum, Cystopteris fragilis and Woodsia ilvensis, Cryptogramma stelleri, Woodsia alpina, and Saxifraga paniculata) OR Fragrant Cliff Fern (Dryopteris fragrans) OR Woodsia scopulina ssp. Laurentiana.	Ecosite	Not present.	Known to occur in the general area.	No further consideration required
Sand Barren	Reindeer Lichens (Cladina spp.), Carex houghtoniana, Carex merritt-fernaldii, Comptonia peregrina, Polygonella articulata, Rubus flagellaris, Selaginella rupestris, Stipa spartea, Viola labradorica	Sand Barren (SB) WITH size 0.5+ha AND <60% vegetation cover *usually located within forest or savannah *caused by lack of moisture, periodic fires and erosion Survey: ELC and vegetation inventory Results: 1+ indicator sp; <50% cover by exotic/invasive species	Ecosite	Not present.	Known to occur in the general area.	No further consideration required
Alvar	Monarda fistulosa, Panicum philadelphicum, Penstemon hirsutus, Rhus aromatica, Scutellaria parvula, Senecio pauperculus	Alvar, Coniferous Forest dominated by Pine or Cedar, Bedrock Cultural Meadow, Juniper Bedrock Alvar Cultural Thicket, Bedrock Cultural Savannah (CUS2), Bedrock Cultural Woodland (CUW2) WITH size 0.5+ha AND in excellent condition AND fits surrounding landscape with few conflicting land uses *typically level mosaic of rock pavements and bedrock overlain by thin veneer of soil *cover varies from sparse lichen-moss to grasslands and shrublands with <60 tree cover Survey: ELC and vegetation inventory Results: 1+ indicator sp; <50% cover by exotic/invasive species	Ecosite	Not present.	Known to occur in the general area.	No further consideration required
Old Growth Forest	None listed	Forest, Treed Swamp WITH size of 30+ha or WITH 10+ha interior habitat (assuming 100 m edge) *gaps caused by overstory mortality; abundance of snags and downed woody debris Survey: ELC and vegetation inventory Results: presence of 140+ year old trees AND no cut stumps or other signs of logging	Limited to area described above (may be less than 1 ecosite)	Not present.	Known to occur in the general area.	No further consideration required
Savannah	Criteria Schedules refer to 6E list	Tallgrass Savannah, Talgrass Woodland, Cultural Savannah WITH tree cover 25-60% *no minimum size Survey: ELC and vegetation inventory Results: <50% cover by exotic/invasive species AND natural OR restored	Ecosite	Not present.	Known to occur in the general area.	No further consideration required
Tallgrass Prairie	Indicator sp: Andropogon gerardii, Spartina pectinata	Tallgrass Prairie WITH <25 tree cover *no minimum size *EXCLUDES remnant sites such as railway right of ways Survey: ELC and vegetation inventory Results: 1+ indicator sp AND 2+ characteristic sp (Bromus kalmii, Ceanothus herbaceus, Lechea intermedia, Monarda fistulosa, Penstemon hirsutus, Polygala polygama, Rudbeckia hirta, Sorghastrum nutans, Viola fimbriatula); <50% cover by exotic/ invasive species	Ecosite	Not present.	Known to occur in the general area.	No further consideration required
Beach/Beach Ridge/Bar/Sand Dunes	Ammophila breviligulata, Lathyrus japonicus	Beach/Bar, Sand Dune, Shoreline Survey: ELC and vegetation inventory Results: 1+ indicator sp	Ecosite	Not present.	Known to occur in the general area.	No further consideration required

SWH Type	Indicator Species	Habitat Descriptions & Criteria for Candidate SWH	SWH	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Shallow Atlantic Coastal Marsh	Rhexia virgininica	Meadow Marsh, Shallow Marsh, Floating-leaved Shallow Aquatic *occurs on sand or sandy peat shoreline on inland lakes and beaver ponds, esp those with fluctuating water levels (i.e. some years with exposed shorelines in summer/fall) Survey: ELC and vegetation inventory Results: 1+ indicator sp AND 5+ other characteristic species (Rhynchospora capitellata, Xyris difformis, Panicum spretum, Triadenum virginicum, Polygonum careyi, Juncus militaris)	Ecosite	Not present.	Known to occur in the general area.	No further consideration required
Rock Barren	None listed	Rock Barren WITH size of 1+ha AND relatively undisturbed AND tree cover <60% *characterized by extensive areas of exposed granitic rock Survey: ELC and vegetation inventory Results: 5+ characteristic species (Reindeer lichens Cladina spp, Haircap mosses Polytrichum spp, Danthonia spicata, Deschampsia flexuosa, Juniperus communis, Vaccinium angustifolium, Comptonia peregrina, Quercus alba, Quercus rubra, Pinus strobus, Pteridium aquilinum, Aralia hispida, Spiranthes casei, Saxifraga virginiensis, Gaylussacia baccata, Corydalis sempervirens, Prunus pensylvanica, Comandra umbellata)	Ecosite	Not present.	Known to occur in the general area.	No further consideration required
Bog	Sphagnum moss, ericaceous shrubs and sedges	Bog *no minimum size Survey: community classification and vegetation inventory Results: no additional criteria	Ecosite	Not present.	Known to occur in the general area.	No further consideration required
