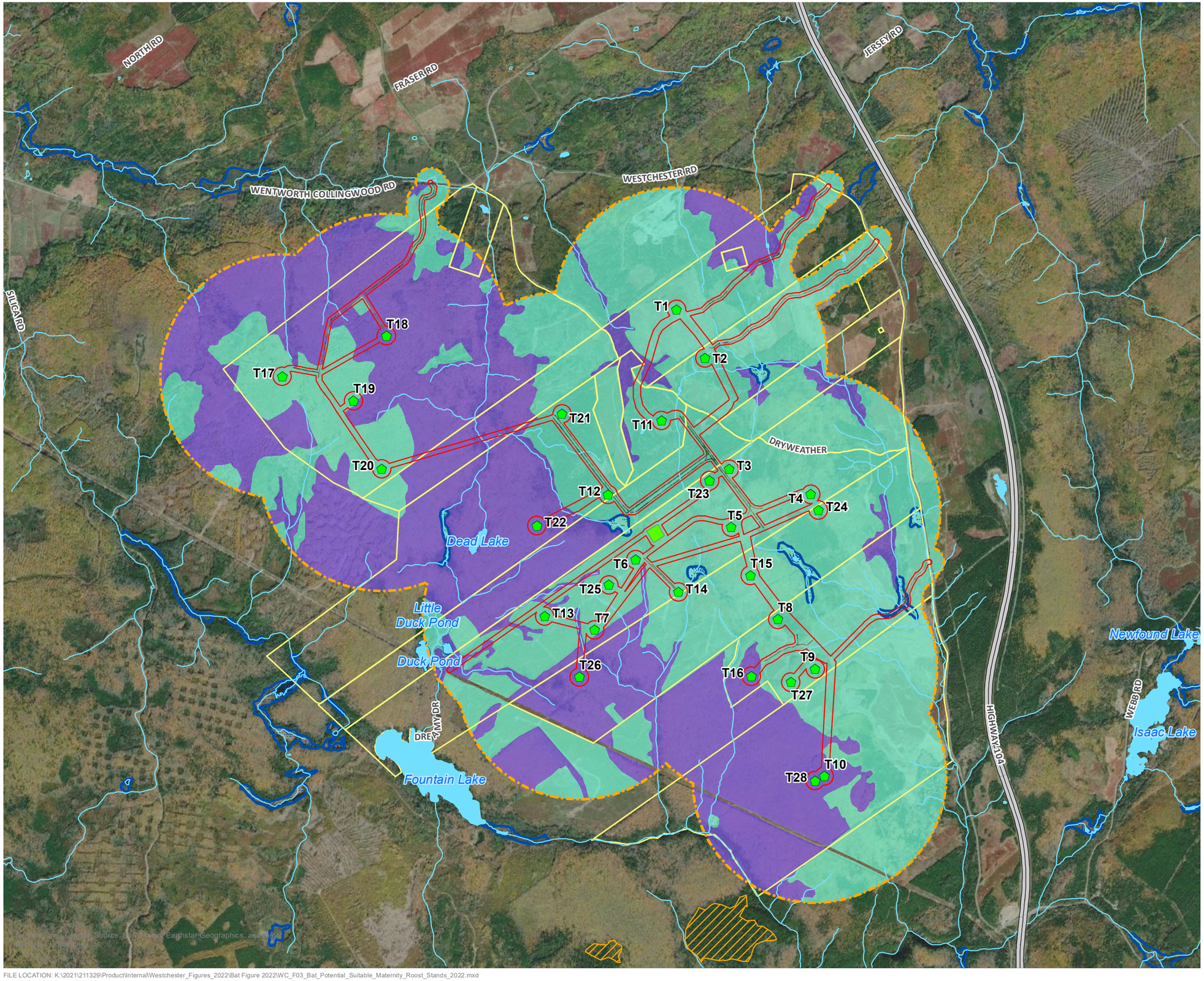


Natural Forces

WESTCHESTER WIND PROJECT

POTENTIAL SUITABLE BAT MATERNITY ROOST STANDS

FIGURE 22

- Proposed Turbine Location
- Proposed Substation Location
- Potential Development Area (PDA)
- Local Assessment Area
- Stand With Average Diameter >= 25cm [1]
- Highway
- Watercourse
- Waterbody
- Wetland (Province of Nova Scotia, 2021)
- Site Parcel
- Forest
  Average DBH > 16 cm
- Forest
  Average DBH < 16 cm

[1] For consideration of large diameter softwood dominant stands as no hardwood or mixed wood dominant stands with average diameter >= 25cm were identified

0 0.25 0.5 1 km

N W E S

SCALE 1:30,000

MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING, NSDNRR, NATURAL FORCES

MAP CREATED BY: DU
MAP CHECKED BY: KB
MAP PROJECTION: NAD 1983 UTM ZONE 20N

DILLON CONSULTING

PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-12-09

FILE LOCATION: K:\2021\211329\Product\Internal\Westchester_Figures_2022\Bat Figure 2022\WC_F03_Bat_Potential_Suitable_Maternity_Roost_Stands_2022.mxd

3.1.6.3 Field Assessment

Approach and Methods

Acoustic bat data were collected from eight acoustic survey stations in 2021 and 2022. The acoustic survey stations were installed at locations within the LAA that were selected to capture the data in representative terrain and habitat types, as well as capture locations that were in proximity to the proposed WTG locations (**Figure 21**). According to the OMNRF (2017) Bat Survey Protocol, monitoring for breeding bats should occur in the evenings between June 1 and June 30 in order to capture the full suite of migratory and resident bat species that may be present on-site. Through the environmental assessment consultation process, NSDNRR recommended the including of two survey periods: a spring period (May 1 to June 30), and a fall period (August 15 to October 31).

Each survey station consisted of either a Wildlife Acoustics SM3BAT, SM4BAT or miniBAT (Wildlife Acoustics 2018, 2022a, 2022b) ultrasonic bat detector that was equipped with an omni-directional microphone. Bat detectors were programmed as follows:

- Trigger Frequency Minimum: 16 kHz;
- Trigger Frequency Maximum: 192 kHz;
- Trigger Level: Automatic (12dB);
- Sample Night: from dusk to 5 hours after dusk; and
- Gain Level: Automatic (12dB).

During 2021 and 2022, five of the acoustic monitoring stations were installed at ground level (<2 m above ground level [agl]) and captured bat activity data within the LAA and located near proposed WTG locations and unique habitat types. Following the recommendations provided by NSDNRR on the EARD, the 2022 acoustic bat meters were programmed to record bat calls from May 1 through October 31 (inclusive). After the installation of a pole on June 16, 2021, an elevated monitoring station approximately 25 m agl was set up as a mechanism to capture activity data within the elevation range of the blade sweep area of a WTG. The pole was damaged during the winter of 2022, therefore this station could not be used again in 2022. Additionally, a privately-owned meteorological tower (MET) tower was identified near the PDA and land owner permission was obtained to install a second elevated monitoring station (i.e., approximately 25 m agl) beginning May 27, 2022.

The analysis focused on the breeding period (i.e., early May to June 30) and the migratory period (i.e., from August 15 to October 31). **Table 30** includes a spatial description and the periods of monitoring for each monitoring station relative to the PDA. Representative photos are presented in **Appendix I** and the locations of the acoustic monitoring are shown on **Figure 21.**

TABLE 30: SUMMARY TABLE OF BAT MONITORING STATIONS AND THEIR LOCATION IN THE LAA

Acoustic Station ID	Description	Habitat	Monitoring Periods
Bat 1	**Elevation**: 1.8 m **Equipment:** Wildlife Acoustics SM3BAT/SM miniBAT	Located at the edge of a blueberry field on the southern edge of the PDA.	June 1-5 and July 14–October 15, 2021 (meter malfunctioned between June 7 and July 13, 2021). April 29–May 18, 2022 (Meter relocated on May 19, 2022).
Bat 2	**Elevation**: 1.5 m **Equipment:** Wildlife Acoustics SM4BAT (2021), SM minibat (2022)	Located at the edge of a blueberry field on the northern side of the PDA	August 11–October 15, 2021 (Location added to the program to capture the migratory period pending late procurement and landowner permission.) May 1—June 12, 2022, June 14—June 28, 2022 (Batteries depleted and data was not captured on June 13, 2022 and June 29-30, 2022).
Bat 3	**Elevation**: 1.8 m **Equipment:** Wildlife Acoustics SM3BAT	Located at the edge of a wetland on the western side of the PDA.	June 1-15, 2021 (Meter was moved to Bat 5A location June 15, 2021). N/A in 2022. Location discontinued (see Bat 5A).
Bat 4	**Elevation**: 1.8 m **Equipment:** Wildlife Acoustics SM3BAT	Located in a small immature tree stand on the edge of a blueberry field and near Gleason Brook, on the south-western portion of the PDA.	June 7 – 25, June 29 – Sept 29, Oct 5 – 15, 2021 (Meter malfunctioned June 26 – 29 and Sept 30 – Oct 4, 2021). N/A in 2022. Location discontinued in favour of locations added to program following changes to the PDA in 2022.
Bat 5A	**Elevation**: 1.8 m **Equipment:** Wildlife Acoustics SM3BAT/ SM miniBAT	Located in an open, recently clear cut area, on the western side of the PDA.	June 16 – 25, June 30 – Sept 16, and Sept 18 – Oct 15, 2021 (Batteries depleted, no data available June 26 – 29 and Sept 17, 2021). May 1—June 12, June 14—June 30, 2022 (Batteries depleted, no data available June 13 2022)

Acoustic Station ID	Description	Habitat	Monitoring Periods
Bat 5B	**Elevation**: 25 m **Equipment:** Wildlife Acoustics SM3BAT/ SM miniBAT	Located in an open, recently clear cut area, on the western side of the PDA.	June 16 – 25, June 30 – Sept 16, and Sept 18 – Oct 15, 2021 (Delayed start due to delay in pole procurement and installation. Batteries depleted and data was not recorded June 26 – 29 and Sept 17 2021). N/A in 2022. Location discontinued as rope on pole was inaccessible (See Bat 7).
Bat 6	**Elevation:** 1.8 m **Equipment:** Wildlife Acoustics SM3BAT/SM minibat	Regenerating Hardwood Forest	N/A in 2021. Location added to program following changes to the PDA in 2022 May 1—May 22, June 14—June 28, July 13—June 30, 2022 (meter malfunctioned May 22-June 13, 2022).
Bat 7	**Elevation:** 25 m **Equipment:** Wildlife Acoustics SM3BAT	Cleared area on the edge of regenerating hardwood forest	N/A in 2021. Location added to program following changes to the PDA in 2022 May 27—June 28, 2022

Bat acoustic data was analyzed using the automated software Kaleidoscope Pro (Wildlife Acoustics) with the following settings:

- Minimum number of pulses = 2;
- Division Ratio = 8;
- Time Expansion Factor = 1;
- Duration = 2 - 500 m/s; and
- Frequency Range = 16 - 120 kHz.

Using the automated species identification feature provided by Kaleidoscope Pro, each acoustic file was first identified to species and species groups (where possible), or identified as either NOID (i.e., pulses recorded but unable to identify species) or NOISE (i.e., no pulse recorded). Species/species groups were identified based on maximum frequency, minimum frequency, call duration and shape (Jones and Siemers 2010).

When bats are far from the detectors or at an angle that reduces detectability, calls can become fragmented where the higher frequency components of the calls are not recorded. This confounds the ability to differentiate several species with overlapping call parameters reliably. For example, several Myotis species can be differentiated based on the maximum frequency of their calls but not the minimum frequency (Agranat 2012). Although call shape can also aid in differentiating Myotis species, shape varies considerably with habitat structure. Bats modify their calls for better long-distance detection in more open habitats and to reduce interference from echoes generated in more cluttered habitat (i.e., within woodlands) (Jones and Siemers 2010). As such, based on the auto ID generated by Kaleidoscope Pro, each of the acoustic files (including NOISE and NOID) was manually reviewed and subsequently classified as follows (van Zyll de Jong 1985):

- LANO/LABO - Silver-haired bat (abbreviated LANO) and eastern red bat (abbreviated LABO). Both of these species are migratory and were assessed together as a group based on similarities of their calls. Silver-haired bats produce calls with a constant frequency (CF) tail around 22 - 25 kHz. Although eastern red bats produce calls with a minimum frequency between 30 - 35 kHz, they also produce calls with lower minimum frequencies within the range of Silver-haired Bats; therefore, these species were grouped together. Although Big Brown Bat (abbreviated EPFU) also produces calls with a CF similar to silver-haired bat and are generally reported as EPFU/LANO, given the few sightings reported to date in Nova Scotia, all potential EPFU/LANO calls were assumed LANO; hence the species grouping of LANO/LABO. Both Silver-haired bat and eastern red bat are considered migratory species.
- LACI - Hoary bat (abbreviated LACI) is a migratory bat with calls that are reliably differentiated from all other species. Hoary Bat calls have lower frequency (ranging from 25 to 18 kHz) and are noticeably longer in duration compared to other bat species known to occur within the LAA.
- MYOTID SSP - (abbreviated MYOTID) is a species group that includes resident (i.e., non-migratory) bat species in Nova Scotia including little brown myotis, northern myotis, and

the tri-colored bat. Unlike the migratory species outlined above, the Myotid species group of bats produce shorter duration calls with a minimum frequency between 40 - 45 kHz, and maximum frequencies ranging between 120 kHz and 80 kHz. Occasionally, Myotis calls can have a minimum call frequency of 35 kHz.

These classifications are justified ecologically, as hoary bats are typically confined to more open habitat, the LANO/LABO group typically forage in the open and along woodland edges, and the MYOTID SSP are the most agile and therefore may be found in more cluttered environments, near water bodies, and along woodland edges (van Zyll de Jong 1985).

Results

A survey data summary, including a breakdown of the number of bat passes by month and monitoring station each year, are included in **Appendix I**.

The number of passes per month recorded during the 2021 and 2022 bat monitoring program are presented below in **Figure 23**. Based on data collected in 2021 and 2022, peak bat activity was recorded between August and September. Of the 105 bat passes recorded during the June 1 to October 15, 2021 monitoring period, 82% (or 86 bat passes) were recorded during the months of August and September 2021 (inclusive). The month of September alone was responsible for 54% (or 57 bat passes) of the 105 recorded bat passes. From May 1st to October 31st, 2022, August and September accounted for 73% of the total 96 recorded passes (70 bat passes). The highest number of bat passes in 2022 was recorded in August with 42% of the total (or 40 bat passes).

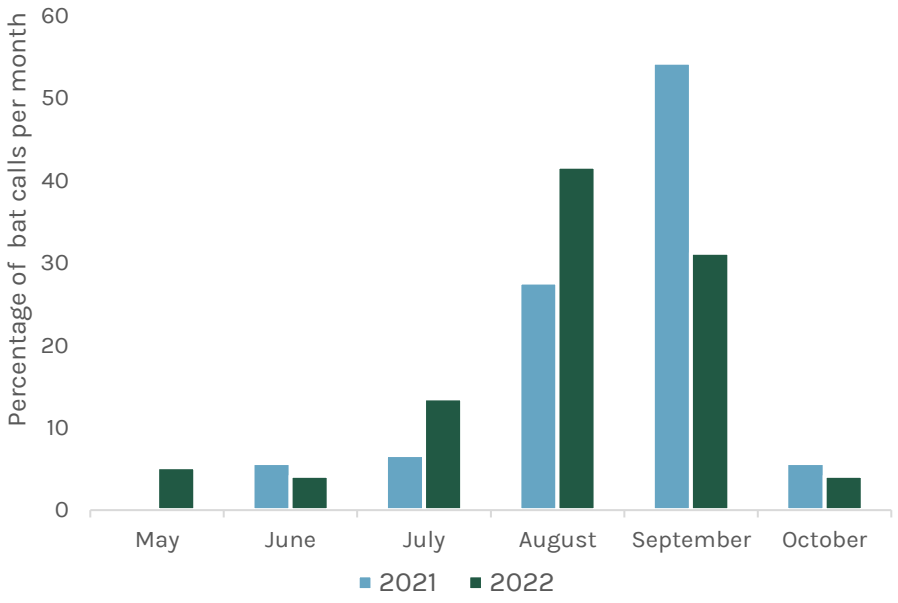


FIGURE 23: MONTHLY RECORDED BAT PASSES IN 2021 AND 2022

In 2021, 13 bat passes were detected during the breeding period (recorded June 1 through July 31). The 13 passes comprised of 3 myotid bats species (i.e., resident species) and 10 migratory bat passes. A total of 92 bat passes were recorded in 2021 between August 1 and October 15 (targeting the fall migration period for migratory bats), 19 bat passes were from migratory bat species during the fall migration period.

The total number of bat passes per species/species group (and broken down by migratory and non-migratory species) per month in 2021 is presented in **Figure 24**. As illustrated in **Figure 24**, the MYOTID species group accounted for 72% (or 76 bat passes) of the 105 bat passes recorded during the survey period, of which 62% (or 47 bat passes) of the 76 MYOTID passes occurred during the month of September alone. Based on the automated species identification feature provided by Kaleidoscope Pro (Wildlife Acoustics), the majority of the MYOTID passes (72 passes or 95%) were from the little brown myotis; the remaining four passes were identified as tri-coloured bat and northern myotis (2 passes each). These three bat species are considered to be resident species on Nova Scotia and are listed as Endangered under both the federal SARA and the NSESA.

