



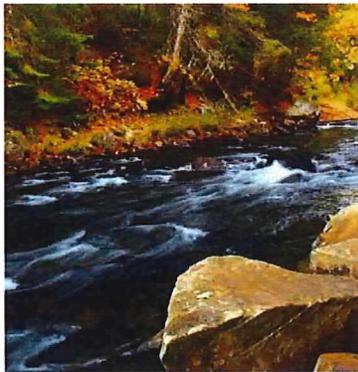
Natural Environment Level 1 Study

John Rintala Trucking Quarry
Fairbank Lake Rd, City of Greater Sudbury

Project # 191439

11 January 2021

Version 1.0





VERSION HISTORY

Version	Date	Modifications
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1. INTRODUCTION

Tulloch Environmental, a division of Tulloch Engineering (Tulloch), was retained by Brad Rintala (the Proponent) to perform Natural Environment Levels 1 and 2 (NEL1 & NEL2) studies for inclusion in an application for Category 3 Class A Pit and Category 4 Class A Quarry licences under the Aggregate Resources Act (ARA). This application is in relation to privately owned lands on Lot 9, Concession 2 of the Township of Denison, City of Greater Sudbury, Ontario (henceforth the Property'; Figure 1).

1.1 Project Description and Study Area

The proposed Rintala quarry (the Project) is located on Lot 9, concession 2 of the Township of Denison, City of Greater Sudbury, Ontario; UTM (NAD83) 17T 469546 5137345 (Figure 1). This Property is located on Fairbank Lake Road, approximately 2 km west of the intersection of Fairbank Lake Road and Bay Street. The Property includes approximately 124 hectares of privately owned land. The north end of the Property is transected by road and rail right-of-ways for Fairbank Lake Road and a Genesee & Wyoming Canada Inc. rail line, respectively. Property access is facilitated by an existing unpaved driveway that extends south from Fairbank Lake Road, across the rail corridor and onto the main upland body of the Site. The existing access driveway is not subject to this ARA permit application.

Not all areas of the Property are feasible for development and large areas of the Property have been excluded from this ARA licence application. The southernmost portion of the Property is isolated by a large wetland complex that transects the Property and renders this area logistically inaccessible. This isolated section of the Property and the southern wetland complex have been omitted from the proposed Licence Area.

An ecological approach was taken to establishing the proposed Licence and Extraction Areas for this Project. In early 2019, the Proponent engaged Tulloch to undertake a desktop environmental opportunities and constraints assessment for the Property. That assessment identified the potential sensitivities of wetland complexes north, south and east of the Property, as well as the potential for intensive studies to evaluate the impacts of aggregate extraction if proposed in close proximity. Based on this information, the Proponent committed *a priori* to retain those large wetland complexes and to establish appropriate operational setbacks to safeguard their function. The Proponent further requested that the environmental professionals at Tulloch propose and delineate the Extraction Area for this Project in a manner that avoided known (and in some instances, candidate) Natural Heritage features. The Licence Area (also referred to as the 'Site') was then established in relation to the Extraction Area. This proactive approach has three advantages, (1) the potential for project impacts is greatly reduced by integrating Natural Heritage feature avoidance into the project design from inception, (2) the retention of, and setback from, key sensitive areas avoided the need for intensive studies associated with those areas, and (3)

tailoring the Licence Area to the operations allowed NEL1 studies to better focus effort on those areas to be impacted.

The Study Area is defined as the Licence Area and areas within 120m. As the Licence Area was situated based on environmental considerations, habitat assessments were undertaken in areas beyond the Study Area. This additional habitat information is also included in this NEL1 report for reference purposes.

1.2 Natural Heritage and Natural Environment Study Objectives

NEL1 and NEL2 studies are performed in partial fulfillment of licence application standards under the ARA. Policy number A.R.4.01.06 of the Aggregate Resources Program Policies and Procedures Manual (MNR 2006) outlines the Natural Environment Report Standards for aggregate site applications. This policy states that the NEL studies shall determine whether one or more of the following Natural Heritage features, as identified within Section 2.1 of the Provincial Policy Statement (PPS; OMMAH 2014) exists on-site, or within 120 m of the Site:

- a. significant wetlands;
- b. significant habitat of endangered and threatened species;
- c. significant areas of Natural and Scientific Interest (ANSIs);
- d. significant woodlands (south and east of the Canadian Shield);
- e. significant valleylands (south and east of the Canadian Shield);
- f. significant wildlife habitat; and,
- g. fish habitat.

These features are themselves defined by provincial legislation (e.g. the *Endangered Species Act*), provincial policy documents (e.g. the *Ontario Wetland Evaluation System*, *Significant Wildlife Habitat Technical Guide*) or are directly established by the provincial government.

The federal government also identifies natural features of conservation concern and establishes protections that apply to provincial developments. Examples include migratory birds (via the *Migratory Birds Conservation Act*; S.C. 1994, c. 22) and fish habitat (via the *Fisheries Act*; R.S.C., 1985, c. F-14). These federal priorities, while not defined as Natural Heritage features, are typically assessed in conjunction with provincial Natural Heritage as their identification, evaluation and mitigation are closely related and interconnected.

These NEL1 studies were performed in partial fulfillment of permit application standards under the ARA. Policy number A.R.4.01.06 of the Aggregate Resources Program Policies and Procedures Manual (MNR 2006) outlines the Natural Environment Report Standards for aggregate site applications. This policy states that the NEL1 report shall determine whether one or more Natural Heritage features, as identified within the Provincial Policy Statement (PPS; OMMAH 2014) exists on-site or within 120 m of the proposed development.

These NEL1 studies were undertaken as a stepwise process by which habitat was described, candidate Natural Heritage features were identified, and their significance assessed. **Each step is summarised in one or more tables / figures, and these summaries are listed in Table 1.** This report outlines the methods and results of desktop and on-site field studies performed throughout the 2019 and 2020 field seasons. This report establishes the existing conditions on Site and forms the basis for impact assessments and mitigation strategies that will be outlined in a Natural Environment Level 2 (NEL2) report issued separately.

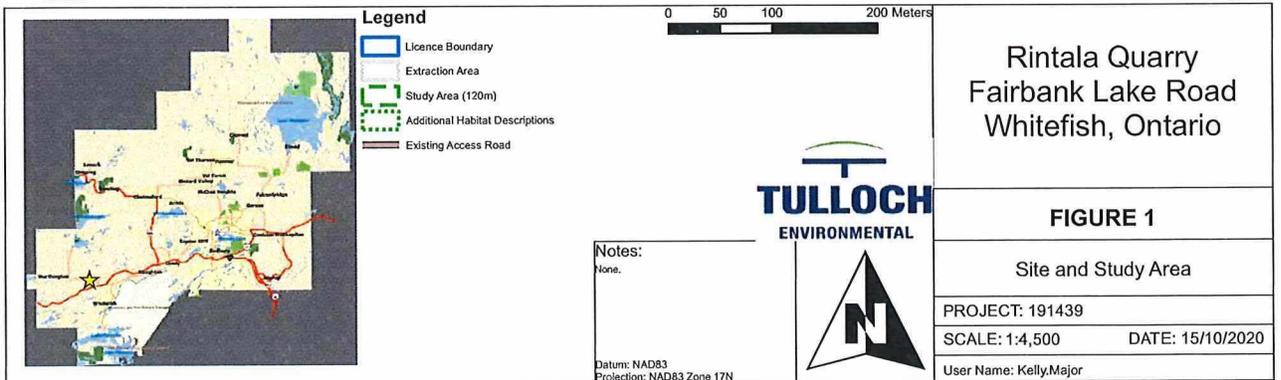
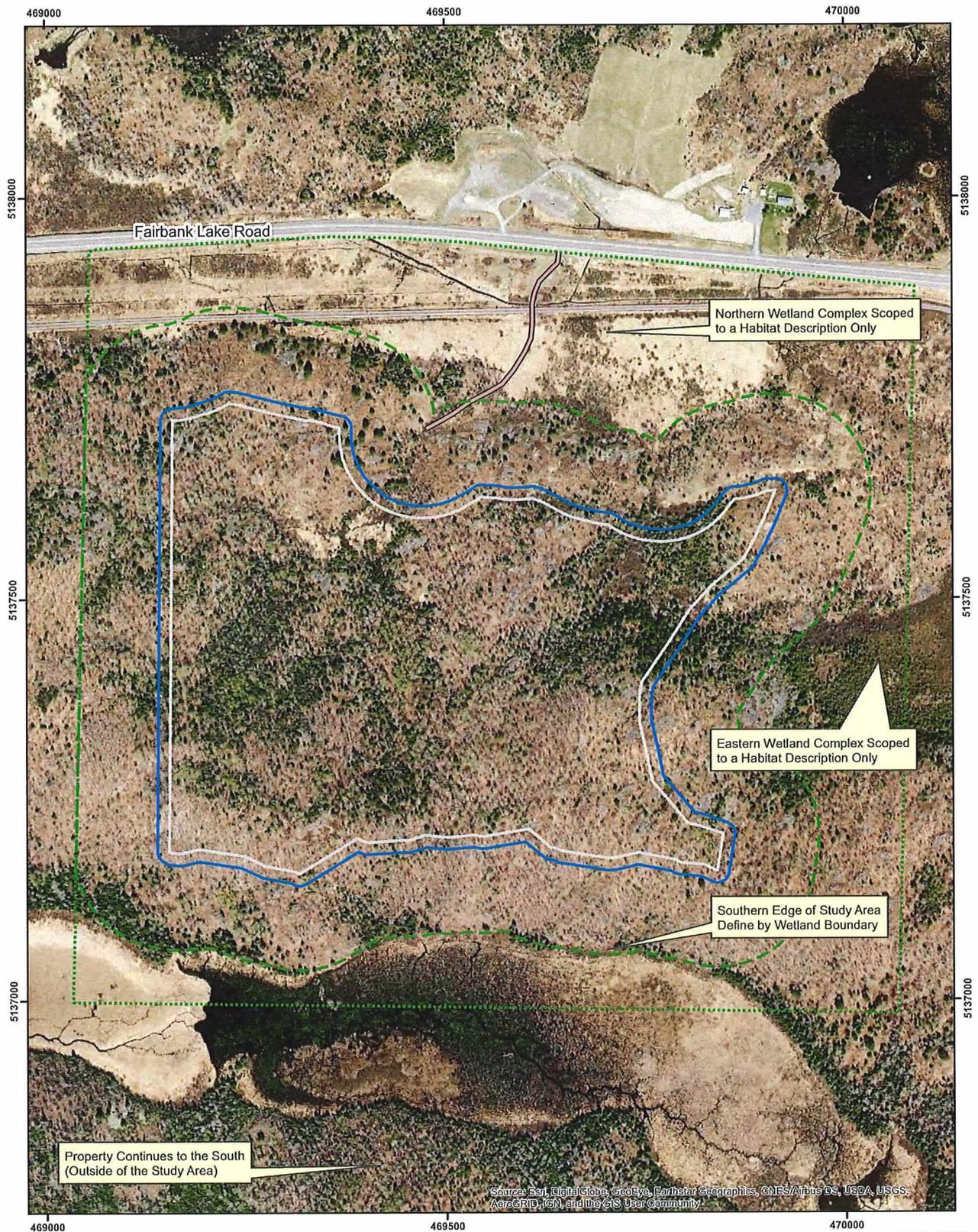


Table 1 – Summary of the steps taken in these NEL1 studies and locations of summary figures / tables for each step.

Step	Objective	Summaries
1. Natural Heritage Background Review	To review provincial, federal and local databases for records of Natural Heritage features know to occur, or with a potential to occur, within the Study Area.	See Table 4 in Section 2.14.
2. Habitat Description	To describe and classify the physical structure and composition of terrestrial and aquatic habitat across the Study Area. Habitats was also described for some areas beyond the Study Area.	See Figures 2, 3 and 4 in Section 4.1.
3. Identify <i>Candidate</i> Natural Heritage Features	To identify species and habitat that may qualify as significant Natural Heritage features based on information from Step 1 and Step 2.	See Table 10 in Section 4.2.
4. Assess the Significance of Candidate Natural Heritage Features.	To undertake studies to evaluate if candidate Natural Heritage features meet criteria to be considered significant.	See Table 15 and Figure 6 in Section 5.
5. Carry Forward to NEL2 Studies.	Any Natural Heritage features confirmed (or assumed) to be present are carried forward to NEL2 studies for the establishment of avoidances and mitigations.	See Table 15 in Section 5. See NEL2 Study.

2. NATURAL HERITAGE BACKGROUND REVIEW

2.1 Sources Reviewed

A background natural heritage review was conducted to determine which natural heritage features exist, or have the potential to exist, within the defined Study Area and its general vicinity. Records and resources searched as part of the background review are listed in Table 2. Communications with regulatory authorities are provided in Appendix A.

2.2 Ecodistrict and Ecoregion

This Study Area is located in Ecodistrict 5E-4 of Ecoregion 5E (the Georgian Bay Ecoregion). The Georgian Bay Ecoregion is characterized by a cool-temperate and humid climate with a mean annual temperature range of 2.8 to 6.2°C (MNR 2009b). This Ecoregion is situated on the southern edge of the Precambrian shield. It is typically underlain with gneissic bedrock as well as deposits of ground moraine till and glaciofluvial materials. This Ecoregion is part of the Great Lakes Watershed. Land cover is predominantly mixed forest, deciduous forest, and coniferous forest of the Great Lakes – St. Lawrence Forest Region (MNR 2009b).

2.3 Protected Areas

Protected areas included federal, provincial, and municipal parks as well as Conservation Reserves, Enhanced Management Areas (EMAs), Provincially Significant Wetlands (PSWs) and Areas of Natural and Scientific Interest (ANSI).

A review of data provided by LIO in conjunction with communications with the Ministry of Natural Resources and Forestry (MNRF) have identified no protected areas within 1000 m of the Study Area.

Table 2 - Records and resources searched in background review.

Record Source		Records Requested and/or Reviewed
Ministry of Natural Resources and Forestry (MNRF) Sudbury District	Date of Request: 31 May 2019 Date of Data Receipt: 02 July 2019 12 July 2019	Mike Hall Management Biologist Existing environmental values information, including any sensitivities and environmental constraints.
Nickel District Conservation Authority	Accessed: 31 May 2019	Accessed web application for review of NDCA administrative area.
Natural Heritage Information Centre (NHIC) Ministry of Natural Resources and Forestry (MNRF)	Accessed: 31 May 2019	Natural Heritage Mapping Tool queried for records of provincially tracked species (e.g. SAR and rare species), ANSI and other protected areas in vicinity to the Study Area.
MNRF Fish ON-line	Accessed: 31 May 2019	Reviewed known fish species present in waterbodies near the Study Area.
Atlas of the Breeding Birds of Ontario (ABBO)	Accessed: 31 May 2019	Determine migratory birds, including SAR within block #: 17MM73, 17MM63
Ontario Reptile and Amphibian Atlas	Accessed: 31 May 2019	Determine reptiles and amphibians including SAR within block #: 17MM73, 17MM63
Bat Conservation International (BCI)	Accessed: 31 May 2019	Reviewed SAR bat ranges associate with the Study Area and surrounding area.
Ontario Butterfly Atlas Online (OBAO) Toronto Entomologists' Association	Accessed: 31 May 2019	Query for records of SAR butterflies in vicinity to the Study Area
eBird.org Cornell Lab of Ornithology	Accessed: 07 August 2020	Query for records of selected SAR bird species in vicinity to the Study Area.
Global Biodiversity Information Facility	Accessed: 07 August 2020	Query for records of wildlife and plant species in vicinity to the Study Area.
Ontario GeoHub	Accessed: 12 June 2019	Accessed GIS spatial data regarding known significant habitats including: <ul style="list-style-type: none"> • Significant Wildlife Habitats • Wildlife Nesting Areas • Provincially Significant Wetlands • Areas protected federally, provincially or municipally.

2.4 Land Use

The Property is Private Land and abuts private land on the all four sides. The north end of the Property is transected by road and rail right-of-ways for Fairbank Lake Road and a Genesee & Wyoming Canada Inc. rail line, respectively. Property access is facilitated by an existing unpaved driveway that extends south from Fairbank Lake Road, across the rail corridor, and onto the main upland body of the Site. Aside from the access driveway and rail corridor, areas south of Fairbank Lake Road remain undeveloped natural spaces. North of Fairbank Lake Road is a residential dwelling and cleared fallow fields that are also owned by the Proponent. Areas north of the road corridor are not included in this study.

2.5 Migratory Birds

The *Migratory Birds Convention Act* (MBCA S.C. 1994, C.22) and the Ontario Fish and Wildlife Conservation Act (FWCA S.O. 1997, C.41) prohibits the disturbance and destruction of most birds, their nests and eggs. Environment and Climate Change Canada has developed a number of tools, including the general nesting calendars (<https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html>) and avoidance guidelines (<https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/guidelines.html>) to support compliance with the Act.

Environment and Climate Change Canada considers the General Nesting Period for the Study Area (Nesting Zone C3) to be from April 08 to August 28 in forested areas, from April 12 to August 28 in open habitat, and from April 08 to August 16 in wetlands.

2.6 Species at Risk (SAR)

Species at Risk (SAR) include species identified federally under the *Committee on the Status of Endangered Wildlife in Canada* (COSEWIC) and provincially under the *Committee on the Status of Species at Risk in Ontario* (COSSARO). Species and their habitat listed as endangered or threatened are regulated federally under the *Canadian Species at Risk Act* (SARA S.C. 2002 c.29) and provincially under the *Ontario Endangered Species Act* (ESA S.O. 2007 c.6). In some instances, species listed as special concern may also receive habitat protection under the *2014 Provincial Policy Statement* (PPS; MMAH 2014); see Section 2.7, below.

Information obtained from the review of provincial databases and species atlases in combination with consultation with the MNRF identified 17 SAR with records in vicinity to the Study Area (Table 3). NHIC data indicated one (1) SAR record within 1000m of the Study Area; Barn Swallow (*Hirundo rustica*; Threatened).

ABBO records indicate 11 SAR species have been observed within the 10km x 10km atlas block associated with this Study Area:

- Bank Swallow (*Riparia riparia*; Threatened)
- Bobolink (*Dolichonyx oryzivorus*; Threatened)
- Canada Warbler (*Cardellina canadensis*; Special Concern)
- Chimney Swift (*Chaetura pelagica*; Threatened)
- Common Nighthawk (*Chordeiles minor*; Special Concern)
- Eastern Meadowlark (*Sturnella magna*; Threatened)
- Eastern Whip-poor-will (*Antrostomus vociferous*; Threatened)
- Eastern Wood-pewee (*Contopus virens*; Special Concern)
- Golden-winged Warbler (*Vermivora chrysoptera*; Special Concern)
- Olive-sided Flycatcher (*Contopus cooperi*; Special Concern)
- Short-eared Owl (*Asio flammeus*; Special Concern)

Queries of Cornell Lab's eBird atlas identified records of the following four (4) SAR birds:

- Barn Swallow (*Hirundo rustica*; Threatened)
- Bobolink (*Dolichonyx oryzivorus*; Threatened)
- Eastern Meadowlark (*Sturnella magna*; Threatened)
- Golden-winged Warbler (*Vermivora chrysoptera*; Special Concern)

The ORAA indicated that Blanding's Turtle (Block 17MM73) and Snapping Turtle (Blocks 17MM63 & 17MM73) are associated with this Study Area. The MNRF identified timing windows for Blanding's Turtle, with the active period identified to be from May 01 to September 30 and the overwintering period identified as September 01 to May 15.

BCI indicated that three (3) Endangered bat species have ranges which include the Study Area:

- Little Brown Bat (*Myotis lucifugus*)
- Northern Long-eared Bat (*Myotis septentrionalis*)
- Eastern Small-footed Bat (*Myotis leibii*)

OBAO records indicated no SAR butterfly species with records within the 10 x 10km atlas block associated with the Study Area.

Queries of GBIF records indicated no SAR species with records within 1000m of the Study Area.

Table 3 – Species at Risk with records in vicinity to the Study Area.

Species	Scientific Name	Source	SARA	ESA
Bank Swallow	<i>Ripari riparia</i>	ABBO (Record)	THR	THR
Barn Swallow	<i>Hirundo rustica</i>	NHIC / eBird.org	-	THR
Blanding's Turtle	<i>Emydoidea blandingii</i>	ORAA (Record)	THR	THR
Bobolink	<i>Dolichonyx oryzivorus</i>	ABBO (Record) / eBird.org	-	THR
Canada Warbler	<i>Cardellina canadensis</i>	ABBO (Record)	THR	SPC
Chimney Swift	<i>Chaetura pelagica</i>	ABBO (Range)	THR	THR
Common Nighthawk	<i>Chordeiles minor</i>	ABBO (Record)	THR	SPC
Eastern Meadowlark	<i>Sturnella magna</i>	ABBO (Record) / eBird.org	-	THR
Eastern Small-footed Bat	<i>Myotis leibii</i>	BCI (Range)	END	END
Eastern Whip-poor-will	<i>Antrostomus vociferous</i>	ABBO (Record)	THR	THR
Eastern Wood-pewee	<i>Contopus virens</i>	ABBO (Record)	SPC	SPC
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	ABBO (Range) / eBird.org	THR	SPC
Little Brown Bat	<i>Myotis lucifugus</i>	BCI (Range)	END	END
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	BCI (Range)	END	END
Olive-sided Flycatcher	<i>Contopus cooperi</i>	ABBO (Record)	THR	SPC
Short-eared Owl	<i>Asio flammeus</i>	ABBO (Record)	SPC	SPC
Snapping Turtle	<i>Chelydra serpentina</i>	ORAA (Record)	SPC	SPC

ABBO = Atlas of the Breeding Bird of Ontario; BCI = Bat Conservation International; ORAA = Ontario Reptile and Amphibian Atlas, END = Endangered; THR = Threatened; SC = Special Concern, SARA = Species at Risk Act (Federal); ESA = Endangered Species Act (Provincial)

2.7 Significant Wildlife Habitat (SWH)

Significant Wildlife Habitats (SWH) are outlined in the *Significant Wildlife Habitat Technical Guide* (MNR 2000) as natural heritage areas that are “ecologically important in terms of features, functions, representation and amount and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System”. The alteration and development of SWH is prohibited under the 2014 PPS. Habitat may be considered to be SWH according to four broad categories:

- Seasonal concentration areas (i.e., winter deer yards, colonial bird nesting sites, reptile hibernacula);
- Rare vegetation communities or specialized habitat for wildlife (i.e., alvars, rare forest types, moose aquatic feeding areas, amphibian woodland breeding ponds, turtle nesting habitat);
- Habitat of species of conservation concern (i.e., species identified as special concern federally or provincially, and species listed as rare or historical in Ontario based on records kept by the NHIC (i.e. S1- Critically Imperiled, S2- Imperiled, S3- Vulnerable and SH -

Historic ranks); These ranks are not legal designations but are assigned in a manner to set protection priorities); and,

- Animal movement corridors (i.e., naturally vegetated corridors or man-made features such as power transmission and pipeline corridors that provide animal movement from one habitat to another).

The Study Area is located in Ecodistrict 5E-4. The MNRF identifies 43 SWH associated with Ecoregion 5E. A review of provincial records in conjunction with correspondence with the MNRF found no existing records of SWH associated with the Study Area.

The MNRF identified that this Study Area is within the known range of a re-introduced population of Elk (*Cervus canadensis*). This Worthington area herd was first established from animals that escaped the Burwash Prison Camp in the 1930s. This herd has since been bolstered with the release of approximately 300 more individuals since 1998 (Mike Hall, personal communications). There are no SWH that specifically address Elk in Ecoregion 5E, and Elk is not a protected SAR in Ontario. Tulloch will consider Elk in light of SWH addressing other cervid species (White Tailed Deer and Moose). Tulloch has made multiple attempts to contact the *Sudbury Elk Restoration Committee* for comment and mitigation input, but no response has been received as of the publication of this report.

2.8 Locally Rare Species

The NHIC and consultation with MNRF identified no locally rare species associated with the Study Area.

2.9 Significant Woodlands and Valleylands

Significant woodlands and valley lands do not apply to this undertaking as the Study Area is not located in Ecoregions 6E or 7E.

2.10 Fisheries and Fish Management Objectives

Ontario GeoHub data and aerial imagery indicated a number of unsurveyed waterbodies, (e.g. creeks and wetlands) along Fairbank Lake Road and in wetland complexes adjacent the north, south and east sides of the Study Area. These aquatic features are connected to nearby waterbodies including Perch Lake, May Lake, St. Pothier Lake and Fairbank Creek. No fisheries information is available. The MNRF identified Fairbank Creek as a cold-water thermal regime, and St. Pothier Lake as a warm-water thermal regime.

2.11 Wetlands

Extensive wetland complexes exist within, and in vicinity to, the Study Area. These wetlands are divided into two complexes by a quaternary watershed (Figure 1). One complex includes wetland units north and south of the Study Area. The other complex includes wetland units east of the Study Area. Both wetland complexes extend for multiple kilometers. Additional smaller wetland units may be present within the Study Area.

The significance of these wetlands are not known as neither have been evaluated per the Ontario Wetland Evaluation System (OWES; MNR 2014). According to the PPS, development cannot occur within wetlands deemed to be provincially significant, and development may only occur adjacent significant wetlands if it can be demonstrated that the undertaking will not negatively impact the ecological functions of these areas. The proposition of aggregate extraction within unevaluated wetlands typically triggers the need for OWES studies. OWES evaluations are not feasible for this undertaking owing the size of the two wetland complexes and the need this level of study would produce to evaluate wetlands that extend for kilometers in each cardinal direction. At Tulloch's recommendation, the Proponent has committed to retain and set back from any wetlands that could qualify as Provincially Significant in order to forgo the need for OWES evaluations and to preserve these potentially sensitive habitats.

2.12 Surficial Soil Substrates

Surficial soils information was queried from two sources; the Northern Ontario Engineering Geology Terrain Study (NOEGTS) and the Soil Survey Complex data obtained from LIO.

Information obtained from the NOEGTS suggests the Study Area is located within bedrock dominated (rock knob) terrain with areas of ground moraine till and organic peat. Local relief is moderate but jagged, ridged and cliffed. Soil drainage is predominantly dry but punctuated by organic wetlands.

Soil Survey Complex data suggests that the Study Area is predominantly underlain by rockland with components of sandy loam (Monteagle Sandy Loam Complex) and silty loam (Baldwin Silt Loam Complex). Wetlands at the north and south sides of the Study Area are identified as organic soils dominated by peat.