Red Spruce Forest	Picea rubens	Coniferous Forest and some coniferous swamps/bottomlands, often on shallow till soils, organic soils over rock, or steeper slopes *no minimum size Survey: ELC and vegetation inventory Results: 10+% cover by Red Spruce	Ecosite	Not present.	Known to occur in the general area.	No further consideration required
White Oak Forest	White Oak	Deciduous or Mixed forest *no minimum size Survey: ELC and vegetation inventory Results: 10+% cover by White Oak	Ecosite	Not present.	Known to occur in the general area.	No further consideration required
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, Common Merganser, Red-breasted Merganser, Mallard, Canada Goose, American Widgeon, Bufflehead, Common Goldeneye	Upland Habitats WITH width 120+m AND adjacent shallow aquatic, shallow marsh, meadow marsh, thicket swamp, or treed swamp *Wood Ducks Bufflehead, Common Goldeneye, and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects during breeding (Apr-Jun) Results: 1+ nesting site of Black Duck OR 10+ nesting pairs of Mallard OR 3+ nesting pairs of other listed species AND <120m from a wetland 0.5+ha OR 3 small wetlands <0.5ha	Ecosite + 100-300m radius	No suitable nesting habitat present. These waterfowl species were not observed nesting during field investigations or breeding bird surveys.	Known to occur in the general area.	No further consideration required
Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat	Osprey, Bald Eagle	Forest, Swamp AND adjacent to shoreline/riparian areas of rivers, lakes, ponds, wetlands *Osprey nests are usually at the top a tree *Bald Eagle nests are typically in a notch in the canopy of supercanopy trees *EXCLUDES: Nests on man-made objects (e.g. telephone poles, constructed platforms) Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects (Mar-Aug) Results: 1+ active nest AND known to be used annually; to be excluded nests must be known to be inactive for 3+yrs or suspected to be inactive for 5+yrs	Osprey: active nest +300m radius OR contiguous woodland; Bald Eagle: active nest +400-800m radius	No. Field investigations did not observe nests of Osprey, Bald Eagle or the species.	Known to occur in the general area.	No further consideration required

SWH Type	Indicator Species	Habitat Descriptions & Criteria for Candidate SWH	SWH	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Woodland Raptor Nesting Habitat	Broad-winged Hawk, Cooper's Hawk, Merlin, Northern Goshawk, Red-shouldered Hawk, Red-tailed Hawk, Sharp-shinned Hawk, Barred Owl, Great-horned Owl	Forest, treed Swamp, Coniferous Plantations WITH size 30+ha AND 4+ha of interior habitat assuming a 200m edge *nests may be re-used from year to year or built in close proximity to old nests Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects (Mar-May) Results: 1+ active nest	Red-shouldered Hawk, Northern Goshawk: active nest +400m radius OR 28ha suitable habitat; Barred Owl: active nest +200m radius; Broad-winged Hawk, Coopers Hawk, Great-horned Owl, Red-tailed Hawk: active nest +100m radius; Merlin, Sharp-shinned Hawk: active nest +50m radius	No interior habitat present on or adjacent to the Project Location. No raptor nests observed during field investigation.	Known to occur in the general area.	No further consideration required
Turtle and Lizard Nesting Areas	Midland Painted Turtle, Snapping Turtle, Northern Map Turtle	Open sand and gravel beaches WITH adjacent Bog, Fen, Meadow Marsh, Floating Marsh, or undisturbed shallow weedy areas of marshes, lakes, and rivers *EXCLUDES nest sites along roads / highways Survey: should be conducted in prime nesting season typically late spring to early summer Results: 5+ nesting Midland Painted OR 1+ nesting Northern Map or Snapping Turtle	Nesting area + 30-100m radius, depending on slope, riparian vegetation, adjacent land use, and consideration of travel routes to/from nest sites	No. Field studies confirmed the absence of turtle nesting habitat on the Site. Roadways used within the Site are not accessible to reptiles due to the presence of permiter fencing around the facility.	Known to occur in the general area.	No further consideration required
	Five-lined Skink	Deciduous and Mixed Forests *nests under logs, in stumps or under loose rock in partially wooded areas Survey: should be conducted in prime nesting season typically late spring to early summer Results: 1+ nesting skink	Active nest +30m radius	No suitable habitat present.	Known to occur in the general area.	No further consideration required
Seeps and Springs	Wild Turkey, Ruffed Grouse, Spruce Grouse, Moose, White-tailed Deer, Salamander spp.	Forest in headwaters area of a stream/river system *important wildlife feeding/drinking areas, especially in the winter Results: 2+ seeps/springs	Ecosite/ecoelement; may include ajdacent habitats pending consideration of: slope, vegetation, height of trees and groundwater condition	No seeps/springs observed.	Known to occur in the general area.	No further consideration required