Migratory bats recorded in 2021 included 16 passes from either silver-haired bats or eastern red bats, which were assessed together as a group based on similarities of their passes (abbreviated as LANO/LABO), and 13 passes from hoary bats (abbreviated as LACI).

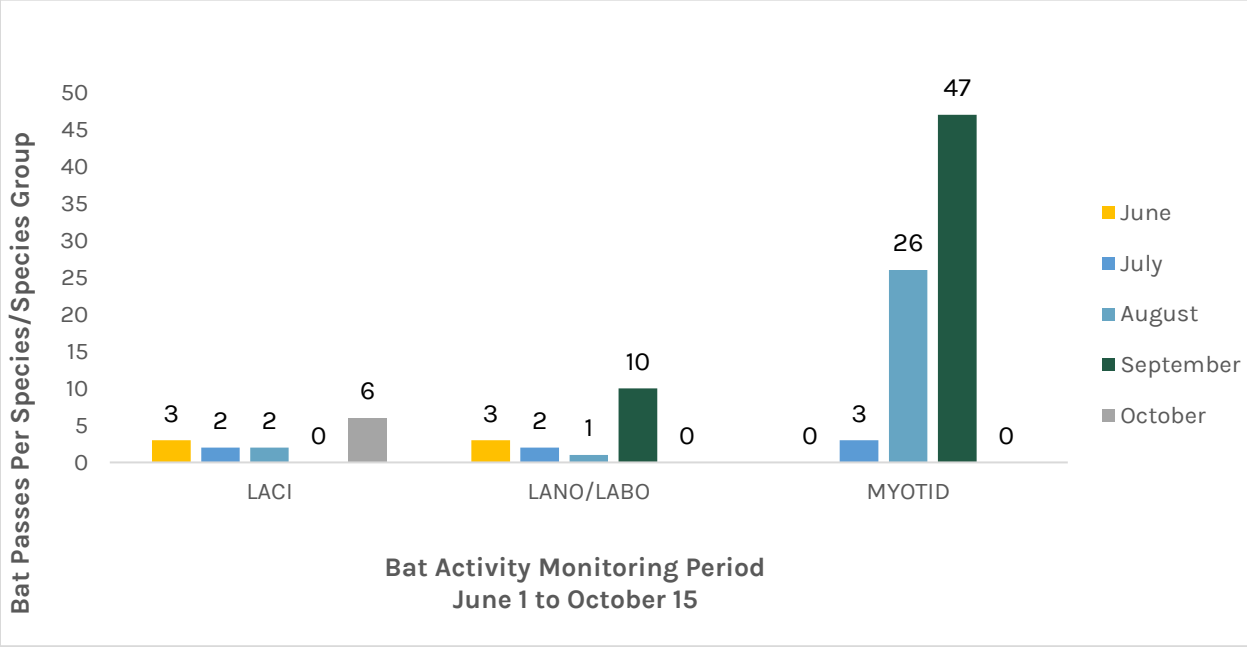


FIGURE 24: NUMBER OF BATS PASSES RECORDED IN 2021 BY SPECIES AND SPECIES GROUPING

In 2022, 22 bat passes were detected during the breeding period (recorded May 1 through July 31). The 22 passes comprised of 14 myotid bats species (i.e., resident species) and 8 migratory bat passes. A total of 74 bat passes were recorded in 2021 between August 1 and October 15 (targeting the fall migration period for migratory bats), 36 migratory bat passes were from migratory bat species during the fall migration period.

The total number of bat passes per species/species group (and broken down by migratory and non-migratory species) per month in 2022 is presented in **Figure 25**. As illustrated in **Figure 25**, the MYOTID species group accounted for 54% (or 52 bat passes) of the 96 bat passes recorded during the survey period, of which 40% (or 21 bat passes) of the 52 MYOTID passes occurred during the month of August alone. Based on the automated species identification feature provided by Kaleidoscope Pro (Wildlife Acoustics), all of the MYOTID passes were from the little brown myotis. This bat species is considered to be a resident species in Nova Scotia and is listed as Endangered under both the federal SARA and the NSESA.

Migratory bats recorded in 2022 included 8 passes from either silver-haired bats or eastern red bats, which were assessed together as a group based on similarities of their passes (abbreviated as LANO/LABO), and 36 passes from hoary bats (abbreviated as LACI).

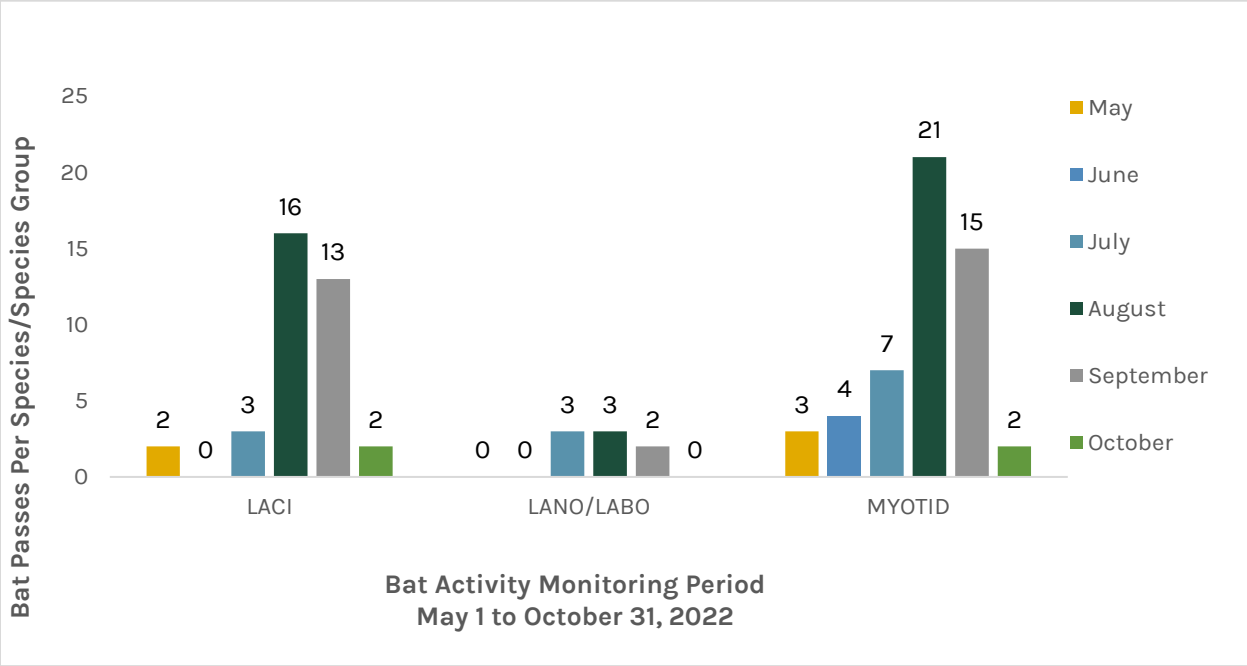


FIGURE 25: NUMBER OF BATS PASSES RECORDED IN 2022 BY SPECIES AND SPECIES GROUPING

3.1.6.4 Assessment Conclusions

The following bat species/species groups were detected during the bat acoustic survey program.

- Silver-haired bat and eastern red bat (these species were assessed together as a group based on similarities of their calls);
- Hoary Bat were detected site wide; however, were detected more frequently by acoustic monitors that were placed adjacent to open habitats, (e.g., forest edges that face a blueberry field); and,

- Little brown myotis northern myotis, and tri-coloured bat (these species were assessed together as a group based on similarities of their calls). Myotid bats which were more frequently detected by acoustic monitors that were placed adjacent to blueberry fields; as well as at one location within a regenerating wood lot.

Based on Dillon's experience on similar bat acoustic programs throughout the country, the total number of bat passes (during the breeding period, fall migration, and entire survey period) are considered very low. Population benchmark guidelines for bats within Nova Scotia are not currently available; therefore, an assessment of how the bat populations in the PDA compare to the regional area is subjective and based on professional opinion only. As discussed above, drastic bat population declines that have occurred throughout Nova Scotia due to a fungal infection (i.e., white nose syndrome, or WNS) that appears to severely affect cave-dwelling hibernating bats. It is believed that mortalities affecting up to 90% of populations result from interference with hibernation and starvation during the winter period. The syndrome was first observed in 2006 in New York and has been since confirmed in Ontario, Québec, New Brunswick and Nova Scotia (EC 2014).

Hibernating bats are known to travel several hundreds of kilometres between overwintering and breeding locations. However, few detections of SARA-listed bats were detected during the two-year acoustic monitoring program during the breeding season (i.e., 17 passes or 13% of SARA-list bat species detected occurred May1-July-31 in 2021 and 2022). Additionally, very little suitable bat maternity roosting habitat based on forestry data was available for bats at the time of the assessment. Based on the information available, maternity roosts within 1,000 m of the WTGs are considered to be possible, but unlikely. The majority of detections were recorded in the late summer/fall as bats move towards swarming and overwintering sites. Effects of the Project on bats and bat habitat and the proposed mitigation measures are described in **Section 3.2.7**.

3.1.7 Species At Risk

Scope of VECs

The PDA will span several landscapes and include areas that have the potential to provide habitat for SAR and SoCC populations. Natural Forces is committed to protecting SAR, SoCC and their habitat as important features and VECs related to the Project. Particular focus is placed on wildlife SAR and SoCC as identified by provincial and federal regulatory agencies. SAR/SoCC are often susceptible to changes in the environment and, therefore, are useful indicators of ecosystem health and regional biodiversity. Both provincial and federal legislation provides protections to designated fauna SAR. SAR are protected under the federal Species at Risk Act (SARA) and the Nova Scotia Endangered Species Act (NSESA).

For this Addendum, the following definitions of SAR and SoCC apply:

- **Species at Risk** (abbreviated SAR): A species that is determined to be Endangered, Threatened, or Vulnerable/Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Nova Scotia Endangered Species Act (NSESA), or the federal *Species at Risk Act* (SARA); and,

- **Species of Conservation Concern** (abbreviated SoCC): those species that are not SAR but are identified as regionally vulnerable or imperilled by AC CDC (i.e., those species with AC CDC S-ranks of S1: Critically imperiled in province; S2: Imperiled in province; and S3: Vulnerable in province of Nova Scotia).

Approach and Methodology

Dillon reviewed readily-available information from reputable sources. The information was reviewed to evaluate the potential for flora and fauna SAR and SoCC within 100 km of the Project. Dillon completed a review of the following sources and data lists for the purpose of characterizing existing conditions at the Project site:

- Custom AC CDC reports (AC CDC 2021 and 2022; **Appendix K**);
- The federal SAR registry;
- The provincial Endangered Species registry;
- Publicly-available governmental GIS map layers and databases;
- High resolution aerial photography;
- Second Maritimes Breeding Birds Atlas (MBBA; Stewart et al. 2015); and
- Nova Scotia Provincial Landscape Viewer mapping resource.

Other available background information sources and mapping reviewed to identify and assess SAR and SoCC and their habitats within the LAA included:

- Provincial Parks and Protected Areas mapping;
- ESAs database;
- Listed species by the COSEWIC;
- Listed species under the federal SARA or the NSESA;
- Atlas of Breeding Birds of the Maritime Provinces (MBBA; Stewart et al. 2015);
- IBAs of Canada;
- Federally-designated Migratory Bird Sanctuaries;
- Provincially-identified DWAs;
- Final Bird Survey Report Study by Strum Environmental completed during a previous iteration of the Project (Strum 2013); and
- Identified Protected Natural Areas and Wildlife Management Zones (WMZ).

In addition to the desktop studies, priority species were targeted during field surveys and priority species found within the LAA were assessed for their likelihood to be found throughout the LAA. Recommendations described in “A Guide to Addressing Wildlife Species and Habitat in an EA Registration Document” (NSE 2009) were consulted when planning field surveys to include the assessment for potential SAR and SoCC within the LAA. Various biophysical surveys were conducted in 2021 and 2022 to characterize site-specific environmental conditions for flora and fauna within and around the LAA. Incidental observations of SAR were recorded in concert with all field surveys.

Results

Site-specific AC CDC reports were generated on May 7, 2021 and September 20, 2022, and included historical observations of SAR and SoCC reported within 10 km of the Project centre (in 2021 and 2022, respectively). Table 31 and **Table 32** present the SAR and SoCC detected or reported within 10 km of the Project, respectively. The 2021 and 2022 AC CDC results for SAR or SoCC within 100 km of the Project site are included in **Appendix K**. Descriptions of other relevant SAR and/or SoCC observed more than 10 km from the Project's centre (e.g., brook trout, common nighthawk, little brown myotis, etc.) are also included in the following sections.

TABLE 31: HISTORICAL OBSERVATIONS OF SPECIES AT RISK WITHIN 10 KM OF THE PROJECT'S CENTRE (AC CDC 2022)

Common Name (*Scientific Name*)	S-Rank	Protection Status	AC CDC Reported Distance
Prototype Quillwort (*Isoetes prototypus*)	S3	SARA: SC COSEWIC: SC NSESA: V	6.8± 0.0 km
Moose (*Alces americanus*)	S1	NSESA: E	8.9 ± 0.0 km from PDA
Eastern Painted Turtle (*Chrysemys picta picta)*	S4	SARA: SC COSEWIC: SC	7.2 ± 10.0 km
Snapping Turtle (*Chelydra serpentina)*	S3	SARA: SC COSEWIC: SC NSESA: V	14.8 ± 0.0 km
Wood Turtle (*Glyptemys insculpta)*	S2	SARA: T COSEWIC: T NSESA: T	9.3 ± 0.0 km
Bank Swallow (*Riparia riparia)*	S2B	SARA: T COSEWIC: T NSESA: E	7.2 ± 7.0 km
Barn Swallow (*Hirundo rustica)*	S3B	SARA: T COSEWIC: SC NSESA: E	3.1 ± 7.0 km
Bobolink (*Dolichonyx oryzivorus)*	S3B	SARA: T COSEWIC: T NSESA: V	7.2 ± 7.0 km
Canada Warbler *(Cardellina canadensis)*	S3B	SARA: T COSEWIC: SC NSESA: E	3.1 ± 7.0 km
Chimney Swift *(Chaetura pelagica)*	S2S3B, S1M	SARA: T COSEWIC: T NSESA: E	6.5 ± 0.0 km
Eastern Wood-Pewee *(Contopus virens)*	S3S4B	SARA: SC COSEWIC: SC NSESA: V	1.6 ± 0.0 km
Evening Grosbeak *(Coccothraustes vespertinus)*	S3B,S3N, S3M	SARA: SC COSEWIC: SC NSESA: V	0.6 ± 0.0 km

Common Name (*Scientific Name*)	S-Rank	Protection Status	AC CDC Reported Distance
Olive-sided Flycatcher *(Contopus cooperi)*	S3B	SARA: T COSEWIC: SC NSESA: T	1.3 ± 0.0 km
Monarch (*Danaus plexippus)*	S2B	SARA: SC COSEWIC: E NSESA: E	6.8 ± 0.0 km from PDA

Notes:
1. S-rank refers to the Sub-national (Provincial) rank provided by the Atlantic Canada Conservation Data Centre (AC CDC). S-Ranks are as followed: S1: Critically imperiled in province; S2: Imperiled in province; S3: Vulnerable in province; S4: Apparently secure, uncommon but not rare in province; S5: Secure: Common, widespread and abundant in province. S#S# = a numeric range rank used to indicate any range of uncertainty about the status of the species or community. B= Breeding, N = Nonbreeding, M = Migrant, U = Unrankable, ? = Inexact or Unknown (AC CDC 2021). S-Ranks are as of December 2022.
2. Status refers to listings of E: Endangered, T: Threatened, V: Vulnerable or SC: Special Concern on Schedule 1 of the federal *Species at Risk Act* (SARA), the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or the *Nova Scotia Endangered Species Act* (NSESA).
3. Species at Risk are those species whose status is E, T or V/SC.