2.13 Canada Land Inventory Soil Capability Classification

The Canada Land Inventory (CLI) established a *Soil Capability Classification for Agriculture* (Environment Canada, 1972) which characterizes the potential for a site to support agricultural practices. Tulloch reviewed *Multiple Scales of Land Capability / Limitation for Agriculture* data from the Government of Canada (<https://open.canada.ca/data/en/dataset/0c113e2c-e20e-4b64-be6f-496b1be834ee>) to obtain the CLI agricultural capability classification associated with this Property.

The Study Area is identified as Class 7P/R, reflecting “no capability for arable culture or permanent pasture” (Class 7) due to stoniness (P) and consolidated bedrock (R). (Environment Canada, 1972).

2.14 Summary of Natural Heritage Desktop Review

A summary of Natural Heritage features identified during the desktop review of provincial and federal data, and through communications with regulators, is provided in Table 4.

Table 4 – Review of Natural Heritage features associated with the Study Area and identification of studies carried forward to the field investigations.

Feature	Records Review	Carried Forward to Habitat Descriptions
Significant Wetlands	Two large wetland complexes are identified north/south and east of the Study Area. Additional smaller wetland units may be present on site.	Yes. <ul style="list-style-type: none"> • General Study Area Reconnaissance • Ecological Land Classification (ELC) • Wetland Delineations (OWES) • Candidate Natural Heritage Feature Identification
Species at Risk (SAR): Threatened and Endangered	Records exist in vicinity of the Study Area for: <ul style="list-style-type: none"> • Barn Swallow • Bank Swallow • Bobolink • Chimney Swift • Eastern Meadowlark • Eastern Whip-poor-will • Blanding’s Turtle • Little Brown Myotis • Northern Myotis • Eastern Small-footed Myotis 	Yes. <ul style="list-style-type: none"> • General Study Area Reconnaissance • Ecological Land Classification (ELC) • Candidate Natural Heritage Feature Identification
ANSI and other Protected Areas	No Parks, Conservation Reserves, EMAs, PSWs or ANSI within 1000m of Study Area	No.
Significant Wildlife Habitat (SWH)	43 SWH are associated with Ecoregion 5E. No existing records of SWH within the Study Area.	Yes. <ul style="list-style-type: none"> • General Study Area Reconnaissance • Ecological Land Classification (ELC) • Candidate Natural Heritage Feature Identification

Feature	Records Review	Carried Forward to Habitat Descriptions
Significant Woodlands	Does not apply: Property is located on the Canadian Shield.	No.
Significant Valleylands	Does not apply: Property is located on the Canadian Shield.	No.
Fish and Aquatic Habitat	Wetlands in the Study Area. Unnamed watercourses throughout Study Area.	Yes. <ul style="list-style-type: none"> • General Study Area Reconnaissance • Aquatic Habitat Assessment • Candidate Natural Heritage Feature Identification
Migratory Birds	Migratory birds are associated with the Study Area.	Yes. <ul style="list-style-type: none"> • General Study Area Reconnaissance • Ecological Land Classification (ELC)
Canada Land Inventory Soil Capability Classification	7P/R - No capability for arable culture or permanent pasture.	No.

3. FIELD INVESTIGATION METHODS

3.1 Habitat Descriptions

3.1.1 Ecological Land Classification (ELC)

Terrestrial habitat was described across the entire Study Area according to the Ontario Ecological Land Classification (ELC) system (MNR 2009). Recent areal imagery of the Study Area was used to perform preliminary ecosite delineations based on variation in plant as well as general surficial geologic information collected from the NOEGTS and hydrological information provided by GeoHub. Minimum mappable community size was considered to be 0.5 ha. Each preliminary ELC polygon was visited in the field to ground truth delineation accuracy and to classify the area to ecosite.

ELC plots were established at representative locations around the Study Area in order to evaluate habitat conditions according to influential properties of the soil substrate and plant community. At each ELC plot, the effective texture and moisture regime of soil substrates were described according to the *Field Guide to the Substrates of Ontario* (MNR 2011b). Substrate profiles were excavated to a maximum depth of 120 cm using an Edelman combination auger. Where soils were shallow, or profiles were impeded by coarse fragments, up to five profiles were attempted in one location to ascertain average soil conditions. In some instances, other variables (including slope position, plant community composition and bedrock indicators) were used to make inferences about soil moisture and depth. Opportunities were also taken to examine pre-existing soil profiles, such as overturned tree root masses, excavations (e.g. ditching) and sloughed slope faces.

The plant community composition and structure were also assessed at each ELC plot. The species composition of forest canopies was visually estimated to the nearest tenths. Where forest compositions were complex and / or difficult to visually estimate, 2-factor metric forestry prisms were employed to accurately quantify the composition and relative dominance of each canopy tree species. Total midstory and ground layer plant covers were visually estimated to the nearest 10%. Dominant and secondary species were noted for each stratum of the plant community (canopy, midstory and ground later).

Soil substrate and plant community properties were classified to ecosite according to the Operational Draft of the *Great Lake/St. Lawrence Manual of Ecosite of Ontario* (MNR 2009) and the *Operational Draft of the Great Lake/St. Lawrence Ecosite Factsheets* (MNR 2011c).

ELC plot data were supplemented with visual plant community descriptions made throughout the Study Area during periods of Site reconnaissance. Visual plant community descriptions typically included the overstory forest compositions (in tenths), ELC vegetation cover class, and an estimated moisture class (based on slope position and plant community composition). Visual plant community descriptions documented in this manner captured the degree of habitat variability

within ecosite polygons, aided in the interpretation of 'average' ecosite conditions, assisted in the placement of breaks (ecotones) between different ecosites, and allowed for the description of otherwise inaccessible areas (e.g. adjacent properties and wetlands south of the Study Area). These visual plant community descriptions were georeferenced in Avenza mapping application for iOS based on the location of the community being described (not the vantage point).

3.1.2 Wetland Habitat Delineation

Wetland boundaries throughout the Study Area were delineated according to OWES criteria (MNR 2014) by a trained OWES wetland evaluator. Wetland interfaces were walked and GPS waypointed at approximately 20m intervals. Handheld GPS accuracy is assumed to be +/- 3m. OWES evaluations were not performed, but wetlands were described according to the ELC systems and were subject to other Natural Heritage studies described below.

3.1.3 Aquatic Habitat Description

The Study Area abuts an unevaluated wetland complex on the southern section of the Study Area. The proponent has committed to setting back all activities associated with this undertaking at least 120 m away from this wetland. As such, no aquatic habitat assessments or fish sampling effort was undertaken in this wetland. During general Study Area reconnaissance this wetland was incidentally confirmed to be fish habitat.

The Study Area was searched for ephemeral, intermittent or permanent waterbodies which could support fish habitat. Any observed waterbodies were assessed for suitability to support direct or indirect fish habitat.

The access driveway at the north end of the Study Area extends over a culvert which maintains flow for a permanent unnamed watercourse which runs along the rail tracks. The existing access driveway is not subject to this ARA permit application. This crossing was investigated to determine the potential to provide fish habitat. A detailed assessment was completed between the crossing location and the areas 20m upstream and 50m downstream. Habitat features, barriers to fish passage, and connectivity to adjacent fish habitat were documented. Once fish habitat was confirmed, a detailed assessment was completed to document the characteristics of the fish habitat present and to identify any areas of sensitivity or critical fish habitat.

Water quality parameters were collected in the unnamed waterbody at the crossing using a combination of the UltraPen PT to measure dissolved oxygen (% and mg/L) and a Hanna Combo Pen to measure pH, conductivity ($\mu\text{S}/\text{cm}$) and temperature ($^{\circ}\text{C}$).

3.1.4 General Study Area Reconnaissance

The Study Area was walked by a qualified environmental professional in search of Natural Heritage features or candidate areas that may support those features. This reconnaissance was

undertaken in tandem with, and in addition to, ELC studies. The objectives of this reconnaissance were to (1) discount the presence of certain features (e.g. Bank Swallow habitat, rare vegetation communities), (2) identify candidate features (e.g. Whip-poor-will habitat, amphibian breeding habitat), and (3) provide an initial search effort for features that may require follow-up studies (e.g. breeding birds; outlined below).

In addition to on-foot studies, northern portions of the Study Area were flown with a UAV drone (DJI Mavic Pro Platinum). These flights were undertaken during spring leaf-off conditions to allow for assessments of standing water (e.g. to assist with turtle and aquatic habitat descriptions), habitat boundaries (e.g. for ELC ecosite and wetland delineations) and to perform canopy searches (e.g. for woodland raptor nesting). Georeference photographs were collected.

3.2 Natural Heritage Assessments

Habitat descriptions and habitat characteristics observed during general Study Area reconnaissance were compared against the known habitat preferences for Threatened and Endangered SAR identified in the Natural Heritage Desktop Review and / or known to occur in the region. As per the ESA, suitable SAR habitat was considered as the “*typical ecological conditions on which a species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, migration or feeding*”. Where possible, SAR habitat was defined in conformance with MNRF General Habitat Descriptions, provincial / federal recovery strategies, or as regulated under the ESA. Any habitat with a moderate to high potential for supporting Threatened and Endangered SAR was considered candidate SAR habitat. Where candidate SAR habitat was located in an area that could not be avoided by the Project, follow-up species-specific studies were undertaken, as outlined below.

Habitat descriptions and habitat characteristics observed during general Study Area reconnaissance were also compared against criteria outlined in the *Significant Wildlife Habitat Criteria Schedule for Ecoregion 5E* (MNRF 2015). Any habitat having a moderate to high potential for supporting SWH was considered candidate SWH. Where candidate SWH could not be avoided by the Project, follow-up habitat-specific assessments were undertaken, as outlined below.

Any aquatic habitat with a moderate to high potential for supporting fish was noted as candidate fish habitat. Where candidate fish habitat could not be avoided by the Project, follow-up fish community assessments were undertaken, as outlined below.

The potential for Natural Heritage feature presence in the Study Area was ranked according to the following criteria outlined in Table 5.

Table 5 – Criteria for establishing the potential for Natural Heritage features occurring within the Study Area.

Potential	Criteria
None	Feature is not present in this Ecoregion.
Low	Feature is present in this Ecoregion, but habitat is not suitable in the Study Area, or the known feature range does not include the Study Area.
Moderate	Feature is present in this Ecoregion with a range that includes the Study Area, habitat is suitable for the feature, but feature presence is considered unlikely.
High	Feature is present in this Ecoregion with a range that includes the Study Area, habitat is suitable for the feature, and feature presence is considered likely.
Confirmed	Feature was confirmed to be present in the Study Area at the time(s) of assessment.
Absent	Feature was confirmed to be absent in the Study Area at the time(s) of assessment.

Candidate Natural Heritage features identified in this Study Area are outlined in Section 4.2, below. Survey effort and methods are included in this Section 3.2. Comprehensive results for all possible Natural Heritage features are provided in Appendix C.

3.2.1 *Eastern Whip-poor-will*

Eastern Whip-poor-will is a ground nesting species of bird that forages nocturnally for aerial insects. Preferred nesting habitat includes forest edges, forest clearings and areas of forest with partial canopy closure. Soils must be relatively dry / well drained. This species is commonly encountered in suitable habitat adjacent lakes, wetlands, fields, clearcuts and utility corridors as well as within regenerating forests and forests punctuated with rock outcroppings.

Areas deemed suitable habitat for Eastern Whip-poor-will nesting were surveyed using the MNRF *Draft Eastern Whip-poor-will Survey Protocol* (MNR 2014). A minimum of three nocturnal acoustic surveys, spread over two lunar cycles from May 15 to June 30, were performed to confirm the presence or absence of Eastern Whip-poor-will. Surveys were performed on warm nights (10°C or warmer) with calm winds (less than 20 km/hr.), minimal cloud cover (less than 50%), without precipitation, and when the moon was more than 50% illuminated and visible above the horizon. Weather conditions were recorded on-site at the beginning and end of each survey using a digital thermometer and anemometer. Surveys began no sooner than 30 mins after sunset and ended no later than 15 mins before sunrise.

Surveys were comprised of a series of passive acoustic listening stations dispersed throughout the Study Area; each with an effective radius of 300 m. Listening stations were determined *a priori* to ensure full coverage of the Study Area.

On each survey night, surveyors worked in teams of two and performed a series of silent point counts. Each point count was at least 6 minutes in duration. If Eastern Whip-poor-will were heard calling, surveyors recorded the bearing (direction) and estimated the distance to each calling bird to allow the bird's approximate location to be mapped. Whenever possible, an attempt was made to collect data on each bird from multiple vantage points to increase mapping accuracy through triangulation. Observations of Common Nighthawk (Special Concern), an ecologically similar species, were also recorded in a similar manner (if encountered).

Mapping of survey results was performed by a Tulloch biologist based on the sum of the data collected each survey night. Mapping considered factors such as the number of Whip-poor-will observed calling at a time, triangulation collected throughout each the night, influences of topography and landcover, and habitat suitability. Mapping accuracy is greatest for birds observed within the Study Area. Whip-poor-will observe in close proximity to the Study Area were also mapped, but these locations (and information yielded from those observations) is of lower accuracy.

Any Eastern Whip-poor-will observed calling from the same (or similar) location within the Study Area on any two survey nights would result in the delineation of Eastern Whip-poor-will habitat according to the *General Habitat Description for Eastern Whip-poor-will (Antrostomus vociferus)* (MNR 2013):

- **Category 1 Habitat*** includes a nest and the area within 20 m of the nest. It is considered to have the lowest tolerance to alteration.
- **Category 2 Habitat** includes the defended territory of males heard calling within the Study Area. Defended territories are typically considered areas between 20 m and 170 m from the nest or approximated center of the defended territory. Study Area specific considerations may require Category 2 Habitat be delineated in a more irregular polygon, but defended territories are generally considered to be at least 9ha in size. Category 2 habitat is considered to have a moderate tolerance to alteration.
- **Category 3 Habitat** includes areas of suitable habitat between 170 m and 500 m of the nest or center of the approximated defended territory. This area supports species movement and feeding. Category 3 habitat is considered to have the highest tolerance to alteration.

* Category 1 is often not delineated as nest searches are discouraged by the MNRF. Field studies instead focus on delineating Category 2 Habitat which is assumed to contain the Category 1 Habitat.

Defended territories were given a minimum size 9ha unless population density suggested that smaller was warranted. In some instances, biologists needed to extrapolate the defended territory

beyond where males were heard calling in order to achieve the minimum 9ha size. In these cases, preference was given to incorporating the highest quality nesting habitat nearby and/or nesting habitat that bordered the most ideal foraging habitat (e.g. wetlands and waterbodies).

Formal survey effort targeting Whip-poor-will was supplemented with data collected during breeding bird studies. Three songmeters were deployed within the Study Area, and each was programmed to collect 3-minute acoustic recordings in the evenings of the month of May 2020. See Section 3.2.4 for further details on songmeter deployment and data sampling. While songmeters are not effective for triangulating and mapping Whip-poor-will calling locations, they can assist in establishing species presence / absence in a Study Area.

3.2.2 *Blanding's Turtle and Turtle Habitat*

The Natural Heritage Background Review identified three turtle species with a potential to occur within the Study Area:

- Blanding's Turtle (Threatened)
- Midland Painted Turtle
- Snapping Turtle (Special Concern)

All three are species of pond turtle with somewhat similar ecological needs. Of greatest conservation concern for pond turtles is habitat in which they overwinter and nest. Typical pond turtle overwintering habitat is characterized as wetlands that have soft substrates and that sustain some unfrozen water under the ice all winter long. For Blanding's Turtle, ideal free water under the ice is generally considered 7 to 50 cm (MNR 2013). Common overwintering locations include shallow marshes and ponds, but can also include a variety of wetlands, water channels and deep ditches where sufficient water exists, and conditions are suitable.

Typical pond turtle nesting habitat is sandy/gravelly substrate that is warmed by direct sun exposure. Most turtles will nest within 30m of a wetland or waterbody, and Blanding's Turtle will typically nest within 250m. Pond turtles can migrate to access preferred habitat, with Blanding's Turtle, in particular, able to migrate 2 km or more to access preferred nesting habitats (MNR 2013). Common nesting locations include shorelines, beaches, gravel roads / road shoulders and ploughed fields.

This report considers turtle habitat according to the MNRF's *General Habitat Description for Blanding's Turtle* (MNRF 2017) and the MNRF's criteria for SWH Ecoregion 5E (MNRF 2015). The General Habitat Description for Blanding's Turtle establishes three categories of habitat for this species:

- **Category 1 Habitat** includes nests and the area within 30 metres or overwintering sites and the area within 30 metres.

- **Category 2 Habitat** includes the wetland complex (i.e. all suitable wetlands or waterbodies within 500 metres of each other) that extends up to two kilometers from an occurrence, and the area within 30 m around those suitable wetlands or waterbodies.
- **Category 3 Habitat** includes areas between 30 metres and 250 metres around suitable wetlands/waterbodies identified in Category 2, within two kilometers of an occurrence.

The MNRF's *Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E* (MNRF 2015), with respect to pond turtles, identified two (2) SWH as:

- **Turtle Wintering Areas:** Candidate habitat includes natural areas that are flooded with sufficient water to not freeze completely in the winter and with soft muddy substrates. For landscapes classified according to the Ecological Land Classification (ELC) system, this can include Ecosites G128 to G135 and G140 to G152. This habitat is considered significant if it supports the overwintering of at least: five (5) Midland Painted Turtles, or one (1) Snapping Turtle, or one (1) Northern Map Turtle. The significant habitat is delineated as the ELC Ecosite in which the overwintering is occurring.
- **Turtle Nesting Areas:** Candidate habitat is considered any naturalized habitat that supports sandy or graveled substrates suitable for turtle nesting. Significant habitat is considered the presence of nests from at least: five (5) Midland Painted Turtles, or one (1) Snapping Turtle, or one (1) Northern Map Turtle. The significant habitat is delineated as sandy habitat in which the nesting is occurring and a protective buffer of 30 to 100m, depending on the slope, riparian vegetation and adjacent land uses. Travel routes, such as road shoulders and gravel roads, do not qualify as candidates.

Candidate turtle overwintering habitat was assessed on foot. Standing water depths were measured and substrate properties were assessed with an Engleman combination auger. Any turtle sign was noted, including turtle observations, droppings and tracks. Any turtle nesting habitat was noted and searched for signs, including eggshells, nesting pits or tracks.

On foot assessments were supplemented by UAV reconnaissance during May (leaf-off) conditions. These aerial assessments provided greater insights into the distribution of standing water within wetlands, the plant community structure / compositions of wetlands, and the presence of potentially suitable nesting sites in vicinity.

The Proponent identified an *a priori* intent to retain all candidate turtle habitat within the Study Area, and to establish appropriate protective setbacks, to ensure these Natural Heritage features, if present, are not negatively impacted. For this reason, surveys targeting turtles (e.g. basking encounter surveys) were not undertaken. The objective of this report was to establish the presence / absence of candidate turtle habitat and assess the potential for turtle species, including Blanding's Turtle, to occur within the Study Area. The NEL2 report for this Project will establish turtle mitigation and avoidance measures under the assumption that any candidate turtle habitats could be significant.

3.2.3 *Endangered Bats and Bat Habitat*

Three (3) species of Endangered bat occur in the Sudbury District: Little Brown Bat, Eastern Small-footed Bat and Northern Long-eared Bat. Of greatest conservation concern for SAR bats are large (>25 cm diameter at breast height) living and dead-standing cavity trees that can support bat maternity roosting, and caves that can serve as bat hibernacula (MNR 2000, MNR 2011a).

Evidence of high-quality maternity roosting habitat was considered forested areas containing clusters of large (>25 cm DBH) and tall cavity trees in early stages of decay (MNR 2011a). Cavities should be more than 10m from the ground and forest canopy closure should be somewhat open. Cavity trees in vicinity to ponds, streams and wetlands are generally preferred owing to the greater abundance of aerial insect forage (Harvey 2011, Thorne 2017). For non-SAR bat species, two SWH are identified:

Bat Maternity Colonies: Candidate bat maternity colony habitat is considered large (>10ha) wooded areas with mature trees (>80 years old, >25cm diameter) and cavity tree densities of at least 21 per hectare. Candidate habitat is considered significant if >10 Big Brown Bats or >5 adult Silver-Haired Bats are confirmed to be roosting. The significant habitat is delineated as the ELC Ecosite in which the roosting is occurring.

Bat Hibernacula: Candidate bat hibernacula are considered caves, mine shafts, underground foundations and Karsts. Candidate habitat is considered significant if any bats are found to be hibernating within the feature. The significant habitat is delineated as the feature and areas within 200m.

Other bat habitat considerations include areas for foraging and day-roosting. Although bats are known to forage over wide areas and varied habitat conditions, preference is often shown for wetlands (where insect densities are greater) and forest edges (where flyways are less obstructed; Harvey 2011, Thorne 2017). Bat foraging occurs at night.

In the day, males and non-gravid female bats roost individually, or in small groups, in temporary and transient day-roosts. Day-roosts typically occur in confined spaces produced by cracks and crevices in trees and rocks of various size (Harvey 2011, Thorne 2017).

High-quality maternity roosting habitat and caves suitable for hibernation were sought during ELC and general Study Area reconnaissance and, if found, were noted, waypointed and photographed. Habitat suitability for foraging and day-roosting was also assessed.

3.2.4 *Bird Habitat*

A variety of breeding bird habitats can qualify as Natural Heritage features. Seven SWH were identified as candidates with a moderate or high potential for occurring within this Study Area:

Special Concern Bird Breeding Habitat: A total of six (6) species of Special Concern bird were identified during the Natural Heritage Background Review as having been observed in vicinity to the Study Area: Canada Warbler, Common Nighthawk, Eastern Wood-pewee, Golden-winged Warbler, Olive-sided Flycatcher and Short-eared Owl. In addition, Tulloch would add Wood Thrush as another notable Special Concern species to be considered as potentially present. Individual ecological needs vary by species, but all forested habitat on Site is considered candidates for one or more of these species. Candidate habitat is significant if based on species presence coupled with habitat quality relative to the species' ecological needs. Significant habitat is defined by the ELC ecosite, or ecoelement, required to meet the species needs.

Colonial Nesting Birds (Tree/Shrub): Candidate habitat includes most forested ecosites. Significant habitat is defined by the presence of 10 or more active Great Blue Heron nests. Significant habitat includes the nesting colony and areas within 300m.

Colonial Nesting Birds (Bank and Cliff): Candidate hibernacula is considered sites with exposed soil banks, sandy hills, borrow pits, steep slopes and sand piles. This habitat type does not include man-made structures, areas resulting from human disturbances within the previous 2-years and active aggregate operations. Candidate habitat is considered significant if the feature is found to support nesting by eight (8) or more pairs of Cliff Swallow and / or Northern Rough-winged Swallow. Significant habitat is delineated as the nesting colony and areas within 50m.

Marsh Birds Breeding: Candidate habitat includes all wetlands (ecosites G138 to G152) where standing water and emergent aquatic vegetation are present. Candidate habitat significance is based on the confirmed presence of nesting by defined quantities of waterfowl, crane or other marsh bird species; a full list of species is provided in the Criteria Schedule. The significant habitat is considered the ELC ecosite.

Waterfowl Nesting: Candidate habitat includes all upland areas adjacent to wetland ecosites G129 to G135 and G142 to G152. Candidate habitat significance is based on the confirmed presence of nesting by defined quantities of waterfowl species; a full list of species is provided in the Criteria Schedule. Significant habitat can be more or less than 120m from the wetland boundary, provided sufficient habitat is retained for waterfowl to successfully nest.

Woodland Raptor Nesting: Candidate habitat is considered all forested habitat. Candidate habitat significance is based on the confirmed presence of nesting by various falcon, hawk and owl species; a full list of species is provided in the Criteria Schedule. The significant habitat includes the nest and a radius of 50-400m around the nest, depending on the species.

Bald Eagle/Osprey Nesting, Candidate habitat is considered all riparian forested habitat in proximity to lakes, ponds, rivers or wetlands. Candidate habitat significance is based on the confirmed presence of nesting by Osprey or Bald Eagle. The significant habitat includes the nest and a radius of 300-800m around the nest, depending on the species and habitat.

In addition to provincial Natural Heritage features, the federal *Canadian Migratory Birds Convention Act* affords protections to migratory bird species and their active nests.

Seven (7) protocols were undertaken to address and assess bird breeding within the Study Area: ELC habitat descriptions, on foot general Study Area reconnaissance, UAV drone Study Area reconnaissance, songmeter recordings at dawn, songmeter recording in the evening, on-site nocturnal bird acoustic surveys and documenting incidental bird species encounters.

ELC habitat description and habitat characteristics observed during general Study Area reconnaissance allowed for the assessment of habitat suitability to support breeding by various guilds of bird species. General Study Area reconnaissance on foot and by UAV drone were performed during leaf-off (spring) conditions for the observation of nests from the ground and from the air, respectively. Any nest observations were noted and GPS waypointed. Any observed raptor stick nests, sandy banks or tall cliffs were noted and re-visited in June to assess for signs of nesting activity (e.g. whitewash, freshly repaired or adorned nests) or the presence of adults and young.

Three (3) songmeters (Wildlife Acoustics SM4) were deployed within the Study Area for the months of May and June. Songmeters were strategically positioned on ecotones (ecosite boundaries) to capture recordings of bird communities in at least two habitat types simultaneously. Songmeters were programmed to record at four intervals throughout each 24-hour period; two dawn recordings (5 minutes each) and two evening recordings (3 minutes each). Dawn recording times were linked to the solar cycle; at sunrise and 30 minutes after sunrise. Evening recordings occurred at 2130h and 2200h.

A sample of the recordings were selected for office interpretation by a biologist proficient in bird identification by call. Six recordings from each songmeter (three morning recordings and three evening recordings) were sampled; 18 recordings total. Sample selection was not random, but instead sought to take advantage of the most ideal weather conditions (Environment Canada historical weather records) conducive for active bird calling and for recording quality. Dawn recordings were selected to coincide with the *Ontario Breeding Bird Atlas: Guide for Participants* (OBBA 2001) survey period and weather conditions for Northern Ontario, specifically; June 1 and July 10 during days without precipitation and winds not exceeding 3 on the Beaufort Scale (19 km/hour). When possible, recordings were selected from days spaced equally across the duration of the songmeter deployment. Evening recordings were selected from rainless nights in May.

Incidental observations of bird species within the Study Area were collected by field crews whenever possible. Incidental observations were collected throughout the Study Area and

included acoustic and visual observations of birds as well as any identifiable bird signs (e.g. nests, tracks, etc.). Any calls observed from SAR birds (including Special Concern species) were investigated to confirm species location and to assess the likelihood of breeding. Raptor calls, when repeatedly observed calling from the same general location, were also investigated for signs of nesting.