Amphibian Breeding Habitat (Woodland)	Eastern Newt, Blue-spotted Salamander, Spotted Salamander, Four-toed Salamander, Northern Two-lined Salamander, Spring Peeper, Wood Frog	Pond / vernal pool WITH size of 500+m^2 (~25m diameter) WITH adjacent Forest/Swamp *ponds containing water until at least mid-July are preferred Survey: combo observational and call count surveys required (Mar-Jun) Results: 1+ breeding salamander species OR 2+ breeding frog species WITH 20+ individuals (adults or eggs masses) OR Call Level Code 3	Breeding pond/wetland +230m radius of woodland habitat *should consider travel corridor SWH	No. Amphibian breeding surveys were completed and wetlands are not significant wildlife habitat for amphibians.	Known to occur in the general area.	No further consideration required
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	Swamp, Fen, Bog, Meadow Marsh, Shallow Marsh, Shallow Aquatic, Open Aquatic *Shrubs and logs increase significance for some species because of structure for calling, foraging, escape, and concealment from predators Survey: combination of observational study and call count surveys required during the spring (Mar-Jun) Results: 1+ breeding salamander species OR 2+ breeding frog/toad species WITH 20+ individuals (adults or eggs masses) OR Call Level Code 3	Breeding pond/wetland +230m radius of woodland habitat *Should consider travel corridor SWH	No. Amphibian breeding surveys were completed and wetlands are not significant wildlife habitat for amphibians.	Known to occur in the general area.	No further consideration required

SWH Type	Indicator Species	Habitat Descriptions & Criteria for Candidate SWH	SWH	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Aquatic Feeding Habitat	Moose, White-tailed Deer	Wetlands or isolated embayments that provide an abundance of submerged aquatic vegetation WITH adjacent Conifer/Mixed Forest Survey: Observational use or evidence (tracks) when submergent aquatic vegetation has peaked (Jun-Jul) *MNRF maps these on Crown land on a scale of 0 (poor) – 4 (best); Sites classed 3 or 4 are candidate SWH; where habitat is in low supply, class 2 can be candidate SWH Results: any candidate site with observed or demonstrated moose use	Wetland area and adjacent forest stands (120m) of mixed or conifer forest *should consider movement corridor SWH	Suitable habitat not observed during site invesitgations.	Known to occur in the general area.	No further consideration required
Mineral Licks	Moose, White-tailed Deer	Forest WITH upwelling groundwater Survey: Field investigations should be conducted in early spring prior to leaf out Results: confirmed habitat	Ecosite +100-200m radius of contiguous forest habitat, depending on level of disturbance	Suitable habitat not observed during site invesitgations.	Known to occur in the general area.	No further consideration required
Denning Sites for Mink, Otter, Marten, Fisher and Eastern Wolf	Mink, Otter, Marten, Fisher, Grey Wolf, Eastern Wolf	*Mink prefer coniferous or mixed forest on shorelines, sometimes use old muskrat lodges *Otters prefer undisturbed shorelines along water bodies that support productive fish populations with abundant shrubby vegetation and downed woody debris for denning; often use old beaver lodges, log jams, and crevices in rock piles *Marten and fisher require large tracts of mature/older coniferous or mixed forests Survey: none specified; dens are very difficult to locate, so protection of all suitable habitat should be considered Results: confirmed habitat	Known Wolf den +200m radius OR known den of any other listed species +100m radius	Denning habitat was not observed during the site investigations.	Known to occur in the general area.	No further consideration required
Mast Producing Areas	Black Bear, Whire-tailed Deer, Wild Turkey, Ruffed Grouse	Deciduous and Mixed Forests WITH mature Oak or Beech AND size 0.5+ha *Significant associates: hickory, basswood, black cherry, ironwood, mountain ash, pin cherry, butternut, blueberries, blackberry, serviceberry, raspberry, beaked hazel, choke cherry, hawthorn Survey: Surveys should be conducted when plants are actively growing (Jun-Aug) Results: forest WITH 50+% of mast producing tree species >40-65cm dbh OR opening within a forest with an 50+% cover of mast producing shrubs	Ecosite	Not present.	Known to occur in the general area.	No further consideration required
Habitat of Species of Conservation Concern						