TABLE 32: HISTORICAL OBSERVATIONS OF SPECIES OF CONSERVATION CONCERN WITHIN 10 KM OF THE PROJECT'S CENTRE (AC CDC 2022)

Common Name (*Scientific Name*)	S-Rank	AC CDC Reported Distance
American Beech *(Fagus grandifolia)*	S3S4	1.4 ± 0.0 km
Appalachian Polypody *(Polypodium appalachianum)*	S3	6.4 ± 0.0 km
Blood Milkwort *(Polygala sanguinea)*	S3	1.7 ± 5.0 km
Boreal Aster *(Symphyotrichum boreale)*	S3	7.2 ± 7.0 km
Corrugated Shingles Lichen (*Fuscopannaria ahlneri)*	S3	< 5km from PDA
Disguised St. John's-wort *(Hypericum x dissimulatum)*	S2S3	3.9 ± 1.0 km
Fringed Blue Aster *(Symphyotrichum ciliolatum)*	S3	7.2 ± 7.0 km
Green Spleenwort *(Asplenium viride)*	S3	3.1 ± 7.0 km
Great-Spurred Violet *(Viola selkirkii)*	S3S4	3.1 ± 7.0 km
Large Purple Fringed Orchid *(Platanthera grandiflora)*	S3	7.5 ± 1.0 km from PDA
Northern Bedstraw *(Galium boreale)*	S2	4.6 ± 5.0 km

Common Name (*Scientific Name*)	S-Rank	AC CDC Reported Distance
Showy Lady's-Slipper (Cypripedium reginae)	S2	7.2 ± 7.0 km
Small Round-leaved Orchid *(Platanthera orbiculate)*	S3S4	3.1 ± 7.0 km
Tender Sedge *(Carex tenera)*	S3	8.2 ± 0.0 km
Yellow Ladies'-tresses *(Spiranthes ochroleuca)*	S3?	8.2 ± 0.0 km
American Kestrel (*Falco sparverius)*	S3B, S4S5M	3.1 ± 7.0 km
Bay-breasted Warbler (*Setophaga castanea)*	S3S4B, S4S5M	0.6 ± 0.0 km
Black-backed Woodpecker *(Picoides arcticus)*	S3S4	3.1 ± 7.0 km
Blackpoll Warbler *(Setophaga striata)*	S3B, S5M	7.2 ± 7.0 km
Boreal Chickadee (*Poecile hudsonicus)*	S3	0.5 ± 0.0 km
Canada Jay *(Perisoreus canadensis)*	S3	3.1 ± 7.0 km
Cape May Warbler (*Setophaga tigrine)*	S3B, SUM	0.7 ± 0.0 km
Cliff Swallow (*Petrochelidon pyrrhonota*)	S2S3B	7.2 ± 7.0 km
Eastern Kingbird (*Tyrannus tyrannus*)	S3B	9.3 ± 7.0 km
Killdeer (*Charadrius vociferus)*	S3B	7.2 ± 7.0 km
Northern Goshawk (*Accipiter gentilis)*	S3S4	9.3 ± 7.0 km
Pine Grosbeak (*Pinicola enucleator)*	S3B, S5N, S5M	0.5 ± 0.0 km
Pine Siskin (*Spinus pinus)*	S3	2.1 ± 0.0 km
Rose-breasted Grosbeak (*Pheucticus ludovicianus)*	S3B	3.1 ± 7.0 km
Spotted Sandpiper (*Actitis macularius)*	S3S4B, S5M	3.1 ± 7.0 km

Common Name (*Scientific Name*)	S-Rank	AC CDC Reported Distance
Tennessee Warbler (*Oreothlypis peregrina)*	S3S4B, S5M	3.1 ± 7.0 km
Vesper Sparrow *(Pooecetes gramineus)*	S1S2B, SUM	3.1 ± 7.0 km
Wilson's Snipe *(Gallinago delicata)*	S3B, S5M	3.1 ± 7.0 km

1. S-rank refers to the Sub-national (Provincial) rank provided by the Atlantic Canada Conservation Data Centre (AC CDC). S-Ranks are as followed: S1: Critically imperiled in province; S2: Imperiled in province; S3: Vulnerable in province; S4: Apparently secure, uncommon but not rare in province; S5: Secure: Common, widespread and abundant in province. S#S# = a numeric range rank used to indicate any range of uncertainty about the status of the species or community. B= Breeding, N = Nonbreeding, M = Migrant, U = Unrankable, ? = Inexact or Unknown (AC CDC 2021). S-Ranks are as of December 2022.
2. Species of Conservation Concern are those species that are not SAR but are identified as regionally vulnerable or imperilled by the Atlantic Canada Conservation Data Centre (AC CDC) (i.e., those species with AC CDC S-ranks of S1, S2 or S3).

The following sections outline the results of VEC-specific SAR assessments. The assessments provide a description of the preferred habitat conditions for reported SAR/SoCC and compare them to the environment at the Project site. This provides a deeper understanding of the likelihood of encountering the species at the Project site.

3.1.7.1 Vegetation SAR and SoCC Assessment

Prototype quillwort (*Isoetes prototypus*) is an aquatic perennial SAR vascular plant that is found in nutrient-poor, cold, spring-fed lakes (NSDNRR 2022). Sutherland Lake is approximately 5 km southeast of the PDA, within the same secondary watershed as part of the PDA (i.e., the Portapique River Secondary Watershed) and is known to have prototype quillwort (NSDNRR 2022). An outlet of Sutherland Lake is the Portapique River which receives flow from tributaries within the PDA via Gleason Brook and Fountain Lake Brook. Sutherland Lake is upstream and hydrogeologically connected to the watercourses within the PDA; therefore, the Project is not anticipated to affect Sutherland Lake. Further, the PDA for the Project does not include applicable habitat for this SAR and no prototype quillworts were observed during the field surveys for vascular plants or during other biophysical surveys conducted in 2021 and 2022.

During the 2021 and 2022 field seasons, locations of flora and lichen SAR and SoCC were recorded within the LAA and are shown on **Figure 26** no plant SAR were identified and the following four vascular plant SoCC were identified during biological field surveys:

- **Large purple fringed orchid** (*Platanthera grandiflora*) is ranked by the AC CDC as S3 (Vulnerable) and was identified at two locations within wetlands in the terrestrial LAA in 2021. Approximately 12 plants were observed in a wetland adjacent to Westchester Road and a tributary to Gleason Brook.
- **American beech** (*Fagus grandifolia*) is ranked by the ACCD as S3S4 (vulnerable/apparently secure) in Nova Scotia and was found to be common through hardwood dominated forests of the LAA.

- **Woodland strawberry** (*Fragaria vesca*) is ranked by the ACCD as S3S4 (vulnerable/apparently secure) in Nova Scotia and was identified around the edges of the row cuts in hardwoods located near the north eastern corner of the LAA.
- **Small round-leaved orchid** (*Platanthera orbiculata*) is ranked by the ACCD as S3S4 (vulnerable/apparently secure) in Nova Scotia and was identified at 1 location near the PDA in a forested area between T20 and T21.

One lichen SAR and three lichen SoCC were identified incidentally during biological field surveys conducted in 2021 and 2022.

- **Eastern waterfan** (*Peltigera hydrothyria*) is an aquatic lichen that is listed as Threatened under SARA, COSEWIC and NS ESA. In addition, it is ranked S1 by the Atlantic Canada Conservation Data Centre (AC CDC) as imperiled in Nova Scotia. In 2021, Eastern waterfan was observed in one location within the LAA (Gleason Brook). A second observation of this lichen was detected further upstream and outside of the LAA incidentally during a turtle survey in the same year. In 2022, eastern waterfan was observed at one location in Mountain Brook and no observations were reported within the Gleason Brook during the dedicated surveys in 2022. This lichen was growing on rocks within the brooks at the three locations where it was observed.

A protected zone within a 200 m radius of the observed location of the lichen is required based on NSDNRR At-Risk Lichens-Special Management Practices (2018); however, CWS recommends 50 m riparian (streamside) buffer of the occupied stream (including streams running into the occupied stream) for 1000m radius around occurrences of eastern waterfan. The additional buffers for the protection of eastern waterfan are recommended due to the high sensitivity of this lichen to siltation/sedimentation. Following a review of the 2021 biophysical survey results, the proposed Project layout was redesigned to minimize crossing of Gleason Brook and its tributaries.

The following four SoCC lichen species were observed within and near the LAA:

- **Acadian Jellyskin Lichen** (*Leptogium acadinse*) is ranked by the AC CDC as S3S4 (vulnerable/apparently secure) in Nova Scotia, and was observed near the PDA in a forested area between T20 and T21.
- **Fringe Lichen** (*Heterodermia neglecta*) and **Powered Fringe Lichen** (*Heterodermia speciosa*) are ranked by the AC CDC as S3S4 (vulnerable/apparently secure) in Nova Scotia. These species were observed in old hardwoods near Mountain Brook within the LAA.
- **Shaggy Fringed Lichen** (*Anaptychia palmulata*) is ranked by the AC CDC as S3S4 (vulnerable/apparently secure) in Nova Scotia, and was observed in open hardwood forests adjacent to the LAA near Mountain Brook.

Anaptychia palmulata (Shaggy Fringed Lichen)

Leptogium acadiense (Acadian Jellyskin Lichen)

Leptogium acadiense (Acadian Jellyskin Lichen)

Peltigera hydrothyria (Eastern Waterfan)

Platanthera orbiculata (Small round-leaved orchid)

Platanthera grandiflora (Large Purple Fringed Orchid)

Heterodermia neglecta (Fringe Lichen)

Peltigera hydrothyria (Eastern Waterfan)

Peltigera hydrothyria (eastern waterfan)

Heterodermia speciosa (Powdered Fringe Lichen)

Platanthera grandiflora (Large Purple Fringed Orchid)

Natural Forces

WESTCHESTER WIND PROJECT

VEGETATION AND LICHEN SPECIES AT RISK AND SPECIES OF CONSERVATION CONCERN
FIGURE 6

- Potential Development Area (PDA)
- Local Assessment

Plant

- Species at Risk
- Species of Conservation Concern
- American Beech (Fagus grandifolia) (common in hardwood forests)
- Woodland strawberry (Fragaria vesca)

0 0.25 0.5 1 km

N W E S

SCALE 1:21,284

MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING, GEONB, NATURAL FORCES

MAP CREATED BY: DU
MAP CHECKED BY: KB
MAP PROJECTION: NAD 1983 UTM ZONE 20N

DILLON CONSULTING

PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-12-09

FILE LOCATION: K:\2021\211329\Product\Internal\Westchester_Figures_2022\Vegetation Figures 2022\WC_F04_Vegetation_Lichen_SpeciesAtRisk_2022.mxd

3.1.7.2 Terrestrial Wildlife SAR and SoCC Assessment

Although not identified during field surveys of the PDA, a Long-tailed Shrew (*Sorex dispar*) was reported by the AC CDC within 10 km of the PDA. Long-tailed shrews are listed as S2 for Imperiled (AC CDC 2022). This species lives in a number of forested environments, preferring moist forests in areas of high altitude (Burian 2022). There is a specific population of long-tailed shrew in Nova Scotia that is associated with the Cobequid Mountains in Cumberland and Colchester Counties. Sightings of the species have occurred in the Portapique Wilderness Area, which is located 1 km south from the nearest WTG. According to the 2022 AC CDC report, the species has had observations within the 15 km boundary surrounding the project site. Although not observed during the 2021 or 2022 field surveys, Long-tailed Shrews have potential to occur within the general area of the PDA.

Mainland Moose (*Alces americanus*) are listed as Endangered by the NSESA, COSEWIC and SARA, and ranked as S2 by the AC CDC for Imperiled. Moose can reside in a variety of forest habitats; however, they require an abundance of mature forest for security and thermal cover, as well as areas of interspersed young deciduous trees and shrubs for browsing (NSDNRR 2021). Although not encountered during the 2021 or 2022 field surveys, Mainland Moose were reported by the AC CDC as being observed within 10 km of the Project site and potential habitat is available at the site. In addition, moose tracks were observed during a field survey that was conducted near the PDA in 2012. Further details of Mainland Moose are included in **Section 3.1.2.3**.

3.1.7.3 Fish SAR and SoCC Assessment

Based on a review of the AC CDC records, American eel and Atlantic salmon from the Inner Bay of Fundy and the Gaspe-Southern Gulf of St. Lawrence populations were observed within 12, 14 and 16 km from the PDA, respectively (AC CDC 2022). The Gaspe-Southern Gulf of St. Lawrence population was observed within the Wallace River (AC CDC 2022). Though part of the PDA does cross through the Wallace River secondary watershed, the West Branch Wallace River connection to the Wallace River is located 18 km from the PDA and it is not anticipated to be affected by the Project. The Inner Bay of Fundy population of Atlantic salmon, however, have been identified throughout the Portapique River watershed (DFO, 2022), which has been identified as critical habitat for this species. Suitable Atlantic salmon habitat was identified during initial field studies. The effects of past development activities (e.g. layout of access roads and installation of the culverts) may presently be limiting the productivity of fish and fish habitat.

American Eel (*Anguilla rostrata*) is ranked as Threatened (COSEWIC) and S2 for Imperiled (AC CDC). This species spends most of its life in freshwater systems, only traveling to the Sargasso Sea to mate and die (NSDLF 2021b). American Eel can be found in all freshwater and saltwater systems as well as estuaries assessable via the Atlantic Ocean (COSEWIC 2012). American eel are catadromous species spend most of their life cycle in freshwater, returning to the Sargasso Sea to spawn (COSEWIC 2012). This species was not observed during the 2021 or 2022 field surveys. Based on its varied habitat use and widespread distribution, the species may utilize the PDA.

Atlantic salmon (*Salmo salar*) are anadromous species with adults migrating from the ocean to spawn in freshwater rivers, generally in the same river where they were born. Salmon rivers or streams are generally large, clear, and cool, with riverbeds composed of gravel, cobble and boulder substrates (DFO 2010). Atlantic salmon are divided into unique populations based on genetic distinction and range. The Gaspe-Southern Gulf of St. Lawrence population of Atlantic salmon has been assessed as Special Concern by COSEWIC (2010) and is considered imperiled provincially by the AC CDC (ranked S1); this population is not currently protected under SARA or NSESA. The Inner Bay of Fundy population of both Atlantic salmon populations are considered imperiled provincially by the AC CDC (ranked S1). The Gaspe-Southern Gulf of St. Lawrence population was observed within the Wallace River (AC CDC 2022). Though part of the PDA does cross through the Wallace River secondary watershed, the West Branch Wallace River connection to the Wallace River is located 18 km from the PDA and it is not anticipated to be affected by the Project.

The Inner Bay of Fundy population of Atlantic salmon have been identified throughout the Portapique River watershed (DFO 2022), which has been identified as critical habitat for this species. DFO records provided through the AC CDC database (AC CDC 2022) indicated that this population of Atlantic salmon has been identified in the Bass River, the Portapique River and Great Village River (Amiro 1998). Inner Bay of Fundy Atlantic salmon are not expected to inhabit watercourses evaluated within the Study Area based on the absence of suitable aquatic habitat with the exception of Gleason Brook, where access to the site is provided by an existing access road and bridge. No instream work is anticipated within the Gleason Brook and instream work within tributaries of Gleason brook is not anticipated within 100 m upstream of suitable Atlantic salmon habitat.

Brook trout (*Salvelinus fontinalis*) are considered by AC CDC to be vulnerable in Nova Scotia (Ranked S3), but are not currently protected under SARA or NSESA. Brook trout are freshwater fish with a preference for cool, freshwater environments but spend parts of their life cycle in a variety of habitats from small headwater streams to large lakes (Nova Scotia Department of Agriculture and Fisheries [NSDFA] 2005).

3.1.7.4 Herptile SAR and SoCC Assessment

Although reptile or amphibian (herptile) SAR or SoCC were not observed during the 2021 and 2022 field surveys or within 5 km as reported by the AC CDC (**Appendix K**), the AC CDC (2022) reported observations of Eastern Painted Turtle (*Chrysemys picta picta*) within the 10 km of the PDA, as well as Wood Turtle (*Glyptemys insculpta*) and Snapping Turtle (*Chelydra serpentina*) within the 20 km of the PDA. **Table 33** summarizes the historical observations of turtle SAR and SoCC as reported by the AC CDC (2022). The three-turtle species are all considered to be SAR based on their conservation status and the definition of SAR for the purposes of this Addendum.

A document review for turtle management plans was conducted for turtles with the potential to occur in the vicinity of the proposed Project to identify potential Critical Habitat or other designated areas with significant turtle habitat. Critical Habitat is defined under Section 2 of SARA as: "the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' Critical Habitat in the recovery strategy or in an action

plan for the species." The following federal and/or provincial recovery strategies/plans and managements plans for the three turtles have been published to date:

- Environment and Climate Change Canada. 2020. Recovery Strategy for the Wood Turtle (*Glyptemys insculpta*) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. vi + 52 pp.
- Nova Scotia Department of Lands and Forestry. 2020. Recovery Plan for the Wood turtle (*Glyptemys insculpta*) in Nova Scotia [Final]. Nova Scotia Endangered Species Act Recovery Plan Series.
- Environment and Climate Change Canada. 2020. Management Plan for the Snapping Turtle (*Chelydra serpentina*) in Canada. Species at Risk Act Management Plan Series. Environment and Climate Change Canada, Ottawa, iv + 40 p.

Critical Habitat for the wood turtle has been identified in one of the watersheds that intersects the PDA (i.e., within the Wallace River secondary watershed in the West Branch of the Wallace River, beginning approximately 3 km from the nearest proposed WTG location). Though a part of the PDA (an existing road) crosses through the Wallace River secondary watershed, the watercourses within the watershed are not anticipated to be affected given that they do not intersect the existing road.

TABLE 33: HISTORICAL OBSERVATIONS OF TURTLE SAR WITHIN 15 KM OF THE PROJECT'S CENTRE (AC CDC 2022)

Species	Ranking	Distance from PDA Centre
Wood turtle *(Glyptemys insculpta)*	COSEWIC: Threatened SARA: Threatened NS ESA: Threatened ACCDC: S2	9.3 ± 0 km
Snapping turtle *(Chelydra serpentine)*	COSEWIC: Special Concern SARA: Special Concern NS ESA: Vulnerable ACCDC: S3	14.8 ± 0 km
Eastern painted turtle *(Chysemys picta picta)*	SARA: Special Concern COSEWIC: Special Concern ACCDC: S4S5	7.2 ± 10 km

Notes:
Sub-national (provincial) ranks (S-ranks) retrieved from the Atlantic Canada Conservation Data Centre (ACCDC) and are up to date as of September 2022 for the province of Nova Scotia.
S1 Critically Imperiled; S2 Imperiled; S3 Vulnerable; S4 Apparently Secure; S5 Secure.

3.1.7.5 Bird SAR and SoCC Assessment

During 2021 and 2022 surveys were conducted using a variety of techniques and timing windows to gather information of birds and their habitats with the LAA for the Project. The survey locations and methods were also selected to target potential SAR and SoCC, using the

preliminary habitat assessment and desktop SAR and SoCC screening, presented above in **Section 3.1.5**.