Nocturnal bird breeding was assessed in tandem with acoustic surveys performed according to MNRF protocols for Whip-poor-will (see Section 3.2.2, above); Common Nighthawk, owl species and other nocturnal birds were noted as encountered.

3.2.5 *Amphibian Habitat*

Amphibian habitat includes three (3) potential SWH, each with a moderate or high potential for occurring within the Study Area:

Amphibian Breeding Habitat (Woodland): Candidate habitat includes woodland pools with areas $>500\text{m}^2$; especially if they persist into mid-July. Candidate habitat is considered significant if, (1) it was found to support 20 or more individuals (adults or egg masses) from 1 or more newt / salamander species, (2) it was found to support 20 or more individuals (adults or egg masses) of 2 or more frog / toad species, or (3) it was found to support 2 or more frog / toad species with a full chorus (Call Code 3) of vocalizations in the evening. Confirmed significant habitat is considered the area of vernal pooling plus a 230 m radius of surrounding woodland.

Amphibian Breeding Habitat (Wetland): Candidate habitat includes wetlands $>500\text{m}^2$; especially if standing water persist into mid-July. Candidate habitat is considered significant if, (1) it was found to support 20 or more individuals (adults or egg masses) from 1 or more newt / salamander species, (2) it was found to support 20 or more individuals (adults or egg masses) of 2 or more frog / toad species, or (3) it was found to support 3 or more frog / toad species with a full chorus full chorus (Call Code 3) of vocalizations in the evening. Confirmed significant habitat is considered the ELC ecosite.

Amphibian Movement Corridors: Candidate habitat only exists if significant breeding habitat is found. Movement corridors should include at least 15m of vegetation on either side of a waterway or up to 200m wide of woodland habitat. Gaps in the corridor should be less than 20m wide.

A visual encounter survey was performed in May 2020 (prior to leaf emergence and when water levels were high) to identify areas of vernal pooling within the Study Area. Areas of vernal pooling were waypointed and measured for surface area via a rangefinder. Vernal pools that exceeded 500m^2 in area were searched in May for evidence of amphibian breeding, including; egg masses, remnants of hatched egg masses, emerged larva and adults (by sight and vocalization). All evidence of amphibian breeding was noted, GPS waypointed and photographed (where possible).

Survey effort targeting amphibian breeding was supplemented with data collected by three songmeters (Wildlife Acoustics SM4) deployed within the Study Area. Songmeters were placed in proximity to wetland habitat and programmed to collect 3-minute acoustic recordings at 2130h and 2200h over the course of at least 10 days in May. A sample of the recordings were selected for office interpretation by a biologist proficient in amphibian identification by call. Three evening recordings from each songmeter were sampled; 9 recordings total. Sample selection was not random, but instead sought to take advantage of the most ideal weather conditions (Environment Canada historical weather records) conducive for amphibian calling. Specifically, evening recordings were selected to conform with ideal survey conditions outlined in the Marsh Monitoring Program protocols prepared by Bird Studies Canada (BSC 2000); precipitation free days with nightly low temperatures at least 5, 10 and 17 degrees per observation and winds not exceeding 3 on the Beaufort Scale (19 km/hour).

Amphibian calls heard on Site (in person, or on songmeter recordings) were classified according to three (3) call codes obtained from CITATION :

Call Code 1 - Individuals can be counted; calls not simultaneous. This code is assigned when individual males can be counted, and when the calls of individuals of the same species do not start at the same time.

Call Code 2 - Calls distinguishable; some simultaneous calling. This code is assigned when there are a few males of the same species calling simultaneously. However, with a little work, individual males can still be distinguished.

Call Code 3 - Full chorus; calls continuous and overlapping. This code is assigned when a full chorus is encountered; when there are so many males of one species calling that all the calls sound like they are overlapping and continuous.

Incidental observations of amphibian species within the Study Area were collected by field crews whenever possible. Incidental observations were collected throughout the Study Area and included acoustic and visual observations.

3.2.6 *Cervid Habitat*

In Ecoregion 5E, ungulates typically include White-tailed Deer and Moose. This Study Area is also within the range of a re-introduced population of Elk.

Cervid Yarding Areas: Candidate habitats are considered tall treed conifer and mixedwood stands. Aerial surveys are required to identify where White-tailed Deer and Moose yard during the winter months areas. This research is undertaken by the MNRF and yard locations are made available via Ontario GeoHub. Proponents are not required to study this habitat type in the field but are instead instructed to review provincial data for known yard locations.

Moose Feeding Areas: Candidate habitats are considered wetlands and isolated embayments in rivers or lakes that provide an abundance of submerged and floating aquatic vegetation. Candidate habitat significance is based on habitat size, the plant community composition and the presence of Moose using the habitat. Significant habitat includes the wetland areas and upland forested areas within 120m.

Cervid Movement Corridors: Candidate habitat only exists if significant yarding or aquatic feeding areas are found. Movement corridors should include at least 15m of vegetation on either side of a waterway or at least 200m wide with gaps in the corridor less than 20m wide.

Habitat description (i.e. ELC) and habitat characteristics observed during general Study Area reconnaissance allowed for the assessment of habitat suitability to support cervid habitat. General Study Area reconnaissance on foot and by UAV drone were also performed during leaf-offspring conditions for the observation of cervid sign. Cervid sign includes tracks, scats, trails, beds, rubs, scrapes and browse. Suitable habitat was noted, GPS waypointed and photographed. Cervid yarding data was obtained from Ontario GeoHub.

3.2.7 *Snake Habitat*

Snake habitat includes one (1) form of SWH:

Snake Hibernacula: Candidate habitat is considered talus slopes, rock barrens and caves within otherwise upland forested habitat. Candidate habitat is considered significant if used for hibernation by two or more snake species, or at least five individuals from one species. Hibernation by one or more Special Concern snake species automatically results in significance. Significant habitat is delineated as the hibernaculum and areas within 30m.

Any potentially suitable habitat for snake hibernation was noted, GPS waypointed and photographed.

3.2.8 *Fish Community Survey*

Fish collection was completed under a Ministry of Natural Resources and Forestry (MNR) License to Collect Fish for Scientific Purposes No. 1094279. A total of ten (10) Gee minnow traps were set upstream and downstream of the crossing. Traps were baited with dog kibble and set overnight. All fish captured were identified to species by a qualified fisheries biologist and fish were measured for length. Fish handling was kept to a minimum and fish were released carefully in the same general location where they were captured.

3.3 **Data Management and Quality Control**

Data were collected using a combination standardized data sheets and georeferenced notes compiled in Avenza mapping application for iOS. All field data were inventoried, reviewed and

signed-off daily by field crews to ensure information was clear, complete and accurate. Where relevant to the protocol, weather conditions were collected *in-situ*, at the time of the survey, using a digital thermometer and anemometer. All electronic field equipment was calibrated / checked for functionality before use. Reviews, inventories and calibrations were documented. All field data was backed up electronically on cooperate servers. Spatial data was mapped in ESRI ArcGIS 10.7. Spatial data is considered accurate to within +/- 3 m (standard level of error attributed to handheld GPS systems).

4. FIELD INVESTIGATION RESULTS

Environmental assessments throughout the Study Area included 11 visits conducted over the course of the 2019 and 2020 field season (Table 6). Existing environmental conditions and the presence / potential presence of Natural Heritage features within the Study Area were assessed by Tulloch biologists with assistance from environmental technicians. All staff have extensive experience in the identification of flora and fauna (including SAR and their habitat), as well as the identification of SWH as described in the *Significant Wildlife Habitat Technical Guide* (MNR 2000). Staff profiles and qualifications are provided in Appendix B.

Study results are summarized in Section 6, below. Comprehensive study results (i.e. results that address all SAR and SWH associated with the region) are provided in Appendix C.

Table 6 – Summary of field assessments performed throughout the Study Area in 2018

Date	Survey Type*	Staff on Site**	Weather Conditions		
			Air Temp. (°C)	Wind (Beaufort)	Cloud Cover (%)
17 Sept 2019	General Recon ELC Incidental Obs.	KM + EW	9 to 22	1	0-25%
24 Sept 2019	General Recon ELC Wetland Delineation Incidental Obs.	KM + EW	9	1	0-25%
26 Sept 2019	General Recon ELC Incidental Obs.	KM + VS	11	1	75-100%
01 Oct 2019	General Recon ELC Incidental Obs. Aquatic Habitat	KM + EMG	14 to 22	1	75-100%

Date	Survey Type*	Staff on Site**	Weather Conditions		
			Air Temp. (°C)	Wind (Beaufort)	Cloud Cover (%)
02 Oct 2019	General Recon ELC Incidental Obs. Aquatic Habitat Fish Survey	EMG + KM	6 to 8	3 to 4	50-75%
13 May 2020	UAV Drone Recon SM4 Deployed Amphibian Breeding Incidental Obs.	KM+EMG	9 to 12	1	0-25%
21 May 2020	Amphibian Breeding Incidental Obs.	KM + VS	15 to 23	1	0-25%
12 June 2020	SM4 Retrieval Incidental Obs.	KM + VS	8 to 11	2 to 3	75-100%
02 June 2020	Nocturnal Birds	EMG + BT	15 to 19	1	25-50%
04 June 2020	Nocturnal Birds Incidental Obs.	EMG + BT	17 to 18	1	0-25%
29 June 2020	Nocturnal Birds Incidental Obs.	EMG + KM	17 to 20	1	0-25%

* Survey Types

- Amphibian Breeding – General encounter survey for wetlands and vernal pools that could support amphibian breeding. Searches for egg masses and larva (tadpoles) if found (potential SWH).
- Aquatic Habitat – General encounter survey for aquatic habitat (streams, creeks, wetlands, ponds, etc.).
- ELC – Ecological Land Classification of the Study Area based on properties of the soil and plant community.
- Fish Survey – Deployment of fish capture equipment to document fish community
- General Recon – General reconnaissance of Study Area habitat, noting plant community composition and structure as well as suitability to support SAR and SWH.
- Incidental Obs. – Records kept of wildlife observed incidentally while within the Study Area.
- Nocturnal Birds – Night survey targeting Eastern Whip-poor-will and Common Nighthawk.
- SM4 – Deployment and retrieval of SM4 songmeter equipment (records bird and amphibian calls).
- UAV Drone Recon – General Study Area reconnaissance from the air using a UAV drone.
- Wetland Delineation – Delineation of wetland boundaries per OWES standards.

** Investigators

- EW – Emily Wyszynski (Environmental Technician)
- KM – Kelly Major (Terrestrial Ecologist)
- EMG – Emelia Myles-Gonzalez (Aquatic Ecologist)
- BT – Bill Tibble (Environmental Team Lead)
- VS – Vanessa Smith (Junior Planner)

4.1 Habitat Descriptions

Terrestrial and aquatic habitat descriptions are provided below. Photos are provided in Appendix D.

4.1.1 Ecological Land Classification (ELC)

ELC was performed across a 97.1 ha area of the Property in September and October of 2019. This classified area included the Study Area and portions of the Property to the north, south and east. ELC classification included 17 full ELC plots and 137 visual plant community descriptions (Figure 2). A total of 32 ecosite communities (polygons) from 16 ecosite types were identified and mapped (Figure 3, Table 7). All observed ecosite types are considered common for Ecoregion 5E.

The Study Area exhibits a moderately rugged bedrock dominated topography (Photo 1). Soils are predominantly fine mineral (Silt Loam, Silty Clay Loam) of varying depths over consolidated bedrock. Soils at hill crests frequently become shallow and produce bedrock outcroppings. Most soils across upland portions of the Study Area exhibit a fresh moisture class, but moist and wet soils occur in swales between the rocky knobs and at the toe slopes. Wet organic soils are common in wetlands abutting the south side of Fairbank Lake Road and immediately south of the Study Area.

The majority of the Study Area is tall hardwood forest dominated by Trembling Aspen (*Populus tremuloides*) and Large-tooth Aspen (*Populus grandidentata*); ecosites G104Tt and G119Tt. Where soils are shallow, tree canopies are lower / stunted, and dominated by Trembling Aspen (G016TI), Red Maple (*Acer rubrum*; G018TI) or Red Pine (*Pinus resinosa*; G011TI, G015TI).

Wetland ecosites are predominantly meadow marsh (G144N) and thicket swamp (G135S) abutting the south side of Fairbank Lake Road (Figure 3). These meadow marshes are dominated by tussock sedge (*Carex stricta*). The thicket swamps are dominated Speckled Alder (*Alnus incana*) and various willow species (*Salix nigra*, *S. discolor*, *S. petiolaris* and *S. bebbiana*). Standing water was rarely encountered in these wetlands in both the fall of 2019 and spring of 2020. In both instances, standing water was confined to drains along the rail right-of-way, drains between the rail track and Fairbank Lake Road, and two flooded areas at the east and west sides of the Study Area (Photos 2 and 3).

Two small (1.5ha each) wetlands were observed centrally within the Study Area. These wetlands were a thicket swamp (G134S) dominated by dominated Speckled Alder, and a mineral conifer swamp (G223TI) dominated by White Spruce (*Picea glauca*), Trembling Aspen and Balsam Fir (*Abies balsamea*). Both wetlands reside in swales between rocky knolls and exhibit water tables near the soil surface. Standing water was absent from these areas in October of 2019. Standing water remained largely absent in the wetlands when observed again in May 2020 but some isolated pools of 5cm to 20cm depth had formed. This flooding is estimated at less than 5% and

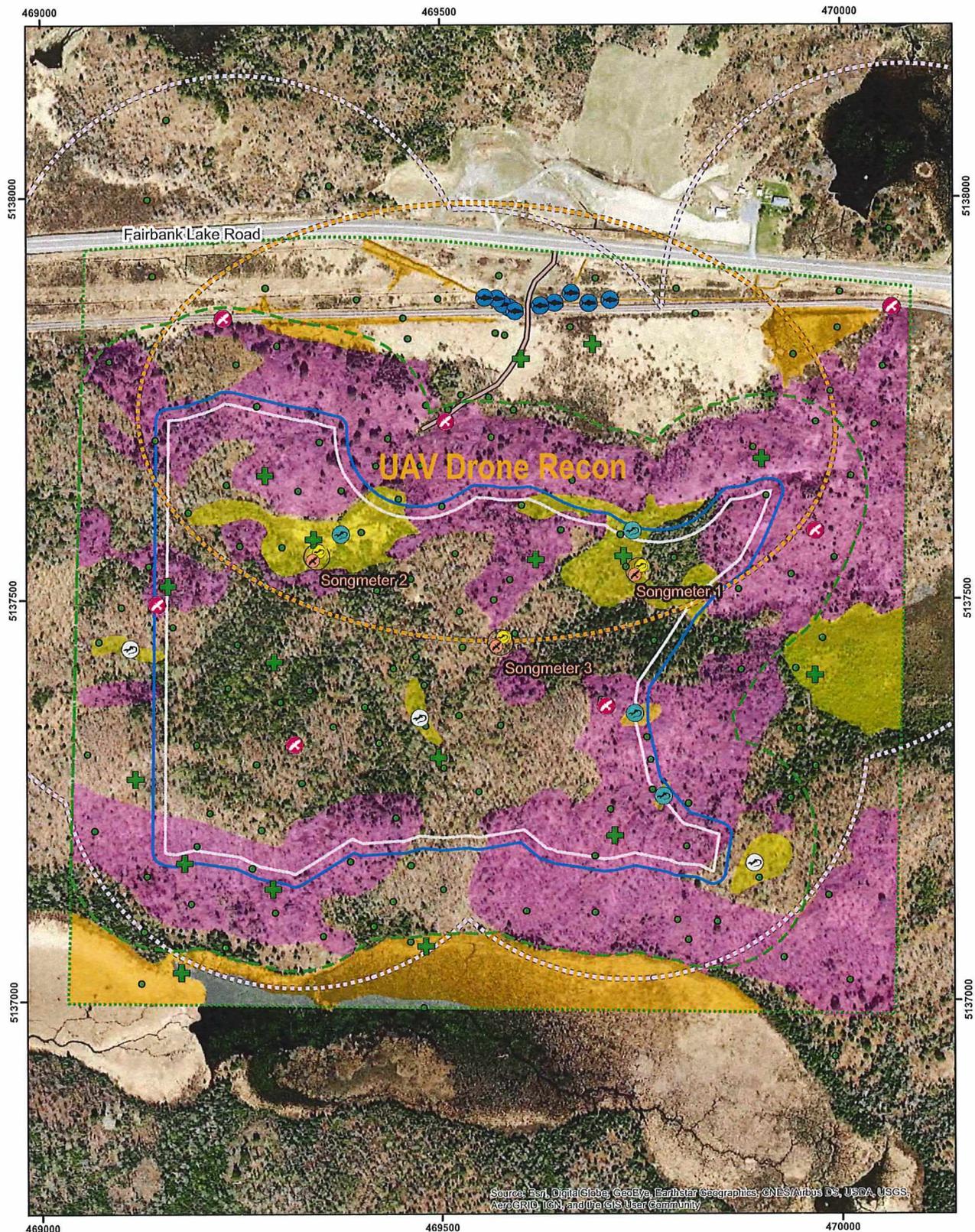


10% of G134S and G223TI areas, respectively. Top-down aerial photos of G134S and G223TI in May 2020 are provided in Photos 4 and 5, respectively. Further information on the extent of flooding in these wetlands is provided in Section 4.2.5, below (Amphibian Habitat).

Outside of the Study Area, wetlands to the south are comprised of shallow marsh (G149N) and open water marsh (G150N). Wetlands to the east of the Study Area abuts rich conifer swamp (G129Tt) dominated by White Cedar (*Thuja occidentalis*) and Black Spruce (*Picea mariana*).

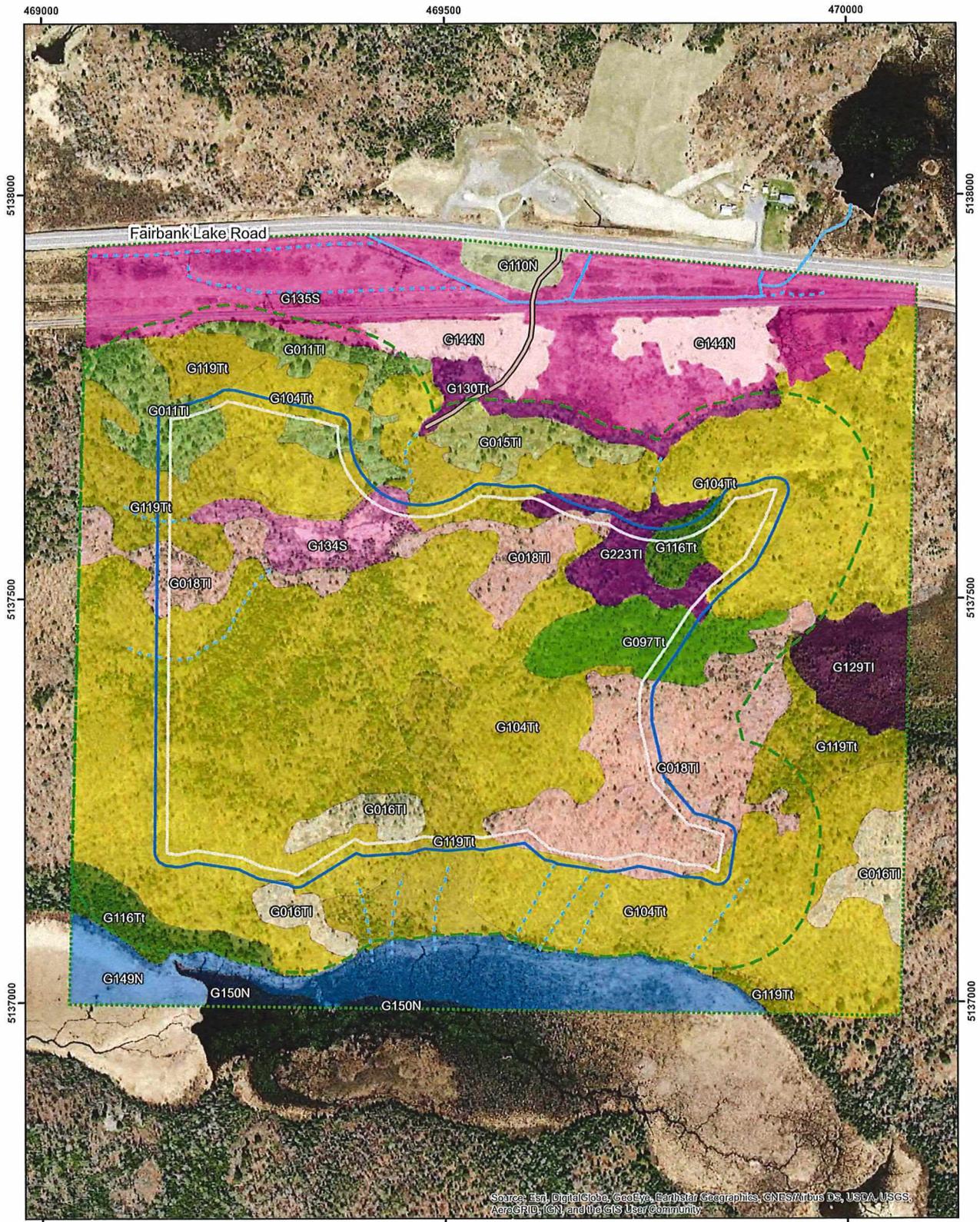
Table 7 – Ecosites observed within the Extraction Area, Licence Area, Study Area and during additional habitat descriptions beyond the Study Area. Ecosites are depicted in Figure 3. Photos are provided in Appendix D.

Ecosite	Name	Photo(s)	Extraction Area	Licence Area	Study Area	Additional Habitat Descriptions
Upland Ecosite Communities						
G011TI	Red/White Pine Conifer (Low Treed, Shallow Soils)	Photo 7	X	X	X	X
G015TI	Red/White Pine Mixedwood (Low Treed, Shallow Soils)	Photo 8		X	X	X
G016TI	Aspen/Birch Hardwood (Low Treed, Shallow Soils)	Photo 9	X	X	X	X
G018TI	Maple Hardwood (Low Treed, Shallow Soils)	Photo 10	X	X	X	X
G097Tt	Red/White Pine Conifer (Tall Treed, Fresh Fine Soils)	Photo 11	X	X	X	X
G104Tt	Aspen/Birch Hardwood (Tall Treed, Fresh Fine Soils)	Photo 12 Photo 13	X	X	X	X
G110N	Meadow (Moist Fine Soils)	Photo 14				X
G116Tt	Spruce/Fir Conifer (Tall Treed, Moist Fine Soils)	Photo 15	X		X	X
G119Tt	Aspen/Birch Hardwood (Tall Treed, Moist Fine Soils)	Photo 16	X	X	X	X
Wetland Ecosite Communities						
G129TI	Rich Conifer Swamp (Low Treed, Organic Soils)	Photo 17				X
G130Tt	Intermediate Conifer Swamp (Tall Treed, Organic Soils)	Photo 18			X	X
G134S	Thicket Swamp (Mineral Soils)	Photo 4 Photo 19	X	X	X	X
G135S	Thicket Swamp (Organic Soils)	Photo 20 Photo 21			X	X
G144N	Meadow Marsh (Organic Soils)	Photo 22 Photo 23			X	X
G150N	Open Water Marsh (Floating Leaved)	Photo 6				X
G223TI	Intermediate Conifer Swamp (Tall Treed, Mineral Soils)	Photo 5 Photo 24	X	X	X	X



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

<p>Legend</p> <ul style="list-style-type: none"> Licence Boundary Extraction Area Study Area (120m) Additional Habitat Descriptions Nocturnal Birds Study Effective Radius UAV Drone Reconnaissance Area Existing Access Road <p>Candidate Significant Habitats</p> <ul style="list-style-type: none"> Amphibian Breeding Moose Aquatic Feeding Turtle Overwintering Whip-poor-will Nesting 		<p>Field Effort Points</p> <ul style="list-style-type: none"> ELC Pkbt (Full) Plant Community Description Nocturnal Bird Acoustic Station Bird/Amphibian Songmeter Station Amphibian Breeding Search (Wetted) Amphibian Breeding Search (Dry) Minnow Trap 	
<p>Notes: All values in this map are approximate and are based on aerial interpretation, data obtained from GeoHub (Land Information Ontario) and field GPS waypoints (subject to +/- 3m accuracy).</p> <p>Datum: NAD83 Projection: NAD83 Zone 17N</p>		<p>0 50 100 200 Meters</p> <p>TULLOCH ENVIRONMENTAL</p> <p>Rintala Quarry Fairbank Lake Road Whitefish, Ontario</p> <p>FIGURE 2</p> <p>Field Effort Map</p> <p>PROJECT: 191439 SCALE: 1:4,500 DATE: 15/10/2020 User Name: Kelly, Major</p>	



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend <ul style="list-style-type: none"> Licence Boundary Extraction Area Study Area (120m) Additional Habitat Descriptions Existing Access Road Watercourses <ul style="list-style-type: none"> Ephemeral Permanent 		ELC Ecosites <ul style="list-style-type: none"> G011TI: Red/White Pine Conifer (Low Tree, Shallow Soils) G015TI: Red/White Pine Mixedwood (Low Tree, Shallow Soils) G016TI: Aspen/Birch Hardwood (Low Tree, Shallow Soils) G018TI: Maple Hardwood (Low Tree, Shallow Soils) G097TI: Red/White Pine Conifer (Tall Tree, Fresh Fine Soils) G104TI: Aspen/Birch Hardwood (Tall Tree, Fresh Fine Soils) G110N: Meadow (Moist Fine Soils) G116TI: Spruce/Fir Conifer (Tall Tree, Moist Fine Soils) G119TI: Aspen/Birch Hardwood (Tall Tree, Moist Fine Soils) G129TI: Rich Conifer Swamp (Low Tree, Organic Soils) G130TI: Intolerant Hardwood Swamp (Tall Tree, Organic Soils) G134S: Thicket Swamp (Mineral Soils) G135S: Thicket Swamp (Organic Soils) G144N: Meadow Marsh (Organic Soils) G149N: Shallow Marsh (Organic Soils) G150N: Open Water Marsh (Floating Leaved) G223TI: Intermediate Conifer Swamp (Tall Tree, Mineral Soils) 	
<p>0 50 100 200 Meters</p>		 	
<p>Notes: All values in this map are approximate and are based on aerial interpretation, data obtained from GeoHub (Land Information Ontario) and field GPS waypoints (subject to +/- 3m accuracy).</p> <p>Datum: NAD83 Projection: NAD83 Zone 17N</p>			
<p>Rintala Quarry Fairbank Lake Road Whitefish, Ontario</p>			
<p>FIGURE 3</p>			
<p>ELC Ecosite Map</p>			
PROJECT: 191439		DATE: 15/10/2020	
SCALE: 1:4,500		User Name: Kelly.Major	

4.1.2 Wetland Habitat and Delineation

Wetland boundaries throughout the Study Area were delineated according to OWES criteria by walking the boundary on foot and GPS way-pointing the wetland / upland interface. Wetland ELC ecosite boundaries depicted in Figure 3 are adjusted to reflect these OWES boundaries. Wetland significant is discussed in Section 4.3, below.