Marsh Bird Breeding Habitat	American Bittern, Virginia Rail, Yellow Rail, Sora, Red-necked Grebe, Pie-billed Grebe, Redhead, Ring-necked Duck, Lesser Scaup, Ruddy Duck, Common Moorhen, American Coot, Wilson's Phalarope, Common Loon, Sandhill Crane, Green Heron, Sedge Wren, Marsh Wren, Trumpeter Swan, Black Tern	Wetland WITH shallow water AND emergent vegetation *Green Heron prefers edge of water (sluggish streams, ponds, marshes sheltered by shrubs and trees), but can also be found in upland shrubs or forest a considerable distance from water Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects during breeding (May-Jun) Results: 1+ breeding Black Tern, Trumpeter Swan, Green Heron or Yellow Rail OR 5+ nesting pairs of Sedge Wren or Marsh Wren OR breeding by 5+ other listed species	Ecosite	No. Breeding bird studies did not confirm breeding of the listed marsh birds.	Known to occur in the general area.	No further consideration required
Open Country Bird Breeding Habitat	Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow, Northern Harrier, Savannah Sparrow, Short-eared Owl	Cultural Meadows WITH size 30+ha AND history of longevity present for at least 5 years) *EXCLUDES Class 1 or 2 agricultural lands AND lands being actively used for crops or pasture in the last 5 years Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects spring-summer breeding and territorial defense Results: nesting/breeding of 2+ listed species OR 1+ breeding Short-eared Owl	Ecosite + contiguous field habitats	Suitable habitat not observed during site invesitgations.	Known to occur in the general area.	No further consideration required

SWH Type	Indicator Species	Habitat Descriptions & Criteria for Candidate SWH	SWH	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Shrub/Early Successional Bird Breeding Habitat	Brown Thrasher, Clay-coloured Sparrow, Field Sparrow, Eastern Towhee, Willow Flycatcher, Blue-winged Warbler, Tennessee Warbler, Prairie Warbler, Golden-winged Warbler	Field habitats succeeding to Cultural Woodland, Cultural Savannah or Cultural Thicket WITH size of 10+ha AND history of longevity *EXCLUDES Class 1 or 2 agricultural lands AND lands being actively used for crops or pasture in the last 5 years Survey: Bird and Bird Habitats: Guidelines for Wind Power Projects spring-summer breeding and territorial defense Results: 1+ indicator species AND 2+ listed common species OR 1+ breeding Yellow-breasted Chast or Golden-winged Warbler	Ecosite + contiguous field/thicket habitats	Suitable habitat not observed during site invesitgations.	Known to occur in the general area.	No further consideration required
Special Concern and Rare Wildlife Species	Any Special Concern or provncially rare (S1-S3, SH) species	Any - varies by species *Presence of NHIC Element Occurrence records should trigger screening Survey: to be completed during the time of year when the species is present or easily identifiable Results: habitat needs to cover an important life stage component (e.g. nesting, foraging, or wintering habitat)	Finest ELC scale that protects the habitat form and function	No. Field studies confirmed the absence of Special Concern species and provincially rare species within the Project Area. Thus, this type of SWH is absent within the Project Location.	Known to occur in the general area.	No further consideration required
Animal Movement Corridors						
Amphibian Movement Corridors	Frogs, Toads and salamanders	Any habitat associated with water, ideally WITH several layers of native vegetation AND unbroken by roads, waterways, waterbodies, and development *potential determined based on identification of Amphibian Breeding SWH Survey: Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites (early spring / late summer for most species) Results: Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat	15+m on both sides of a waterway/ecosite OR up to 200m wide in woodland habitats	No. Field surveys confirmed the absence of SWH for amphibian breeding. Thus, no amphibian movement corridors are located within the Project Location.	Known to occur in the general area.	No further consideration required
Cervid Movement Corridors	White-tailed Deer, Moose	Any forested habitat *potential determined based on identification of Deer Wintering SWH, Moose Aquatic Feeding Area SWH or Mineral Lick SWH Survey: Studies must be conducted at the time of year when deer or moose are migrating or moving to and from yard, mineral lick or feeding areas Results: Shorter corridors are more significant than longer corridors, however cervids must be able to get to and from their habitat	Corridors should be 200+m wide with gaps <20m OR if following riparian area, 15+m vegetation cover on both sides of the waterway	Suitable habitat not observed during site invesitgations.	Known to occur in the general area.	No further consideration required
Furbearer Movement Corridor	Mink, Otter	Any Forest habitat within/adjacent to shoreline *potential determined based on identification of Denning SWH Survey: Surveys must be conducted at the time of year when mink or otter are using the denning site and can be based on direct observation or evidence (scat, tracks) Results: not specified in Criteria Schedules	Not specified in Criteria Schedules	Suitable habitat not observed during site invesitgations.	Known to occur in the general area.	No further consideration required