Priority bird species that were observed during the field surveys included 6 SAR and 15 SoCC. A summary of the season that they were identified in and the survey type used is provided below in Table 34 with comments on whether or not the birds observed are likely to be breeding in the LAA. The locations where the priority bird species were observed are shown on **Figure 27**.

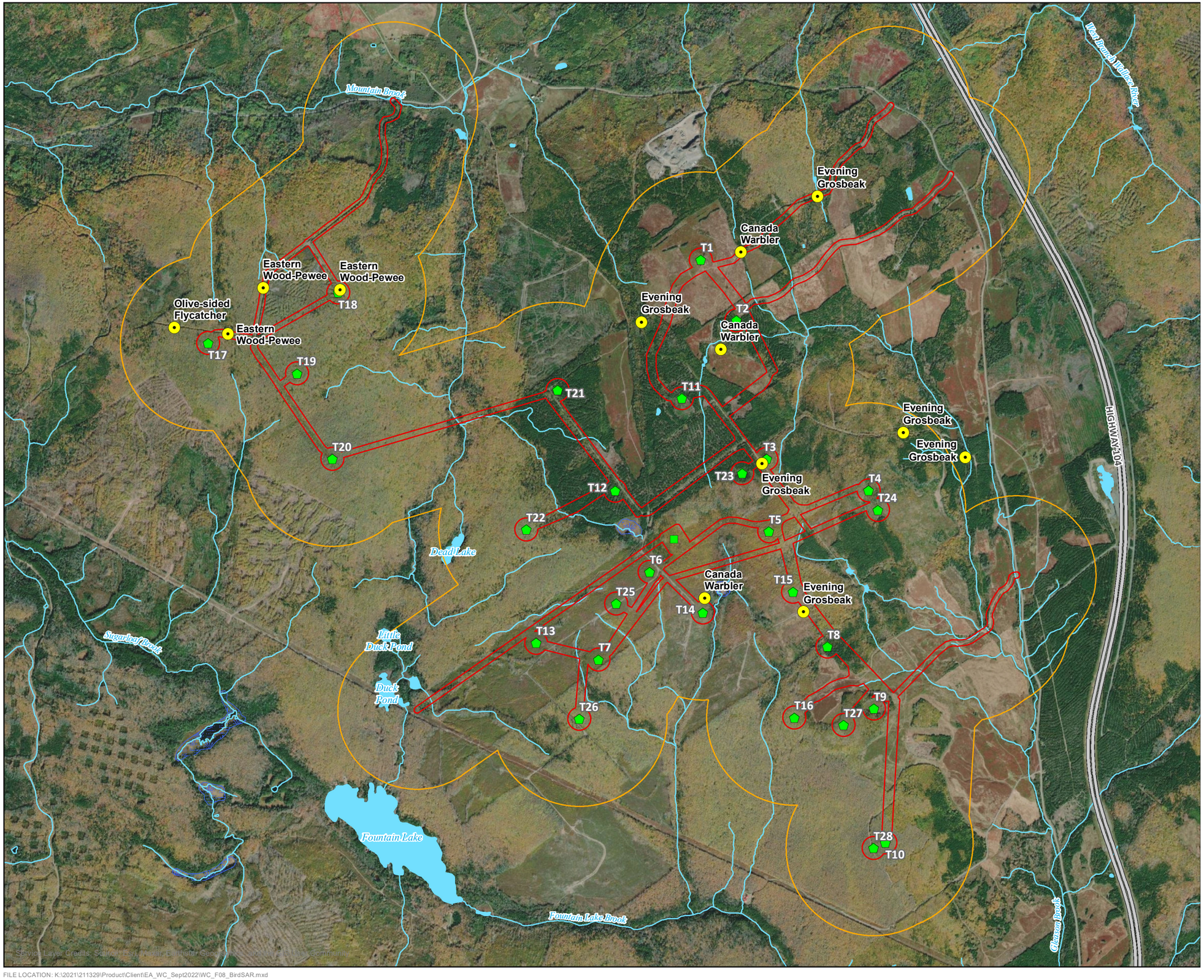
Information on bird SAR that have the potential to be present within the LAA, including their general habitat requirements are summarized below in **Table 35**. This includes SAR that were observed during the field surveys and SAR that were documented by the AC CDC within 10 km of the PDA centre (AC CDC 2022).

TABLE 34: BIRD SAR AND SOCC OBSERVED IN THE LAA

Species	S-rank	Protection Status	Survey Type	Winter	Spring	Summer	Fall	Comments
*American Kestrel *Falco sparverius*	S3B, S4S5M		PC/DWC/Inc		X	X	X	Observed during sensitive breeding season
*American Robin *Turdus migratorius*	S5B, S3N		DWC/PC		X	X	X	Observed both during breeding and non-breeding season - considered sensitive in non-breeding season
Barn Swallow *Hirundo rustica*	**S3B**	**SARA: T COSEWIC: SC NSESA: E**	**DWC**		**X**			**Observed during breeding season (sensitive period)**
*Bay-breasted Warbler *Setophaga castanea*	S3S4B, S4S5M		PC/Inc.		X	X	X	Observed during breeding season (sensitive period)
*Blackpoll Warbler *Setophaga striata*	S3B, S5M		PC		X		X	Not observed during sensitive breeding season. Considered secure during migration.
*Boreal Chickadee *Poecile hudsonicus*	S3		PC/Inc.	X	X	X	X	Observed in all seasons
*Canada Jay *Perisoreus canadensis*	S3		DWC/PC		X	X	X	Observed during breeding season
Canada Warbler Cardellina canadensis	**S3B**	**SARA: T COSEWIC: SC NSESA: E**	**PC/Inc.**		**X**		**X**	**Not observed during sensitive breeding season**
*Cape May Warbler *Setophaga tigrina*	S3B,SUM		PC/Inc.		X	X	X	Observed during sensitive breeding season
Common Nighthawk *Chordeiles minor*	**S2B**	**SARA: SC COSEWIC: SC NSESA: E**	**Br.CNHk**			**X**		**Observed during sensitive breeding season**
*Cooper's Hawk *Accipiter cooperii*	S1?B,SUN,SUM	NAR	DWC				X	Not observed during sensitive breeding season

Species	S-rank	Protection Status	Survey Type	Winter	Spring	Summer	Fall	Comments
Eastern Wood-Pewee *Contopus virens*	**S3S4B**	**SARA: SC COSEWIC: SC NSESA: V**	PC		X	X		**Observed during sensitive breeding season**
Evening Grosbreak *Coccothraustes vespertinus*	**S3B, S3N, S3M**	**SARA: SC COSEWIC: SC NSESA: V**	PC		X	X		**Observed during breeding and non-breeding seasons (both sensitive).**
*Northern Goshawk *Accipiter gentilis*	S3S4	NAR	PC/DWC		X		X	Observed during breeding season
Olive-sided Flycatcher *Contopus cooperi*	**S3B**	**SARA: T COSEWIC: SC NSESA: T**	**PC**			**X**		**Observed during sensitive breeding season**
*Philadelphia Vireo *Vireo philadelphicus*	S2?B,SUM		PC				X	Observed outside of sensitive breeding season
*Pine Siskin *Spinus pinus*	S3		PC		X	X	X	Observed in all seasons except winter
*Purple Finch *Haemorhous purpureus*	S4S5B, S3S4N, S5M		PC		X	X	X	Observed during sensitive non-breeding season.
*Red Crossbill *Loxia curvirostra*	S3S4		PC		X	X	X	Observed during breeding season
*Rose-breasted Grosbeak *Pheucticus ludovicianus*	S3B		PC/Inc.		X			Observed outside sensitive breeding season
*Turkey Vulture *Cathartes aura*	S2S3B,S4S5M		DWC/Inc.		X	X	X	Observed during breeding season

Bold indicates a species is considered a SAR
* indicates a species is considered a SoCC
T = threatened; SC = special concern; E = endangered; V = vulnerable; NAR = not at risk; PC = point count; DWC = diurnal watch count; Inc. = incidental; Br.CNHk = Breeding Common Nighthawk.



Natural Forces

WESTCHESTER WIND PROJECT

LOCATIONS WHERE BIRDS SPECIES AT RISK WERE OBSERVED

FIGURE 27

- Species at Risk (SAR) Observations
- Proposed Turbine Location
- Proposed Substation Location
- Local Assessment Area (LAA)
- Potential Development Area (PDA)
- Highway
- Watercourse
- Waterbody
- Wetland

0 0.125 0.25 0.5 km

N W E S

SCALE 1:24,000

MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING, GEONB, NATURAL FORCES

MAP CREATED BY: GAM
MAP CHECKED BY:CK
MAP PROJECTION: NAD 1983 UTM ZONE 20N

DILLON CONSULTING

PROJECT: 22-4065
STATUS: DRAFT
DATE: 2022-12-08

FILE LOCATION: K:\2021\211329\Product\Client\EA_WC_Sept2022\WC_F08_BirdSAR.mxd

TABLE 35: BIRD SAR AND SOCC WITH THE POTENTIAL TO BE PRESENT IN THE LAA

Species	AC CDC Reported Distance	Potential Habitat within the LAA
Bank Swallow *Riparia riparia*	7.2 ± 7.0 km	Species is listed as threatened (SARA and COSEWIC), endangered (NSESA) and ranked by the AC CDC as S2B for imperilled in Nova Scotia for the breeding population. Bank Swallows are a colonial breeder that are found across Nova Scotia in lowlands along rivers, streams and ocean coasts and nest around vertical, or near vertical cliffs or banks. These birds are aerial insectivores catching nearly all their prey in flight which requires open areas (ECCC 2022a). Suitable habitat for Bank Swallows is limited and they are not expected to occur frequently in the LAA.
Barn Swallow *Hirundo rustica*	3.1 ± 7.0 km	Species is listed as threatened (SARA) special concern COSEWIC), endangered (NSESA) and ranked by the AC CDC as S3B for vulnerable in Nova Scotia for the breeding population. Barn Swallows typically inhabit open areas near human settlements and land uses including parks, ball fields, golf courses and agricultural fields where they forage for flying insects. These birds will typically construct their nests on human-made structures, and rarely in more natural locations such as cliffs, caves or hollowed trees (COSEWIC 2021). Suitable habitat for barn swallows is limited and they are not expected to occur frequently within the LAA.
Bobolink *Dolichonyx oryzivorus*	7.2 ± 7.0 km	Species is listed as threatened (SARA), special concern (COSEWIC), vulnerable (NSESA) and ranked by the AC CDC within Nova Scotia as S3B for vulnerable for the breeding population. Bobolinks typically occur in grassland habitats (ECCC 2022d). Suitable habitat for Bobolink is limited within the LAA, however, they were not detected during the 2021 or 2022 surveys and are not expected to occur frequently within the LAA.
Canada Warbler *Cardellina canadensis*	3.1 ± 7.0 km	Species is listed as threatened (SARA), special concern (COSEWIC), endangered (NSESA) and ranked by the AC CDC as S3B for vulnerable in Nova Scotia for the breeding population. Canada Warblers typically breed throughout Maritimes and southeastern Canada. This species prefers wet mixed forests with well-developed shrub layers, as well as regenerating areas (COSEWIC 2020). Canada Warblers were detected and suitable nesting habitat does exist within the LAA.
Chimney Swift *Chaetura pelagica*	6.5 ± 0.0 km	Species is listed as threatened (SARA and COSEWIC), endangered (NSESA), and ranked by the AC CDC within Nova Scotia as S2S3B for vulnerable to imperiled for the breeding population and S1M as critically imperiled for the migratory population. Chimney Swifts are aerial foragers and tend to concentrate near water where insects are abundant (ECCC 2022c). Suitable habitat for is limited within the LAA, however, they were not detected during the 2021 or 2022 surveys and

Species	AC CDC Reported Distance	Potential Habitat within the LAA
		are not expected to occur frequently within the LAA.
Common Nighthawk *Chordeiles minor*	11.5 ± 7.0 km	Species is listed as Threatened (SARA and NSESA), Special Concern (COSEWIC) and ranked by the AC CDC as S2S3B for vulnerable to imperiled in Nova Scotia for the breeding population and critically imperilled for the migrating population. They typically nest on the ground in open or sparsely vegetated habitats (ECCC 2016a). This species was detected within the LAA and suitable nesting habitat does exist within the LAA.
Eastern Wood-Pewee *Contopus virens*	1.6 ± 0.0 km	Species is listed as Special Concern (COSEWIC/SARA) and Vulnerable (NSESA), and ranked by the AC CDC as S3S4B for vulnerable to apparently secure in Nova Scotia for the breeding population. This species breeds in open woodland of all types in Nova Scotia, but shows a preference for forests with a dominance of deciduous trees. The Eastern Wood-pewee forages on flying insects in the middle canopy (COSEWIC 2012). This species was detected within the LAA in 2012 and 2022 and is likely to use the LAA for foraging and nesting purposes.
Evening Grosbreak *Coccothraustes vespertinus*	0.6 ± 0.0 km	Species is listed as Special Concern (SARA and COSEWIC), Vulnerable (NSESA) and ranked by the AC CDC as S3B/N/M in Nova Scotia for vulnerable for the breeding, non-breeding and migratory populations. Evening Grosbeaks tend to nest in older growth and second-growth conifer-dominated forests. They primarily prey on insects and their larvae during the breeding season, on a wide variety of seeds and the leaf buds of many deciduous tree and shrub species over winter (ECCC 2022b). Evening Grosbreaks were identified during the 2021 and 2022 surveys and potential breeding habitat for the Evening Grosbreak does exist in very limited mature forested areas within the LAA.
Olive-sided Flycatcher *Contopus cooperi*	1.3 ± 0.0 km	Species is listed as Threatened (SARA and NSESA), Special Concern (COSEWIC) and ranked by the AC CDC as S3B for vulnerable in Nova Scotia for the breeding population. This species nests in open, forested areas, often with many conspicuous perches (i.e., tall trees or snags alongside open areas) (ECCC 2016b). Olive-sided Flycatchers were detected in 2022 and suitable nesting habitat does exist within the LAA.

3.1.7.6 Bat SAR and SoCC Assessment

Based on the 2022 AC CDC report, no bat species were historically observed within 10 km of the Project's centre; however, five bat species were historically recorded within 100 km (AC CDC 2021; 2022). **Table 36** summarizes the historical observations of bat SAR and SoCC within 100 km of the Project's centre as reported by the AC CDC.

TABLE 36: RARE AND/OR ENDANGERED BATS WITHIN 100 KM FROM THE PROJECT'S CENTRE (AC CDC 2022)

Common Name (*Scientific Name*)	S-rank and Conservation Status	Distance from PDA Centre to the closest observation (km)
Little Brown Myotis *(Myotis lucifugus)*	S1, Endangered (SARA and NS ESA)	11.7
Northern Myotis *(Myotis septentrionalis)*	S1, Endangered (SARA and NS ESA)	11.7
Tri-coloured Bat *(Perimyotis subflavus)*	S1, Endangered (SARA and NS ESA)	33.9
Hoary Bat* *(Lasiurus cinereus)*	S1S2B,S1M (no SARA, NS ESA, or COSEWIC listing)	66.8
Bat species* *(Vespertilionidae sp)*	S1S2 (no SARA, NS ESA, or COSEWIC listing)	13.9

Bold indicates a species is considered a SAR
* indicates a species is considered a SoCC
S-rank refers to the Sub-national (Provincial) rank provided by the AC CDC and includes the following: S1 Critically Imperiled, S2 Imperiled, S3 Vulnerable, S4 Apparently Secure, S5 Secure and SU Unrankable. Rankings are frequently paired with the following breeding status qualifiers: B Breeding, N Non-breeding and M Migrant

As mentioned previously, species associated with the MYOTID species group of bats (which include little brown myotis, northern myotis, and Tri-coloured Bats) were detected during the 2021 and 2022 bat surveys. These bats are known to inhabit much of Nova Scotia, and all three are listed as Endangered under both the federal SARA and the NSESA. Additionally, all three migratory bat SoCC currently undergoing assessment by COSEWIC (i.e., silver-haired bat, eastern red bat, and hoary bat) were detected at the site in 2021.

Critical habitat for little brown myotis, northern myotis, and/or tri-coloured bat includes any site where hibernation by these bat species has been observed at least once between 1995 and 2018 (ECCC 2018). Hibernacula are required for these bats to survive when ambient temperatures decline and insects are unavailable (Ontario Ministry of Natural Resources 2010, COSEWIC 2013). Hibernacula for these species can include caves, abandoned mines, hand-dug wells, cellars, tunnels, rock crevices or tree root hollows where light and noise levels are low and can support relatively stable temperatures (2-10 ˚C) and high humidity levels (>80 %) (ECCC 2018). Maternity roosts are used for giving birth and rearing young and are considered to be important habitat but are not yet officially recognized as critical habitat (ECCC 2018).

Critical habitat for bats in Atlantic Canada are mapped but the locations are not shared publicly. The AC CDC did not identify any known bat hibernacula within 5 km of the Project site (AC CDC 2021; 2022). Based on the ECCC's Recovery Plan for little brown myotis, northern myotis, and tri-colored bat (ECCC 2018), which uses a 10 km x 10 km grid to buffer known locations of hibernacula, critical bat habitat is present approximately 14 km south of the nearest Project WTG location.