Five wetlands / wetland complexes were identified within the Study Area, Table 8.

The Proponent has committed to retain and set back from any wetlands that could qualify as Provincially Significant in order to forgo OWES evaluations and to preserve this potentially sensitive habitat. The OWES determine wetland significant based on the biological, hydrological, and social functions it supports, as well as the presence / absence of special features such as SAR. OWES protocols establish a minimum wetland unit size of 2 ha for evaluation unless smaller units present particularly unique / significant ecological functions or are necessary for maintaining connectivity among larger wetland units. All wetlands within the Study Area that are greater than 2 ha in size are therefore candidates for OWES evaluation and were identified *a priori* to be retained within the Study Area under the assumption that they could be significant.

Two small wetland units (ecosites G134S and G223TI) were identified within the Study Area (Figure 3) and were subjected to studies to (1) accurately measure their area, and (2) identify if they supported any significant ecological functions that would justify they're exemption from the minimum size directive of the OWES protocol. Assessments of these areas in relation OWES criteria is provided in Table 9. Individual studies are outlined in Section 4.2, above.

Based on the assessments of biological, hydrological and social functions (Table 9), there is no evidence to suggest that either small wetland G134S or G223TI support any significant or unique ecological functions that would justify they're exemption from the OWES minimum size rule. As a result, neither of these small wetland units are subject to OWES evaluation and neither would qualify for Provincial Significance.

Table 8 – Wetlands observed on and around the Study Area.

Wetland Name	Comments
Northern Complex Photos 2 & 3	Located north of the Site along the south side of Fairbank Lake Road, this complex includes 13.3ha of habitat within the subject property (ecosites G130Tt, G135S and G144N) and it extends beyond the property for approximately 500m and 1000m to the east and west, respectively. Its water level is driven principally by constructed surface drainage flowing from the east along Fairbank Lake Road.
Eastern Complex Photo 17	Located east of the Site, this complex is almost entirely outside of the subject property and it extends approximately 1200m to the east. Its water level is likely controlled principally by a watercourse further to the east which flows from Ethel Lake, southward through May Lake, and eastward toward Whitefish.
Southern Complex Photo 6	Located south of the Site, this complex Site includes 17.7ha of habitat within the subject property (ecosites G149N and G150N) and extends beyond the property for approximately 400m and 2000m to the east and west, respectively. Its water level is driven principally by surface water flowing from St. Pothier Lake in the east and beaver impoundments along that watercourse.
Wetland G134S Photo 4	Located on northwest side of the Site, this wetland is a small (1.51ha) Alder thicket swamp (ecosite G134S) whose water level is controlled by local Site run-off. This wetland outlets to the Northern Complex via a linkage on its northeast side. This linkage is predominantly subsurface, but a small (~20cm wide, 10cm deep; Photo 46) current of surface water flow was observed in spring (May) when water levels on Site were highest.
Wetland G223TI Photo 5	Located on northeast side of the Site, this wetland is a small (1.56ha) conifer swamp (ecosite G223TI) whose water level is controlled by local Site run-off. This wetland outlets to the Northern Complex via a linkage on its north side. This linkage is predominantly subsurface, and negligible surface water flow was observed in spring (May) when water levels on Site were highest.

Table 9 – Assessment of small wetland units for OWES evaluation eligibility.

Feature / Function	Field Studies	Results	Unique or Significant?*
Wetland Area	<ul style="list-style-type: none"> • OWES Wetland Delineation 	G134S: 1.51 Ha Area G223TI: 1.56 Ha Area	G134S: No G223TI: No
Plant Community	<ul style="list-style-type: none"> • ELC 	G134S and G223TI: Plant community compositions are similar to surrounding wetlands. Ecosites are common for Ecoregion 5E.	G134S: No G223TI: No
Turtle Habitat	<ul style="list-style-type: none"> • Turtle Habitat Assessment 	G134S and G223TI: Neither are suitable for turtle overwintering or nesting.	G134S: No G223TI: No
Bat Habitat	<ul style="list-style-type: none"> • Bat Habitat Assessment 	G134S and G223TI: All wetlands in the Study Area are suitable for bat foraging, including these two units.	G134S: No G223TI: No
Bird Habitat	<ul style="list-style-type: none"> • Bird Habitat Assessment • General Reconnaissance on Foot • General Reconnaissance by UAV Drone • Songmeter Recordings (Dawn/Evening) • Nocturnal Bird Acoustic Surveys • Incidental Encounters 	G134S and G223TI: Both likely support breeding by migratory bird species. No SAR were observed. No marsh bird breeding habitat. No SWH for raptors, waterfowl or colonial nesting species.	G134S: No G223TI: No
Cervid Habitat	<ul style="list-style-type: none"> • General Reconnaissance on Foot • General Reconnaissance by UAV Drone 	G134S and G223TI: Both are used by Elk as part of a corridor that extends northward to Fairbank Lake Road.	G134S: No G223TI: No
Amphibian Habitat	<ul style="list-style-type: none"> • Egg Mass Searches • Songmeter Evening Recordings 	G134S and G223TI: No significant levels of amphibian breeding.	G134S: No G223TI: No
Fish Habitat	<ul style="list-style-type: none"> • General Reconnaissance on Foot • General Reconnaissance by UAV 	G134S and G223TI: No fish habitat.	G134S: No G223TI: No
Social Function	<ul style="list-style-type: none"> • N/A 	G134S and G223TI: Private land. No authorized social functions.	G134S: No G223TI: No
Hydrological Function	<ul style="list-style-type: none"> • N/A 	G134S and G223TI: Small wetland size and minimal water content indicated negligible hydrological function.	G134S: No G223TI: No

* Uniqueness is considered in relation to adjacent larger wetland units. Significant is considered in relation to provincial SAR and SWH habitat criteria.

4.1.3 Aquatic Habitat Description

The southern section of the Study Area includes a large unevaluated wetland complex. During general Study Area reconnaissance investigations on 01 October 2019, this wetland was confirmed to be fish habitat. The proponent has committed to setting back all activities associated with this undertaking at least 120m away from this wetland and the associated watercourses.

The unnamed waterbody which flows under the Site access driveway through a currently installed culvert (17T 469609 5137867) at the north end of the Study Area was assessed for its' potential to provide fish habitat, and for the presence of any critical or sensitive fish habitat (Figure 4; Photo 25). The corrugated steel pipe culvert is partially embedded in the substrate and measured 1.6m from top of the culvert to the substrate.

Any work below the high-water mark must be assessed for whether it needs to be submitted to DFO for review. If the development has a potential to result in the death of fish or the harmful alteration, disruption, or destruction of fish habitat the project may require an Authorization under the Fisheries Act. To determine whether the proposed development is required to be submitted to DFO and assistance in submitting a project request for review to DFO see: <https://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/request-review-demande-d-examen-001-eng.html>.

Assistance by a qualified Fisheries Scientist is recommended for DFO permitting support.

Physical Habitat Description Upstream of Crossing

The unnamed watercourse upstream of the crossing (30m upstream of the existing culvert; Figure 4; Photos 26 and 27) supports a mean water depth of 0.45m, and was dominated by flat (98%) habitat, with one identified riffle (2%). Water depth shallows to 0.1m as it flows into the culvert. Mean bankfull depth was estimated to be between 2.2 and 2.5m. However, conservations with a CN rail worker while within the Study Area, suggests that flooding occurs yearly due to the presence of beaver dams upstream. CN workers regularly break the beaver dams to prevent flooding in the area, and it was identified that water levels in the spring get high enough to overtop the tracks (+3.0m). The wetted width was 1.8m and mean bankfull width was 4.8m. The channel was fairly homogeneous extending upstream, and approximately 50m upstream the channel splits. One arm flows from the north under Fairbank Lake Rd. through a concrete box culvert another 50m upstream, and the other arm continues east for another 200m and flows under Fairbank Lake Rd, originating from a wetland to the North. Substrate consisted of cobble (30%), gravel (10%), sand (55%) and clay (5%). In-water cover consisted of aquatic vegetation (25%) and cobbles (30%).

The riparian canopy provided little cover to the surface of the channel. The banks were unstable, with exposed and eroding sections on both banks directly upstream of the culvert. Further upstream the banks become stabilized with established shrubs and grasses. Bank slopes were approximately 85°. The right upstream bank extended upland to the rail tracks. The left upstream bank extended up to dense vegetation, which continued to Fairbank Lake Rd. Aquatic vegetation

included 20% submergent species (*Vallisneria* sp., *Callitriche stagnalis*), 5% floating (*Sagittaria* sp.), 5% floating mats (algae) and 2% emergent (*Alisma trivale*). Water temperature was 13.8°C, pH was 7.01, dissolved oxygen was 48.2% (4.92 mg/L), and conductivity was 294 uS/cm.

Physical Habitat Description Downstream of Crossing

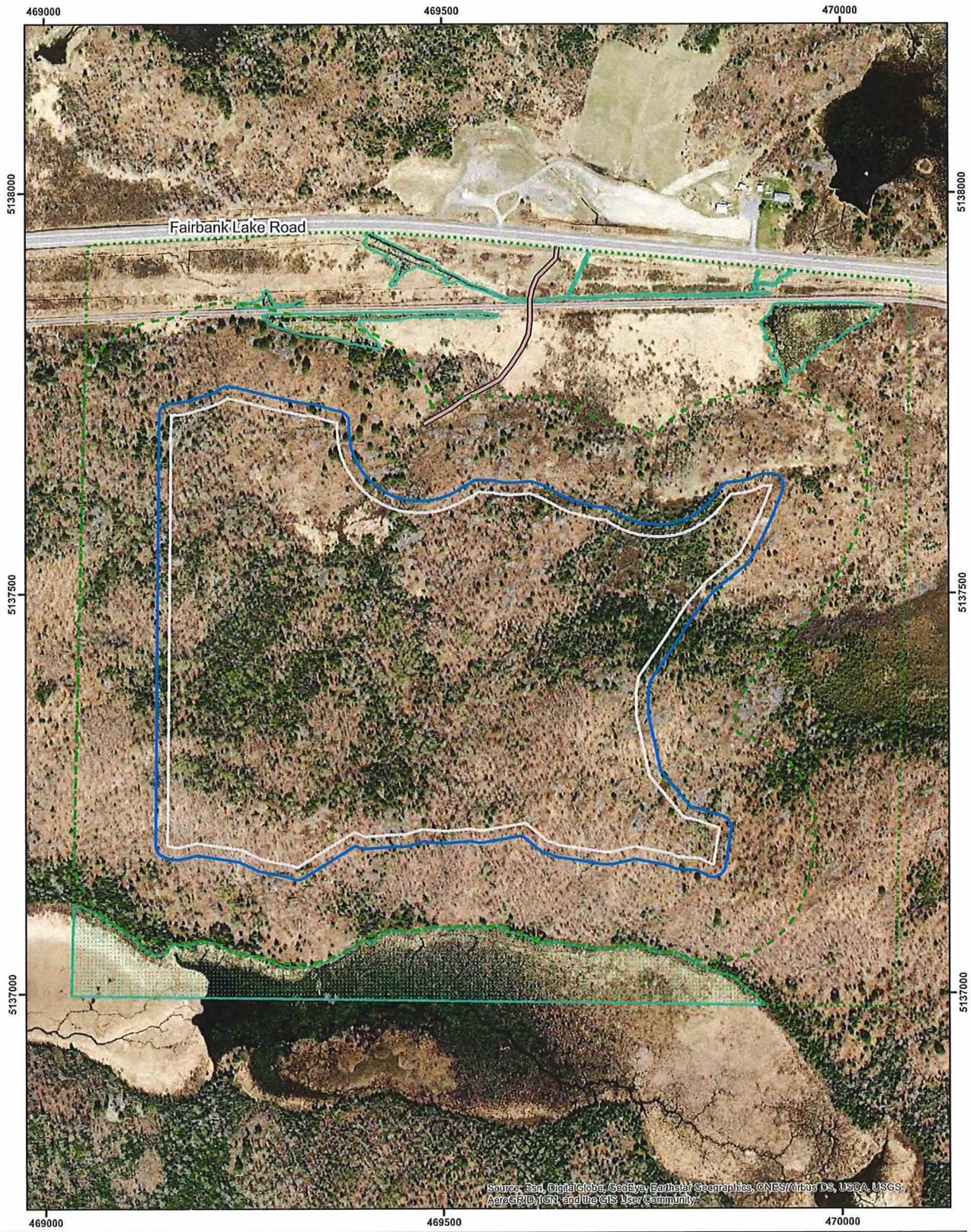
The unnamed watercourse downstream of the crossing (50m downstream of existing culvert; Figure 4; Photos 28 and 29) supports a mean water depth of 0.45m and was dominated by flat (100%) habitat. The mean wetted width was 1.1m, and the mean bankfull width was 4.6. The mean bankfull depth was estimated to be 3.10m, which considered the information provided by the rail workers within the Study Area in regard to spring flooding events and beaver dams in the channel. Dense vegetation constricted the channel directly downstream of the culvert. Extending further downstream, the vegetation becomes less dense, and the channel widens as the bank slope becomes shallower. Existing beaver dams were identified 40m and 50m downstream of the culvert. Substrate consisted of cobble (20%), gravel (10%), sand (60%), clay (5%) and detritus (5%). In-water cover consisted of logs (5%), organic woody debris (10%) and aquatic vegetation (20%).

The riparian canopy provided a moderate amount of cover to the channel. The banks were slightly unstable. The left upstream bank was steep and unstable in several sections. The right upstream bank was shallow, with established long grasses extending 2.5m from the channel. The left upstream bank was approximately 1.3m in height right upstream bank was 0.5m high. The right upstream bank extended upland to the rail tracks. The left upstream bank extended up to dense vegetation, which continued to Fairbank Lake Rd. Aquatic vegetation included 10% submergent species (*Vallisneria* sp., *Equisetum hyemale*, *Lemna* sp., *Myriophyllum spicatum*), 2% floating (*Sagittaria* sp.) and 2% floating mats (algae). Water temperature was 14.2°C, pH was 6.88, dissolved oxygen was 57.2% (5.83 mg/L), and conductivity was 297 uS/cm.



Within the Extraction Area

There are no surface water features within the Extraction Area aside from small ephemeral streams that only flow during spring freshet. Most water movement on Site appears to be sub-surface with some shallow pools scattered in small wetlands G134S and G223TI. These features do not support fish habitat.



Legend	0 50 100 200 Meters
License Boundary	
Extraction Area	
Study Area (120m)	
Additional Habitat Descriptions	
Existing Access Road	
Fish Habitat	

**Rintala Quarry
Fairbank Lake Road
Whitefish, Ontario**

FIGURE 4

Fish Habitat

PROJECT: 191439

SCALE: 1:4,500 DATE: 15/10/2020

User Name: Kelly, Major

**TULLOCH
ENVIRONMENTAL**

Notes:
 All values in this map are approximate and are based on aerial interpretation, data obtained from GeoHub (Land Information Ontario) and field GPS way-points (subject to +/- 3m accuracy).

Datum: NAD83
 Projection: NAD83 Zone 17N

4.2 Candidate Natural Heritage Features

Habitat descriptions and habitat characteristics observed during general Study Area reconnaissance identified several candidate Natural Heritage features with a moderate or high potential for occurring in this Study Area (Table 10). Follow-up studies were undertaken to assess feature significance as outline in Section 3.2, above. The significance of some features were not assessed if it was identified that future Study Area operations could avoid these areas and / or NEL2 studies could assume the feature is significant and provide adequate mitigations to prevent negative impacts.

Table 10 – Candidate Natural Heritage features chosen for follow-up studies.

Feature	Candidate Habitat*	Carried Forward to Natural Heritage Assessments
Significant Wetlands	<p>Two large wetland complexes are identified north/south and east of the Study Area.</p> <p>Two additional smaller wetland units (<2ha) are present in the Study Area.</p>	<p>Yes:</p> <p>Wetlands within the Study Area were assessed for various ecological functions including SWH, SAR habitat and fish habitat. Effort was focused on wetlands immediately south of Fairbanks Lake Road (north side of the Study Area) and small (<2ha) wetlands within the main body of the Study Area as these areas are subject to potential impacts by the Project.</p> <p>Although some ecological functions are discussed for the large wetlands south and east of the Study Area, these areas were not extensively studied as an operational setback of 120m is an <i>a priori</i> assumption (i.e. Project impacts can be avoided).</p>
Species at Risk (SAR): Threatened and Endangered	<ul style="list-style-type: none"> • Eastern Whip-poor-will • Blanding's Turtle • Little Brown Bat • Northern Long-eared Bat • Small Footed Bat <p>No other Threatened or Endangers SAR habitat was observed within the Study Area.</p>	<p>Yes:</p> <p>Whip-poor-will</p> <ul style="list-style-type: none"> • Nocturnal Birds Acoustic Surveys (MNRFB Whip-poor-will Protocol) <p>Blanding's Turtle</p> <ul style="list-style-type: none"> • General Habitat Assessment <p>Endangered Bats</p> <ul style="list-style-type: none"> • General Habitat Assessment
Significant Wildlife Habitat (SWH)	<ul style="list-style-type: none"> • Turtle Wintering Areas • Turtle Nesting Areas • Bat Hibernacula • Bat Maternity Colonies • Special Concern Songbird Breeding Habitat • Colonial Nesting Birds (Tree/Shrub) • Colonial Nesting Birds (Bank and Cliff) • Marsh Birds Breeding Habitat • Waterfowl Nesting Areas • Woodland Raptor Nesting 	<p>Yes:</p> <p>Turtle Habitat</p> <ul style="list-style-type: none"> • Overwintering Habitat Assessment • Nesting Habitat Assessment <p>Bat Habitat</p> <ul style="list-style-type: none"> • Bat Habitat Assessment <p>Breeding Bird Habitat</p> <ul style="list-style-type: none"> • SM4 Songmeters (Dawn Recordings) • SM4 Songmeters (Evening Recordings)

Feature	Candidate Habitat*	Carried Forward to Natural Heritage Assessments
	<ul style="list-style-type: none"> • Bald Eagle/Osprey Nesting, Foraging, Perching • Cervid Yarding Area • Moose Aquatic Feeding Area • Cervid Movement Corridor • Amphibian Breeding Habitat (Woodland) • Amphibian Breeding Habitat (Wetland) • Amphibian Movement Corridors • Snake Hibernacula <p>No other candidate SWH were observed within the Study Area.</p>	<ul style="list-style-type: none"> • Nocturnal Birds Acoustic Surveys (MNRF Whip-poor-will Protocol) • Study Area Reconnaissance (on Foot) • Study Area Reconnaissance (UAV Drone) • Incidental Observations <p>Amphibian Habitat</p> <ul style="list-style-type: none"> • SM4 Songmeters (Evening Recordings) • Egg Mass / Larva Searches • Incidental Observations • SM4 Songmeters (Evening Recordings) <p>Cervid Habitat</p> <ul style="list-style-type: none"> • GeoHub Data Review • General Study Area Reconnaissance • Incidental Observations <p>No:</p> <p>Snake Hibernacula; Candidate habitat can be avoided.</p>
Fish and Aquatic Habitat	<ul style="list-style-type: none"> • Fish Habitat 	<p>Yes.</p> <ul style="list-style-type: none"> • Fish Community Survey
Migratory Birds	<ul style="list-style-type: none"> • Nesting Habitat 	<p>Yes.</p> <ul style="list-style-type: none"> • SM4 Songmeters (Dawn Recordings) • SM4 Songmeters (Evening Recordings) • Nocturnal Birds Acoustic Surveys (MNRF Whip-poor-will Protocol) • Study Area Reconnaissance (on Foot) • Study Area Reconnaissance (UAV Drone) • Incidental Observations

4.2.1 *Eastern Whip-poor-will*

Suitable habitat for Whip-poor-will was identified throughout the Study Area, including all areas of low treed forest above shallow soils (ecosites G011TI, G015TI, G016TI and G018TI; Photos 7 to 10) and some areas of mature aspen forest (G104Tt) where rock outcroppings were encountered. Candidate Whip-poor-will habitat is depicted in Figure 2.

A total of three (3) surveys were conducted within the Study Area. The timing and weather conditions of these surveys are provided in Table 11. The timing and weather conditions of all surveys conformed to MNRF survey standards (MNRF 2014). Each acoustic survey included seven (7) listening stations within the Study Area (21 stations total over three nights). Survey station locations are provided in Figure 2.

One Whip-poor-will was observed calling within the Study Area on every survey night. Up to an estimated seven (7) Whip-poor-will were observed calling from areas north, east and west of the Study Area.

Estimated Whip-poor-will call locations are provided in Figure 5. Whip-poor-will were observed calling from eight (8) areas on two or more nights, resulting in the delineation of eight (8) defended territories (Category 2 Habitat). Three (3) of these territories are estimated to intersect with the Study Area, and one (1) intersects with the Licence Boundary. The Extraction Area was delineated to avoid all defended territories. Most calling males appeared to be defending territories in proximity to wetlands east of the Study Area and north of Fairbank Lake Road.

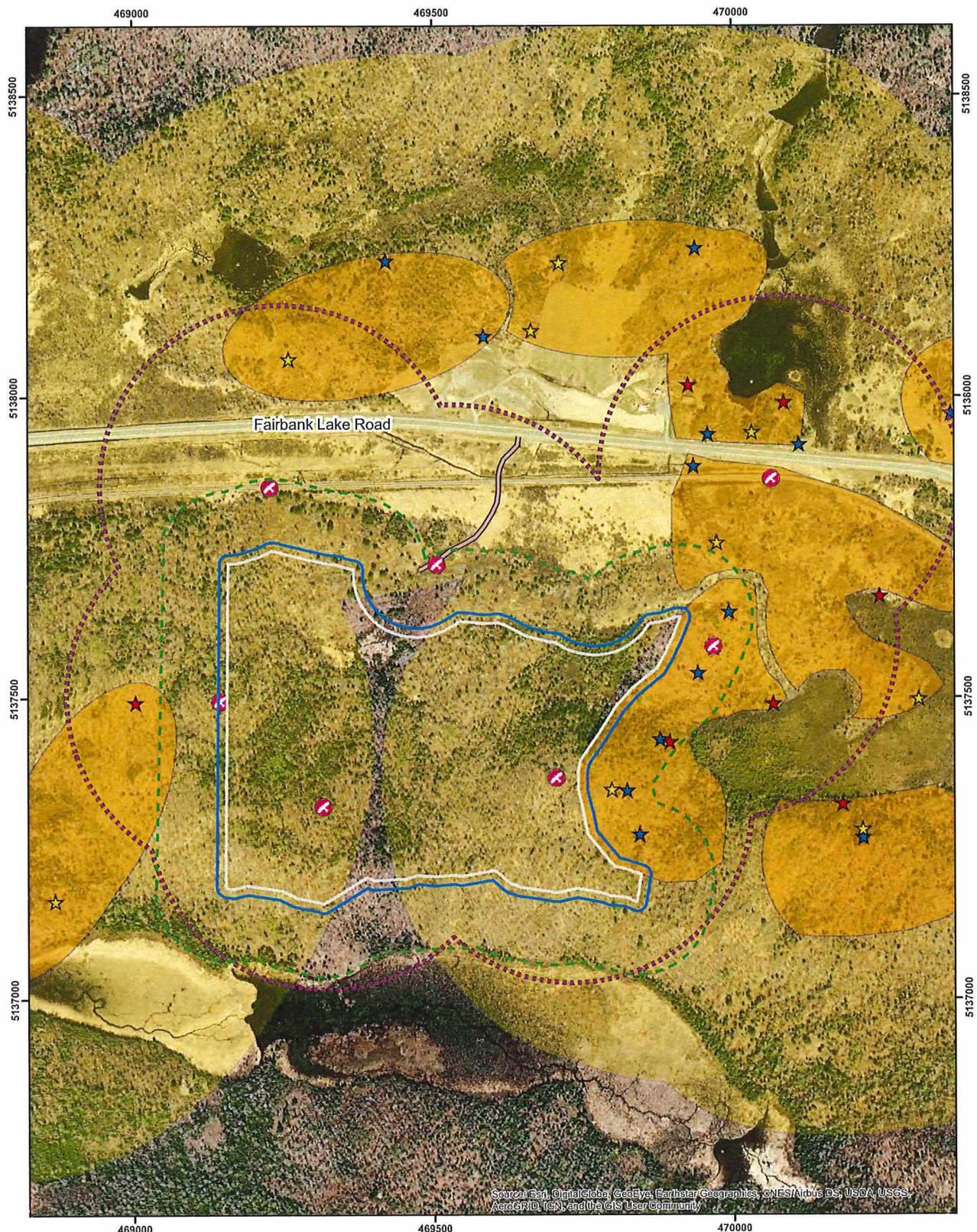
Defended territories within the Study Area were mapped to best reflect the locations at which the birds were observed calling and to reflect nesting habitat suitability. As per the MNRF General Habitat Description, all defending territories were mapped to have an area of at least 9ha of suitable nesting habitat. Defended territories beyond the Study Area were generalized to circular or elliptic geometries. Most of the Study Area qualifies as Category 3 Habitat for this species (Figure 6).

Despite the presence of suitable nesting habitat within the Study Area, and the number of conspecifics observed calling in vicinity, no Whip-poor-will were observed calling from the central portions of the Study Area at any time. This was further corroborated by evening songmeter recordings interpreted for three nights in May (the 13th, 19th and 23rd). All recordings captured distance Whip-poor-will calls, but none in vicinity to the equipment locations. See Figure 2 for songmeter locations. See Section 4.2.4, below, for songmeter recording times and weather conditions.

Table 11 – Dates, times, weather conditions and summary of results of three acoustic surveys targeting Eastern Whip-poor-will. Weather conditions were measured within the Study Area.