3.1.7.7 Environmentally Sensitive or Managed Areas

The following managed or protected habitats have been identified the within the 10 km PDA and surrounding areas:

- Portapique River Wilderness Area is 2,050 hectares of old growth hemlock (*Tsuga Canadensis*), red spruce (*Picea rubens*), hardwood mixed-wood forests (NSE 2022b). This Wilderness Area is approximately 1 km south from the PDA.
- A deer wintering area (DWA) is located approximately 1.5 km northeast of the PDA. During the winter, White-tailed Deer (*Odocoileus virginianus*) congregate in high density groups in areas which provide shelter from the prevailing wind, offer maximum exposure to the sun and offer cover as well as access to vegetation for browse (NSDNR 2012b). DWAs are identified by NSDNRR for identifying areas for special management practices in Nova Scotia. No designated DWAs are located within the PDA and deer wintering within the PDA is considered to be unlikely because much of the lands are cut and developed, providing little protection from wind.
- An area designated as Core Habitat for Mainland Moose (NSDNRR 2021). The PDA is located within this area;
- A proposed access road for the Project intersects with a Crown Land Parcel located to the north of the PDA. Additional Crown Land Parcels are located approximately 400 metres to the west, 1.5 km southeast and 1.5 km east of the PDA.

3.2 Effects of the Undertaking on the Environment

Standard mitigation has been identified to prevent the interaction from possibly occurring, or to reduce the magnitude, geographic extent, frequency, duration, reversibility, or ecological/socioeconomic context of the interaction. Best management practices (based on industry guidelines and regulatory guidance documents) have been proposed as mitigation measures. In addition, several acts, codes, regulations, and guidelines may require appropriate actions be conducted as mitigation measures prior to, or during, the interaction.

The federal and provincial legislation and codes that could apply to the Project include (but may not be limited to):

- *Canadian Environmental Protection Act* and regulations (ECC 1999);
- *Fisheries Act* (FA 1985);
- *Species at Risk Act* (ECCC 2002);
- *Transportation of Dangerous Goods Act*, and regulations (TC 1992);
- *Migratory Bird Convention Act* (ECCC 1994);
- *Nova Scotia Environment Act* and regulations (NSECC 1994-95);
- *Nova Scotia Water Resources Protection Act*, and regulations (NSECC 2000);

- *Nova Scotia Endangered Species Act*, and regulations (NSECC 1998a);
- *Nova Scotia Wilderness Areas Protection Act*, and regulations (NSECC 1998b); and
- Contingency Planning Guidelines (NSECC 2021).

3.2.1 Mitigation for Unplanned Events

Over the course of the different phases of the Project, as with any development, there is the potential for unplanned events. These include but are not limited to accidents, malfunctions, and severe weather events. The risks and potential interactions can be challenging to predict.

The Proponent has taken this potential risk into consideration and developed a series of mitigation measures and best practices to limit and prevent impacts on VECs by such incidents. The mitigation measures for unplanned events, listed in **Table 37**, will be followed by the Proponent and all contractors.

During construction and decommissioning, a direct release of a contaminating substance (e.g., fuel or sediment) into the environment could result in a negative effect of the Project on the watercourse and fish habitat VEC. The mitigation measures for unplanned events listed in **Table 37** are anticipated to limit the potential effect as a result of an unplanned event, such as a spill, to be of a small magnitude, of short duration and localized.

TABLE 37: PROPOSED MITIGATION FOR UNPLANNED EVENTS

Unplanned Events	Proposed Mitigation Measures
Potential accidents, malfunctions, severe weather events, among other incidents.	1) Proper wetland protection and erosion and sediment control measures following the Environmental Management and Protection Plan (**Appendix O**) will be installed and checked regularly during the construction phase and prior to, and after, storm events to ensure they are continuing to operate properly to minimize potential effects to adjacent habitat. 2) Work during storm events will be avoided if feasible. 3) Chemicals and petroleum products will be managed in accordance to manufacturer specifications and stored more than 30 m from a watercourse or wetland. 4) Equipment will be kept in good working order and maintained so as to reduce risk of spills/leaks and to avoid water contamination. 5) Frequent inspection of equipment will minimize the likelihood of fluids leaking into wetlands. 6) If contaminated soil is encountered, it will be reported to NSECC and managed utilizing the Nova Scotia Contaminated Site Regulations. 7) Mats and other means to avoid disruption of the wetlands will be used during necessary tree clearing. 8) Visual monitoring of silt or sedimentation within watercourses will occur after heavy weather events during construction. 9) Refueling, oiling, and maintenance of equipment will be completed in specifically designated areas located at least 30 m away from any watercourse, wetland, or well to minimize potential effects that could arise in the event of a spill. 10) No stockpiling of materials will occur within 30 m of a wetland or watercourse.

Unplanned Events	Proposed Mitigation Measures
	11) Spill response kits will be readily available for each piece of equipment, on site workers are required to be knowledgeable on emergency spill response protocols and initiate corrective measures immediately to minimize any impacts to the surrounding environment. 12) Where applicable, secondary containment and limited quantities of chemicals and fuels required to be stored on site will be in an area away from the surrounding terrestrial environment, or direct pathways (i.e., ditches) to the surrounding environment, all chemicals and fuels will be stored in appropriate containers designed for the reduction of potential spills or leaks. Work entailing use of toxic or hazardous materials, chemicals, or otherwise creating hazard to life, safety of health, will be conducted in accordance with National Fire Code of Canada to minimize the potential for spills or fires.

3.2.2 Terrestrial Habitats and Vegetation

Potential Interactions and Mitigation

Through the site selection process, the Project footprint has been sited predominantly in areas previously disturbed via clear cutting through forestry activities, creating a highly fragmented habitat and the project footprint is limited, to the extent possible, in areas of undisturbed habitat. Information collected during field surveys has covered all habitat types within the PDA. Habitat types and vegetation present have been identified in **Section 3.1.1**.

Without mitigation, the Project has the potential to cause a reduction of vegetation and lichen habitat due to linear infrastructure and turbine foundations. While the construction and decommissioning phases present the potential for negative impact, impacts are temporary or reversible, most notably when the decommissioning phase has concluded, and land reclamation activities restore the Project site to its previous state. The potential impacts of the Project to vegetation and lichens include the following:

- The potential for direct loss of vegetation through Project activities including vegetation clearing and grubbing activities during the construction, operational phase, as well as during the eventual Project decommissioning and site reclamation activities.
- The potential for indirect loss of riparian or wetland vegetation communities resulting from the introduction of sediment due to Project activities around waterways and wetlands.
- The potential introduction or spread of invasive species on and off site through plant matter attached to construction equipment.
- The potential loss or disturbance to SAR/SoCC plants and lichens during construction and decommissioning phases of the Project or from required maintenance during the operational phase.

To further reduce the likelihood of interactions between any phase of the Project to vegetation or lichens, the proposed mitigation measures summarized in **Table 38** will be implemented.

TABLE 38: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR TERRESTRIAL HABITATS AND VEGETATION

Potential Interactions with Terrestrial Habitats and Vegetation	Proposed Mitigation Measures
Direct loss of vegetation due Project activities including clearing and grubbing during construction, decommissioning and site reclamation activities. Direct loss of vegetation due to maintenance clearing during operations.	1) Proper vegetation management measures following the Environmental Management and Protection Plan (**Appendix O**) will be instated. 2) The Project footprint will be limited to that which is necessary to enable the Project to be carried out. 3) Existing roads and trails will be utilized to limit disturbance outside the Project footprint and minimize the amount of flora to be cleared. 4) Vegetation will be retained where possible. 5) Following the construction and decommissioning phases of the Project, revegetation with native species will be promoted in consultation with the landowner. 6) Vegetation control measures during the operational phase will be minimized to the extent possible.
Indirect loss of riparian or wetland vegetation communities due to introduction of sediment from Project activities around waterways and wetlands during construction and decommissioning.	Mitigation measure #5 is also applicable. Additionally, the following measures will be implemented: 7) The removal of riparian zone vegetation will be limited to the extent possible. 8) Vehicle cleaning will occur away from any watercourse/wetland. Cleaning will also occur as vehicles leave the site to ensure that invasive species already present are not spread to other areas.
Introduction or spread of invasive species on and off site due to plant matter attached to equipment during construction and decommissioning.	Mitigation measure #8 is also applicable. Additionally, the following measures will be implemented: 9) Heavy equipment will be properly cleaned and visually inspected prior to mobilizing to site to avoid potential introduction of exotic and invasive species.
Loss or disturbance to SAR/SoCC plants and lichens due to clearing and grubbing during construction, decommissioning. Loss or disturbance to SAR/SoCC plants and lichens due to required maintenance during operations.	Mitigation measure #6 is also applicable. Additionally, the following measures will be implemented: 10) Eastern waterfan is listed as Threatened under NSESA, as such, no disturbance of the species or its habitat is allowed. 11) Based on NSDNRR At-Risk Lichens–Special Management Practices (2018), a protected zone within

Potential Interactions with Terrestrial Habitats and Vegetation	Proposed Mitigation Measures
	a 200 m radius of the observed location of the SAR lichen, eastern waterfan is to be maintained for minimal disturbance. 12) In addition, based on recommendations from CWS, a 50m riparian (streamside) buffer of the stream (including streams running into the occupied stream) occupied with the eastern waterfan for a 1000m radius around occurrences of eastern waterfan. 13) The locations of SAR plants will be avoided by adjusting utility pole alignment to buffer these species. 14) Where feasible, the locations of SoCC plants will be avoided by adjusting utility pole alignment or spanning their locations by utility poles and refraining from clearing vegetation in their vicinity. 15) Glyphosate will not be used in vegetation management for the Project. 16) Onsite workers will be familiarized with the SAR/SoCC identified by the field studies prior to any site activities taking place. 17) Work in waterways will be minimized where feasible. 18) Project activities will maintain a 50m riparian (streamside) buffer of any waterways where SAR species have been observed. 19) Specimens will be marked with flagging tape and GPS location will be provided to onsite workers to ensure they avoid work in the setback area. 20) Efforts will be made to maintain mature vegetation along the edges of the development area particularly in riparian areas. 21) If a new SAR/SoCC is identified during Project activities, a buffer will be maintained and additional mitigation will be developed in consultation with NSDNRR.

Monitoring

A post-construction monitoring program for the aquatic SAR lichen, eastern waterfan (*Peltigera hydrothyria*), will be developed consisting of two annual field surveys targeting the previously identified locations of eastern waterfan in Gleason Brook in order to assess the impact of construction activities on the population of the lichen. The monitoring program will be developed in consultation with NSDNRR and implemented following approval.

Significance of Residual Effects

The Project will be developed in such a way as to minimize the area of disturbance within the Project site and natural revegetation of the site will be promoted at the earliest opportunity. The majority (approximately 57%) of the PDA has already been disturbed due to previous site activities, including agriculture and forestry, which are unrelated to the Project. The final

Project layout will consider appropriate buffers for any identified SAR/SoCC. Project siting has minimized the flora footprint from the access roads, crane pads, turbine foundation, and substation by making use of existing infrastructure and disturbed areas. Land cleared for construction that is not needed for the operational phase of the Project will be restored to the extent possible and is anticipated to naturally regenerate.

Given current knowledge as informed by the desktop assessment, biophysical assessments, and previous site activities, significant potential impacts to vegetation communities are not anticipated as a direct result of the Project with the appropriate implementation of the mitigation measures presented. Any revisions to the project footprint will consider the locations of the SAR and SoCC plants and lichens and avoid them to the extent possible by adjusting utility pole alignment to buffer these species, where feasible, or spanning their locations by utility poles and refraining from clearing vegetation in their vicinity. Additionally, once the decommissioning phase occurs, land reclamation will restore the Project site to its previous state or similar based on discussions with landowners.

With the proposed mitigation measures employed, the significance of residual effects on flora is predicted to be minor; however, post-construction monitoring and adaptive management plans will include monitoring the effects on the aquatic SAR lichen, eastern waterfan (*Peltigera hydrothyriai*), identified at the site. Other monitoring or biophysical assessments were not deemed required.

3.2.3 Terrestrial Wildlife

Potential Interactions and Mitigation

Without mitigation, the Project has the potential to cause a minor reduction of some wildlife habitat due to linear infrastructure and turbine foundations. While the construction and decommissioning phases present potential for negative impact, impacts are reversible once the decommissioning phase has started and land reclamation activities restore the Project site to its previous state. The Project is anticipated to interact with wildlife and their habitats and cause environmental effects in the following ways:

- Temporary disturbance, or displacement from surrounding habitat, during Project construction and decommissioning activities due to increased human presence, noise and anthropogenic footprint; and
- Loss of habitat due to project infrastructure and crane pads during construction, operation, and decommissioning.

To further reduce the likelihood of interactions between any phase of the Project and wildlife, the mitigation measures, summarized below in **Table 39** will be followed.

TABLE 39: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR TERRESTRIAL WILDLIFE

Potential Interactions with Terrestrial Wildlife	Proposed Mitigation Measures
Short-term, reversible disturbance of potential foraging fauna and habitat and fauna	1) The Project footprint will be limited to that which is necessary to enable the Project to be carried out.

Potential Interactions with Terrestrial Wildlife	Proposed Mitigation Measures
during construction and decommissioning due to increased human presence, noise and anthropogenic footprint.	2) Vegetation will be retained where possible to maintain wildlife habitat. 3) Following the construction and decommissioning phases of the Project, revegetation with native species will be promoted in consultation with the landowner. 4) Existing roads and trails will be utilized to limit disturbance outside the Project footprint and minimize the interactions with wildlife and wildlife habitat. 5) The site and working areas will be kept clean of food scraps, and waste will be removed from the site routinely to minimize wildlife encounters. 6) Reduced speeds, dust suppression, and noise and lighting restrictions will be implemented to minimize disturbance to wildlife in the PDA. 7) To minimize disruptions of fauna activity at night, Project construction activities will be limited to daylight hours when feasible. 8) Construction activities within 30m of a watercourse will be limited where feasible to minimize impacts to wildlife's use of watercourses and movement in corridors. 9) In the case of wildlife encounters, the following will be implemented: (1) no attempt will be made by any worker at the Project site to chase, catch, divert, follow or otherwise harass wildlife by vehicle or on foot; (2) equipment and vehicles will yield the right-of-way to wildlife; and (3) if a SAR is encountered during activities, work around the SAR will cease until a biologist is dispatched to assess the situation and appropriate mitigation is applied. 10) All workers will be familiarized and will adhere to the Nova Scotia *Endangered Species Act* and the federal *Species at Risk Act.* 11) Erosion and sediment control measures will be installed and checked regularly during the construction phase and prior to, and after, storm events to confirm they are continuing to operate properly to minimize potential effects to adjacent habitat.
Short-term, reversible loss of potential breeding and foraging habitat due to linear infrastructure and crane pads during construction and decommissioning. Long-term, reversible loss of potential breeding and foraging habitat due to linear infrastructure during operations.	Mitigation measures #1-4 are also applicable. Additionally, the following measures will be implemented: 12) Control measures to manage and prevent the spread of invasive plant species will be applied to each phase of the Project. 13) Glyphosate will not be used in vegetation management for the Project. 14) No fences that would impede movement of large terrestrial wildlife will be built, and any of built fences will not cut off viable habitat for wildlife. 15) Decommissioning/reclamation activities following the Project will be undertaken to improve interconnections between landscapes in the PDA.

The effects of the Project activities on terrestrial wildlife are expected to be limited to only the Project footprint. Disturbance of fauna habitat as a result of the Project will be minimized through turbine and infrastructure siting and by employing the proposed mitigation measures. Noise associated with the construction may deter wildlife, but potential effects are expected to be short term. With the proposed mitigation, residual interactions of the Project with terrestrial fauna species are anticipated to be short in duration and to not be substantive, as they are limited to construction and reclamation phases and are already occurring already in an area with ongoing anthropogenic activities including, but not limited to agriculture and forestry.

In consideration of the above and planned mitigation, the residual environmental effects of the Project on terrestrial wildlife (excluding birds, bats, turtles and moose, which are evaluated in their separate reports) is predicted to be negligible in terms of the significance of the environmental effect.

3.2.3.1 Mainland Moose
Potential Interactions and Mitigations

Based on the results of the desktop and field surveys for Mainland moose, it was concluded that the potential for moose to be present within the LAA is low. Existing anthropogenic activities within and surrounding the PDA such as public roads, Highway 104, a nearby quarry, ATVs and snowmobile trails, agricultural blueberry fields, and maple syrup production are likely contributing factors that reduce the likelihood of Moose occupation within the LAA. Moose have, however, been observed in the region, which is connected to and is present within their core habitat (NSDNRR 2021); therefore, it is possible for moose to travel through the LAA.

The Project has been intentionally sited to minimize the potential impact of the Project on natural landscapes and undisturbed natural habitat by selecting lands previously impacted by anthropogenic activities. In this case, the majority (i.e., approximately 57%) of the PDA is sited on lands previously or presently used for forestry activities, agricultural operations, and access roads and trails. These impacted lands do not meet the biophysical requirements for core moose habitat as defined by NSDNRR (2021).

Without mitigation, the Project has the potential to cause a minor reduction of Mainland moose habitat due to linear infrastructure and turbine foundations. While the construction, operation, and decommissioning present potential for negative impact, impacts are temporary and/or reversible, most notably when the decommissioning phase has concluded, and land reclamation activities restore the Project to its previous state. The potential impacts of the Project to Mainland moose and their habitat include:

- Temporary disturbance within potential Mainland moose foraging habitat during construction and decommissioning due to increased human presence, noise and anthropogenic footprint; and,

- Loss and fragmentation of potential Mainland moose habitat during construction, operation, and decommissioning due to linear infrastructure and crane pads.

To further reduce the likelihood of interactions between any phase of the Project and Mainland moose, the mitigation measures, summarized in **Table 40** will be followed. In addition to the mitigation measures presented below, the Proponent has engaged with the Confederacy of Mainland Mi'kmaq (CMM) to understand current and proposed Mainland Moose recovery programs. Further discussions are required to understand the scope of work and funding required for such programs; however, the Proponent commits to contributing to these programs in order to help the recovery of the Mainland moose population as they are a species that are of particular significance to the Mi'kmaq and to the ecosystems within the area. Efforts such as these are important moving forward and lend well to the Mainland moose Recovery Plan (NSDNRR 2021).

TABLE 40: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR MAINLAND MOOSE

Potential Interactions with Moose and Moose Habitat	Proposed Mitigation Measures
Short-term, reversible disturbance to potential Mainland Moose foraging habitat during construction and decommissioning due to increased human presence, noise and anthropogenic footprint.	1) The Project footprint will be limited to that which is necessary to enable the Project to be carried out. 2) Vegetation will be retained where possible to maintain wildlife habitat. 3) Existing roads and trails will be utilized to limit disturbance outside the Project footprint and minimize the interactions with wildlife and wildlife habitat. 4) Reduced speeds, dust suppression, and noise and lighting restrictions will be implemented to minimize disturbance to Moose and other wildlife in the PDA. 5) To minimize disruptions with Mainland moose activity at night, Project construction activities will be limited to daylight hours when feasible. 6) Equipment will be kept in good working order and maintained to avoid noise disturbances. 7) To minimize impacts to Mainland Moose use of watercourses and movement in corridors, construction activities within 30m of a watercourse will be limited where feasible. 8) In the case of Mainland Moose encounters, the following will be implemented: (1) no attempt will be made by any worker at the Project site to chase, catch, divert, follow or otherwise harass individuals by vehicle or on foot; and (2) equipment and vehicles will yield the right-of-way to individuals. 9) Participation in or funding to Mi'kmaq run Mainland Moose recovery programs. 10) All workers will be familiarized and will adhere to the Nova Scotia *Endangered Species Act* and the federal *Species at Risk Act.*
Short-term, reversible loss and fragmentation of potential	Mitigation measures #1-3 are also applicable. Additionally, the

Potential Interactions with Moose and Moose Habitat	Proposed Mitigation Measures
Mainland Moose habitat during construction and decommissioning due to linear infrastructure and crane pads. Long-term, reversible loss and fragmentation of potential Mainland Moose habitat during operations due to linear infrastructure.	following measures will be also implemented: 11) Control measures to manage and prevent the spread of invasive plant species will be applied to each phase of the Project. 12) Glyphosate will not be used in vegetation management for the Project. 13) Road and access points will be laid out in a manner to avoid fragmentation of habitat and/or isolation of habitat where feasible. 14) Following the construction and decommissioning phases of the Project, revegetation with native species will be promoted in consultation with the landowner. 15) Decommissioning/reclamation activities following the Project will be undertaken to improve interconnections between landscapes in the PDA.

Significance of Residual Effects

The effects of the Project activities on Mainland Moose are expected to be limited to the PDA, as required to meet Project objectives during the construction, operation, and decommissioning phases. The Project is to be constructed within existing anthropologically disturbed areas where possible, which reduces effects to moose, moose habitat, and moose ability to traverse between habitats. Disturbance of mature forest habitat as a result of this Project will be minimized through site selection and by employing the proposed mitigation measures.

Noise associated with the construction phase of the project may deter moose and the potential effects are considered to be short term and reversible. With the proposed mitigation, the residual interactions of the Project with moose are anticipated to be short in duration are not anticipated to be substantive because they are limited to the construction and decommissioning phases and are occurring already in highly fragmented habitat that has ongoing forestry, agriculture, and recreation activities.

Further fragmentation of habitat, which is presently fragmented by forestry activities, agricultural operations and access roads, as well as snowmobile and ATV trails, is minimized through careful site selection and the re-purposing of existing roads and trails. Following the construction and decommissioning phases of the Project, natural revegetation of the site will be promoted.

3.2.4 Wetlands

Potential Interactions and Mitigation

Based on the proposed layout, potential indirect and direct effects on wetlands within 30 m of the PDA were identified for Wetland 3, Wetland 6, and Wetland 7 due to proposed access road construction. Careful planning around the turbines layout will be utilized to avoid impacts.

A change in wetland size and/or function could occur during the construction of access roads or site restoration in the areas of the wetlands that may require clearing. This could alter the vegetation, increase erosion rates or alter natural drainage patterns in proximity to the aquatic receptors and/or alter the functions of a wetland. Loss of wetland area or function (i.e., hydrological regime, habitat and water quality maintenance) could occur due to the clearing of trees and vegetation within the wetlands.

Pursuant to the Nova Scotia Wetland Conservation Policy, for any Projects that negatively affect wetland areas or function, NSECC will require the adherence to the mitigation sequence to prevent the net loss of wetland area and function (NSE 2019). During construction of the collector network, care will be taken to avoid wetlands, and all attempts will be made to span wetlands with poles.

Without mitigation, the Project has the potential to cause a minor reduction of some wetlands due to linear infrastructure. While the construction and decommissioning phases present potential for negative impact, impacts are reversible once the decommissioning phase has started and land reclamation activities restore the Project site to its previous state. The Project is anticipated to interact with wetlands and cause environmental effects in the following ways:

- During the construction phase, Project activities, such as clearing, grubbing, infilling, and excavation, have the potential to impact wetlands. Such activities have the potential to induce silt run-off, alter flow into the wetlands or see them become repositories of significantly increased water flow, nutrients or sediments; and,
- Total loss of wetlands or a portion of wetlands within the footprint of new roads and infrastructure which may impact the interconnectivity of adjacent wetlands within the same watershed.

To further reduce the likelihood of interactions between any phases of the Project wetlands, the mitigation measures, summarized below in **Table 41** will be followed.

TABLE 41: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR WETLANDS

Potential Interactions with Wetlands	Proposed Mitigation Measures
Silt run-off, flow alteration, and/or significant increase of water flow, nutrients or sediments into the wetlands due to clearing, grubbing, infilling and excavation during construction.	1) Work within 30 m of wetlands will be avoided to the extent feasible. 2) Where avoidance is not possible, disturbances will be minimized as much as feasible (i.e., limited to the area which is required to accomplish the Project objectives). 3) A wetland alteration permit will be applied for and obtained for work in any wetland, noting that work

Potential Interactions with Wetlands	Proposed Mitigation Measures
	within wetlands will be avoided or minimized to the extent possible during the Project design phase. 4) Appropriate sediment erosion and run-off control measures (e.g. silt fencing, hay bales) will be implemented, following best management practices (**Appendix O**), to prevent sediment from leaving the site at all times. 5) Natural regeneration of the site will be promoted to aid in storm water retention and reduce run-off. 6) Vehicle traffic in the wetlands will be minimized by using alternate techniques (e.g. hand cutting vegetation) where possible. 7) Wetlands within the PDA of collector or transmission lines will be spanned with electrical poles where possible where feasible. 8) Compensation will be implemented for net loss of wetland function.
Partial or total loss of wetlands due to new roads and infrastructure during construction, impacting interconnectivity of adjacent wetlands within the same watershed.	Mitigation measures #1-8 presented above are also applicable to potential partial or total loss of wetlands.

Monitoring

Consultation with NSECC regarding the development of a post-construction monitoring program and compensation for selected wetlands will be conducted prior to development as part of the wetland alteration permit process.

Significance of Residual Effects

The Project will be developed in such a way as to avoid wetlands, minimize disturbance to wetlands where avoidance is not possible, and minimize the area of disturbance within the Project site. Avoidance through site design has been completed to the extent possible (i.e., avoiding wetlands where possible, spanning wetlands using overhead collection lines, and use of existing roads). In addition, following the construction and decommissioning phases of the Project, natural revegetation with native species will be promoted in consultation with the landowners to minimize the potential for habitat loss and invasive species spread. Given current knowledge as informed by the desktop assessment, biophysical assessments, and previous site activities, significant potential impacts to wetlands are not anticipated as a direct result of the Project with the appropriate implementation of the mitigation measures presented.

3.2.5 Aquatic Habitat

3.2.5.1 Watercourse and fish habitat

Potential Interactions and Mitigation

The PDA was selected to minimize interactions with watercourse crossings by avoiding development in locations with watercourses to the extent possible. The proposed layout utilizes existing road infrastructure where possible to minimize disturbance of the local environment and the proposed WTG locations were carefully selected in locations more than 30 m from watercourses.

Without mitigation, watercourses with crossings within the PDA have the potential to be impacted during the construction and decommissioning phases of the proposed Project. Interaction may primarily occur during clearing and grubbing and access road widening, as well as during eventual infrastructure removal and site reclamation activities in the decommissioning phase. Potential interactions include increasing sediment load during earth works from altering surface water drainage patterns.

While the construction and decommissioning phases present potential for negative impacts to watercourses within 30 m of Project-related activities, impacts are reversible once the decommissioning phase has started and land reclamation activities restore the Project site to its previous state.

Potential effects of sounds and vibrations associated with the construction (e.g. blasting) and daily operation of the proposed project to fishes occurring within the LAA and the impacts of seismic vibrations and anthropogenic sounds on the behavior and health of fishes (and other wildlife) are still unclear. The construction and decommissioning phases of the project are expected to temporarily increase noise and vibration due to potential blasting and an increase in heavy vehicle traffic on the Project site.

Studies on offshore wind energy turbines have indicated that underwater sound can be generated at levels that are detectable by fish (Mooney 2020). It remains unclear whether onshore WTGs generate underwater noise that has the potential to affect fish health and behaviours. Although not included as a study for the proposed Project, ambient underwater noise in the watercourses located near the project area is expected to be present as a result of pre-existing site activity and the turbulent nature of the watercourses caused by the steep terrain. None of the proposed WTG locations have been sited within 250 m of watercourses with a high potential for fish to be present.

The potential interactions of the Project on watercourses and fish habitat and the proposed mitigation measures are summarized in **Table 42**.

TABLE 42: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR WATERCOURSE AND FISH HABITAT

Potential Interactions with Watercourse and Fish Habitat	Proposed Mitigation Measures
Loss or damage to watercourses and fish habitat due to clearing, grubbing, and/or access road widening during construction and decommissioning. Loss or damage to watercourses and fish habitat due infrastructure removal during decommissioning and site	1) The removal of riparian zone vegetation will be limited and minimized to the extent possible. 2) The use of heavy equipment within 30 m of a watercourse will be minimized to the extent possible. 3) The use of blasting within 30 m of a watercourse will be minimized to the extent possible 4) Construction activities near watercourses will comply with the applicable regulations and guidelines such

Potential Interactions with Watercourse and Fish Habitat	Proposed Mitigation Measures
reclamation activities.	as the *Fisheries Act* and will be carried out strictly in accordance with NSECC and DFO Approvals, Terms and Conditions, and Letters of Advice. 5) Where possible, watercourse crossings will be located in areas that exhibit a stable soil type where grades approaching the crossings will not be too steep and will span the watercourse. 6) Proper erosion and sediment control measures will be installed and checked regularly during construction and prior to, and after, storm events to ensure they are continuing to operate properly to minimize potential effects to adjacent habitat. These measures will be included in the Environmental Management and Protection Plan (**Appendix O**). 7) Sufficient staff and equipment to manage erosion and sediment control during storm events and other emergencies will be provided. 8) In-stream work will be timed to occur in the dry season and not during significant rainfall. Culverts will be designed and installed to prevent the creation of barriers to fish movement and maintain bankfull channel functions and habitat functions to the extent possible. 9) Prior to in-stream work, fish-outs will be completed to ensure no harm to resident fish species. Captured fish will be released outside of the work area. 10) Runoff will be controlled, and sediment will be prevented from leaving the site at all times. 11) Equipment will be kept in good working order and maintained to avoid noise disturbances. 12) All workers will be familiarized with potential aquatic SAR (i.e., Atlantic Salmon, Eastern waterfan and American eel) and will adhere to mitigation measures for the protection of aquatic SAR as outlined within the Adaptive Management Plan (AMP; **Appendix N**). 13) All workers will adhere to the provincial Nova Scotia Endangered Species Act and federal Species at Risk Acts. 14) A surface water management plan will be submitted to NSECC prior to construction.

Significance of Residual Effects

Avoidance through site design has been completed to the extent possible (i.e., avoiding watercourses where possible, spanning watercourses using overhead collection lines, and use of existing roads). In addition, following the construction and decommissioning phases of the Project, natural revegetation with native species will be promoted in consultation with the landowners to minimize the potential for habitat loss and invasive species spread.

Short-term, reversible disturbance to watercourses and fish habitat due to clearing, grubbing, and/or access road widening during construction and decommissioning were assessed above as a potential intersection between the Project and the watercourse and fish habitat VEC. After employing the proposed mitigation strategies, these potential effects are anticipated to be temporary, of small magnitude and contained.

During construction and decommissioning, a direct release of a contaminating substance (e.g., fuel or sediment) into environment could result in a negative effect of the Project on the watercourse and fish habitat VEC. The mitigation measures for unplanned events are anticipated to limit the potential effect as a result of an unplanned event, such as a spill, to be of a small magnitude, of short duration and localized.

3.2.5.2 Turtles and Turtle Habitat Potential Interactions and Mitigation

There is potential for wood turtle SAR individuals to be found on-site. Wood turtles can be active from April through October and can travel hundreds of meters from their rivers as they move from their overwintering habitats to their nesting and foraging/thermoregulation habitats. Accidental mortality from roads can be a potential threat for individual wood turtles, which are vulnerable given their slow travel speed and how far they range from aquatic habitats in summer. Without mitigation, the Project has the potential to interact with turtles and their habitats and cause environmental effects in the following ways:

- Temporary disturbance, or displacement from surrounding habitat, during Project construction and decommissioning activities due to increased human presence, noise and anthropogenic footprint;
- Loss of habitat due to project infrastructure and crane pads during construction, operation, and decommissioning; and
- Temporary disturbance of potential foraging and basking turtles due to increased human presence and noise within the Project footprint.

To further reduce the likelihood of interactions between any phase of the Project and wildlife, the mitigation measures, summarized below in **Table 43** will be followed.

TABLE 43: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR TURTLES AND TURTLE HABITAT

Potential Interactions with Turtles and Turtle Habitat	Proposed Mitigation Measures
Short-term disturbance of foraging or baking habitat due to increased human presence and noise during construction and decommissioning.	1) The Project footprint will be limited to that which is necessary to enable the Project to be carried out. 2) Vegetation will be retained where possible to maintain wildlife habitat. 3) Existing roads and trails will be utilized to limit disturbance outside the Project footprint and minimize the interactions with wildlife and wildlife habitat. 4) In the case of wildlife encounters, the following will be

Potential Interactions with Turtles and Turtle Habitat	Proposed Mitigation Measures
	implemented: (1) no attempt will be made by any worker at the Project site to chase, catch, divert, follow or otherwise harass wildlife by vehicle or on foot; (2) equipment and vehicles will yield the right-of-way to wildlife; and (3) if a SAR is encountered during activities, work around the SAR will cease until a biologist is dispatched to assess the situation and appropriate mitigation is applied. 5) To minimize disruptions of fauna activity at night, Project construction activities will be limited to daylight hours when feasible. 6) Reduced speeds, dust suppression, and noise and lighting restrictions will be implemented to minimize disturbance to wildlife in the PDA. 7) Construction activities within 30m of a watercourse will be limited where feasible to minimize impacts to wildlife's use of watercourses and movement in corridors. 8) All workers will be familiarized and will adhere to the *Nova Scotia Endangered Species Act* and the federal *Species at Risk Act*. 9) Erosion and sediment control measures will be installed and checked regularly during the construction phase and prior to, and after, storm events to confirm they are continuing to operate properly to minimize potential effects to adjacent habitat.

Significance of Residual Effects

With the proposed mitigation, residual interactions of the Project with turtles and turtle habitat are anticipated to be short in duration and to not be substantive, as they are limited to construction and reclamation phases and are already occurring already in an area with ongoing anthropogenic activities including, but not limited to agriculture and forestry.

In consideration of the above and planned mitigation, the residual environmental effects of the Project on turtles or turtle habitat is considered to be negligible in terms of the significance of the environmental effect. A significant environmental effect would result if a considerable change to turtle populations such as a decline in abundance and/or a change in distribution, beyond which natural recruitment (i.e., reproduction and immigration from unaffected areas) would not return the population to its former level within several generations. No follow-up or monitoring is proposed to monitor environmental interactions specific to turtles and turtle habitat, unless required under permit from NSECC.

3.2.6 Birds and Bird Habitat

Potential Interactions and Mitigation

To minimize the potential impact of the Project on natural landscapes and undisturbed natural habitat, the proposed locations for the WTGs were selected in areas previously cut through forestry activities and used for agricultural operations when feasible. The Project is located in an area where bird populations and habitat are present and a key environmental concern associated with wind projects is the potential for effects to birds (i.e., collision) and their habitat. Birds, including SAR and SoCC, are considered important features and VECs related to the Project.