Survey:	1	2	3
Date:	02 June 2020	04 June 2020	29 June 2020
Sunset/Sunrise:	2111h / 0534h	2112h / 0533h	2121h / 0534h
Moonrise:	1724h	2003h	1508h
Moon Illumination:	85%	98%	69%
Start Time:	2140h	2142h	2150h
Start Temperature:	19°C	19°C	20.3°C
Start Wind Speed (Beaufort Wind):	0- Calm	0- Calm	0- Calm
Start Sky Conditions:	Mostly Clear 25-50% Cloud	Clear 0-25% Cloud	Clear 0-25% Cloud
Start Precipitation:	None	None	None
End Time:	2356h	0000h	0027h
End Temperature:	15°C	17°C	17.2°C
End Wind Speed (Beaufort Wind):	0- Calm	0- Calm	0- Calm
End Sky Conditions:	Mostly Clear 25-50% Cloud	Clear 0-25% Cloud	Clear 0-25% Cloud
End Precipitation:	None	None	None
Number of Survey Stations:	7	7	7
Minimum Survey Time per Station:	6 Minutes	6 Minutes	6 Minutes
Whip-poor-will Observed (All):	6	8	7
Whip-poor-will Observed (Study Area)	1	1	1
Surveyors**:	EMG + BT	EMG + BT	KM + EMG

** EMG = Emelia Myles-Gonzalez (Aquatic Ecology), KM = Kelly Major (Terrestrial Ecologist), BT = Bill Tibble (Environmental Team Lead)



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

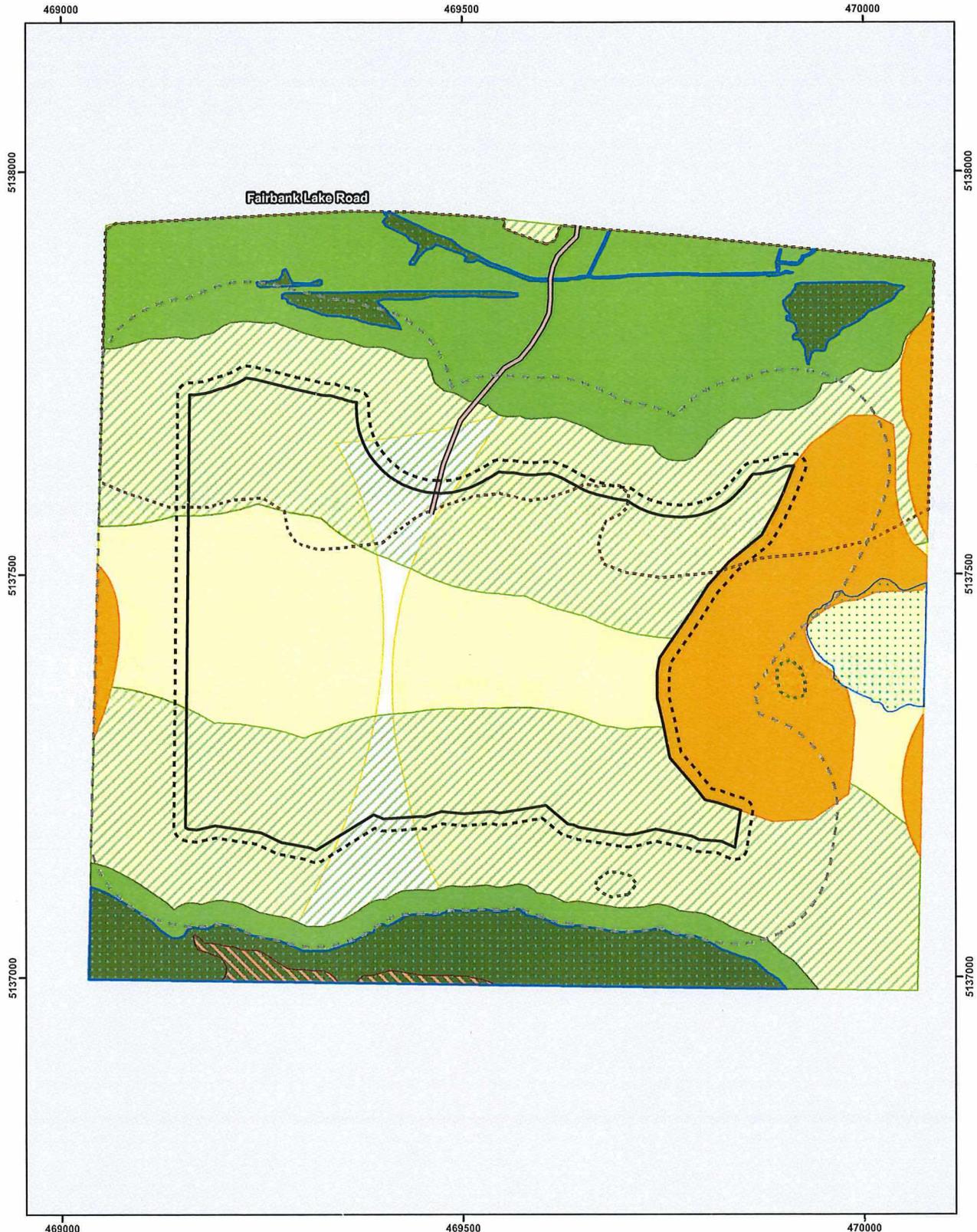
Legend

- Extraction Area (070c02020)
- License Boundary (070c02020)
- Study Area (Reduced License) (070c02020)
- Nuthatch Birds Study Effective Radius (200m)
- Existing Access Road
- Nuthatch Birds Acoustic Station
- Whip-poor-will Estimated Call Locations
- Survey 1 (02 June 2020)
- Survey 2 (24 June 2020)
- Survey 3 (29 June 2020)
- Whip-poor-will Defended Territory (Category 2 Habitat)
- Whip-poor-will Category 3 Habitat



Notes:
 All values in this map are approximate and are based on field GPS waypoints (subject to +/- 3m accuracy) and the best objective interpretation of field observations. Whip-poor-will call locations were triangulated where possible. Observations outside the effective survey radius are considered less accurate.
 Datum: NAD83
 Projection: NAD83 Zone 17N

<h2>Rintala Quarry Fairbank Lake Road Whitefish, Ontario</h2>	
FIGURE 5	
Whip-poor-will Study Results	
PROJECT: 191439	
SCALE: 1:6,000	DATE: 15/10/2020
User Name: Kelly.Major	



<p>Legend</p> <ul style="list-style-type: none"> Licence Boundary Extraction Area Study Area (120m) Existing Access Road Natural Heritage Feature (Candidate / Confirmed) <ul style="list-style-type: none"> Fish Habitat (Confirmed) Ungulate (Elk) Corridor (Candidate) Snake Hibernacula (Candidate) Amphibian Breeding (Candidate) Moose Feeding (Candidate) Turtle Wintering (Candidate) Turtle Supporting Wetland & 30m Riparian (Candidate) Turtle Supporting 250m Up- and Riparian (Candidate) Whip-poorwill Category 2 (Confirmed) Whip-poorwill Category 3 (Confirmed) 	<p>0 50 100 200 Meters</p> <p>TULLOCH ENVIRONMENTAL</p> <p>Notes: All values in this map are approximate and are based on aerial interpretation, data obtained from GeoHub (Land Information Ontario) and field GPS waypoints (subject to +/- 3m accuracy). The significance of 'Candidate' features has not been confirmed and are considered to have a moderate to high potential of occurring.</p> <p>Datum: NAD83 Projection: NAD83 Zone 17N</p>
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<p>Rintala Quarry Fairbank Lake Road Whitefish, Ontario</p>	
<p>FIGURE 6</p>	
<p>Natural Heritage Features</p>	
<p>PROJECT: 191439</p>	<p>DATE: 04/12/2020</p>
<p>User Name: Kelly.Major</p>	

4.2.2 *Blanding's Turtle and Turtle Habitat*

Suitable habitat for pond turtles, including Blanding's Turtle, was observed to the north and south of the Study Area (Figure 2). Potentially suitable turtle overwintering habitat was found in some sections of the wetland complex abutting the south side of Fairbank Lake Road. Flooded sections of ecosites G144N and G135S were observed in association with drains along the rail right-of-way, drains between the rail track and Fairbank Lake Road, and two flooded areas at the east and west side of the Study Area (Photos 2 and 3, Photos 31 and 32). The remainder of these wetland ecosites are not considered suitable for turtle wintering owing to an observed lack of standing water in fall 2019 and spring 2020.

Based on these observations, ecosites G149N and G150N, as well as portions of G135N and G144N were considered candidate turtle wintering habitat for up to three species: Blanding's Turtle, Midland Painted Turtle and Snapping Turtle. Other wetlands on / around the Study Area (G134S, G223S and G129TI) did not support sufficient standing water to allow for turtle wintering.

Turtle nesting habitat was identified in association with the graveled shoulders of Fairbank Lake Road and the granular ballast of the rail corridor. These anthropogenic areas do not qualify as candidate SHW. No other sandy or graveled substrate was observed that would be typical for turtle nesting.

No turtles were observed at any time during the 11 Site visits. No evidence of turtle nesting was observed at any time. As targeted basking surveys were not performed, turtle absence cannot be confirmed.

Without confirmed absence, candidate turtle wintering habitat must be considered potentially significant SWH for that purpose (Figure 6). As Blanding's Turtle may be present, this candidate wintering habitat must also be considered candidate Category 1 Habitat for that species. As per the MNR General Habitat Description, the remainder of those wetland complexes (and upland areas within 30m) should be considered candidate Category 2 Habitat for Blanding's Turtle (Figure 6). Areas within 220m of these candidate Category 1 and 2 Habitats should be treated as candidate Category 3 Habitat for Blanding's Turtle. Project operations intend to avoid these wetland habitats and NEL2 studies will establish protective setbacks and provide appropriate mitigations as though these areas are significant.

4.2.3 *Endangered Bats and Bat Habitat*

High-quality maternity roosting habitat and caves suitable for hibernation were sought during ELC and general Study Area reconnaissance fall 2019. Much of the Study Area is dominated by mature stands of aspen (G103Tt, G104Tt, G119Tt, G130Tt), Red Pine (G097Tt) and White Spruce (G116Tt). Although some large (>25cm diameter) trees were observed, forest cover was generally middle ages and mid-sized. Few stems were observed in excess of 25cm diameter and fewer cavity trees in this size class were encountered. Cavity trees recorded at 17 ELC plots did

not find densities in excess of 21 stems per hectare. Habitat in the Study Area is therefore not considered high quality for bat maternity roosting, and as such the potential for bat maternity roosting on the Study Area is considered low. No caves or other areas suitable for bat hibernation were found within the Study Area.

All wetland and wooded ecosites observed within the Study Area could provide foraging habitat for Endangered bat species, including Little Brown Bat, Northern Long-eared Bat and Eastern Small-footed Bat. The best foraging habitat is likely to be associated with the large wetland complexes abutting Fairbank Lake Road and wetland complexes located south and east of the Study Area.

Day-roosting by Endangered bats can occur within most wooded habitats across Ontario, including throughout this Study Area. The best day-roosting habitat is likely to be associated with riparian forest abutting the large wetland systems (i.e. in proximity to the superior forage habitat).

The potential for foraging and day-roosting by Endangered bats within the Study Area will be forwarded to a NEL2 report and impacts of the proposed undertaking will be assessed in relation to the ecological needs of these species.

4.2.4 Bird Habitat

A total of 50 bird species were observed within the Study Area (Table 12). Bird observations resulted from a combination of incidental encounters, acoustic nocturnal surveys and automated songmeter recordings (at dawn and in the evening) conducted over Fall 2019 and Spring / Summer 2020.

Song meters were deployed on Site for a total of 30 days (May 13 to June 12, 2020; Photo 33). Three evening recordings from May, and three dawn recordings from June, were selected to receive office interpretation. The dates, times and weather conditions for the recordings selected for interpretation are provided in Table 13. Songmeter locations are depicted in Figure 2. Calls from 31 bird species were identified on the Songmeter recordings and acoustic / visual incidental observations on Site resulted in the identification of 38 bird species.

Table 12 – Birds species observed within the Study Area during 2019 and 2020 field studies. Observations are based on incidental encounters and automated songmeter recordings.

Species		Protections ¹		Evidence	
Common Name	Scientific Name	MBCA	ESA	Songmeter ²	Incidental ³
Alder Flycatcher	<i>Empidonax alnorum</i>	Migratory	---	A	---
American Bittern	<i>Botaurus lentiginosus</i>	Migratory	---		A
American Crow	<i>Corvus brachyrhynchos</i>	---	---		A&V
American Goldfinch	<i>Spinus tristis</i>	Migratory	---	A	A&V
American Kestrel	<i>Falco sparverius</i>	---	---		V
American Redstart	<i>Setophaga ruticilla</i>	Migratory	---	A	A
American Robin	<i>Turdus migratorius</i>	Migratory	---	A	A
American Woodcock	<i>Scolopax minor</i>	Migratory	---	A	---
Black-and-white Warbler	<i>Mniotilta varia</i>	Migratory	---	A	---
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Migratory	---	A	---
Black-capped Chickadee	<i>Poecile atricapilla</i>	Migratory	---	A	A
Black-throated Green Warbler	<i>Dendroica virens</i>	Migratory	---	A	A
Blue Headed Vireo	<i>Vireo solitarius</i>	Migratory	---		A
Blue Jay	<i>Cyanocitta cristata</i>	---	---	A	A&V
Broadwinged Hawk	<i>Buteo platypterus</i>	---	---		A
Brown Thrasher	<i>Toxostoma rufum</i>	Migratory	---		A&V
Canada Goose	<i>Branta canadensis</i>	Migratory	---	A	A
Cedar Waxwing	<i>Bombycilla cedrorum</i>	Migratory	---	A	A&V
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	Migratory	---	A	A
Chipping Sparrow	<i>Spizella passerina</i>	Migratory	---		A
Clay-colored Sparrow	<i>Spizella pallida</i>	---	---		A
Common Nighthawk	<i>Chordeiles minor</i>	Migratory	SC	A	---
Common Raven	<i>Corvus corax</i>	---	---		A
Common Yellowthroat	<i>Geothlypis trichas</i>	Migratory	---	A	A
Downy Woodpecker	<i>Picoides pubescens</i>	Migratory	---		A
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	Migratory	TH	A	A
Golden-crowned Kinglet	<i>Regulus satrapa</i>	Migratory	---		A
Gray Catbird	<i>Dumetella carolinensis</i>	Migratory	---		A
Gray Jay	<i>Perisoreus canadensis</i>	---	---		A
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Migratory	---	A	---
Hermit Thrush	<i>Catharus guttatus</i>	Migratory	---	A	A&V

Species		Protections ¹		Evidence	
Merlin	<i>Falco columbarius</i>	---	---		A&V
Nashville Warbler	<i>Vermivora ruficapilla</i>	Migratory	---	A	A
Northern Flicker	<i>Colaptes auratus</i>	Migratory	---		A&V
Ovenbird	<i>Seiurus aurocapillus</i>	Migratory	---	A	A
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Migratory	---		A
Red-breasted Nuthatch	<i>Sitta canadensis</i>	Migratory	---	A	A
Red-eyed Vireo	<i>Vireo olivaceus</i>	Migratory	---	A	A
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	---	---	A	---
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	Migratory	---	A	---
Ruffed Grouse	<i>Bonasa umbellus</i>	---	---		A&V
Song Sparrow	<i>Melospiza melodia</i>	Migratory	---		A&V
Swamp Sparrow	<i>Melospiza georgiana</i>	Migratory	---		A&V
Veery	<i>Catharus fuscescens</i>	Migratory	---	A	---
White-throated Sparrow	<i>Zonotrichia albicollis</i>	Migratory	---	A	A
Wilson's Snipe	<i>Gallinago delicata</i>	Migratory	---	A	---
Winter Wren	<i>Troglodytes hiemalis</i>	Migratory	---	A	---
Yellow Warbler	<i>Setophaga petechia</i>	Migratory	---	A	---
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	Migratory	---	A	A
Yellow-rumped Warbler	<i>Dendroica coronata</i>	Migratory	---	A	A

¹ Birds Convention Act (MBCA) and Endangered Species Act (ESA).

² Songmeter: Wildlife Acoustics SM4 recording at dawn and in the evening.

³ Evidence: A = Acoustic (species identified by call), V = Visual (species identified by sight).

Table 13 – Time, weather, and location information for three (3) songmeters deployed within the Study Area in May and June 2020.

Songmeter Placement			
Songmeter Name:	Songmeter 1	Songmeter 2	Songmeter 3
Location (UTM):	17T 469751 5137543	17T 469341 5137554	17T 469576 5137454
Ecosite:	G223TI, G116TE	G1345, G018TI	G104TI
Songmeter Dawn Recording and Weather Information			
Recording Date:	04-June-2020	06-June-2020	09-June-2020
Sunrise Time:	5:35am	5:34am	5:33am
Recording Time:	5:35am	5:34am	5:33am
Recording Duration:	5 Minutes	5 Minutes	5 Minutes
Weather Conditions*:	9°C, Mainly Clear Wind 6km/h	8°C, Mainly Clear Wind 6km/h	12°C, Cloudy Wind 1km/h
Songmeter Evening Recording and Weather Information			
Recording Date:	13-May-2020	19-May-2020	26-May-2020
Sunset Time:	8:49pm	8:56pm	9:04pm
Recording Time:	9:30pm	9:30pm	10:00pm
Recording Duration:	3 Minutes	3 Minutes	3 Minutes
Weather Conditions*:	5°C, Mainly Clear Wind 12km/h	13°C, Clear Wind 10km/h	20°C, Clear Wind 7km/h

*Temperatures derived from an average of SM4 internal thermometer data. Other weather information provided by Environment Canada historical weather data for Sudbury.

Special Concern Bird Breeding

Habitat within the Study Area is suitable to support nesting by up to five species of Special Concern songbird: Canada Warbler, Common Nighthawk, Wood Thrush, Olive-sided Flycatcher, Eastern Wood-pewee and Golden-winged Warbler (Cadman *et al* 2007, Sandilands 2010). Common Nighthawk was observed foraging over the Study Area in one evening recording on one Songmeter (Songmeter 3, 23 May 2020). This species was not observed during the nocturnal acoustic bird studies. While habitat is suitable for nesting by Common Nighthawk (i.e. low treed ecosites G011TI, G015TI, G016TI and G018TI), nesting within the Study Area would have result in a defended territory that would have yielded more frequent species observation on both the Songmeters and during the nocturnal acoustic studies. Nesting by Common Nighthawk on Site is therefore considered unlikely.

No other Special Concern bird species were observed in the Study Area at any time. Special Concern Songbirds are therefore considered absent from the Study Area.

Colonial Nesting Birds (Tree / Shrub)

Ecosites G129TI and G097Tt are considered candidate habitat for Colonial Nesting Birds (i.e. Great Blue Heron) as well as portions of tall treed ecosites G104Tt, G119Tt, G116Tt that abut wetlands at the north, east and south of the Study Area. Study Area reconnaissance on foot and by air (UAV drone) did not observed any evidence of nesting by the large stick nests produce by Great Blue Heron. No records of colonial bird nesting or Great Blue Heron nesting were returned from a review of GeoHub data. This feature is therefore considered absent from the Study Area.

Colonial Nesting Birds (Bank and Cliff)

No suitable natural habitat was observed for nesting by Cliff Swallow or Barn Swallow. Existing dwellings north of Fairbank Lake Road were not searched for these species but may support suitable habitat.

No suitable sandy bank or berm habitat was observed in the Study Area for nesting by Bank Swallow or Northern Rough-winged Swallow.

No swallow species were observed on Site at any time and none were recorded by the Songmeters. Quarry operations could result in the creation of swallow habitat which could cause swallow species to recruit onto the Site; this will be discussed in the NEL2 study.

Marsh Bird Breeding Habitat

Ecosites G144N, G149N and G150N, where standing water and emergent aquatic vegetation are present, are considered candidates for this SWH. Standing water and emergent aquatic vegetation was observed in all areas of G149N and G150N. Only small portions of G144N were flooded in Fall 2019 and Spring 2020 (see candidate Turtle Wintering habitat; Figure 2). The small

size and fragmented nature of suitable habitat in G144N mean that the potential for significant quantities of marsh breeding is low. No marsh bird species were observed on Site at any time and none were recorded by the Songmeters.

Large wetland complexes of G149N and G150N south (outside) of the Study Area have a high potential for supporting significant marsh bird breeding. Bird breeding was not studied in this wetland as it will be retained and left unaltered.

Project operations intend to avoid these G144N, G149N and G150N wetland habitats. NEL2 studies will establish protective setbacks and provide appropriate mitigations as though these areas are significant.

Waterfowl Nesting Area

Upland riparian forests within 120m of wetland ecosites G129TI, G134S, G135S, G144N, G149N and G150N are candidate habitat for waterfowl nesting. This includes portions of G011TI, G015TI, G016TI, G018TI, G097Tt, G103Tt, G104Tt, G110N, G116Tt and G119Tt. No waterfowl nests were encountered at any time while on Site and no waterfowl were observed foraging in wetlands within the Study Area.

Riparian forests adjacent the northern wetland complex received considerable study owing to Site reconnaissance, ELC studies, general habitat assessments, wetland delineations and amphibian habitat searches. They are also situated at the three points of on-foot access to the Site (at the east, center and west sides of the Study Area) and therefore received the most incidental observation. Based on thorough coverage of this area by biologists in spring, summer and fall, it is confidently concluded that significant levels of waterfowl nesting is not occurring in this area.

Riparian forest within 120m of the southern wetland complex also received the above protocols but were not traversed at all times of the bird breeding season to the same extent as those in the north. Open water marshes within the southern complex (G150N) also represent the highest quality (and quantity) of waterfowl feeding and staging habitat in vicinity to the Site. For these reasons, we do not preclude the possibility that waterfowl nesting could be significant in riparian forests adjacent the southern complex. NEL2 studies will establish protective setbacks and mitigations such that this waterfowl nesting habitat will be retained.

Woodland Raptor Nesting

General Study Area reconnaissance on foot and by air (UAV drone) encountered no raptor stick nests at any time. Incidental observations, nocturnal bird acoustic studies and songmeter recordings observed two raptor species within the Study Area: Broadwing Hawk and Merlin. Neither species were observed to be repeatedly calling, occupying or favouring the same location in successive Site visits / recordings. As a result, no evidence was found that raptors are defending territories or nesting within the Study Area.

Bald Eagle and Osprey Nesting, Foraging and Perching Areas

General Study Area reconnaissance on foot and by air (UAV drone) encountered no Bald Eagle or Osprey stick nests at any time. Incidental observations and songmeter recordings did not observe either species at any time. As a result, no evidence was found that Bald Eagle or Osprey are utilizing the Study Area.

Migratory Bird Species

All vegetated upland and wetland habitats within the Study Area could support nesting by migratory bird species. Incidental observations, nocturnal bird acoustic studies and songmeter recordings observed 40 species of migratory bird within the Study Area. The potential for migratory birds breeding within the Study Area is considered high (likely to occur).

4.2.5 Amphibian Habitat

Candidate amphibian breeding habitat was identified in fall 2019 and revisited in May 2020 for visual and acoustic studies.

Wetland Amphibian Breeding

All wetland habitats observed in fall 2019 were considered candidate SWH for wetland amphibian breeding; ecosites G129TI, G134S, G135S, G144N, G149N, G150N and G223TI. *A priori* commitments on behalf of the Proponent to retain, and set back from, the large wetland complexes north, east and south of the Study Area (ecosite G144N, G149N and G150N) meant that amphibian breeding in these areas could be assumed present and NEL2 studies will apply appropriate setbacks and mitigations with the assumption that this feature could be significant (Figure 6). Amphibian breeding was therefore not quantified in these areas.

Small (<2ha) wetlands located centrally within the Study Area (ecosites G134S and G223TI) could be impacted by operations and amphibian breeding was studied in these two areas. All flooded areas within these ecosites were walked in mid-May 2020 in search of evidence of amphibian breeding. In addition, songmeters 1 and 2 were situated on the edge of wetlands G223TI and G134S, respectively. Evening songmeter recordings were selected to best capture amphibian calls in conformance with ideal survey conditions outlined in the Marsh Monitoring Program protocols produced by Bird Studies Canada (BSC 2000). See Table 13 for recording times and weather conditions.

Wetland G134S was found to support small (1 to 4m²) and shallow (<15cm deep) water windows scattered across the northern half of the ecosite (Photos 34 and 35). A search on May 13, 2020 found no evidence of amphibian breeding. Search effort was timed as 21 minutes. Songmeter 2 recorded no amphibian calls in proximity. A full chorus of Spring Peepers (Call Code 3) could be heard calling in the distance and is associated with wetlands adjacent Fairbank Lake Road.

Individual calls of Grey Treefrog and American Toad (each Call Code 1) could also be heard from various locations around the Study Area.

Wetland G223TI was found to support small (1 to 2m²) and shallow (<20cm deep) water windows scattered across the ecosite (Photos 36 and 37). A search on May 13, 2020 found no evidence of amphibian breeding. Search effort was timed as 36 minutes. Songmeter 1 recorded no amphibian calls in proximity. Similar to Songmeter 2, a full chorus of Spring Peepers (Call Code 3) could be heard calling in the distance and was assumed to be associated with wetlands adjacent Fairbank Lake Road. Individual calls of Grey Treefrog and American Toad (each Call Code 1) could also be heard from various locations around the Study Area.

Based on the absence of both visual and acoustic evidence of amphibian breeding in wetlands G134S and G223TI, neither are considered significant for this function.

Woodland Amphibian Breeding

Five (5) potentially suitable woodland pools were identified throughout the Study Area during general Study Area reconnaissance in fall of 2019 (Figure 2). Most were dry at the time but exhibited leaf litter discoloration that suggested a potential for spring flooding. These areas were revisited on May 13 and May 21, 2020. Three (3) of the five (5) locations remained dry (or nearly so) at that time (Photo 38). The other two (2) were observed to be flooded but pools were small (90m² and 248m²; Photo 39). Despite being less than the prerequisite 500m² minimum area, the two flooded pools were none-the-less searched for amphibian breeding. The locations of candidate pools and the amphibian searches are provided in Figure 2. Searches yielded observations three adult Wood Frogs at the larger pool, and one (1) Spring Peeper, two (2) Green Frog and (2) Wood Frogs at the smaller pool. Six (6) spring peeper larva were also observed at the smaller pool. Small pool sizes, coupled with negligible evidence of breeding, suggest no significant SWH for woodland amphibian breeding exist on Site.

Amphibian movement corridors are assumed to be present where significant woodland or wetland breeding habitat is found. No significant woodland breeding habitat was found in this Study Area but wetlands north, east and west of the Study Area could support significant quantities of breeding (Figure 6). The NEL2 study will ensure that corridors are retained around these areas with the assumption that those features could be significant.