Without mitigation, the Project has the potential to cause negative impacts to birds and their habitat. The potential impacts of the Project to birds and bird habitat include the following:

- Loss of habitat due to project infrastructure and crane pads during construction, operation, and decommissioning;
- Temporary disturbance, or displacement from surrounding habitat, during Project construction and decommissioning activities due to increased human presence, noise, lighting and anthropogenic footprint;
- During operation there is a possibility that migrating birds could collide with the wind turbines and Project infrastructure. In addition, birds may alter their migration flyways and/or local flight paths to avoid wind turbines;
- Nocturnal migrant and night-flying seabirds that are most at risk of attraction to lights may be attracted to the operational lighting of the Project; and
- Fog events can impair avian visibility, increasing the likelihood of mortality from collision with wind turbines; and
- Potential impacts as a result of through unplanned events.

During operation, the key potential effect of the Project to birds will be potential impacts to flight paths of migrating birds. The predicted mortality rate of birds due to collision and/or habitat loss cannot be accurately predicted prior to the operational phase. The implementation of a robust post- construction biophysical assessments will improve our understanding of the potential interactions between wind projects and wildlife. The post-construction monitoring programs will aid in the identification of potential interactions and determination of when to implement certain mitigation measures (i.e., reporting to CWS or implementing a temporary shutdown) to reduce further impacts.

Through vegetation clearing and the construction of additional access roads and other linear infrastructure, the Project will decrease the availability of bird habitat.

During the construction and decommissioning phases interactions are possible as a result of disturbance caused by noise, the loss of habitat within the PDA, and the temporary disruption of nesting habitat (specifically for Common Nighthawks); however, the Project layout was designed with specific effort to minimize the disruption to terrestrial habitats and limit construction as much as possible to areas that have previously been developed or are undergoing regular disturbance due to forestry or agricultural (i.e., blueberry fields and maple

sugary) practices. Though initial loss of habitat will be during the construction phase, loss of habitat will continue throughout the operational phase, in addition to noise disturbances throughout the operational phase. Noise disturbances throughout the operational phase includes from the WTGs and noise from maintenance and post-construction monitoring.

During operation there is a possibility that migrating birds could collide with the wind turbines and Project infrastructure. In addition, birds may alter their migration flyways and/or local flight paths to avoid wind turbines. Although the predicted mortality rate of birds due to collision and/or habitat loss cannot be accurately predicted prior to the operational phase, technology and more robust post- construction biophysical assessments have improved understanding of the potential interactions between wind projects and wildlife.

A more exhaustive summary of potential interactions of the Project with birds and bird habitat and the proposed mitigation measures are summarized below in **Table 44** below. Monitoring and mitigation plans for nocturnal avian migration will be implemented. These mitigation measures have also been implemented in the EMPP (**Appendix O**), and findings will inform the AMP (**Appendix N**) and any future actions.

TABLE 44: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR BIRDS AND BIRD HABITAT

Potential Interactions with Birds and Bird Habitat	Proposed Mitigation Measures
Temporary disturbance of foraging fauna and loss of breeding and foraging habitat during Project activities due to increased human presence, noise and Project footprint.	1) Vegetation will be retained where possible to maintain bird habitat, and glyphosate pesticides will not be used. 2) The Project footprint will be limited to that which is necessary to enable the Project to be carried out. 3) Existing roads and trails will be utilized to limit disturbance outside the Project footprint and minimize the interactions with wildlife and wildlife habitat. 4) The Proponent will endeavor to conduct construction activities such as clearing and grubbing during a time period that does not coincide with when migratory and breeding birds would be in the area as much as feasible. 5) Reduced speeds will be employed in the vicinity of wildlife. 6) Tree and vegetation clearing will not be undertaken during the breeding bird season (May 1 to August 31) to the extent possible. Should clearing be required during the breeding bird season the proponent will consult with CWS for appropriate mitigation measures. 7) Should clearing and grubbing be required during the breeding season, it will only occur following approval and survey requirements developed and approved in consultation with NSDNRR. 8) Should a nesting migratory bird be identified within the work area, CWS and NSDNRR will be notified and an appropriate no-work buffer zone (in consultation with CWS and NSDNRR) will be applied around the nest until the nest has been fledged. No flagging of the nest will occur to

Potential Interactions with Birds and Bird Habitat	Proposed Mitigation Measures
	minimize chances of predation. 9) All workers will be familiarized with the SAR/SOCC that were identified as having the potential to occur on site through both field and desktop analysis prior to work commencing. 10) A reference document will be prepared to ensure workers are aware of potential SAR/SOCC in the Project area. 11) Stockpiling of fill and excavated materials will be minimized to deter the potential for nesting by bank swallows or other ground nesting species (e.g., common nighthawk). 12) Fill/excavation material piles will be at low angles, if left standing for long durations. 13) All workers will adhere to the *Migratory Birds Convention Act* and the *Migratory Birds Regulations*. 14) All workers will adhere to the provincial *Nova Scotia Endangered Species Act* and federal *Species at Risk Act*.
Behaviour alterations due to lighting during construction and operations.	15) To minimize disruptions with wildlife activity at night, the Project construction activities will be limited to daylight hours when feasible. 16) Necessary construction lighting will be pointed downwards. 17) Lighting will be shielded downward. 18) Instruction will be given to maintenance staff to ensure all work lights are turned off upon leaving the site particularly during foul weather events.
Collision of migrating birds with wind turbines and Project infrastructure during operations.	19) A comprehensive AMP will be developed and implemented in consultation with CWS and NSDNRR (**Appendix N**). This includes the development of a follow-up avian mortality survey that will be conducted after the Project commissioning. 20) During the first year, post construction monitoring events will be targeted to capture the morning following nights with favorable tail wind conditions. 21) Blade feathering will be employed as required, and remote shutdown will be employed when appropriate. 22) Should unexpected negative impact to migration flyways occur, appropriate actions will be taken in consultation with CWS and NSDNRR. 23) Non-operational towers will be dismantled if not expected to be put back into operation.
Alteration of migration flyways and/or local flight paths to avoid wind turbines during operations.	Mitigation measures #19-23 are also applicable for potential migration flyways or flight paths.
Adverse impacts on nocturnal migrant and night-flying seabirds due to attraction to lights during	Mitigation measures #19 is also applicable. Additionally, the following measures will be implemented:

Potential Interactions with Birds and Bird Habitat	Proposed Mitigation Measures
operations.	24) Lighting requirements will meet, but not exceed, Transport Canada standards to minimize the potential impacts to migratory birds. 25) Only the required amount of pilot warning and obstruction avoidance lighting will be used. 26) Only lights with short flash durations and the ability to emit no light during the 'off phase' of the flash (i.e. as allowed by strobes and modern LED lights) will be installed on tall structure 27) Lights will operate at the minimum intensity and minimum number of flashes per minute (longest duration between flashes) allowable by Transport Canada. 28) Instruction will be given to wind farm maintenance staff to ensure all work lights are turned off upon leaving the site particularly during extreme weather events.
Avian visibility impairment, increasing the likelihood of mortality from collision with wind turbines during fog events.	Mitigation measure #28 are also applicable for potential avian visibility impairment during fog events.

Monitoring

A comprehensive AMP will be developed and implemented in consultation with CWS and NSDNRR (**Appendix N**). A post-construction bird and bat mortality survey will be conducted for two consecutive years following commissioning. The result of the post-construction surveys will determine if further mitigation is required in consultation with CWS and NSDNRR. Post-construction monitoring will include targeted events to capture the morning following favourable tail wind conditions.

The Proponent has and will continue to work towards the development of a regional radar study in coordination with NSDNRR to better inform regional/ provincial level understanding of avian migration and how such information can better inform risk management in Project development.

Significance of Residual Effects

The predicted mortality rate of birds due to collision and/or habitat loss cannot be accurately predicted prior to the operation of the Project as there is little correlation between pre-construction activity levels and operational mortality, however, it is anticipated that the mortality rate of birds from collision or habitat loss during Project operation, if at all, will be low. Mabee et al. (2006) reported that migration altitudes averaged 410 m agl within the ground to 1.5 km altitude range, and nightly averages ranged from 214 to 769 m. It is important to note that the percent of targets detected in that study was relatively uniform between 0 and 500 m a.g.l., which would indicate that there isn't a greater risk of avian

collision at specific elevations. Erickson et al. (2014) indicated that bird mortality at wind energy facilities in North America account for less than 0.05% of the population estimates for the species most affected by collision mortality; turbine collision mortality accounted for a lower rate than this for all other species and did not pose a threat to populations.

Impacts to bird nocturnal migration will be minimized by employing the proposed mitigation measures. The predicted mortality rate of birds due to collision cannot be accurately predicted at the time of the assessment as there is little correlation between pre-construction activity levels and operational mortality. The Proponent is committed to developing an AMP that will include a monitoring plan for bird and bat mortality during operation and appropriate mitigation should a mortality even occur. Therefore, with proposed mitigation, the residual interactions of the Project with nocturnal migrating birds are not anticipated to be substantive. Should post-construction mortality monitoring surveys not reflect this prediction, the proponent will engage regulatory authorities in an adaptive management framework and work collaboratively with those agencies to utilize the best practices available at that time to reduce impacts in a fashion that addresses the site-specific findings from the monitoring program.

The Proponent does not anticipate significant mortality rates for the proposed turbines at a maximum height of 200 m. The Proponent is committed to developing an AMP that will include a monitoring plan for bird mortality during operation. The recommended post-construction monitoring for bird mortality during operation will verify the impact the Project has on migratory and breeding birds. With the proposed mitigation measures employed, the significance of residual effects on migratory and breeding birds is predicted to be minor and limited to the Project site. Should the post- construction surveys indicate something different, the Proponent will follow the AMP and engage regulatory authorities in applying additional mitigation measures.

With the proposed mitigation measures employed, the significance of residual effects on birds is predicted to be minor; however, post-construction monitoring and AMP will include monitoring the effects on the bird SAR and SoCC identified above in **Section 3.1.5.**

3.2.7 Bats and Bat Habitat

Potential Interactions and Mitigation

The mortality rate of bats due to collision and/or habitat loss cannot be accurately predicted as there is little correlation between pre-construction activity levels and operational mortality. However, industry standards, technology and more robust biophysical assessments have improved understanding of the potential interactions between wind projects and wildlife. Without mitigation, the Project is anticipated to interact with bats and/or bat habitat and cause environmental effects in the following ways:

- Temporary disturbance, or displacement from surrounding habitat, during Project construction and decommissioning activities due to increased human presence, noise and anthropogenic footprint;

- Loss of habitat due to Project infrastructure and crane pads during construction, operation, and decommissioning;
- Fatalities due to barotrauma or collisions with turbine towers or blades or the transmission line infrastructure during the operation; and
- Modifications to existing flight paths as bats avoid the PDA or are attracted to the area by tower lights during the operation.

Under *SARA*, general prohibitions apply regarding any SARA-listed bat (or other) species to the Proponent, staff and contractors. Personnel associated with all phases of the Project are to be made aware that no person will:

- Kill, harm, harass, capture or take an individual SAR;
- Possess, collect, buy, sell or trade an individual, or any part or derivative; and
- Damage or destroy the residence of one or more individuals.

To further reduce the likelihood of interactions between any phase of the Project and bats and bat habitat, the mitigation measures, summarized below in **Table 45** will be followed.

TABLE 45: POTENTIAL INTERACTIONS AND PROPOSED MITIGATION FOR BATS AND BAT HABITAT

Potential Interactions with Bat and Bat Habitat	Proposed Mitigation Measures
Temporary disturbance, or displacement from surrounding habitat, during Project construction and decommissioning activities due to increased human presence, noise and anthropogenic footprint. Loss of habitat due to Project infrastructure and crane pads during construction, operation, and decommissioning.	1) The Project footprint will be limited to that which is necessary to enable the Project to be carried out. 2) Vegetation will be retained where possible to maintain bats and bat habitat. 3) Any revegetation of a reclaimed site must be either naturally occurring or using native local vegetation in consultation with the landowner. 4) Existing roads and trails will be utilized to limit disturbance outside the Project footprint and minimize the interactions with bats and bat habitat. 5) Workers, particularly the on-site environmental monitor, will be familiarized with the bat SAR/SoCC identified as having the potential to occur on site prior to work commencing. 6) Should a bat SAR/SoCC be identified during Project activities, a buffer will be maintained, and additional mitigation measures will be developed in consultation with NSDNRR. 7) Bat SAR observations will be submitted to the AC CDC, following the directions on how to contribute data found at http://AC CDC.com/en/contribute.html
Fatalities due to barotrauma or collisions with turbine towers, blades or the transmission line infrastructure during operations.	8) A comprehensive AMP (**Appendix N**) will be developed and implemented in consultation with NSDNRR and CWS, including a follow up bat mortality survey to be conducted after the Project commissioning, and appropriate actions to be taken should there be a significant negative impact to

Potential Interactions with Bat and Bat Habitat	Proposed Mitigation Measures
	bats. 9) Non-operational towers will be dismantled if not expected to be put back into operation. 10) Lighting requirements will meet, but not exceed, Transport Canada standards to minimize the potential impacts to migratory birds.
Modifications to existing flight paths, as bats avoid PDA or are attracted to tower lights during operations.	Mitigation measures #8-10 are also applicable for potential modifications to existing flight paths.

Monitoring

A comprehensive AMP will be developed and implemented in consultation with CWS and NSDNRR (**Appendix N**). A post-construction bird and bat mortality survey will be conducted for two consecutive years following commissioning. The result of the post-construction surveys will determine if further mitigation is required in consultation with CWS and NSDNRR. Post-construction monitoring will include targeted events to capture the morning following favourable tail wind conditions.

Significance of Residual Effects

Disturbance of bat habitat has the potential to occur during the construction and operation phases of the Project. However, due to the low number of bat passes recorded at the Project site, limited predicted impacts to the habitat, the implementation of planned mitigation, and careful development of contingency and emergency response plans, it is anticipated that effects related to the Project will not be substantive.

Fatalities due to barotrauma or collisions with turbine towers or blades or the transmission line infrastructure during the operation will be monitored. Post-construction monitoring for bat mortality during operation will also verify the effect the Project has on bats. Should a significant amount of bat mortality be observed following the post construction surveys, the Proponent will follow the AMP (**Appendix N**) and engage regulatory authorities in applying additional mitigation measures.

3.2.8 Species At Risk

Potential Interactions and Mitigation

The Project is located in a primarily agricultural and forested area that has the potential to provide habitat for some SAR and SoCC. The Proponent is committed to protecting SAR, SoCC and their habitat as important features and VECs related to the Project. A significant effect is considered to include the loss of SAR, SoCC and their habitats. SAR and SoCC either confirmed or that have the potential to be present within the PDA are listed in **Section 3.1.7**.

Potential interactions and proposed mitigation measures for SAR and SoCC are dependent on the type of flora or fauna encountered and are discussed is the following sections:

- **Section 3.2.2:** Potential interactions and proposed mitigation measures for vegetation and lichen SAR and SoCC;
- **Section 3.2.3:** Potential interactions and proposed mitigation measures for terrestrial wildlife (including Mainland moose but excluding birds and bats) SAR and SoCC;
- **Section 3.2.4:** Potential interactions and proposed mitigation measures for wetlands
- **Section 3.2.5:** Potential interactions and proposed mitigation measures for fish and turtle SAR and SoCC
- **Section 3.2.6:** Potential interactions and proposed mitigation measures for bird SAR and SoCC
- **Section 3.2.7:** Potential interactions and proposed mitigation measures for bat SAR and SoCC

The potential interactions of the Project on species at risk and the proposed mitigation measures are summarized in **Table 46**.

TABLE 46: POTENTIAL INTERACTIONS & PROPOSED MITIGATION FOR SPECIES AT RISK

Potential Interactions with Species at Risk	Proposed Mitigation Measures
Disturbance and/or loss of SAR or SoCC if present within the Project due to increased human presence, noise and anthropogenic footprint during construction, operation and decommissioning.	1) Should a SAR/SOCC be identified during Project activities, a buffer will be maintained and additional mitigation will be developed in consultation with NSDNRR. 2) All workers will be informed of known/suspected SAR and SoCC and will be familiarized with their appearances prior to starting work. 3) Wildlife protection measures following the Environmental Management and Protection Plan (**Appendix O**) will be instated. 4) SAR observations will be submitted to the Atlantic Canada Conservation Data Centre, following the directions on how to contribute data found at http://ACCDC.com/en/contribute.html 5) SAR observation will also be submitted to the Canadian Wind Energy Association (CanWEA) database at: https://canwea.ca/

Significance of Residual Effects

The effects of the Project activities on SAR are expected to be limited to the Project footprint that is required to meet Project objectives. Disturbance of SAR and their potential habitat as a result of this Project will be avoided or minimized by employing the proposed mitigation measures. With the proposed mitigation, the residual interactions of the Project with SAR are

anticipated to be short in duration are not anticipated to be substantive because they are limited to the construction and reclamation phases.

3.2.9 Cumulative effects

Cumulative effects are changes to the environment that are caused by an action in combination with other past, present and future human actions (GoC 2022). Specific to the nature of the undertaking, cumulative effects are combined impacts that may occur when wind power projects or other types of projects are located in the same region (NSECC 2021). This area of the province has a number of existing wind energy developments. The nearest wind farms are as follows:

- Higgins Mountain Wind Phase I, a 3.6 MW project located approximately 9 km east from the Project. This project was commissioned in 2006.
- Fitzpatrick Mountain Wind, a 0.8 MW project located approximately 28 km from the Project. This project was commissioned in 2007.
- Nuttby Mountain Wind, a 50.6 MW project located approximately 40 km east from the Project. This project was commissioned in 2010.
- Amherst Wind, a 32 MW project located approximately 45 km from the Project. This project was commissioned in 2012.