4.2.6 *Cervid Habitat*

Data obtained from GeoHub indicated that no cervid winter yarding areas are associated with this Study Area. No field studies were warranted for that feature.

The large wetland complex south of the Study Area supports a large area of open water marsh (G150N; Photo 6) with floating vegetation that qualifies as a candidate Moose Aquatic Feeding Area. This area is outside of the Study Area and was not assessed for significance. The potential for Moose aquatic feeding in this wetland will be considered in the NEL2 study.

The Study Area exhibited an abundance of Elk sign, including tracks, trails, scatts, beds rubs and scrapes (Photos 40 to 43). This sign was most concentrated in the wetlands abutting the south side of Fairbank Lake Road and in woodlands abutting the south side of these wetland; to a distance of about 200m.

Tulloch also encountered two anecdotal testimonials of Elk presence; (1) by rail workers who noted they frequently observed Elk crossing Fairbank Lake Road and within the wetland complex adjacent the rail right-of-way, and (2) an off-duty Tulloch employee who performed a roadside Elk call in front of the Study Area and successfully attracted a mature bull male. This bull male emerged from the north into the meadows north of Fairbank Lake Road (Emily Wyszynski, personal communication).

These observations are interpreted by Tulloch to suggest that wetland and riparian woodland areas abutting Fairbank Lake Road are being used as a movement corridor for Elk (Figure 6). This corridor appears to range from 300-400m wide (as measured from the south side of Fairbank Lake Road). This movement corridor does fit the definition of a Cervid Movement Corridor provided in the SWH Criterion Schedule for Ecoregion 5E as that definition does not include Elk. Elk is also not a list at-Risk species. None-the-less, Tulloch recommends retaining some habitat to ensure that Elk movement is not inhibited once operations are underway. Elk movement will be forwarded for consideration in the NEL2 study.

4.2.7 *Snake Habitat*

Two areas on Site were identified as having talus slopes that could be used for snake hibernation (Photos 44 and 45); both on slopes facing wetland features (Figure 6). Both features are adjacent wetlands that are to be retained on Site. *A priori* commitments on behalf of the proponent to retain, and set back from, the large wetland complexes north, east and south of the Study Area (ecosite G144N, G149N and G150N) meant that snake hibernation in these areas could be assumed present and NEL2 studies will apply appropriate setbacks and mitigations with the assumption that this feature could be significant. Snake hibernation presence / absence was therefore not quantified in these areas.

4.2.8 Fish Community Survey

The unnamed watercourse at the crossing was confirmed to support fish habitat. Barriers to fish habitat were identified downstream (beaver dams), and likely occur intermittently throughout the entire reach from beaver damming. No critical or sensitive fish habitat was identified.

A total of ten (10) baited Gee minnow traps were set upstream and downstream of the culvert between 10:00AM and 10:25AM on 01 October 2019 (Figure 2; Photo 30). Traps were retrieved between 10:47AM and 11:00AM on 02 October 2020. Minnow trapping efforts totaled 250 hours and resulted in the capture of 452 fish being caught (Catch Per Unit Effort = 1.81 fish/hour). The species included Fathead Minnow (*Pimephales promelas*; n = 137; TL_{avg} = 58.0mm; FL_{avg} = 54.2mm), Northern Redbelly Dace (*Chrosomus eos*; n = 109; TL_{avg} = 51.6 mm; FL_{avg} = 48.3mm), Creek Chub (*Semotilus atromaculatus*; n = 45; TL_{avg} = 79.1mm; FL_{avg} = 69.4mm), Northern Pearl Dace (*Margariscus nachtriebi*; n = 16; TL_{avg} = 65.0 mm; FL_{avg} = 61.8mm), Bluntnose Minnow (*Pimephales notatus*; n = 134; TL_{avg} = 56.8mm; FL_{avg} = 50.6mm), Brook Stickleback (*Culaea inconstans*; n = 1; TL = 50.0mm) and Finescale Dace (*Chrosomus neogaeus*; n = 10; TL_{avg} = 58.7mm; FL_{avg} = 54.3mm).

MNRF has stated that in-water work is restricted in warmwater fisheries between April 1st and June 15th.

4.3 Other Incidental Observations

Incidental wildlife observations were collected by field crews whenever possible. Most of the incidental observations acquired on this Study Area were bird species and are reported in Table 12 of Section 4.2.4. Fourteen (14) other species were encountered within the Study Area; see Table 14.

Table 14 – Species encountered incidentally while within the Study Area. All bird species encountered incidentally within the Study Area are reported in Table 12 of Section 4.2.4.

Species		Protections ¹	Evidence	
Common Name	Scientific Name	ESA	Songmeter ²	Incidental ³
American Black Bear	<i>Ursus americanus</i>	---	---	T
American Toad	<i>Anaxyrus americanus</i>	---	--	A
Grey Treefrog	<i>Hyla versicolor</i>	---	--	A
Green Frog	<i>Rana clamitans</i>	---	---	V
Elk	<i>Cervus canadensis</i>	---	---	T&S
Moose	<i>Alces alces</i>	---	---	S&T
Mourning Cloak Butterfly	<i>Nymphalis antiopa</i>	---	---	V
North American Beaver	<i>Castor canadensis</i>	---	---	A
Spring Peeper	<i>Pseudacris crucifer</i>	---	--	A
Porcupine	<i>Erethizon dorsatum</i>	---	--	S
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	---	--	A&V
Red-backed Salamander	<i>Plethodon cinereu</i>	---	---	V
White-tailed Deer	<i>Odocoileus virginianus</i>	---	---	T
Wood Frog	<i>Lithobates sylvaticus</i>	---	---	V

¹ Protections include the Endangered Species Act (ESA)

² Songmeters deployed within the Study Area to record bird and amphibian calls. 'Yes' indicates that the species was recorded by a songmeter.

³ Evidence: A = Acoustic (species identified by call), V = Visual (species identified by sight), S = Scat (species identified by scat found), T = Tracks (species identified by the tracks found).

5. NATURAL HERITAGE SUMMARY

Investigations completed as part of these NEL 1 study identified Natural Heritage features (as identified in the PPS) within the Study Area. An NEL2 study is therefore required to ensure that impacts to these features are adequately avoided or mitigated.

A summary of the NEL1 study results and the Natural Heritage features carried forward to the NEL2 report are provided in Table 15. A comprehensive listing of study results (all SAR and SWH associated with the region) are provided in Appendix C.

Table 15 – Summary of Natural Heritage assessment results for studies performed in 2019 and 2020.

Feature	Natural Heritage Assessments	Results	Carried Forward to NEL2 Studies?
Significant Wetlands	<p>Wetlands within the Study Area were assessed for various ecological functions including SWH, SAR habitat and fish habitat. Effort was focused on wetlands immediately south of Fairbanks Lake Road (north side of the Study Area) and small (<2ha) wetlands within the main body of the Study Area as these areas are subject to potential impacts by the Project.</p> <p>Although some ecological functions are discussed for the large wetlands south and east of the Study Area, these areas were not extensively studied as an operational setback of 120m is an <i>a priori</i> assumption (i.e. Project impacts can be avoided).</p>	<ul style="list-style-type: none"> Large wetland complexes north, south and east of the Study Area would require OWES evaluations to determine provincial significance. In the absence of these OWES studies, these wetlands should be retained and work in vicinity should demonstrated no negative impacts. Small wetlands (<2ha) within the Study Area (G135S and G223S) are not eligible for OWES evaluation and therefore do not qualify for provincial significance. 	<p>Yes.</p> <p>May be Present (to be Avoided): Northern, eastern and southern wetland complexes to be retained and safeguarded.</p> <p>Confirmed Absent: Small (<2ha) wetlands are not eligible for OWES evaluation.</p>
Species at Risk (SAR): Threatened and Endangered	<p>Whip-poor-will</p> <ul style="list-style-type: none"> Nocturnal Birds Acoustic Surveys (MNRFP Whip-poor-will Protocol) <p>Blanding's Turtle</p> <ul style="list-style-type: none"> General Habitat Assessment <p>Endangered Bats</p> <ul style="list-style-type: none"> General Habitat Assessment 	<p>Whip-poor-will</p> <ul style="list-style-type: none"> Whip-poor-will are confirmed present on in the Study Area. Three (3) defended territories were observed to be intersecting the Study Area; Figure 5. <p>Blanding's Turtle</p> <ul style="list-style-type: none"> Blanding's Turtle wintering habitat could exist in wetlands north and south of the Study Area (Figure 6). Species presence not confirmed as these wetlands are to be retained. <p>Endangered Bats</p> <ul style="list-style-type: none"> The Study Area does not appear to present ideal habitat for bat maternity roosting. Foraging and day-roosting by these species are possible; especially in proximity to wetlands. No suitable hibernation habitat. 	<p>Yes.</p> <p>Confirmed Present: Whip-poor-will</p> <p>May be Present (to be Avoided): Blanding's Turtle Endangered Bats</p>



Feature	Natural Heritage Assessments	Results	Carried Forward to NEL2 Studies?
Significant Wildlife Habitat (SWH)	<p>Yes:</p> <p>Turtle Habitat</p> <ul style="list-style-type: none"> Overwintering Habitat Assessment Nesting Habitat Assessment <p>Bat Habitat</p> <ul style="list-style-type: none"> Bat Habitat Assessment <p>Bird Habitat</p> <ul style="list-style-type: none"> SM4 Songmeters (Dawn Recordings) SM4 Songmeters (Evening Recordings) Nocturnal Birds Acoustic Surveys (MNRFP Whip-poor-will Protocol) Study Area Reconnaissance (on Foot) Study Area Reconnaissance (UAV Drone) Incidental Observations <p>Amphibian Habitat</p> <ul style="list-style-type: none"> SM4 Songmeters (Evening Recordings) Egg Mass / Larva Searches Incidental Observations SM4 Songmeters (Evening Recordings) <p>Cervid Habitat</p> <ul style="list-style-type: none"> GeoHub Data Review General Study Area Reconnaissance Incidental Observations <p>No:</p> <p>Snake Hibernacula; Candidate habitat can be avoided.</p>	<p>Turtle Habitat</p> <ul style="list-style-type: none"> Turtle wintering habitat could exist in wetlands north and south of the Study Area. Species presence not confirmed as these wetlands are to be retained. <p>Bat Habitat</p> <ul style="list-style-type: none"> The Study Area does not appear to present ideal habitat for bat maternity roosting. No suitable hibernation habitat. <p>Bird Habitat</p> <ul style="list-style-type: none"> No evidence of breeding by Special Concern birds. Waterfowl Nesting is possible in proximity to the large southern wetland complexes. The significance of all other candidate bird SWH in the Study Area was discounted. <p>Amphibian Habitat</p> <ul style="list-style-type: none"> No significant amphibian breeding in small wetlands G134S and G223S Amphibian breeding could be significant within portions of the large northern, eastern and western wetland complexes. Species presence not confirmed as these wetlands are to be retained. <p>Cervid Habitat</p> <ul style="list-style-type: none"> Elk movement corridor along the north side of the Site (Figure 6). Candidate moose aquatic feeding area in southern wetland complex. 	<p>Yes</p> <p>May be Present (to be Avoided):</p> <p>Turtle Habitat Waterfowl Nesting Habitat Amphibian Breeding (Wetlands)</p> <p>Additional Considerations:</p> <p>Elk Movement Corridor</p>



Feature	Natural Heritage Assessments	Results	Carried Forward to NEL2 Studies?
		Significance not confirmed as these wetlands are to be retained.	
Fish and Aquatic Habitat	Yes. <ul style="list-style-type: none"> Fish Community Survey 	<ul style="list-style-type: none"> Fish habitat confirmed in drains adjacent Fairbank Lake Road and the Rail Right-of-way (Figure 6) 	Yes. Confirmed Present. Although operations will set back from waterbodies and wetlands, best practices for the protection of aquatic habitat in vicinity to the Study Area will be carried forward for consideration in the NEL2. Furthermore, Study Area access occurs in vicinity to confirmed fish habitat.
Migratory Birds	Yes. <ul style="list-style-type: none"> SM4 Songmeters (Dawn Recordings) SM4 Songmeters (Evening Recordings) Nocturnal Birds Acoustic Surveys (MNRF Whip-poor-will Protocol) Study Area Reconnaissance (on Foot) Study Area Reconnaissance (UAV Drone) Incidental Observations 	<ul style="list-style-type: none"> Vegetated habitat throughout the Study Area supports suitable nesting by various migratory bird species. Many migratory bird species were observed within the Study Area. 	Yes. Confirmed Present: Migratory Bird Breeding Habitat

6. CLOSING

This NEL1 report has been prepared in partial fulfillment of a permit application for Category 3 Class A Pit and Category 4 Class A Quarry licences under the ARA. MNRF policy (OMNR 2006) states that this NEL1 report shall determine whether one or more Natural Heritage features exist on Site or within 120m. These natural heritage features are outlined in the Section 2.1 of the PPS and in Section 1.2 of this report.

Tulloch is pleased to provide this NEL1 report as record of studies performed at this Site over the course of the 2019 and 2020 field season. The work contained herein has been undertaken by qualified subject experts according to industry and provincial standards that are appropriate and defensible for the scope and location of this Project. The results obtained during these investigations are summarized in Table 15 and comprehensive results are provided in Appendix C.

Observations are representative of the conditions as they existed at the time of the field investigations. Habitat changes over time, which can affect suitability to support species of conservation concern. Many wildlife species are migratory and their individual habitat fidelities will vary. Tulloch Environmental has used its best professional judgment to interpret the background information and field observations to produce accurate and defensible conclusions.



This report will serve as the bases for an NEL2 report that will assess potential impacts of the Project on the Natural Heritage features identified on (and around) the Study Area. The NEL2 will also identify avoidance and mitigation strategies that will eliminate / reduce foreseen impacts in order to safeguard local wildlife and maintain the ecological functions of the area.

Yours truly,

TULLOCH ENVIRONMENTAL

Report prepared by:

A handwritten signature in blue ink, appearing to read 'K. Major'.

Kelly Major, M.Sc. EP
Senior Terrestrial Ecologist

Report reviewed by:

A handwritten signature in black ink, appearing to read 'E. Myles-Gonzalez'.

Emelia Myles-Gonzalez, M.Sc.
Aquatic Ecologist

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APPENDIX A

Natural Heritage Review and Communications with Regulators



1942 Regent Street
Unit L
Sudbury, ON
3E 5V5

T. 705 671.2295
F. 705 671.9477
TF. 800 810.1937
sudbury@Tulloch.ca

[WWW.Tulloch.ca](http://www.tulloch.ca)

June 12, 2019

Jean Enneson | Management Biologist
Ministry of Natural Resources and Forestry (MNR)
3767 Hwy 69S,
Sudbury, ON, P3G 1E7
Tel: 705-564-7862

Dear Jean,

Re: Natural Heritage Background Information Request: Lot 9, Concession 2 in the Township of Denison, Fairbank Lake Road, Greater Sudbury, Ontario, Canada (Tulloch Project ID # 191439).

Tulloch Environmental, a division of Tulloch Engineering Inc. (Tulloch), has been retained by John Rintala Trucking to conduct a review of Natural Heritage Background Information available for a property on Fairbank Lake Road (Hwy 4), in Greater Sudbury. This review is in support of an environmental opportunities and constraints assessment Tulloch is preparing for the site.

The site is located on the south side of Fairbank Lake Road (Hwy 4), about 1.2km west of Crean Hill Road. The property includes all of Lot 9, Concession 2 in the Township of Denison. UTM Coordinates (NAD83) for the site are: 17T 469800 5137600. A map of the project location is provided in the attachments. The scope of this review includes the site and areas within 1000m.

This environmental opportunities and constraints assessment is being undertaken as a possible first step in Natural Heritage Levels 1 and 2 (NEL1 and NEL2) studies in partial fulfillment of application requirements for permitting under the Aggregate Resources Act. The results of this assessment will assist in the preparation of a proposed permit area. Once an area has been identified by the proponent, Tulloch will request a kick-off meeting with the MNR to discuss any Natural Heritage features and conservation concerns associated with the site, and to assist in scoping NEL1 field studies going forward.

To date, Tulloch has reviewed information obtained from Land Information Ontario (LIO) regarding land uses and natural heritage features known (or believed) to occur within 1000m of the site. This data included sites of domestic, recreational, commercial and industrial land uses as well as known environmental sensitivities (e.g. Significant Wildlife Habitat, nesting sites, fish spawning sites) and areas of enhanced protection (e.g. parks, conservation reserves, ANSI). A series of maps indicating LIO findings are additionally provided in the attachments.

Tulloch has also reviewed natural heritage information provided by the Ministry of Natural Resources and Forestry via the Natural Heritage Information Centre (NHIC) Make-a-map, Crown Land Use Atlas and Fish ON-Line web applications. This information was supplemented with records obtained from authoritative atlases, including; the Atlas of the Breeding Birds of Ontario (ABBO), Bat Conservation International and the Ontario Reptiles and Amphibians Atlas (OBBA).

A summary of notable information is provided below:

1. A review of the NHIC database revealed records for Barn Swallow within 1000m of the site.
2. A review of the provincial atlases (ABBO & ORAA) have identified records of the following species at risk (SAR) in vicinity to the site:
 - Bank Swallow
 - Barn Swallow
 - Bobolink
 - Canada Warbler
 - Chimney Swift
 - Common Nighthawk
 - Eastern Meadowlark
 - Eastern Whip-poor-will
 - Eastern Wood-Pewee
 - Golden-winged Warbler
 - Olive-sided Flycatcher
 - Short-eared Owl
 - Blanding's Turtle
 - Snapping Turtle
3. The Sudbury District SAR list (updated June 2017) includes 43 species found on the mainland portions of the District; see attached.
4. No ANSIs have been identified within 1000m of any sites.
5. Wetlands within and adjacent the site have not been evaluated as per the Ontario Wetland Evaluation System.
6. No known Significant Wetlands have been identified within 1000m of any sites.
7. Environment and Climate Change Canada considers the General Nesting Periods for this area (Nesting Zone C3) to be April 8- August 28 for forests, April 8 to August 16 for wetlands and April 12 to August 28 for open habitats.
8. Aquatic features exist within the subject property. Aquatic features adjacent/connected to waterbodies at the proposed site include:
 - **Perch Lake** – No known information
 - **Fairbank Creek** – No known information
 - **May Lake** – No known information
 - **Ethel Lake (further upstream)** – No known information
 - **St. Pothier Lake (downstream)** – No known information

Tulloch is requesting the following information and guidance from the OMNRF:

- Terrestrial data pertaining to the site and areas within 1000m, such as:
 - Any records of provincially tracked species beyond those provided above.
 - A more recent District SAR list, if available.
 - Any known Significant Wildlife Habitat and other areas of critical habitat associate with the site.
 - The General Nesting Periods for the area (if different from that recommended by Environment and Climate Change Canada, above).
 - Other terrestrial timing windows and restrictions, if relevant.

- Fishery data for water bodies adjacent to the project area including:
 - Known fish community species
 - Thermal regimes (if different than above)
 - Areas of known critical habitat (spawning, etc.)
 - Aquatic species at risk (records, local knowledge)
 - Any known barriers to passage

- OMNRF fishery management information:
 - In-water work timing windows
 - Areas of concern (e.g. known sources of sediment and erosion, sources of pollution)
 - Fishery management objectives (e.g. rehabilitation or protection goals, etc.)
 - Known commercial fishing licenses (i.e. commercial baitfish licenses) in the area

- Adjacent areas of protection not listed above (ANSI, Parks, Conservation Reserves, etc.)

If you have any questions or require additional information, please do not hesitate to contact the undersigned at (705) 522-6303.

Thank you for your time and assistance.

Sincerely,



Emily Wyszynski
Environmental Technician
Tulloch Environmental, a division of Tulloch Engineering
emily.wyszynski@gmail.com
(705) 522-6303 x 627

Attachments

Rintala Quarry Fairbank Lake Road Project # 191439

Natural Heritage
Background Review
- Land Use Features -

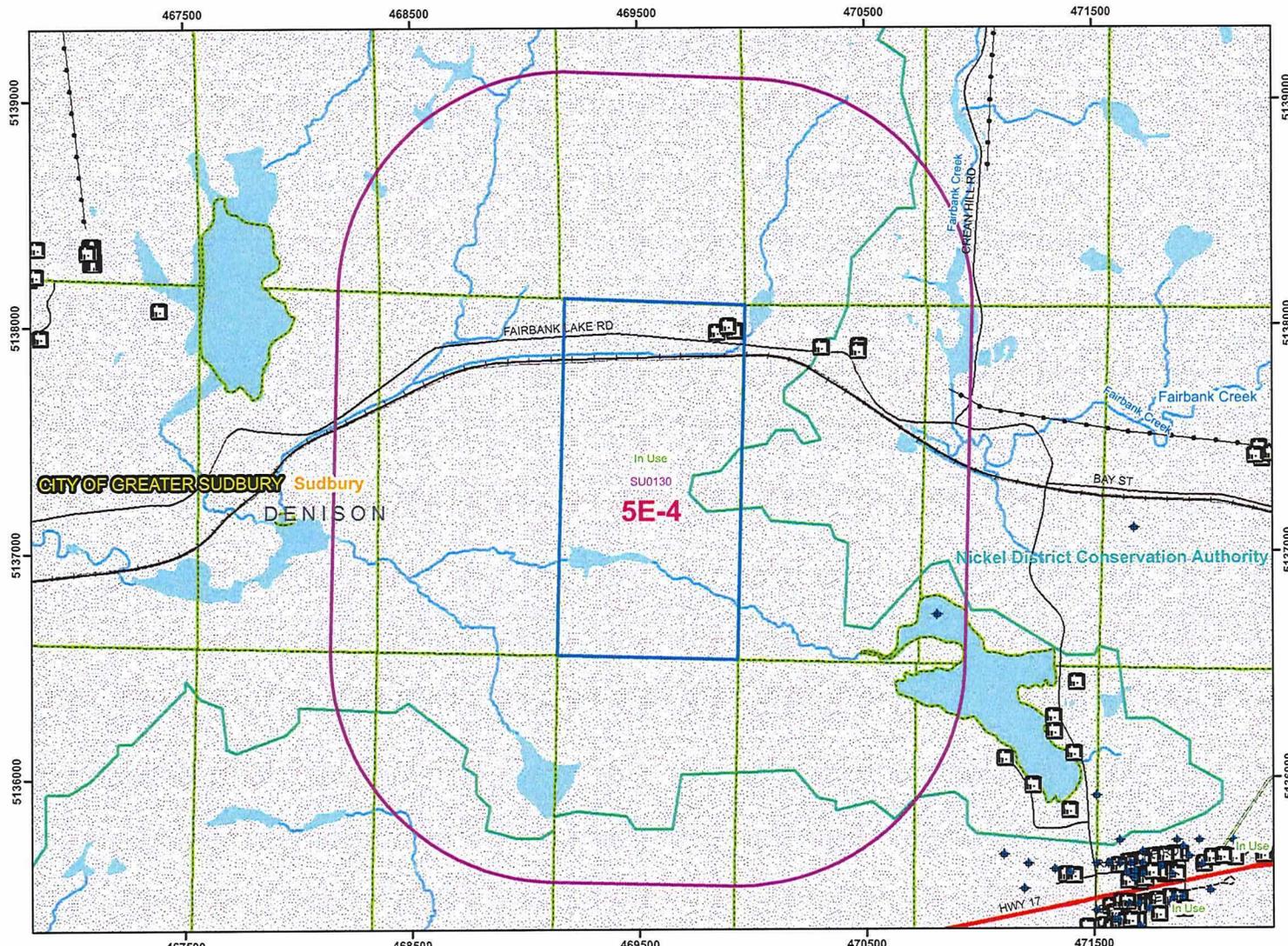
Legend

- Groundwater Well
- Building
- Tower
- Highway
- Local Road
- Other Road
- Rail Line
- Utility Line
- Township
- Ecodistrict
- Municipalities
- Geographic Lot Fabric
- Trapline License Area
- Bait Harvest Area
- Bear Management Area
- MNR District
- Conservation Authority Admin Area
- Patent Land
- OHN Waterbody
- OHN Watercourse

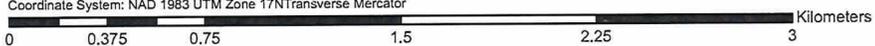
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DATE: 10/06/2019

Data Provided by Land Information Ontario:
Data updated as of February 2018.



Coordinate System: NAD 1983 UTM Zone 17N Transverse Mercator



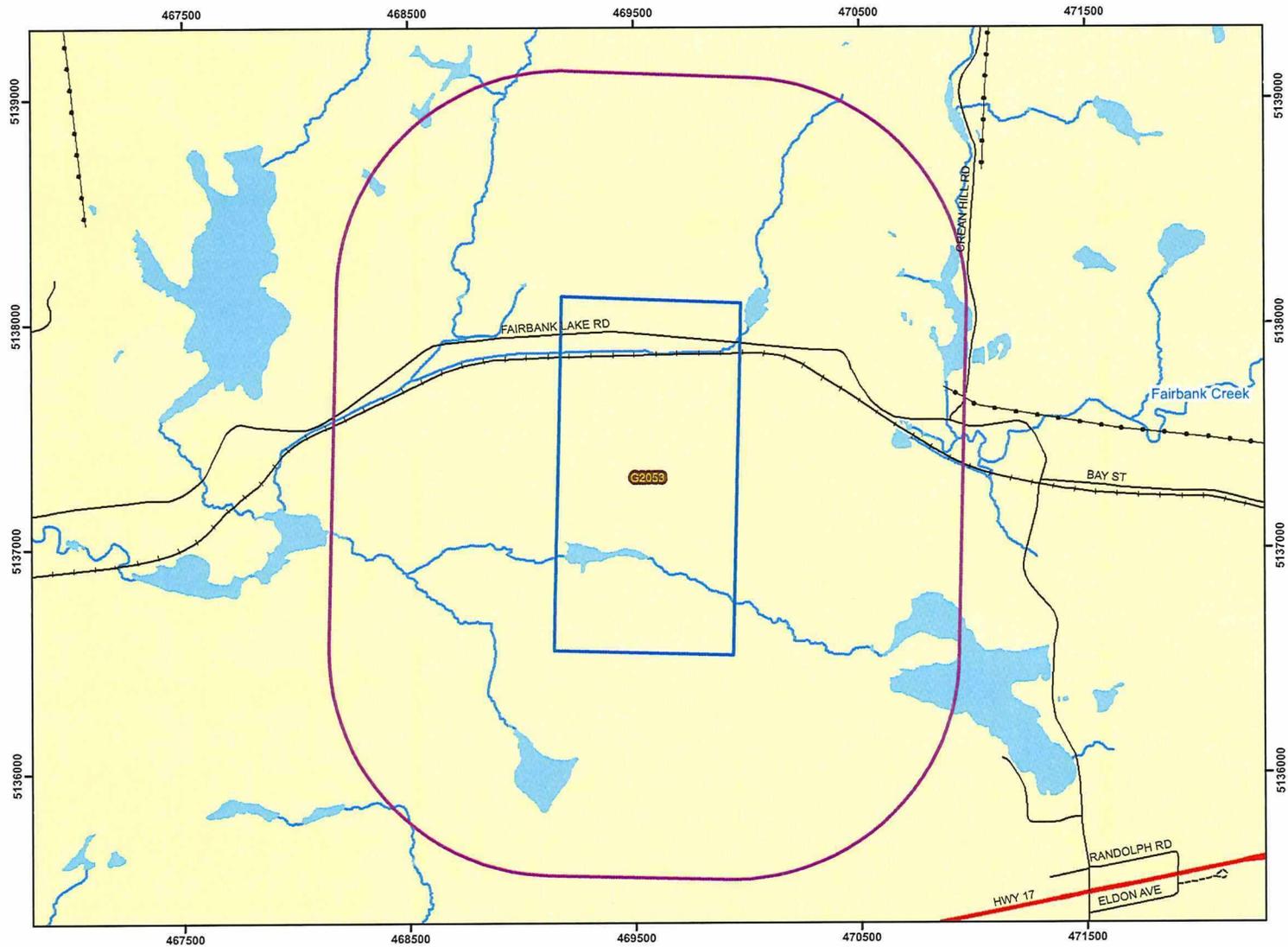
User Name: Kelly.Major

Rintala Quarry Fairbank Lake Road Project # 191439

Natural Heritage
Background Review
- Protected Areas -

Legend

- Highway
- Local Road
- - - Other Road
- +— Rail Line
- Utility Line
- OHN Waterbody
- OHN Watercourse
- CLUPA Designation
- General Use Area



Coordinate System: NAD 1983 UTM Zone 17N Transverse Mercator
 0 0.375 0.75 1.5 2.25 3 Kilometers

User Name: Kelly.Major

SCALE: 1:18,088

DATE: 10/06/2019

Data Provided by Land Information Ontario:
Data updated as of February 2019.

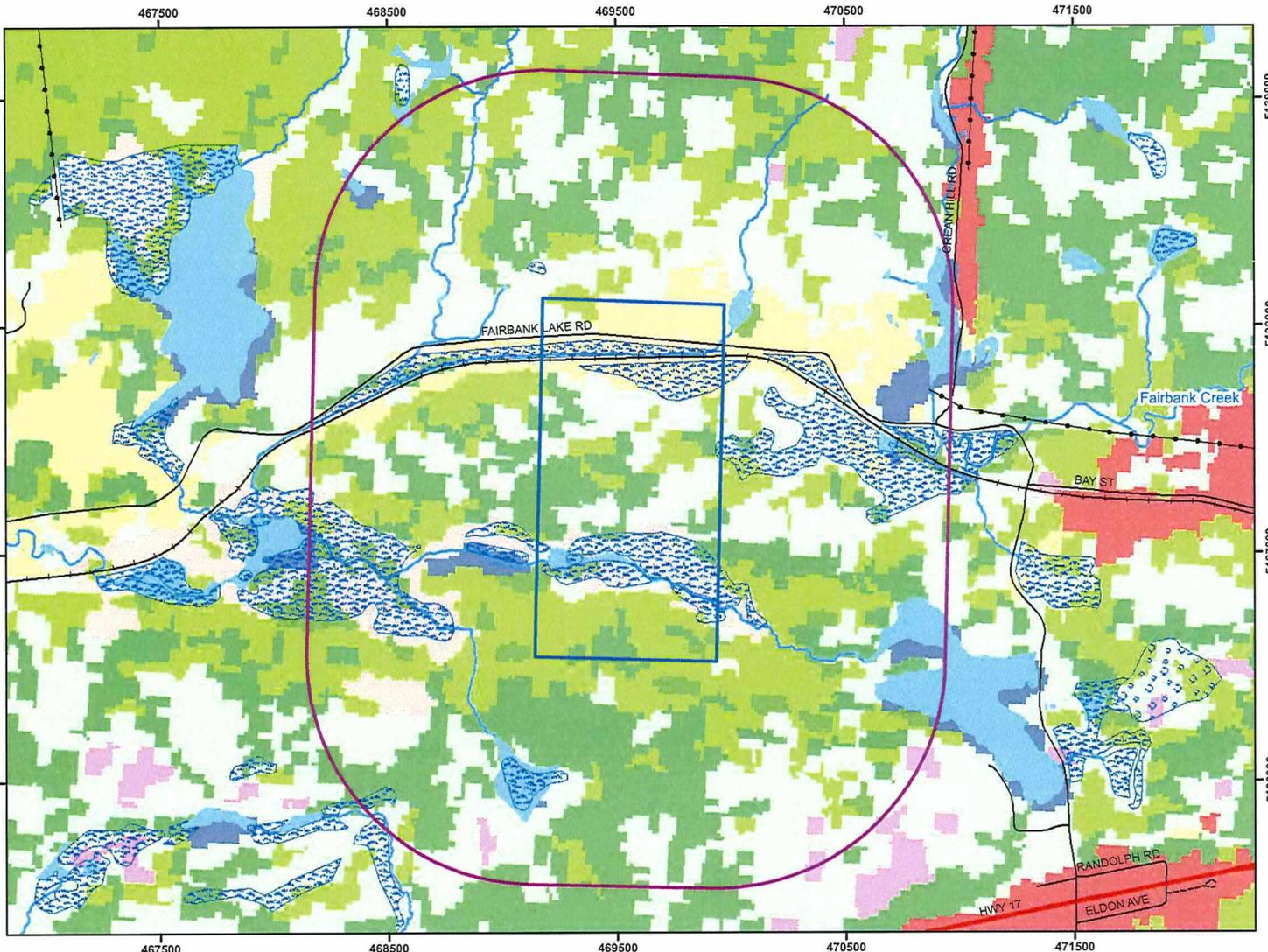


Rintala Quarry Fairbank Lake Road Project # 191439

Natural Heritage
Background Review
- Terrestrial Habitat -

Legend

- Highway
 - Local Road
 - Other Road
 - Rail Line
 - Utility Line
 - FRI Wetland (Open)
 - FRI Wetland (Treed)
 - OHN Waterbody
 - OHN Watercourse
- Ontario Land Cover Compilation Version 2**
- 1 - Clear Open Water
 - 8 - Bog
 - 11 - Sparse Treed
 - 13 - Deciduous Treed
 - 14 - Mixed Treed
 - 15 - Coniferous Treed
 - 18 - Disturbance
 - 26 - Bedrock
 - 27 - Community/Infrastructure



Coordinate System: NAD 1983 UTM Zone 17N Transverse Mercator
 0 0.375 0.75 1.5 2.25 3 Kilometers

User Name: Kelly.Major

SCALE: 1:18,088
 DATE: 10/06/2019
 Data Provided by Land Information Ontario:
 Data updated as of February 2018.

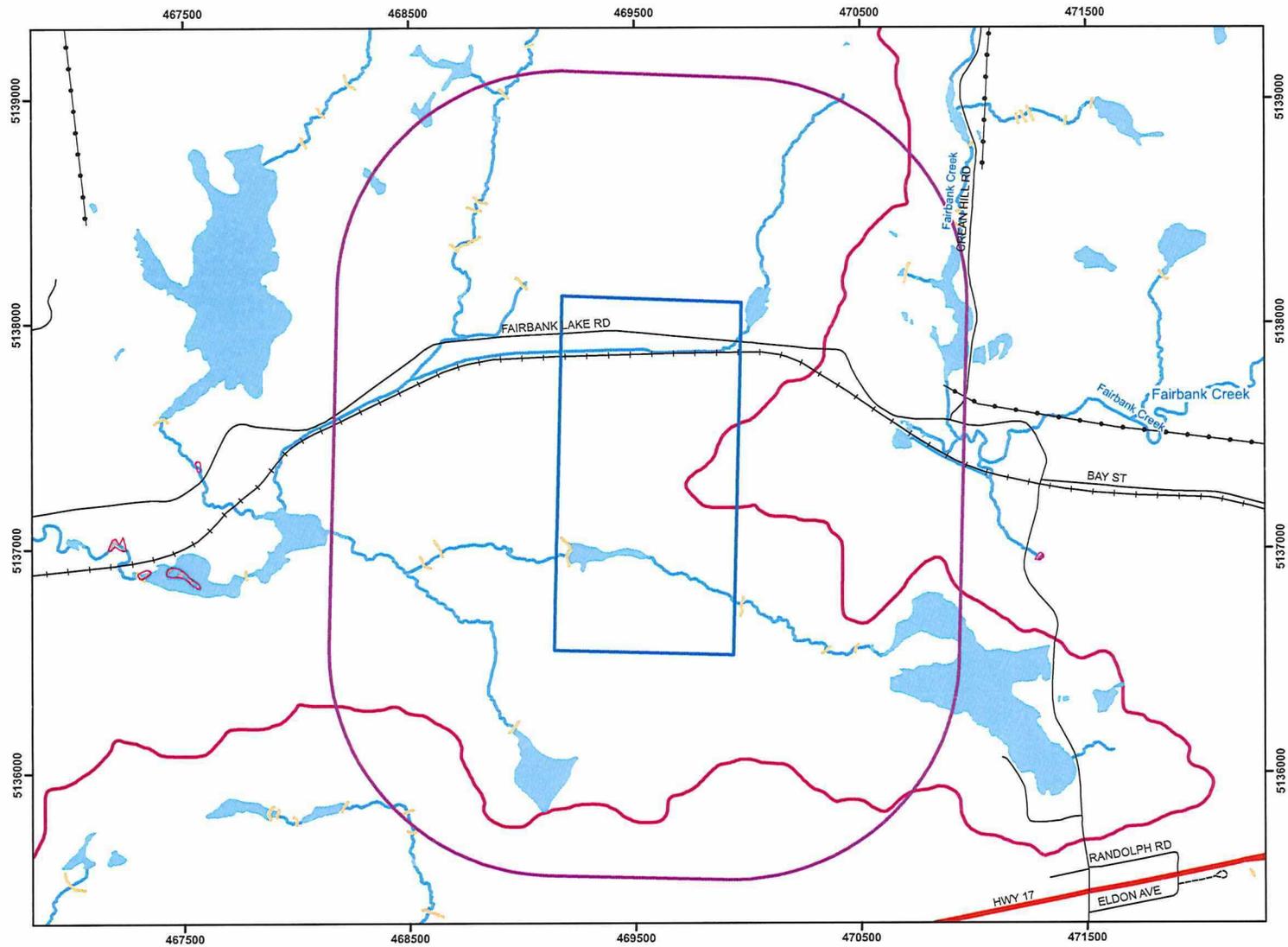


Rintala Quarry Fairbank Lake Road Project # 191439

Natural Heritage
Background Review
- Aquatic Habitat -

Legend

-  Highway
-  Local Road
-  Other Road
-  Rail Line
-  Utility Line
-  Beaver Dam
-  OHN Waterbody
-  OHN Watercourse
-  Primary Watershed
-  Secondary Watershed
-  Tertiary Watershed
-  Quarternary Watershed
- ARA Waterbody Regime**
-  Unknown Regime
-  Cold Water
-  Cool Water
-  Warm Water



Coordinate System: NAD 1983 UTM Zone 17N Transverse Mercator
 Kilometers

User Name: Kelly.Major

SCALE: 1:18,088

DATE: 11/06/2019

Data Provided by Land Information Ontario;
Data updated as of February 2019.

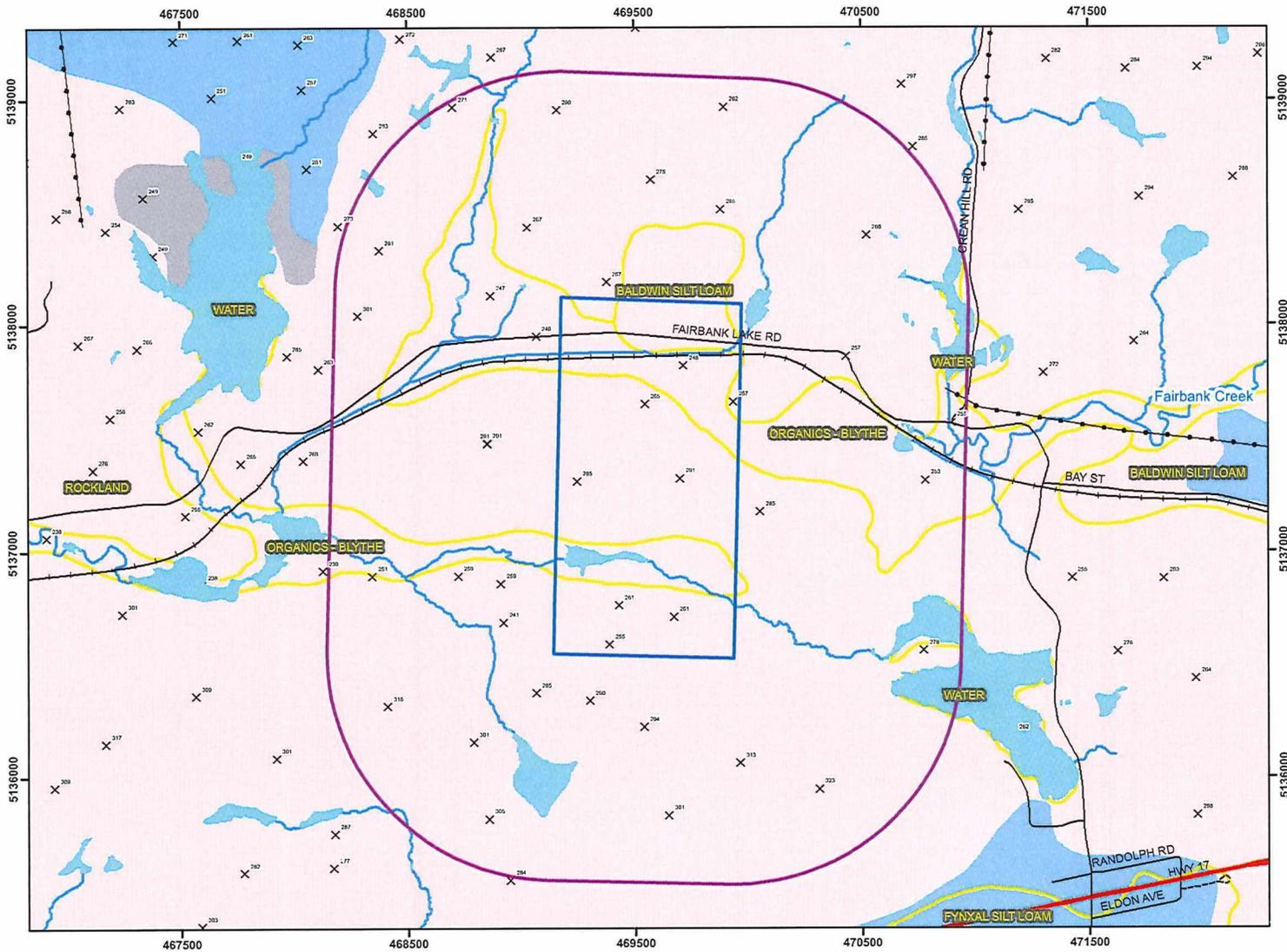


Rintala Quarry Fairbank Lake Road Project # 191439

Natural Heritage
Background Review
- Surficial Geology -

Legend

-  Highway
 -  Local Road
 -  Other Road
 -  Rail Line
 -  Utility Line
 -  OHN Waterbody
 -  OHN Watercourse
 -  Spot Height
 -  Soil Survey Complex
- NOEGTS Geologic Terrain**
- LANDFORM**
-  Glaciolacustrine plain
 -  Organics
 -  Bedrock knob



SCALE: 1:18,088

DATE: 11/06/2019
Data Provided by Land Information Ontario;
Data updated as of February 2018.

Coordinate System: NAD 1983 UTM Zone 17N Transverse Mercator



User Name: Kelly.Major

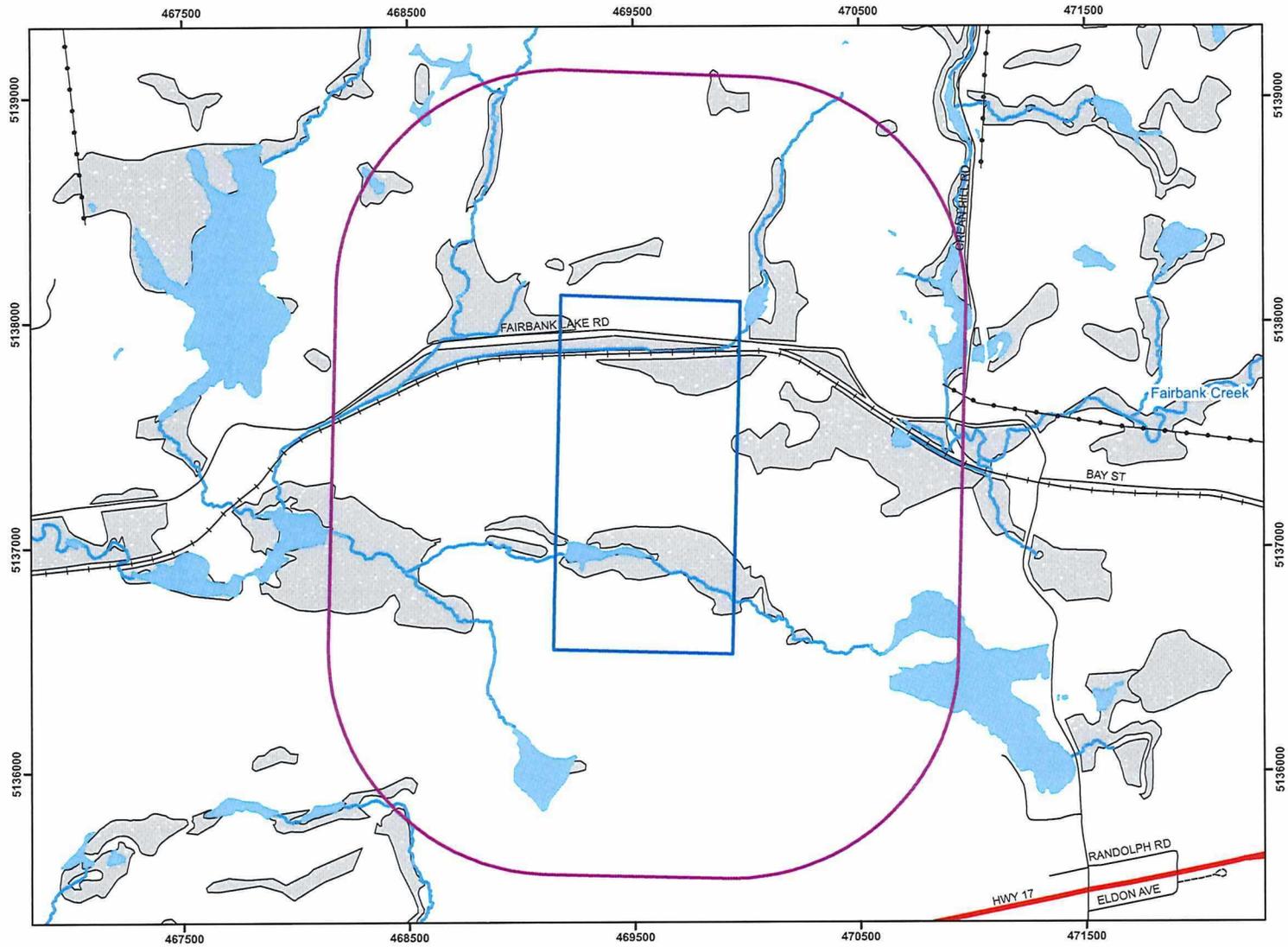


Rintala Quarry Fairbank Lake Road Project # 191439

Natural Heritage
Background Review
- Wetlands -

Legend

-  Highway
-  Local Road
-  Other Road
-  Rail Line
-  Utility Line
-  OHN Waterbody
-  OHN Watercourse
- Wetlands 5e**
-  Not OWES Evaluated



Coordinate System: NAD 1983 UTM Zone 17N Transverse Mercator
 0 0.375 0.75 1.5 2.25 3 Kilometers

User Name: Kelly.Major

SCALE: 1:18,088

DATE: 12/06/2019
 Data Provided by Land Information Ontario:
 Date updated as of February 2018.



From: [Emily Wyszynski](#)
To: [Bill Tibble](#); [Emelia Myles-Gonzalez](#); [Josh Wilson](#); [Kelly Major](#)
Subject: FW: Natural Heritage Review and Background Information Request - MNRF - Rintala Quarry June 12 2019
Date: July-02-19 8:36:26 AM
Attachments: [image001.png](#)

FYI Response from MNRF for Rintala Quarry. I will also be adding this to the shared folder under background information.

Cheers

Emily Wyszynski

Environmental Technician



Tel: 705 522 6303
Fax: 705 671 9477

TULLOCH Environmental Inc
1942 Regent Street, Sudbury, ON P3E 5V5
emily.wyszynski@tulloch.ca | TULLOCH.ca

From: Hall, Mike (MNRF) <mike.hall@ontario.ca>
Sent: June 24, 2019 9:58 AM
To: Emily Wyszynski <emily.wyszynski@tulloch.ca>
Subject: RE: Natural Heritage Review and Background Information Request - MNRF - Rintala Quarry June 12 2019

Hi Emily,

With regards to your information request, please see embedded text (**below**)

Tulloch is requesting the following information and guidance from the OMNRF:

- Terrestrial data pertaining to the site and areas within 1000m, such as:
 - Any records of provincially tracked species beyond those provided above. – **no records available; understandable given that 1) much of the available information is derived from incidental sightings; no targeted surveys have been done on Crown lands, and 2) much of the identified area is not Crown land**
 - A more recent District SAR list, if available. – **SAR responsibility now rests with MOECP**
 - Any known Significant Wildlife Habitat and other areas of critical habitat associate with the site. – **no records found; understandable given that 1) no targeted surveys have been done on Crown lands and 2) much of the identified area is not Crown land**
 - The General Nesting Periods for the area (if different from that recommended by Environment and Climate Change Canada, above). (**ECCC recommendations are acceptable**)
 - Other terrestrial timing windows and restrictions, if relevant. – **no information available**

- Fishery data for water bodies adjacent to the project area including:
 - Known fish community species – identified water bodies/courses have not been surveyed; a scientific collector's permit from MNRF may be required if a survey to determine species composition is contemplated.
 - Thermal regimes (if different than above) – identified water bodies/courses have not been surveyed; a scientific collector's permit from MNRF may be required if a survey to determine species composition/ thermal regime is contemplated.
 - Areas of known critical habitat (spawning, etc.) – identified water bodies/courses have not been surveyed
 - Aquatic species at risk (records, local knowledge) – contact MOECP
 - Any known barriers to passage – identified water bodies/courses have not been surveyed
- OMNRF fishery management information:
 - In-water work timing windows – in water work is permitted in cold water fisheries from June 16th till August 31st, in water work is permitted in warm water fisheries from June 16th till March 31st.
 - Areas of concern (e.g. known sources of sediment and erosion, sources of pollution) – identified water bodies/courses have not been surveyed
 - Fishery management objectives (e.g. rehabilitation or protection goals, etc.) – standard position is to maintain existing populations
 - Known commercial fishing licenses (i.e. commercial baitfish licenses) in the area – there is a commercial baitfish operator for Denison Twp. If contact information for this person is required please contact Keith Scott at 705-564-7861.
- Adjacent areas of protection not listed above (ANSI, Parks, Conservation Reserves, etc.) – none on record for the area identified on the attached.

Regards,

Mike

Mike Hall

Management Biologist
 Sudbury District
 (705) 564-7862
mike.hall@ontario.ca

From: Enneson, Jean (MNRF)

Sent: June-13-19 1:22 PM

To: emily.wyszynski@tulloch.ca; Hall, Mike (MNRF) <mike.hall@ontario.ca>

Subject: FW: Natural Heritage Review and Background Information Request - MNRF - Rintala Quarry
 June 12 2019

Hi Emily,

I am forwarding your email to Mike Hall, as this is in the geographical area he covers.

Jean Enneson

(705) 564-7859

From: Emily Wyszynski <emily.wyszynski@tulloch.ca>
Sent: June-12-19 2:58 PM
To: Enneson, Jean (MNRF) <Jean.Enneson@ontario.ca>
Subject: Natural Heritage Review and Background Information Request - MNRF - Rintala Quarry June 12 2019

Hi Jean,

Tulloch Environmental is working on a background review for a proposed quarry on Fairbank Lake Road between Worthington and Whitefish in Greater Sudbury, Ontario. Please find attached a letter of request (including LIO mapping) which provides additional information for the project. While this letter contains information on Species at Risk (SAR), we understand these details are now provided by the MECP and so a copy of this letter has also been provided to them. Any information you could provide to supplement or elaborate on what we have already found through our desktop studies would be greatly appreciated. If this letter should be forwarded on to another individual at the MNRF please feel to do so.

I can be contacted at the details below should you have any questions or require any further information. Please acknowledge receipt of this email.