Additionally, there are other forms of existing disturbances on, and adjacent to, the Project site, including:

- A quarry that has proposed an expansion from 4 hectares (ha) to 40.36 ha to the north of the site, and is situated approximately 0.5 km from the PDA;
- Public roads including highway 104 boarding the LAA to the east;
- Roads for historical and ongoing agricultural and forestry activities located within the LAA;
- Recreational trails for motorized vehicles (heavy equipment, passenger vehicles, and recreational vehicles including All Terrain Vehicles and snowmobiles) located throughout the LAA; and
- Telecommunication towers and the associated overhead power lines and access routes located within the LAA.

The Project is located in an area with ongoing agricultural and forestry land uses, including the following anthropogenic activities and developments:

- Historic and ongoing forestry activities within and adjacent to the PDA;
- Historic and ongoing agricultural activities within and adjacent to the PDA;
- Existing major transmission line corridor adjacent to the PDA;
- Existing telecommunication towers and associated infrastructure, including overhead power lines and access roads;
- Existing local roads, provincial roads, and Trans- Canada highway; and

- Operation of motorized vehicles (heavy equipment, passenger vehicles, and recreational vehicles including All Terrain Vehicles and snowmobiles) within and adjacent to the PDA.

In order to further reduce to potential for residual impacts to biophysical VECs during the Project phases, there will be a concerted effort to use existing cleared corridors found on site, to limit over story removal, and vegetation management.

Regional population-wide effects due to the Project would be unlikely because the anticipated terrestrial wildlife to be present within the PDA have populations considered to be secure in Nova Scotia by the AC CDC (2021). The Project's impact on terrestrial wildlife (excluding birds and bats) is predicted to be negligible in terms of significance of environmental effect. A significant environmental effect would result in a considerable change to wildlife populations such as a decline in abundance and/or a change in distribution, beyond which natural recruitment (i.e., reproduction and immigration from unaffected areas) would not return the population to its former level within several generations.

The projected cumulative effects on Mainland Moose, and other terrestrial wildlife from the Project are anticipated to be very low. While the Project is within an area considered to be core habitat in the Mainland Moose Recovery Plan (NSDNRR 2021), anthropogenic areas, including agricultural fields, are not considered part of core habitat as they do not meet the diverse biophysical requirements. As the Project is proposed in an area with ongoing agricultural and forestry land uses, and the Project will utilize existing cleared corridors, there is a reduced risk of effects to moose, their habitat, and their ability to traverse habitats associated with the Project.

The residual cumulative environmental effects of the Project in combination with past, present, or reasonably foreseeable projects or activities on wetlands during the phases including unplanned events are rated not significant. Impacts on turtles and turtle habitat is predicted to be negligible in terms of significance of environmental effect. A significant environmental effect would result if a considerable change to turtle populations was a result of project activities.

Without mitigation measures, cumulative impacts to watercourses and fish could occur due to the increased number of and use of site access roads in addition to the existing site uses. However, the mitigation measures detailed in **Section 3.2.5.1** have been carefully developed to prevent residual and cumulative impacts to watercourse and fish habitat as a result of the Project.

Bird and bat mortality in Atlantic Canada has been recorded as relatively low. Between 2008 and 2012, 7 datasets within 50 metres of turbine bases were collected at 5 wind power projects in Atlantic Canada (Bird Studies Canada et al. 2018). No mortalities were recorded for raptors in this time period. Using the Ontario Ministry of Natural Resources and Forestry (OMNRF) method, the estimated mortality for non-raptors averaged 1.03 ± 0.48 birds/turbine. Based on the same dataset, average mortality for bats in Atlantic Canada was 0.23 ± 0.05 bats/turbine. Using a different estimation method (Schoenfeld-Erickson and Huso) for the same dataset, the estimated mortality for non-raptor birds was reduced to 0.7 ± 0.11 birds/turbine. As for bats, results were similar to the ones obtained with the OMNRF method.

Average mortality for bats in Atlantic Canada was estimated at 0.24 ± 0.05 bats/turbine. These results are an indicator of low mortality rates among wind farms in Atlantic Canada.

The anticipated cumulative effects to biophysical VECs are anticipated to be low. By following the AMP, the EMPP, and through engagement of regulatory authorities, regional population-wide effects due to the cumulative residual effects of each existing land uses are considered unlikely.

4 Ambient Sound Levels

This section serves to fulfill the following request from the Minister's AIR:

4. Provide justification for the noise assessment methodology used and how the modelling software addresses these larger scale commercial wind-turbines (5 MW) and their sound level outputs at the nearest receptor locations. Refer to Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise (Health Canada, 2017) as necessary. The noise assessment should also ensure the modulation of sounds from operations, low frequency noise, proposed mitigation and monitoring.

4.1 Sound Level Assessments

The Project is located in a rural area with ongoing forestry, agricultural, and recreational activities. Due to these activities, as well as the site elevation and wind resource, ambient noise levels in the area may be elevated during short periods of time. As the site was chosen for its excellent wind resources, particularly windy days can greatly increase existing ambient sound levels. Prior to this assessment, careful siting of the turbines has reduced the majority of sound impacts to neighbouring residents. Based on the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia, the maximum allowable sound level from wind turbines at a receptor is 40 dB[A] in Nova Scotia.

The Proponent has undertaken a sound level impact assessment for the Representative 12T layout to determine the impact of the sound emissions from the Project on the dwellings, seasonal residences, and local businesses in the surrounding area during both construction and operation.

The Proponent reviewed the following documents in order to conduct the sound level impact assessment:

- Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia (2021);
- Federal Guidance for Evaluating Human Health Impacts in Environmental Assessment: NOISE (2017).
- Highway Traffic Noise Analyses and Abatement: Policy and Guidance. U.S. Department of Transportation (US Department of Transportation, 1995)
- Biological Assessment Preparation for Transportation Projects – Advanced Training Manual (Washington State Department of Transportation, 2017)

- Training Manual (Washington State Department of Transportation, 2017)

The Project and surrounding areas are considered a rural area, and ambient sound for this type of environment was considered as part of this assessment.

All turbines have been set back over a kilometer from the nearest dwellings. There are no schools, care homes, or other sensitive receptors within 2 km of the turbines and no other wind turbines within 3 km of the Project. The area is currently used for forestry. The current vegetation cover of trees and thick shrubs will aid in the absorption of sound from both construction and operation of the Project. The Project is not near the ocean.

There are 61 receptors located within 2 km of the turbine locations that consist of year-long dwellings and seasonal dwellings. As mentioned above, all receptors are located over 1 km away from the proposed turbine locations. They have been identified based on online geographical data from the Data Catalogue available from the Government of Nova Scotia and cross referenced with aerial photography, as well as site visits. The geographical coordinates of these receptors are included in **Appendix L**.

While several turbine models are being considered, this assessment has been completed using the Enercon E-160 EP5 E2 turbine. This model has a nameplate capacity of 5.5 MW, a hub height of 120 m and a rotor diameter of 160 m. The geographical coordinates of the Representative 12T layout are included in **Appendix L**. Should an alternate turbine model be selected, a new sound assessment will be conducted.

The sound level impact assessment study consisted of the following assessments:

- Construction Sound Assessment;
- Operation Sound Assessment; and,
- Operational Low Frequency Sound Assessment.

The construction sound assessment was conducted using standard methodology. Construction noise is not always constant and can produce impulsive and variable sounds at different noise levels, which could create heightened annoyance levels in the surrounding community. The construction noise assessment has considered the maximum noise levels produced by various construction equipment to determine maximum sustained noise levels when all equipment is running.

The operational sound assessment was conducted using the ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation model within the Decibel module of the software package, windPRO version 3.5. The *Guide to Preparing an EA Registration Document for Wind Power Projects* was consulted during this assessment.

4.1.1 Construction Sound Assessment

General construction activities include those associated with vegetation clearing, road building, foundations, and turbine erection. These activities will likely involve the use of backhoes, concrete mixers and pumps, cranes, dump trucks, excavators and light-duty pickup trucks with the associated sound levels predicted in **TABLE 47.**

Construction noise is not always constant and can produce impulsive and variable sounds at different noise levels. It is not expected that all equipment would be running at the same time, but to determine maximum expected sound levels during construction, the WSDoT (2017) guidelines for decibel addition were used to determine that 86 dB[A] is the highest expected sound level during combined construction activities (WSDoT 2017).

TABLE 47: SOUND POWER LEVELS ASSOCIATED WITH CONSTRUCTION EQUIPMENT (WSDOT 2017).

Equipment	Max Sound Power Level (dB[A])
Backhoe	78
Concrete Mixer	79
Concrete Pump	81
Crane	81
Dump Truck	76
Excavator	81
Pick-up Truck	75

In addition, occasional blasting may be associated with impact equipment use and that noise can reach 126 dBA (WSD0T 2017); however blasting is anticipated to occur infrequently and be of short duration. It is not expected that all equipment would be running at the same time, but to determine maximum expected sound levels during construction, the WSDoT (2017) guidelines for decibel addition were used to conclude that 86 dB[A] is the highest expected sound level during combined construction activities.

The environment in which the Project construction will occur is considered a soft environment with normal unpacked earth. The normal unpacked earth and topography will facilitate attenuation of noise emissions at shorter distances. **Table 48** identifies the sound levels predicted to be observed at various distances from the construction site determined using WSDoT (2017) guidelines.

TABLE 48: WORST-CASE SOUND LEVELS IN THE SURROUNDING ENVIRONMENT CALCULATED USING WSDOT (2017) GUIDELINES*

Distance	Construction Sound Level (dB[A])
50 ft. (15.2 m)	86

Distance	Construction Sound Level (dB[A])
100 ft. (30.5 m)	78.5
200 ft. (61 m)	71
400 ft. (122 m)	63.5
800 ft. (244 m)	56
1600 ft. (488 m)	48.5
3200 ft. (975 m)	41

* Assumes Sound Levels in Soft Environment Attenuates at -7.5 dB[A] per Doubling of Distance

Many sound level scales refer to 70 dB[A] as an arbitrary base of comparison where levels above 70 dB[A] can be considered annoying to some people (Purdue University 2017). As indicated in **Table 48**, at 61 m from the construction site, noise levels are approximately 70 dB[A], similar to that of a car travelling at 100 km/h and just at the threshold of possible annoyance (Purdue University 2000). Also indicated in **Table 48**, sound levels from the construction site reach approximately 40 dB[A] at 1 km from the site. With the nearest dwelling located approximately 1.5 km from a proposed turbine, construction noise is not expected to impact dwellings in the area. Further, the construction noise is not expected to be annoyingly high beyond 61 m from the construction site as sound levels at this distance have already attenuated to approximately 70 dB[A].

Additionally, this site has been chosen due to its excellent wind resource. Wind generally increases ambient sound levels in an area and in combination with the vegetative cover will aid in making construction noise less noticeable at even shorter distances (WSDoT 2017).

4.1.2 Operational Sound Assessment

The Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia requires that wind farm design and siting does not cause sound levels to exceed 40 dBA at the exterior of receptors. The more detailed recommendations included in the New Brunswick guidance document Additional Information Requirements for Wind Turbines created to outline additional requirements to the Environmental Impact Assessment Regulation are outlined in **Table 49**.

TABLE 49: RECOMMENDED SOUND CRITERIA FOR WIND TURBINES (ADDITIONAL INFORMATION REQUIREMENTS FOR WIND TURBINES).

Wind Speed (m/s)	4	5	6	7	8	9	10	11
Wind Turbine Sound Criteria (dB[A])	40	40	40	43	45	49	51	53

Using both the Nova Scotia and New Brunswick guidance documents, a threshold of 40 dB(A) for sound levels at the exterior of a receptor for all wind speeds was selected.

The operational sound pressure level was calculated at each point of reception using the Decibel module of WindPRO v.3.5, which uses the ISO 9613-2 method “Attenuation of sound

during propagation outdoors, Part 2: A general method of calculation". The ISO 9613-2 method is a general standard used to fit the requirements of any wind farm.

Low frequency sound is understood to the frequency of which is below 125 Hz. Infrasound describes sounds with a frequency less than 20 Hz and can occur when large masses are in motion (Leventhall 2007). In some cases, the movement of wind turbine blades has generated infrasound in the local environment (Bolin et al. 2011).

4.1.2.1 Model Assumptions

Ambient Noise Assumptions

In order to assess the cumulative sound impacts of adding wind turbines to the existing landscape, Natural Forces considered local existing noise sources, and reviewed guidelines on ambient noise modelling in other jurisdictions. For site-specific context, the following anthropogenic noise sources exist near the Project and in surrounding communities. These sources include but are not limited to:

- Passenger vehicles, transport trucks, forestry equipment, all-terrain vehicles, and snowmobiles operating on local roads and trails;
- Forestry activities;
- Existing transmission lines;
- Recreational activities; and
- Local pits and quarries.

The temporal frequency, duration, and specific locations of the above-mentioned noise vary significantly throughout the day and across seasons. As detailed in the Alberta Utilities Commission Noise Control Guidelines (AUC, 2021), this variation poses challenges to assessment and in some situations assumptions about existing noise levels are appropriate. As such, an assumption for ambient noise was determined. 35 dB[A], the average nighttime ambient sound level in rural Alberta (AUC, 2021) was applied to the model. As this project is located in rural Nova Scotia, 35dB[A] was determined to be an appropriate estimate of nighttime ambient noise.

Low Frequency Sound Model Assumptions

The low frequency noise assessment uses the Finland Low Frequency Noise calculation model, which operates under a number of assumptions. While operating under this model, WindPro automatically removes the A-weighting from the source noise level before processing the result. The software autofills most of the values and parameters that are part of this model, including wind speed frequency. The calculation is done at 8 m/s at 10m height, and looks at a range of frequencies from 20-200 Hz. The receptor file being used must be modified to check for low frequency, which is accomplished through the Objects pane. The calculation is then completed using the Decibel module in WindPro.

4.1.2.2 Methodology

The realistic-case sound assessment used site specific information in calculating sound levels by utilizing existing wind direction data. This model assumes downwind propagation is occurring simultaneously in all directions of the wind turbines. Sound propagation in an upwind direction would result in a significant reduction of sound levels at any receptor located upwind from the turbine. This means that the resulting sound levels from the assessment are likely calculated as higher than they would be experienced.

A ground attenuation value of 1 was used in this model to account for some absorption of sound by the surrounding environment. An ambient value of 35 dB(A) was added to the receptors in order to account for existing sound levels in addition to any sound produced by the WTGs. A demand type "2: WTG plus ambient noise is compared to ambient noise plus margin" was used to compare the sound levels from the WTGs alone, and with the added ambient value.

No correction for special audible characteristics, such as clearly audible tones, impulses, or modulation of sound levels, was made as part of this assessment. These are not common characteristics of modern WTGs in a well-designed wind farm. It is common that WTG manufacturers guarantee the absence of tonal sound produced by the WTG. Furthermore, impulses and modulation of sound levels from the wind farm under normal conditions would not be of a level to necessitate the application of any penalty.

4.1.2.3 Results

Realistic-case Sound Assessment

The results of the realistic-case sound prediction model for the receptors that are predicted to receive the highest expected sound levels are summarized in **Table 50**. A map of the Project area and the realistic case sound assessment contours with the receptors presented in **Figure 28**. The full windPRO results are included in **Appendix L**. All receptors adhere to the *Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia* in that the sound levels do not exceed 40 dBA at the receptors.

Table 50 shows the expected modeled sound levels that are predicted to be experienced at each of the 11 receptors predicted to receive the highest sound levels for any wind speed from 4.0 m/s to 12.0 m/s. The highest perceived sound (WTG + Ambient) is anticipated to be 36.9 dB(A) according to the current modelling.

TABLE 50: OPERATIONAL SOUND LEVEL SUMMARY OF THE 11 RECEPTORS PREDICTED TO RECEIVE THE HIGHEST ANTICIPATED SOUND LEVELS FOR ANY WIND SPEED MODELLED BETWEEN AND INCLUDING 4 TO 12 M/S.*

Receptor ID	Realistic Case Max Sound Level from WTG [dB(A)]	Realistic Case Max Sound Level from WTG and Ambient [dB(A)]	Compliance with Nova Scotia's Requirements (under realistic-case assessment)
BD	32.3	36.9	Yes

Receptor ID	Realistic Case Max Sound Level from WTG [dB(A)]	Realistic Case Max Sound Level from WTG and Ambient [dB(A)]	Compliance with Nova Scotia's Requirements (under realistic-case assessment)
AH	31.3	36.5	Yes
AV	31.3	36.5	Yes
BH	31.3	36.5	Yes
BB	30.9	36.4	Yes
BC	30.9	36.4	Yes
AF	30.2	36.2	Yes
AG	30.1	36.2	Yes
AE	29.6	36.1	Yes
AK	29.4	36.1	Yes
BE	29.5	36.1	Yes

* Model assumes an ambient noise level of 35 dB[S]. The combined sound level from WTGs and ambient were combined and calculated in Windpro.

Low Frequency Sound Assessment

An additional assessment was completed through the Finland Low Frequency module of windPRO v3.5. This assessment showed a minimum frequency of 80 Hz observed at all receptors, 60 Hz higher than the threshold for infrasound.

Results for this assessment are included in **Appendix L**. The results of the infrasound modeling show that the infrasound is not expected at the receptors since the lowest frequency created by the Project is expected to be much higher than the frequency designated as infrasound (20 Hz or less).