Take care,

Emily

Emily Wyszynski

Environmental Technician



Tel: 705 522 6303

Fax: 705 671 9477

TULLOCH Environmental Inc

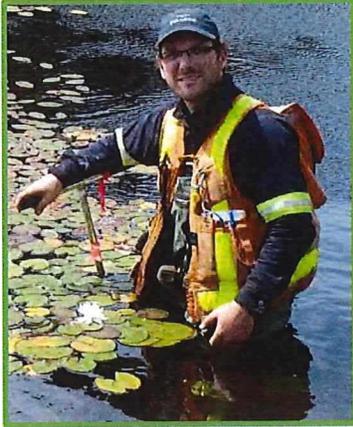
1942 Regent Street, Sudbury, ON P3E 5V5

emily.wyszynski@tulloch.ca | TULLOCH.ca

APPENDIX B

Project Staff

APPENDIX B – Project Staff



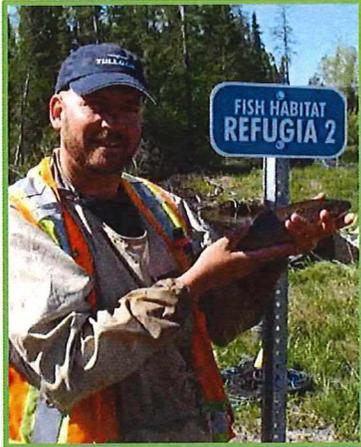
Kelly Major, M.Sc. EP is a Terrestrial Ecologist at Tulloch Engineering. Mr. Major has worked as a biologist throughout Ontario for nine years in consulting, government and academic sectors. His areas of specialization include species at risk, environmental assessment, wetland evaluation and GIS mapping. As an academic, Mr. Major has acted as principal investigator for studies in community ecology, plant invasion and silviculture. His research has been peer-reviewed and published. With the Ministry of Natural Resources and Forestry (MNRF), he surveyed wildlife biodiversity across the province and co-authored technical guides forecasting boreal forest succession. As a consultant, Mr. Major now leads habitat assessments, species-at-risk surveys and environmental impact assessments. He acts as GIS Specialist for Tulloch's

environmental group, he has served as expert witness for LPAT tribunal, and is recognized by the MNRF as formally trained in the Ontario Ecological Land Classification System, the Ontario Wetland Evaluation System and Ontario reptile and amphibian survey. Mr. Major is recognized by the Ontario Ministry of Transportation (MTO) as RAQS certified in the Natural Sciences.



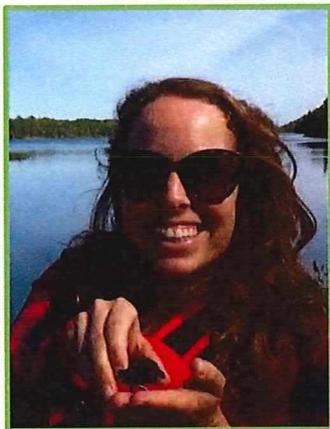
Emelia Myles-Gonzalez, M.Sc. is an Aquatic Biologist for TULLOCH Engineering. She has extensive knowledge of aquatic habitats and ecosystems. She has worked as an aquatic biologist at Tulloch for two years, and previously worked in academic sectors. Emelia's focus is on aquatic habitat assessments, cause-effect monitoring, community composition assessments and environmental baseline and contaminant monitoring. Emelia has excellent oral and written communication skills, preparing reports, scientific papers, permit and grant applications, and presenting at numerous international conferences. She has experience collecting, organizing and reporting on data from water, soil and sediment quality measurements, habitat assessments, fisheries/macroinvertebrate collections and environmental impact assessments. Emelia has played an integral role in study design, sample collection, statistical analyses, interpretation

and reporting on numerous projects. Emelia has acted as a principle investigator on projects involving the Department of Fisheries and Oceans and the Great Lakes Fisheries Commission.



Bill Tibble, M.Sc. is the Environmental Department Lead at Tulloch Engineering. He has worked professionally throughout Canada for 15 years as an Aquatic Biologist/Ecologist in the environmental consulting, government and academic sectors. His areas of specialization include environmental effects monitoring, environmental assessment, environmental baseline studies, and aquatic habitat characterization. He has taken part in each stage of project development, including study design, data collections and interpretation, permitting, reporting and post-construction monitoring. Bill has acted as the principle investigator for various projects requiring liaising with regulators such as Fisheries and Oceans Canada and the Ministry of Natural Resources and has obtained the required advice, authorizations and permits for numerous projects

involving in-water work.



Emily Wyszynski, B.Sc. is an Environmental Technologist with Tulloch Engineering and has worked in the environmental consulting field for over 4 years. While she has a wide range of experience in aquatic and terrestrial assessments, her specialization is in wildlife ecology and botany. Her interest in work involving Species at Risk (SAR) began when she was tasked with implementing the MTO SAR training course for all Tulloch employees working along the Highway 69 corridor. She has since worked on multiple projects involving the identification, protection and monitoring of SAR. Emily's assists with environmental impact assessments for residential, commercial and municipal developments as well as prepares avoidance /

mitigation measures to minimize project impacts. Emily is certified as a Wetland Evaluator according to the Ontario Wetland Evaluation System (OWES) and is trained as a Class 2 Electrofisher.

APPENDIX C

Comprehensive Study Results

APPENDIX C – Comprehensive Study Results

This table lists all SAR identified as associated with the Study Area from the background review and SWH associated with Ecoregion 5E, respectively. The potential for species to occur within the Study Area is determined according to criteria outline in Table 5 (Section 4.2). These ratings are based on all information collected over the course of the NEL1, including: the Natural Heritage background review, habitat assessments and targeted surveys. All features considered to have a moderate or high potential for occurring within the Study Area are carried forward for consideration in the NEL2 report. Some features with a low potential for occurring within the Study Area may also be carried forward to the NEL2; justification for these latter choices are provided individually.

Natural Heritage Feature	Potential to Occur in the Study Area	Justification	Forwarded to NEL2?
Migratory Birds Convention Act			
Migratory Bird Breeding	High	All wooded ecosites could support nesting by migratory bird species. 40 Species observed on or within the Study Area.	Yes
Provincial Policy Statement			
Significant Wetlands	Moderate	Large wetland complexes north, south and east of the Study Area have not been evaluated per the OWES. NEL2 studies must recommend retaining these wetlands along with appropriate upland setbacks and mitigations. Small (<2ha) wetlands on Site are not eligible for OWES evaluation and therefore do not qualify for Significance.	Yes
Coastal Wetlands	None	The Study Area is not within 2km of the Great Lakes coastline.	No
Significant Woodlands	None	Not applicable to Ecoregion 5E.	No
Significant Valleylands	None	Not applicable to Ecoregion 5E.	No
Significant Areas of Natural and Scientific Interest	None	Feature is not present within Ontario GeoHub databases.	No

Natural Heritage Feature	Potential to Occur in the Study Area	Justification	Forwarded to NEL2?
Endangered Species Act – Endangered SAR			
Eastern Small-footed Myotis <i>Myotis leibii</i>	Maternity Roosting: Low Hibernacula: Low Feeding/Day Roosting: Moderate	All wooded ecosites within the Study Area could provide foraging and day roosting habitat for endangered bat species; G011TI, G015TI, G016TI, G018TI, G097Tt, G103Tt, G104Tt, G116Tt, G119Tt, G130Tt. Wetland ecosites are likely to support the best forage habitat; G130Tt, G134S, G135S, G144N, G149N, G150N, G223TI. The best bat habitat on Site is therefore associated with wooded areas adjacent the wetland ecosites. No clusters of cavity trees were encountered that would be indicative of prime maternity roosting habitat. No caves suitable for bat hibernation were observed within the Study Area. The potentials for bat maternity roosting or hibernation within the Study Area are considered low. The potential for bat foraging and day-roosting is considered moderate.	Yes
Little Brown Myotis <i>Myotis lucifugus</i>	Maternity Roosting: Low Hibernacula: Low Feeding/Day Roosting: Moderate	All wooded ecosites within the Study Area could provide foraging and day roosting habitat for endangered bat species; G011TI, G015TI, G016TI, G018TI, G097Tt, G103Tt, G104Tt, G116Tt, G119Tt, G130Tt. Wetland ecosites are likely to support the best forage habitat; G130Tt, G134S, G135S, G144N, G149N, G150N, G223TI. The best bat habitat on Site is therefore associated with wooded areas adjacent the wetland ecosites. No clusters of cavity trees were encountered that would be indicative of prime maternity roosting habitat. No caves suitable for bat hibernation were observed within the Study Area. The potentials for bat maternity roosting or hibernation within the Study Area are considered low. The potential for bat foraging and day-roosting is considered moderate.	Yes

Natural Heritage Feature	Potential to Occur in the Study Area	Justification	Forwarded to NEL2?
Northern Myotis <i>Myotis septentrionalis</i>	Maternity Roosting: Low Hibernacula: Low Feeding/Day Roosting: Moderate	All wooded ecosites within the Study Area could provide foraging and day roosting habitat for endangered bat species; G011TI, G015TI, G016TI, G018TI, G097Tt, G103Tt, G104Tt, G116Tt, G119Tt, G130Tt. Wetland ecosites are likely to support the best forage habitat; G130Tt, G134S, G135S, G144N, G149N, G150N, G223TI. The best bat habitat on Site is therefore associated with wooded areas adjacent the wetland ecosites. No clusters of cavity trees were encountered that would be indicative of prime maternity roosting habitat. No caves suitable for bat hibernation were observed within the Study Area. The potentials for bat maternity roosting or hibernation within the Study Area are considered low. The potential for bat foraging and day-roosting is considered moderate.	Yes
Endangered Species Act – Threatened SAR			
Bank Swallow <i>Riparia riparia</i>	Absent	No suitable habitat (sandy banks, sand piles) was identified on the Study Area. Species was not observed incidentally or on Songmeter recordings. The species could occupy the Study Area once operational.	Yes
Barn Swallow <i>Hirundo rustica</i>	Absent	Suitable habitat (porous vertical structures sheltered from the rain) is not present within the Study Area. Species was not observed incidentally or on Songmeter recordings.	No
Blanding's Turtle <i>Emydoidea blandingii</i>	Moderate	Wetlands south of the Study Area (G149N and G150N), and flooded portions of wetlands adjacent Fairbank Lake Road (G135S and G144N) may support suitable overwintering habitat. NEL2 studies must recommend retaining these wetlands along with appropriate upland setbacks and mitigations. See Figure 6.	Yes
Bobolink <i>Dolichonyx oryzivorus</i>	Absent	Suitable habitat (active and inactive agricultural fields, large meadows, grasslands) is not present within the Study Area. Species has a very conspicuous call; it was not observed on Site and was not captured in any Songmeter recordings.	No
Chimney Swift <i>Chaetura pelagica</i>	Absent	No suitable habitat within the Study Area. Species was not observed incidentally or on Songmeter recordings.	No

Natural Heritage Feature	Potential to Occur in the Study Area	Justification	Forwarded to NEL2?
Eastern Meadowlark <i>Sturnella magna</i>	Absent	Suitable habitat (active and inactive agricultural fields, large meadows, grasslands) is not present within the Study Area. Species has a very conspicuous call; it was not observed on Site and was not captured in any Songmeter recordings.	No
Eastern Whip-poor-will <i>Antrostomus vociferus</i>	Present	Species was confirmed to be present within the Study Area in 2020, including three (3) defended territories that intersect with the Study Area and one (1) with the Licence Area. The Extraction Area was delineated to avoid all Whip-poor-will defended territories. See Figure 5.	Yes
Species at Risk (Special Concern)			
Canada Warbler <i>Cardellina canadensis</i>	Absent	Moist forests and shrubby areas within the Study Area could support species nesting; G116Tt, G119Tt, G130Tt, G134S, G135S, G223TI. Species was not observed on Site and was not captured in any Songmeter recordings in 2019/2020.	No
Common Nighthawk <i>Chordeiles minor</i>	Low	Habitat is suitable for species nesting and foraging. Species was observed once in one Songmeter recording, but not during nocturnal bird acoustic surveys. Not believed to be nesting on Site.	No
Eastern Wood-pewee <i>Contopus virens</i>	Absent	Mature forests and forest edges within the Study Area could support nesting by this species; G097Tt, G103Tt, G104Tt, G116Tt and G119Tt. Species has a very conspicuous call; it was not observed on Site and was not captured in any Songmeter recordings in 2019/2020.	No
Golden-winged Warbler <i>Vermivora chrysoptera</i>	Absent	Forest edges could support marginal nesting habitat for this species. Species typically occurs in Southern Ontario. Species was not observed on Site and was not captured in any Songmeter recordings in 2019/2020.	No
Olive-sided Flycatcher <i>Contopus cooperi</i>	Absent	Forest edges, especially those in proximity to water and wetlands, could support nesting by this species; G011TI, G015TI, G016TI, G018TI, G097Tt, G103Tt, G104Tt, G116Tt, G119Tt, G129TI, G130Tt, G223TI. Species has a very conspicuous call; it was not observed on Site and was not captured in any Songmeter recordings in 2019/2020.	No

Natural Heritage Feature	Potential to Occur in the Study Area	Justification	Forwarded to NEL2?
Short-eared Owl <i>Asio flammeus</i>	Low	Suitable habitat (large open grasslands, marshes or tundra) is not present within the Study Area.	No
Snapping Turtle <i>Chelydra serpentina</i>	Moderate	Wetlands south of the Study Area (G149N and G150N), and flooded portions of wetlands adjacent Fairbank Lake Road (G135S and G144N) may support suitable overwintering habitat. NEL2 studies must recommend retaining these wetlands along with appropriate upland setbacks and mitigations. See Figure 6.	Yes
Wood Thrush <i>Hylocichla mustelina</i>	Absent	Mature forests and forest edges within the Study Area could support nesting by this species; G097Tt, G103Tt, G104Tt, G116Tt and G119Tt. Species has a very conspicuous call; it was not observed on Site and was not captured in any Songmeter recordings in 2019/2020.	No
Significant Wildlife Habitat – Seasonal Concentrations of Wildlife			
Waterfowl Stopover Area (Terrestrial)	Absent	Suitable habitat (flooded wetlands) is not present within the Study Area. Suitable habitat may exist in wetlands south of the Study Area (G150N).	No
Waterfowl Stopover Area (Aquatic)	Absent	No suitable habitat within the Study Area. Could be present in large wetland systems south of the Study Area (G149N and G150N).	No
Shorebird Migratory Stopover Area	Absent	No suitable habitat within the Study Area.	No
Raptor Wintering Area	Absent	Suitable habitat (forest adjacent large open meadows and fields) was not found within the Study Area.	No
Bat Hibernacula	Absent	No suitable habitat within the Study Area.	No
Bat Maternity Colonies	Low	Some large (>25cm diameter) trees were observed, but forest cover was generally middle aged and mid-sized. Few stems were observed in excess of 25cm diameter and fewer cavity trees in this size class were encountered. Cavity tree densities in excess of 21 stems per hectare were not observed. Habitat on the Study Area is therefore not considered high quality for bat maternity roosting.	No

Natural Heritage Feature	Potential to Occur in the Study Area	Justification	Forwarded to NEL2?
Turtle Wintering Area	Moderate	Wetlands south of the Study Area (G149N and G150N), and flooded portions of wetlands adjacent Fairbank Lake Road (G135S and G144N) may support suitable overwintering habitat. NEL2 studies must recommend retaining these wetlands along with appropriate upland setbacks and mitigations. See Figure 6.	Yes
Reptile Hibernaculum	Moderate	Two small areas of thallus slope were observed within the Study Area (Figure 6). NEL2 studies must recommend retaining these features along with appropriate upland setbacks and mitigations.	Yes
Colonially-nesting Bird Breeding Habitat (Bank and Cliff)	Absent	No suitable habitat was found within the Study Area. No swallow species were observed on / over the Study area and no swallow calls were captured on Songmeter recordings. Habitat may be created within the Study Area once operations are underway.	Yes
Colonially-nesting Bird Breeding Habitat (Tree/Shrub)	Absent	Ecosites G129Tt and G097Tt are considered candidate habitat for Colonial Nesting Birds (i.e. Great Blue Heron) as well as portions of tall treed ecosites G104Tt, G119Tt, G116Tt that abut wetlands at the north, east and south of the Study Area. Study Area reconnaissance on foot and by air (UAV drone) did not observed any evidence of nesting by the large stick nests produce by Great Blue Heron. No records of colonial bird nesting or Great Blue Heron nesting were returned from a review of GeoHub data.	No
Colonially-nesting Bird Breeding Habitat (Ground)	Absent	No suitable habitat (rocky islands and peninsulas) was not found within the Study Area.	No
Deer Yarding Area	Absent	Feature is not present within GeoHub databases.	No

Natural Heritage Feature	Potential to Occur in the Study Area	Justification	Forwarded to NEL2?
Significant Wildlife Habitat – Specialized Habitat for Wildlife			
Waterfowl Nesting Area	Moderate	Upland areas within 120m of wetland ecosites G129TI, G134S, G135S, G144N, G149N and G150N are candidate habitat for waterfowl nesting. This includes portions of G011TI, G015TI, G016TI, G018TI, G097Tt, G103Tt, G104Tt, G110N, G116Tt and G119Tt. No waterfowl nests were encountered at any time while on Site and no waterfowl were observed foraging in wetlands within the Study Area. This feature is confirmed absent adjacent to the northern wetlands complex owing to extensive studies in this area throughout he spring, summer and fall. Bird breeding was not studied in wetlands south of the Study Area. NEL2 studies must recommend retaining riparian habitat abutting the southern wetland complex.	Yes
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Absent	Forest edges, especially those in proximity to water and wetlands, could support nesting by this species; G011TI, G015TI, G016TI, G018TI, G097Tt, G103Tt, G104Tt, G116Tt, G119Tt, G129TI, G130Tt, G223TI. General Study Area reconnaissance on foot and by air (UAV drone) encountered no Bald Eagle or Osprey stick nests at any time. Incidental observations and songmeter recordings did not observe either species at any time.	No
Woodland Raptor Nesting Habitat	Absent	General Study Area reconnaissance on foot and by air (UAV drone) encountered no raptor stick nests at any time. Incidental observations, nocturnal bird acoustic studies and songmeter recordings observed two raptor species within the Study Area: Broadwing Hawn and Merlin. Neither species were observed to be repeatedly calling, occupying or favouring the same location in successive Site visits / recordings. As a result, no evidence was found that raptors are defending territories or nesting within the Study Area.	No

Natural Heritage Feature	Potential to Occur in the Study Area	Justification	Forwarded to NEL2?
Reptile Nesting Area	Low	Turtle nesting habitat was identified in association with the graveled shoulders of Fairbank Lake Road and the granular ballast of the rail corridor. These anthropogenic areas do not qualify as candidate SHW. No other sandy or graveled substrate was observed that would be typical for turtle nesting.	No
Seeps and Spring	Low	Some groundwater seepage was occasionally observed in swales between rocky knolls. These features were few and were not associated with headwater areas.	No
Aquatic Feeding Habitat [Moose]	Absent	No suitable habitat within the Study Area. Wetlands south of the Study Area (G149N and G150N) may be suitable for this purpose.	No
Mineral Lick	Low	No MNRF records within 1000 m of the Site. Study Area geology does not appear conducive to mineral licks.	No
Denning Study Areas for Mink, Otter, Marten, Fisher and Eastern Wolf	Low	Forest edges in proximity to water and wetlands could support denning by these species; G011TI, G015TI, G016TI, G018TI, G097Tt, G103Tt, G104Tt, G116Tt, G119Tt, G129TI, G130Tt, G223TI. No such features observed. NEL2 studies will recommend retaining riparian habitat abutting the large wetland complexes.	No
Amphibian Breeding Habitat (Woodland)	Absent	No vernal pools of appropriate size were encountered within the Study Area. Searches of smaller pools were none-the-less completed, and no significant quantities of amphibian breeding was found.	No

Natural Heritage Feature	Potential to Occur in the Study Area	Justification	Forwarded to NEL2?
Amphibian Breeding Habitat (Wetlands)	<p>Large Wetlands: High</p> <p>Small Wetlands: Absent</p>	<p>All wetland habitats observed in fall 2019 were considered candidate SWH for wetland amphibian breeding; ecosites G129TI, G134S, G135S, G144N, G149N, G150N and G223TI. The potential for significant amphibian breeding in these areas is considered high and NEL2 studies will required that large wetland systems north, south and east of the Site be retained along with appropriate setbacks and mitigations. Flooded portions of small (<2ha) wetlands on Site were searched for amphibian breeding and songmeters were installed to acquire evening recordings. Visual and acoustic data found no evidence of significant quantities of amphibian breeding in these areas. The potential for significant amphibian breeding in these small wetlands is considered low.</p>	Yes
Mast Producing Areas	Low	<p>The Study Area contains few large mast-producing Red Oak. Red Oak was typically encounter in areas of shallow soil where tree size is low and stunted. Mast producing species do not exceed 50% of canopy dominance for any areas >0.5 ha.</p>	No
Significant Wildlife Habitat – Habitat for Species of Conservation Concern			
Marsh Breeding Bird Habitat	<p>Large Wetlands: High</p> <p>Small Wetlands: Absent</p>	<p>Large wetland complexes south of the Study Area (G149N and G150N) have a high potential for supporting significant marsh bird breeding. Bird breeding was not studied in these wetlands. Some flooded habitat exists in wetland adjacent Fairbank Lake Road (G114N) but the small size and fragmented nature of this suitable habitat mean that the potential for significant quantities of marsh breeding is low. No marsh bird species were observed on Site at any time and none were recorded by the Songmeters.</p>	No
Open Country Bird Breeding Habitat	Absent	<p>Suitable habitat (large >30ha. grasslands) is not present within the Study Area.</p>	No
Shrub/Early Successional Bird Breeding Habitat	Absent	<p>No suitable habitat of sufficient size (>30ha) exists within the Study Area.</p>	No
Special Concern Species	Low	<p>See individual Species Concern species entries within this table, above.</p>	No

Natural Heritage Feature	Potential to Occur in the Study Area	Justification	Forwarded to NEL2?
Rare Species	Low	No rare species found on Site.	No
Fish Habitat			
Fish Habitat	Confirmed	Fish habitat exists at the northern extreme of the Study Area within portions of the wetland complex immediately south of Fairbank Lake Road (Figure 4). Additional fish habitat exists north and south of the Study Area.	Yes

APPENDIX D

Study Area Photos



Photo 1 – Main upland body of the Study Area. Photo taken on May 13, 2020 at UTM 17T 469588 5137549 (looking southward).



Photo 2 – Wetlands G139S and G144N immediately south of Fairbank Lake Road. Photo taken on May 13, 2020 at UTM 17T 469631 5137765 (looking eastward). Flooded areas visible at the top of the photograph (east-most extreme of the wetland) and in channels parallel the rail and road corridors.



Photo 3 – Wetlands G139S and G144N immediately south of Fairbank Lake Road. Photo taken on May 13, 2020 at UTM 17T 469631 5137765 (looking westward). Flooded areas visible at the top of the photograph (west-most extreme of the wetland) and in channels parallel the rail and road corridors.



Photo 4 – Small wetland G134S. Photo taken on May 13, 2020 at UTM 17T 469374 5137581 (south is up).



Photo 5 – Small wetland G223TI. Photo taken on May 13, 2020 at UTM 17T 469716 5137549 (south is up).



Photo 6 – Large wetland complex south of the Study Area (ecosites G149N and G150N). Photo facing south.



Photo 7 – Example of ecosite G011TI within the Study Area.

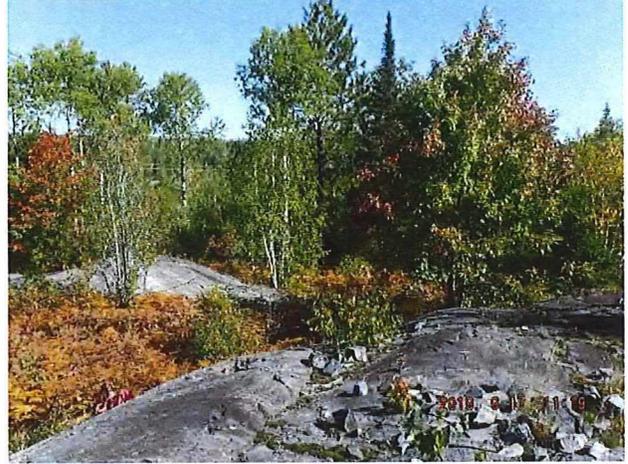


Photo 8 – Example of ecosite G015TI within the Study Area.



Photo 9 – Example of ecosite G016TI within the Study Area.



Photo 10 – Example of ecosite G018TI within the Study Area.



Photo 11 – Example of ecosite G097Tt within the Study Area.



Photo 12 – Example of ecosite G104Tt within the Study Area.



Photo 13 – Example of ecosite G104Tt canopy.



Photo 14 – Example of ecosite G110N adjacent the Study Area.



Photo 15 – Example of ecosite G116Tt within the Study Area.



Photo 16 – Example of ecosite G119Tt within the Study Area.



Photo 17 – Example of ecosite G129S adjacent the Study Area.



Photo 18 – Example of ecosite G130Tt within the Study Area.



Photo 19 – Example of ecosite G134S within the Study Area.



Photo 20 – Example of ecosite G135S within the Study Area (aerial view – May 13, 2020).



Photo 21 – Example of ecosite G135S within the Study Area (ground view – October 1, 2019).



Photo 22 – Example of ecosite G144N within the Study Area (aerial view – May 13, 2020).



Photo 23 – Example of ecosite G144N within the Study Area (ground view – September 26, 2019).



Photo 24 – Example of ecosite G223TI within the Study Area.



Photo 25 – Rail and drain crossings at the Site entrance



Photo 26 – Aquatic habitat located upstream of the Site entrance (looking downstream).



Photo 27 – Aquatic habitat located upstream of the Site entrance (looking upstream).



Photo 28 – Aquatic habitat located downstream of the Site entrance (looking upstream).



Photo 29 – Aquatic habitat located downstream of the Site entrance (looking downstream).



Photo 30 – Blunt-nosed Minnow, one of the most common fish species encountered during the fisheries assessments.



Photo 31 – Example of potentially suitable turtle overwintering habitat adjacent the south side of the rail right-of-way (subset of ecosite G144N).



Photo 32 – Example of potentially suitable turtle overwintering habitat between the rail and road right-of-ways (subset of in ecosite G135S).



Photo 33 – SM4 Songmeter deployed within the Study Area.



Photo 34 – Minor flooding observed in small wetland G134S at the time of the amphibian surveys (typical conditions on May 13, 2020).



Photo 35 – Largest pool observed in G134S at the time of the amphibian surveys (May 13, 2020)



Photo 36 – Minor flooding observed in small wetland G223TI at the time of the amphibian surveys (typical conditions on May 13, 2020).



Photo 37 – Largest pool observed in G223T1 at the time of the amphibian surveys (May 13, 2020)



Photo 38 – Example of a small (<500m²) vernal pool searched for amphibian breeding in May 2020.



Photo 39 – Example of a (mostly) unflooded vernal pool area discounted from amphibian breeding surveys.



Photo 40 – Example of a cervid bedding area (likely Elk) found in wetlands abutting the south side of the rail corridor (G144N).



Photo 41 – Example of a cervid incisor scrapes (likely Elk) found within the Study Area.



Photo 42 - Example of a cervid scat (likely Elk) found within the Study Area.



Photo 42 – Example of a cervid rutting scrape (likely Elk) found within the Study Area.



Photo 44 – Larger talus slope found on the east side of the Study Area.



Photo 45 – Smaller talus slope found on the south side of the Study Area.



Photo 46 – Small quantity of surface water flow from wetland G134S to the northern wetland complex during highwater in May.

